

# Unicenter® VM:Account®

## System Administrator's Guide

16



Computer Associates™

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# Contents

## Changes in Unicenter VM:Account

|                                                |     |
|------------------------------------------------|-----|
| Documentation Changes .....                    | xix |
| Name Change and Licensing .....                | xix |
| Support for Type '03' Accounting Records ..... | xix |

## About This Book

|                             |       |
|-----------------------------|-------|
| Syntax Conventions .....    | xxi   |
| Example Conventions .....   | xxiii |
| Related Documentation ..... | xxiii |

## Part I. Concepts and Tasks

### Chapter 1. About Unicenter VM:Account

|                                                     |   |
|-----------------------------------------------------|---|
| Assumptions .....                                   | 4 |
| Requirements .....                                  | 4 |
| COBOL .....                                         | 4 |
| CP Accounting Records .....                         | 4 |
| Operating Mode .....                                | 4 |
| Dynamic Deletion of Real Devices .....              | 5 |
| Running VM:Account□ .....                           | 5 |
| How Accounting Works .....                          | 6 |
| Implementing Accounting .....                       | 6 |
| Authorizations .....                                | 7 |
| Getting Information From Unicenter VM:Account ..... | 7 |
| Customizing Your System .....                       | 8 |

### Chapter 2. System Overview

### Chapter 3. Screens

|                                                          |    |
|----------------------------------------------------------|----|
| Accessing and Leaving Unicenter VM:Account Screens ..... | 13 |
| Screen and Menu Help .....                               | 15 |

## Chapter 4. Choosing an Accounting Method

|                                 |    |
|---------------------------------|----|
| Accounting Elements .....       | 17 |
| Customers .....                 | 17 |
| Account Numbers .....           | 18 |
| Projects .....                  | 19 |
| COSTABLE Files .....            | 20 |
| Accounting Structure .....      | 20 |
| Account Number Accounting ..... | 21 |
| Implementation .....            | 21 |
| Example .....                   | 22 |
| Project Accounting .....        | 23 |
| Implementation .....            | 25 |
| Example .....                   | 26 |

## Chapter 5. Resource Accounting

|                                                                 |    |
|-----------------------------------------------------------------|----|
| Setting Up a Charging System .....                              | 27 |
| Determining Rates .....                                         | 27 |
| Applying Rates to Data .....                                    | 28 |
| Charging for Software Package Usage .....                       | 29 |
| Multiple Entry Points .....                                     | 31 |
| How To Package Account a Software Package Database Module ..... | 31 |
| Charging for DASD Ownership (SFS and Minidisk) .....            | 32 |
| VMACCT DASDINFO Control File .....                              | 34 |
| EXCLUDE Record .....                                            | 35 |
| OVERLAP Record .....                                            | 36 |
| SETPROJ Record .....                                            | 36 |
| Example .....                                                   | 37 |
| Charging for SFS Usage .....                                    | 38 |
| Update the Unicenter VM:Account Service Virtual Machine .....   | 38 |
| Update the SFS Server Machine .....                             | 39 |
| Charging for SQL/DS Usage .....                                 | 39 |
| Update the Unicenter VM:Account Service Virtual Machine .....   | 40 |
| Update the SQL/DS Database Service Virtual Machines .....       | 40 |
| Initialize SQL/DS .....                                         | 42 |
| Charging for SQL/DS DBSPACE Ownership .....                     | 42 |
| Charging for Mountable Disk Usage .....                         | 43 |
| Charging for BrightStor VM:Archiver Usage .....                 | 44 |
| Charging for Unicenter VM:Batch Usage .....                     | 44 |
| Charging for BrightStor VM:Migrate Usage .....                  | 45 |
| Charging for Spool Usage .....                                  | 45 |
| Charging for BrightStor VM:Tape Usage .....                     | 45 |
| Charging for CA-VM:Webgateway Usage .....                       | 46 |
| Implementation .....                                            | 47 |
| Step 1. Set Up Accounting in CA-VM:Webgateway .....             | 47 |
| Step 2. Set Up Accounting in Unicenter VM:Account .....         | 48 |

|                                                                     |    |
|---------------------------------------------------------------------|----|
| Controlling CA-VM:Webgateway Accounting .....                       | 49 |
| Turning On Accounting .....                                         | 49 |
| Closing the CA-VM:Webgateway Accounting Punch File .....            | 49 |
| Turning Off Accounting .....                                        | 50 |
| Querying CA-VM:Webgateway Accounting .....                          | 50 |
| Closing the Period When Accounting for CA-VM:Webgateway Usage ..... | 51 |
| Charging for TSAF Usage .....                                       | 51 |
| Charging for RSCS Usage .....                                       | 52 |
| Charging for Non-Machine Resources .....                            | 52 |
| Charging for CMSBATCH Usage .....                                   | 53 |
| Charging for Guest I/O Usage .....                                  | 54 |
| Implementation .....                                                | 55 |

## Chapter 6. Surcharges and Discounts

|                                                  |    |
|--------------------------------------------------|----|
| Cost Table Search Order .....                    | 57 |
| Charging Different Customer Rates .....          | 58 |
| Charging Different Shift Rates .....             | 58 |
| Charging Different Daily and Holiday Rates ..... | 59 |

## Chapter 7. Performing Common Unicenter VM:Account Tasks

|                                                                          |    |
|--------------------------------------------------------------------------|----|
| Closing an Accounting Period .....                                       | 61 |
| Assumptions .....                                                        | 62 |
| Task 1: Closing the Accounting Period .....                              | 62 |
| Task 2: Preparing to Run the Compression Utility .....                   | 63 |
| Task 3: Running the Compression Utility .....                            | 64 |
| Creating Accounting Reports .....                                        | 65 |
| Assumptions .....                                                        | 65 |
| Task 1: Selecting Records From the Input File .....                      | 66 |
| Task 2: Running and Printing the Report .....                            | 67 |
| Setting Up Software Package Accounting for Unicenter VM:Sort .....       | 67 |
| Assumptions .....                                                        | 68 |
| Task 1: Identifying Unicenter VM:Sort to Unicenter VM:Account .....      | 68 |
| Task 2: Marking Unicenter VM:Sort for Software Package Accounting .....  | 68 |
| Task 3: Testing Your New VMSORT Module .....                             | 69 |
| Task 4: Putting VMSORT on the Public Minidisk .....                      | 70 |
| Task 5: Setting Up VMSLIB TXTLIB .....                                   | 70 |
| Reporting Daily CPU Usage .....                                          | 70 |
| Assumptions .....                                                        | 70 |
| Task 1: Sorting the Accounting Records .....                             | 70 |
| Task 2: Changing RAWDATA File Records to CP Format .....                 | 71 |
| Task 3: Creating the Unicenter VM:Account Capacity Planning Report ..... | 72 |
| Creating an Additional Copy of Accounting Data .....                     | 72 |
| Implementation .....                                                     | 72 |

|                                                       |     |
|-------------------------------------------------------|-----|
| Budgeting .....                                       | 73  |
| Budget Processing .....                               | 73  |
| Implementation .....                                  | 74  |
| Analyzing Long-Term Trends .....                      | 75  |
| Implementation .....                                  | 75  |
| Using Trend Information .....                         | 75  |
| Querying Unicenter VM:Account .....                   | 76  |
| Moving Around the Screen .....                        | 76  |
| PF Keys on Query Screens .....                        | 76  |
| Refining Full-Screen Queries .....                    | 77  |
| QUERY USAGE Operation .....                           | 78  |
| Control Files .....                                   | 79  |
| Creating a Control File .....                         | 79  |
| Displaying Information .....                          | 80  |
| Changing Information .....                            | 80  |
| QUERY USAGE Example .....                             | 80  |
| Modifying Unicenter VM:Account Tables and Files ..... | 85  |
| PF Keys on Update Screens .....                       | 89  |
| Update Screen Data Fields .....                       | 90  |
| Creating Locally Defined Accounting Records .....     | 99  |
| Implementation .....                                  | 100 |
| Re-allocating Costs .....                             | 100 |
| Reallocating Costs by Account Number .....            | 100 |
| Reallocating Costs by Project .....                   | 101 |
| Using Tapes .....                                     | 102 |
| BrightStor VM:Tape .....                              | 102 |
| FILEDEFS and LABELDEFS .....                          | 103 |
| Overriding the Default FILEDEFS .....                 | 103 |
| Improved Data Recording Capability Support .....      | 103 |
| PERIOD Command .....                                  | 103 |
| Example .....                                         | 104 |
| VMJSEL and VMJCMP Utilities .....                     | 105 |
| Using Tapes With VMJSEL .....                         | 105 |
| Using Tapes With VMJCMP .....                         | 105 |
| Using Tapes With Reports .....                        | 106 |

## Part II. Reference Material

### Chapter 8. Commands

|                                  |     |
|----------------------------------|-----|
| Entering Commands .....          | 110 |
| Pattern Matching .....           | 111 |
| Command Help .....               | 111 |
| ABEND Command .....              | 113 |
| CHARGE and CREDIT Commands ..... | 114 |
| CMS Command .....                | 117 |
| DASDACCT Command .....           | 118 |

|                       |     |
|-----------------------|-----|
| END Command .....     | 120 |
| PACKAGE Command ..... | 121 |
| PERIOD Command .....  | 122 |
| PROJECT Command ..... | 124 |
| QUERY Command .....   | 125 |
| REFRESH Command ..... | 130 |
| RESUME Command .....  | 131 |
| SUSPEND Command ..... | 132 |
| UPDATE Command .....  | 133 |
| VERIFY Command .....  | 140 |

## Chapter 9. Configuration File Records

|                       |     |
|-----------------------|-----|
| ACCTCRDS Record ..... | 144 |
| AUTHORIZ Record ..... | 145 |
| BUDGET Record .....   | 147 |
| CHGCUST Record .....  | 148 |
| COLLECT Record .....  | 149 |
| CONSOLE Record .....  | 151 |
| COSTSYMB Record ..... | 152 |
| CTLDISK Record .....  | 153 |
| DASDACCT Record ..... | 154 |
| DBDISK Record .....   | 157 |
| DBINDEX Record .....  | 158 |
| DBSPACE Record .....  | 160 |
| DIRECT Record .....   | 162 |
| DUMP Record .....     | 163 |
| FILEPOOL Record ..... | 164 |
| IGNORE Record .....   | 165 |
| MESSAGE Record .....  | 166 |
| PRODUCT Record .....  | 167 |
| PROJECT Record .....  | 169 |
| QRLIMIT Record .....  | 170 |
| QROUTPUT Record ..... | 171 |
| RSCSNODE Record ..... | 172 |
| SHIFT Record .....    | 173 |
| SIOCOUNT Record ..... | 175 |
| SPECIAL Record .....  | 176 |
| SYSOPER Record .....  | 177 |

|                       |     |
|-----------------------|-----|
| TRNDFILE Record ..... | 178 |
| USEREXIT Record ..... | 179 |
| WORKER Record .....   | 180 |

## Chapter 10. Utilities

|                                                                |     |
|----------------------------------------------------------------|-----|
| System Date Verification Utility (VMCLOCK) .....               | 183 |
| PERIODTE File Compression Utility (VMJCMP) .....               | 185 |
| Capacity Planning Utility (VMJCPR) .....                       | 196 |
| File Pool Allocation Table Conversion Utility (VMJCVTBL) ..... | 198 |
| Disk Volume Accounting Utility (VMJDVA) .....                  | 199 |
| Invalid File Report Utility (VMJIFR) .....                     | 202 |
| Software Package Accounting Utility (VMJPKG) .....             | 204 |
| VMJPKG Installation Utility (VMJPKINS) .....                   | 210 |
| Accounting Data Conversion Utility (VMJRAW) .....              | 211 |
| Recost Utility (VMJRCS) .....                                  | 213 |
| Security Violations Report Utility (VMJRSE) .....              | 218 |
| Installation Aid Utility (VMJSCD) .....                        | 221 |
| Record Selection Utility (VMJSEL) .....                        | 223 |
| SQL/DS Installation Utility (VMJSQINS) .....                   | 235 |
| SQL/DS DBSPACE Accounting Utility (VMJSQJ) .....               | 236 |
| Tape Storage Accounting Utility (VMJTVA) .....                 | 240 |

## Chapter 11. User Exits

|                                           |     |
|-------------------------------------------|-----|
| Implementing User Exits .....             | 244 |
| Requirements .....                        | 245 |
| User Exit Processing .....                | 245 |
| Writing User Exits Using OS Linkage ..... | 246 |
| Writing User Exits in REXX .....          | 246 |
| Compiled REXX .....                       | 247 |
| ACCTDATA User Exit .....                  | 248 |
| BUDGET User Exit .....                    | 249 |
| COMMAND User Exit .....                   | 251 |
| COSTING User Exit .....                   | 253 |
| ENDCMD User Exit .....                    | 254 |
| QUERY User Exit .....                     | 255 |
| RAWDATA User Exit .....                   | 257 |
| SHIFT User Exit .....                     | 259 |
| Callable Service Routines .....           | 260 |



## Chapter 12. COBOL Reports

|                                                             |     |
|-------------------------------------------------------------|-----|
| Overview .....                                              | 264 |
| Control Files .....                                         | 265 |
| Input Files .....                                           | 265 |
| Minidisk Requirements .....                                 | 265 |
| Modifying the Reports .....                                 | 266 |
| Compiler Options .....                                      | 266 |
| Accounting Record Data Descriptions .....                   | 267 |
| Compile Time .....                                          | 267 |
| Record Sorting and Selection .....                          | 268 |
| Report Execution Under Unicenter VM:Sort and CMS SORT ..... | 268 |
| Eliminating Unnecessary Sorting .....                       | 268 |
| Using Other Sorting Utilities .....                         | 269 |
| Running the Report .....                                    | 269 |
| Error Reporting .....                                       | 270 |
| Charge Summary Report (VMJCHRGs) .....                      | 271 |
| Invoice and Invoice Ledger Reports (VMJINVCE) .....         | 274 |
| Minidisk Utilization Summary Report (VMJMDISK) .....        | 277 |
| Miscellaneous Charges/Credits Report (VMJMISC) .....        | 279 |
| Monthly VM Utilization Report (VMJMONTH) .....              | 281 |
| Operations Overview Report (VMJORVW) .....                  | 283 |
| Quarterly VM Utilization Report (VMJQRTR) .....             | 286 |
| RSCS Utilization Report (VMJRSCS) .....                     | 288 |
| Resource Utilization Report (VMJRUT) .....                  | 290 |
| Utilization Trend Analysis (VMJTREND) .....                 | 291 |

## Chapter 13. Keyword Definitions

## Chapter 14. Resource Costing Files

|                                          |     |
|------------------------------------------|-----|
| Master Description Files .....           | 313 |
| Customer Master File .....               | 313 |
| Packages Master File .....               | 314 |
| Projects Master File .....               | 315 |
| Daily Events File .....                  | 316 |
| Customer Accounts List File .....        | 316 |
| Projects Accounts List File .....        | 317 |
| Holidays Validation File .....           | 318 |
| Miscellaneous Charges/Credits File ..... | 320 |
| COSTABLE Files .....                     | 320 |
| Valid Device Types .....                 | 321 |
| Session Costing File .....               | 326 |
| Dedicated Device Costing File .....      | 327 |
| Temporary Disk Costing File .....        | 328 |
| Link Charges Costing File .....          | 329 |
| Minidisk Costing File .....              | 330 |

|                                                   |     |
|---------------------------------------------------|-----|
| Package Surcharges Costing File .....             | 331 |
| Tape Mount Charges Costing File .....             | 333 |
| Volumes (Disk/Tape) Costing File .....            | 334 |
| RSCS Charges Costing File .....                   | 335 |
| VSCS Charges Costing File .....                   | 336 |
| Guest I/O Charges Costing File .....              | 337 |
| BrightStor VM:Archiver Charges Costing File ..... | 338 |
| SQL/DS Charges Costing File .....                 | 339 |
| Unicenter VM:Spool Charges Costing File .....     | 340 |
| Unicenter VM:Batch Costing File .....             | 341 |
| CA-VM:Webgateway Costing File .....               | 342 |
| TSAF Costing File .....                           | 343 |
| SQL/DS Storage Costing File .....                 | 344 |
| SFS Usage Costing File .....                      | 345 |
| SFS Storage Costing File .....                    | 346 |

## Chapter 15. Data Collection Files

|                                        |     |
|----------------------------------------|-----|
| Accounting Data Workfile .....         | 347 |
| Current Period-to-Date File .....      | 348 |
| Invalid Reader File .....              | 349 |
| Rejected Accounting Records File ..... | 349 |
| Accepted Accounting Records File ..... | 350 |
| Messages File .....                    | 350 |

## Chapter 16. Unicenter VM:Account Records

|                                                        |     |
|--------------------------------------------------------|-----|
| Description of Records .....                           | 351 |
| Raw Data Format .....                                  | 351 |
| PERIODTE Format .....                                  | 351 |
| The First 80 Bytes .....                               | 352 |
| Datatype and Record Type .....                         | 352 |
| User Exit Flag .....                                   | 354 |
| Billing/Data Flag .....                                | 354 |
| Surcharge Flag .....                                   | 355 |
| Time of Accounting (Begin) .....                       | 355 |
| Shift ID .....                                         | 355 |
| Link-Back Code .....                                   | 356 |
| Record Layouts .....                                   | 356 |
| Session Record Layouts .....                           | 357 |
| Dedicated Device Record Layouts .....                  | 359 |
| TDISK Record Layouts .....                             | 361 |
| Invalid Logon/ Autolog Record Layouts .....            | 363 |
| Successful Link Record Layouts .....                   | 364 |
| Unsuccessful Link Record Layouts .....                 | 366 |
| VSCS Record Layouts .....                              | 367 |
| Guest I/O Record Layouts .....                         | 369 |
| Volumes Record Layouts .....                           | 371 |
| MDISK Record Layouts .....                             | 373 |
| Miscellaneous Charges and Credits Record Layouts ..... | 375 |

BrightStor VM:Tape Mount Record Layouts ..... 377

RSCS Record Layouts ..... 379

BrightStor VM:Archiver Usage Record Layouts ..... 381

SQL/DS Usage Record Layouts ..... 383

Unicenter VM:Spool Usage Record Layouts ..... 385

TSAF Record Layouts ..... 387

SQL/DS Storage Record Layouts ..... 388

SFS Usage Record Layouts ..... 390

SFS Storage Record Layouts ..... 392

CA-VM:Webgateway Record Layouts ..... 394

**Chapter 17. Frequently Asked Questions**

**Index**



# Figures

|            |                                                                               |     |
|------------|-------------------------------------------------------------------------------|-----|
| Figure 1.  | Unicenter VM:Account System Overview .....                                    | 10  |
| Figure 2.  | Account Record Processing .....                                               | 11  |
| Figure 3.  | Relationship Between Account Numbers and Userids .....                        | 18  |
| Figure 4.  | Relationship Between Customer IDs and Account Numbers .....                   | 18  |
| Figure 5.  | Relationship Between Projects and Account Numbers .....                       | 19  |
| Figure 6.  | Relationship Between Customer IDs and Projects .....                          | 19  |
| Figure 7.  | Accounting Structure 1: Charging by Account Number .....                      | 21  |
| Figure 8.  | Accounting Structure 2: Charging by Project .....                             | 24  |
| Figure 9.  | Query Usage Selection Screen with Query Example .....                         | 80  |
| Figure 10. | Output from Query Usage, Screen 1 of 4 .....                                  | 81  |
| Figure 11. | Output from Query Usage, Screen 2 of 4 .....                                  | 82  |
| Figure 12. | Output from Query Usage, Screen 3 of 4 .....                                  | 83  |
| Figure 13. | Output from Query Usage, Screen 4 of 4 .....                                  | 84  |
| Figure 14. | System Files Update Selection Menu .....                                      | 85  |
| Figure 15. | Additional Options on the Software Package Accounting<br>Utility Screen ..... | 207 |
| Figure 16. | Charge Summary Report (VMJCHRGs) .....                                        | 272 |
| Figure 17. | Invoice and Invoice Ledger Reports (VMJINVCE) .....                           | 275 |
| Figure 18. | Minidisk Utilization Summary Report (VMJMDISK) .....                          | 278 |
| Figure 19. | Miscellaneous Charges/Credits Report (VMJMISC) .....                          | 280 |
| Figure 20. | Monthly VM Utilization Report (VMJMONTH) .....                                | 282 |
| Figure 21. | Operations Overview Report (VMJORVW)--Grand Total, Page 1 .....               | 284 |
| Figure 22. | Quarterly VM Utilization Report (VMJQRTR) .....                               | 287 |
| Figure 23. | RSCS Utilization Report (VMJRSCS) .....                                       | 289 |
| Figure 24. | Resource Utilization Report (VMJRUT) .....                                    | 290 |
| Figure 25. | Utilization Trend Analysis Report (VMJTREND) .....                            | 292 |



# Tables

|           |                                                                                              |     |
|-----------|----------------------------------------------------------------------------------------------|-----|
| Table 1.  | Types of Accounting Records Created by SFS .....                                             | 38  |
| Table 2.  | Types of Accounting Records Created by SQL/DS .....                                          | 39  |
| Table 3.  | Unicenter VM:Account Files You Can Select on the System Files<br>Update Selection Menu ..... | 86  |
| Table 4.  | Update Screen Data Fields .....                                                              | 90  |
| Table 5.  | Command Quick Reference .....                                                                | 109 |
| Table 6.  | Fields You Can Modify With the UPDATE Command .....                                          | 134 |
| Table 7.  | Configuration File Record Quick Reference .....                                              | 141 |
| Table 8.  | Unicenter VM:Account Commands and the Authorizations Required<br>to Run Them .....           | 146 |
| Table 9.  | Utility Quick Reference .....                                                                | 181 |
| Table 10. | Key Fields When Compressing Records .....                                                    | 187 |
| Table 11. | Fields VMJCMP Does Not Save in a Compressed Record .....                                     | 189 |
| Table 12. | VMJDVA Inventory Control File Structure .....                                                | 200 |
| Table 13. | User Exit Quick Reference .....                                                              | 243 |
| Table 14. | Callable Service Routines .....                                                              | 260 |
| Table 15. | PLIST Contents for Service Routines .....                                                    | 261 |
| Table 16. | COBOL Reports Quick Reference .....                                                          | 263 |
| Table 17. | Report Generation Checklist .....                                                            | 264 |
| Table 18. | Keywords Common to All Unicenter VM:Account Records .....                                    | 295 |
| Table 19. | Keywords for Session Records--Datatype 01 .....                                              | 298 |
| Table 20. | Keywords for Dedicated Device Records--Datatype 02 .....                                     | 299 |
| Table 21. | Keywords for TDISK Records--Datatype 03 .....                                                | 299 |
| Table 22. | Keywords for Successful Link Records--Datatype 05 .....                                      | 300 |
| Table 23. | Keywords for VSCS Records--Datatype 07 .....                                                 | 300 |
| Table 24. | Keywords for Guest I/O Records--Datatype 0C .....                                            | 301 |
| Table 25. | Keywords for Volumes Records--Datatype A3 .....                                              | 301 |
| Table 26. | Keywords for MDISK Records--Datatype A4 .....                                                | 302 |
| Table 27. | Keywords for Miscellaneous Charges and Credits Records--<br>Datatype A5 .....                | 302 |
| Table 28. | Keywords for BrightStor VM:Tape Mount Records--Datatype A6 .....                             | 303 |
| Table 29. | Keywords for RSCS Records--Datatype A7 .....                                                 | 303 |
| Table 30. | Keywords for BrightStor VM:Archiver Usage Records--Datatype A9 ..                            | 304 |
| Table 31. | Keywords for SQL/DS Usage Records--Datatype AA .....                                         | 305 |
| Table 32. | Keywords for Unicenter VM:Spool Usage Records--Datatype AB .....                             | 306 |
| Table 33. | Keywords for TSAF Records--Datatype AC .....                                                 | 306 |
| Table 34. | Keywords for SQL/DS Storage Records--Datatype AD .....                                       | 307 |
| Table 35. | Keywords for SFS Usage Records--Datatype AE .....                                            | 308 |
| Table 36. | Keywords for SFS Storage Records--Datatype AF .....                                          | 308 |
| Table 37. | Keywords for CA-VM:Webgateway Records--Datatype AG .....                                     | 309 |

|           |                                                                              |     |
|-----------|------------------------------------------------------------------------------|-----|
| Table 38. | Resource Costing Files Quick Reference .....                                 | 312 |
| Table 39. | CUSTOMER MASTER File .....                                                   | 313 |
| Table 40. | PACKAGES MASTER File .....                                                   | 314 |
| Table 41. | PROJECTS MASTER File .....                                                   | 315 |
| Table 42. | CUSTOMER ACCTLIST File .....                                                 | 317 |
| Table 43. | PROJECTS ACCTLIST File .....                                                 | 318 |
| Table 44. | HOLIDAYS MASTER File .....                                                   | 318 |
| Table 45. | MISCCHGS MASTER File .....                                                   | 320 |
| Table 46. | Valid Device Types and Equivalents .....                                     | 321 |
| Table 47. | SESSION COSTABLE File .....                                                  | 326 |
| Table 48. | DEDEVICE COSTABLE File .....                                                 | 327 |
| Table 49. | TDISK COSTABLE File .....                                                    | 328 |
| Table 50. | LINKS COSTABLE File .....                                                    | 329 |
| Table 51. | MDISK COSTABLE File .....                                                    | 330 |
| Table 52. | PACKAGES COSTABLE File .....                                                 | 331 |
| Table 53. | TAPMOUNT COSTABLE File .....                                                 | 333 |
| Table 54. | VOLUMES COSTABLE File .....                                                  | 334 |
| Table 55. | RSCS COSTABLE File .....                                                     | 335 |
| Table 56. | VSCS COSTABLE File .....                                                     | 336 |
| Table 57. | LGAI COSTABLE File .....                                                     | 337 |
| Table 58. | ARCHIVE COSTABLE File .....                                                  | 338 |
| Table 59. | SQL-DS COSTABLE File .....                                                   | 339 |
| Table 60. | SPOOL COSTABLE File .....                                                    | 340 |
| Table 61. | VMBATCH COSTABLE File .....                                                  | 341 |
| Table 62. | WEB COSTABLE File .....                                                      | 342 |
| Table 63. | TSAF COSTABLE File .....                                                     | 343 |
| Table 64. | DBSPACE COSTABLE File .....                                                  | 344 |
| Table 65. | SFS COSTABLE File .....                                                      | 345 |
| Table 66. | SFSDASD COSTABLE File .....                                                  | 346 |
| Table 67. | Data Collection Files Quick Reference .....                                  | 347 |
| Table 68. | Accounting Record Layout (PERIODTE Format) .....                             | 351 |
| Table 69. | Datatypes and Record Types in PERIODTE-Format Records .....                  | 353 |
| Table 70. | Session Record Layout--Datatype 01 (Raw Data Format) .....                   | 357 |
| Table 71. | Session Record Layout--Datatype 01 (PERIODTE Format) .....                   | 357 |
| Table 72. | Dedicated Device Record Layout--Datatype 02 (Raw Data Format) ....           | 359 |
| Table 73. | Dedicated Device Record Layout--Datatype 02 (PERIODTE Format) ...            | 360 |
| Table 74. | TDISK Record Layout--Datatype 03 (Raw Data Format) .....                     | 361 |
| Table 75. | TDISK Record Layout--Datatype 03 (PERIODTE Format) .....                     | 361 |
| Table 76. | Invalid Logon/ Autolog Record Layout--Datatype 04<br>(Raw Data Format) ..... | 363 |
| Table 77. | Successful Link Record Layout--Datatype 05 (Raw Data Format) .....           | 364 |
| Table 78. | Successful Link Record Layout--Datatype 05 (PERIODTE Format) ....            | 364 |
| Table 79. | Unsuccessful Link Record Layout--Datatype 06 (Raw Data Format) ...           | 366 |
| Table 80. | VSCS Record Layout--Datatype 07 (Raw Data Format) .....                      | 367 |
| Table 81. | VSCS Record Layout--Datatype 07 (PERIODTE Format) .....                      | 367 |



|            |                                                                                         |     |
|------------|-----------------------------------------------------------------------------------------|-----|
| Table 82.  | Guest I/O Record Layout--Datatype 0C (Raw Data Format) .....                            | 369 |
| Table 83.  | Guest I/O Record Layout--Datatype 0C (PERIODTE Format) .....                            | 369 |
| Table 84.  | Volumes Record Layout--Datatype A3 (Raw Data Format) .....                              | 371 |
| Table 85.  | Volumes Record Layout--Datatype A3 (PERIODTE Format) .....                              | 372 |
| Table 86.  | MDISK Record Layout--Datatype A4 (Raw Data Format) .....                                | 373 |
| Table 87.  | MDISK Record Layout--Datatype A4 (PERIODTE Format) .....                                | 373 |
| Table 88.  | Miscellaneous Charges and Credits Record Layout--Datatype A5<br>(Raw Data Format) ..... | 375 |
| Table 89.  | Miscellaneous Charges and Credits Record Layout--Datatype A5<br>(PERIODTE Format) ..... | 375 |
| Table 90.  | BrightStor VM:Tape Mount Record Layout--Datatype A6<br>(Raw Data Format) .....          | 377 |
| Table 91.  | BrightStor VM:Tape Mount Record Layout--Datatype A6<br>(PERIODTE Format) .....          | 377 |
| Table 92.  | RSCS Record Layout--Datatype A7 (Raw Data Format) .....                                 | 379 |
| Table 93.  | RSCS Record Layout--Datatype A7 (PERIODTE Format) .....                                 | 380 |
| Table 94.  | BrightStor VM:Archiver Usage Record Layout--Datatype A9<br>(Raw Data Format) .....      | 381 |
| Table 95.  | BrightStor VM:Archiver Usage Record Layout--Datatype A9<br>(PERIODTE Format) .....      | 382 |
| Table 96.  | SQL/DS Usage Record Layout--Datatype AA (Raw Data Format) .....                         | 383 |
| Table 97.  | SQL/DS Usage Record Layout--Datatype AA (PERIODTE Format) ...                           | 384 |
| Table 98.  | Unicenter VM:Spool Usage Record Layout--Datatype AB<br>(Raw Data Format) .....          | 385 |
| Table 99.  | Unicenter VM:Spool Usage Record Layout--Datatype AB<br>(PERIODTE Format) .....          | 386 |
| Table 100. | TSAF Record Layout--Datatype AC (Raw Data Format) .....                                 | 387 |
| Table 101. | TSAF Record Layout--Datatype AC (PERIODTE Format) .....                                 | 387 |
| Table 102. | SQL/DS Storage Record Layout--Datatype AD (Raw Data Format) .....                       | 388 |
| Table 103. | SQL/DS Storage Record Layout--Datatype AD (PERIODTE Format) ..                          | 389 |
| Table 104. | SFS Usage Record Layout--Datatype AE (Raw Data Format) .....                            | 390 |
| Table 105. | SFS Usage Record Layout--Datatype AE (PERIODTE Format) .....                            | 391 |
| Table 106. | SFS Storage Record Layout--Datatype AF (Raw Data Format) .....                          | 392 |
| Table 107. | SFS Storage Record Layout--Datatype AF (PERIODTE Format) .....                          | 393 |
| Table 108. | CA-VM:Webgateway Record Layout--Datatype AG<br>(Raw Data Format) .....                  | 394 |
| Table 109. | CA-VM:Webgateway Record Layout--Datatype AG<br>(PERIODTE Format) .....                  | 395 |



# Changes in Unicenter VM:Account

Unicenter VM:Account Release 1.6, Gen Level 0212, is released as part of the CA VM:Manager Release 2.8, Service Pack 01.

For a complete listing of all changes in CA VM:Manager Service Pack 01, see the *Release Summary* document.

## Documentation Changes

This section lists the documentation changes specific to Unicenter VM:Account. Technical changes to existing information in this guide are identified by vertical bars in the outer page margins.

### Name Change and Licensing

- References to the product name now contain the Computer Associates brand name. This change is reflected in product initialization messages, the copyright screen, and the initial screens for the end user, system operator, and system administrator. This change is reflected throughout the product documentation set, and in some messages.
- To address Computer Associates License Management Program (LMP) key support, all references to the CPUID have been removed from the product messages, and new messages have been added that pertain to CA LMP keys. Additionally, CPUID references have been removed from the product documentation set.

### Support for Type '03' Accounting Records

Unicenter VM:Account Release 1.6 provides support for new Network Data Transmissions (record type '0C') accounting records. These records, first available in z/VM Version 4 Release 3 Modification 0, provide "Linux Guest Accounting Improvements." In particular, they provide information about resource consumption for characters sent/received via virtual network interface cards (vNICs), virtual channel-to-channel adapters (CTCAs), and inter-user communication vehicle (IUCV) or advanced program-to-program (APPC) connections by guest virtual machines.

If you are using 390 processors running z/VM to run multiple instances of the Linux Operating System, you can use Unicenter VM:Account Release 1.6 to monitor and perform chargeback of those resources, setting different rates based on guest access from vNICs, CTCA, or IUCV/APPC.

After setting the rates, based on the needs of your site, you can charge the users making use of these virtual connections.

In support of guest I/O accounting, the Unicenter VM:Account QUERY USAGE line-mode command and full-screen version has been extended to report on guest I/O resource usage. Additionally, cost table files for guest I/O data have been added to enable you to specify rate information and control these connections. If you need to report on these transmissions, the raw account data records are provided.

The following specific areas of the documentation have been updated to support guest I/O accounting records:

- ▶ Instructions for implementing guest I/O accounting. See Chapter 5, *Resource Accounting* for details.
- ▶ **Selection 2. Guest Virtual I/O**, has been added to the System Files Update Selection Menu. This menu option enables you to specify rate information in the new Guest I/O Costable file, LGAI COSTABLE.
- ▶ Guest I/O accounting information is included in the output from both the QUERY USAGE line-mode command and full-screen versions.
- ▶ Fields you can modify for Guest I/O Costable file (GIOcost) have been added to the UPDATE line-mode command and full-screen versions.
- ▶ LGAI has been added as a datatype to ignore on the IGNORE record.
- ▶ VMJCMP utility has been updated to include record type '0C' accounting records. VMJCMP does not compress '0C' records, however, the record type has been added to the list of fields that VMJCMP does not save in a compressed record.
- ▶ Record type 0C, to indicate Guest I/O accounting records, has been added to the RECTYPE parameter on the VMJRCS utility.
- ▶ Guest I/O accounting keywords used in the VMJSEL utility and the full-screen QUERY USAGE command, have been added. See Chapter 13, *Keyword Definitions*, for a listing of the keywords.
- ▶ The LGAI COSTABLE (Guest I/O Charges Costing) file information has been added. See Chapter 14, *Resource Costing Files* for complete file information.
- ▶ Record layouts for the Guest I/O resource costing files, both the 80-byte raw data format and the 240-byte PERIODTE format, have been added. See Chapter 16, *Unicenter VM:Account Records* for complete record information.



# About This Book

---

This book is designed for system administrators responsible for customizing and maintaining Unicenter VM:Account.

It assumes you are thoroughly familiar with VM/CMS standards, conventions, and operation, and with the daily requirements of your VM environment.

The information in this book describes how to customize Unicenter VM:Account to your data center's requirements and explains how to use Unicenter VM:Account for resource accounting, reporting, and capacity management.

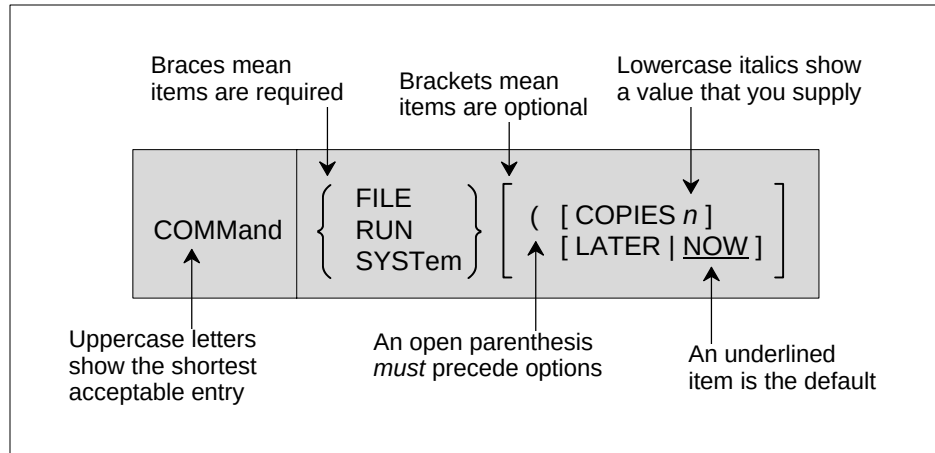
The contents of this book are organized into two parts.

- ▶ Part I, *Concepts and Tasks*, provides an explanation of the variety of accounting chores that Unicenter VM:Account assists you with (for example, charge users for tape mounts). Part I also includes task-oriented instructions for performing common accounting jobs.
- ▶ Part II, *Reference Material*, provides reference material on topics such as Unicenter VM:Account commands, configuration file records, and record layouts.

## Syntax Conventions

Syntax for commands, records, control statements, utilities, and user exits are shown in the reference chapters of this book. They follow the conventions illustrated and described below.

Note that the brackets, braces, and underscore symbols are used only to define the format; do not type them as part of your entry.



Vertically listed items enclosed in braces or not enclosed in anything are required, as follows:

**This format:**                      **Means you must select:**

|                                                             |                   |
|-------------------------------------------------------------|-------------------|
| $\left\{ \begin{array}{c} A \\ B \\ C \end{array} \right\}$ | One item only     |
| $\begin{array}{c} A \\ B \\ C \end{array}$                  | At least one item |

Vertically listed items enclosed in brackets are optional, as follows:

**This format:**                      **Means you can select:**

|                                                                                                                                                     |                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| $\left[ \begin{array}{c} A \\ B \\ C \end{array} \right]$ or $\left[ \begin{array}{c} A \\ B \\ C \end{array} \right]$ or $[A   B   C]$             | One item only                                |
| $\left[ \begin{array}{c} ([A]) \\ [B] \\ [C] \end{array} \right]$ or $\left[ \begin{array}{c} [A] \\ [B] \\ [C] \end{array} \right]$ or $[A][B][C]$ | One or more items                            |
| $[A [B [C]]]$                                                                                                                                       | The first, the first two, or all three items |

You can use upper or lower case when you enter commands. Enter these special characters exactly as shown:

|   |          |   |        |     |                        |   |            |
|---|----------|---|--------|-----|------------------------|---|------------|
| * | asterisk | : | colon  | -   | hyphen                 | = | equal sign |
| , | comma    | . | period | ( ) | open/close parentheses |   |            |

Some syntax boxes include an ellipsis (...). If the ellipsis is shown in a list (for example,  $userid_1 \text{ } userid_2 \text{ } \dots \text{ } userid_n$ ), it represents values not shown. If the ellipsis appears at the end of one line and at the beginning of the next, it means the line was broken because of space constraints. Do not type the ellipses as part of the syntax.

## Example Conventions

Examples are shown throughout the text of this book to illustrate when to use commands, how to use options, or how the system responds to your entries. The examples are illustrations only and may differ slightly from what appears on your screen.

Bold characters represent user entries. If the entry is a command, it appears in lowercase letters even though you can enter commands in either upper or lower case. A command that a user enters looks like this:

**vmacct package start testpkg2**

If the entry is a record, it appears in uppercase letters. A record that a user enters looks like this:

**DASDACCT SCAN 23:30:00**

Uppercase, nonbold characters represent system responses or prompts. A system response looks like this:

ENTER PASSWORD

## Related Documentation

There are two books that make up the Unicenter VM:Account library. The first is the book you are now reading. The other is *Unicenter VM:Account Messages and Codes*, which lists all messages that Unicenter VM:Account produces, the possible cause of the situation that generated the message, and any actions to take in response to the situation. The book also has a cross-reference that lists the first 60 characters of each Unicenter VM:Account message in alphabetical order.

There are other Computer Associates manuals to which you may want to refer. These include:

- ▶ *CA VM:Manager Installation Guide*
- ▶ *CA VM:Manager Upgrade Guide*
- ▶ *CA VM:Manager Reference Manual*
- ▶ *Component Interface Guide*
- ▶ *Generalized Report Writer Guide*
- ▶ *BrightStor VM:Archiver System Administrator's Guide*
- ▶ *BrightStor VM:Archiver User's Guide*
- ▶ CA-VM:Webgateway online documentation





# **Concepts and Tasks**



# About Unicenter VM:Account

---

Unicenter VM:Account is a resource accounting, reporting, and capacity management system for the VM environment. Unicenter VM:Account provides:

- ▶ Project accounting, software-package accounting, and minidisk and Shared File System (SFS) accounting
- ▶ Online querying
- ▶ Reporting and invoicing
- ▶ Budget control facilities
- ▶ Real-time collecting, validating, processing, and reporting on VM accounting data, allowing accurate cost allocation and cost recovery
- ▶ Preservation of data integrity and protection against lost accounting data
- ▶ Workload balancing through discounts and surcharges
- ▶ An audit trail for all CMS user activity, allowing long-term trend analysis
- ▶ Full-screen maintenance of the Unicenter VM:Account project, customer, account number, and rate information tables

Unicenter VM:Account lets you assert greater control over your data center by giving you the information to:

- ▶ Estimate and justify data center costs
- ▶ Monitor system resource usage and plan for system upgrades
- ▶ Track and charge for software package usage
- ▶ Charge users or organizations for resource consumption
- ▶ Allocate resource usage to projects
- ▶ Control and track project costs and budget limits

Unicenter VM:Account continuously collects VM accounting information, performing real-time validation and costing as it receives data. This allows queries and reports to provide up-to-the-minute information.

## Assumptions

This book makes the following assumptions:

- ▶ VMRMaint is your maintenance userid.
- ▶ MAINT is your directory maintenance userid.
- ▶ VMACCT is the userid for your Unicenter VM:Account service virtual machine.

If you are using a different naming convention, substitute your userids for the defaults.

## Requirements

Computer Associates products support VM releases that are supported by IBM. To see a list of the supported releases, select the VM Software News option on the VMIMaint Main Menu. For information about accessing this menu, refer to the *CA VM:Manager Installation Guide*.

## COBOL

If you plan to run the Unicenter VM:Account reports, you must have the IBM VS COBOL II, VS COBOL, or Language Environment run-time library.

If you plan to modify the Unicenter VM:Account reports, you must have the IBM VS COBOL II, VS COBOL, or IBM COBOL for MVS & VM compiler.

## CP Accounting Records

Unicenter VM:Account can process site-defined accounting records, but it cannot process modified CP accounting records. If your site has modified the standard CP accounting records, you must either remove these modifications or use the RAWDATA user exit to reformat them in accordance with CP standards.

## Operating Mode

The Unicenter VM:Account service virtual machine can run in ESA or XC mode. If during initialization Unicenter VM:Account determines that its service virtual machine is running with the 370 Accommodation feature turned off, Unicenter VM:Account automatically turns the feature on and notifies you by sending a message. When you end Unicenter VM:Account, it automatically turns the feature back off.

---

**Note:** Unicenter VM:Account does not automatically reset the 370 Accommodation Feature when a user exit returns control; therefore, if you use Unicenter VM:Account user exits, it is up to you to set and reset the mode properly.

---

End users communicating with Unicenter VM:Account through the VMACCT MODULE can run in ESA mode with the 370 Accommodation Feature turned on or off, or in XC mode.

The Unicenter VM:Account Retriever virtual machine, which passes accounting records to the Unicenter VM:Account service virtual machine, can run with the 370 Accommodation Feature on or off.

The Unicenter VM:Account DASDACCT virtual machine (VMJDASD), which accounts for DASD usage, must run with the 370 Accommodation Feature on. When this userid is autologged, the feature is automatically set on if necessary.

### Dynamic Deletion of Real Devices

All versions of VM allow real devices to be dynamically deleted or cleared. If you dynamically delete or clear a device, you must reinitialize Unicenter VM:Account.

### Running VM:Account

The userid that runs the VMJRET EXEC, the function that receives accounting records from CP, is the one that is defined in the ACCOUNT1 (or the ACCOUNT2) parameter of the SYSTEM\_USERIDS statement in the SYSTEM CONFIG file for your system. The VMJRET EXEC blocks them into groups of 82 records (two spool file buffers), and sends the blocks to the Unicenter VM:Account service virtual machine for processing. In this way, VMJRET passes accounting records between CP and Unicenter VM:Account.

The VMJRET EXEC should run constantly, even if Unicenter VM:Account is down. You can lose accounting data if you turn off the VMJRET EXEC for a long time.

You can issue the following command from the Unicenter VM:Account service virtual machine userid specified in the VMJRET EXEC or the VM system operator.

|          |                               |
|----------|-------------------------------|
| #CP SMSG | <i>userid</i> [ CLOSE   END ] |
|----------|-------------------------------|

**userid**  
is the virtual machine running the VMJRET EXEC.

**CLOSE**  
VMJRET sends all the records it has collected to the Unicenter VM:Account service virtual machine even if it does not have the full 82-record block. The Unicenter VM:Account service virtual machine issues this command when a user requests an account number change or when a QUERY USAGE is issued.

**END**  
ends execution of the VMJRET EXEC. This command can also be issued from the service virtual machine on which the EXEC is executing.

## How Accounting Works

To run Unicenter VM:Account, you need a userid to run the VMJRET EXEC. This userid is known as the Retriever machine. You can create a new service virtual machine for running VMJRET or you can modify the DISKACNT userid. In either case, you must AUTOLOG the userid and include EXEC VMJRET in its PROFILE EXEC so that accounting record processing begins as soon as the system comes up.

Do not run VMJRET from the Unicenter VM:Account service virtual machine or system administrator userid because VMJRET must run whenever VM/ESA is up and the userid will be unavailable for any other work.

The userid specified in the ACCOUNT1 (or ACCOUNT2) parameter of the SYSTEM\_USERIDS statement in the SYSTEM CONFIG file is the one that collects accounting records. The default userid is OPERACCT. Refer to the *z/VM Planning and Administration* manual for detailed information about this configuration statement.

Do not specify the D8ONECMD FAIL parameter on the directory record option or the line-mode command for the Unicenter VM:Account service virtual machine.

## Implementing Accounting

1. Update the VMACCT directory entry to include:
  - OPTION D84NOPAS record (to perform PACKAGE or PROJECT accounting, or to use the Unicenter VM:Account interface to eTrust VM:Director or eTrust VM:Secure)
  - MACHINE ESA record
2. Make sure the userid you set up to do the accounting record retrieval (the Retriever machine) is specified in either the SYSTEM\_USERIDS ACCOUNT1 or ACCOUNT2 system configuration file statement or the SYSACNT macro instruction. Also, verify that the userid has the IUCV \*ACCOUNT record in its directory entry.
3. Make sure the Retriever machine userid conforms to the following specifications:
  - Virtual size: 8M (minimum)
  - Disk size: 1 cylinder (minimum)
  - Disk virtual address: 191
  - PROFILE EXEC commands:
    - CP LINK VMACCT 192 192 RR
    - ACC 192 D
    - EXEC VMJRET

4. Modify VMJRET EXEC to set:
  - a. Spool file class--must match the class specified on the COLLECT record in the VMACCT CONFIG file.
  - b. Userid of the Unicenter VM:Account service virtual machine--must match the name of the Unicenter VM:Account service virtual machine that you want to receive accounting records.
5. Add a PRODUCT VMJRTRVR record to the VMACCT CONFIG file to identify the userid of the Retriever machine running the VMJRET EXEC. See *PRODUCT Record* on page 167 for more information.

## Authorizations

You can give users the ability to execute specific commands. For a list of those commands and complete information about enabling their use, see Table 8 on page 146.

## Getting Information From Unicenter VM:Account

Unicenter VM:Account provides accounting information in the form of:

### ► Full-screen queries

The QUERY USAGE command displays the Query Usage Selection Screen, which contains onscreen resource usage information for your userid. This screen lets you specify the type and amount of resource consumption information. For more information about the full-screen version of the QUERY command, refer to page 76.

### ► Reporting

Unicenter VM:Account has 10 COBOL reports to provide information about your accounting system. These reports are listed and described in Chapter 12, *COBOL Reports*.

You can run a report against the PERIODTE CURRENT file, a closed PERIODTE file, or a trend file. A report's control file enables you to control the data you want to display in the report and the appearance of the report.

### ► Trend files

Unicenter VM:Account can collect data over time so you can analyze long-term trends in resource usage. This data is maintained in a trend file. Trend files can be used as input to online queries or reports. Refer to *Analyzing Long-Term Trends* on page 75 for more information about trend files.

## Customizing Your System

After installing Unicenter VM:Account, you will have a basic data collection and reporting system. Computer Associates provides you with a configuration file that gives some basic information to Unicenter VM:Account and allows it to:

- ▶ Collect data
- ▶ Generate accounting records
- ▶ Perform minidisk accounting
- ▶ Charge customers by account number
- ▶ Index the database by the first character of the userid

The complete Unicenter VM:Account system offers many more features. Refer to Chapter 5, *Resource Accounting*, and Chapter 9, *Configuration File Records*, for further information and instructions about how to install these features at your site.



# System Overview

---

Unicenter VM:Account uses a number of files and processes while performing its tasks. Figure 1 on page 10 illustrates the relationship among the files and processes. Figure 2 on page 11 illustrates the flow of data through the system.

Here is a description of some of the entities presented in Figure 1:

**Invalid Reader Files (*yymmdd* INVFILES)**

Accounting records that come from a userid not authorized to send accounting records to Unicenter VM:Account. You can read about invalid reader files on page 349.

**Rejected Accounting Records (*yymmdd* REJECTS)**

Rejected accounting records are records coming from a valid userid. Unicenter VM:Account did not have enough information to cost them. When you correct the problem, the data can be reissued to Unicenter VM:Account for processing. You can read about the rejected records file on page 349.

**Accepted Accounting Records (*RAWDATA \$\$yymmdd*)**

Exact 80-byte copies of records as received by Unicenter VM:Account. You can read about the accepted records file on page 350.

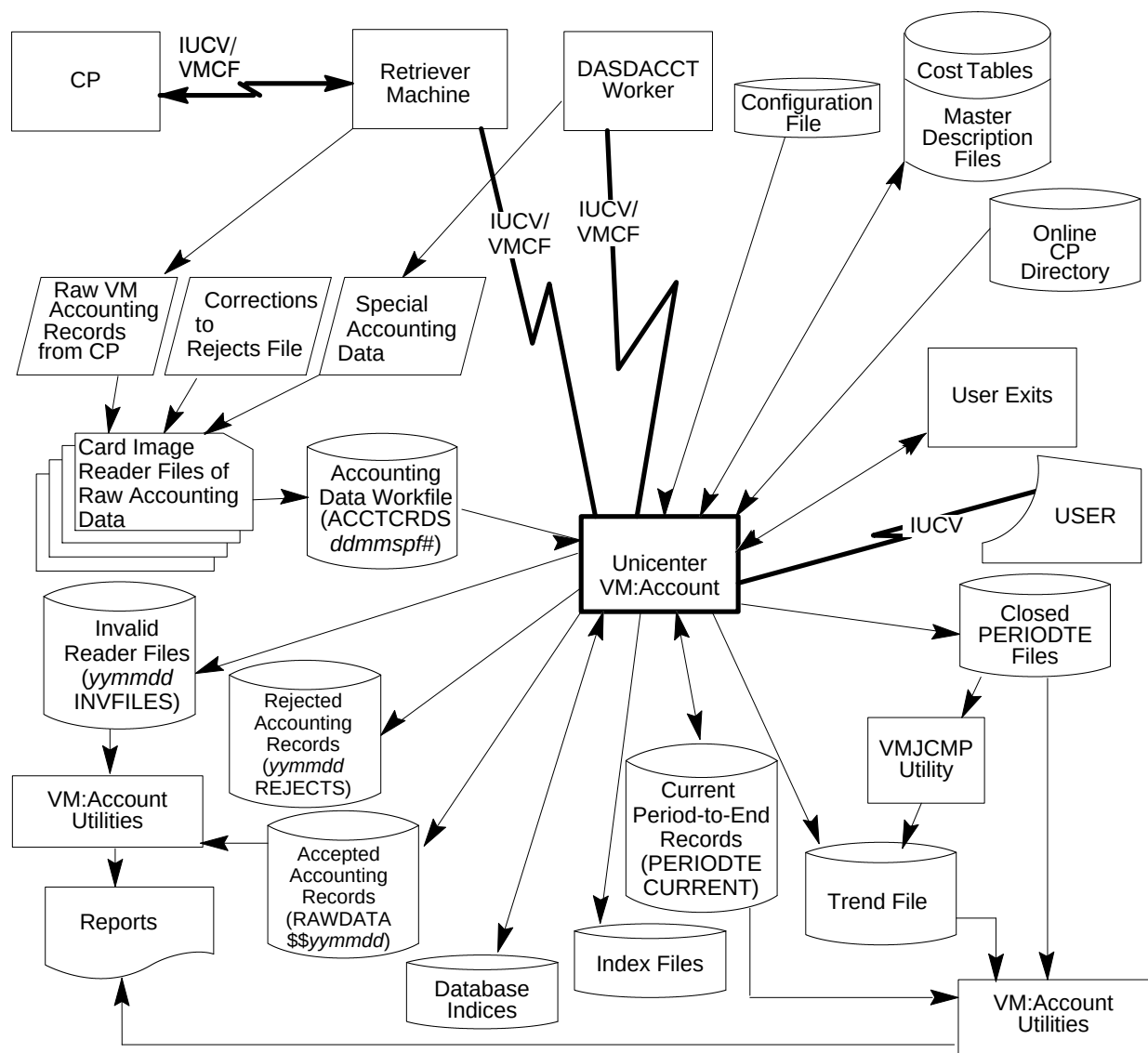


Figure 1. Unicenter VM:Account System Overview

#### Current Period-to-End Records (PERIODTE CURRENT)

Records that Unicenter VM:Account has processed and calculated rates for. You can read more about this file on page 348.

#### Accounting Data Workfile (ACCTCRDS ddmmsp#)

Intermediate file of spool file image of records being received by Unicenter VM:Account. You can read about the workfile on page 347.

#### Closed PERIODTE Files (PERIODTE filetype)

A PERIODTE file that has been closed by the PERIOD command.

#### Trend File

A file containing records that represent multiple closed-out, compressed periods produced by the VMJCOMP utility. The trend files are used to analyze trends in accounting.

**Index Files (CURRENT DBIXFILE, CURRENT IXIXFILE, TRNDFILE DBIXFILE, TRNDFILE IXIXFILE)**

Files used to index into the current PERIODTE and trend files for online queries. You can read about the DBINDEX configuration file record on page 158 for information about controlling the size and contents of index files.

**DASDACCT Worker**

A worker machine that gathers DASD ownership information about minidisks and SFS filepools and generates appropriate accounting records. See page 32 for an explanation of how to charge for DASD ownership (SFS and minidisk).

**Retriever Machine**

A service virtual machine that collects CP accounting records from CP and passes them in spool files to Unicenter VM:Account.

**Cost Tables and Master Description Files**

Files used as input for processing the accounting records. They control project and package use. You can read about these files in Chapter 14, *Resource Costing Files*.

Figure 2 illustrates the flow of data through the system.

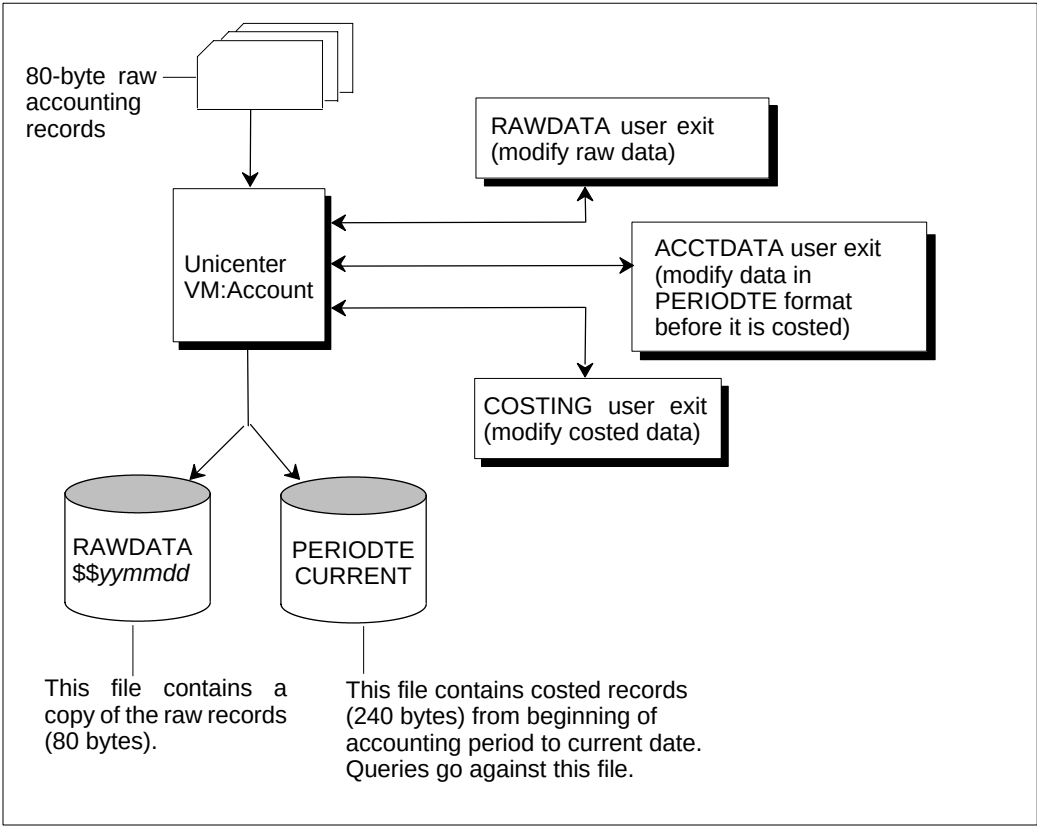


Figure 2. Account Record Processing



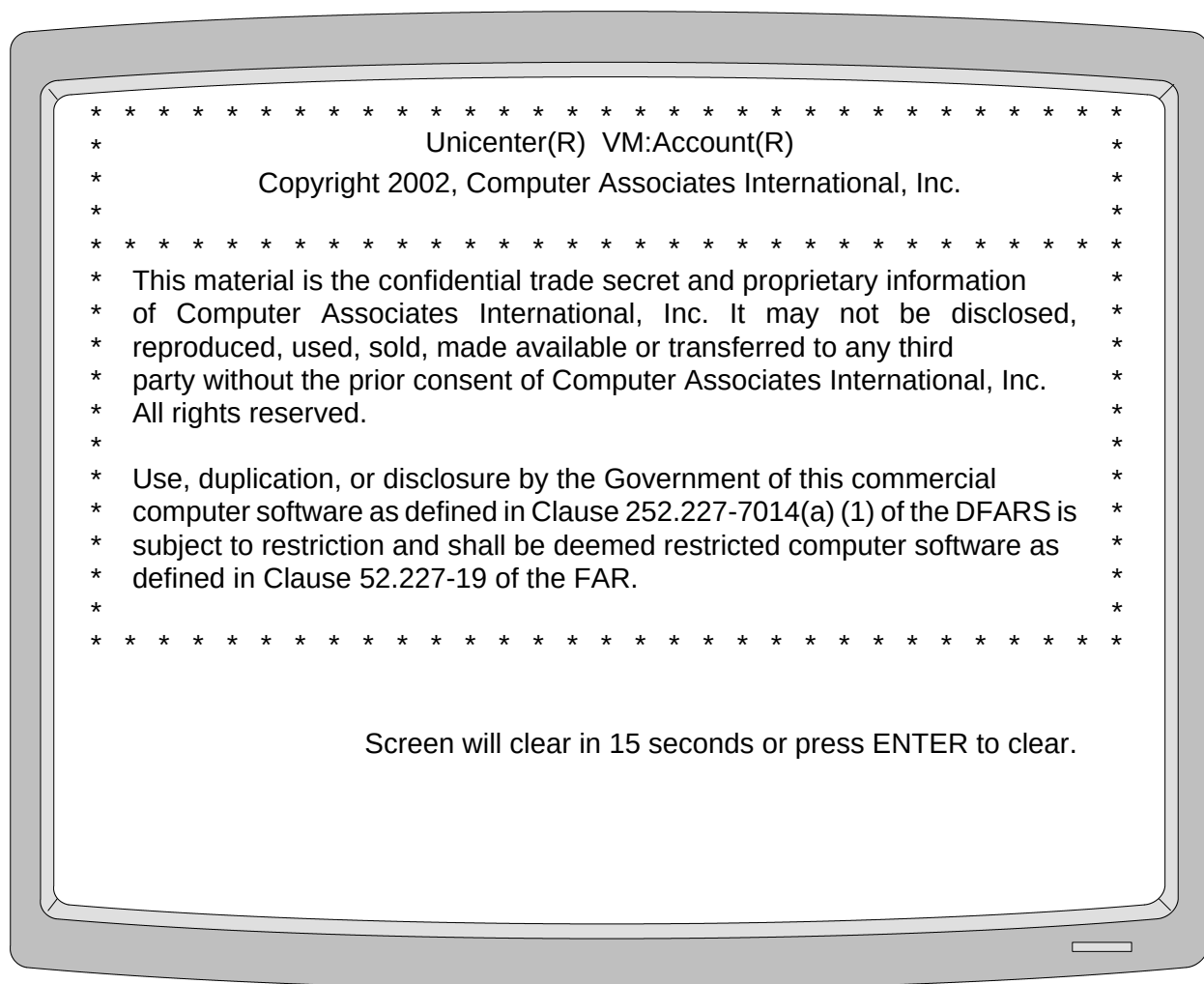
Screens facilitate data entry and are particularly appropriate for the Unicenter VM:Account novice.

## Accessing and Leaving Unicenter VM:Account Screens

The CHARGE, CREDIT, QUERY USAGE, and UPDATE commands and the package accounting utility (VMJPKG) all have full-screen versions. To access their screens, enter **vmacct** and the command name. For example, to display the Query Usage Selection screen, enter:

**vmacct query usage**

If this is the first time you have accessed Unicenter VM:Account after IPLing CMS, you see the copyright screen (shown below). If you want to prevent the copyright screen from appearing again, rename or erase the VMACCT COPYRIGHT file on the public minidisk.



All Unicenter VM:Account screens have five standard PF key functions. The table below lists and describes these functions. PF keys used for a particular process are described in the section for that process.

| Key<br>(Label) | Function                                                                                                                                                                                |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PF1<br>(Help)  | Displays an online help screen. Position the cursor in any field and press to get help for that field. Position the cursor on the command line and press to obtain help for the screen. |
| PF3<br>(Quit)  | Returns you to the previous screen. If there is no previous screen, you are returned to CMS. Unicenter VM:Account ignores any changes made to the screen that you are leaving.          |
| PF4<br>(Clear) | Clears the screen and puts the cursor in the first data entry field. Unicenter VM:Account ignores data entered since the last update and resets the screen to blanks.                   |

(continued)

| <b>Key<br/>(Label)</b> | <b>Function</b>                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------|
| PF10<br>(Print)        | Sends an image of the screen to your virtual printer.                                         |
| PF12<br>(End)          | Processes the screen and returns you to CMS. Press to leave the current full-screen facility. |

## Screen and Menu Help

To see help information about a screen or menu, press PF1 from that screen or menu. A help screen displays and explains what you can do from the screen or menu. When you finish reading the help screen, press PF3 to return to the original screen or menu.





# Choosing an Accounting Method

---

When deciding on whether to base your accounting method on account numbers or projects, you must first consider the many different elements that make up an accounting system.

## Accounting Elements

### Customers

Customers are persons or organizations who use resources; for example, a department or division in a company. Customers receive invoices charging them for the resources consumed by the users under their control. Invoices reflect charges in terms of the account numbers assigned to the users under their control or the projects users were working on. Unicenter VM:Account uses a 12-character field, Customer ID, to identify customers.

## Account Numbers

An account number of up to eight characters exists in the VM user directory for each userid. As Figure 3 illustrates, an account number can have multiple userids associated with it. A userid is assigned to only one account number.

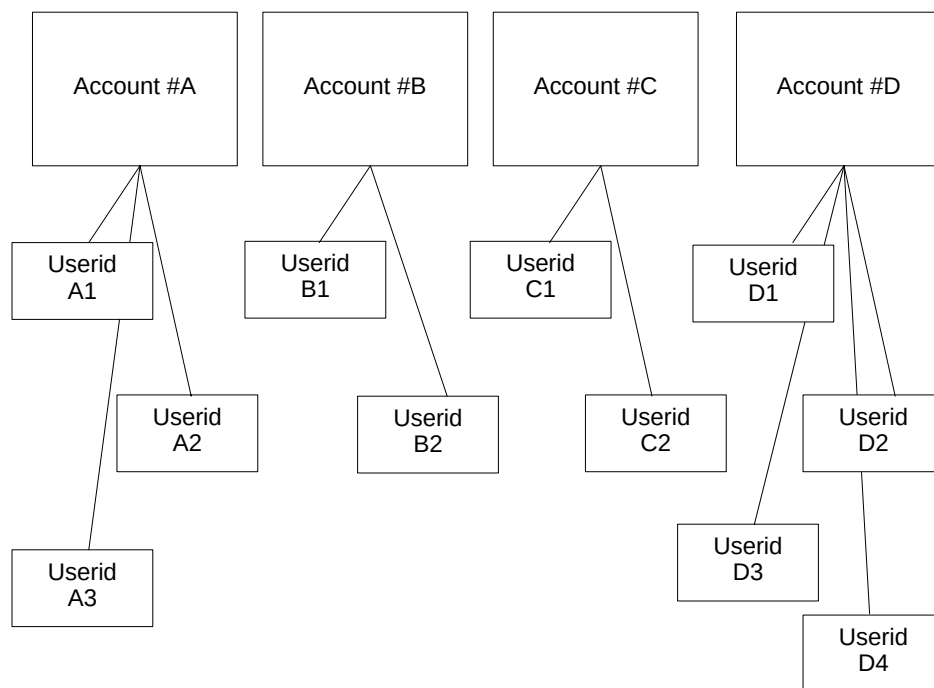


Figure 3. Relationship Between Account Numbers and Userids

A Customer ID can be associated with multiple account numbers, but an account number can belong to only one Customer ID. (See Figure 4.) For example, users in the Accounting department can be identified by one account number and users in the Data Processing department can be identified by another.

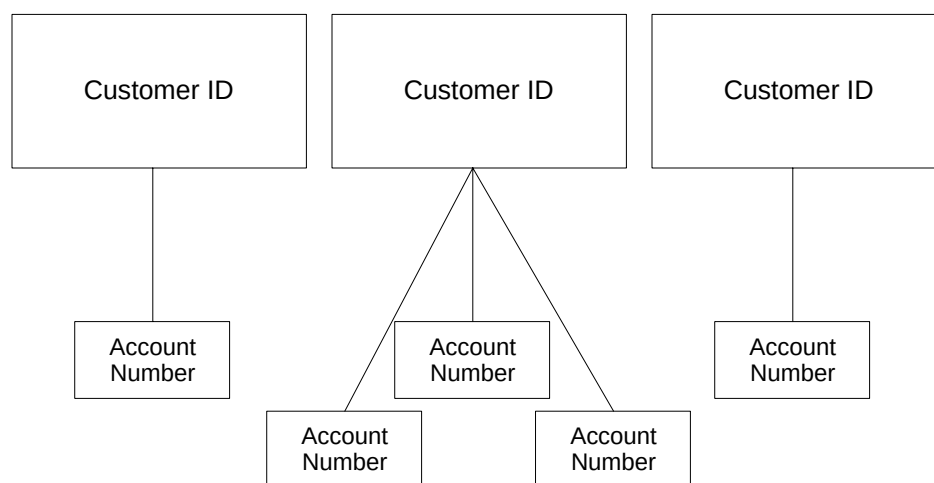


Figure 4. Relationship Between Customer IDs and Account Numbers

## Projects

Unicenter VM:Account also maintains project information. You can track projects even if you do not choose to charge customers by project. Project names are 1 to 24 characters long and provide an additional way to track charges. Examples of projects include tasks performed on a specific product or service, contracts, or grants. As Figure 5 illustrates, a project can have one or more account numbers and an account number can belong to one or more projects.

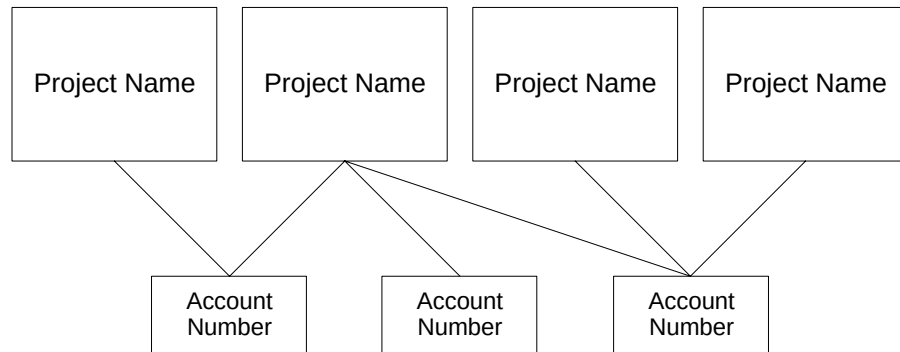


Figure 5. *Relationship Between Projects and Account Numbers*

Users can use only one project at a time but they can use the PROJECT command to change their project at any time during a terminal session. For further information about the PROJECT command, refer to online help or the section *PROJECT Command* on page 124.

As Figure 6 illustrates, a Customer ID can have multiple projects associated with it. A project belongs to only one Customer ID.

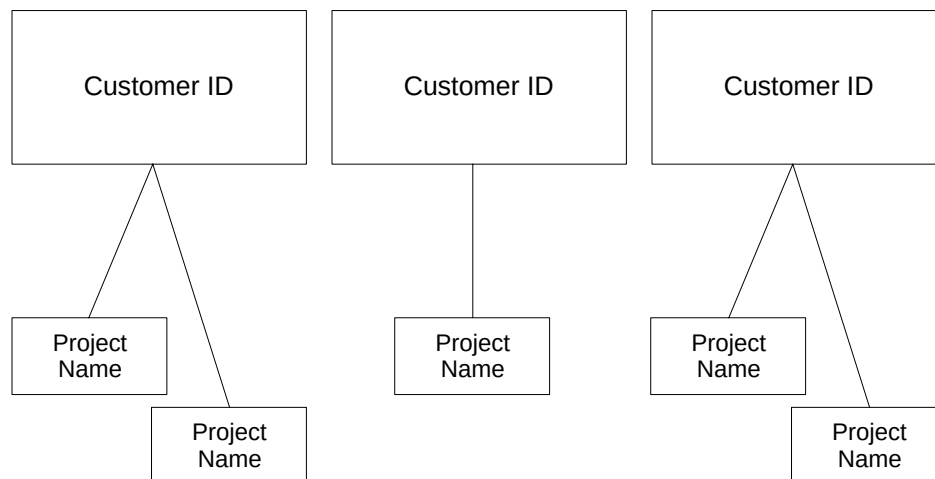


Figure 6. *Relationship Between Customer IDs and Projects*

## COSTABLE Files

COSTABLE files (also referred to as *cost tables*) contain rates and other identifying information. Each COSTABLE file corresponds to a different Unicenter VM:Account accounting record. For example, the minidisk (MDISK) COSTABLE file maintains the rates charged for owning minidisk space.

The section *COSTABLE Files* (beginning on page 320) contains layouts of COSTABLE files.

Use the UPDATE command to create and maintain COSTABLE files. For more information about the UPDATE command, refer to page 133.

Refer to Chapter 5, *Resource Accounting*, for more information about charging for resources.

## Accounting Structure

The accounting structure determines how customers are charged for resource usage. It defines the relationship between userids, account numbers, projects, and Customer IDs. You can use one of two structures:

### Charging by Account Number

Bill customers according to the account number of the userid using a resource. You can also set up projects within account numbers to further define this information. This structure is discussed in the section *Account Number Accounting*, below.

### Charging by Project

Bill customers for resources consumed by users working on a project for them. This structure is discussed in the section *Project Accounting* on page 23.

Reports are available by account number or project regardless of the structure you select.

If you want to change from one accounting method to the other, make the change at the end of an accounting period.

## Account Number Accounting

Account number accounting is the first of two accounting structures. This structure relates resources consumed by an account number directly to a Customer ID. This structure is best suited to a departmental environment where the customers are company departments, the account numbers identify departments or divisions of a department, and users only perform work for their departments or divisions.

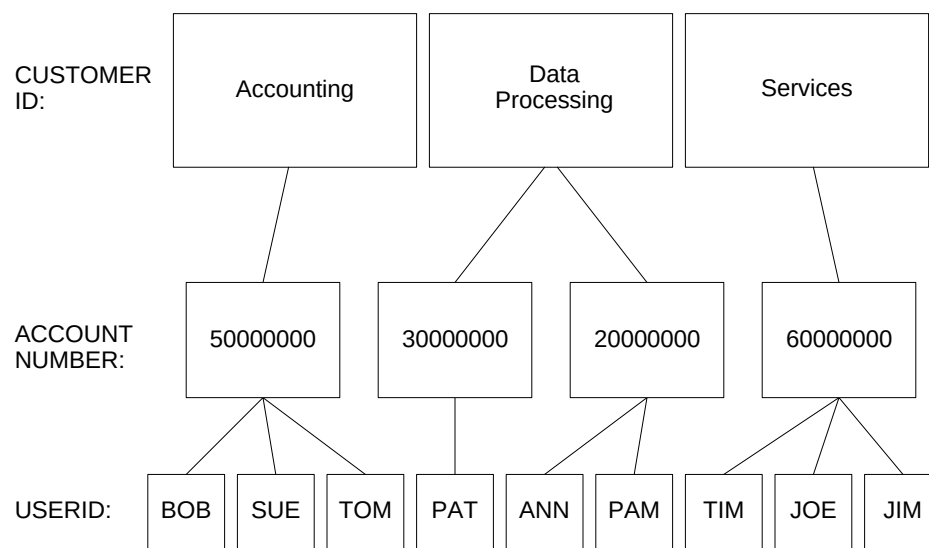


Figure 7. Accounting Structure 1: Charging by Account Number

There are several benefits of account number accounting:

- ▶ Any user can use any project for tracking resources.
- ▶ No project verification is required.

Unicenter VM:Account cannot automatically charge more than one customer for resources used by a single userid.

You can use the CHARGE and CREDIT commands to make online corrections and charge resources to different customers after the fact.

## Implementation

1. Add the following records to your VMACCT CONFIG file:

- **PROJECT NOVERIFY ADD**

The PROJECT NOVERIFY ADD record disables project verification. Any user can use any project with the PROJECT command. The ADD option adds new projects to the PROJECTS MASTER file.

- **CHGCUST ACCOUNT**

The CHGCUST ACCOUNT record implements account number accounting.

2. Enter the UPDATE command. The System Files Update Selection menu displays.
3. Select **Customer Master** (the CUSTOMER MASTER file) from the System Files Update Selection menu.
4. Fill in the fields on this screen for each customer you want to set up account number accounting for.
5. Press PF2 to add this information to the file.
6. Repeat the previous two steps for each of your customers.
7. Press PF3 to return to the System Files Update Selection menu.
8. Press PF3 again to return CMS.
9. Assign account numbers for groups of users and relate the account numbers to the Customer IDs in the CUSTOMER ACCTLIST file.

You can either:

- Run the Installation Aid utility (VMJSCD) with the CUSTOMER option. This builds a CUSTOMER ACCTLIST file containing a record for each unique account number in the directory. Refer to *Installation Aid Utility (VMJSCD)* on page 221 for more information.
  - Enter the UPDATE command, choose **Customer Acctlist** from the System Files Update Selection menu, and fill in the screen for each account number.
10. Assign userids to the account numbers by updating the VM user directory.

## Example

The ABC Company has three departments: Accounting, Data Processing, and Services. Departmental divisions are identified by account numbers. Users only perform work for their own departmental divisions. Resources are charged to departments.

- ▶ Resources used by TOM, DICK, HARRY, and MARY are charged to the Accounting Department.
- ▶ Resources used by JANE are charged to the Data Processing department.
- ▶ Resources used by JILL, JOHN, CINDY, SUSAN, JEFF, KEVIN, CLARK, LOIS, and LANA are charged to the Services department.

The following table shows the relationship between the departments, divisions, account numbers, and userids at the ABC Company:

| Department      | Division         | Account Number | Userid             |
|-----------------|------------------|----------------|--------------------|
| Accounting      | Payroll          | 10000000       | TOM, DICK,         |
|                 | Accounts Payable | 20000000       | HARRY              |
|                 |                  |                | MARY               |
| Data Processing | Development      | 30000000       | JANE               |
| Services        | Research         | 40000000       | JILL               |
|                 |                  | 50000000       | JOHN, CINDY        |
|                 |                  | 60000000       | SUSAN, JEFF, KEVIN |
|                 | Public Relations | 70000000       | CLARK, LOIS, LANA  |

## Project Accounting

Project accounting is the second of two accounting structures. This structure relates resources consumed by users working on a project to a Customer ID. This structure is best suited to environments where users perform work for different customers or different projects.

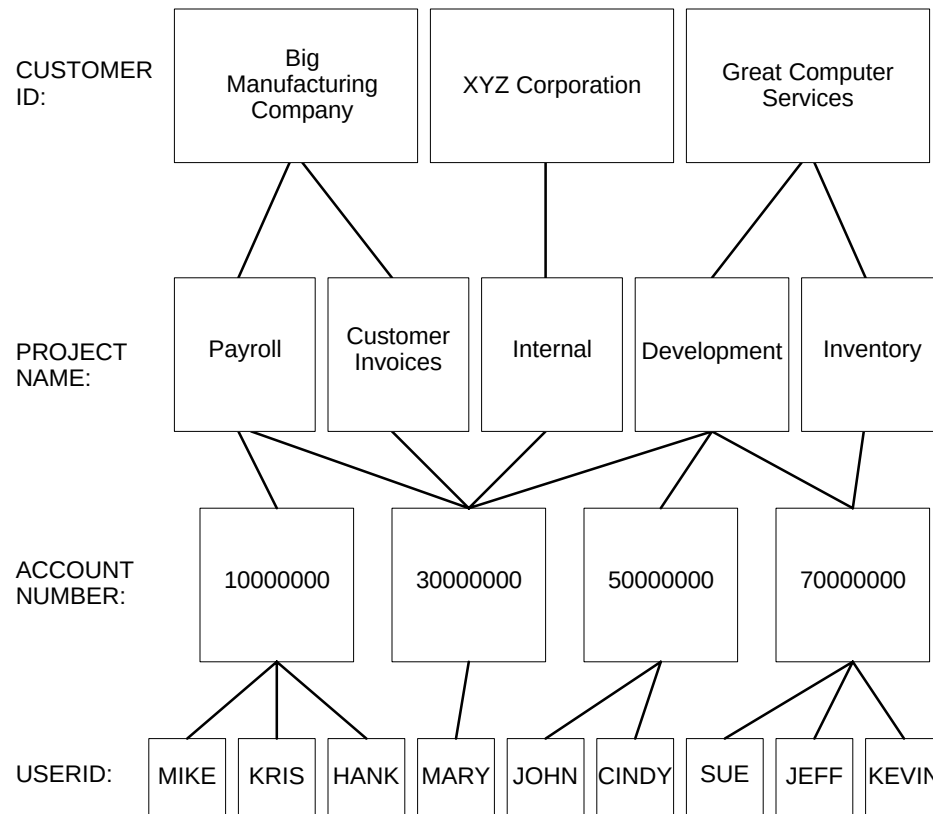


Figure 8. Accounting Structure 2: Charging by Project

The benefits of project accounting are:

- You can work on different tasks, even during the same terminal session, and have the resources charged to the appropriate customer or project.
- You can track costs incurred for different tasks by defining the task as a project.

You must add projects to the PROJECTS MASTER and PROJECTS ACCTLIST files with the UPDATE command.

You must specify a default project for each account number.

Unicenter VM:Account must validate projects entered by users and users need access to valid projects.



## Implementation

1. Add the following records to your VMACCT CONFIG file:
  - **PROJECT VERIFY**

The PROJECT VERIFY record specifies that Unicenter VM:Account checks the PROJECT ACCTLIST file to see if a user is authorized to charge to a project.
  - **CHGCUST PROJECT**

The CHGCUST PROJECT record implements project accounting.
2. Enter the UPDATE command.
3. Select **Customer Master** (the CUSTOMER MASTER file) from the System Files Update Selection menu.
  - a. Fill in the fields on this screen for each customer you want to set up project accounting for.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your customers.
  - d. Press PF3 to return to the System Files Update Selection menu.
4. Select **Projects Master** (the PROJECTS MASTER file) from the System Files Update Selection menu.
  - a. Fill in the fields on this screen to establish the relationship between your projects and Customer IDs.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your customers and projects.
  - d. Press PF3 to return to the System Files Update Selection menu.
5. Select **Projects Acctlist** (the PROJECTS ACCTLIST file) from the System Files Update Selection menu.
  - a. Fill in the fields on this screen to establish the relationship between your account numbers and projects and to define the default project for each account number.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your projects and account numbers.
  - d. Press PF3 to return to the System Files Update Selection menu.
  - e. Press PF3 again to return to CMS.

6. If you use budgeting, to create the CUSTOMER ACCTLIST file, either:
  - Run the Installation Aid Utility (VMJSCD) with the CUSTOMER option. This builds a CUSTOMER ACCTLIST file containing a record for each unique account number in the directory. Refer to *Installation Aid Utility (VMJSCD)* on page 221 for more information.
  - Enter the UPDATE command, select **Customer Acctlist** (the CUSTOMER ACCTLIST file) from the System Files Update Selection menu, and fill in a screen for each account number.
7. Assign userids to the account numbers by updating the VM user directory.

## Example

The ABC Company has three departments: Accounting, Data Processing, and Services. Projects are identified by account numbers. Users only perform work for their own departmental projects. Resources are charged to departments.

The following table shows the relationship among the departments, projects, account numbers, and userids at the ABC Company:

| Department      | Project          | Account Number | Userid |
|-----------------|------------------|----------------|--------|
| Accounting      | Payroll          | 4000000        | JILL   |
| Data Processing |                  | 10000000       | JOHN   |
| Services        | Research         | 30000000       | JANE   |
|                 | Public Relations | 20000000       | MARY   |

# Resource Accounting

When you have decided on and established an accounting structure, you can levy charges for the different resources your site provides. You must decide why, who, what, and how much to charge at your site. (See Chapter 4 for a discussion on Accounting structures).

Sites commonly install a resource accounting system to either:

- ▶ Charge users for the resources they consume
- ▶ Track resource usage without charging for it

If you want to track resources only, the default cost tables that Unicenter VM:Account provides at installation enable you to do this. If you want to charge users for resources, you must determine your objectives and decide how much to charge for each resource.

## Setting Up a Charging System

This section provides an overview of updating cost tables and using the new rates to update the PERIODTE file.

Determine why you want to charge for resources. Before setting rates, decide whether you want to do the following:

- ▶ Charge users for resources at the same rate as another site
- ▶ Operate the data center at cost
- ▶ Generate a profit from running the data center

## Determining Rates

1. After installing Unicenter VM:Account, let it run for a week and collect accounting records.

This gives you the data you will need to analyze resource usage. Make sure the COLLECT record in the VMACCT CONFIG file specifies HOLD 7 so that Unicenter VM:Account saves the raw data for the entire data collection period.

2. Build a resource usage model:
  - a. Run the Capacity Planning utility (VMJCPR) against each raw data file. This produces a report of CPU utilization for a day.

- b. Update the control file for the Operations Overview report (VMJORVW) to sort the raw data files by CUSTOMER ID.
- c. Run the VMJORVW report. This report lists total resource usage and breaks usage down by type (for example, minidisk usage).
- d. Analyze the totals for each subgroup on the reports and review your objectives in light of the data.

## Implementation

Before you enter your rates, use your model to determine:

- ▶ Session Rates
- ▶ Dedicated Device Rates
- ▶ Temporary Disk Rates
- ▶ Link Rates
- ▶ VSCS Rates

To put your rates into Unicenter VM:Account:

1. Enter the UPDATE command.
2. Select a cost table from the System Files Update Selection menu. The COSTABLE files contain the information Unicenter VM:Account uses to cost records. For example, enter 6 on the menu's command line to get a blank data entry screen for the SESSIONS COSTABLE file.
3. Enter your rates for each category on the screen. Decimal points separate dollars and cents. Often, Unicenter VM:Account enables you to charge fractions of a cent for resource usage. Unicenter VM:Account goes to five decimal places for most calculations.
4. Press PF2 to add the rate information to the cost table.
5. When you finish with a cost table, press PF3 to return to the System Files Update Selection menu.
6. Select another cost table to update or press PF3 again to return to CMS.

## Applying Rates to Data

If you want to apply these rates to the data you collected to build your model:

1. Log on to VMACCT.
2. Terminate VMACCT with the END command.
3. Prepare a VMJRCS specification control file. Refer to page 214 for more information about this file.

4. Run the VMJRCS utility against the PERIODTE CURRENT file.

**vmjrsc periodte current b**

The utility displays information similar to:

| CUSTOMER | PRECOSTED<br>TOTAL | SELECTED<br>TOTAL | RECOSTED<br>TOTAL | CHARGE/<br>CREDIT | FINAL<br>TOTAL |
|----------|--------------------|-------------------|-------------------|-------------------|----------------|
| CUST1    | 9166               | 9166              | 18332             | 0                 | 18332          |
| CUST2    | 196296             | 196296            | 392592            | 0                 | 392592         |
| CUST3    | 205462             | 205462            | 410924            | 0                 | 410924         |

You can run the VMJORVW report again, to compare the changes item by item.

5. If the new charges are satisfactory, erase PERIODTE CURRENT and rename the PERIODTE RECOSTED output file to PERIODTE CURRENT.

If the new costs are not satisfactory, adjust the cost tables with the UPDATE command, erase the PERIODTE RECOSTED file, and run the VMJRCS utility again.

6. Start the Unicenter VM:Account service virtual machine when you complete your recosting. Unicenter VM:Account will cost all new records using the new COSTABLE files.

## Charging for Software Package Usage

You can track software package usage at your site and surcharge or discount the use of this software. Unicenter VM:Account processes surcharges and discounts as a percentage of the SESSION COSTABLE rates during package execution. For example, you could charge 20% more for a session while a user is executing a package.

### Implementation

1. Identify the software package to Unicenter VM:Account:
  - a. Enter the UPDATE command.
  - b. Select **Packages Master** from the System Files Update Selection menu.
  - c. Fill in the fields on this screen to assign a package id to the software package and specify the maximum number of users who can use the package simultaneously.
  - d. Press PF2 to add this information to the file.
  - e. Repeat the previous two steps for each of the packages you want to account for.

- f. Press PF3 to return to the System Files Update Selection menu.
  - g. Press PF3 again to return to CMS.
- 2. Discount or surcharge the use of package-accounted software.
  - a. Enter the UPDATE command.
  - b. Select **Package Surcharge** from the System Files Update Selection menu.
  - c. Fill in the fields on this screen to set the amount of surcharge or discount for any or all of the items displayed on the screen. If you do not set a discount or surcharge, use of the package is charged at the SESSIONS rate. Refer to *Setting Up a Charging System* on page 27 for more information about charging for terminal sessions.
  - d. Press PF2 to add this information to the file.
  - e. Repeat the previous two steps for each of the packages you want to discount or surcharge.
  - f. Press PF3 to return to the System Files Update Selection menu.
  - g. Press PF3 again to return to CMS.
- 3. To track the package, either:

- Use the VMJPKG utility. The VMJPKG utility inserts a stub into the package module. The stub allows Unicenter VM:Account to take control of the module at the beginning and end of package execution. It also includes an abend handler to end package tracking if an error occurs during package execution.

When package accounting is installed for a module or text file, the package-accounted program has a filetype of \$MODULE or \$TEXT. Rename the package-accounted software and make it available to your users.

Refer to page 204 for an explanation of the VMJPKG utility.

- Wrap the module in an EXEC.

You cannot use the VMJPKG utility to package-account modules that run in the transient area if the size of the package plus the stub exceeds 8K. In this case, VMJPKG will terminate and you need to wrap the module in an EXEC to perform package accounting.

To wrap a module in an EXEC, include a PACKAGE START command, a statement to run the package, and a PACKAGE END command. Use the EXEC to run the package. For example:

```
/* Sample EXEC for Package Accounting */
'VMACCT PACKAGE START' package
module-name
retc=rc
'VMACCT PACKAGE END'
exit retc
```

Although there are occasions when you must use an EXEC for package accounting, try to use the VMJPKG utility whenever possible. An EXEC does not handle package abends and users can override package accounting by running the package without the EXEC.

## Multiple Entry Points

The VMJPKG utility cannot package-account secondary entry points or aliases in a TEXT file or similar members in a TXTLIB. But the Unicenter VM:Account VMJPKTXT and VMJPKENT EXECs give you the ability to install package accounting for secondary entry points. VMJPKTXT installs package accounting in TEXT files and VMJPKENT performs the same function for TXTLIB members.

## How To Package Account a Software Package Database Module

The following examples show how to mark a software package named DATABASE with a package id of DB.

Using VMJPKG:

1. Use the UPDATE command to add the package id to the PACKAGES MASTER file.
2. If you want to surcharge or discount the use of this package, return to the System Files Update Selection menu, and select and modify the PACKAGES SURCHARGES file.
3. To mark the package, type **vmjpkg**.
4. When the Software Package Accounting Utility screen displays, fill in the screen fields with the following information:

|               |                 |
|---------------|-----------------|
| Function:     | <b>install</b>  |
| Package Name: | <b>database</b> |
| ID:           | <b>db</b>       |
| Package Type: | <b>module</b>   |

5. Press Enter to install the package-accounting stub.

6. Rename DATABASE \$MODULE to DATABASE MODULE and copy it to a public minidisk.

To wrap this module in an EXEC:

1. Use the UPDATE command to add the package to the PACKAGES MASTER file.
2. If you want to surcharge or discount the use of this package, return to the System Files Update Selection menu, and select and modify the PACKAGES SURCHARGES file.
3. Create an EXEC similar to the following:

```
/* EXEC for package accounting DATABASE MODULE */  
'VMACCT PACKAGE START DB'  
'DATABASE'  
retc=rc  
'VMACCT PACKAGE END'  
exit retc
```

## Charging for DASD Ownership (SFS and Minidisk)

You can set rates and charge users on a daily basis for owning minidisks or for the space they use in a file pool. For minidisks, rates are applied for each 100 blocks for FBA-type devices or for each cylinder for CKD-type devices. For SFS file pools, rates are applied for each 100 blocks used.

Minidisk (datatype A4) and SFS storage (datatype AF) accounting records are generated by the worker machine, VMJDASD, when you:

- ▶ Enter the DASDACCT GENERATE command (either manually or with a configuration file record)
- ▶ Enter the DASDACCT SCAN command (either manually or with a configuration file record)

### Requirement

The DASDACCT worker machine, VMJDASD, must have SFS Administrator authorization to scan file pools for SFS DASD ownership.

### Record Processing

The routines that collect the DASD information and generate accounting records reside in a module named VMJDSA (Unicenter VM:Account DASD Space Accounting). Unicenter VM:Account autologs the DASDACCT worker when the DASDACCT command is issued manually or initiated by the VMACCT CONFIG file.



When Unicenter VM:Account autologs the DASDACCT worker, it passes the worker a command, VMJDSA. VMJDSA then runs on the worker machine but the module resides on the VMACCT 192 minidisk.

The VMJDSA MODULE does the following:

- ▶ Validates the VMACCT DASDINFO file at Unicenter VM:Account system initialization, checking for syntactical and semantic errors. See page 34 for more information about the VMACCT DASDINFO control file.
- ▶ Maintains a table of DASD allocations for minidisks and each SFS file pool. VMJDSA updates the table each time the DASDACCT worker machine performs a SCAN. These tables reside on the worker's 191 minidisk.
- ▶ Generates accounting records according to the specifications defined in the DASDACCT configuration file record. Refer to page 154 for more information about the DASDACCT configuration file record.

The three actions discussed above can happen automatically in Unicenter VM:Account or you can do them by issuing the DASDACCT command.

## Implementation

1. Add the following records to the VMACCT CONFIG file. Select both or either SCAN and GENERATE records for SFS and DASD accounting:

- One or more DASDACCT SCAN configuration file records

Use DASDACCT SCAN records to specify times during the day for the DASDACCT worker machine to scan the online directory for changes in minidisk ownership.

- One or more DASDACCT GENERATE configuration file records

Use DASDACCT GENERATE records to specify when Unicenter VM:Account should generate minidisk and SFS accounting records. Refer to page 154 for more information about the DASDACCT record.

- One or more FILEPOOL configuration file records

Use FILEPOOL records to specify the names of all of the SFS serverids and file pools defined on your system. If you do not want to charge for a file pool, specify it on an EXCLUDE record in the VMACCT DASDINFO file. Refer to page 164 for more information about the FILEPOOL record.

---

**Note:** If you are generating accounting records for more than three file pools, ensure the OPTION record in the VM directory entry of the DASDACCT worker machine, VMJDASD, has a MAXCONN value greater than or equal to the number of file pools for which accounting is being done.

---

- A WORKER configuration file record

Use the WORKER record to specify the userid of the DASDACCT worker machine. This machine performs the DASDACCT commands.

The userid specified on the WORKER record is automatically authorized to send accounting records to Unicenter VM:Account. This userid need not be defined on ACCTCRDS or SPECIAL records. Refer to page 180 for more information about the WORKER record.

2. Enter the UPDATE command.
3. Select **Minidisks** from the System Files Update Selection menu.
  - a. Fill in the fields on this screen for the DASD devices you want to charge for.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your DASD devices.
  - d. Press PF3 to return to the System Files Update Selection menu.
4. Select **SFS Storage** from the System Files Update Selection menu.
  - a. Fill in the fields on this screen for the SFS file pools you want to charge users for DASD ownership.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your SFS file pools.
  - d. Press PF3 to return to the System Files Update Selection menu.
  - e. Press PF3 again to return to CMS.
5. Exclude minidisks from costing or associate minidisks with projects in the VMACCT DASDINFO file.

Refer to the next section for information about the VMACCT DASDINFO file. Refer to page 277 for an explanation of the Minidisk Utilization report.

## VMACCT DASDINFO Control File

Unicenter VM:Account uses the VMACCT DASDINFO control file with the DASDACCT command to:

- ▶ Exclude minidisks and Shared File System file pools from minidisk and SFS accounting
- ▶ Specify the action Unicenter VM:Account should take when overlapping minidisks are encountered

- Associate and charge minidisk and SFS file pool ownership to a project

If you do not have a VMACCT DASDINFO file, VMISTART will create one.

Make sure all control statements are limited to 72 columns. The contents of the last 8 columns will be ignored.

## EXCLUDE Record

This record specifies minidisks to exclude from minidisk processing or file pools from SFS processing. You can specify an unlimited number of EXCLUDE records.

You can use masking on userid, serverid, file pool, or volser values.

|         |                                                                                                                                                                                                                                                                        |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EXCLUDE | $\left\{ \begin{array}{l} \text{FILEPOOL [ serverid ] filepool} \\ \text{USERID userid } \left[ \begin{array}{l} \text{vaddr}_1 \text{ [ vaddr}_2 \text{ ]} \\ \text{FILEPOOL [ serverid ] filepool} \end{array} \right] \\ \text{VOLUME volser} \end{array} \right\}$ |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### FILEPOOL [ *serverid* ] *filepool*

excludes an SFS serverid and file pool from SFS accounting. If *serverid* is omitted, it is assumed to be the same as *filepool*.

If a value for USERID *userid* precedes FILEPOOL [*serverid*] *filepool*, only those SFS file pools associated with that userid are excluded from SFS accounting. If no serverids and file pools are specified after a userid, all serverids and file pools associated with the specified userid are excluded from SFS accounting.

### USERID *userid*

excludes minidisks or SFS file pools belonging to a userid from minidisk or SFS accounting. If no minidisks or file pools are specified after a userid, all minidisks or file pools belonging to the specified userid are excluded from Unicenter VM:Account processing.

### vaddr<sub>1</sub> [ vaddr<sub>2</sub> ]

excludes the virtual address (vaddr) of a minidisk belonging to a userid from minidisk processing. *vaddr<sub>1</sub>* *vaddr<sub>2</sub>* specifies that all minidisks in the range of virtual addresses from *vaddr<sub>1</sub>* through *vaddr<sub>2</sub>* are excluded from minidisk processing. If no *vaddr* is specified, all minidisks belonging to the userid are excluded from minidisk processing.

### VOLUME *volser*

excludes a complete DASD volume (volser) from minidisk processing.

## OVERLAP Record

This record specifies the action Unicenter VM:Account takes when it finds overlapping minidisks.

You can specify only one OVERLAP record, and it must be the first record in the DASDINFO file. You can specify only one option on the OVERLAP record.

|         |                                    |
|---------|------------------------------------|
| OVERLAP | { ALLOW   DISALLOW   <u>WARN</u> } |
|---------|------------------------------------|

### ALLOW

specifies that if overlapping minidisks are detected, DASDACCT processing continues and no error messages are generated.

### DISALLOW

specifies that if overlapping minidisks are detected, DASDACCT processing terminates with error (severity code E) messages.

### WARN

specifies that if overlapping minidisks are detected, DASDACCT processing is done for all minidisks and warning (severity code W) messages are generated for minidisks that have overlapping extents. This is the default.

## SETPROJ Record

This record associates a project with a userid's minidisks or SFS file pools for minidisk or SFS accounting. You can specify an unlimited number of SETPROJ records.

You can use masking on userid, serverid, or file pool values.

|         |                                                                                                                                                                       |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SETPROJ | <i>project</i> USERID <i>userid</i> $\left[ \begin{array}{l} \text{vaddr}_1 \text{ [ vaddr}_2 \text{ ]} \\ \text{FILEPOOL [ serverid ] filepool} \end{array} \right]$ |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### *project*

specifies the project to which a user's minidisks or SFS file pools will be associated for minidisk or SFS accounting.

### USERID *userid*

specifies the userid to be associated with *project* for minidisk or SFS accounting.

***vaddr<sub>1</sub> [ vaddr<sub>2</sub> ]***

specifies the virtual address (vaddr) of a minidisk belonging to a userid to be associated with a project for minidisk accounting. *vaddr<sub>1</sub> vaddr<sub>2</sub>* specifies that all minidisks in the range of virtual addresses from *vaddr<sub>1</sub>* through *vaddr<sub>2</sub>* are associated with the project for minidisk accounting. If no *vaddr* is specified, all minidisks belonging to the userid are associated with the project for minidisk accounting.

**FILEPOOL [ *serverid* ] *filepool***

specifies the *serverid* and file pool name belonging to a userid to be associated with a project for SFS accounting. If *serverid* is omitted, it is assumed to be the same as *filepool*.

If no *serverids* or file pools are specified, all of the userid's SFS file pools are associated with the project for SFS accounting.

### Example

The sample VMACCT DASDINFO control file that follows:

- ▶ Allows overlaps
- ▶ Excludes the disk volume VMJSYS from minidisk accounting
- ▶ Excludes SAM's 191, 192, and 193 minidisks from minidisk accounting
- ▶ Excludes MIKE's DEVELOPMENT SFS file pool from SFS accounting
- ▶ Excludes the SYSTEM file pool from SFS accounting
- ▶ Associates PETE's DEVO1 SFS file pool with the CONVERSION project and his DEVO2 SFS file pool with the ACCOUNTING project

```
OVERLAP ALLOW
EXCLUDE VOLUME VMJSYS
EXCLUDE USERID SAM 191 193
EXCLUDE USERID MIKE FILEPOOL DEVELOPMENT
EXCLUDE FILEPOOL SYSTEM
SETPROJ CONVERSION USERID PETE FILEPOOL DEVO1
SETPROJ ACCOUNTING USERID PETE FILEPOOL DEVO2
```

## Charging for SFS Usage

The Shared File System lets users save and own data in directories in a shared DASD file pool.

Table 1 identifies the types of accounting records that SFS creates.

*Table 1. Types of Accounting Records Created by SFS*

| Record         | Type | Notes                                                                                                     |
|----------------|------|-----------------------------------------------------------------------------------------------------------|
| Initialization | ISFS |                                                                                                           |
| Operator       | OSFS |                                                                                                           |
| Checkpoint     | CSFS |                                                                                                           |
| Termination    | TSFS |                                                                                                           |
| User           | USFS | The USFS records become Unicenter VM:Account record datatype AE when placed in the PERIODTE CURRENT file. |

Unicenter VM:Account processes and applies charges for the USER record; however, other record types are placed in the RAWDATA *\$\$\$ymmdd* raw data file for any use determined by your site.

Three SFS items can be costed:

- ▶ Each minute of connect time
- ▶ Each second of CPU usage
- ▶ Each physical I/O request

## Update the Unicenter VM:Account Service Virtual Machine

1. Add one or more FILEPOOL configuration file records to the VMACCT CONFIG file.

Use FILEPOOL records to specify the names of all of the SFS serverids and file pools defined on your system.

2. Enter the UPDATE command.
3. Select **SFS Usage** from the System Files Update Selection menu.
4. Fill in the fields on this screen for the SFS file pools you want to charge users for using.
5. Press PF2 to add this information to the file.

6. Repeat the previous two steps for each of your SFS file pools.
7. Press PF3 to return to the System Files Update Selection menu.
8. Press PF3 again to return to CMS.

## Update the SFS Server Machine

1. Update the VM directory entry for each SFS server and include ACCT on the option statement.
2. Add the following start-up parameter to the DMSPARMS file:

**ACCOUNT**

For additional information about SFS accounting, see the appropriate CMS shared file administration guide for your operating system.

## Charging for SQL/DS Usage

The SQL/DS accounting support feature provides a facility for handling SQL/DS accounting records. Table 2 identifies the types of accounting records that SQL/DS creates.

*Table 2. Types of Accounting Records Created by SQL/DS*

| Record         | Type | Notes                                                                                                     |
|----------------|------|-----------------------------------------------------------------------------------------------------------|
| Initialization | ISQL |                                                                                                           |
| Operator       | OSQL |                                                                                                           |
| Checkpoint     | CSQL |                                                                                                           |
| Termination    | TSQL |                                                                                                           |
| User           | USQL | The USQL records become Unicenter VM:Account record datatype AA when placed in the PERIODTE CURRENT file. |
| Remote user    | RSQL |                                                                                                           |

Unicenter VM:Account processes and applies charges for the USER record; however, other record types are placed in the RAWDATA \$\$ymmdd raw data file for any use determined by your site.

You can charge for using SQL/DS databases. There are three charging alternatives:

- ▶ For each minute of active time
- ▶ For each second of CPU usage
- ▶ For each 1000 page buffer requests

Unicenter VM:Account allows you to charge for any combination of these activities.

## Update the Unicenter VM:Account Service Virtual Machine

1. Run the VMJSQINS utility if the userid of the Unicenter VM:Account virtual service machine is not VMACCT.

This utility changes the name of the Unicenter VM:Account service virtual machine that SQL/DS uses for communication in the ARIUXIT TEXT file. Refer to page 235 for more information about the VMJSQINS utility.

2. For proper IUCV communications, update the MAXCONN limit on the OPTION statement in the VMACCT directory entry to equal or exceed the number of userids in the system, or to the maximum allowable number.
3. Add SPECIAL SQL/DS records to the VMACCT CONFIG file to define the SQL/DS database machine userids you want to account for.
4. Enter the UPDATE command.
5. Select **SQL/DS** from the System Files Update Selection menu.
6. Fill in the fields on this screen for the SQL/DS databases you want to charge users for using.
7. Press PF2 to add this information to the file.
8. Repeat the previous two steps for each of your SQL/DS databases.
9. Press PF3 to return to the System Files Update Selection menu.
10. Press PF3 again to return to CMS.

## Update the SQL/DS Database Service Virtual Machines

1. Update the directory entry for each SQL/DS database service virtual machine userid and include an OPTION ACCT statement.

You must include this option to generate accounting records.



2. Update your supplied SQL/DS load library (ARISQLLD LOADLIB) with the Computer Associates version of the ARIUXIT TEXT by link-editing the Data System Control (DSC) component on all SQL/DS production minidisks.

- a. Log on to an SQL/DS database virtual machine.

- b. Access the service minidisk:

**access 193 v**

- c. Define a read-only link to the VMRMaint 170 minidisk. This is where the Computer Associates version of ARIUXIT is located:

**link vmrmaint 170 111 rr**

- d. Access the minidisk with a filemode letter that comes before the SQL/DS service minidisk in the CMS search order:

**access 111 u**

This ensures that the Computer Associates version of the ARIUXIT EXIT is the one placed in the ARISQLLD LOADLIB.

---

**Caution:** Do not replace the IBM version of the ARIUXIT EXIT with the Computer Associates version. Doing so will prevent IBM maintenance from overlaying or incorrectly modifying the Computer Associates version of the ARIUXIT EXIT.

---

- e. Define a write-only link to the SQL/DS production minidisk so you can update the SQL/DS load library on the production minidisk:

**link sqldba 195 195 w**

You will be prompted for a password. Respond to the prompt.

- f. Access the minidisk:

**acc 195 q**

- g. Link edit ARISLKMC:

**arislkit arislkmc arisqllld loadlib q**

ARISLKMC is an IBM-supplied link book text file for SQL/DS. It identifies the TEXT files associated with the DSC (Data System Control) component. *arislkit* is the name of the EXEC that will perform the link edit. *arislkmc* is the name of the data system control component TEXT file that contains INCLUDE records for the TEXT files, ARICMOD and ARIUXIT. *arisqllld loadlib q* is the SQL/DS load library to which the DSC component members are being added.

After the link edit completes, the Computer Associates version of ARIUXIT is installed.

- h. Get read access to the SQL/DS production minidisk:

```
link sqldb 195 195 rr
access 195 q
```

- i. If you are using SQL/DS in a DCSS, save the DBSS discontinuous saved segment again after the link edit to pick up the changes.

## Initialize SQL/DS

After implementing SQL/DS accounting and updating the SQL/DS load library, you can initialize SQL/DS and start the accounting facility using the ACCOUNT initialization parameter. For additional information, see the appropriate SQL/DS planning and administration guide for your operating system.

1. Log on to an SQL/DS database machine.

The database machine must have the ACCT operand specified on its OPTION directory statement in the current CP directory.

2. Re-IPL CMS:

```
ipl cms
```

3. Run the SQLSTART EXEC with ACCOUNT=D to start SQL/DS with accounting turned on.

All other initialization parameters can be set normally, for example:

```
sqlstart db(database)
parm(account=d)
```

The ACCOUNT parameter is a standard initialization parameter you can specify in a CMS parameter file. *account=d* specifies that SQL/DS accounting records are to be generated and directed to the appropriate VM system accounting file for your operating system. If *d* is not specified, the default is *n*, specifying that accounting records will not be generated.

## Charging for SQL/DS DBSPACE Ownership

You can charge users for the amount of SQL/DS DBSPACE they own. Unicenter VM:Account enables you to charge a daily rate for every 100 pages of DBSPACE used.

## Implementation

1. Add SPECIAL SQLSTOR records to the VMACCT CONFIG file to define the userids that generate SQL/DS DBSPACE accounting records.
2. Enter the UPDATE command.

3. Select **SQL/DS Storage** from the System Files Update Selection menu.
  - a. Fill in the fields on this screen for the SQL/DS databases you want to charge users for owning.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your SQL/DS databases.
  - d. Press PF3 to return to the System Files Update Selection menu.
  - e. Press PF3 again to return to CMS.
4. Build a VMJSQI CONTROL file on the userid from which you will run the VMJSQI utility. Refer to page 237 for more information about the control file.
5. Run the VMJSQI utility to generate SQL/DS ownership accounting records for processing by Unicenter VM:Account. The utility punches these records to the Unicenter VM:Account service virtual machine. They are Unicenter VM:Account record datatypeAD.

Refer to page 236 for more information about the VMJSQI utility.

## Charging for Mountable Disk Usage

Charge customers for using mountable disk devices on a daily basis. The Unicenter VM:Account Disk Volume Accounting utility (VMJDVA) processes the inventory file you create to determine charges.

### Implementation

1. Add a SPECIAL DISKVOLS record to the VMACCT CONFIG file to identify the userid running the VMJDVA utility.
2. Enter the UPDATE command.
3. Select **Volumes** from the System Files Update Selection menu. Fill in the fields on this screen for your mountable disk devices.
4. Press PF2 to add this information to the file.
5. Repeat the previous two steps for each of your mountable disk devices.
6. Press PF3 to return to the System Files Update Selection menu.
7. Press PF3 again to return to CMS.

8. Build and maintain an inventory file (DISK VOLUMES) of disk volume usage.

Refer to the DISK VOLUMES file for more information about this file.

9. Run VMJDVA to generate accounting records from the information stored in the inventory file. The utility punches these records to the Unicenter VM:Account service virtual machine. They are Unicenter VM:Account record datatype A3.

You can run VMJDVA for specific dates or allow it to account for all dates since the last time it ran. Refer to page 199 for more information about the VMJDVA utility.

## Charging for BrightStor VM:Archiver Usage

The Unicenter VM:Account interface with BrightStor VM:Archiver enables you to determine how much BrightStor VM:Archiver is being used. This is useful information if you are trying to encourage archive usage by charging less for archive storage than for storage on users' minidisks.

You can control which archive storage types (ONLINE, STAGE, or TAPE) are accounted for in batch and exception accounting. A charging strategy can be set and Unicenter VM:Account reports can be used to determine the breakdown of resources and costs attributed to each of the three storage types.

For instructions about setting up the Unicenter VM:Account/BrightStor VM:Archiver interface, refer to the *Component Interface Guide*.

## Charging for Unicenter VM:Batch Usage

The Unicenter VM:Account interface with Unicenter VM:Batch enables you to charge and report separately on Unicenter VM:Batch and interactive resource usage. You can also charge users who run jobs on a remote system.

This interface can decrease the prime-time workload by enabling you to charge users less for batch jobs that run during off hours than those that run during peak operating hours.

For more information about the Unicenter VM:Account/Unicenter VM:Batch interface and instructions on setting it up, refer to the *Component Interface Guide*.

Other batch products are charged at session rates unless you specify \*BATCH in the PACKAGES COSTABLE file and define a discount or surcharge rate.

## Charging for BrightStor VM:Migrate Usage

The Unicenter VM:Account interface with BrightStor VM:Migrate enables you to charge one rate for each 100 blocks of data in primary storage, another rate for each 100 blocks of data migrated to tape, and still another rate for each 100 blocks of data migrated to FRA (fast recall area). This is useful because you can charge less for migrated data than for data still in primary storage.

A charging strategy can be set and Unicenter VM:Account reports can be used to determine the breakdown of resources and costs attributed to each of the migration options.

For instructions about setting up the Unicenter VM:Account/BrightStor VM:Migrate interface, refer to the *Component Interface Guide*.

## Charging for Spool Usage

The Unicenter VM:Account interface with Unicenter VM:Spool enables you to charge users for spool-space usage. The Unicenter VM:Spool worker machine uses DIAG X'4C' to send the accounting records to CP that can then be costed and reported on by Unicenter VM:Account. You charge by the hour for each group of 100 records in the spool file.

The Unicenter VM:Account interface with Unicenter VM:Spool:

- ▶ Prevents users from using spool space as an alternative storage area and helps pinpoint those users who use the spool area excessively
- ▶ Gives you the opportunity to show users the advantages of utilizing BrightStor VM:Archiver as an alternative storage facility
- ▶ Ensures that out-of-date files get deleted from their online space

For instructions on setting up the Unicenter VM:Account/Unicenter VM:Spool interface, refer to the *Component Interface Guide*.

## Charging for BrightStor VM:Tape Usage

The Unicenter VM:Account interface with BrightStor VM:Tape enables you to:

- ▶ Charge users for tape mounts
- ▶ Charge users for storing tape volumes

This interface enables you to maintain control of tape usage and storage, thereby controlling costs that are usually allocated as overhead. It also helps in the effort to recycle tapes by indicating tapes that are not being used and the users who own them and are being charged for storing them. These tapes can be scratched and returned to general use.

The BrightStor VM:Tape VMTEXIT4 user exit can be used to create accounting records for tape mounts. These accounting records are subsequently used to charge users for the tape mounts.

With the Unicenter VM:Account/BrightStor VM:Tape interface you can charge users for storing tape volumes. Accounting records for tape volume storage are created by executing the Unicenter VM:Account VMJTVA tape storage accounting utility. VMJTVA generates one accounting record for each user who owns a tape. This record specifies the number of days for tape volume storage.

For instructions about setting up the Unicenter VM:Account/BrightStor VM:Tape interface, refer to the *Component Interface Guide*.

## Charging for CA-VM:Webgateway Usage

You can set rates and charge users for CA-VM:Webgateway usage. CA-VM:Webgateway produces general C0 accounting cards reporting on web server resource usage when serving data.

Due to the volume of accounting records that is generated by accessing data through a web server, CA-VM:Webgateway does not use DIAG X'4C' to send the accounting records directly to CP. Instead, CA-VM:Webgateway punches records to a post-processor userid that reduces the accounting data by merging similar records and then punches the remaining output to Unicenter VM:Account.

CA-VM:Webgateway does not supply an account number with these accounting records; however, it does include two chargeable userids: one userid for the data owner and another userid for the client or requester of the data. The data owner is the default chargeable user but, you can customize the accounting record to charge the client instead. After Unicenter VM:Account receives the accounting record, it performs the account number lookup based on the userid included in the CA-VM:Webgateway accounting record.

The CA-VM:Webgateway accounting records include the following information:

- ▶ Userid of the CA-VM:Webgateway userid
- ▶ Userid of the data owner
- ▶ Userid of user (or client) accessing the data, when CA-VM:Webgateway authenticates the userid. See the CA-VM:Webgateway online documentation for more information about authenticating userids.
- ▶ IP address and TCP port of the client and the web server
- ▶ Basic resource consumption in virtual CPU milliseconds and process I/Os for the web server and workers
- ▶ Number of bytes served out TCP
- ▶ Number of transactions the accounting card represents after the data reduction step

- Flags indicating authentication of userid, whether the userid was truncated (non-VM), and whether date format conversion was performed

This information enables you to set different rates based on selecting the web server name and TCP port number. Rates can be assigned to:

- 1000 bytes of data transferred using TCP
- Seconds of CPU time on the service virtual machine or worker
- 1000 DASD I/Os on the service virtual machine or worker

CPU and I/Os rates can be set differently for the resources that are consumed by the web server virtual machine versus those by a worker virtual machine invoked through the web server.

## Implementation

### Step 1. Set Up Accounting in CA-VM:Webgateway

Some of the setup process involves configuring some accounting information in CA-VM:Webgateway. The following steps are explained in detail in the CA-VM:Webgateway online documentation:

1. Initialize and configure CA-VM:Webgateway using the CA-VM:Webgateway CONFIG ACCOUNT command.

The CA-VM:Webgateway CONFIG ACCOUNT command controls:

- The post-processor userid to which CA-VM:Webgateway punches its accounting data
- How often or when to close the accounting data, based on time or number of accounting records
- Whether CA-VM:Webgateway collects accounting data about the files it serves

See the CA-VM:Webgateway online documentation for complete information about the CONFIG ACCOUNT command.

2. Set up the accounting post-processor.

Computer Associates recommends that you use the post-processor to save DASD space on the VMACCT 1B0 minidisk and to reduce Unicenter VM:Account processing.

To help implement the post-processor, two sample programs are provided with CA-VM:Webgateway: ACRUN XEXEC and ACREDUCE XEXEC.

- ACRUN XEXEC checks its reader for CA-VM:Webgateway accounting files to process and calls the ACREDUCE XEXEC with a list of CA-VM:Webgateway userids.

- ACREDUCE XEXEC, by default, combines like records and converts the TOD value to a human-readable format (mmddyyhhmmss). There are two Unicenter VM:Account-specific considerations that apply to this program:
  - The sample program contains a default Unicenter VM:Account server name of VMACCT. This is the userid to which the post-processor sends the accounting records. If you are using a different naming convention, substitute the name of your Unicenter VM:Account service virtual machine.
  - The sample program specifies a default spool class of A. This class must match the class specified on the COLLECT record in the VMACCT CONFIG file. If the classes do not match, change the spool class in the sample program to match the class on the COLLECT record. This prevents the accounting files from accumulating in the Unicenter VM:Account reader instead of being processed into the PERIODTE CURRENT file.
- 3. Optionally, you will also have to modify the CA-VM:Webgateway accounting record if you want to charge the client instead of the data owner.

For detailed instructions about performing the steps above, refer to the CA-VM:Webgateway online documentation.

## Step 2. Set Up Accounting in Unicenter VM:Account

1. Edit the VMACCT CONFIG file and make the following changes:
  - Add a PRODUCT record to identify each CA-VM:Webgateway service virtual machine for which you want to provide accounting:
 

**PRODUCT VMWEBSRV *userid***
  - Add an ACCTCRDS record to identify the userid of the post-processor that is authorized to send CA-VM:Webgateway accounting records to Unicenter VM:Account:
 

**ACCTCRDS *ppuserid***
2. Enter the UPDATE command.
3. Select **CA-VM:Webgateway** from the System Files Update Selection menu.
  - a. Fill in the fields on this screen for the rates you want to charge for.
  - b. Press PF2 to add this information to the file.
  - c. Repeat the previous two steps for each of your CA-VM:Webgateway service virtual machines.
  - d. Press PF3 to return to the System Files Update Selection menu.



## Controlling CA-VM:Webgateway Accounting

You control CA-VM:Webgateway accounting from CA-VM:Webgateway using the CONFIG ACCOUNT, ACCOUNT, and QUERY ACCOUNT commands.

### Turning On Accounting

The CA-VM:Webgateway CONFIG ACCOUNT command controls whether CA-VM:Webgateway collects accounting data about the files it serves, and defines the criteria CA-VM:Webgateway uses when closing the accounting period and sending the accounting data to the accounting userid. The accounting userid is either the userid of the accounting package or the userid of the accounting post-processor.

1. Log onto the CA-VM:Webgateway administrator userid, such as VMRMaint.
2. Issue the CA-VM:Webgateway CONFIG ACCOUNT ON TO.

For example, the following command tells CA-VM:Webgateway to turn on accounting, and punch the accounting records to the post-processor userid (VIWPP). The WHEN parameter tells CA-VM:Webgateway to automatically close accounting at midnight every day:

**CONFIG ACCOUNT ON TO VIWPP CLOSE WHEN 00:00**

If accounting is currently on and you issue the CONFIG ACCOUNT command with the ON parameter, CA-VM:Webgateway closes the current accounting punch file and sends it to the userid before collecting additional accounting data using the newly specified configuration.

If you did not configure CA-VM:Webgateway to automatically close accounting, CA-VM:Webgateway places the accounting records in an open punch file until CA-VM:Webgateway is shut down or the ACCOUNT CLOSE command is issued. If your CA-VM:Webgateway server is heavily used, having these accounting records in an open punch file could cause spool space to fill. Therefore, Computer Associates recommends that you close the punch file on a regular basis, according to your CA-VM:Webgateway usage.

For complete information about the CA-VM:Webgateway CONFIG ACCOUNT command and the post-processor userid and function, see the CA-VM:Webgateway online documentation.

### Closing the CA-VM:Webgateway Accounting Punch File

If you did not configure CA-VM:Webgateway to automatically close accounting, use the CA-VM:Webgateway ACCOUNT command with the CLOSE parameter to manually close the CA-VM:Webgateway accounting punch file and send the file to the accounting userid.

Issuing the ACCOUNT CLOSE command does not turn off accounting. After you issue the command, CA-VM:Webgateway closes the open accounting punch file, sends it to the userid you configured, and opens a new accounting punch file.

To close the accounting punch file and send the file to the accounting userid:

1. Log on to a CA-VM:Webgateway administrator userid, such as VMRMaint.
2. Issue the CA-VM:Webgateway ACCOUNT CLOSE command:

#### **ACCOUNT CLOSE**

For complete information about the CA-VM:Webgateway ACCOUNT command, see the CA-VM:Webgateway online documentation.

### **Turning Off Accounting**

To tell CA-VM:Webgateway to stop accounting and not to cut accounting records:

1. Log on to a CA-VM:Webgateway administrator userid, such as VMRMaint.
2. Issue the CA-VM:Webgateway CONFIG ACCOUNT command:

#### **CONFIG ACCOUNT OFF**

For complete information about the CA-VM:Webgateway CONFIG ACCOUNT command, see the CA-VM:Webgateway online documentation.

### **Querying CA-VM:Webgateway Accounting**

To display the current configuration of CA-VM:Webgateway accounting, issue the QUERY ACCOUNT command:

1. Log on to a CA-VM:Webgateway administrator userid, such as VMRMaint.
2. Issue the CA-VM:Webgateway QUERY ACCOUNT command:

#### **QUERY ACCOUNT**

Output from the QUERY ACCOUNT command will differ depending on how you close your CA-VM:Webgateway accounting period. For example, if you specified the WHEN parameter on the CONFIG ACCOUNT command and close the accounting period at midnight each day, CA-VM:Webgateway responds:

**Accounting is in use. CA-VM:Webgateway sends accounting cards in punch files to the reader of userid *ppuserid*  
CA-VM:Webgateway closes the punch file at the following times of day: 00:00:00**

For complete information about the CA-VM:Webgateway QUERY ACCOUNT command, see the CA-VM:Webgateway online documentation.

## Closing the Period When Accounting for CA-VM:Webgateway Usage

Before you close accounting for the period in Unicenter VM:Account, you must close the account file on CA-VM:Webgateway to allow the records for the period you are closing to be processed by the optional post-processor and Unicenter VM:Account. The following steps provide recommendations about how to close accounting:

1. If you have not configured CA-VM:Webgateway to automatically close accounting at midnight, issue the CA-VM:Webgateway ACCOUNT CLOSE command at midnight of the day of the new accounting period. This allows all accounting data for the period you are closing out to be sent to the post-processor userid.
2. Run the post-processor program after CA-VM:Webgateway has sent the accounting punch file to its reader. The post-processor should be set up to send its output to the Unicenter VM:Account reader.
3. After Unicenter VM:Account has received the accounting records from the post-processor and has processed them into its PERIODTE CURRENT file, you can close the accounting period using the Unicenter VM:Account PERIOD command.

## Charging for TSAF Usage

Set up the TSAF communications package to generate accounting records and send them to Unicenter VM:Account. You can charge users for the amount of time they are connected to the TSAF machine, for each 1000 bytes sent, and for each 1000 bytes received.

TSAF generates four record types, but Unicenter VM:Account processes only the session record. The last six bytes of the record contain the characters *SATSC0*. Unicenter VM:Account changes columns 79 and 80 to AC, so Unicenter VM:Account can identify it.

## Implementation

1. Add the ACCT option to the VM directory entry for the TSAF service virtual machine.
2. Add a SPECIAL TSAF record to the VMACCT CONFIG file to identify the TSAF service virtual machine.
3. Enter the UPDATE command.
4. Select **TSAF** from the System Files Update Selection menu.
5. Fill in the fields on this screen specifying the rate for using TSAF.
6. Press PF2 to add this information to the file.
7. Press PF3 to return to the System Files Update Selection menu.
8. Press PF3 again to return to CMS.

## Charging for RSCS Usage

Process RSCS accounting records for RSCS transactions that originate on another CPU. Unicenter VM:Account enables you to charge for each 100 records sent or received. You assign userids to receive the charges for each node.

### Implementation

1. Update the directory entry for each RSCS userid and include an ACCT on the OPTION statement.
2. Add RSCSNODE records to the VMACCT CONFIG file to identify the userids sending RSCS accounting data from other RSCS nodes to Unicenter VM:Account.
3. Add SPECIAL RSCS records to the VMACCT CONFIG file to identify the userids running RSCS on the same system as Unicenter VM:Account.
4. Enter the UPDATE command.
5. Select **RSCS** from the System Files Update Selection menu.
6. Fill in the fields on this screen specifying the rate for using RSCS.
7. Press PF2 to add this information to the file.
8. Press PF3 to return to the System Files Update Selection menu.
9. Press PF3 again to return to CMS.

Refer to page 288 for an explanation of the RSCS Utilization report.

## Charging for Non-Machine Resources

You can charge users for non-machine resources (support time or courier services) with the CHARGE command. You must determine the services you want to charge for at your site and identify them in the miscellaneous charges and credits file (MISCCHGS MASTER).

Use the CREDIT command to correct overcharges. The requirements and implementation steps for the CREDIT command are the same as those for the CHARGE command. Refer to *AUTHORIZ Record* on page 145 for more information about authorizations. Refer to page 114 for more information about the CHARGE and CREDIT commands.

These commands create C0 accounting records. When these records are placed in the PERIODTE CURRENT file, their Unicenter VM:Account record datatype becomes A5.

## Implementation

1. Add an AUTHORIZ CHGADMIN record to the VMACCT CONFIG file.

If you do not add this record, only the system administrator or users with AUDITOR authorization can use the CHARGE and CREDIT commands.

2. Enter the UPDATE command.
3. Select **Misc. Charges/Credits** from the System Files Update Selection menu.
4. Fill in the fields on this screen specifying the rate for the service.
  - a. A charge or credit code for each charge or credit.
  - b. A description of the charge or credit.
  - c. A plus sign (+) for a charge or a minus sign (-) for a credit. Create a credit code so you can correct overcharges.
  - d. Whether the system administrator can override the default rate for the charge or credit.
  - e. A default rate for the charge or credit.
5. Press PF2 to add this information to the file.
6. Press PF3 to return to the System Files Update Selection menu.
7. Press PF3 again to return to CMS.

For an explanation of the Miscellaneous Charges/Credits report, refer to page 279.

## Charging for CMSBATCH Usage

You can charge users for using CMSBATCH. Unicenter VM:Account uses the SESSION COSTABLE file to determine the charge for these records. CMSBATCH records have the same format as session records but the card type is different. You can surcharge or discount CMSBATCH jobs with the PACKAGES SURCHARGES cost table.

## Implementation

1. Create a CMSBATCH user exit to validate the accounting records.

For more information, refer to the appropriate system programmer's guide for your operating system.

2. If you want to surcharge or discount CMSBATCH:
  - a. Enter the UPDATE command.
  - b. Select **Package Surcharges** from the System Files Update Selection menu.
  - c. Enter \*BATCH as the package id.
  - d. Enter the amount of surcharge or discount you want to apply.
  - e. Press PF2 to add this information to the file.
  - f. Press PF3 to return to the System Files Update Selection menu.
  - g. Press PF3 again to return to CMS.

## Charging for Guest I/O Usage

When accounting for guest I/O usage, Unicenter VM:Account uses the Network Data Transmission accounting records (type '0C') generated by CP. These records, first available in z/VM Version 4 Release 3 Modification 0, provide "Linux Guest Accounting Improvements." In particular, they provide information about resource consumption for characters sent/received via virtual network interface cards (vNICs), virtual channel-to-channel adapters (CTCAs), and inter-user communication vehicle (IUCV) or advanced program-to-program (APPC) connections by guest virtual machines.

If you are using S/390 or zSeries processors running z/VM to run multiple instances of the Linux Operating System, you can use Unicenter VM:Account Release 1.6 to monitor and perform chargeback of those resources, setting different rates based on guest access from vNICs, CTCA, or IUCV/APPC.

The accounting data differs based on the network device type (as specified in byte 78 of the accounting record):

- ▶ virtual Network Interface Card (vNIC)
- ▶ virtual channel-to-channel adapters (CTCAs)
- ▶ inter-user communication vehicle (IUCV) or advanced program-to-program (APPC) connections

For more information about the accounting record data for each device type, see *Guest I/O Record Layouts* on page 369.

## Implementation

1. Update the directory entry for each network server userid that uses one of these forms of virtual communication, and include a NETAccounting or NETRouter on the OPTION statement.

CP produces type '0C' accounting records for SVM userids with the NETAccounting or NETRouter option specified in their directory entry. For additional information about accounting records for network data transmissions, refer to the IBM z/VM planning and administration manual.

2. Enter the Unicenter VM:Account UPDATE command.
3. Select **Guest Virtual I/O** from the System Files Update Selection menu.
4. Fill in the fields on this screen, specifying the rate per 1000 bytes for each network device type.

You must enter a rate for each device type. If you do not want to charge for a device type, enter **000.00000** as the rate.

5. Press PF2 to add this information to the COSTABLE file.
6. Press PF3 to return to the System Files Update Selection menu.
7. Press PF3 again to return to CMS.





# Surcharges and Discounts

## Cost Table Search Order

When Unicenter VM:Account searches cost tables to find a customer to charge, it looks for the most specific entry it can find, based first on the customer ID, then on the date, then on shift, and finally on device type. These are the steps that Unicenter VM:Account follows when it searches cost tables:

1. Determines who the customer is based on PROJECT or ACCOUNT number accounting. This depends on the value of the CHGCUST record in the VMACCT CONFIG file.
2. Looks for the customer ID and other pertinent information. For example, on the minidisk cost table, Unicenter VM:Account looks for the customer ID and device type.
3. Uses the most specific match found. If there is more than one entry that specifically matches the record being processed, Unicenter VM:Account uses the effective date of the cost table entry to determine the correct record.

You can use masking for some cost table fields. This becomes the default if a more specific entry is not found.

For example, say the two entries in your cost table are:

| Customer ID | Effective Date | Rates |
|-------------|----------------|-------|
| ABC*        | 06/01/02       | ...   |
| *           | 07/01/02       | ...   |

Unicenter VM:Account receives a record for Customer ABCDEF. Unicenter VM:Account will choose Customer ID ABC\* because Unicenter VM:Account looks at the Customer ID before the Effective Date, searching in the sequence customer, date, shift, device name.

## Charging Different Customer Rates

You can charge different customers, or groups of customers, different rates for the same services.

### Implementation

1. Enter the UPDATE command.
2. Select a cost table from the System Files Update Selection menu.
3. Fill in the Customer ID field, assign rates for the customer, and press PF2 to add this information to the file.

Repeat this step for each of your customers.

4. Press PF3 to return to the System Files Update Selection menu.
5. Select another cost table or press PF3 again to return to CMS.

### Recommendation

To simplify this process, assign similar Customer IDs to groups of similar customers. Then you can use masking. For example, if you have two groups of customers, assign one group Customer IDs beginning with 1 and another group of Customer IDs beginning with 2. When you create your cost tables, you can use masking to specify the whole group 1\* for the first group and 2\* for the second group.

## Charging Different Shift Rates

You can charge different rates for different times during the day, or charge a different rate for different days. For example, you can give a discount to users who use SQL/DS during evenings and weekends. A shift for a record is defined by the begin time on that record.

### Implementation

1. Add SHIFT records to the VMACCT CONFIG file.

The following records define a prime time shift from 9 a.m. to 5 p.m. on weekdays and a non-prime shift for the rest of the time:

```
SHIFT PRIME 09:00:00 WEEKDAY
SHIFT NONPRIME 17:00:00 WEEKDAY
SHIFT NONPRIME 00:00:00 24:00:00
```

2. Enter the UPDATE command.
3. Select a cost table from the System Files Update Selection menu.

4. Fill in the **Customer ID** and shift fields, and assign rates for the shift, and press PF2 to add this information to the file.

The Shift ID is the shift name specified on the SHIFT configuration file record. Using the example above, you would specify **PRIME** or **NONPRIME** in the **Shift ID** field. You can use CMS standard masking for the Shift ID. For example, an asterisk (\*) specifies all shifts.

Repeat this step for each shift and customer. For example, if you have two shifts and you charge resources to two customers, you would complete four screens for each cost table.

5. Press PF3 to return to the System Files Update Selection menu.
6. Select another cost table or press PF3 again to return to CMS.

## Charging Different Daily and Holiday Rates

Apply surcharges or discounts to the rates specified in the sessions cost table for different days of the week or holidays. Surcharges and discounts are a percentage of the rates specified in the SESSION COSTABLE file.

### Implementation

1. Enter the UPDATE command to update the PACKAGES SURCHARGES cost table.
2. Select **Package Surcharges** from the System Files Update Selection menu.
3. Use one of the following keywords in the **Package ID** field:

|          |          |
|----------|----------|
| *HOLIDAY | *THU     |
| *SUN     | *FRI     |
| *MON     | *SAT     |
| *TUE     | *WEEKDAY |
| *WED     | *WEEKEND |
4. Set the percentage of discount (-) or surcharge (+) to apply to charges during the specified period.
5. Fill in the **Customer ID** field.
6. Press PF2 to add this information to the file.
7. Repeat steps 2 through 6 for each day and customer.

For example, if you are discounting SESSION rates for Saturday and Sunday, and you charge resources to two customers, you would complete four PACKAGES SURCHARGES screens.

8. Press PF3 to return to the System Files Update Selection menu.
9. If you used the \*HOLIDAY keyword in step 3, update the HOLIDAYS MASTER file to specify the holidays observed at your site.
10. Press PF3 to return to the System Files Update Selection menu.
11. Press PF3 again to return to CMS.

# Performing Common Unicenter VM:Account Tasks

This chapter presents instructions for performing typical Unicenter VM:Account tasks. The following table lists the tasks that this chapter presents.

| <b>Task</b>                                                  | <b>Page</b> |
|--------------------------------------------------------------|-------------|
| Closing an Accounting Period                                 | 61          |
| Creating Accounting Reports                                  | 65          |
| Setting Up Software Package Accounting for Unicenter VM:Sort | 67          |
| Reporting Daily CPU Usage                                    | 70          |
| Creating an Additional Copy of Accounting Data               | 72          |
| Budgeting                                                    | 73          |
| Analyzing Long-Term Trends                                   | 75          |
| Querying Unicenter VM:Account                                | 76          |
| Modifying Unicenter VM:Account Tables and Files              | 85          |
| Creating Locally Defined Accounting Records                  | 99          |
| Reallocating Costs                                           | 100         |
| Using Tapes                                                  | 102         |

## Closing an Accounting Period

You need to close your accounting files at the end of an accounting period. Because an accounting period is usually defined in increments of a month, you will follow this scenario once a month. When you close your accounting period, store your accounting data on either tape or disk.

To close an accounting period and store the accounting data, perform these tasks:

- ▶ Task 1: Close the accounting period.
- ▶ Task 2: Prepare to run the compression utility.
- ▶ Task 3: Run the compression utility.

These tasks are described in the example below.

## Assumptions

- ▶ Today is June 2, 2002.
- ▶ This is the first time that you are closing your accounting period using Unicenter VM:Account.
- ▶ VMRMaint is your system administrator userid.
- ▶ The value of the CHGCUST record in the VMACCT CONFIG file is ACCOUNT. This record tells Unicenter VM:Account that you are using the account number method of accounting.
- ▶ You are going to do queries against your trend file, which is on the Unicenter VM:Account 1B0 minidisk. This also means that you must have a TRNDFILE record in your VMACCT CONFIG file.
- ▶ You have the VMRMaint 170 minidisk accessed.

## Task 1: Closing the Accounting Period

To close the accounting period, follow these steps:

1. Log on to VMRMaint.
2. Mount a tape with a volser of ACCT96 attached to VMACCT as 181.
3. Run the PERIOD command anytime after 12:01 a.m., June 2. This gives you all of June 1 to process rejected records and run utilities and commands to generate additional accounting records not produced by CP.

The command below closes the accounting period by creating a file containing records with dates before the date you specify, 06/01/02.

The file created is named PERIODTE INITIAL and it is written to tape volser ACCT02.

**vmacct period 06/01/02 jun02 (tape acct02**

4. The PERIOD command also opens a new accounting period containing records whose dates are equal to or later than June 1, 2002. JUN02 is the filetype of the file that will be created next month when you close your accounting period.
5. Keep the tape containing the PERIODTE INITIAL file easily available. You will need it when you run the compression utility.

## Task 2: Preparing to Run the Compression Utility

Accounting data files are often large and, because you have at least 12 files for the year, you should compress the accounting data before storing it.

Accounting data is useful for discovering trends in resource usage and expenditure. To keep track of monthly accounting data, store it in a file that you use during the year to look at accounting trends. Create a trend file and continually append your monthly accounting information to the file at the close of each accounting period.

Before compressing your accounting data and appending it to a trend file, you must create your VMJCMP control file. This file tells the utility how you want the data compressed.

Follow these steps to create the VMJCMP control file:

1. Log on to VMRMAINT. The control file will be created on the VMRMAINT A-disk.
2. Edit the control file named VMJCMP CONTROL A:

**xedit vmjcmp control a**

3. Choose data compression fields.

Because you are going to keep a trend file for the entire year to monitor accounting trends, you must choose certain fields on your accounting records that you want to keep after the compression. These are the only fields that you will be able to compress on for the entire year so choose them carefully!

For this scenario, we will compress on the Customer, Account, and Shift fields because these are the important fields when you are using CHGCUST ACCOUNT.

Specify the Customer, Account, and Shift fields on the COMPRESS record:

**COMPRESS CUSTOMER ACCOUNT SHIFT**

4. Specify trend file name.

Your management has decided that you need to look for accounting trends over the course of a year. To do this, you must maintain a trend file and append newly compressed accounting data to it every month.

The first time you close an accounting period, there is no trend file to append the information to. Therefore, Unicenter VM:Account creates the trend file from the information it reads on the TRNDFILE record.

You have decided to name your trend file PERIODTE 2002. *J* is the filemode of the file because you are going to have a copy of the trend file on TDISK accessed as J. 12 MO tells Unicenter VM:Account to keep the accounting data in the trend file for 12 months. The TRNDFILE record in the VMJCMP control file is:

**TRNDFILE PERIODTE 2002 J (12 MO**

After you close your accounting period for the first time and create your trend file, put a record in the VMACCT CONFIG file identifying the trend file to Unicenter VM:Account. (See Task 3.)

The second time you close an accounting period, the trend file already exists. Unicenter VM:Account simply reads the TRNDFILE record in the VMJCMP control file to determine the name of the file to append the new accounting data to. Each time you want to append to the trend file, copy it to TDISK on VMRMAINT and run VMJCMP.

5. You have finished creating your control file. File the control file.

### Task 3: Running the Compression Utility

Now that you have your data file, PERIODTE INITIAL, and you have your control file, VMJCMP CONTROL \*, for the compression utility, you are ready to compress the data and append it to the trend file.

1. Log on to VMRMAINT.
2. Attach a tape drive to VMRMAINT as 181.
3. Mount the tape with the PERIODTE INITIAL file on it.
4. Define a TDISK for VMRMAINT and access it as J.
5. Because this is the first time you are compressing data and appending it to a trend file, there is no previous trend file to copy. Go to step 6.

The second time you compress data, copy the trend file from the Unicenter VM:Account 1B0 minidisk to the VMRMAINT J-disk at this step.

6. To do the actual compression and append the results to the trend file, enter this command:

**vmjcmp tape acct96 (vmjcmp control a**

*tape* is the TAPE parameter that tells the utility to read the data from a tape, *acct96* is the volser name of the tape, and *vmjcmp control a* is the control file name.

7. End Unicenter VM:Account by entering **vmacct end**.
8. Send the new trend file to Unicenter VM:Account.

If you only plan to run reports against your newly created trend file, you do not need to put the file on the Unicenter VM:Account 1B0 minidisk.

9. Disconnect VMRMAINT.
10. Log on to Unicenter VM:Account.
11. Respond **n** to the prompt that asks you if you want to start Unicenter VM:Account.



12. Because this is the first time that you have closed an accounting period, there are no old trend files on VMACCT. However, if you perform this procedure and you do have an old trend file on VMACCT, erase the old trend file now.
13. Receive the new trend file to the Unicenter VM:Account 1B0 minidisk.
14. Add a TRNDFILE record to the VMACCT CONFIG file specifying the name of your newly created trend file.
15. Type **profile**.
16. Respond **y** to the prompt that asks if you want to start Unicenter VM:Account.
17. After initialization, enter **#cp disconn**.

## Creating Accounting Reports

There are many types of accounting reports that you can generate using Unicenter VM:Account. To create a report, follow these general steps:

- ▶ Task 1: Select records from an input file.
- ▶ Task 2: Run and print the report.

The tasks are described in detail below.

### Assumptions

- ▶ Today is July 17, 2002.
- ▶ You are going to use the trend file for input.
- ▶ VMRMAINT is your system administrator.
- ▶ You have the VMRMAINT 170 minidisk accessed.
- ▶ You have a link to the COBOL runtime library.
- ▶ You have this record in the VMACCT CONFIG file:

**SHIFT SECOND 08:00:00 16:00:00**

### Report Criteria

Management has informed you that it needs a report that:

- ▶ Contains customer, account number, and shift information
- ▶ Shows information for January, February, and March 2002 (the first quarter)
- ▶ Shows information for the second shift only (8 a.m. to 4 p.m.)
- ▶ Has a title of *Second Shift Customer Charges for Q1 2002*

## Task 1: Selecting Records From the Input File

To get the information from your trend file for Q1, you must set up your report control file (VMJQRTR CONTROL A) to choose the correct accounting records. All the control file records can be found under *VMJSEL Control File* on page 223.

To create your VMJQRTR control file, follow these steps:

1. The control file will be created on the VMRMAINT A-disk. Log on to VMRMAINT.
2. Edit the control file named VMJQRTR CONTROL A:

**xedit vmjqrtr control a**

3. Specify your input file.

You are going to use your trend file, PERIODTE 2002, as input to the report. This file is on the Unicenter VM:Account 1B0 minidisk. Specify the trend file's filename, filetype, and filemode on the input file record, INFILE.

**INFILE PERIODTE 2002 \***

You do not need to specify an output file because your report sends it to the printer by default.

4. Specify Q1 dates.

Because it is July, you have more than just Q1 accounting data stored in your trend file. To specify the Q1 timeframe and the shift (second shift, 8 a.m. to 4 p.m.), use the parameters record, PARMS:

**PARMS QUARTER 01/01/02 SHIFT SECOND**

The QUARTER parameter tells Unicenter VM:Account that you want three months of accounting records. Unicenter VM:Account automatically calculates the ending date by using the starting date that you specify on the record. The SHIFT parameter tells Unicenter VM:Account that you only want records for the second shift, appropriately named *SECOND*.

5. Sort trend file records.

You want to sort the records in your trend file by Customer and Account number fields. Your SORT record looks like this:

**SORT CUSTOMER ACCOUNT**

6. Label your report.

To give your report a name, use the TITLE record. The name of your report is *Second Shift Customer Charges for Q1 2002*. Your TITLE record looks like this:

**TITLE1 'Second Shift Customer Charges for Q1 2002'**

7. You have now finished creating your control file. File the control file.

Your control file named VMJQRTR CONTROL A looks like this:

```
INFILE PERIODTE 2002 *  
PARMS QUARTER 01/01/02 SHIFT SECOND  
SORT CUSTOMER ACCOUNT  
TITLE1 'Second Shift Customer Charges for Q1 2002'
```

## Task 2: Running and Printing the Report

Now that you have created your control file to choose records for you, you are ready to run your report.

1. Log on to VMRMaint.
2. Link to Unicenter VM:Account 1B0 minidisk and access the minidisk at any address so you can read your input trend file, PERIODTE 2002.
3. To run your report, enter **vmjqrtr**.

Output is sent to the user's virtual printer unless a PARMS record in the report's control file directs the output to a minidisk.

## Setting Up Software Package Accounting for Unicenter VM:Sort

You want to keep track of how much money certain software packages cost to use at your site. Do this using Unicenter VM:Account software package accounting. Below is a scenario in which you set up software package accounting for Unicenter VM:Sort.

To set up software package accounting for Unicenter VM:Sort, perform these tasks to set up VMSORT MODULE and VMSLIB TXTLIB:

- ▶ Task 1: Identify Unicenter VM:Sort to Unicenter VM:Account.
- ▶ Task 2: Mark the VMSORT MODULE for accounting.
- ▶ Task 3: Test the newly marked VMSORT MODULE.
- ▶ Task 4: Put the new VMSORT MODULE on a public disk.
- ▶ Task 5: Repeat tasks 2 through 4 for VMSLIB TXTLIB.

These tasks are described in detail below.

## Assumptions

- ▶ Unicenter VM:Sort is on a public minidisk.
- ▶ VMRMaint is your system administrator userid.
- ▶ You have the VMRMaint 170 minidisk accessed.
- ▶ The userid for the Unicenter VM:Account virtual machine is VMACCT.
- ▶ This is the first time that you have set up software package accounting for Unicenter VM:Sort.

## Task 1: Identifying Unicenter VM:Sort to Unicenter VM:Account

Before you can install software package accounting for Unicenter VM:Sort, you must identify Unicenter VM:Sort to Unicenter VM:Account as a software package. Do this by adding Unicenter VM:Sort to the PACKAGES MASTER file.

1. Log on to VMRMaint.
2. To update the PACKAGES MASTER file using full-screen Unicenter VM:Account, enter:

**vmacct update**

3. Select **Packages Master** from the System Files Update Selection menu.
4. Fill in the fields on this screen to assign a Package ID to Unicenter VM:Sort (call it VMSORT) and specify the maximum number of users who can use Unicenter VM:Sort simultaneously.
5. Press PF2 to add this information to the file.
6. Press PF3 to return to the System Files Update Selection menu.
7. Press PF3 again to return to CMS.

## Task 2: Marking Unicenter VM:Sort for Software Package Accounting

Now that you have identified Unicenter VM:Sort to Unicenter VM:Account, you are ready to mark Unicenter VM:Sort for accounting. Marking Unicenter VM:Sort will cause an accounting record to be cut every time Unicenter VM:Sort is used.

1. Log on to VMRMaint.
2. To invoke the Software Package Accounting Utility, enter:

**vmjpkg**

- When the Software Package Accounting Utility screen displays, fill the screen fields with this information:

|               |                |
|---------------|----------------|
| Function:     | <b>install</b> |
| Package Name: | <b>vmsort</b>  |
| ID:           | <b>vmsort</b>  |
| Package Type: | <b>module</b>  |

Notice that the ID corresponds to the ID you put in the Packages Master file in step 4 of *Identifying Unicenter VM:Sort to Unicenter VM:Account* on page 68.

- Press Enter to display additional options.
- Fill in the screen fields with this information:

|                       |                               |                            |                          |
|-----------------------|-------------------------------|----------------------------|--------------------------|
| Condition Options:    | <u>Run</u><br>(Y   N   Abend) | <u>Msg User</u><br>(Y   N) | <u>Msg Op</u><br>(Y   N) |
| VMACCT not available: | <b>yes</b>                    | <b>no</b>                  | <b>yes</b>               |
| Package not valid:    | <b>no</b>                     | <b>yes</b>                 | <b>no</b>                |

- Press Enter to create the package-accounting stub. This marks the VMSORT MODULE. The VMJPKG utility creates a module named VMSORT \$MODULE on your A-disk.

### Task 3: Testing Your New VMSORT Module

Test your newly stubbed module before you put it on your public disk to make sure you have done your software package accounting correctly. Do your testing from VMRMAINT.

- Log on to VMRMAINT.
- Run the QUERY USAGE command to check Unicenter VM:Sort usage by entering:  
**vmacct query usage**
- In the **Package** field, type **vmsort** and press PF2 to start the query. Because this is the first time that you have marked Unicenter VM:Sort for package accounting, you get a message telling you that there are no records selected. This is normal.
- Rename the VMSORT \$MODULE on your A-disk to VMSORT MODULE A.
- Run the new module, VMSORT MODULE, on your A-disk. You must enter and exit Unicenter VM:Sort. This creates accounting records if you have installed your software package accounting correctly.
- Run the QUERY USAGE command again to check Unicenter VM:Sort usage for userid VMRMAINT by entering:

**vmacct query usage**

7. In the **Package** field, type **vmSORT** and press PF2 to start the query. The QUERY USAGE screen displays. You should now see values in the **Connect Time** and **Virtual CPU** fields.

## Task 4: Putting VMSORT on the Public Minidisk

After successfully testing the new VMSORT MODULE, you are ready to put the new module out on your public minidisk.

1. Rename the VMSORT MODULE that you currently have on your public minidisk.
2. Put the new VMSORT MODULE on the public minidisk.

## Task 5: Setting Up VMSLIB TXTLIB

Repeat Tasks 2 through 4, substituting VMSLIB TXTLIB where necessary.

# Reporting Daily CPU Usage

You want to create a report of CPU usage for a single day to see if there was an unusually large amount of resources used on April 1. Perform these tasks:

- ▶ Task 1: Sort the accounting records.
- ▶ Task 2: Change RAWDATA file records to CP format.
- ▶ Task 3: Create and print the Unicenter VM:Account Capacity Planning report.

These tasks are described in detail below.

## Assumptions

- ▶ Your RAWDATA input file is RAWDATA \$\$020401.
- ▶ Your RAWDATA file exists on the Unicenter VM:Account 1B0 minidisk.
- ▶ CMS SORT is your sorting tool.
- ▶ VMRMaint is your system administrator userid.
- ▶ You have the VMRMaint 170 minidisk accessed.

## Task 1: Sorting the Accounting Records

CP produces accounting records and sends them to the Unicenter VM:Account virtual reader. Unicenter VM:Account then accepts the records and puts them into the RAWDATA file, which resides on the Unicenter VM:Account 1B0 minidisk. The name of the RAWDATA file is RAWDATA \$\$020401.

To run the RAWDATA file with the VMJRAW utility, you must sort the records in the file by userid, date, and time. If you use CMS SORT, the sort field parameters are: 1, 8, 21, 22, 17, 20, 23, 28.

To sort the accounting records, follow these steps:

1. Log on to VMRMaint.
2. Link to and access the Unicenter VM:Account 1B0 minidisk to access the RAWDATA file.
3. Global your TXTLIB by entering:

**global txtlib cmslib**

To sort the file, enter this command using SORTEDRD \$\$020401 A as your output file:

**sort rawdata \$\$020401 \* sortedrd \$\$020401 a**

4. CMS asks you for the sort parameters. Enter these numbers separated by one or more blanks:

**1 8 21 22 17 20 23 28**

5. The sorted data is written to file SORTEDRD \$\$020401 on the VMRMaint A-disk.

## Task 2: Changing RAWDATA File Records to CP Format

Run the VMJRAW utility against the RAWDATA file to create a file of standard CP accounting records that you can use as input for the VMJCPR utility.

1. Log on to VMRMaint.

The output file (SORTEDRD \$\$020401 A) from the previous step should still be on your A-disk.

2. Link to your object directory. This disk should not be accessed.

This allows Unicenter VM:Account to find account number information that was removed when Unicenter VM:Account manipulated CP accounting records.

3. To put the accounting records in standard CP record format, enter:

**vmjraw sortedrd \$\$020401 a vmjraw \$\$020401 a (direct 1A0**

*sortedrd \$\$020401 a* is the input RAWDATA file on the VMRMaint A-disk. *vmjraw \$\$020401 a* is the output file that goes to the VMRMaint A-disk. *direct 1A0* tells Unicenter VM:Account to read the object directory that is linked as 1A0 if it cannot find certain account number information from the accounting records.

### Task 3: Creating the Unicenter VM:Account Capacity Planning Report

Run the VMJCPR utility against the VMJRAW \$\$020401 input file to create the Unicenter VM:Account Capacity Planning report.

1. Log on to VMRMaint.

The output file (RAWDATA \$\$020401 A) from the previous step should still be on your A-disk.

2. To create and print the report, enter:

**vmjcpr vmjraw \$\$020401 \* (print**

*vmjraw* \$\$020401 \* is the input file. *print* is the option that sends the report to the printer.

### Creating an Additional Copy of Accounting Data

You can specify a backup collection disk for your site's raw accounting data. Unicenter VM:Account maintains a copy of the RAWDATA \$\$*yyymmdd* files on the backup disk. This not a true backup of your data. It is simply a copy of the information. If your first copy becomes damaged, use the copy without losing any information.

#### Implementation

1. Allocate a minidisk for the backup raw data files.
2. Specify the label and address on the COLLECT-TWIN record in the MDISKS file. There is no default virtual address for this minidisk. Make it the Unicenter VM:Account 1B1, for example. For additional information about the VMACCT MDISKS file, see the *CA VM:Manager Reference Manual*.
3. Add a filemode to the COLLECT configuration file record to specify the twin disk to keep a copy of the RAWDATA files:

**COLLECT B F CLASS D HOLD 3**

In this example, *F* represents the additional filemode.

4. Link the minidisk you allocated in Step 1 to the Unicenter VM:Account service virtual machine.



## Budgeting

You can limit the use of computer resources. You can set budgets and enforce them when users reach a specified percentage of their budget or exceed their budget. You can set up budgets for the following:

- ▶ Your customers (by Customer ID)
- ▶ Account numbers under the control of your customers (by Account Numbers within Customer IDs)
- ▶ Projects used at your site (by Project ID)
- ▶ Account numbers charging resources to a project (by Account Numbers within Project IDs)

When a user reaches a budget limit you can:

- ▶ Send the user a message
- ▶ Change the user's budget limit
- ▶ Force the user off the system
- ▶ Change the user's password to NOLOG

You can take any combination of these actions.

Do not install budgeting until you have some experience with Unicenter VM:Account and your rate structure is stable.

Unicenter VM:Account does not restrict how or when you establish budgets. Modify or set budgets at any time by updating the appropriate MASTER and ACCTLIST files.

Unicenter VM:Account does not check for consistency between budgets; it enforces each budget independently. For example, you could specify a budget limit for a customer that is less than the total of the budget limits specified for all the projects the customer owns. The customer could reach his budget limit without using up any of his project budgets.

## Budget Processing

Unicenter VM:Account processes budgets by comparing resource consumption with the budget limits defined in the MASTER and ACCTLIST files. When a user exceeds the budget limit or the percentage of the budget specified on the BUDGET configuration file record, Unicenter VM:Account calls the BUDGET user exit. The BUDGET user exit specifies an action and Unicenter VM:Account performs the action.

Unicenter VM:Account posts charges against a budget for only the current accounting period. When you perform end-of-period processing, the entire budget limit is available again. Define your budgets in terms of the accounting period used at your site. For example, if a user has an annual project budget of \$12,000 and you close your accounting period monthly, set the monthly budget limit at \$1,000. This lets the user expend 1/12th of the project budget monthly.

## Implementation

1. Determine the budget limits for each customer, account number, and project at your site.

The amount and type of budget depends on:

- Your rates
- The length of your accounting period
- The accounting structure
- The funding available for projects or departmental activities

Do not use a budget limit of zero. Unicenter VM:Account acts as if there is no budget, and does not call your BUDGET user exit.

2. Decide on the action or actions to take when a budget is exhausted and create a BUDGET user exit to implement the action. For more information about the BUDGET user exit, refer to page 249.
3. Add a BUDGET YES record to the VMACCT CONFIG file. You can also set a percentage on this record to specify when Unicenter VM:Account should call the user exit. Refer to page 147 for more information about the BUDGET configuration file record.
4. Enter the UPDATE command.
5. Select **Customer Master** (the CUSTOMER MASTER file) from the System Files Update Selection menu to set a budget for your customers.
  - a. Enter an amount in the **Budget Limit** field for each customer.
  - b. After budget limits are set for each customer, press PF3 to return to the System Files Update Selection menu.
6. Select **Customer Acctlist** (the CUSTOMER ACCTLIST file) from the System Files Update Selection menu to set budgets for the account numbers under your customers' control.
  - a. Enter an amount in the **Budget Limit** field for each Customer ID and Account Number combination. You can use masking on the **Customer ID** and **Account Number** fields.
  - b. After budget limits are set for each customer, press PF3 to return to the System Files Update Selection menu.
7. Select **Projects Master** (the PROJECTS MASTER file) from the System Files Update Selection menu to set budgets for the projects that the customers at your site use.
  - a. Enter an amount in the **Budget Limit** field for each Project and Customer ID combination. You can use masking on the **Project** and **Customer ID** fields.
  - b. After budget limits are set for each customer, press PF3 to return to the System Files Update Selection menu.

8. Select **Projects Acctlist** (the PROJECTS ACCTLIST file) from the System Files Update Selection menu to set budgets for the account numbers performing work on the projects at your site.
  - a. Enter an amount in the **Budget Limit** field for each Project and Account Number combination. You can use masking on the **Project** and **Account Number** fields.
  - b. After budget limits are set for each project, press PF3 to return to the System Files Update Selection menu.
9. Press PF3 again to return to CMS.

## Analyzing Long-Term Trends

You can use the Unicenter VM:Account compression utility (VMJCMP) to maintain accounting data over time so you can analyze long-term trends. You can use this data in online queries and reports.

### Implementation

1. Edit the VMACCT CONFIG file and add a TRNDFILE record. This record tells Unicenter VM:Account that a trend file exists and to use it during initialization and refresh processing when building the database indices.
2. Create a control file to use with the VMJCMP utility and include a TRNDFILE record. For example, TRNDFILE TREND FILE A (24 MO specifies that VMJCMP should send its output to TREND FILE A, and maintain data in TREND FILE A for two years.
3. Run VMJCMP to create the trend file. Refer to *PERIODTE File Compression Utility (VMJCMP)* on page 185 for detailed information about VMJCMP.

### Using Trend Information

You can run onscreen queries, specifying different dates and compare the output. You can also use trend information with these COBOL reports:

- ▶ VMJTREND: Utilization Trend Analysis Report (see page 291)
- ▶ VMJMONTH: Monthly VM Utilization Report (see page 281)
- ▶ VMJQTR: Quarterly VM Utilization Report (see page 286)

## Querying Unicenter VM:Account

Use the full-screen version of the QUERY USAGE command to get information about resource usage. (For information about the line-mode version of the QUERY USAGE command, refer to page 125.)

To display the Query Usage Selection screen, enter:

```
vmacct query usage
```

### Moving Around the Screen

Press Tab to move from field to field. Fill in only those fields you want to define as parameters for the query. Put an asterisk in the remaining fields as a default value. The asterisk means to select all records in that category.

If you press Enter, the defaults for your userid display.

To define additional criteria with the SELECT and IGNORE statements, press PF5. The Query Usage Additional Selection Criteria screen displays.

### PF Keys on Query Screens

When the Query Usage Selection screen displays, the following functions are available. Use the PF keys or enter the key's label on the command line. Only those PF keys specific to query processing are listed here.

| Key<br>(Label)    | Function                                                                                                                                                                |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PF2 (Run)         | Performs query processing. Selects data according to the selection criteria specified on the screen, formats the data, and outputs it to the destination you specified. |
| PF6<br>(Retrieve) | Places information from the specified control file on the screen.                                                                                                       |
| PF7 (Back)        | Moves the Query Usage Additional Selection Criteria screen back one page.                                                                                               |
| PF8<br>(Forward)  | Moves the Query Usage Additional Selection Criteria screen forward one page.                                                                                            |
| PF9 (Save)        | Saves the information on the screen into a control file on your A-disk.                                                                                                 |

## Refining Full-Screen Queries

You can refine your full-screen queries by entering SELECT or IGNORE statements on the Query Usage Additional Selection Criteria screen. SELECT and IGNORE statements are equivalent to the Data Selection Options described in *QUERY Command* on page 125. Enter SELECT and IGNORE statements in this format:

|        |                                                                                                                                                                 |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SELECT | [ NOT ] <i>condition</i> <sub>1</sub> [ { AND   OR } [ NOT ] <i>condition</i> <sub>2</sub> ] ...<br>... [ { AND   OR } [ NOT ] <i>condition</i> <sub>16</sub> ] |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

|        |                                                                                                                                                                 |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IGNORE | [ NOT ] <i>condition</i> <sub>1</sub> [ { AND   OR } [ NOT ] <i>condition</i> <sub>2</sub> ] ...<br>... [ { AND   OR } [ NOT ] <i>condition</i> <sub>16</sub> ] |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

SELECT and IGNORE statements cannot extend past column 72. Continue a SELECT or IGNORE statement onto the next line by entering any nonblank character in column 72. Words cannot be broken across lines.

Enter comments by placing an asterisk in the first column of a statement. Comments cannot be embedded in a series of continued statements. Use comments if you plan to save the query in a control file.

### NOT

reverses the result of the logical expression immediately following it.

### ***condition*<sub>1</sub> *condition*<sub>2</sub> ... *condition*<sub>16</sub>**

are logical expressions in the format *keyword operator value*:

*keyword*      Keyword as described in Chapter 13, *Keyword Definitions*

*operator*      Any of these operators:

|    |                          |
|----|--------------------------|
| EQ | equal to                 |
| NE | not equal to             |
| GT | greater than             |
| LT | less than                |
| LE | less than or equal to    |
| GE | greater than or equal to |

*value*      Constant against which a data field in an input record (as defined by *keyword*) is evaluated. NULL means that a blank field is used in the evaluation against the data field. Specify generic values by using an asterisk immediately followed by a blank. If an asterisk is part of the value, enclose the entire value in single quotes. Values in quotes cannot use asterisks as masks. Quotes are allowed as part of a constant value except when immediately followed by a blank.

### **{ AND|OR }**

specifies the logical operator to use between logical expressions. AND specifies that the conditions preceding and following it are evaluated together, as a set. OR specifies that the conditions preceding and following it are evaluated separately. Each condition in a set must be true for the whole set to be true.

You can include up to 16 logical conditions on a single SELECT or IGNORE record.

The order of selection is from left to right. Conditions connected by AND are considered as a group.

For example:

**SELECT A and B and C or D or E and F and G or H**

can be thought of as:

**SELECT (A and B and C) or D or (E and F and G) or H**

First, the condition (A and B and C) is checked. Second, condition D is checked. Third, the condition (E and F and G) is checked. Last, condition H is checked.

If any of the conditions are met, the record is selected. If none of the conditions are met, the record is not selected.

## **QUERY USAGE Operation**

Unicenter VM:Account executes part of the query processing on its own service virtual machine and the rest on the requesting userid's service virtual machine. The Unicenter VM:Account service virtual machine:

- ▶ Selects records from PERIODTE CURRENT and the trend file (if it exists) based on the selection criteria entered on the Query Selection screen.
- ▶ Copies the following onto the requesting userid's A-disk:
  - Control file
  - Selected data
  - QUERY EXEC

---

**Note:** The selected data file and the QUERY EXEC are copied to files using filemode A3. This means that CMS automatically erases the file after it has been read.

---

- ▶ Stacks the QUERY command with its options on the requesting userid's program stack.
- ▶ Returns control to the requesting userid.

---

**Note:** If you issued the QUERY command from an EXEC, you must read the stack and execute the command within the EXEC.

---

If there is a nonzero return code from the QUERY USAGE command, the command does not go into the stack.

Execution of the query request continues on the requesting userid's service virtual machine. It performs the following tasks:

- Sorts the data (if this is necessary)
- Compiles totals
- Formats the information
- Sends the information to the destination specified on the Query Selection screen
- If the control file is named VMJQUT1 CONTROL, erases the version Unicenter VM:Account put on the requesting userid's A-disk
- Erases the selected data

## Control Files

Use a control file to streamline your query processing. After you enter your selection criteria on the Query Usage Selection screen, you can save that information in a control file to be used for subsequent queries. Then, enter the name of the control file; Unicenter VM:Account fills in the selection screen with the information you saved.

### Creating a Control File

To create a control file, enter a name for it in the Control Filename field in the upper left-hand corner of the Query Usage Selection screen. Enter your query processing selection criteria as outlined above. Then press PF9 or enter **save** to save the control file. A file is created on your A-disk with the filename you specified and a filetype of CONTROL. The next time you want to query usage, simply enter the name of the saved control file on the screen, retrieve it, and press PF2, or enter **run** to begin query processing.

---

**Note:** Create control files with the online QUERY command (and not with XEDIT) by entering the statements on the screen and then performing a SAVE. If you use XEDIT to modify a control file, the first 10 lines of the file should not be altered. These are in a specific format and if altered may not run.

---

## Displaying Information

To display the information in a control file on your screen, enter the control file name and press PF6 or enter **retrieve**.

## Changing Information

Change your control file by entering changes on the screen. To save the changes, press PF9 or enter **save**.

You can also press PF2 or enter **run** to have the data saved in a control file with the name specified for the CONTROL FILENAME field (unless you use VMJQUT1).

## QUERY USAGE Example

Figure 9 shows an example of a query entered on the Query Usage Selection screen. Figures 10 through 13 show output that the query might produce.

The screenshot shows a terminal window titled "Query Usage Selection Screen" with the identifier "QRYUUJC1" and "VM:Account". The screen contains several input fields and a list of options.

Control Filename: \_\_\_\_\_ Query EXEC: \_\_\_\_\_

|            | Selection Data           | Summary Level                 |
|------------|--------------------------|-------------------------------|
| Customer : | *                        | —                             |
| Project :  | *                        | —                             |
| Account :  | *                        | —                             |
| Userid :   | BIGBEAR                  | —                             |
| Package :  | *                        | —                             |
| Shift :    | *                        | —                             |
| Date :     | 06 01 02 (thru 06 30 02) | — (Date format is 'mm dd yy') |

Output Type: \_\_\_\_\_ (Detail | Summary) Screen Page: \_ (1-4 | \* Detail only)  
Destination: \_\_\_\_\_

Copyright 1994, Computer Associates, Inc.

1= Help    2= Run    3= Quit    4= Clear    5= More\_Sel    6= REtrieve  
7= ...    8= ...    9= Save    10= Print    11= ...    12= End  
==>

Figure 9. Query Usage Selection Screen with Query Example



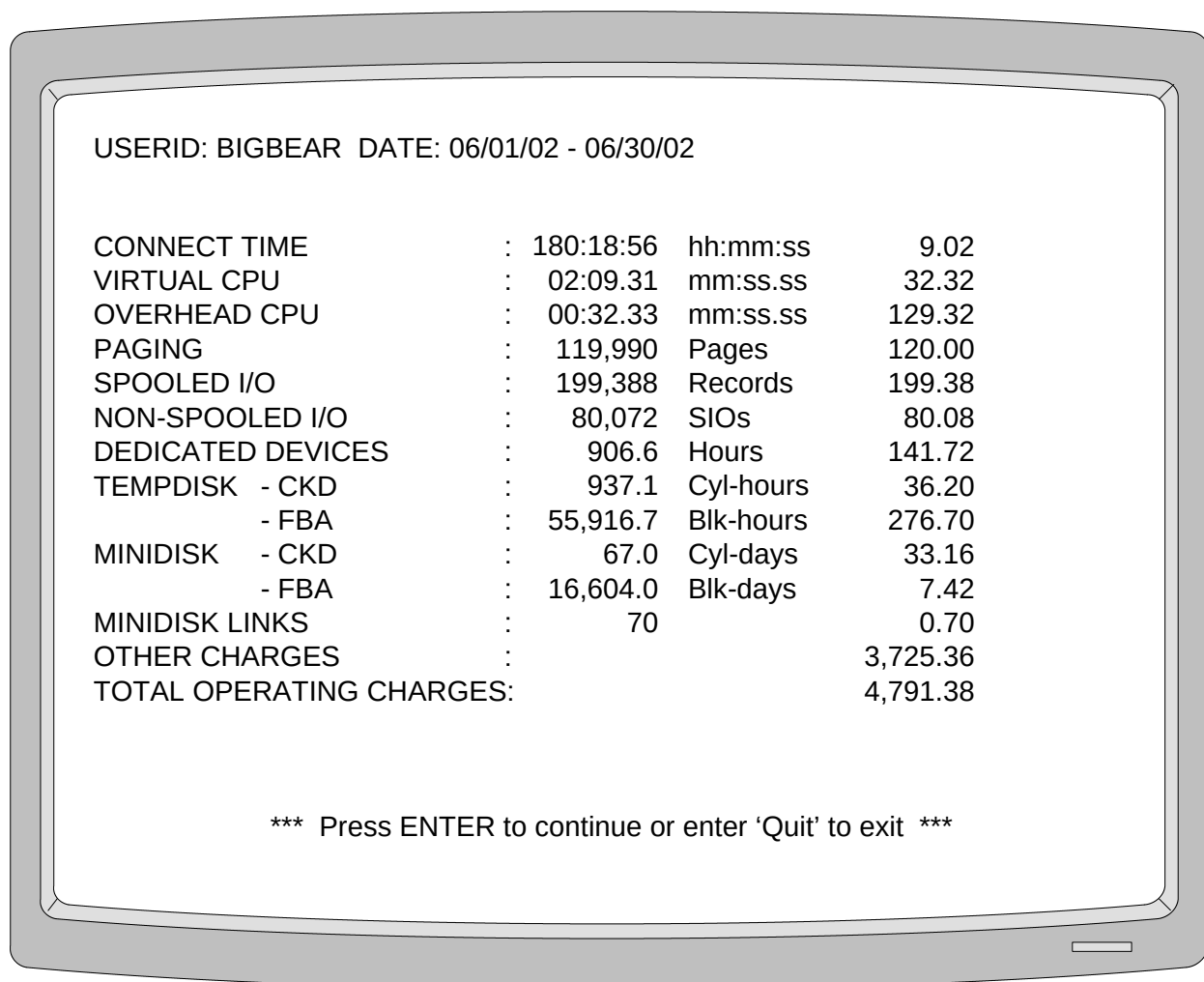


Figure 10. Output from Query Usage, Screen 1 of 4

|                                                         |         |               |           |          |
|---------------------------------------------------------|---------|---------------|-----------|----------|
| USERID: BIGBEAR DATE: 06/01/02 - 06/30/02               |         |               |           |          |
| RSCS                                                    | :       | 615,561       | Records   | 307.78   |
| TAPE MOUNTS                                             | :       | 60            |           | 30.00    |
| VOLUMES                                                 | Disk    | 30            | Vol-days  | 150.00   |
|                                                         | Tape    | 30            | Vol-days  | 150.00   |
| VSCS                                                    | Input   | 4,296,467,294 | Bytes     | 75.00    |
|                                                         | Output  | 4,296,060,058 | Bytes     | 54.64    |
|                                                         | Other   |               | Combined  | 156.18   |
| ARCHIVAL                                                | Online  | 613,344       | Kbyte-hrs | 30.67    |
|                                                         | Offline | 1,226,688     | Kbyte-hrs | 61.34    |
|                                                         | Staged  | 1,226,688     | Kbyte-hrs | 61.34    |
| SPOOL USAGE                                             | :       | 19,704.0      | Rec-hrs   | 98.52    |
| OTHER CHARGES                                           | :       |               |           | 4,615.91 |
| TOTAL OPERATING CHARGES:                                |         |               |           | 4,791.38 |
| *** Press ENTER to continue or enter 'Quit' to exit *** |         |               |           |          |

Figure 11. Output from Query Usage, Screen 2 of 4

|                           |   |           |                   |
|---------------------------|---|-----------|-------------------|
| DATE: 06/01/02 - 06/30/02 |   |           |                   |
| SQL/DS Active Time        | : | 39:00:06  | hh:mm:ss \$140.46 |
| CPU Usage                 | : | 816:00.00 | mm:ss.ss 24.48    |
| Page Buffer               | : | 7,689     | Requests 3.84     |
| SFS Active Time           | : | 24:00:00  | hh:mm:ss 240.00   |
| CPU Usage                 | : | 90:00.00  | mm:ss.ss 72.00    |
| Physical I/O              | : | 196,608   | I/Os 19.62        |
| Primary Storage           | : | 96,888    | Blk-Days 0        |
| Mig. FRA Storage          | : | 96,888    | Blk-Days 0        |
| Mig. Tape Storage         | : | 80,888    | Blk-Days 0        |
| SFS DASD Storage          | : | 274,664   | Blk-days 0        |
| VMBATCH                   |   |           |                   |
| Connect Time              | : | 90:09:28  | hh:mm:ss 4.51     |
| Virtual CPU               | : | 01:04.66  | mm:ss.ss 16.16    |
| Overhead CPU              | : | 00:16.16  | mm:ss.ss 64.66    |
| Paging                    | : | 59,995    | Pages 60.00       |
| Spooled I/O               | : | 99,694    | Records 99.69     |
| Non-spooled I/O           | : | 40,036    | SIOs 40.04        |
| OTHER CHARGES             | : |           | 3,658.46          |
| TOTAL OPERATING CHARGES   | : |           | 4,791.38          |

Figure 12. Output from Query Usage, Screen 3 of 4

|                                |   |                           |                 |
|--------------------------------|---|---------------------------|-----------------|
| USERID: BIGBEAR                |   | DATE: 06/01/02 - 06/30/02 |                 |
| DOS/VSE                        |   |                           |                 |
| Elapsed Time                   | : | 22:24:45                  | hh:mm:ss 22.05  |
| Virtual CPU                    | : | 360:00.00                 | mm:ss.ss 108.00 |
| Overhead CPU                   | : | 10620:00.00               | mm:ss.ss 637.20 |
| Wait Time                      | : | 2160:00.00                | mm:ss.ss 129.60 |
| Memory Usage                   | : | 7,074                     | 2K Pages 35.10  |
| Start I/O                      | : | 2,884,902,056             | SIOs 437.34     |
| Lines Printed                  | : | 3,018                     | Lines 3.03      |
| Pages Printed                  | : | 49,635                    | Pages 49.65     |
| WEB SERVER                     |   |                           |                 |
| Virtual CPU SVM                | : | 01:04:66                  | mm:ss.ss 4.51   |
| I/Os SVM                       | : | 196,608                   | I/Os 19.62      |
| Virtual CPU worker             | : | 00:23:05                  | mm:ss.ss 0.34   |
| I/Os worker                    | : | 3,111                     | I/Os 0.25       |
| Bytes through TCP              | : | 1,226,668                 | Bytes 23.10     |
| Guest I/O                      |   |                           |                 |
| Guest I/O vNIC                 | : | 1,048,576                 | Kilobytes 23.40 |
| CTCA                           | : | 30,172                    | Kilobytes 6.27  |
| IUCV                           | : | 49,152                    | Kilobytes 8.05  |
| OTHER PROCESSING CHARGES       | : |                           | 3,372.61        |
| ADDITIONAL CHARGES AND CREDITS | : |                           | 5.00-           |
| TOTAL OPERATING CHARGES        | : |                           | 4,791.38        |

Figure 13. Output from Query Usage, Screen 4 of 4

## Modifying Unicenter VM:Account Tables and Files

Use the UPDATE command to modify Unicenter VM:Account tables and files, including the cost tables, master files, and account list tables.

There are a full-screen and a line-mode version of this command. The full-screen version of the UPDATE command is explained in this section. The line-mode version of this command is explained beginning on page 133.

You must have SYSADMIN or AUDITOR authorization to use the UPDATE command.

To display the System Files Update Selection menu enter:

**vmacct update**

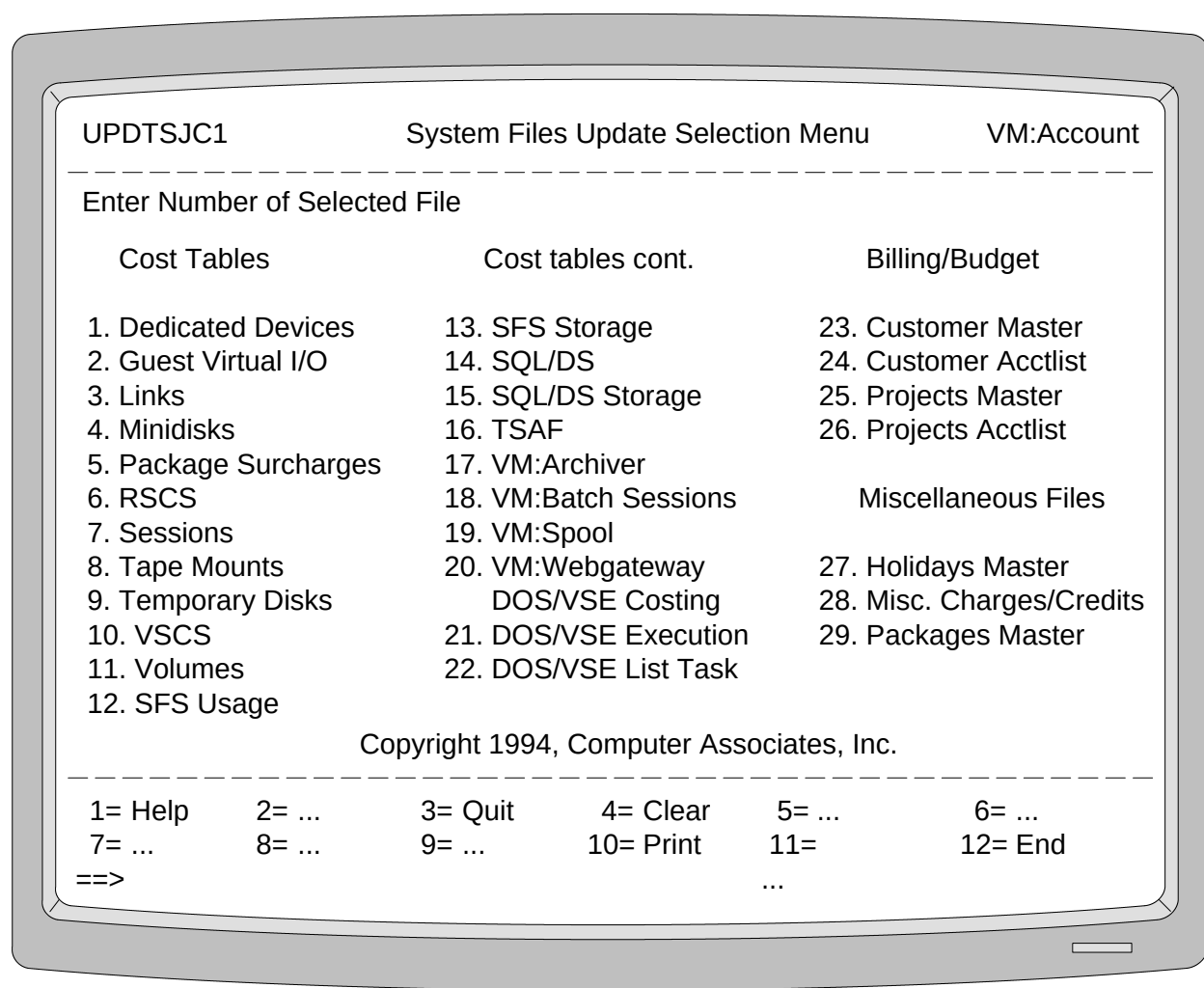


Figure 14. System Files Update Selection Menu

Up to 16 users can work with the Unicenter VM:Account table files at the same time. If another user is using a record in a file at the same time you are, you cannot modify the record. If you try to modify the record, you receive a message that the record is being viewed by one or more users.

Table 3 provides additional information about the files listed on the System Files Update Selection menu.

View a data entry screen by entering the number next to the name of the file or the file's abbreviation on the command line. (Abbreviations are shown in the Abbreviation column of Table 3). For example, to work with the Dedicated Devices Cost Table, enter **1** or **ddev** on the command line.

Table 3. *Unicenter VM:Account Files You Can Select on the System Files Update Selection Menu*

| Selection                | File Name                     | Abbreviation | Description                                                                                                                                                                                                                           |
|--------------------------|-------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cost Tables Files</b> |                               |              |                                                                                                                                                                                                                                       |
| 1                        | Dedicated Devices Cost Table  | DDEV         | Specifies rates for using dedicated devices, such as tape drives, on datatype 02 accounting records                                                                                                                                   |
| 2                        | Guest Virtual I/O             | GIO          | Specifies rates for guest virtual I/O via virtual LAN (vNIC), channel-to-channel adapter (CTCA), and IUCV                                                                                                                             |
| 3                        | Links Cost Table              | LINK         | Specifies rates for links to minidisks                                                                                                                                                                                                |
| 4                        | Minidisk Cost Table           | MDSK         | Specifies rates for minidisk usage                                                                                                                                                                                                    |
| 5                        | Package Surcharges Cost Table | PKGS         | Specifies discounts or surcharges applied to charges associated with using a software package that is package accounted with Unicenter VM:Account; also specifies discounts or surcharges to charges incurred on weekends or holidays |
| 6                        | RSCS Cost Table               | RSCS         | Specifies rates for RSCS utilization                                                                                                                                                                                                  |
| 7                        | Session Cost Table            | SESS         | Specifies rates for resource usage in datatype 01 accounting records                                                                                                                                                                  |
| 8                        | Tape Mounts Cost Table        | TAPM         | Specifies rates for tape mounts by BrightStor VM:Tape                                                                                                                                                                                 |

(continued)

† Only sites with the DOS/VSE option need these files. Refer to *Unicenter VM:Account DOS/VSE Support Option* for a complete description of these files.

‡ To delete information from the master description files, update the ACCTLIST files first.

Table 3. *Unicenter VM:Account Files You Can Select on the System Files Update Selection Menu (continued)*

| Selection                                 | File Name                              | Abbreviation | Description                                                                      |
|-------------------------------------------|----------------------------------------|--------------|----------------------------------------------------------------------------------|
| 9                                         | Temporary Disk Cost Table              | TDSK         | Specifies rates for temporary disk space usage in datatype 03 accounting records |
| 10                                        | VSCS Cost Table                        | VSCS         | Specifies rates for VSCS utilization                                             |
| 11                                        | Volumes Cost Table                     | VOL          | Specifies rates for tape or disk volume usage                                    |
| 12                                        | SFS Usage Cost Table                   | SFS          | Specifies rates for using space in SFS filepools                                 |
| 13                                        | SFS Storage Cost Table                 | SFSD         | Specifies rates for DASD ownership in SFS filepools                              |
| 14                                        | SQL/DS Cost Table                      | SQL          | Specifies rates for SQL/DS utilization                                           |
| 15                                        | SQL/DS Storage Cost Table              | SQLS         | Specifies rates for SQL/DS DBSPACE ownership                                     |
| 16                                        | TSAF Cost Table                        | TSAF         | Specifies rates for TSAF utilization                                             |
| 17                                        | BrightStor VM:Archiver Cost Table      | ARCH         | Specifies rates for using BrightStor VM:Archiver storage                         |
| 18                                        | Unicenter VM:Batch Sessions Cost Table | BAT          | Specifies rates for Unicenter VM:Batch jobs                                      |
| 19                                        | Unicenter VM:Spool Cost Table          | SPL          | Specifies rates for using spool space                                            |
| 20                                        | CA-VM:Webgateway                       | WEB          | Specifies rates for CA-VM:Webgateway resource accounting                         |
| <b>DOS/VSE Costing Files <sup>†</sup></b> |                                        |              |                                                                                  |
| 21                                        | DOS/VSE Execution                      | VSEE         | Specifies rates for DOS/VSE execution                                            |
| 22                                        | DOS/VSE List Task                      | VSEL         | Specifies rates for DOS/VSE list tasks                                           |

(continued)

<sup>†</sup> Only sites with the DOS/VSE option need these files. Refer to *Unicenter VM:Account DOS/VSE Support Option* for a complete description of these files.

<sup>‡</sup> To delete information from the master description files, update the ACCTLIST files first.

Table 3. *Unicenter VM:Account Files You Can Select on the System Files Update Selection Menu (continued)*

| Selection                                          | File Name                     | Abbreviation | Description                                                                                                                                                   |
|----------------------------------------------------|-------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Master Description Files (Billing/Budget) ‡</b> |                               |              |                                                                                                                                                               |
| 23                                                 | Customer Master               | CUSTO        | Specifies information about customers and a unique customer ID for each                                                                                       |
| 24                                                 | Customer Acctlist             | CUSTA        | Cross-references all customer IDs in the Customer Master file with account numbers in the VM user directory                                                   |
| 25                                                 | Projects Master               | PROJE        | Associates customer IDs with project names                                                                                                                    |
| 26                                                 | Projects Acctlist             | PROJA        | Specifies project names and their associated account numbers in the VM user directory                                                                         |
| <b>Miscellaneous Files</b>                         |                               |              |                                                                                                                                                               |
| 27                                                 | Holidays Master               | HOL          | Specifies holidays                                                                                                                                            |
| 28                                                 | Miscellaneous Charges/Credits | MISC         | Specifies miscellaneous non-machine charge and credit codes                                                                                                   |
| 29                                                 | Packages Master               | PACKA        | Specifies the names of software packages that are package-accounted by Unicenter VM:Account. It also contains charge differentials for weekends and holidays. |

† Only sites with the DOS/VSE option need these files. Refer to *Unicenter VM:Account DOS/VSE Support Option* for a complete description of these files.

‡ To delete information from the master description files, update the ACCTLIST files first.



## PF Keys on Update Screens

Use the following PF keys on any update screen. You can use the PF keys or enter the name of the key's label on the command line.

| Key<br>(Label)    | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PF2 (Add)         | Adds the record on the screen to the file. If the record is already in the file, an error message tells you that the record already exists.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PF5<br>(Find)     | Finds the first record with an entry that matches an entry in a field. For example, if you are looking for customer ADMIN on the Dedicated Devices Cost Table Screen, type <b>admin</b> in the Customer ID field and press this PF key. FIND retrieves the first record with a Customer ID of ADMIN and displays it on the screen. To find a masked field, specify a double mask. For example, to find Customer ID CUST*, enter <b>cust**</b> in the Customer ID field. FIND can be used only with key fields (for example, you cannot do a FIND on a COMMENT). |
| PF6<br>(Change)   | Changes the current entry. You cannot change key fields in the PROJECTS MASTER and PROJECTS ACCTLIST files.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PF7<br>(Previous) | Displays the previous entry in the table. For the HOLIDAYS MASTER file, the previous entry in the file displays.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| PF8<br>(Next)     | Displays the next entry in the table. For the HOLIDAYS MASTER file, the next entry in the file displays.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PF9<br>(Repeat)   | Repeats the last ADD, CHANGE, DELETE, or FIND command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| PF11<br>(Delete)  | Deletes the displayed entry from the file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Update Screen Data Fields

Table 4 lists the data entry fields found on the update screens, the file where they appear, and a description of each field.

Table 4. Update Screen Data Fields

| Data Entry Field         | Located In This File                   | Description                                                                                                                                                                                                                                                                                                                 |
|--------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ACCOUNT                  | CUSTOMER ACCTLIST<br>PROJECTS ACCTLIST | Y means that an * is placed in column 28 of the record to indicate that this is the default project. N means that column 28 of the record is blank.                                                                                                                                                                         |
| ACCOUNT NO               | CUSTOMER ACCTLIST<br>PROJECTS ACCTLIST | Account number associated with the customer ID as specified in the CUSTOMER ACCTLIST file. In the PROJECTS ACCTLIST file, it specifies the account number that can charge to a project. The account number can contain up to eight alphanumeric characters and is left-justified. You can use the * mask instead of a name. |
| ADDRESS                  | CUSTOMER MASTER                        | Customer's address, consisting of four lines: three 20-character lines and one 9-character Zip Code line. Each line is left justified.                                                                                                                                                                                      |
| ADDRESS                  | LINKS COSTABLE                         | Linked minidisk address or * mask.                                                                                                                                                                                                                                                                                          |
| ARCHIVAL TYPE            | ARCHIVE COSTABLE                       | Type of archive storage being costed: ONLINE, OFFLINE, or STAGED.                                                                                                                                                                                                                                                           |
| BUDGET LIMIT             | CUSTOMER ACCTLIST<br>CUSTOMER MASTER   | Budget associated with a customer ID and account number in the CUSTOMER ACCTLIST file. This field can contain up to eight numeric characters and it is right-justified. Do not use decimal points.                                                                                                                          |
| BUDGET LIMIT FOR PROJECT | PROJECTS ACCTLIST<br>PROJECTS MASTER   | Budget associated with a project name and account number in the PROJECTS ACCTLIST file. This field can contain up to eight numeric characters and it is right-justified. Do not use decimal points.                                                                                                                         |
| CHARGE/ CREDIT CODE      | MISCCHGS MASTER                        | Charge or credit name, up to eight characters long.                                                                                                                                                                                                                                                                         |
| CHARGE/ CREDIT INDICATOR | MISCCHGS MASTER                        | + = Charge<br>- = Credit                                                                                                                                                                                                                                                                                                    |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field | Located In This File                                                                                                                                                                                                                                                                                                                          | Description                                                                                                                                                    |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CLASS            | SPOOL COSTABLE                                                                                                                                                                                                                                                                                                                                | Spool file class. This field can contain a single character A-Z or 0-9.                                                                                        |
| COMMENTS         | ARCHIVE COSTABLE<br>DBSPACE COSTABLE<br>DEDEVICE COSTABLE<br>LGAI COSTABLE<br>LINKS COSTABLE<br>MDISK COSTABLE<br>PACKAGES COSTABLE<br>RSCS COSTABLE<br>SESSION COSTABLE<br>SFS COSTABLE<br>SFSDASD COSTABLE<br>SPOOL COSTABLE<br>SQL-DS COSTABLE<br>TAPMOUNT COSTABLE<br>TDISK COSTABLE<br>TSAF COSTABLE<br>VMBATCH COSTABLE<br>WEB COSTABLE | A comment or record description, up to 20 characters long.                                                                                                     |
| CONTACT NAME     | CUSTOMER MASTER                                                                                                                                                                                                                                                                                                                               | Person's name associated with the customer ID in the CUSTOMER MASTER file. Contact name can contain up to 20 alphanumeric characters and it is left-justified. |
| CUSTOMER ID      | CUSTOMER ACCTLIST<br>CUSTOMER MASTER<br>PROJECTS MASTER                                                                                                                                                                                                                                                                                       | Customer ID, up to eight alphanumeric characters. You cannot use the * mask in these files.                                                                    |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field                             | Located In This File                                                                                                                                                                                                                                                                                                                                                               | Description                                                                                                                                                            |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CUSTOMER ID                                  | ARCHIVE COSTABLE<br>DBSPACE COSTABLE<br>DEDEVICE COSTABLE<br>LGAI COSTABLE<br>LINKS COSTABLE<br>MDISK COSTABLE<br>PACKAGES COSTABLE<br>RSCS COSTABLE<br>SESSION COSTABLE<br>SFS COSTABLE<br>SFSDASD COSTABLE<br>SPOOL COSTABLE<br>SQL-DS COSTABLE<br>TAPMOUNT COSTABLE<br>TDISK COSTABLE<br>TSAF COSTABLE<br>VMBATCH COSTABLE<br>VOLUMES COSTABLE<br>VSCS COSTABLE<br>WEB COSTABLE | Customer ID or * mask. * means that all customers are charged for using a resource.                                                                                    |
| CUSTOMER NAME                                | CUSTOMER MASTER                                                                                                                                                                                                                                                                                                                                                                    | Customer's name in the CUSTOMER MASTER file. The name can be contain up to 20 alphanumeric characters and it is left-justified. The first character cannot be a blank. |
| DAILY RATE PER CYLINDER OR 100 BLOCKS        | MDISK COSTABLE                                                                                                                                                                                                                                                                                                                                                                     | Daily minidisk ownership rate. The highest rate you can charge is 999.99999. If the rate has more than five significant digits, it is rounded to five.                 |
| DAILY RATE PER 100 BLOCKS OWNED (IN PRIMARY) | SFSDASD COSTABLE                                                                                                                                                                                                                                                                                                                                                                   | Daily SFS DASD ownership rate for blocks in primary storage. The highest rate you can charge is 999.99999.                                                             |
| DAILY RATE PER 100 BLOCKS OWNED (IN FRA)     | SFSDASD COSTABLE                                                                                                                                                                                                                                                                                                                                                                   | Daily SFS DASD ownership rate for blocks in the fast recall area. The highest rate you can charge is 999.99999.                                                        |
| DAILY RATE PER 100 BLOCKS OWNED (MIGRATED)   | SFSDASD COSTABLE                                                                                                                                                                                                                                                                                                                                                                   | Daily SFS DASD ownership rate for blocks migrated to tape. The highest rate you can charge is 999.99999.                                                               |
| DAILY RATE PER 100 PAGES                     | DBSPACE COSTABLE                                                                                                                                                                                                                                                                                                                                                                   | Daily SQL/DS page use rate. The highest rate you can charge is 999.99999.                                                                                              |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field    | Located In This File                                                                                                                                                                                                                                                                                                                                             | Description                                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| DATA BASE NAME      | SQL-DS COSTABLE<br>DBSPACE COSTABLE                                                                                                                                                                                                                                                                                                                              | Name of the SQL/DS database you are charging for. The database name can be a maximum of eight alphanumeric characters.                       |
| DBSPACE             | DBSPACE COSTABLE                                                                                                                                                                                                                                                                                                                                                 | Type of DBSPACE storage used.                                                                                                                |
| DEFAULT PROJECT FOR | PROJECTS ACCTLIST                                                                                                                                                                                                                                                                                                                                                | Whether the project name entry is the default project name for the account number entry.                                                     |
| DEFAULT UNIT PRICE  | MISCCHGS MASTER                                                                                                                                                                                                                                                                                                                                                  | Default unit price for a specified charge or credit.                                                                                         |
| DESCRIPTION         | MISCCHGS MASTER                                                                                                                                                                                                                                                                                                                                                  | Description of a charge or credit, up to 24 characters long.                                                                                 |
| DEVICE TYPE         | DEDEVICE COSTABLE<br>MDISK COSTABLE<br>TDISK COSTABLE                                                                                                                                                                                                                                                                                                            | Device type listed in one of the device tables in Chapter 5, <i>Resource Accounting</i> .                                                    |
| DISTRIBUTION CODE   | SPOOL COSTABLE                                                                                                                                                                                                                                                                                                                                                   | Distribution code assigned to a spool file.                                                                                                  |
| EFFECTIVE DATE      | ARCHIVE COSTABLE<br>DBSPACE COSTABLE<br>DEDEVICE COSTABLE<br>LGA1 COSTABLE<br>LINKS COSTABLE<br>MDISK COSTABLE<br>PACKAGES COSTABLE<br>RSCS COSTABLE<br>SESSION COSTABLE<br>SFS COSTABLE<br>SFSDASD COSTABLE<br>SQL-DS COSTABLE<br>TAPMOUNT COSTABLE<br>TDISK COSTABLE<br>TSAF COSTABLE<br>VMBATCH COSTABLE<br>VOLUMES COSTABLE<br>VSCS COSTABLE<br>WEB COSTABLE | Date the information on the screen takes effect. Dates are entered in <i>mm dd yy</i> format. The earliest date you can specify is 01 01 83. |
| FILEPOOL NAME       | SFS COSTABLE<br>SFSDASD COSTABLE                                                                                                                                                                                                                                                                                                                                 | Name of the SFS Filepool being costed. The name can contain up to eight alphanumeric characters.                                             |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field                                  | Located In This File                 | Description                                                                                                                                                                        |
|---------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HOURLY RATE PER CYLINDER OR 100 BLOCKS            | SPOOL COSTABLE                       | Highest value that may be specified is 999.99999. If the value entered has more than five significant digits, the rate is rounded.                                                 |
| HOURLY RATE PER 100 HOURS                         | SPOOL COSTABLE                       | Highest value that may be specified is 999.99999. If the value entered has more than three significant digits, the rate is rounded.                                                |
| HOURLY RATE PER 1000 BYTES                        | SPOOL COSTABLE                       | Hourly rate per 1000 bytes of archival storage used. The rate can be up to six numeric characters, including five decimal places (9.99999).                                        |
| INDEX                                             | PACKAGES MASTER<br>PROJECTS MASTER   | This field cannot be modified by the user. It is an index used internally by Unicenter VM:Account. When a package or project displays, its index displays in this field.           |
| JOB CLASS                                         | VM BATCH COSTABLE                    | Class of Unicenter VM:Batch job.                                                                                                                                                   |
| MAXIMUM NUMBER OF USERS EXECUTING PACKAGE AT ONCE | PACKAGES MASTER                      | Maximum number of users who can execute the package-accounted program concurrently. * indicates that there is no limit to the number of users who may execute the package at once. |
| MM DD(1) ...<br>MM DD(15)                         | HOLIDAYS MASTER                      | Holidays for the given year must be in the format <i>mm dd</i> .                                                                                                                   |
| NAME                                              | VM BATCH COSTABLE                    | Name of the Unicenter VM:Batch job.                                                                                                                                                |
| OWNER USERID FOR LINKED DISK                      | LINKS COSTABLE                       | Linked minidisk owner or * mask. If a userid is specified here (that is, not the * mask), the userid must exist in the directory.                                                  |
| OVERRIDE ON UNIT PRICE                            | MISCCHGS MASTER                      | Y=Yes, N=No. Specifies if an override on the unit price is allowed when the charge or credit is entered.                                                                           |
| PACKAGE ID                                        | PACKAGES MASTER<br>PACKAGES COSTABLE | Name Unicenter VM:Account uses to identify the package-accounted software.                                                                                                         |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field                 | Located In This File                 | Description                                                                                                                                                     |
|----------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PHONE NUMBER                     | CUSTOMER MASTER                      | Telephone number associated with the customer ID in the CUSTOMER MASTER file                                                                                    |
| PROJECT NAME                     | PROJECTS ACCTLIST<br>PROJECTS MASTER | Project name associated with the costed record. It can be up to 16 characters in length.                                                                        |
| PRIORITY                         | VM BATCH COSTABLE                    | Priority of the Unicenter VM:Batch job.                                                                                                                         |
| RATE PER DAY                     | VOLUMES COSTABLE                     | Highest value that may be specified is 99999.999. If the value entered has more than three significant digits, the rate is rounded.                             |
| RATE PER HOUR                    | DEDEVICE COSTABLE                    | Highest value that may be specified is 999.99999. If the value entered has more than five significant digits, the rate is rounded.                              |
| RATE PER LINK                    | LINKS COSTABLE                       | Highest value that may be specified is 999.99999. If the value entered has more than five significant digits, the rate is rounded.                              |
| RATE PER MINUTE<br>ACTIVE TIME   | SFS COSTABLE                         | Time the user is connected to an SFS filepool. The rate can be up to eight numeric characters, including up to five decimal places (999.99999).                 |
| RATE PER MINUTE<br>ACTIVE TIME   | SQL-DS COSTABLE                      | Time the user is connected to a real agent or an SFS filepool. The rate can be up to eight numeric characters, including up to five decimal places (999.99999). |
| RATE PER MINUTE<br>CONNECT TIME  | TSAF COSTABLE                        | Amount to charge for each minute a user is connected to the TSAF resource.                                                                                      |
| RATE PER MOUNT                   | TAPMOUNT COSTABLE                    | Highest value that may be specified is 999.99999. If the value entered has more than three significant digits, the rate is rounded.                             |
| RATE PER PAGE<br>BUFFER REQUESTS | SQL-DS COSTABLE                      | Number of times the agent requested a page from SQL/DS. The rate is up to eight numeric characters, including up to five decimal places (999.99999).            |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field                 | Located In This File | Description                                                                                                                                                    |
|----------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RATE PER SECOND CPU USAGE        | SFS COSTABLE         | Rate per second of CPU usage while a user is using an SFS filepool. Up to eight numeric characters, including up to five decimal places (999.9999).            |
| RATE PER SECOND CPU USAGE        | SQL-DS COSTABLE      | Rate per second of CPU usage while a user is connected to SQL/DS. Up to eight numeric characters, including up to five decimal places (999.9999).              |
| RATE PER SECOND CPU USAGE SVM    | WEB COSTABLE         | Rate per second of web server virtual CPU processor time. Up to eight numeric characters, including up to two decimal places (999999.99).                      |
| RATE PER SECOND CPU USAGE WORKER | WEB COSTABLE         | Rate per second of virtual CPU processor time by web server worker. Up to eight numeric characters, including up to two decimal places (999999.99).            |
| RATE PER 100 RECORDS RECEIVED    | RSCS COSTABLE        | Highest value that may be specified is 99999.999. If the value entered has more than three significant digits, the rate is rounded.                            |
| RATE PER 100 RECORDS SENT        | RSCS COSTABLE        | Highest value that may be specified is 99999.999. If the value entered has more than three significant digits, the rate is rounded.                            |
| RATE PER 1,000 BYTES SENT        | TSAP COSTABLE        | Highest value that may be specified is 999.999.                                                                                                                |
| RATE PER 1000 BYTES THROUGH TCP  | WEB COSTABLE         | Rate for each 1000 bytes of data through TCP. Up to eight numeric characters, including up to two decimal places (999999.99)                                   |
| RATE PER 1000 BYTES VIA CTCA     | LGAI COSTABLE        | For Linux guest virtual I/O, the rate for each 1000 bytes of data through channel-to-channel adapter (CTCA). Highest value that may be specified is 999.99999. |
| RATE PER 1000 BYTES VIA IUCV     | LGAI COSTABLE        | For Linux guest virtual I/O, the rate for each 1000 bytes of data through IUCV. Highest value that may be specified is 999.99999.                              |

(continued)



Table 4. Update Screen Data Fields (continued)

| Data Entry Field                | Located In This File                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RATE PER 1000 BYTES VIA vNIC    | LGAI COSTABLE                        | For Linux guest virtual I/O, the rate for each 1000 bytes of data through virtual LAN (vNIC). Highest value that may be specified is 999.99999.                                                                                                                                                                                                                                                                                                                    |
| RATE PER 1,000 DASD I/Os        | SFS COSTABLE                         | Number of DASD I/Os used when a user accesses data in an SFS filepool. Up to eight numeric characters, including up to five decimal places (999.9999).                                                                                                                                                                                                                                                                                                             |
| RATE PER 1,000 DASD I/Os SVM    | WEB COSTABLE                         | Rate for each 1,000 I/O requests by the web server SVM. Up to eight numeric characters, including up to two decimal places (999999.99).                                                                                                                                                                                                                                                                                                                            |
| RATE PER 1,000 DASD I/Os WORKER | WEB COSTABLE                         | Rate for I/O requests by the web server worker. Up to eight numeric characters, including up to two decimal places (999999.99).                                                                                                                                                                                                                                                                                                                                    |
| RATE PER 1,000 BYTES RECEIVED   | TSAP COSTABLE                        | Highest value that may be specified is 999.999.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| RATES                           | SESSION COSTABLE<br>VMBATCH COSTABLE | <p>Highest value that may be specified is 999.999. If the value entered has more than three significant digits, the rate will be rounded. These rates can be set:</p> <p>Rate per Hour Connect Time<br/> Rate per Second Virtual CPU<br/> Rate per Second Overhead CPU<br/> Rate per 100 Page Reads<br/> Rate per 100 Page Writes<br/> Rate per 1,000 Start I/Os<br/> Rate per 1,000 Punch I/Os<br/> Rate per 1,000 Print I/Os<br/> Rate per 1,000 Reader I/Os</p> |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field     | Located In This File                                                                                                                                                                                                                              | Description                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RATES FOR VSCS USAGE | VSCS COSTABLE                                                                                                                                                                                                                                     | Highest value that may be specified for all of the rates in the VSCS Costable is 99999.999. If the value entered has more than three significant digits, the rate is rounded. These rates can be set:<br><br>Rate per 100 Input Request Units<br>Rate per 1,000 Input Bytes<br>Rate per 100 Output Request Units<br>Rate per 1,000 Output Bytes<br>Rate per 100 Console Output Lines<br>Rate per 100 Copy Requests |
| RESOURCE NAME        | TSAF COSTABLE                                                                                                                                                                                                                                     | TSAF resource type consumed.                                                                                                                                                                                                                                                                                                                                                                                       |
| SHIFT                | DEDEVICE COSTABLE<br>LINKS COSTABLE<br>PACKAGES COSTABLE<br>RSCS COSTABLE<br>SESSION COSTABLE<br>SFS COSTABLE<br>SFSDASD COSTABLE<br>SQL-DS COSTABLE<br>TAPMOUNT COSTABLE<br>TDISK COSTABLE<br>TSAF COSTABLE<br>VMBATCH COSTABLE<br>VSCS COSTABLE | Shift identifier or *. The shift must be one that is specified in the configuration file. SHIFT 00 may not be specified. A blank character may not be entered in this field.                                                                                                                                                                                                                                       |
| SPOOL FILE           | SPOOL COSTABLE                                                                                                                                                                                                                                    | The spool file types:<br><br>Account      Print<br>Console      Punch<br>CPTrap      Unknown<br>Monitor      VMDump<br>PDump                                                                                                                                                                                                                                                                                       |
| STORAGE GROUP        | SFSDASD COSTABLE                                                                                                                                                                                                                                  | SFS storage group containing the FILEPOOL.                                                                                                                                                                                                                                                                                                                                                                         |
| STORAGE POOL NUMBER  | DBSPACE COSTABLE                                                                                                                                                                                                                                  | SQL/DS Storage Pool containing the DBSPACE.                                                                                                                                                                                                                                                                                                                                                                        |

(continued)

Table 4. Update Screen Data Fields (continued)

| Data Entry Field      | Located In This File | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SURCHARGE OR DISCOUNT | PACKAGES COSTABLE    | (+ = Surcharge, - = Discount) The following percentages are whole numbers between 0 and 100. If a number with a decimal place is specified, the percentage will be rounded to the nearest whole number.<br><br>Connect Time Sign (+/-)<br>Connect Time Percentage<br>Virtual CPU Sign<br>Virtual CPU Percentage<br>Overhead CPU Sign<br>Overhead CPU Percentage<br>Page Reads Sign<br>Page Reads Percentage<br>Page Writes Sign<br>Page Writes Percentage<br>Start I/O Sign (non-spool)<br>Start I/O Percentage<br>Punch I/O Sign<br>Punch I/O Percentage<br>Print I/O Sign<br>Print I/O Percentage<br>Reader I/O Sign<br>Reader I/O Percentage |
| TCP PORT NUMBER       | WEB COSTABLE         | Web server TCP port - maximum 5 numeric digits not to exceed 65535.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| WEB SERVER NAME       | WEB COSTABLE         | Web server userid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| YEAR                  | HOLIDAYS MASTER      | Year for which these holidays apply (specified in the format yy).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Creating Locally Defined Accounting Records

You can create accounting records for resources not included in the Unicenter VM:Account cost tables. For example, you can create a record to charge for using printers.

Unicenter VM:Account does not process locally defined records as part of budgeting, querying, or reporting.

- You must write your own EXECs to include locally defined accounting records for budgeting.

- ▶ Unicenter VM:Account passes locally defined records to the userid running a query, but the query EXEC ignores them.
- ▶ You can modify the Unicenter VM:Account COBOL reports to include locally defined records. Refer to the section *Modifying the Reports* on page 266 for information about customizing reports for your site.

## Implementation

1. Add an ACCTCRDS record to the VMACCT CONFIG file to identify the userid punching the records to Unicenter VM:Account.

Use the QUERY VIRTUAL 00D command to verify that this userid is punching the records to the Unicenter VM:Account service virtual machine in the class you specified on the COLLECT configuration file record.

2. Create RAWDATA, ACCTDATA, and COSTING user exits to process the records.

Refer to Chapter 11, *User Exits*, for more information about creating user exits. Refer to Figure 68 (page 351) for more information about record layouts.

## Re-allocating Costs

One feature of the VMJRCS utility is the ability to move resource costs from one customer to another. The examples below show how you can move resource costs under the CHGCUST ACCOUNT or CHGCUST PROJECT charging strategy.

### Reallocating Costs by Account Number

Back in January of 1996, all resources for users with account number 6 were charged to the Accounting Department. Resources for users with account number 5 were charged to the Data Processing Department. You want to shift the costs incurred by Accounting to Data Processing.

Use this procedure to shift charges from one department to another if you charge by account numbers:

1. Use the UPDATE command and make the following changes to the CUSTOMER ACCTLIST file:
  - a. Change the Accounting Department's account number to 4 or some other unique value.
  - b. Add a new Data Processing record with an account number of 6.
2. Log onto the Unicenter VM:Account service virtual machine and terminate processing with the END command.

3. Create a VMJRCS specification control file named, for example, SPECS DATA, with a NEWCUST record.
4. Run the VMJRCS utility with this command:

**vmjrsc periodte jan96 specs data a**

You see a display similar to this:

| CUSTOMER     | PRECOSTED<br>TOTAL | SELECTED<br>TOTAL | RECOSTED<br>TOTAL | CHARGE/<br>CREDIT | FINAL<br>TOTAL |
|--------------|--------------------|-------------------|-------------------|-------------------|----------------|
| DATA-PROCESS | 0                  | 0                 | 600               | 0                 | 600            |
| ACCOUNTING   | 600                | 600               | 0                 | 0                 | 0              |
| SYSTEM TOTAL | 600                | 600               | 600               | 0                 | 600            |

The COSTABLE files were not changed in this example, so there was no change to the total dollar figures. The costs were moved from the Accounting Department to the Data Processing Department.

## Reallocating Costs by Project

Back in January of 1996, resources used by the PAYROLL project were charged to the Data Processing Department. You want to charge these resources to the Accounting Department.

Use this procedure to shift charges from one department to another if you use project accounting:

1. Use the UPDATE command and make these changes to the PROJECTS ACCTLIST file:
  - a. Update the PROJECTS MASTER file to change the customer ID field for the project name PAYROLL from Data Processing to Accounting.
  - b. Update the PROJECTS ACCTLIST file and change the account number field for the PAYROLL project from the Data Processing Department account number to the Accounting Department account number.
2. Log onto the Unicenter VM:Account service virtual machine and terminate processing with the END command.
3. Create a VMJRCS specification control file named, for example, SPECS DATA, with a NEWCUST record.
4. Run the VMJRCS utility with this command:

**vmjrsc periodte jan96 specs data a**

You see a display similar to this:

| CUSTOMER     | PRECOSTED<br>TOTAL | SELECTED<br>TOTAL | RECOSTED<br>TOTAL | CHARGE/<br>CREDIT | FINAL<br>TOTAL |
|--------------|--------------------|-------------------|-------------------|-------------------|----------------|
| DATA-PROCESS | 600                | 600               | 0                 | 0                 | 0              |
| ACCOUNTING   | 0                  | 0                 | 600               | 0                 | 600            |
| SYSTEM TOTAL | 600                | 600               | 600               | 0                 | 600            |

## Using Tapes

You can use tapes as input or output for the following:

- ▶ PERIOD command
- ▶ VMJSEL utility
- ▶ VMJCMP utility
- ▶ Unicenter VM:Account COBOL reports

## BrightStor VM:Tape

Interfacing Unicenter VM:Account with BrightStor VM:Tape lets BrightStor VM:Tape control tape mounts and multivolume processing. (If you do not use BrightStor VM:Tape, you must manage your own tapes.) The interface also lets you charge for tape mounts and for using tape volumes. Refer to the *Component Interface Guide* for more information about the Unicenter VM:Account interface to BrightStor VM:Tape.

If you have BrightStor VM:Tape installed, Unicenter VM:Account uses the DMSTVI module to handle all tape mounts, including multivolume mounts, and to update the Tape Management Catalog for the VMJCMP and VMJSEL utilities and the COBOL reports. If you are using the DMSTVI module, make sure it is the one supplied by your tape management system. In the case of BrightStor VM:Tape, this module is generated by the VMTTVI utility. If you do not have DMSTVI installed, you must mount your own tapes and you will not be able to do multivolume processing.

Computer Associates recommends that you set up a tape pool for your Unicenter VM:Account tapes. When you ask for scratch tapes, BrightStor VM:Tape automatically selects volumes from your tape pool for you.

If you plan to run VMJSEL, VMJCMP, or any of the Unicenter VM:Account COBOL reports from another userid (not VMACCT), using tapes created by the PERIOD command, grant that user the necessary authorizations in your tape management system.

If you want to use the Unicenter VM:Account interface to BrightStor VM:Tape, add a PRODUCT VMTAPE record to the VMACCT CONFIG file and make the necessary modifications to BrightStor VM:Tape. This allows the PERIOD command to take full advantage of the capabilities of BrightStor VM:Tape. If you want BrightStor VM:Tape to handle the tape requests when running VMJCMP, VMJSEL, or the Unicenter VM:Account COBOL reports, the DMSTVI module must be available on an accessed minidisk.

## FILEDEFS and LABELDEFS

Unicenter VM:Account uses these FILEDEFS and LABELDEF:

```
FILEDEF ddname TAP1 SL (LRECL 240 BLKSIZE 30720 RECFM FB
FILEDEF ddname TAP2 SL (LRECL 240 BLKSIZE 30720 RECFM FB
LABELDEF ddname VOLID ? FID ?
```

You can load files from tape to minidisk using the VMJSEL utility. Refer to the PERIOD command and the VMJSEL and VMJCMP utilities for specific file characteristics given to the tape file when it was created.

Unicenter VM:Account uses these FILEDEF and LABELDEF statements to manipulate tape input and output files. Unicenter VM:Account uses a ddname of VMJUT1 for input files and VMJUT2 for output files unless it uses Unicenter VM:Sort. In that case, the ddnames are SORTIN for input files and SORTOUT for output files.

## Overriding the Default FILEDEFS

You can override the default FILEDEFS by issuing your own CMS FILEDEF commands before running a command or utility. This enables you to write more than one output file to a tape and enables you to specify an input file from a tape containing more than one file.

For more information about CMS FILEDEF, refer to the appropriate CMS command and macro reference guide for your operating system.

## Improved Data Recording Capability Support

The Improved Data Recording Capability (IDRC) feature provides data compression during write-mode activity, thereby increasing the cartridge capacity and the data rate (rate at which data can be read from or written to a device).

To write to or read from a cartridge using the IDRC feature, override the Unicenter VM:Account default using a CMS FILEDEF command.

## PERIOD Command

When the PERIOD command sends a file to tape, Unicenter VM:Account uses this data set name that corresponds to the OS standard naming convention:

**DSN=PERIODTE.*periodname*.*Bmmdyy*.*Emmdyy***

### ***periodname***

is the name supplied in the last PERIOD command with the *period\_filetype* parameter.

### ***Bmmdyy***

is the begin date; it starts with *B* to conform to the convention that each part of the data set name must start with an alphabetic character.

**Emmddy**

is the end date; it starts with *E* to conform to the convention that each part of the data set name must start with an alphabetic character.

**Example**

Unicenter VM:Account produces a data set name for the standard label that looks like this:

**PERIODTE.JAN96.B010196.E013196**

To close an accounting file to tape if the Unicenter VM:Account interface to BrightStor VM:Tape is not installed:

1. Terminate Unicenter VM:Account with the END command.
2. Acquire a tape drive and mount a tape at virtual address 181.
3. If you want to change the default FILEDEF specifications, issue a CMS FILEDEF command. For example:

**filedef vmjut1 tap1 sl 2 (perm**

where:

*vmjut1* is the data set name.

*sl* specifies a standard labeled tape.

*2* specifies that the file will be the second file on the tape.

*perm* specifies that the FILEDEF command is in effect until it is cleared.

4. Restart Unicenter VM:Account.
5. Enter the PERIOD command, sending the closed accounting file to tape.

To close an accounting file to tape if the Unicenter VM:Account interface to BrightStor VM:Tape is installed:

1. Enter a CMS FILEDEF command if you want to change the default FILEDEF specifications.
2. Enter the PERIOD command, sending the closed accounting file to tape.



## VMJSEL and VMJCMP Utilities

The record selection (VMJSEL) and compression (VMJCMP) utilities do not use the Unicenter VM:Account interface to BrightStor VM:Tape because they are run as stand-alone applications.

- ▶ If you have BrightStor VM:Tape or a similar tape management system installed at your site and DMSTVI is available to the userid running VMJSEL or VMJCMP, you do not have to request tape mounts and tapes.
- ▶ If DMSTVI is not available, and you have BrightStor VM:Tape or a similar tape management system installed, you must ask your tape management system for tape mounts and tapes.
- ▶ If you do not have a tape management system installed at your site, you must manage and mount your tapes yourself.

For both utilities, the input tape drive must be attached at virtual address 181 and the output must be attached at virtual address 182.

### Using Tapes With VMJSEL

1. Specify the tape files in a VMJSEL control file. For example, INFILE TAPE 30100 DSN PERIODTE.JAN02 and OUTFILE TAPE 30095 DSN JAN02.SESSIONS specifies data set name PERIODTE.JAN02 on volume 30100 as the input file and data set name JAN02.SESSIONS on volume 30095 as the output file. Refer to page 223 for detailed information about the VMJSEL control file.
2. Enter CMS FILEDEF commands if you want to change the input or output defaults. For example, FILEDEF VMJUT1 TAP1 SL 5 (PERM specifies the fifth file on a standard labeled tape as the input file and FILEDEF VMJUT2 TAP2 SL 5 (PERM specifies the fifth file on a standard labeled tape as the output file.
3. Run the VMJSEL utility. For detailed information about this utility, refer to page 223.

### Using Tapes With VMJCMP

1. Specify the tape files in a VMJCMP OUTFILE control file statement. For example, OUTFILE TAPE 30095 DSN PERIOD.JAN96.COMP specifies that the output file is written to volume 30095 with a data set name of PERIOD.JAN96.COMP. Refer to page 193 for detailed information about the VMJCMP control file.
2. Enter CMS FILEDEF commands if you want to change the input or output defaults. For example, FILEDEF SORTIN TAP1 SL 2 (PERM specifies the second file on a standard labeled tape as the input file and FILEDEF VMJUT2 TAP2 SL 5 (PERM specifies the fifth file on a standard labeled tape as the output file.
3. Run the VMJCMP utility. For detailed information about this utility, refer to page 185.

## Using Tapes With Reports

1. Specify the tape input file in a report control file. For example, INFILE TAPE 30100 DSN PERIODTE.JAN96 specifies data set name PERIODTE.JAN96 on tape volume 30100 as the input file.
2. Enter CMS FILEDEF commands if you want to change the input defaults. For example, FILEDEF VMJUT1 TAP1 SL 5 (PERM specifies that the input file is the fifth file on a standard labeled tape.
3. Run the report.

## Part II.

---

# Reference Material



# Commands

You can enter all Unicenter VM:Account commands in line mode. One advantage to using line-mode commands is that you can use them in EXECs.

This chapter explains how to enter commands and get help for commands, then presents detailed information about each command. Commands are presented in alphabetical order.

The following table lists Unicenter VM:Account commands, briefly describes them, and lists the authorization required to use each command.

Table 5. Command Quick Reference

| Command  | Description                                                                                               | Authorization Required         | Page |
|----------|-----------------------------------------------------------------------------------------------------------|--------------------------------|------|
| ABEND    | Terminates Unicenter VM:Account processing and generates a dump                                           | Sysadmin or Operator           | 113  |
| CHARGE   | Permits entry of miscellaneous charges for non-machine use items such as delivery service or support time | Sysadmin, Chgadmin, or Auditor | 114  |
| CMS      | Enables users to issue CMS commands for execution on the Unicenter VM:Account service virtual machine     | Sysadmin                       | 117  |
| CREDIT   | Permits entry of credits to correct overcharges                                                           | Sysadmin, Chgadmin, or Auditor | 114  |
| DASDACCT | Generates minidisk and SFS accounting records                                                             | Auditor, Operator, or Sysadmin | 118  |
| END      | Terminates Unicenter VM:Account after active requests finish processing                                   | Sysadmin or Operator           | 120  |
| PACKAGE  | Begins and ends the resource accounting for a specific software package                                   | None                           | 121  |
| PERIOD   | Closes the current accounting period and starts a new period                                              | Sysadmin or Auditor            | 122  |

(continued)

Table 5. Command Quick Reference (continued)

| Command | Description                                                                                                                                                                          | Authorization Required | Page |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------|
| PROJECT | Specifies the work project to which subsequent session costs are to be charged                                                                                                       | None                   | 124  |
| QUERY   | Enables users to obtain information about resource usage costs for the current accounting period                                                                                     | None                   | 125  |
| REFRESH | Reinitializes Unicenter VM:Account                                                                                                                                                   | Sysadmin or Auditor    | 130  |
| RESUME  | Restarts the Unicenter VM:Account service virtual machine after you suspend it                                                                                                       | Sysadmin or Operator   | 131  |
| SUSPEND | Stops the Unicenter VM:Account service virtual machine from processing reader files containing VM accounting records; all commands continue to be processed during system suspension | Sysadmin or Operator   | 132  |
| UPDATE  | Adds or deletes records in the master description and COSTABLE files                                                                                                                 | Sysadmin or Auditor    | 133  |
| VERIFY  | Verifies a user's authorization to issue the PROJECT command for a specific project or to execute a given command                                                                    | None                   | 140  |

## Entering Commands

You must enter Unicenter VM:Account commands differently depending on your environment:

- From CMS, type the userid of the Unicenter VM:Account service virtual machine, type the command, and press Enter. For example, to run the RESUME command from CMS, enter **vmacct resume**.
- From CP, type the CP SMSG command, the userid of the Unicenter VM:Account service virtual machine, and the command, then press Enter. For example, to enter the RESUME command from a VM operator userid running in CP mode, enter **cp smsg vmacct resume**.

- From the Unicenter VM:Account service virtual machine, type the command and press Enter. For example, to enter the RESUME command from the Unicenter VM:Account service virtual machine, enter **resume**.

CP edits responses to commands according to your virtual machine's current EMSG setting.

## Pattern Matching

Pattern matching allows you to act on several items that have similar identifiers with one command. For example, pattern matching allows you to easily archive, query, or recall more than one file at a time when those files have similar filenames or filetypes. With pattern matching, you can specify objects that have identifiers that begin with, contain, or end with a particular character.

The table below lists the pattern-matching characters you can use.

| Character | Meaning                                          |
|-----------|--------------------------------------------------|
| *         | Matches any number of characters from zero on up |
| %         | Matches <i>one</i> character only                |

## Examples

- To specify all files with a filename ending in SALES and any filetype, use:  
**\*sales \***
- To specify any file with a five-character filename ending in DEC and a filetype containing the character string REP, use:  
**%%dec \*rep\***

## Command Help

You can get help on Unicenter VM:Account commands through the CMS HELP facility. To see an overview of Unicenter VM:Account help and a list of commands for which help is available, enter **help vmacct** from CMS.

To see the help screen for one of the commands listed in the overview, move the cursor to that command and press Enter. When you are finished reading the help screen, press PF3 to return to the help overview screen, and press PF3 from the help overview screen to exit the CMS HELP facility.

You can bypass the help overview screen and get help on a command directly by entering **help vmacct** and the name of the Unicenter VM:Account command for which you need

help. For example, to display help for the QUERY command, enter **help vmacct query** from CMS.

For more information about using the CMS HELP facility, refer to the CMS user's guide for your system.



## ABEND Command

|               |
|---------------|
| Authorization |
|---------------|

|                         |
|-------------------------|
| Operator or<br>Sysadmin |
|-------------------------|

Use the ABEND command to terminate Unicenter VM:Account processing immediately and create a dump. The type of dump is set by the DUMP configuration file record.

Use the ABEND command only if you need a dump to document or diagnose a problem. The ABEND command returns control to CMS at completion; the userid is not logged off unless CP LOGOFF is included in the start-up EXEC that initialized Unicenter VM:Account. Subsequent Unicenter VM:Account commands result in the message:

USERID 'VMACCT' IS NOT AVAILABLE.

|       |                    |
|-------|--------------------|
| ABEND | [ <i>comment</i> ] |
|-------|--------------------|

[ *comment* ]

is a comment to be printed in the dump.

## CHARGE and CREDIT Commands

|                                         |
|-----------------------------------------|
| Authorization                           |
| Auditor,<br>Chgadmin,<br>or<br>Sysadmin |

Use the CHARGE and CREDIT commands to maintain items in the COSTABLE files. Use of the CHARGE and CREDIT commands creates a Miscellaneous Charges and Credits record (datatype A5).

- Use the CHARGE command to charge for items that do not appear in the COSTABLE files.

To use the CHARGE command, the MISCCHGS MASTER file must contain at least one charge code. Examples of items that do not appear in the COSTABLE files include delivery service, preparing and mailing tapes, and special support time.

- Use the CREDIT command to correct overcharges or remove charges.

To use the CREDIT command, the MISCCHGS MASTER file must contain at least one credit code.

### Line-Mode Version

The CHARGE and CREDIT commands have the same syntax.

|                          |                                                                                                                                                                                                                                                                                                |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CHARGE<br>-or-<br>CREDIT | <pre>userid chargecode/creditcode [ units ] [ ( options ) ]</pre> <p><b>Options:</b><br/> [ ACCOUNT <i>accountnumber</i> ]<br/> [ PROJECT <i>project</i> ]<br/> [ PACKAGE <i>package</i> ]<br/> [ DATE <i>mm/dd/yy</i> ]<br/> [ LOGNUM <i>nnnnnnnn</i> ]<br/> [ UNITCOST <i>dddd.ddd</i> ]</p> |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### **userid**

specifies the userid to charge or credit.

#### **chargecode/creditcode**

specifies the charge or credit code for this transaction. The code can be from one to eight characters long and must be defined in the MISCCHGS MASTER file.

You can use the full-screen version of the UPDATE command to display existing charge and credit codes, or you can review the MISCCHGS MASTER file.

#### **[ units ]**

specifies the number of units to charge to or credit the userid. The default is 1. The maximum value you can specify is 32,767.

**[ ACCOUNT *accountnumber* ]**

specifies the number of the account to charge or credit. The default is the account number of the specified userid.

**[ PROJECT *project* ]**

specifies the name of the project to charge or credit. The default project is the project for the specified userid.

**[ PACKAGE *package* ]**

specifies the package to charge or credit. No package is specified by default.

**[ DATE *mm/dd/yy* ]**

specifies the date on which this transaction occurred. The default is the current date.

**[ LOGNUM *nnnnnnnn* ]**

assigns a log number to this transaction. The default is 00000000.

**[ UNITCOST *dddd.ddd* ]**

specifies the rate to charge or credit the userid at cost per unit. Unicenter VM:Account multiplies the cost per unit by the units to determine the total charge or credit.

## Example

You mailed two tapes for userid HARDEE at \$25.00 per tape and charged it to the BIG project. Xmail is the charge code that you used. The charge code must be in the MISCCHGS MASTER file. Enter:

**vmacct charge hardee xmail 2 (project big unitcost 25.00**

Unicenter VM:Account issues this message when the command has completed:

VMJXMS139I THE MISCELLANEOUS CHARGE RECORD IS GENERATED.

## Full-Screen Version

Enter **vmacct charge** to levy charges or **vmacct credit** to give credit for overcharges. Unicenter VM:Account displays the Miscellaneous Charge Facility screen. Fill in the Account, Charge Code, and Userid fields. Unicenter VM:Account will fill in the display for the values established for the charge or credit code in the MISCCHGS MASTER file.

## Correcting Errors

You must fill in the Charge Code, Userid, and Account fields. If you omit one of these fields or if an entry is incorrect, Unicenter VM:Account:

- ▶ Highlights the field.
- ▶ Displays MISSING OR ERRONEOUS FIELD in the lower left corner of the screen. This also occurs if you used a charge code on a credit screen or a credit code on a charge screen.

- Positions the cursor at the first missing or invalid field. Enter the correct information in the highlighted field and resubmit the request.

Enter the correct information in the highlighted field and resubmit the request.

## CMS Command

|               |
|---------------|
| Authorization |
|---------------|

|          |
|----------|
| SysAdmin |
|----------|

Use the CMS command to run a CMS command, a CP command, or an EXEC on the Unicenter VM:Account service virtual machine.

This command enables you to perform housekeeping functions, such as erasing files on the Unicenter VM:Account service virtual machine, without terminating Unicenter VM:Account.

---

**Caution:** Unicenter VM:Account stops processing while the CMS command runs. If you need to run this command, first consider how long it will take to run.

---

Unicenter VM:Account returns to the Unicenter VM:Account environment immediately after the CMS or CP command or the EXEC completes.

|     |                                                           |
|-----|-----------------------------------------------------------|
| CMS | { <i>command</i>   <i>CP command</i>   <i>EXEC name</i> } |
|-----|-----------------------------------------------------------|

**{ *command* | *CP command* | *EXEC name* }**

specifies the CMS subset command, CP command, or EXEC to run.

### Example

After determining that the REJECTS files on the Unicenter VM:Account B-disk are no longer needed, enter this command to erase them:

**vmacct cms erase \* rejects b**

# DASDACCT Command

## Authorization

**Auditor,  
Operator, or  
Sysadmin**

Use the DASDACCT command to generate minidisk and Shared File System (SFS) accounting records (datatypes A4 and AF, respectively).

Unicenter VM:Account generates an accounting record for each minidisk specified in the VM object directory or each SFS filepool defined on the FILEPOOL configuration file record. These records show the device type and the number of blocks or cylinders allocated. The system action for overlapping minidisks depends on the option specified on the OVERLAP record in the VMACCT DASDINFO file. Rates for minidisk and SFS records are set by using the UPDATE command against the MDISK and SFSDASD COSTABLE files.

Before using the DASDACCT command, you must:

- ▶ Have a VMACCT DASDINFO control file on the Unicenter VM:Account 191 minidisk. Refer to page 34 for detailed information about this file.
- ▶ Create the DASDACCT worker machine. Refer to the *CA VM:Manager Reference Manual* for detailed information about this Unicenter VM:Account worker machine.
- ▶ Specify a WORKER record in the VMACCT CONFIG file that identifies the DASDACCT worker machine. Refer to *WORKER Record* on page 180 for more information.
- ▶ If you are doing SFS accounting, specify a FILEPOOL record in the VMACCT CONFIG file that identifies all of the SFS filepools defined on your system. Refer to *FILEPOOL Record* on page 164 for more information.

Remember that, as explained in the *CA VM:Manager Upgrade Guide*, the SFS file pool allocation tables were converted when you last upgraded Unicenter VM:Account. (The VMJCVTBL utility converted Unicenter VM:Account SFS file pool allocation tables from their old [pre-Release 1.2] format to their new [Release 1.2 and greater] format.) If the DASDACCT GENERATE or DASDACCT SCAN command encounters an allocation table with the old format, the command fails.

|          |                                               |
|----------|-----------------------------------------------|
| DASDACCT | { GENERATE [ mm/dd/yy ]<br>SCAN<br>VALIDATE } |
|----------|-----------------------------------------------|

## GENERATE [ mm/dd/yy ]

specifies the date through which Unicenter VM:Account is to generate minidisk and SFS accounting records. By default, Unicenter VM:Account generates minidisk and SFS records through today's date. Unicenter VM:Account begins with the day after the date on which you last performed DASD accounting.

Unicenter VM:Account performs an automatic SCAN before record generation to ensure that the accounting records are up to date.

**SCAN**

scans minidisks and SFS filepools for changes in ownership or usage information. If there are changes, Unicenter VM:Account generates an accounting record.

**VALIDATE**

checks the VMACCT DASDINFO file for errors. Unicenter VM:Account does not generate any accounting records.

**Example**

To generate minidisk and SFS accounting records for the period of time since the last generation was done through June 14, 1902, enter:

```
vmacct dasdacct generate 06/14/02
```

## END Command

|               |
|---------------|
| Authorization |
|---------------|

Use the END command to end Unicenter VM:Account after all active requests finish processing. All pending requests are canceled.

|                                 |
|---------------------------------|
| <b>Operator or<br/>Sysadmin</b> |
|---------------------------------|

Modules designated for package accounting using the NORUN or ABEND action on the Software Package Accounting utility (VMJPKG) cannot run when Unicenter VM:Account is shut down.

|     |  |
|-----|--|
| END |  |
|-----|--|



# PACKAGE Command

|               |
|---------------|
| Authorization |
| None          |

Use the PACKAGE command to start and stop package accounting during a terminal session.

Package accounting enables you to track resources consumed by a software package.

You can also automatically implement package accounting with the Software Package Accounting (VMJPKG) utility. Refer to *Software Package Accounting Utility (VMJPKG)* on page 204 for detailed information about this utility.

You can levy surcharges or give discounts to the use of a package by adding the package name and the amount of the surcharge or discount to the PACKAGES COSTABLE file. Refer to *Charging for Software Package Usage* on page 29 for more information about surcharges and discounts.

|         |                                  |
|---------|----------------------------------|
| PACKAGE | { START <i>packageid</i>   END } |
|---------|----------------------------------|

## { START *packageid* | END }

starts or stops tracking resource consumption. If you specify START, the command starts tracking resource consumption by the specified package. The package must be identified in the PACKAGES MASTER file. If you specify END, the command stops tracking resource consumption by the most recently specified package.

You can specify up to eight nested PACKAGE START commands during a terminal session.

## Example

To start package accounting for TESTPKG2, enter:

```
vmacct package start testpkg2
```

## PERIOD Command

### Authorization

Use the PERIOD command to close the current accounting period and start a new period.

### Auditor or Sysadmin

Records are divided based on the start date of each record. This command locks the PERIODTE CURRENT (database) file. Although QUERY commands can share this lock, any QUERY USAGE commands must complete before PERIOD processing can begin.

---

**Note:** After you install Unicenter VM:Account, the first file created using the PERIOD command is named PERIODTE INITIAL.

---

Always execute the PERIOD command after the last day of an accounting period, after running the CHARGE and CREDIT commands, and after resubmitting all corrected REJECT records. Close your accounting files as soon as the period ends.

Unless you close the accounting period to tape, archive the PERIODTE file for the closed period after you complete billing and reporting.

|        |                                                                                                                                                                                                                        |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PERiod | <i>mm/dd/yy period_filetype</i> [ ( options )<br><br><b>Options:</b><br><u>DISK</u> <i>filemode</i><br>TAPE [ <u>SCRATCH</u>   <i>volser<sub>1</sub></i> [ <i>volser<sub>2</sub></i> ... <i>volser<sub>n</sub></i> ] ] |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***mm/dd/yy***

specifies the start date for the next accounting period.

### ***period\_filetype***

specifies the filetype to associate with the new accounting period's data when it is closed. The *period\_filetype* can be up to eight characters long and must be a valid CMS filetype. The *period\_filetype* specified is stored in the PERIODTE CURRENT file and used when the next period is closed.

### **[ DISK *filemode* ]**

specifies the filemode of the Unicenter VM:Account minidisk on which to write the closed accounting period data file. If you are running the PERIOD command from a system administrator userid, *filemode* is one of the Unicenter VM:Account minidisks, not one of the system administrator minidisks. The default minidisk is the Unicenter VM:Account COLLECT minidisk, which is where the PERIODTE CURRENT file resides.

### **[ TAPE [ SCRATCH ] ]**

### **[ TAPE [ *volser<sub>1</sub>* [ *volser<sub>2</sub>* ... *volser<sub>n</sub>* ] ] ]**

specifies the tapes on which to write the file that contains accounting data for the closed period. By default, Unicenter VM:Account writes the closed accounting period data to any scratch tape (SCRATCH), but you can identify volume serial

numbers (volsers) of tape volumes on which to write the closed accounting period data instead (*volser<sub>1</sub> ... volser<sub>n</sub>*).

SCRATCH tapes must have standard labels.

Unicenter VM:Account sets the expiration date for the tape equal to the first day of the thirteenth month after the date you ran the PERIOD command.

## Attaching Tape Drives

If Unicenter VM:Account is interfaced with BrightStor VM:Tape, BrightStor VM:Tape allocates drives and requests tape mounts for you.

If Unicenter VM:Account is not interfaced with BrightStor VM:Tape, you must attach a tape drive at vaddr 181 for Unicenter VM:Account. You must do this *regardless* of who is running the PERIOD command. Refer to *Using Tapes* on page 102 for more information about using tapes with Unicenter VM:Account.

## What To Do If the COLLECT Minidisk Fills

If you run out of space for the new PERIODTE CURRENT file on the COLLECT minidisk during PERIOD processing, and you were using the DISK option, Unicenter VM:Account abends with message 105S and abend number PTD001. To recover:

1. Increase the size of the minidisk where the data is being written.
2. Initialize Unicenter VM:Account.
3. Issue the PERIOD command again if you are closing to a minidisk other than the COLLECT minidisk.

If you were using the TAPE option, you must:

1. Detach the output tape drive.
2. Check the collection minidisk, and if necessary, increase its size.
3. Initialize Unicenter VM:Account.
4. Issue the PERIOD command again.

## Example

To open a new accounting period beginning April 1, close the previous period, and create a file containing records collected during the previous period, enter:

```
vmacct period 04/01/02 apr02
```

## PROJECT Command

|               |
|---------------|
| Authorization |
|---------------|

|      |
|------|
| None |
|------|

Use the PROJECT command to specify a project to charge for resources used during a terminal session.

The PROJECT command generates accounting records for session, dedicated device, and temporary disk space resources used by a userid during a terminal session. When the user logs off or issues another PROJECT command, these resource accumulations are reset.

All users can execute this command. However, if a PROJECT VERIFY record exists in the VMACCT CONFIG file, users will need a list of valid project names. If the PROJECT NOVERIFY ADD and CHGCUST ACCOUNT records are in the VMACCT CONFIG file, Unicenter VM:Account adds all unique project names to the PROJECTS MASTER file.

|         |                    |
|---------|--------------------|
| PROJect | <i>projectname</i> |
|---------|--------------------|

### ***projectname***

specifies the name of the project to charge for resources used by the userid during a terminal session. Resources are charged against the project until the user enters another PROJECT command or logs off. You can specify \* to have Unicenter VM:Account charge the default project, identified in the PROJECTS ACCTLIST file.

## QUERY Command

| Authorization |
|---------------|
| None          |

Use the QUERY command to get information about:

- Budget usage
- Status of Unicenter VM:Account
- Current shift
- Project and/or package that is currently in effect for a userid
- Resource/cost usage as recorded on accounting records in the Unicenter VM:Account database

Any user can use the QUERY command. However, you need special authorization to query userids or budgets other than your own. Users with AUDITOR, MANAGER, or SYSADMIN authorizations can query on any userid or budget.

Users with PROJLDR authorization can get budget information about their projects if a PROJECT VERIFY record is in the VMACCT CONFIG file; if there is a PROJECT NOVERIFY record, these users can get budget information for any project.

---

**Note:** If a QUERY command is issued while the system is suspended, the resources displayed reflect resources used before the SUSPEND command was issued.

---

There is a full-screen version of the QUERY USAGE command. For information, refer to the section *Querying Unicenter VM:Account* on page 76.

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Query | $\left\{ \begin{array}{l} \text{BUDGET } \left\{ \begin{array}{l} \text{CUSTOMER } \textit{customer} \\ \text{PROJECT } \textit{project} \end{array} \right\} [ \text{ACCOUNT } \textit{account} ] [ ( \textit{dest} ) ] \\ \text{SET } [ \text{USER } \textit{userid} ] [ ( \text{STACK } [ \text{FIFO}   \text{LIFO} ] ) ] \\ \text{SHIFT } [ ( \text{STACK } [ \text{FIFO}   \text{LIFO} ] ) ] \\ \text{STATE} \\ \text{USAGE } [ \_   \textit{controlfilename} ] [ \textit{execfilename} ] [ ( [ \textit{dest} ] [ \textit{dataset} ] ) ] \end{array} \right\}$ <p><b>Destination Options ( <i>dest</i> ):</b><br/>[ APPEND   DISK   PRINT   STACK [ FIFO   LIFO ]   TERM ]</p> <p><b>Data Selection Options ( <i>dataset</i> ):</b><br/>[ ACCount { <i>account</i>   <i>_</i> } [ <i>summarylevel</i> ] ]<br/>[ CUSTomer { <i>customer</i>   <i>_</i> } [ <i>summarylevel</i> ] ]<br/>[ DATE <i>mm/dd/yy</i> [ THRU <i>mm/dd/yy</i> ] [ <i>summarylevel</i> ] ]<br/>[ DETAIL [ <u>1</u>   2   3   4   * ]   SUMMARY ] ]<br/>[ PACKage { <i>package</i>   <i>_</i> } [ <i>summarylevel</i> ] ]<br/>[ PROJect { <i>project</i>   <i>_</i> } [ <i>summarylevel</i> ] ]<br/>[ SHIFT { <i>shift</i>   <i>_</i> } [ <i>summarylevel</i> ] ]<br/>[ USERid { <i>userid</i>   <i>_</i> } [ <i>summarylevel</i> ] ]</p> |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**BUDGET { CUSTOMER *customer* | PROJECT *project* }**

specifies the customer or the project for which you want budget information.

**[ ACCOUNT *account* ]**

specifies the account for which you want budget information.

**SET [ USER *userid* ]**

displays information about the project and package. By default, Unicenter VM:Account runs this query against your userid. If you are authorized to issue the QUERY command for a userid other than your own, you can specify a different userid.

**STACK [ FIFO | LIFO ]**

specifies that Unicenter VM:Account is to place the response from the query in the stack in first in, first out order or last in, first out order.

**SHIFT**

displays the shift that Unicenter VM:Account is currently using.

**STATE**

displays an informational message that indicates whether Unicenter VM:Account is running, suspended, or quiesced.

**USAGE [ \* | *controlfilename* ] [ *execfilename* ]**

displays resource usage information.

- ▶ If you specify \* and you are a general user, Unicenter VM:Account selects accounting records using the defaults of the data selection options with your userid substituted for the USERID option. If you specify \* and you have AUDITOR, MANAGER, or SYSADMIN authorization, Unicenter VM:Account selects accounting records using the defaults for the data selection options with all userids substituted for the USERID option.
- ▶ If you specify a control file with the *controlfilename* parameter, Unicenter VM:Account does the following:
  - If the control file exists and you do not specify new data selection options, Unicenter VM:Account uses the data selection instructions stored in the file
  - If the control file exists and you specify new data selection options, Unicenter VM:Account executes the query using the data selection options and saves them to the control file
  - If the control file does not exist, Unicenter VM:Account executes the query using the data selection options you specify. Unicenter VM:Account also creates a control file on your A-disk and stores the data selection options.

The easiest way to create a control file is with the full-screen version of the QUERY USAGE command. Refer to the section *Control Files* on page 79 for more information about creating and modifying a QUERY USAGE control file.

- The parameter *execfilename* specifies an EXEC that formats the output from this command. The EXEC should be on the VMACCT 191 minidisk; the file must be fixed format with an LRECL of 80. The default value for *execfilename* is VMJQRR, an EXEC supplied with Unicenter VM:Account.

When you request resource usage information, Unicenter VM:Account queries the PERIODTE CURRENT file and the trend file if it exists. If you request resource usage information for a single userid (USERID option) up to the current date (DATE option), Unicenter VM:Account also generates an accounting record so the information is up to date.

---

**Note:** You cannot use the CP SMSG command to run a QUERY USAGE command.

---

## Destination Options

You can specify where Unicenter VM:Account sends the output from the QUERY command. You may want to send large query usage files to the printer or to disk so you can analyze them later or use them in your programs. If you need information about your budget or usage, display the results on the terminal.

### [ APPEND | DISK | PRINT | STACK [ FIFO | LIFO ] | TERM ]

specifies where Unicenter VM:Account is to send the output from the QUERY command.

| Option                | Description                                                                                                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------|
| APPEND                | Appends the output to the CMS file VMJQUERY OUTPUT; if this file does not exist, Unicenter VM:Account creates it |
| DISK                  | Writes the output to the CMS file VMJQUERY OUTPUT A1; if this file already exists, the new file replaces it      |
| PRINT                 | Sends the output to your virtual printer                                                                         |
| STACK [ FIFO   LIFO ] | Places the output in the stack in either first in, first out or last in, first out order                         |
| TERM                  | Displays the output on your terminal                                                                             |

## Data Selection Options

The data selection options enable you to define selection criteria to limit QUERY USAGE requests. The data selection options you provide override what is in the control file (if you specified one).

If a control file already exists, Unicenter VM:Account updates it with values provided here. If a control file does not yet exist, Unicenter VM:Account creates one with the values provided here.

**[ ACCount { *account* | *\_* } ]**

specifies one or more account numbers. You can use trailing pattern matching (for example, you can use **ACC 1\*** to select account numbers beginning with 1).

You can specify just an \* to include all accounts.

**[ CUSTOMer { *customer* | *\_* } ]**

specifies one or more customers. You can use trailing pattern matching. Use an \* to include all customers.

**[ DATE *mm/dd/yy* [ THRU *mm/dd/yy* ] ]**

specifies a single date or a date range. DATE *mm/dd/yy* specifies the earliest date for which records are to be selected. THRU *mm/dd/yy* specifies the latest date for which records are to be selected. The default is today's date. You can specify an \* for DATE to include all dates.

You must specify two digits for the month and day. For example, the month of May is 05, not 5.

**[ DETAIL [ 1 | 2 | 3 | 4 | \* ] | SUMMARY ]**

indicates whether to include details in the output from the query or to summarize the output.

| Option   | Description                                                                      |
|----------|----------------------------------------------------------------------------------|
| DETAIL 1 | Only the first page displays detailed data; the other pages show summarized data |
| DETAIL 2 | Detailed data displays only on the second page                                   |
| DETAIL 3 | Detailed data displays only on the third page                                    |
| DETAIL 4 | Detailed data displays only on the fourth page                                   |
| DETAIL * | All pages of the output display detailed data                                    |
| SUMMARY  | The query returns summarized information                                         |

**[ PACKage { *package* | *\_* } ]**

specifies one or more packages. You can use trailing pattern matching.

You can specify just an \* to include all packages.

**[ PROJect { *project* | *\_* } ]**

specifies one or more project names. You can use trailing pattern matching.

You can specify just an \* to include all projects.

**[ SHIFT { *shift* | *\_* } ]**

specifies one or more shifts.

You can specify just an \* to include all shifts.

**[ USERid { *userid* | *\_* } ]**

specifies one or more userids. The default is your userid. General users can only query their own userid. If you have AUDITOR, MANAGER, or SYSADMIN authorization, you can use trailing pattern matching to specify multiple userids or you can specify an \* to include all userids.



**[ summarylevel ]**

specifies sorting criteria for the output. You can sort on ACCOUNT, CUSTOMER, DATE, PACKAGE, PROJECT, SHIFT, and USERID. You can have seven levels of sorting, specified using the numbers 1 through 7. Do not specify the same summary level more than once.

For example, if you specify 1 for CUSTOMER and 2 for USERID, your output is sorted first by customer, then by userid within customer. Your command might look like this:

**vmacct query usage (customer \* 1 userid \* 2**

## Examples

- To determine whether Unicenter VM:Account is running, enter:

**vmacct query state**

Unicenter VM:Account responds:

VMACCT IS CURRENTLY RUNNING

- To determine the project and package settings for your userid, enter:

**vmacct query set**

Unicenter VM:Account responds:

PROJECT: CSS-DOC,GENERAL, PACKAGE: NONE

- To select all records for your userid for 2/1/02 through 2/15/02 and sort them by project, enter:

**vmacct query usage (date 02/01/02 thru 02/15/02 project \* 1**

- To select records using the control file LEIGH1, format the output using the EXEC called FORM, and sort the output by customer within account, enter:

**vmacct query usage leigh1 form (account \* 1 customer \* 2**

## REFRESH Command

|                            |                                                                                                                           |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Authorization              | Use the REFRESH command to end and reinitialize Unicenter VM:Account.                                                     |
| <b>Auditor or Sysadmin</b> | Use this command if you have modified the VMACCT CONFIG file and want Unicenter VM:Account to begin using the new values. |

|         |  |
|---------|--|
| REFresh |  |
|---------|--|

## RESUME Command

|               |
|---------------|
| Authorization |
|---------------|

|                                 |
|---------------------------------|
| <b>Operator or<br/>Sysadmin</b> |
|---------------------------------|

Use the RESUME command to restart the Unicenter VM:Account service virtual machine after a SUSPEND command. The RESUME command makes Unicenter VM:Account resume processing reader files that contain accounting records.

|        |  |
|--------|--|
| RESUME |  |
|--------|--|

# SUSPEND Command

|                      |                                                                                                                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Authorization        | Use the SUSPEND command to stop the Unicenter VM:Account service virtual machine from processing reader files containing CP accounting records.                                                            |
| Operator or Sysadmin | When Unicenter VM:Account stops processing the reader files, you can use commands that affect data costing on the files. Use the SUSPEND command before running reports against the PERIODTE CURRENT file. |

Unicenter VM:Account continues to process all commands during system suspension.

---

**Note:** If a QUERY command is issued while the system is suspended, the resources displayed only include resources consumed before the SUSPEND command was issued.

---

To restart the system and resume processing of accounting records, use the RESUME command. You should run the RESUME command as soon after the SUSPEND command as possible.

|         |  |
|---------|--|
| SUSPEND |  |
|---------|--|

# UPDATE Command

Authorization

Auditor or  
Sysadmin

Use the UPDATE command to modify Unicenter VM:Account tables and files, including the COSTABLE files, master description files, and account list tables. Changes take place immediately for all entries.

**Note:** You can modify only certain fields in line mode. These are listed in Table 6 under the heading Fields.

When you use this command, keep the following in mind:

- ▶ Currency rates are expressed with decimal points separating dollars and cents. For example, 3.08 translates to three dollars and eight cents. Remember to convert this into your own monetary system if you do not use United States currency at your site.
- ▶ You can add holidays but you cannot change or delete them. If you want to change or delete holidays you must use the full-screen version of this command.
- ▶ If you add project names through this command and there is a PROJECT VERIFY record in the VMACCT CONFIG file, you must also add the new project names to the PROJECTS ACCTLIST. Unicenter VM:Account checks that the project names in the PROJECTS ACCTLIST file are also in the PROJECTS MASTER file before initialization.

There is a full-screen version of the UPDATE command. For information about it, refer to the section *Modifying Unicenter VM:Account Tables and Files* on page 85.

UPDate

*tablename* { Add | CHange | DElete } *field\_list*

## ***tablename***

specifies the name of the table you want to add records to, change records in, or delete records from. The Table Name column of Table 6 (page 134) identifies the values you can use for *tablename*.

## **{ Add | CHange | DElete }**

specifies the action you are performing on *tablename*.

## ***field\_list***

are the data fields for the table. The values for these fields must be entered in the order shown in the Fields column of Table 6. You must include a value for each field.

## Table Names and Fields

The Table Name column of Table 6 contains values you can enter for the *tablename* parameter of the UPDATE command. Table 6 is ordered on this column.

The Fields column of Table 6 identifies the fields you must provide for the *fieldlist* parameter of the UPDATE command.

Table 6. Fields You Can Modify With the UPDATE Command

| Table Name <sup>†</sup> | File              | Fields <sup>‡</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ARCHcost                | ARCHIVE COSTABLE  | <i>Customer ID</i><br><i>Effective date</i><br><i>Archival Type</i><br>Rate per 1000 bytes per hour                                                                                                                                                                                                                                                                                                                                                           |
| BATcost                 | VMBATCH COSTABLE  | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br><i>Job class</i><br><i>Job Priority</i><br><i>Job name</i><br>Rate per hour connect time<br>Virtual CPU rate per second<br>Overhead CPU rate per second<br>Rate per 100 page reads<br>Rate per 100 page writes<br>Rate per 1000 start I/Os<br>Rate per 1000 punch I/Os<br>Rate per 1000 print I/Os<br>Rate per 1000 reader I/Os<br>Virtual VPU rate per second<br>Overhead VPU rate per second |
| CUSTAcct                | CUSTOMER ACCTLIST | <i>Customer ID</i><br><i>Account number</i><br>Budget limit for customer/account                                                                                                                                                                                                                                                                                                                                                                              |
| CUSTOmer                | CUSTOMER MASTER   | <i>Customer ID</i><br>Budget limit                                                                                                                                                                                                                                                                                                                                                                                                                            |
| DDEVcost                | DEDEVICE COSTABLE | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br><i>Device type</i><br><i>Rate per hour</i>                                                                                                                                                                                                                                                                                                                                                     |

(continued)

<sup>†</sup> Uppercase letters designate the minimum required entry for table names.

<sup>‡</sup> Bold italic letters indicate the key fields--those fields by which the table is sorted and internally stored and for which the FIND function can be performed.

Table 6. Fields You Can Modify With the UPDATE Command (continued)

| Table Name <sup>†</sup> | File              | Fields <sup>‡</sup>                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HOLidays                | HOLIDAYS MASTER   | <b><i>year (yy)</i></b> [not sorted]<br><b><i>mm/dd(1)</i></b><br><b><i>mm/dd(2), ..., mm/dd(15)</i></b>                                                                                                                                                                                                                                                                                                             |
| GIOcost                 | LGAI COSTABLE     | <b><i>Customer ID</i></b><br><b><i>Effective date</i></b><br>Rate per 1000 bytes via vNIC<br>Rate per 1000 bytes via CTCA<br>Rate per 1000 bytes via IUCV                                                                                                                                                                                                                                                            |
| LINKcost                | LINKS COSTABLE    | <b><i>Customer ID</i></b><br><b><i>Shift</i></b><br><b><i>Effective date</i></b><br><b><i>Owner userid</i></b><br><b><i>Disk address</i></b><br>Rate per link                                                                                                                                                                                                                                                        |
| MDSKcost                | MDISK COSTABLE    | <b><i>Customer ID</i></b><br><b><i>Effective date</i></b><br><b><i>Device Type</i></b><br>Rate (per cylinder or 100 blocks per day)                                                                                                                                                                                                                                                                                  |
| MISCchgs                | MISCCHGS MASTER   | <b><i>Charge/credit code</i></b><br>Charge/credit indicator (+ or -)<br>Override on unit price (Y or N)<br>Default unit price                                                                                                                                                                                                                                                                                        |
| PACKAges                | PACKAGES MASTER   | <b><i>Package ID</i></b><br>Maximum concurrent users                                                                                                                                                                                                                                                                                                                                                                 |
| PKGScost                | PACKAGES COSTABLE | <b><i>Customer ID</i></b><br><b><i>Shift</i></b><br><b><i>Effective date</i></b><br>Connect time rate per hour<br>Virtual CPU rate per second<br>Overhead CPU rate per second<br>Rate per 100 page reads<br>Rate per 100 page writes<br>Rate per 1000 start I/Os<br>Rate per 1000 punch I/Os<br>Rate per 1000 print I/Os<br>Rate per 1000 reader I/Os<br>Virtual VPU rate per second<br>Overhead VPU rate per second |

(continued)

<sup>†</sup> Uppercase letters designate the minimum required entry for table names.

<sup>‡</sup> Bold italic letters indicate the key fields--those fields by which the table is sorted and internally stored and for which the FIND function can be performed.

Table 6. Fields You Can Modify With the UPDATE Command (continued)

| Table Name <sup>†</sup> | File              | Fields <sup>‡</sup>                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJAcct                | PROJECTS ACCTLIST | <i>Project name</i><br><i>Account number</i><br>Default for account (Y or N)<br>Budget limit for project/account                                                                                                                                                                                                                                                                                |
| PROJEcts                | PROJECTS MASTER   | <i>Project name</i><br><i>Customer ID</i><br>Budget limit for project                                                                                                                                                                                                                                                                                                                           |
| RSCScost                | RSCS COSTABLE     | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br>Rate per 100 records sent<br>Rate per 100 records received                                                                                                                                                                                                                                                                       |
| SESScost                | SESSION COSTABLE  | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br>Connect time rate per hour<br>Virtual CPU rate per second<br>Overhead CPU rate per second<br>Rate per 100 page reads<br>Rate per 100 page writes<br>Rate per 1000 start I/Os<br>Rate per 1000 punch I/Os<br>Rate per 1000 print I/Os<br>Rate per 1000 reader I/Os<br>Virtual VPU rate per second<br>Overhead VPU rate per second |
| SFScost                 | SFS COSTABLE      | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br><i>Filepool name</i><br>Rate per minute active time<br>CPU usage rate per second<br>Rate per 1000 DASD I/Os                                                                                                                                                                                                                      |

(continued)

<sup>†</sup> Uppercase letters designate the minimum required entry for table names.

<sup>‡</sup> Bold italic letters indicate the key fields--those fields by which the table is sorted and internally stored and for which the FIND function can be performed.



Table 6. Fields You Can Modify With the UPDATE Command (continued)

| Table Name <sup>†</sup> | File              | Fields <sup>‡</sup>                                                                                                                                                                                                         |
|-------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SFSDcost                | SFSDASD COSTABLE  | <i>Customer ID</i><br><i>Effective date</i><br><i>Filepool name</i><br><i>Storage group</i><br>Daily rate per 100 primary blocks owned<br>Daily rate per 100 FRA blocks owned<br>Daily rate per 100 blocks migrated to tape |
| SPLcost                 | SPOOL COSTABLE    | <i>Customer ID</i><br><i>Effective Date</i><br><i>Spool file type</i><br><i>Spool file class</i><br><i>Distribution code</i><br>Rate per 100 records per hour                                                               |
| SQLcost                 | SQL-DS COSTABLE   | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br><i>Database name</i><br>Rate per minute active time<br>CPU usage rate per second<br>Rate per 1000 page buffer requests                                       |
| SQLScost                | DBSPACE COSTABLE  | <i>Customer ID</i><br><i>Effective date</i><br><i>Database name</i><br><i>Storage pool number</i><br><i>DBSPACE type</i><br>Daily rate per 100 pages                                                                        |
| TAPMcost                | TAPMOUNT COSTABLE | <i>Customer ID</i><br><b>Shift</b><br><b>Effective date</b><br>Rate per mount                                                                                                                                               |
| TDSKcost                | TDISK COSTABLE    | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br><i>Device Type</i><br>Hourly rate per cylinder or 100 blocks                                                                                                 |

(continued)

<sup>†</sup> Uppercase letters designate the minimum required entry for table names.

<sup>‡</sup> Bold italic letters indicate the key fields--those fields by which the table is sorted and internally stored and for which the FIND function can be performed.

Table 6. Fields You Can Modify With the UPDATE Command (continued)

| Table Name <sup>†</sup> | File             | Fields <sup>‡</sup>                                                                                                                                                                                                                                                       |
|-------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSAFcost                | TSAF COSTABLE    | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br><i>Resource name</i><br>Rate per minute connect time<br>Rate per 1000 bytes sent<br>Rate per 1000 bytes received                                                                                           |
| VOLcost                 | VOLUMES COSTABLE | <i>Customer ID</i><br><i>Effective date</i><br><i>Device type</i><br>Rate per day                                                                                                                                                                                         |
| VSCScost                | VSCS COSTABLE    | <i>Customer ID</i><br><i>Shift</i><br><i>Effective date</i><br>Cost per 100 input request units<br>Cost per 1000 input bytes<br>Cost per 100 output request units<br>Cost per 1000 output bytes<br>Cost per 100 console output lines<br>Cost per 100 copy requests        |
| WEBcost                 | WEB COSTABLE     | <i>Customer ID</i><br><i>Effective date</i><br><i>Web sever name</i><br><i>TCP Port Number</i><br>Rate per 1000 bytes through TCP<br>Rate per second of CPU on server<br>Rate per 1000 I/Os on server<br>Rate per second of CPU on worker<br>Rate per 1000 I/Os on worker |

<sup>†</sup> Uppercase letters designate the minimum required entry for table names.

<sup>‡</sup> Bold italic letters indicate the key fields--those fields by which the table is sorted and internally stored and for which the FIND function can be performed.

## Examples

- To add a package named TESTPKG2 to the PACKAGES MASTER file, enter this (the asterisk indicates that there is no limit to the number of users who can execute the package at once):

**vmacct update packages add testpkg2 \***

- ▶ To add a project named PAYROLL with a budget limit of \$950 for a customer with the customer ID JONES&SONS, enter this:

**vmacct update projects add payroll jones&sons 950**

- ▶ To remove the project DICTIONARY from the PROJECTS MASTER file, enter this:

**vmacct update projects delete dictionary**

- ▶ To add a record to the dedicated devices cost table for customer CUST1, PRIME shift, with an effective start date of 06/01/02, and a rate of \$1 per connect hour, enter:

**vmacct update ddev add cust1 prime 06/01/02 disk 1.0**

- ▶ To delete all occurrences of project DICTIONARY and account 123ABC from the PROJECTS ACCTLIST file, enter:

**vmacct update projacct delete dictionary 123abc**

- ▶ To delete a record from the LINKS COSTABLE file, enter:

**vmacct update link del cust1 \* 06/01/02 testid 192.25**

## VERIFY Command

| Authorization |
|---------------|
| None          |

Use the VERIFY command to determine whether you are authorized to use the PROJECT command to charge resources to a specific project or to execute a specific command.

All users can determine their own authorizations. You need AUDITOR, MANAGER, PROJLDR, or SYSADMIN authorization to verify projects or commands for other usersids.

|        |                                                                                                                                                               |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VERIfy | $\left\{ \begin{array}{l} \text{PROJECT } \textit{projectname} \\ \text{COMMAND } \textit{command} \end{array} \right\} [ ( \text{USER } \textit{userid} ) ]$ |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

### PROJECT *projectname*

specifies the name of a project defined in the PROJECTS MASTER file. If user *userid* may charge to project *projectname*, Unicenter VM:Account issues a return code of 0. If the user is *not* authorized to charge to the project, Unicenter VM:Account displays:

INVALID PROJECT NAME *projectname*

### COMMAND *command*

specifies a Unicenter VM:Account command. Verification of commands is based only on the authorizations specified in the VMACCT CONFIG file. If user *userid* may execute command *command*, Unicenter VM:Account issues a return code of 0. If the user is *not* authorized to issue the command, Unicenter VM:Account displays:

INVALID COMMAND *command*

### [ USER *userid* ]

displays project or command authorization for another userid. If you specify an invalid userid, Unicenter VM:Account displays:

INVALID USER *userid*

## Examples

- To check whether you can charge a session to project X, enter:

**vmacct verify project x**

- To check whether you can issue the UPDATE command, enter:

**vmacct verify command update**

- To check whether userid JACKSON can charge resources to project ANV, enter:

**vmacct verify project anv (user jackson**

# Configuration File Records

The Unicenter VM:Account configuration file, VMACCT CONFIG, allows you to control your Unicenter VM:Account options.

The configuration file contains fixed-length, 80-character records, all 80 columns of which may contain information. A configuration file record is a record name followed by one or more keywords with one or more blanks as delimiters. Parameters can appear anywhere on a line. Unicenter VM:Account ignores blank lines and records beginning with an asterisk.

The VMACCT CONFIG file must be on an accessed minidisk when the Unicenter VM:Account service virtual machine is initialized. Unicenter VM:Account uses the first configuration file it finds according to CMS search order. During initialization, Unicenter VM:Account reads the configuration file and builds its system control blocks. If it finds an invalid configuration file record, it displays a diagnostic message, the invalid record, and terminates without initializing.

The following table summarizes the Unicenter VM:Account configuration file records. (The Required column indicates whether the record is required in the VMACCT CONFIG file.)

Table 7. Configuration File Record Quick Reference

| Record   | Purpose                                                                         | Default | Required | Page |
|----------|---------------------------------------------------------------------------------|---------|----------|------|
| ACCTCRDS | Lists userids that generate special accounting records                          | N/A     | No       | 144  |
| AUTHORIZ | Authorizes specific users to use individual Unicenter VM:Account commands       | N/A     | Yes      | 145  |
| BUDGET   | Implements budget tracking and enforcement                                      | NO      | No       | 147  |
| CHGCUST  | Specifies how resources used by specific userids are to be charged to customers | ACCOUNT | No       | 148  |
| COLLECT  | Validates collected data                                                        | N/A     | Yes      | 149  |
| CONSOLE  | Specifies how often to close the console spool                                  | 24      | No       | 151  |
| COSTSYMB | Specifies the monetary symbol to use in online queries                          | \$      | No       | 152  |

(continued)

Table 7. Configuration File Record Quick Reference (continued)

| Record   | Purpose                                                                               | Default  | Required     | Page |
|----------|---------------------------------------------------------------------------------------|----------|--------------|------|
| CTLDISK  | Specifies the filemode for various files                                              | C        | Yes          | 153  |
| DASDACCT | Controls when calls are made to the DASDACCT worker machine                           | N/A      | No           | 154  |
| DBDISK   | Specifies the filemode for the Unicenter VM:Account database index files              | N/A      | No           | 157  |
| DBINDEX  | Specifies a field for creating a database index                                       | N/A      | No           | 158  |
| DBSPACE  | Specifies the amount of storage available for QUERY processing                        | 64K WARN | No           | 160  |
| DIRECT   | Specifies the location of the CP object directory                                     | N/A      | Yes          | 162  |
| DUMP     | Specifies abend options                                                               | VMDUMP   | No           | 163  |
| FILEPOOL | Specifies SFS server virtual machines                                                 | N/A      | For SFS, Yes | 164  |
| IGNORE   | Identifies the record types that Unicenter VM:Account should not cost                 | N/A      | No           | 165  |
| MESSAGE  | Specifies the CP command that Unicenter VM:Account uses for sending messages          | MSGNOH   | No           | 166  |
| PRODUCT  | Identifies the service virtual machines of other Computer Associates products         | N/A      | No           | 167  |
| PROJECT  | Maintains project-level security                                                      | NOVERIFY | No           | 169  |
| QRLIMIT  | Specifies the number of records the QUERY command can process                         | N/A      | No           | 170  |
| QROUTPUT | Specifies the output for the QUERY USAGE command                                      | BOTH     | No           | 171  |
| RSCSNODE | Specifies the userid that is to receive RSCS charges                                  | N/A      | No           | 172  |
| SHIFT    | Defines work periods that Unicenter VM:Account uses for generating accounting records | N/A      | No           | 173  |

(continued)

Table 7. Configuration File Record Quick Reference (continued)

| Record   | Purpose                                                                                   | Default | Required | Page |
|----------|-------------------------------------------------------------------------------------------|---------|----------|------|
| SIOCOUN  | Indicates whether you want to charge users for all start I/Os or only for successful ones | ALL     | No       | 175  |
| SPECIAL  | Identifies the userids that can create accounting records                                 | N/A     | No       | 176  |
| SYSOPER  | Identifies the userids that will receive Unicenter VM:Account system messages             | VMACCT  | No       | 177  |
| TRNDFILE | Specifies the trend file to include in the Unicenter VM:Account database indices          | N/A     | No       | 178  |
| USEREXIT | Specifies the user exit Unicenter VM:Account should use                                   | N/A     | No       | 179  |
| WORKER   | Specifies the DASDACCT worker machine userid                                              | N/A     | No       | 180  |

## ACCTCRDS Record

### Optional

Use the ACCTCRDS record to identify userids that are authorized to send files containing accounting records to Unicenter VM:Account.

You can use multiple ACCTCRDS records.

Unicenter VM:Account saves accounting records from unauthorized userids (those not specified on ACCTCRDS, FILEPOOL, PRODUCT, or SPECIAL configuration file records) in the *yymmdd* INVFILES file. You can process *yymmdd* INVFILES file records by doing the following:

- ▶ Giving the originating userid authorization through the ACCTCRDS record and sending the file to the VMACCT reader.
- ▶ Using the Invalid File Report utility (VMJIFR) to generate raw data files to submit to Unicenter VM:Account for processing. Refer to *Invalid File Report Utility (VMJIFR)* on page 202.

|          |                                                                         |
|----------|-------------------------------------------------------------------------|
| ACCTCRDS | <i>userid<sub>1</sub> [ userid<sub>2</sub> ... userid<sub>n</sub> ]</i> |
|----------|-------------------------------------------------------------------------|

***userid<sub>1</sub> [ userid<sub>2</sub> ... userid<sub>n</sub> ]***

specifies the userids that are authorized to send accounting records to Unicenter VM:Account. You can specify as many userids as you want.

### Example

To specify that VMJSYSAD and MICKEY are authorized to send accounting records to Unicenter VM:Account, enter:

**ACCTCRDS VMJSYSAD MICKEY**



## AUTHORIZ Record

### Required

Use the AUTHORIZ record to give userids the authorizations necessary to run specific Unicenter VM:Account commands.

You can specify more than one AUTHORIZ record. You can create more than one record for the same authorization, and you can specify multiple authorizations for one userid.

Table 8 lists the Unicenter VM:Account commands and the authorizations required to run them. Authorizations are listed in Table 8 on page 146.

|          |                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------|
| AUTHORIZ | <i>authorization</i> <i>userid</i> <sub>1</sub> [ <i>userid</i> <sub>2</sub> ... <i>userid</i> <sub>n</sub> ] |
|----------|---------------------------------------------------------------------------------------------------------------|

### ***authorization***

specifies the type of authorization. You can specify only one authorization per record.

### ***userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ]**

specifies the userids to receive the specified authorization.

## Examples

- ▶ To give VMJSYSAD system administrator privileges, enter:

**AUTHORIZ SYSADMIN VMJSYSAD**

- ▶ To give GEORGE operator privileges, enter:

**AUTHORIZ OPERATOR GEORGE**

- ▶ To give LEE, JACKSON, and STUART manager privileges, enter:

**AUTHORIZ MANAGER LEE JACKSON STUART**

- ▶ To also give JACKSON auditor privileges, enter:

**AUTHORIZ AUDITOR JACKSON**

Table 8. Unicenter VM:Account Commands and the Authorizations Required to Run Them

| Command  | Authorization |              |             |              |                 |             |      |
|----------|---------------|--------------|-------------|--------------|-----------------|-------------|------|
|          | AUDITOR       | CHGADMIN     | MANAGER     | OPERATOR     | PROJLDR         | SYSADMIN    | None |
| ABEND    |               |              |             | ✓            |                 | ✓           |      |
| CHARGE   | ✓             | ✓            |             |              |                 | ✓           |      |
| CMS      |               |              |             |              |                 | ✓           |      |
| CREDIT   | ✓             | ✓            |             |              |                 | ✓           |      |
| DASDACCT | ✓             |              |             | ✓            |                 | ✓           |      |
| END      |               |              |             | ✓            |                 | ✓           |      |
| PACKAGE  | ✓             | ✓            | ✓           | ✓            | ✓               | ✓           | ✓    |
| PERIOD   | ✓             |              |             |              |                 | ✓           |      |
| PROJECT  | ✓             | ✓            | ✓           | ✓            | ✓               | ✓           | ✓    |
| QUERY    | all options   | general user | all options | general user | limited options | all options | ✓    |
| REFRESH  | ✓             |              |             |              |                 | ✓           |      |
| RESUME   |               |              |             | ✓            |                 | ✓           |      |
| SUSPEND  |               |              |             | ✓            |                 | ✓           |      |
| UPDATE   | ✓             |              |             |              |                 | ✓           |      |
| VERIFY   | ✓             | ✓            | ✓           | ✓            | ✓               | ✓           | ✓    |

Although all userids can use the QUERY, PACKAGE, PROJECT, and VERIFY commands, you need PROJLDR or SYSADMIN authorization to use the QUERY command for information about a userid other than your own. See the *QUERY Command* on page 125 for more information.

## BUDGET Record

### Optional

Use the BUDGET record to implement budget tracking and enforcement. This record specifies when Unicenter VM:Account should call the BUDGET user exit, which defines the action Unicenter VM:Account is to take when a user exceeds his budget limit.

If this record is not in the configuration file, budget tracking and enforcement is turned off (as if you had a BUDGET NO record in the configuration file).

For more information about budget enforcement through user exits, refer to Chapter 11, *User Exits*. For more information about budgeting, refer to *Budgeting* on page 73.

|        |                                     |
|--------|-------------------------------------|
| BUDGET | { NO<br>YES [ <i>percentage</i> ] } |
|--------|-------------------------------------|

### { NO | YES [ *percentage* ] }

indicates whether budget tracking and enforcement are in effect and, if so, specifies the percentage of a budget that a user must consume before Unicenter VM:Account calls the BUDGET user exit.

If budget tracking and enforcement are in effect (YES), the default for *percentage* is 100, which means that Unicenter VM:Account calls the BUDGET user exit only when a user exhausts his or her entire budget. You can specify a number between 1 and 100 for *percentage*.

## Example

To implement budget tracking and enforcement and call the BUDGET user exit when 75% of a user's budget is consumed, enter:

**BUDGET YES 75**

## CHGCUST Record

### Optional

Use the CHGCUST record to specify how to charge customers for resources that usersids consume.

If this record is not in the configuration file, customers are charged for resources by the account numbers defined in the CUSTOMER ACCTLIST file (as if you had a CHGCUST ACCOUNT record in the configuration file).

|         |                       |
|---------|-----------------------|
| CHGCUST | { ACCOUNT   PROJECT } |
|---------|-----------------------|

To change from one accounting method to the other, make the change immediately after end-of-period processing while Unicenter VM:Account is down.

You can account for resource utilization by account or by project. For a complete discussion of each accounting method, refer to Chapter 4, *Choosing an Accounting Method*.

| If these configuration file records are present in VMACCT CONFIG ... | ... the indicated master description files must exist on the minidisk specified on the CTLDISK configuration file record: |                   |                 |                   |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------|
|                                                                      | CUSTOMER MASTER                                                                                                           | CUSTOMER ACCTLIST | PROJECTS MASTER | PROJECTS ACCTLIST |
| PROJECT VERIFY CHGCUST ACCOUNT                                       | ✓                                                                                                                         | ✓                 | ✓               | ✓                 |
| PROJECT NOVERIFY CHGCUST ACCOUNT                                     | ✓                                                                                                                         | ✓                 |                 |                   |
| PROJECT VERIFY CHGCUST PROJECT                                       | ✓                                                                                                                         |                   | ✓               | ✓                 |
| PROJECT NOVERIFY CHGCUST PROJECT                                     | ✓                                                                                                                         |                   | ✓               | ✓                 |

### { ACCOUNT | PROJECT }

specifies whether customers are charged for resources by the account numbers defined in the CUSTOMER ACCTLIST file or by the projects defined in the PROJECTS MASTER and PROJECTS ACCTLIST files.

## COLLECT Record

### Required

Use the COLLECT record to set the following:

- ▶ File modes for the Unicenter VM:Account database collection files
- ▶ Spool file class of the reader files containing accounting records
- ▶ Number of days to hold RAWDATA files before deleting them
- ▶ Percent-full state of a minidisk

Make sure that the minidisks specified on the COLLECT record are accessed by the Unicenter VM:Account service virtual machine before initializing Unicenter VM:Account.

Unicenter VM:Account validates collected data by:

- ▶ Sending edited but invalid records to the *yymmdd* REJECTS file.
- ▶ Accepting reader files only from userids specified on the ACCTCRDS record, the FILEPOOL record, the PRODUCT record, the SPECIAL record, the WORKER record, or those userids generated by CP. The reader files must be the same class as that specified on the COLLECT record.

Userids must punch accounting record files to Unicenter VM:Account. Do not use SENDFILE. An accounting record file sent by the CP TRANSFER command is treated as if it came from an invalid userid. These accounting records are put into files named *yymmdd* INVFILES, where *yymmdd* is the current date.

|         |                                                                                                                                                                                               |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COLLECT | <i>filemode<sub>1</sub></i> [ <i>filemode<sub>2</sub></i> ] CLASS <i>class</i> HOLD <i>nnn</i> [ <i>mmm</i> ] ...<br>... [ DISKFULL <i>shutdown</i> [ <i>warning</i> [ <i>frequency</i> ] ] ] |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***filemode<sub>1</sub>***

specifies the filemode of the COLLECT minidisk. This minidisk is where the PERIODTE CURRENT file, the RAWDATA *\$\$yymmdd* files, and the Unicenter VM:Account work files are stored. You cannot specify filemodes D, S, or Y.

### **[ *filemode<sub>2</sub>* ]**

specifies the filemode of the optional COLLECT-TWIN minidisk where Unicenter VM:Account is to keep a copy of the RAWDATA *\$\$yymmdd* files. If you do not specify *filemode<sub>2</sub>*, Unicenter VM:Account does not make a copy of these files. You cannot specify filemodes D, S, or Y.

The section *Creating an Additional Copy of Accounting Data* (page 72) contains an example of using *filemode<sub>2</sub>* and the COLLECT-TWIN minidisk.

### **CLASS *class***

specifies the reader class of accounting records that CP creates and sends to the Unicenter VM:Account service virtual machine. This should correspond to the class specified in the VMJRET EXEC. Refer to *Running Unicenter VM:Account* on page 5 for more information.

**HOLD *nnn* [ *mmm* ]**

specifies the number of days (*nnn*) that Unicenter VM:Account is to hold RAWDATA files on the COLLECT minidisk before erasing them. The variable *nnn* can be any number from 0 through 999.

The variable *mmm* specifies the number of days (from 0 through 999) that Unicenter VM:Account holds the RAWDATA files on the COLLECT-TWIN minidisk. If you specify a COLLECT-TWIN minidisk with the *filemode<sub>2</sub>* parameter but do not specify a HOLD *mmm* parameter for the COLLECT-TWIN, *mmm* defaults to the *nnn* value. For example, the following COLLECT configuration file record identifies a COLLECT-TWIN minidisk (E) whose RAWDATA files are to be kept the same number of days as on the COLLECT minidisk (3): COLLECT B E HOLD 3.

If you do not want Unicenter VM:Account to write the RAWDATA records to the COLLECT minidisk, do this: Specify a COLLECT-TWIN minidisk with the *filemode<sub>2</sub>* parameter, specify 0 for *nnn*, and specify a value for *mmm*. For example, COLLECT B E HOLD 0 3.

**[ DISKFULL *shutdown* [ *warning* [ *frequency* ] ] ]**

indicates the percentage of the COLLECT or COLLECT-TWIN minidisk that must be full before Unicenter VM:Account shuts itself down. You can specify a number between 1 and 99 for *shutdown*; the default is 95.

You can use *warning* to have Unicenter VM:Account issue a warning message when the COLLECT or COLLECT-TWIN minidisk is a certain percentage full. You can specify a number between 1 and 98 for *warning*; this number must be less than *shutdown*. The default for *warning* is 85.

You can use *frequency* to specify the number of reader files (1-65534) Unicenter VM:Account can process before it issues a warning message. The default is 10.

## Example

You want to create a COLLECT record that specifies:

- ▶ The minidisk at filemode B as the collection disk (that is, the COLLECT minidisk)
- ▶ The minidisk at filemode E as the COLLECT-TWIN minidisk
- ▶ D as the reader class for accounting record files
- ▶ Unicenter VM:Account is to hold RAWDATA \$\$*yyymmdd* files on the COLLECT minidisk for two days and on the COLLECT-TWIN minidisk for seven days
- ▶ Unicenter VM:Account is to shut down when the COLLECT or COLLECT-TWIN minidisk is 98% full, issue warning messages when either minidisk is 90% full, and issue warning messages after processing every 20 reader files

Enter:

**COLLECT B E CLASS D HOLD 2 7 DISKFULL 98 90 20**

## CONSOLE Record

### Optional

Use the CONSOLE record to tell Unicenter VM:Account how often to close the spooled console file each day.

Unicenter VM:Account always closes the spooled console file at midnight.

|         |           |
|---------|-----------|
| CONSOLE | <i>hh</i> |
|---------|-----------|

### *hh*

specifies the interval, in hours, at which to close the Unicenter VM:Account console spool file. The value *hh* is an integer from 1 to 24.

## Example

To have Unicenter VM:Account close the spooled console file every nine hours, enter:

### **CONSOLE 9**

Based on this record, Unicenter VM:Account will close the spooled console at 9:00 a.m. and 6:00 p.m. It will automatically close the console file at midnight, even though midnight is only six hours after 6:00 p.m.

## COSTSYMB Record

### Optional

Use the COSTSYMB record to specify a monetary symbol or two-character string to use in the output of the QUERY USAGE command.

|          |               |
|----------|---------------|
| COSTSYMB | <i>symbol</i> |
|----------|---------------|

### ***symbol***

specifies the monetary symbol or two-character string to use. The default is a dollar sign (\$). You can use another symbol such as a pound or yen sign.

## Example

To have Unicenter VM:Account show DM for Deutschmarks, enter:

**COSTSYMB DM**



## CTLDISK Record

### Required

Use the CTLDISK record to identify the filemode of the minidisk on which the Unicenter VM:Account MASTER, ACCTLIST, COSTABLE, DAILY EVENTS, and Unicenter VM:Batch JOBACCTS files are stored.

If you use the CTLDISK record, you must access the minidisk at the filemode specified on this record before initializing Unicenter VM:Account so Unicenter VM:Account will use this minidisk.

|         |                 |
|---------|-----------------|
| CTLDISK | <i>filemode</i> |
|---------|-----------------|

### ***filemode***

is the filemode for minidisk on which the MASTER, ACCTLIST, COSTABLE, DAILY EVENTS, and Unicenter VM:Batch JOBACCTS file are stored. The default filemode is C.

## DASDACCT Record

### Optional

Use the DASDACCT record to control when the Unicenter VM:Account service virtual machine instructs the Unicenter VM:Account worker machine to perform a SCAN or a GENERATE.

- ▶ The SCAN function examines CMS minidisks and SFS file pools for ownership and usage information. When the SCAN function detects a change in usage or ownership, it creates an MDISK (datatype A4) or SFS Storage (datatype AF) accounting record.
- ▶ The GENERATE function performs a SCAN function and unconditionally creates accounting records (datatypes A4 or AF).

If you do not have a DASDACCT GENERATE record in the configuration file, datatype A4 and AF records are created when the DASDACCT GENERATE command is issued *or* the SCAN function detects a change in minidisk usage or ownership.

You may have multiple DASDACCT configuration records but you must follow these usage rules:

- ▶ DASDACCT records can appear anywhere in the configuration file and in any order.
- ▶ Use of the DASDACCT GENERATE DAILY and DASDACCT GENERATE EVERY *days* records is mutually exclusive. That is, you can have one or the other in the configuration file, but not both.

|          |                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DASDACCT | $\left\{ \begin{array}{l} \text{SCAN } hh:mm:ss_1 [ hh:mm:ss_2 \dots hh:mm:ss_{96} ] \\ \text{GENERATE ON PERIOD} \\ \text{GENERATE DAILY} \\ \text{GENERATE EVERY } days \end{array} \right\}$ |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### SCAN *hh:mm:ss<sub>1</sub> [ hh:mm:ss<sub>2</sub> ... hh:mm:ss<sub>96</sub> ]*

specifies the time of day the DASDACCT worker machine is to scan the SFS filepools and CMS minidisks for changes in DASD ownership and usage information. You can specify up to 96 times per day (the equivalent of every 15 minutes) using a 24-hour clock. You can specify multiple DASDACCT SCAN records as long as the total number of scans specified on all records does not exceed 96.

Unicenter VM:Account performs special end-of-day processing at midnight. A SCAN scheduled for midnight, or within a few seconds of midnight, may be delayed by several seconds to avoid interfering with other end-of-day activities. For example, a SCAN scheduled for 00:00:00 (midnight) may actually occur at 00:00:10 (10 seconds after midnight).

### GENERATE ON PERIOD

specifies that the DASDACCT worker machine is to generate new accounting records automatically when the PERIOD command is run.

## GENERATE DAILY

specifies that the DASDACCT worker machine is to generate new accounting records daily at the last SCAN time of the day.

## GENERATE EVERY *days*

specifies that the DASDACCT worker machine is to generate new accounting records on a specific day or days, as follows:

**If you specify:    The machine generates the records on:**

|                     |                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------|
| <i>dayofweek</i>    | The specified day or days every week; you can specify MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, and SUNDAY |
| <i>dayofmonth</i>   | The specified day or days of the month; you can specify integers from 1 to 31                                            |
| LASTDAY             | The last day of the month                                                                                                |
| LASTDAY - <i>n</i>  | The day <i>n</i> days before the last day of the month                                                                   |
| WEEKDAY or BUSINESS | Monday, Tuesday, Wednesday, Thursday, and Friday                                                                         |
| WEEKEND             | Saturday and Sunday                                                                                                      |

If you generate records monthly using *dayofmonth* or LASTDAY, remember that the information is not available to the QUERY USAGE or QUERY BUDGET command until *after* the records are created.

## Examples

- To have the DASDACCT worker machine scan the SFS filepools and CMS minidisks at 11:30 p.m. each day and generate accounting records when the PERIOD command is run, enter:

```
DASDACCT SCAN 23:30:00
DASDACCT GENERATE ON PERIOD
```

- To have the worker machine scan at 1 a.m., 6 a.m., noon, and 11 p.m. each day and generate accounting records five days before the last day of every month, enter:

```
DASDACCT SCAN 01:00:00 06:00:00 12:00:00 23:00:00
DASDACCT GENERATE EVERY LASTDAY -5
```

- To have the worker machine scan at 11:30 p.m. each day and generate accounting records when the PERIOD command is run and every Saturday, enter:

```
DASDACCT SCAN 23:30:00
DASDACCT GENERATE ON PERIOD
DASDACCT GENERATE EVERY SATURDAY
```

- To have the worker machine scan at 11:30 p.m. each day and generate accounting records on the 7th, 15th, and last day of every month, enter:

**DASDACCT SCAN 23:30:00**

**DASDACCT GENERATE EVERY 7 15 LASTDAY**

## DBDISK Record

### Optional

Use the DBDISK record to specify the filemode of the Unicenter VM:Account database index files.

If you use the DBDISK record, you must access the minidisk at the filemode specified on this record before you initialize Unicenter VM:Account in order for Unicenter VM:Account to use this minidisk.

|        |                 |
|--------|-----------------|
| DBDISK | <i>filemode</i> |
|--------|-----------------|

### ***filemode***

is the filemode for the database index files. The default is the filemode of the costed accounting records file specified on the COLLECT configuration file record as *filemode<sub>1</sub>*.

## DBINDEX Record

### Optional

Index files are built for the PERIODTE CURRENT file and (if one exists) the trend file. Use the DBINDEX record to specify fields on which you want to create database indices.

Indices make queries run faster. Use the DBINDEX configuration file record *only* if you will be using the QUERY USAGE command.

The size of the index file is proportional to the number of DBINDEX records and significant characters you specify. If you specify many indices and significant characters, the index files will be large, more DASD will be needed to store them, and Unicenter VM:Account will require more time to initialize, but the QUERY USAGE command will run faster. Conversely, if you keep the number of index records to a minimum, less DASD will be required and initialization will be quicker, but QUERY USAGE performance will suffer.

Specify DBINDEX fields when you first install Unicenter VM:Account or at the beginning of a new accounting period, when you regenerate the database indices.

Before you add this configuration file record, weigh the consequences of increasing the number and size of the database indices against the benefits.

You can use more than one DBINDEX record.

|         |                                                                                                                                                                                                                                                     |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DBINDEX | $\left\{ \begin{array}{l} \text{ACCOUNT [ } n \text{ ]} \\ \text{BEGDATE} \\ \text{CUSTOMER [ } n \text{ ]} \\ \text{PACKAGE [ } n \text{ ]} \\ \text{PROJECT [ } n \text{ ]} \\ \text{SHIFT} \\ \text{USERID [ } n \text{ ]} \end{array} \right\}$ |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### [ *n* ]

is the number of significant characters to use in building the index. The default is \*, the maximum field size.

The value on this option determines how database searches are performed. Qualifying records are first selected on the basis of the index. The selected records are searched again to satisfy the query.

This option does not apply to the BEGDATE or SHIFT field names. These indices use the default field size.

## Example

This DBINDEX record specifies the first four characters of the USERID field as a database index:

### **DBINDEX USERID 4**

A query on userid JACKSON first retrieves userids beginning with JACK (the indexed value). The indexed values are searched again for JACKSON. As the size of the index increases, the number of retrieval passes decreases and query response improves.

## DBSPACE Record

### Optional

Use the DBSPACE record to specify the amount of storage to use to maintain the database on the Unicenter VM:Account service virtual machine during QUERY command processing.

If this record is not in the configuration file, the database is allocated 64Kb and Unicenter VM:Account warns the user if the storage is not available. (This would be as if you had a DBSPACE 64K WARN record in the configuration file).

|         |                                                                                                                                     |
|---------|-------------------------------------------------------------------------------------------------------------------------------------|
| DBSPACE | $\left\{ \begin{array}{l} nnnnnK \\ nnM \end{array} \right\} \left[ \begin{array}{l} \text{WARN} \\ \text{END} \end{array} \right]$ |
|---------|-------------------------------------------------------------------------------------------------------------------------------------|

### **{ nnnnnK | nnM }**

specifies the amount of storage in kilobytes (K) or megabytes (M). The default is 64K. The minimum you can specify is 48K.

Use this formula to determine your storage requirements in kilobytes:

$$\text{Kbytes} = 4 + ( ( C + T + L ) / 27,000 ) * 4 )$$

where:

C is the maximum number of records in the PERIODTE CURRENT file

T is the maximum number of records in the TRNDFILE; if no TRNDFILE exists, use 0

L is the larger of C or T

For example, if the number of records in your PERIODTE CURRENT file never exceeds 130,000 and the number of records in your TRNDFILE is 64,000, the amount of storage to process queries is:

$$\begin{aligned} \text{Kbytes} &= 4 + (((130,000 + 64,000 + 130,000) / 27,000) * 4) \\ &= 4 + (((324,000) / 27,000) * 4) \\ &= 4 + ((12) * 4) \\ &= 4 + (48) \\ &= 52 \text{ Kbytes per query} \end{aligned}$$

To convert the amount of storage from kilobytes to megabytes, divide the result by 1000 (1 megabyte equals 1000 kilobytes).

### **[ WARN | END ]**

specifies the action Unicenter VM:Account is to take if the specified storage is unavailable. WARN tells Unicenter VM:Account to adjust the specified DBSPACE to 70% of whatever is available and send the operator a warning message. END tells Unicenter VM:Account to terminate and generate the appropriate messages if the storage is unavailable.



## Example

You want to dedicate 128K of the Unicenter VM:Account service virtual machine's virtual storage to maintaining the database during QUERY commands. If 128K is not available, you want Unicenter VM:Account to use 70% of 128K (90K) and send the operator a warning message. Enter:

**DBSPACE 128K**

## DIRECT Record

### Required

Use the DIRECT record to specify the virtual address and volume serial number (volser) of the minidisk that contains the CP object directory.

The DIRECT record must precede all AUTHORIZ records in the configuration file.

|        |                     |
|--------|---------------------|
| DIRECT | <i>vaddr volser</i> |
|--------|---------------------|

### ***vaddr***

is the virtual address of the minidisk on which the VM object directory resides. Computer Associates strongly recommends that you link Unicenter VM:Account to the minidisk containing the CP object directory at virtual device address 1A0.

### ***volser***

is the volser of the minidisk on which the VM object directory resides.

## Example

To specify that the CP object directory resides on a minidisk at virtual address 1A0 whose volser is VMSRES, enter:

**DIRECT 1A0 VMSRES**

## DUMP Record

### Optional

Use the DUMP record to specify whether a dump is to be performed if Unicenter VM:Account terminates abnormally and, if so, identify the userid whose virtual reader is to receive the dump.

If this record is not in the configuration file, Unicenter VM:Account creates its dumps with CP VMDUMP (as if you had a DUMP VMDUMP record in the configuration file).

|      |                                                             |
|------|-------------------------------------------------------------|
| DUMP | { OFF<br>CP [ <i>userid</i> ]<br>VMDUMP [ <i>userid</i> ] } |
|------|-------------------------------------------------------------|

**{ OFF | CP [ *userid* ] | VMDUMP [ *userid* ] }**

specifies whether a dump is to be performed and, if so, identifies the userid to receive the dump.

| Parameter                | Means                                   |
|--------------------------|-----------------------------------------|
| OFF                      | No dump is to be performed              |
| CP [ <i>userid</i> ]     | CP DUMP command is to create the dump   |
| VMDUMP [ <i>userid</i> ] | CP VMDUMP command is to create the dump |

By default, dumps are sent to SYSTEM, but both the CP and VMDUMP options allow you to specify a userid to receive the dump.

## FILEPOOL Record

### Required for SFS

Use the FILEPOOL record to specify the SFS servers and filepools for which Unicenter VM:Account accepts SFS Usage accounting records that SFS generates. Also use this record to instruct Unicenter VM:Account to generate SFS Storage accounting records through the DASDACCT GENERATE command.

Unicenter VM:Account only accepts SFS Usage accounting records from and generates SFS Storage accounting records for servers defined on FILEPOOL records. If there are filepools that you do not want to charge for the use of DASD space, specify them on the EXCLUDE record in the VMACCT DASDINFO file.

The FILEPOOL record is required for SFS accounting. You can specify as many servers and filepools on this record as you need. You can specify multiple FILEPOOL records. FILEPOOL records can occur anywhere in the configuration file.

For more information about SFS Usage accounting, refer to *Charging for SFS Usage* on page 38. For more information about SFS Storage accounting, refer to *Charging for DASD Ownership (SFS and Minidisk)* on page 32. Refer to *VMACCT DASDINFO Control File* on page 34 for more information about the EXCLUDE record.

---

**Note:** If BrightStor VM:Migrate controls a file pool that is defined on a FILEPOOL record in the VMACCT CONFIG file, the Unicenter VM:Account/BrightStor VM:Migrate interface is automatically turned on. Refer to the *Component Interface Guide* for information about this interface.

To determine whether BrightStor VM:Migrate controls a particular file pool, issue the BrightStor VM:Migrate QUERY GROUP *filepoolid* command.

---

|          |                                                                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| FILEPOOL | [ <i>serverid</i> <sub>1</sub> . ] <i>filepool</i> <sub>1</sub> ... [ [ <i>serverid</i> <sub><i>n</i></sub> . ] <i>filepool</i> <sub><i>n</i></sub> ] |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|

**[ *serverid*<sub>1</sub>. ] *filepool*<sub>1</sub> ... [ [ *serverid*<sub>*n*</sub>. ] *filepool*<sub>*n*</sub> ]**

identifies the SFS servers and filepools. If you do not specify *serverid*., Unicenter VM:Account assumes *serverid*. is the same as *filepool*.

---

**Caution:** Do not list VMJMDISK as a filepool. This is the name of the Unicenter VM:Account minidisk allocation table.

---

## Example

To identify the SFS server VMSSERV and the filepool DEVELOP to Unicenter VM:Account, enter:

**FILEPOOL VMSSERV.DEVELOP**

## IGNORE Record

### Optional

Use the IGNORE record to specify the types of records you do not want Unicenter VM:Account to cost.

Ignored records are written to the current RAWDATA files, but are not passed to any user exits or costed in the PERIODTE CURRENT file.

You can specify multiple IGNORE records.

|        |                                                                   |
|--------|-------------------------------------------------------------------|
| IGNORE | <i>name<sub>1</sub> [ name<sub>2</sub> ... name<sub>n</sub> ]</i> |
|--------|-------------------------------------------------------------------|

### *name<sub>1</sub> [ name<sub>2</sub> ... name<sub>n</sub> ]*

lists the types of records to ignore; the values you may enter are presented in the Datatype Name and Record Type Name columns, below. Do not specify a datatype number or a record type number.

| Datatype Name | Datatype Number | Datatype Name | Datatype Number |
|---------------|-----------------|---------------|-----------------|
| SESSION       | 01              | RSCS          | A7              |
| DEDEV         | 02              | VMARCH        | A9              |
| TDISK         | 03              | SQL/DS        | AA              |
| LINKS         | 05              | VMSPool       | AB              |
| VSCS          | 07              | TSAF          | AC              |
| LGAI          | 0C              | SQLSTOR       | AD              |
| VOLS          | A3              | SFS           | AE              |
| MDISK         | A4              | SFSDASD       | AF              |
| MISCHGS       | A5              | WEB           | AG              |
| TAPMNTS       | A6              |               |                 |

| Record Type Name | Record Type Number |
|------------------|--------------------|
| USER             | C0                 |
| USERSESS         | C1                 |
| USERDDEV         | C2                 |
| USERTDSK         | C3                 |

## Example

To have Unicenter VM:Account ignore costing for record datatypes 03 and AA, enter:

**IGNORE TDISK SQL/DS**

## MESSAGE Record

### Optional

Use the MESSAGE record to specify which CP command Unicenter VM:Account is to use to communicate with other users.

If this record is not in the configuration file, Unicenter VM:Account uses the MSGNOH command (as if you had a MESSAGE MSGNOH record in the configuration file).

For more information about CP message commands, refer to the CP command reference guide for your operating system.

|         |                        |
|---------|------------------------|
| MESSAGE | { MSG   MSGNOH   WNG } |
|---------|------------------------|

### **{ MSG |MSGNOH |WNG }**

specifies whether Unicenter VM:Account is to use the CP MSG command, the CP MSGNOH command, or the CP WNG command.

## PRODUCT Record

### Optional

Use the PRODUCT record to identify service virtual machines running other Computer Associates components and to activate the interface between Unicenter VM:Account and these service virtual machines.

The PRODUCT record is required if you want to account for other Computer Associates components or use BrightStor VM:Tape to manage your tapes.

You must specify a separate PRODUCT record for each Computer Associates component. If you need to specify more than one service virtual machine userid for a particular component, you must add a separate PRODUCT record for each userid.

For more information about a particular Computer Associates component interface, refer to the *Component Interface Guide*.

|         |                                                                                                                                                                                                                                                                                   |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRODUCT | <div><div>VMARCHIVE userid</div><div>VMBACKUP userid</div><div>VMBATCH userid</div><div>VMDIRECTOR userid</div><div>VMJRTRVR userid</div><div>VMSECURE userid</div><div>VMSISERV VMRMAINT</div><div>VMSPPOOL userid</div><div>VMTAPE userid</div><div>VMWEBSRV userid</div></div> |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### **VMARCHIVE userid**

specifies the userid of the service virtual machine that generates type C0 (Unicenter VM:Account datatype A9) accounting records.

#### **VMBACKUP userid**

specifies the userid of the BrightStor VM:Backup service virtual machine that quiesces the Unicenter VM:Account COLLECT minidisk.

#### **VMBATCH userid**

specifies the userid of the Unicenter VM:Batch service virtual machine with which Unicenter VM:Account interfaces to provide extended accounting support, and which generates C1, C2, and C3 accounting records (Unicenter VM:Account datatypes 01, 02, and 03).

#### **VMDIRECTOR userid**

specifies the name of the eTrust VM:Director service virtual machine with which Unicenter VM:Account communicates.

**VMJRTRVR *userid***

specifies the service virtual machine (the Retriever machine) receiving accounting records directly from CP. This userid also appears as the argument to the ACCOUNT1 or ACCOUNT2 parameter of the SYSTEM\_USERIDS statement in the SYSTEM CONFIG file. This userid cannot be the same as the userid of the Unicenter VM:Account service virtual machine.

**VMSECURE *userid***

specifies the name of the eTrust VM:Secure service virtual machine with which Unicenter VM:Account communicates.

**VMISERV VMRMAINT**

specifies that VMRMAINT is authorized to perform component maintenance for Unicenter VM:Account.

**VMSPPOOL *userid***

specifies the userid that runs Unicenter VM:Spool and generates type C0 (Unicenter VM:Account datatype AB) accounting records.

**VMTAPE *userid***

specifies the userid that runs BrightStor VM:Tape and generates type C0 (Unicenter VM:Account datatype A6) accounting records.

**VMWEBSRV *userid***

specifies the userid of a CA-VM:Webgateway service virtual machine that generates web accounting cards (Unicenter VM:Account data type AG) for Unicenter VM:Account processing.



## PROJECT Record

### Optional

Use the PROJECT record to instruct Unicenter VM:Account to maintain project-level security. Unicenter VM:Account does this by checking user entries against the authorizations specified in the PROJECTS ACCTLIST file.

If this record is not in the configuration file, there is no security and any user can charge to any project (as if you had a PROJECT NOVERIFY record in the configuration file).

The PROJECTS ACCTLIST file contains the names of projects and the numbers of accounts that can charge to a project along with project budget limits. Without verification, any user can charge to any project.

|         |                                                     |
|---------|-----------------------------------------------------|
| PROJECT | {<br>VERIFY<br>NOVERIFY<br>}<br>[ ADD ] [ NEWDFLT ] |
|---------|-----------------------------------------------------|

#### { VERIFY | NOVERIFY }

specifies whether Unicenter VM:Account is to check the PROJECTS ACCTLIST file to see if a user can charge resources to a specified project. If you specify VERIFY, Unicenter VM:Account checks the file. If you specify NOVERIFY, Unicenter VM:Account does not check the file, and any user can charge to any project.

#### [ ADD ]

specifies that Unicenter VM:Account should add project *projectname* to the PROJECTS MASTER file if the following are true:

- ▶ There is a PROJECT NOVERIFY ADD record in the configuration file
- ▶ You enter the PROJECT *projectname* command
- ▶ Project *projectname* is not defined in the PROJECTS MASTER file

You cannot use this option if you have a CHGCUST PROJECT record in the VMACCT CONFIG file.

#### [ NEWDFLT ]

specifies that, when you change your project using the PROJECT command, Unicenter VM:Account should make the new project your default project.

## Example

To allow users to use any project and to have Unicenter VM:Account add projects that do not already exist to the PROJECT MASTERS file, enter:

**PROJECT NOVERIFY ADD**

## QRLIMIT Record

### Optional

Use the QRLIMIT record to specify the maximum number of records a userid can have the QUERY command process. You can have Unicenter VM:Account send the userid a warning message and terminate the QUERY command if the number is exceeded.

The warning message asks users if they want to continue.

If you do not specify a QRLIMIT record, a user can query any number of records.

|         |                                 |
|---------|---------------------------------|
| QRLIMIT | <i>warning</i> [ <i>final</i> ] |
|---------|---------------------------------|

### ***warning***

specifies the number of records that, when exceeded, makes Unicenter VM:Account send a warning message to the user.

### **[ *final* ]**

is the number of records that, when exceeded, makes Unicenter VM:Account terminate the QUERY command. This number must be larger than *warning*.

## Example

To have Unicenter VM:Account send a message to userids running the QUERY command if the command selects more than 1000 records and to have Unicenter VM:Account terminate the command if it selects more than 20,000, enter:

**QRLIMIT 1000 20000**

# QROUTPUT Record

Optional

Use the QROUTPUT record to limit the output that the QUERY USAGE command produces.  
  
If this record is not in the configuration file, the QUERY USAGE command will report on cost and resource data (as if you had a QROUTPUT BOTH record in the configuration file).

|          |                              |
|----------|------------------------------|
| QROUTPUT | { COSTS   RESOURCES   BOTH } |
|----------|------------------------------|

**{ COSTS | RESOURCES | BOTH }**  
identifies the level of output you want the QUERY USAGE command to produce.

| Parameter | Means the command is to report on |
|-----------|-----------------------------------|
| COSTS     | Cost data only                    |
| RESOURCES | Resource data only                |
| BOTH      | Both cost and resource data       |

## RSCSNODE Record

### Optional

Use the RSCSNODE record to specify a userid (on the same system as the Unicenter VM:Account service virtual machine) to receive charges for activity occurring on another RSCS node.

This record provides a facility for processing RSCS records for transactions originating on another CPU and prevents RSCS accounting records from being rejected because the originating userid does not exist on the same system as the Unicenter VM:Account service virtual machine.

For more information about implementing RSCS accounting, refer to Chapter 5, *Resource Accounting*.

|          |                    |
|----------|--------------------|
| RSCSNODE | <i>node userid</i> |
|----------|--------------------|

### ***node***

specifies the name of the RSCS node on which the RSCS transaction originated. The variable *node* can have an asterisk as its last or only character, denoting it as a generic *node*. The local node does not have to be specified.

A generic *node* causes all RSCS transactions originating from any node starting with the same characters as the generic *node* and that do not have a more specific *node* defined to be charged to the associated userid.

### ***userid***

specifies the userid that receives the charges for the RSCS transactions originating from the associated node.

If you specify an asterisk, the originating userid is charged for the RSCS transaction. Unicenter VM:Account looks for the originating userid in the VM object directory. If the userid is not in the VM object directory, the record is rejected.

## Example

To have Unicenter VM:Account charge RSCS transactions originating on local node VM5 to the submitting userid and to charge RSCS transactions originating on all other nodes to userid RSCS, enter:

```
RSCSNODE VM5 *  
RSCSNODE * RSCS
```

# SHIFT Record

Optional

Use the SHIFT record to define the work periods at your site and specify the starting time of each shift.

If this record is not in the configuration file, Unicenter VM:Account uses the default shift, which spans 00:00:00 through 24:00:00 daily. This makes Unicenter VM:Account generate accounting records every day at midnight.

You can specify more than one SHIFT record.

At shift change, Unicenter VM:Account issues a CP ACNT ALL command to close accounting for every logged on user and begin accounting for the next shift. Unicenter VM:Account also automatically issues a CP ACNT ALL at midnight.

|       |                                                                                                              |
|-------|--------------------------------------------------------------------------------------------------------------|
| SHIFT | <i>name begintime [ endtime ]</i> <div><i>beginday [ endday ]</i><br/>WEEKEND<br/>WEEKDAY<br/>BUSINESS</div> |
|-------|--------------------------------------------------------------------------------------------------------------|

**name**  
specifies the name of the shift; you can use up to eight characters. 0 and 00 are special shifts where *begintime* equals *endtime*. These shifts span no time. 0 and 00 shifts cause accounting records to be generated but do not appear in the SHIFT field for any records.

***begintime [ endtime ]***  
*begintime* specifies the time the shift starts and *endtime* specifies the time the shift ends. Specify both using *hh:mm:ss* format. Shifts can begin anytime between 00:00:00 and 23:59:59 and can end anytime between 00:00:00 and 24:00:00. The *endtime* must be greater than the *begintime*. The default for *endtime* is the beginning of the next shift.

***[ beginday [ endday ] ]***  
means the shift applies from the *beginday* to the *endday*; you can use MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, and SUNDAY for either variable.

***[ WEEKEND ]***  
means the shift applies to Saturday and Sunday.

***[ WEEKDAY ]***  
means the shift applies to Monday, Tuesday, Wednesday, Thursday, and Friday.

***[ BUSINESS ]***  
means the shift applies to Monday, Tuesday, Wednesday, Thursday, and Friday.

## Example

Define the following three accounting shifts:

- ▶ The first shift runs from 8:30 a.m. through 5:30 p.m., Monday through Friday.
- ▶ The second shift starts at 5:30 p.m. and ends at midnight, Monday through Friday.
- ▶ The third shift is for the rest of the time; all day Saturday and Sunday, and from midnight to 8:30 a.m. Monday through Friday.

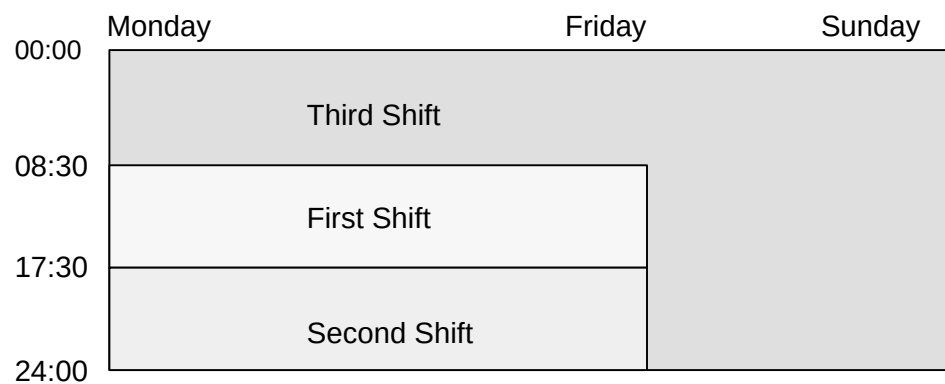
**SHIFT FIRST 08:30:00 WEEKDAY**

**SHIFT SECOND 17:30:00 24:00:00 WEEKDAY**

**SHIFT THIRD 00:00:00 24:00:00**

The variable *endtime* was not specified on the first SHIFT record, so the *endtime* of the first shift is the *begintime* of the next SHIFT record.

The following diagram illustrates how these shift settings cover all days of the week and hours of the day.



# SIOCOUNT Record

Optional

Use the SIOCOUNT record to indicate whether you want to charge users for all start I/Os (SIOs) or only for successful SIOs on CP Session (datatype 01) accounting records.

If this record is not in the configuration file, Unicenter VM:Account charges for all SIOs (as if you had a SIOCOUNT ALL record in the configuration file).

Unicenter VM:Account reports and QUERY USAGE output will show either all SIOs or only successful SIOs based on this record.

|          |                   |
|----------|-------------------|
| SIOCOUNT | { ALL   SUCCESS } |
|----------|-------------------|

**{ ALL | SUCCESS }**  
specifies whether to charge users for all SIOs or for successful SIOs only.

| Option  | Description                                                 |
|---------|-------------------------------------------------------------|
| ALL     | Charge users for all SIOs, both successful and unsuccessful |
| SUCCESS | Charge users for successful SIOs only                       |

The section *Note Concerning the PERIODTE Format of This Datatype* (page 357) explains how datatype 01 records in the PERIODTE CURRENT file are affected by the option you select.

## SPECIAL Record

### Optional

Use the SPECIAL record to identify the userids that can create accounting records for Unicenter VM:Account to process.

The userids identified on the SPECIAL record create records in raw data format. Unicenter VM:Account processes these records and produces records in PERIODTE format.

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPECIAL | $\left\{ \begin{array}{l} \text{DISKVOLS } \text{userid}_1 [ \text{userid}_2 \dots \text{userid}_n ] \\ \text{RSCS } \text{userid}_1 [ \text{userid}_2 \dots \text{userid}_n ] \\ \text{SPOOL } \text{userid} \\ \text{SQL/DS } \text{userid}_1 [ \text{userid}_2 \dots \text{userid}_n ] \\ \text{SQLSTOR } \text{userid}_1 [ \text{userid}_2 \dots \text{userid}_n ] \\ \text{TAPEVOLS } \text{userid}_1 [ \text{userid}_2 \dots \text{userid}_n ] \\ \text{TSAF } \text{userid} \end{array} \right\}$ |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### **DISKVOLS *userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ]**

specifies the userids that run the Unicenter VM:Account VMJDVA (Disk Volume Accounting) utility. VMJDVA generates datatype A3 accounting records.

#### **RSCS *userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ]**

specifies the userids that run the RSCS program product and generate datatype A7 accounting records.

#### **SPOOL *userid***

specifies the Unicenter VM:Spool worker machine userid. This userid creates datatype AB spool accounting records.

#### **SQL/DS *userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ]**

specifies the database virtual machine userids generating SQL/DS (datatype AA) accounting records.

#### **SQLSTOR *userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ]**

specifies the userids authorized to run VMJSQL (the SQL DBSPACE accounting utility). VMJSQL generates datatype AD accounting records.

#### **TAPEVOLS *userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ]**

specifies the userids that execute the VMJTVA (Tape Volume Accounting) utility. VMJTVA generates datatype A3 accounting records.

#### **TSAF *userid***

specifies the userid of the TSAF service virtual machine that generates datatype AC accounting records.



# SYSOPER Record

Optional

Use the SYSOPER record to identify the userids to receive Unicenter VM:Account system messages.

If you do not identify any userids, Unicenter VM:Account sends system messages to the VM system operator's console.

|         |                                                                         |
|---------|-------------------------------------------------------------------------|
| SYSOPER | <i>userid<sub>1</sub> [ userid<sub>2</sub> ... userid<sub>n</sub> ]</i> |
|---------|-------------------------------------------------------------------------|

***userid<sub>1</sub> [ userid<sub>2</sub> ... userid<sub>n</sub> ]***  
specifies one or more userids to receive system messages. If none of the specified userids is logged on, messages are sent to the VM system operator's console.

## TRNDFILE Record

### Optional

Use the TRNDFILE record to tell Unicenter VM:Account to take information from a trend file and include it the Unicenter VM:Account database indices.

This information is included in a response to a QUERY USAGE command or one of the Data Center reports.

The trend file is created and updated by the PERIODTE File Record Compression utility (VMJCMP). It must be a fixed-length file with a logical record length (LRECL) of 240 bytes.

You can specify only one TRNDFILE record.

---

**Note:** The compression user exit, VMJCMPX2, is called from the compression utility. Do not specify it on this record. Refer to *PERIODTE File Compression Utility (VMJCMP)* on page 185 for more information about the utility and compression user exit.

---

|          |                                       |
|----------|---------------------------------------|
| TRNDFILE | <i>filename filetype [ filemode ]</i> |
|----------|---------------------------------------|

***filename filetype [ filemode ]***

specifies the filename, filetype, and filemode of the trend file to include in the Unicenter VM:Account database. This file must reside on an accessed disk when Unicenter VM:Account is initialized. If you do not specify a filemode, Unicenter VM:Account searches for the trend file in CMS search order.

## USEREXIT Record

### Optional

Use the USEREXIT record to specify a user exit you want Unicenter VM:Account to use.

Refer to Chapter 11, *User Exits*, for information about Unicenter VM:Account user exits.

|          |                                            |
|----------|--------------------------------------------|
| USEREXIT | <i>exit program</i> [ <u>TEXT</u>   EXEC ] |
|----------|--------------------------------------------|

### ***exit***

specifies the name of a Unicenter VM:Account user exit. Valid exit names are:

|          |         |        |         |
|----------|---------|--------|---------|
| ACCTDATA | COMMAND | ENDCMD | RAWDATA |
| BUDGET   | COSTING | QUERY  | SHIFT   |

### ***program***

specifies the filename of the user exit.

### [ TEXT | EXEC ]

specifies the filetype of the user exit. TEXT is a user exit written in assembler or another language using OS standard linkage. EXEC is the filetype of a REXX user exit. A compiled REXX user exit should have the filetype EXEC.

## WORKER Record

### Optional

Use the WORKER record to specify the DASDACCT worker machine userid.

The DASDACCT worker machine gathers SFS DASD ownership and minidisk ownership information and uses the information to generate accounting records. If this record is not in the configuration file, datatype A4 and AF accounting records will not be produced.

Userids specified on WORKER records are automatically authorized to send accounting records to Unicenter VM:Account. The userids need not be defined on ACCTCRDS or SPECIAL records.

When installing Unicenter VM:Account, the Automated Installation and Maintenance (AIM) procedure builds the DASDACCT worker machine and names it VMJDASD. If VMJDASD is already defined, the AIM procedure uses userid VMJSD01. When it creates the WORKER configuration file record, the AIM procedure automatically uses the DASDACCT worker machine's userid.

If you are upgrading Unicenter VM:Account and do not have a worker machine, you must create the WORKER configuration file record and the DASDACCT worker machine. Refer to the *CA VM:Manager Upgrade Guide* for more information.

The WORKER record is required for SFS and minidisk accounting.

|        |                          |
|--------|--------------------------|
| WORKER | DASDACCT <i>workerid</i> |
|--------|--------------------------|

### **DASDACCT *workerid***

is the userid of the DASDACCT worker machine.

## Example

To specify VMJDASD as the DASDACCT worker machine, enter:

**WORKER DASDACCT VMJDASD**

The Unicenter VM:Account utilities provide reporting and management functions.

To see how the most common Unicenter VM:Account utilities are used, read Chapter 7, *Performing Common Unicenter VM:Account Tasks*.

The following table lists Unicenter VM:Account utilities and briefly describes them.

Table 9. *Utility Quick Reference*

| Utility  | Name                                  | Function                                                                                                                                       | Page |
|----------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------|
| VMCLOCK  | System Date Verification              | Verifies that CP is being brought up with the correct date and time                                                                            | 183  |
| VMJCMP   | Periodte File Record Compression      | Prepares a summary of a closed accounting record file or creates a TRNDFILE                                                                    | 185  |
| VMJCPR   | Capacity Planning                     | Produces a report of CPU utilization during one day                                                                                            | 196  |
| VMJCVTBL | File Pool Allocation Table Conversion | Converts SFS file pool allocation tables to format used by Unicenter VM:Account Release 1.6 and later                                          | 198  |
| VMJDVA   | Disk Volume Accounting                | Creates mountable disk volume accounting records                                                                                               | 199  |
| VMJIFR   | Invalid File Report                   | Produces a report on invalid spool files and generates raw data files                                                                          | 202  |
| VMJPKG   | Software Package Accounting           | Package-accounts software                                                                                                                      | 204  |
| VMJPKINS | VMJPKG Installation                   | Updates the package-accounting modules when you use a name other than VMACCT as the userid of the Unicenter VM:Account service virtual machine | 210  |
| VMJRAW   | Accounting Data Conversion            | Produces standard CP accounting records for use with other accounting programs                                                                 | 211  |

(continued)

Table 9. Utility Quick Reference (continued)

| Utility  | Name                       | Function                                                                                                                                   | Page |
|----------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------|
| VMJRCS   | Recost                     | Selectively recosts previously costed accounting data using new COSTABLE files or new master description files                             | 213  |
| VMJRSE   | Security Violations Report | Produces reports listing information about unauthorized LOGON and AUTOLOG attempts, and valid and invalid links                            | 218  |
| VMJSCD   | Installation Aid           | Helps you to establish relationships between customer IDs, account numbers, and project names                                              | 221  |
| VMJSEL   | Record Selection           | Allows records to be selected according to user-specified criteria for reporting or to create an output file                               | 223  |
| VMJSQINS | SQL/DS Installation        | Updates the SQL/DS ARIEXIT module when you use a name other than VMACCT for the userid of the Unicenter VM:Account service virtual machine | 235  |
| VMJSQJ   | SQL/DS DBSPACE Accounting  | Creates SQL/DS DBSPACE ownership accounting records                                                                                        | 236  |
| VMJTVA   | Tape Storage Accounting    | Creates Volumes accounting records                                                                                                         | 240  |

## System Date Verification Utility (VMCLOCK)

The VMCLOCK utility verifies that CP is being brought up with the correct date and time.

Specify VMCLOCK as one of the first executable statements in userid AUTOLOG1's PROFILE EXEC.

AUTOLOG1 must have CP privilege classes B and G to run this utility.

Do not use this utility if you have used the TIMEZONE command at your site. This is because the system time could be out of sync with the timestamp on files on the COLLECT minidisk.

|         |                                                                                                                                                                                            |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMCLOCK | <i>filemode</i> $\left[ \begin{array}{l} ( \begin{array}{l} [ \text{SHUTDOWN} ] \\ [ \text{OPERATOR } \textit{userid} ] \\ [ \text{TIME } \textit{hhmm} ] \end{array} \end{array} \right]$ |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***filemode***

specifies the minidisk to check for the last date and time an update was made. This date and time will be used as the last time the machine was running. Although you can use any minidisk that is regularly updated while VM is up, you should use the Unicenter VM:Account 1B0 (COLLECT) minidisk, usually accessed as B.

Specify a read-only link to this minidisk in the AUTOLOG1 PROFILE EXEC. This link *must* be read-only because a read/write link causes the directory to be rewritten at access time.

### **[ SHUTDOWN ]**

terminates the VM system if the date and time are determined to be incorrect. The AUTOLOG1 userid requires CP privilege class A authorization for this option.

### **[ OPERATOR *userid* ]**

is the VM system operator. This userid receives messages if VMCLOCK finds problems, such as a startup using yesterday's date. If this user is not available for messages, userid OP receives the messages. If you omit this option, VMCLOCK sends messages to userid OPERATOR.

### **[ TIME *hhmm* ]**

specifies the allowance time. If it has been more than *hh* hours, *mm* minutes since the minidisk was last updated, the operator is told to verify the IPL date. The maximum for this option is 99 hours and 99 minutes. The default is 12 hours, 0 minutes.

If the difference between the time of the last minidisk update and the current VM system date/time is greater than the allowance specified with the TIME option, the operator receives messages indicating this fact.

After issuing these messages, VMCLOCK remains in a WAIT state until the operator enters a reply.

- ▶ If the operator enters **sm autolog ok**, VMCLOCK passes control back to the AUTOLOG1 PROFILE EXEC with return code zero.
- ▶ If the operator enters **sm autolog1 reject**, VMCLOCK exits with a nonzero return code.



## PERIODTE File Compression Utility (VMJCMP)

VMJCMP compresses a closed accounting period's PERIODTE file based on user-specified fields, such as userid, and record-specific data, such as device type. Compression is the process of combining individual accounting records to reduce space requirements at the expense of individual record detail.

Compression criteria (fields) are specified in a control file as described in *VMJCMP Control File* on page 193. The output from VMJCMP is written to a compressed file or appended to a trend file. If you append the output to a trend file, issue the REFRESH command after running VMJCMP to include the updated trend file in query processing.

You can run VMJCMP as a CMS command or from an EXEC.

VMJCMP uses Unicenter VM:Sort to sort the input file. If Unicenter VM:Sort is unavailable, VMJCMP uses a front-end EXEC to sort the input file with CMS SORT before compressing the records. To use a sort package other than Unicenter VM:Sort, change the reference of VMSLIB to the name of the sort package in the VMJCMP EXEC.

You can use the VMJCMPX2 user exit to examine, modify, delete, or insert records after sorting and before compression. An explanation of the VMJCMPX2 user exit begins on page 190.

|        |                                                                                                                                                                                                                                    |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJCMP | $\left\{ \begin{array}{l} \text{infilename infiletype [ infilemode ]} \\ \text{TAPE volserlist [ DSN datasetname ]} \end{array} \right\} \left[ ( [ \text{EDIT} ] [ \text{ctlfilename [ ctlfiletype [ ctlfilemode ] ] } ] \right]$ |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***infilename infiletype [ infilemode ]***

specifies the closed accounting period file. The default filemode is A.

### ***TAPE volserlist [ DSN datasetname ]***

specifies that the closed accounting period file is to be read from the standard label tapes whose volsers are identified by *volserlist*. Specify more than one volser only if the input file spans more than one tape.

DSN *datasetname* identifies the data set that contains the closed accounting period file. If you are using BrightStor VM:Tape and the volumes are owned by Unicenter VM:Account, you must specify a data set name.

If you are using DMSTVI, it allocates drives and requests tape mounts for you. Otherwise, you must attach your input file's tape drive at virtual address 181 and attach your output file's tape drive at virtual address 182. Refer to *Using Tapes* on page 102 for more information.

### **[ EDIT ]**

specifies that you want to verify the control file. No output is produced. If specified, EDIT must be the first option on the command line.

If you do not specify a control file, the default (VMJCMP CONTROL A) is verified.

**[ *ctlfilename* [ *ctlfiletype* [ *ctlfilemode* ] ] ]**

specifies the filename, filetype, and filemode of the control file to use. The default is VMJCMP CONTROL A.

## Processing

1. Choose which fields you want to keep in the compressed records from among the following fields, and specify them in COMPRESS control statements:

|          |         |         |        |
|----------|---------|---------|--------|
| ACCOUNT  | DATE    | PROJECT | USERID |
| CUSTOMER | PACKAGE | SHIFT   |        |

2. VMJCMP creates a separate record for all unique combinations of values for the selected fields plus key fields that vary by record type. Combining records means summing certain fields and discarding others. Discarded fields are replaced by a single asterisk (character fields) or binary 0 (numeric fields) on the compressed records.

For example, if you specify USERID and ACCOUNT, all records with the same userid and account number plus the applicable key fields are combined into a single record. Individual customer, project, package, date, and shift information is replaced by an asterisk.

3. VMJCMP sorts the records before compression, in ascending order, by the fields you specified plus the accounting period begin date, unless it was already specified. The accounting period begin date allows VMJCMP to determine and store begin and end dates in compressed records that accurately reflect the range of dates of the records making up the compressed record.

The order in which the compress fields are specified in the control file determines the sort order. For example, if you specify userid and account number as the fields you want to keep in the compressed records, the records in the output file are sorted first by userid and then by account number.

4. VMJCMP compresses the records. This consists of combining all records with similar fields specified in the control file along with the key fields for the record. For example, if you choose userid and account number as your compression fields, a separate minidisk (A4) record will be created for each unique userid, account number, and DASD device type combination.

## Restrictions

- ▶ VMJCMP produces additional records to avoid overflowing a numeric field.
- ▶ VMJCMP treats fields as key fields because:
  - They are considered to represent qualitatively significant information that should not be lost through compression. For example, device type in minidisk records or the transaction code in a RSCS record.
  - They represent units or items that should only be combined with other like units or items. For example, you cannot combine the storage represented by a

10-cylinder minidisk owned for five days with a 20-cylinder minidisk owned for one day without some form of normalization or conversion to standard units.

VMJCMP will not combine records with differences in key fields. (Each datatype's key fields are shown in Table 10 on page 187.) For example, VMJCMP would not combine two A4 accounting records having the following keys because their key fields are not identical:

|             |                    |          |           |
|-------------|--------------------|----------|-----------|
| <b>3380</b> | <b>X'04040000'</b> | <b>6</b> | <b>23</b> |
| <b>3390</b> | <b>X'04820000'</b> | <b>6</b> | <b>16</b> |

If you want to combine records with different key fields, use the compression exit (VMJCMPX2) to alter the key fields to a standard value or to normalize items or units. An explanation of the VMJCMPX2 user exit begins on page 190.

Table 10. Key Fields When Compressing Records

| Datatype                               | Key Fields                                                                                                  |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 01 (Session)                           | Billing and data flags                                                                                      |
| 02 (Dedicated Device)                  | Device class code<br>Device type code<br>Device model code<br>Device feature code<br>Billing and data flags |
| 03 (TDISK)                             | Device class code<br>Device type code<br>Device model code<br>Device feature code<br>Billing and data flags |
| 05 (Successful Link)                   | Billing and data flags                                                                                      |
| 07 (VSCS)                              | Billing and data flags                                                                                      |
| A3 (Volumes)                           | Volume name<br>Billing and data flags                                                                       |
| A4 (MDISK)                             | Device type<br>Class/type/model/feature code<br>Number of cylinders/blocks<br>Number of days owned          |
| A5 (Miscellaneous Charges and Credits) | Miscellaneous charge ID code<br>Charge per unit                                                             |
| A6 (BrightStor VM:Tape Mount)          | Billing and data flags                                                                                      |

(continued)

Table 10. Key Fields When Compressing Records (continued)

| Datatype                          | Key Fields                                                                                                                            |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| A7 (RSCS)                         | Link-back code<br>Origin device type<br>Origin location ID<br>Local destination ID<br>Destination location userid<br>Transaction code |
| A9 (BrightStor VM:Archiver Usage) | Archive flag<br>Device information<br>Billing and data flags                                                                          |
| AA (SQL/DS Usage)                 | SQL/DS database name<br>Billing and data flags                                                                                        |
| AB (Unicenter VM:Spool Usage)     | Record type code<br>Spool file class<br>Spool file distribution code<br>Billing and data flags                                        |
| AC (TSAF)                         | TSAF resource name<br>Billing and data flags                                                                                          |
| AD (SQL/DS Storage)               | SQL/DS database name<br>Storage pool number<br>Record type code<br>DBSPACE pages used<br>Days owned<br>Billing and data flags         |
| AE (SFS Usage)                    | SFS current filepool name<br>Billing and data flags                                                                                   |
| AF (SFS Storage)                  | Record type code<br>SFS filepool name<br>Current blocks committed<br>Number of days owned<br>Billing and data flags                   |
| AG (CA-VM:Webgateway Usage)       | Web server name<br>Web server TCP port number                                                                                         |

Table 11 lists the fields that VMJCMP does not save in a compressed record.

Table 11. Fields VMJCMP Does Not Save in a Compressed Record

| Datatype                               | Fields Not Saved                                                                                          |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 05 (Successful Link)                   | Terminal address from which link was issued<br>Address of the minidisk that was linked                    |
| 0C (Guest Virtual I/O)                 | Kilobytes via vNIC<br>Kilobytes via CTCA<br>Kilobytes via IUCV                                            |
| A4 (MDISK)                             | Volser of the real disk<br>Minidisk relocation factor<br>Minidisk virtual address<br>Minidisk access mode |
| A5 (Miscellaneous Charges and Credits) | Userid that applied charges/credits<br>Miscellaneous transaction ID<br>Date charge/credit was created     |
| A6 (BrightStor VM:Tape Mount)          | Volser mounted<br>Label type of tape mounted<br>Tape mount type, read or write                            |
| A7 (RSCS)                              | Original spool file ID<br>Spool file class                                                                |
| A9 (BrightStor VM:Archiver Usage)      | Record type flag                                                                                          |
| AA (SQL/DS Usage)                      | Database machine ID<br>SQL/DS user identifier<br>Database access routine                                  |
| AB (Unicenter VM:Spool Usage)          | Spool link block count<br>Logical record length<br>Origin userid<br>Filename<br>Filetype                  |
| AF (SFS Storage)                       | Unicenter VM:Account worker machine<br>userid                                                             |
| AG (CA-VM:Webgateway Usage)            | IP address of web server and client<br>TCP port of client<br>VIWLOG counter and processing flags          |

## Compression User Exit (VMJCMPX2)

VMJCMPX2 is a user exit to VMJCMP that gives you greater control over record compression. VMJCMPX2 can examine, modify, insert, or delete records. It can also terminate VMJCMP execution prematurely.

### Modifying Records

The VMJCMP utility calls the VMJCMPX2 user exit for each record to be compressed after sorting and before compression. Take care in modifying records. For example, if an exit modifies a compression field so that its value is different from those on adjacent records, the efficiency of the compression may be reduced. Also, as with all exits that allow you to modify record contents, the exit is responsible for the accuracy of the changes.

### Record Sort Order

The order in which the records are sorted before compression may affect how you code the exit. Sort order is determined by the order in which fields are specified on COMPRESS statements in the VMJCMP control file. In addition to the specified fields, the record's begin date is the last sort field, unless it was specified earlier.

### Languages for Coding

You can code the exit in any language that supports OS standard linkage conventions. This includes most compiled languages available under CMS. The overhead that accompanies the repeated entering and exiting of most high level language environments may make their use impractical in some instances. Users contemplating the use of languages other than assembler are advised to run tests with skeletal exits before investing in significant development efforts.

### User Exit Format Restrictions

The VMJCMPX2 user exit needs to be on a minidisk accessed by the userid running the utility. It can be provided in either TEXT or MODULE format. The choice between TEXT and MODULE formats is governed by the following restrictions:

- ▶ TEXT programs must not contain external references. This will usually be possible only with assembly language programs. If unsure, check the front of external symbol dictionary at the start of the program. There should either be no symbols of type ER or any ER symbols present should be physically part of the TEXT program. If this requirement cannot be met, provide the exit in module form.
- ▶ MODULE programs must be generated to load in either the CMS transient area or above the high address of VMJCMP. This is somewhere below 30,000; however, to allow room for future growth 40,000 or higher is recommended. For example:

```
load vmjcpx2 (origin 40000  
genmod vmjcpx2
```

Failure to provide a proper ORIGIN parameter may result in VMJCMP being overlaid when the exit is loaded and a probable program check.

When both TEXT and MODULE versions of VMJCMPX2 are found in the search path, the MODULE version is used.

**VMJCMP/VMJCMPX2 Interface**

The interface between VMJCMP and VMJCMPX2 follows standard OS linkage conventions. Registers at entry are:

- ▶ R1--four-word parameter list:
  - WORD 1    Address of the record about to be compressed or the address of a dummy record after all other records have been processed.
  - WORD 2    Address of a record to be inserted; ignored unless a code of 12 is returned to VMJCMP.
  - WORD 3    Address of a 512-byte double word aligned area available to the exit for any purpose; VMJCMP initially sets it to binary zeros and does not alter it thereafter. Typically, this area is used as memory that persists between calls or to contain pointers to dynamically acquired memory.
  - WORD 4    Address of a full word return code to be set by the exit; the high order bit of word 4 is set to 1 to indicate the end of the parameter list, per standard linkage conventions.
  
- ▶ R13--standard OS 72-byte save area. Use of the save area is optional. The exit does not need to save and restore the caller's registers. However, it must preserve the value of R14 in some form because return must be made to that address.
  
- ▶ R14--return address in VMJCMP.
  
- ▶ R15--entry point of exit VMJCMPX2.

In other high level languages, the interface is equivalent to one of the following:

| Language | Example                                                                  |
|----------|--------------------------------------------------------------------------|
| C        | <code>vmjcmpx2(&amp;cmp_rec,&amp;ins_rec,&amp;user_area,&amp;rc);</code> |
| COBOL    | <code>CALL 'VMJCMPX2' USING CMP-REC, INS-REC, USER-AREA, RC.</code>      |
| FORTRAN  | <code>CALL VMJCMPX2(CMPREC,INSREC,USERA,RC)</code>                       |
| PL/I     | <code>CALL VMJCMPX2(CMP_REC,INS_REC,USER_AREA,RC);</code>                |

## Return Codes

The exit must set an appropriate return code and return to the address passed in R14. The return code determines subsequent VMJCMP actions. The return code must be one of the following:

| Return Code         | Meaning                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0                   | Accepts this record for processing. Any changes made to the image in the record buffer are propagated to the compressed file and may affect the compression.                                                                                                                                                                                                                                  |
| 4                   | Deletes this record. VMJCMP ignores the record.                                                                                                                                                                                                                                                                                                                                               |
| 8                   | Does not return to this exit. VMJCMP issues message VMJCMP212I and processes the remaining input records without making additional calls to the exit.                                                                                                                                                                                                                                         |
| 12                  | Inserts a record. Instructs VMJCMP to insert a record in front of the current record. Before returning to VMJCMP, the address of the record to be inserted must be stored in the second parameter. After the inserted record has been processed, VMJCMP returns to the exit with the same record with which it previously called. This continues until the exit returns a code other than 12. |
| 16                  | Terminates VMJCMP. VMJCMP issues message VMJCMP218I and returns a code of 16 to indicate that the compression was unsuccessful.                                                                                                                                                                                                                                                               |
| Other number values | Any value other than 4, 8, 12, or 16 causes VMJCMP to issue message VMJCMP219E and terminate with a code of 20.                                                                                                                                                                                                                                                                               |

## End-of-File Processing

After all records have been processed, VMJCMP makes a final call to the VMJCMPX2 user exit with a dummy record. The dummy record contains a string of 12 hexadecimal FFs in columns 16-27 (record end date and time, with field names of ARECEDAT and ARECETIM, respectively) and hexadecimal FFFF in columns 79-80 (record type with a field name of ARECCODE). The contents of the rest of the dummy record are not constant. Use this final call to perform termination housekeeping or to insert records at the end of a file.

To insert records at the end of a compressed file, store the address of the record to be inserted in the second parameter and issue a return code of 12, exactly as if a normal, nondummy record had been passed. Control returns again with the same dummy record. You can insert another record and continue inserting as many records as you want.

When you have finished inserting records, issue a return code of 0, 4, or 8. These all have the same effect after a dummy record is passed: control does not return and compression ends normally. Regardless of the return code, the dummy record is never placed in the output file.



## VMJCMP Control File

The VMJCMP control file defines:

- ▶ The fields to preserve in the compressed records
- ▶ Output destinations and filenames, filetypes, and filemodes
- ▶ The number of months of compressed data to keep in a trend file

The VMJCMP control file is composed of fixed-length, 80-byte records. VMJCMP examines only columns 1 through 72.

## COMPRESS Record

This record specifies compression fields. These are the fields you will be saving in the output file.

If you are sending the compressed output records to the trend file specified on the TRNDFILE record in the VMACCT CONFIG file, Unicenter VM:Account checks that the fields specified on the COMPRESS record are the same as those in the trend file. If they are not, Unicenter VM:Account issues an error message and terminates.

You can have more than one COMPRESS record.

|          |                                                                                              |
|----------|----------------------------------------------------------------------------------------------|
| COMPRESS | <i>compressfield<sub>1</sub> [ compressfield<sub>2</sub> ... compressfield<sub>n</sub> ]</i> |
|----------|----------------------------------------------------------------------------------------------|

### ***compressfield<sub>1</sub> [ compressfield<sub>2</sub> ... compressfield<sub>n</sub> ]***

specifies a compression field; one you want to keep in the output records. The output records are also sorted by the compression fields. You can specify one or more of the following fields on a record:

|          |         |         |        |
|----------|---------|---------|--------|
| ACCOUNT  | DATE    | PROJECT | USERID |
| CUSTOMER | PACKAGE | SHIFT   |        |

Your choice of compression fields is critical. Your decisions determine which fields will be kept in the output records. For example:

- ▶ If you specify CUSTOMER and ACCOUNT on the COMPRESS record, userids are not kept in the output records.
- ▶ If you are not compressing records by userid, the distribution code in Unicenter VM:Spool records is not kept in the output records.
- ▶ If you are compressing minidisk records and DATE is not a compression field, all of the records for a userid are combined into a single record.

## OUTFILE Record

This record specifies the destination of compressed records.

|         |                                                                                                                                                       |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| OUTFILE | $\left\{ \begin{array}{l} \text{filename [ filetype [ filemode ] ]} \\ \text{TAPE [ volserlist [ DSN datasetname ]   SCRATCH ]} \end{array} \right\}$ |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------|

### **filename [ filetype [ filemode ] ]**

specifies an output file for the compressed records. The default filetype is OUTFILE; the default filemode is A. The filenames, filetypes, and filemodes specified on the TRNDFILE and OUTFILE records must be different.

### **TAPE [ volserlist [ DSN datasetname ] | SCRATCH ]**

specifies that the output file is written to a standard label tape.

You can use *volserlist* to specify the volsers of one or more tapes on which to write the output file and DSN *datasetname* to specify the data set name to use for the output file. The data set name can be up to 44 characters long. If you do not specify a data set name, Unicenter VM:Account uses COMPRESS.*mm-dd-yy*, where *mm-dd-yy* is the date you ran VMJCMP.

SCRATCH specifies that the output file can be written to any SCRATCH volume. If you specify SCRATCH as the last element of a volser list, and you did not specify enough volsers to write the output file, Unicenter VM:Account uses scratch volumes to complete the job.

If you use DMSTVI, it allocates drives and requests mounts for you; otherwise, you must allocate a tape drive at virtual address 182. Refer to *Using Tapes* on page 102 for more information.

## TRNDFILE Record

This record specifies that the compressed records are written to a trend file.

|          |                                                         |
|----------|---------------------------------------------------------|
| TRNDFILE | <i>filename filetype filemode [ ( number [ MO ] ) ]</i> |
|----------|---------------------------------------------------------|

### **filename filetype filemode**

specifies the filename, filetype, and filemode of the trend file. The output from this run of the VMJCMP utility is appended to this file.

### **[ number [ MO ] ]**

specifies the number of months of data to keep in the trend file; data older than the specified number of months is deleted during processing. The default length of time data is kept is three months. You can change the length of time to keep data in the trend file by editing this record before running VMJCMP.

### Example

This control file compresses the input records by customer, project, userid, and date. VMJCMP creates an output file named ACCTDATA FEB02. VMJCMP also writes this data to a trend file named PERIODTE 2002QTR1 that contains up to three months of data.

```
COMPRESS CUSTOMER PROJECT USERID DATE  
OUTFILE ACCTDATA FEB02 U  
TRNDFILE PERIODTE 2002QTR1 B
```

## Capacity Planning Utility (VMJCPR)

The Capacity Planning utility produces a one-page listing of CPU utilization for a single day.

Because Unicenter VM:Account uses CP accounting records to calculate the results on this report, the results may differ from similar information provided by Unicenter VM:Operator. The two components use different methods to gather information, which sometimes causes apparent inconsistencies. This is especially true of the MAX USERS LOGGED ON field.

Always run VMJRAW and access the Unicenter VM:Account data collection minidisk before running VMJCPR. The filemode of the Unicenter VM:Account minidisk is defined on the COLLECT record in the VMACCT CONFIG file.

|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJCPR | <i>infilename</i> <i>filetype</i> [ <i>infilemode</i> ] [ ( <i>options</i> ) ]<br><br><b>Options:</b><br>[ DISK   <u>PRINT</u> ]<br>[ RSCS <i>userid</i> ]<br>[ EXCLUDE ( <i>userid</i> <sub>1</sub> [ <i>userid</i> <sub>2</sub> ... <i>userid</i> <sub>n</sub> ]<br>[ EXCLUDE FILE <i>filename</i> <sub>1</sub> <i>filetype</i> <sub>1</sub> [ <i>filemode</i> <sub>1</sub> ] ]<br>[ SUMMARY <i>filename</i> <sub>2</sub> <i>filetype</i> <sub>2</sub> [ <i>filemode</i> <sub>2</sub> ] ] |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***infilename* *filetype* [ *infilemode* ]**

is the filename, filetype, and filemode of the raw data input file. The fileid is in the format RAWDATA \$\$*yymmdd*. This file could also be a summary file generated by specifying the SUMMARY option during a previous VMJCPR execution. The default filemode is \*, which means that all accessed minidisks are searched for the input file.

### **[ DISK | PRINT ]**

specifies where the utility's output is sent. DISK creates a CMS file named VMJCPR LISTING A for the output. PRINT sends the output to the virtual printer.

### **[ RSCS *userid* ]**

specifies that the output should include information about RSCS records. The variable *userid* is the userid that generates RSCS records. This option is ignored if a summary file is used as input. If you do not use RSCS, do not specify this option.

### **[ EXCLUDE ( *userid*<sub>1</sub> [ *userid*<sub>2</sub> ... *userid*<sub>n</sub> ] [ EXCLUDE FILE *filename*<sub>1</sub> *filetype*<sub>1</sub> [ *filemode*<sub>1</sub> ] ]**

specifies userids to exclude from the High Resource Consumers portion of the capacity planning report.

- The first format lists the userids to exclude from the High Resource Consumers portion of the report.

- The second format specifies the fileid of a fixed-format, 80-character file containing the userids to exclude from the High Resource Consumers portion of the report. The default filemode is \*, which means that VMJCPR searches all accessed minidisks for the file.

Single records can contain multiple userids. For example, the record RAVEN HEMMY PLATO specifies excluding information about the userids RAVEN, HEMMY, and PLATO from the report.

The EXCLUDE or EXCLUDE FILE option is not valid if a summary file is used as input.

### [ SUMMARY filename<sub>2</sub> filetype<sub>2</sub> [ filemode<sub>2</sub> ] ]

causes a record containing information from the VMJCPR report to be written to a summary file. If a summary file already exists, the summary record is added to the end of the summary file. The default filemode is A. A summary file can be used as input to the VMJCPR utility in the future, eliminating the need to save RAWDATA files.

## Sample Report

|                                     |               |              |                           |              |                          |                        |                          |              |                           |              |
|-------------------------------------|---------------|--------------|---------------------------|--------------|--------------------------|------------------------|--------------------------|--------------|---------------------------|--------------|
| FILE: DATA \$020116                 |               |              | COMPUTER ASSOCIATES, INC. |              |                          | REPORT DATE:01/18/02   |                          |              |                           |              |
| FILE DATE: 01/16/02                 |               |              |                           |              |                          |                        |                          |              |                           |              |
| VM:ACCOUNT CAPACITY PLANNING REPORT |               |              |                           |              |                          |                        |                          |              |                           |              |
| <u>CPU STATISTICS</u>               |               |              | <u>I/O STATISTICS</u>     |              |                          | <u>USER STATISTICS</u> |                          |              |                           |              |
| VIRTUAL CPU (SECONDS)               | 7723.76       |              | PAGE READS TOTAL          | 104966       |                          | TOTAL CONNECT TIME     | 1603:04                  |              |                           |              |
| OVERHEAD CPU (SECONDS)              | 4957.93       |              | PAGE WRITES TOTAL         | 12759        |                          | MAX USERS LOGGED ON    | 94 AT 15:07              |              |                           |              |
| VIRTUAL CPU/TOTAL CPU               | 60.9%         |              | PUNCH I/O TOTAL           | 54609        |                          | VALID LOGONS/AUTOLOGS  | 241                      |              |                           |              |
| VIRTUAL CPU/MINUTE                  | 5.36          |              | PRINT I/O TOTAL           | 64694        |                          | NUMBER UNIQUE USERIDS  | 137                      |              |                           |              |
| OVERHEAD CPU/MINUTE                 | 3.44          |              | READER I/O TOTAL          | 69276        |                          |                        |                          |              |                           |              |
| TOTAL CPU TIME                      | 03:31:22      |              | VIRTUAL SIO TOTAL         | 1400939      |                          |                        |                          |              |                           |              |
| SYSTEM UP TIME                      | 24:00:00      |              | RSCS FILES TOTAL          | 36           |                          |                        |                          |              |                           |              |
|                                     |               |              | RSCS RECRDS TOTAL         | 52828        |                          | INPUT REQUEST UNITS    | 0                        |              |                           |              |
| <u>DEVICE UTILIZATION PEAKS</u>     |               |              |                           |              |                          |                        |                          |              |                           |              |
| <u>T-DISK</u>                       |               |              | <u>DEDICATED TAPES</u>    |              | <u>DEDICATED DISKS</u>   |                        | <u>DEDICATED MISC</u>    |              | <u>MINIDISK LINKS</u>     |              |
| <u>DEVICE CYL/BLK TIME</u>          |               |              | <u>DEVICE COUNT TIME</u>  |              | <u>DEVICE COUNT TIME</u> |                        | <u>DEVICE COUNT TIME</u> |              | <u>USERID VADDR COUNT</u> |              |
| 3380                                | 26            | 18:01        | 3420-8                    | 2 12:30      | 3278-2                   | 30 00:00               |                          |              |                           |              |
|                                     |               |              |                           |              |                          |                        |                          |              |                           |              |
| <u>RESOURCE</u>                     | <u>USERID</u> | <u>COUNT</u> | <u>USERID</u>             | <u>COUNT</u> | <u>USERID</u>            | <u>COUNT</u>           | <u>USERID</u>            | <u>COUNT</u> | <u>USERID</u>             | <u>COUNT</u> |
| VIRTUAL CPU                         | SQLDBA        | 1666.51      | USER2                     | 1142.97      | USER1                    | 797.66                 | USER5                    | 472.93       | USER1                     | 451.82       |
| OVERHEAD CPU                        | USER4         | 901.36       | SQLDBA                    | 612.45       | USER2                    | 377.39                 | USER4                    | 338.53       | VMTAPE                    | 300.01       |
| TOTAL CPU                           | SQLDBA        | 2278.95      | USER2                     | 1520.36      | USER3                    | 1139.92                | USER6                    | 836.16       | USER4                     | 522.83       |
| VIRTUAL SIO                         | USER6         | 522373       | SQLDBA                    | 278075       | RSCSV1                   | 90191                  | VMSECURE                 | 57970        | PVM                       | 47748        |
| PRINT I/O                           | USER2         | 22315        | USER2                     | 8271         | USER4                    | 4508                   | USER9                    | 4218         | USER3                     | 3890         |
| READER I/O                          | USER1         | 43956        | USER7                     | 8429         | USER5                    | 6802                   | USER1                    | 2471         | USER10                    | 2390         |
| PUNCH I/O                           | RSCS          | 26894        | USER1                     | 22853        | USER6                    | 1778                   | USER3                    | 975          | USER99                    | 811          |
| CONNECT TIME                        | VTAM          | 24:00:00     | VMACCT                    | 24:00:00     | VMARCH                   | 24:00:00               | VMTAPE                   | 24:00:00     | USER20                    | 24:00:00     |
| PAGE READS                          | OPERATOR      | 23268        | VMTAPE                    | 23200        | USER7                    | 12458                  | VMSECURE                 | 9818         | USER4                     | 3533         |
| PAGE WRITES                         | USER4         | 858          | USER32                    | 739          | USER3                    | 662                    | USER20                   | 649          | VMARCH                    | 505          |

## File Pool Allocation Table Conversion Utility (VMJCVTBL)

The File Pool Allocation Table Conversion utility converts the SFS file pool allocation tables that Unicenter VM:Account uses. Beginning with Unicenter VM:Account Release 1.2, the allocation tables have a different format.

The utility does not convert the VMJMDISK ALLOCTBL file.

To determine whether an allocation table has been converted, display the first record of its file. (You could use XEDIT to view the file's contents.) If the allocation table has already been converted, the first record in the file contains the character string *VMJ 1.2*.

Attempting to convert an allocation table that has already been converted leaves the table unchanged. For example, if allocation table VMSYSU is already in the new format and you enter the command VMJCVTBL NEW VMSYSU, the utility does not change the allocation table.

|          |                                                                                          |
|----------|------------------------------------------------------------------------------------------|
| VMJCVTBL | $\left\{ \begin{array}{c} \text{NEW} \\ \text{OLD} \end{array} \right\}$ <i>filename</i> |
|----------|------------------------------------------------------------------------------------------|

### NEW | OLD

controls the direction of the conversion.

| Parameter | Effect                                                                                                            |
|-----------|-------------------------------------------------------------------------------------------------------------------|
| NEW       | Converts an allocation table from its old format to the format used by Unicenter VM:Account Release 1.2 and later |
| OLD       | Converts an allocation table back to its old (pre-Release 1.6 0212) format                                        |

---

**Note:** You should not have to use the NEW parameter because the allocation tables were converted to their new format when you upgraded to Unicenter VM:Account Release 1.2.

---

### *filename*

is the filename of the allocation table you are converting. For example, if you want to convert the VMSYSU allocation table (which is stored in the VMSYSU ALLOCTBL file) to its new format, enter VMJCVTBL NEW VMSYSU.

## Disk Volume Accounting Utility (VMJDVA)

The VMJDVA utility reads the input file (VMJDVA Inventory Control file) and creates disk volume accounting records for mountable disks (datatype A3).

VMJDVA maintains a file, DISK ACCTRCD, on the A-disk of the userid that executed it to indicate the last time disk volume accounting was done. Do not erase or modify this file.

Specify the userid running VMJDVA on the SPECIAL DISKVOLS record in the VMACCT CONFIG file. (The SPECIAL configuration file record is explained on page 176.)

The rates for mountable disks are defined in the VOLUMES COSTABLE file. (See page 334 for the layout of this file.)

|        |                                                                                                                                                                                                                                |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJDVA | <pre>[ infilename [ infiletype [ infilemode ] ] ] [ ( options )  <b>Options:</b> [ VMACCT <i>userid</i> ] [ FROM <i>yyddd</i> ] [ TO <i>yyddd</i> ] [ TO TODAY ] [ DAYS <i>number</i> ] [ CLASS <i>class</i> ] [ FORCE ]</pre> |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### [ ***infilename*** [ ***infiletype*** [ ***infilemode*** ] ] ]

is the filename, filetype, and filemode of the input file that contains information about the site's mountable disk packs. The input file must be a fixed-length, 80-byte file. This file is created and maintained with XEDIT. The default is DISK VOLUMES A.

### [ ***VMACCT userid*** ]

specifies the userid of the Unicenter VM:Account service virtual machine. The Unicenter VM:Account service virtual machine receives and processes the accounting records produced by the Disk Volume Accounting utility. The default is VMACCT.

### [ ***FROM yyddd*** ]

specifies that VMJDVA accounts for mountable disk storage from *yyddd* through midnight of the day before you run the utility.

Unicenter VM:Account calculates the shortest period between the start date or disk creation date, and the end date or disk expiration date. This becomes the number of volume-days for which a user is charged.

If you do not specify DAYS or FROM, the accounting records will contain information from the creation date in the input file through yesterday's date or the date specified with the TO option.

**[ TO yyddd ]**

specifies that VMJDVA accounts for disks from the previous run or the FROM date through midnight on *yyddd*. The default is yesterday's date.

**[ TO TODAY ]**

specifies that VMJDVA accounts for mountable disk storage from the previous run or the FROM date through the current date.

**[ DAYS *number* ]**

specifies the number of days VMJDVA accounts for mountable disk packs.

If you do not specify DAYS or FROM, the accounting records will contain information from the creation date in the input file through yesterday's date or the date specified with the TO option.

**[ CLASS *class* ]**

specifies the reader class of the accounting records sent to Unicenter VM:Account. CLASS must be the same as that specified on the COLLECT record in the VMACCT CONFIG file. The default is class A.

**[ FORCE ]**

lets you force the system to double charge costs using the FROM/TO option by creating accounting records for days specified in a previous VMJDVA execution. Without FORCE, double charging causes a system message and a return to CMS.

Do not use the FROM, TO, and DAYS options at the same time. You may, however, use any two of them together.

## VMJDVA Inventory Control File

The VMJDVA inventory control file contains information about the mountable disk packs at your site. It is required for running the VMJDVA utility.

The default VMJDVA inventory control filename is DISK VOLUMES A. The file is composed of fixed-length, 80-byte records and it is created and maintained by XEDIT.

Table 12. VMJDVA Inventory Control File Structure

| Column | Length | Field      | Meaning                                                        |
|--------|--------|------------|----------------------------------------------------------------|
| 1      | 8      | Userid     | VM userid to charge for the disk                               |
| 9      | 1      | --         | Not used                                                       |
| 10     | 8      | Account    | Account number to charge for the disk                          |
| 18     | 1      | --         | Not used                                                       |
| 19     | 5      | Begin date | Julian date to start accounting for this disk ( <i>yyddd</i> ) |
| 24     | 1      | --         | Not used                                                       |

(continued)

† The volser is site-defined and does not have to be specified.



Table 12. VMJDVA Inventory Control File Structure (continued)

| Column | Length | Field    | Meaning                                             |
|--------|--------|----------|-----------------------------------------------------|
| 25     | 5      | End date | Julian date to end accounting for this disk (yyddd) |
| 30     | 1      | --       | Not used                                            |
| 31     | 6      | Volser   | Volser of disk <sup>†</sup>                         |
| 37     | 1      | --       | Not used                                            |
| 38     | 8      | Disktype | Device type                                         |
| 46     | 1      | --       | Not used                                            |
| 47     | 24     | Project  | Project name                                        |

<sup>†</sup> The volser is site-defined and does not have to be specified.

## Example

The VMJDVA file record shown below does the following:

- ▶ Charges userid MORGAN.
- ▶ Specifies account number 12345678.
- ▶ Starts accounting on January 1, 2002.
- ▶ Ends accounting on January 31, 2002.
- ▶ Specifies VMJDAT as the volser of the mountable disk.
- ▶ Specifies 3380 as the device type.
- ▶ Specifies ACCOUNTING as the project.

|                                                                      |
|----------------------------------------------------------------------|
| ...+...1...+...2...+...3...+...4...+...5...+...6                     |
| MORGAN    12345678   02001   02031   VMJDAT   3380        ACCOUNTING |

## Invalid File Report Utility (VMJIFR)

The VMJIFR utility generates a report containing information about invalid reader spool files.

You can use the DISK option to generate raw data files from the invalid reader spool files and resubmit the new files to Unicenter VM:Account for processing. The userid running VMJIFR needs a link to the minidisk specified on the COLLECT record in the VMACCT CONFIG file. Also, the userid must be on the ACCTCRDS record in the VMACCT CONFIG file.

|        |                                                                                                                                                   |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJIFR | <i>infilename infilename infilename</i> $\left[ \begin{array}{l} ( [ \text{DISK} ] \\ [ \text{REPORT} ] \\ [ \text{DETAIL} ] \end{array} \right]$ |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|

### ***infilename infilename infilename***

specifies the filename, filetype, and filemode of the input file from Unicenter VM:Account. Unicenter VM:Account uses *yymmdd* INVFILES files to save records received from userids not authorized to send accounting records to Unicenter VM:Account. *yymmdd* is the date that Unicenter VM:Account received the invalid data. The default filemode is A.

If you specify ACCTCRDS *ddmmssp#* as an input file, you can produce a report on the information in the records in the ACCTCRDS file. (*dd* is the day, *mm* is the minute, and *sp#* is the spool file ID of a disk file.)

### **[ DISK ] [ REPORT ] [ DETAIL ]**

specifies the type of output to create.

| Option | Produces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DISK   | CMS file that contains accounting data from the <i>yymmdd</i> INVFILES and names it INVDATA <i>filetype</i> . <i>filetype</i> is the spool file number of the invalid records file preceded by leading zeros. A single <i>yymmdd</i> INVFILES file may contain more than one spool file. If there is more than one spool file in the INVFILES file, VMJIFR creates a separate INVDATA file for each spool file number. After running VMJIFR, punch INVDATA files to the Unicenter VM:Account service virtual machine for processing |
| REPORT | Printed report containing information about each spool file in the INVFILES file                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DETAIL | Printed report containing information about each spool file in the INVFILES file and details about the accounting records in the spool files                                                                                                                                                                                                                                                                                                                                                                                        |

## Example

The following is an excerpt from an invalid file report:

| VM:ACCOUNT INVALID FILE REPORT |             |             |               |                |                |             |                    |
|--------------------------------|-------------|-------------|---------------|----------------|----------------|-------------|--------------------|
| <u>SOURCE</u>                  | <u>FILE</u> | <u>FILE</u> | <u>SPOOL</u>  | <u>FILE</u>    | <u>FILE</u>    | <u>FILE</u> | <u>FILE REJECT</u> |
| <u>USERID</u>                  | <u>DATE</u> | <u>TIME</u> | <u>FILE</u>   | <u>SIZE</u>    | <u>NAME</u>    | <u>TYPE</u> | <u>REASON</u>      |
| STUART                         | 1/31/02     | 16:23:56    | 2444          | 0051           | RAWDATA        | \$\$020131  | UNAUTHORIZED       |
| INVALID FILES DETAIL REPORT    |             |             |               |                |                |             |                    |
| <u>USERID</u>                  | <u>DATE</u> | <u>TIME</u> | <u>RECORD</u> | <u>PROJECT</u> | <u>PACKAGE</u> |             |                    |
| HOOD                           | 01/31/02    | 00:00:28    | 01            | NONE           | NONE           |             |                    |
| APHILL                         | 01/31/02    | 00:07:48    | 02            | NONE           | NONE           |             |                    |
| DHHILL                         | 01/31/02    | 00:08:30    | 02            | NONE           | NONE           |             |                    |
| JACKSON                        | 01/31/02    | 05:00:45    | 01            | NONE           | NONE           |             |                    |

## Software Package Accounting Utility (VMJPKG)

The Unicenter VM:Account Software Package Accounting utility (VMJPKG) is used to install the mechanism by which software usage is tracked and accounted for.

This mechanism gives the software the ability to notify Unicenter VM:Account when its execution begins and ends. This gives Unicenter VM:Account the ability to track and charge for software usage. You can package-account software in various formats including modules, text files, members of load libraries and text libraries, and software residing in a DCSS.

When you run this utility, keep the following restrictions in mind:

- ▶ Do not run the VMJPKG utility on the Unicenter VM:Account service virtual machine.
- ▶ VMJPKG must be run each time a package is modified and recompiled.
- ▶ The software to be package-accounted must be located on a read/write minidisk.
- ▶ When package accounting is installed for a module or text file, the output from the utility has a filetype of \$MODULE or \$TEXT. After saving the original module or text files, rename the package-accounted versions MODULE or TEXT.
- ▶ The VMJPKG utility adds approximately 430 bytes to a module. This code loads the VMJPKC MODULE, which should reside on the public S- or Y-disk. VMJPKC takes care of communications with the Unicenter VM:Account service virtual machine.
- ▶ A MODULE or TEXT file that is package-accounted with the VMJPKG utility, or the VMJPKTXT or VMJPKENT EXECs, is not reentrant and should not be loaded as a nucleus extension. (The VMJPKTXT and VMJPKENT EXECs are presented on pages 208 and 209, respectively.)
- ▶ If the userid of the Unicenter VM:Account service virtual machine is not VMACCT, run the VMJPKINS utility. Refer to *VMJPKG Installation Utility (VMJPKINS)* on page 210 for more information.

VMJPKG has both a line-mode and full-screen version.

## Line-Mode Version

The line-mode version of the VMJPKG utility enables you to install, change, or remove package accounting for a software package.

|        |                                                                                                                                                                                                                          |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJPKG | <i>function packagename packagetype [ ( options )</i><br><br><b>Options:</b><br>[ PKGID <i>pkgid</i> ]<br>[ TXTLIB <i>name</i> ]<br>[ NOTAVAIL( <i>run,msguser,msgop</i> ) ]<br>[ INVPKGID( <i>run,msguser,msgop</i> ) ] |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***function***

is the task to perform, as follows:

| <b>Keyword</b> | <b>Task</b>                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------|
| CHANGE         | Update the package accounting options for the specified software package                                              |
| INSTALL        | Add the package accounting options needed to monitor the use of the specified software package                        |
| LIST           | Produce a list of package-accounted LOADLIB members, including package name, package ID, and the installation options |
| REMOVE         | Delete the package accounting routines from the specified software package                                            |

### ***packagename***

is the name of the software package. You can specify up to eight characters.

### ***packagetype***

is the type of the software package, as follows:

| <b>Use this keyword</b> | <b>In this case</b>                                                                                                                              |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| MODULE                  | The package's filetype is MODULE                                                                                                                 |
| TEXT                    | The package's filetype is TEXT; If the package is a TXTLIB member, specify it with the TXTLIB option                                             |
| LOADMEM                 | The package is a member of a LOADLIB library; LOADMEM makes the VMJPKG utility search the OSRUN module to locate the LOADLIB library member name |

### **[ PKGID *pkgid* ]**

specifies the name Unicenter VM:Account uses to identify a software package. The package ID can be up to eight characters long. The default is *packagename*.

**[ TXTLIB *name* ]**

is the name of the TXTLIB that contains the member identified by *packagename* and *packagetype*. You can specify up to eight characters. If you specify both the filetype TEXT and the name of a TXTLIB, the VMJPKG utility searches for the TXTLIB member with the specified package name.

**[ NOTAVAIL( *run,msguser,msgop* ) ]**

defines the action to take if Unicenter VM:Account is not available when a user tries to start the package.

| Category       | Action  | What happens when Unicenter VM:Account is not available (and package accounting is not possible)                                                                                                             |
|----------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>run</i>     | RUN     | Package runs                                                                                                                                                                                                 |
|                | NORUN   | Package does not run; the program terminates with return code 990                                                                                                                                            |
|                | ABEND   | User abend occurs, causing the program to terminate with the message DMSABN148T SYSTEM ABEND 990 CALLED FROM <i>xaddress</i> , where <i>xaddress</i> is a hexadecimal address that changes with each release |
| <i>msguser</i> | MSG     | Message is sent to the user                                                                                                                                                                                  |
|                | NOMSG   | Message is not sent to the user                                                                                                                                                                              |
| <i>msgop</i>   | MSGOP   | Message is sent to the operator                                                                                                                                                                              |
|                | NOMSGOP | Message is not sent to the operator                                                                                                                                                                          |

**[ INVPKGID( *run,msguser,msgop* ) ]**

defines the action to take if the package ID is not defined in the PACKAGES MASTER file when a user tries to start the package.

| Category       | Action  | What happens when the package ID is not defined (and package accounting is not possible)                                                                                                                     |
|----------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>run</i>     | RUN     | Package runs                                                                                                                                                                                                 |
|                | NORUN   | Package does not run; the program terminates with return code 990                                                                                                                                            |
|                | ABEND   | User abend occurs, causing the program to terminate with the message DMSABN148T SYSTEM ABEND 990 CALLED FROM <i>xaddress</i> , where <i>xaddress</i> is a hexadecimal address that changes with each release |
| <i>msguser</i> | MSG     | A message is sent to the user                                                                                                                                                                                |
|                | NOMSG   | A message is not sent to the user                                                                                                                                                                            |
| <i>msgop</i>   | MSGOP   | A message is sent to the operator                                                                                                                                                                            |
|                | NOMSGOP | A message is not sent to the operator                                                                                                                                                                        |

## Example

The following command enables package accounting for the VMSORT module:

```
vmjpkg install vmsort module (notavail (run, msg, msgop) invpkgid (run, msg, msgop)
```

## Full-Screen Version

To display the full-screen version of the VMJPKG utility, enter **vmjpkg**. The Software Package Accounting Utility screen displays. After you fill in the fields on the screen, press ENTER. Additional options display as shown in Figure 15 on page 207.

Press PF9 (List) to produce a display of package-accounted LOADLIB members, including package name, package ID, and the installation options.

PACKSJC1                      Software Package Accounting Utility                      VM:Account

---

Function:                      (Install | Remove | Change)

Package Name:                      Id:                     

Package Type:                      (Module | Loadmem | Text)                      Txtlib:                     

| Condition             | Option:Run (Y   N   Abend) | Msg User (Y   N) | Msg Op (Y   N) |
|-----------------------|----------------------------|------------------|----------------|
| VMACCT not available: | YES                        | NO               | YES            |
| Package not valid:    | NO                         | YES              | YES            |

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---

1= Help      2= ...      3= Quit      4= Clear      5= ...      6= ...  
7= ...      8= ...      9= List      10= Print      11=      12= End

Fill in necessary fields then press ENTER.                      ...

==>

Figure 15. Additional Options on the Software Package Accounting Utility Screen

## Package Accounting Multiple Entry Points

VMJPKG cannot directly package account secondary entry points or aliases of a member in a TXTLIB or in a TEXT file. The VMJPKTXT and VMJPKENT EXECs give you the ability to install stubs for these types of entry points. VMJPKTXT installs stubs for secondary entry points in a TEXT file, and VMJPKENT performs the same function on TXTLIB members.

### VMJPKTXT EXEC

VMJPKTXT installs a package accounting stub for a secondary entry point or alias in a TEXT file.

The changed TEXT file has the filetype \$TEXT.

|          |                                                                                                                                                             |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJPKTXT | <i>textfilename entry packageid run<sub>1</sub>,msguser<sub>1</sub>,msgop<sub>1</sub> ...<br/>... run<sub>2</sub>,msguser<sub>2</sub>,msgop<sub>2</sub></i> |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|

***textfilename***

is the name of a text file.

***entry***

is the name of the secondary entry point or alias.

***packageid***

is the name Unicenter VM:Account uses to identify the software package.

***run<sub>1</sub>,msguser<sub>1</sub>,msgop<sub>1</sub>***

defines the action to take if Unicenter VM:Account is not available. See page 206 for an explanation of the actions you can take for the *run*, *msguser*, and *msgop* categories.

***run<sub>2</sub>,msguser<sub>2</sub>,msgop<sub>2</sub>***

defines the action to take if the package is invalid (that is, not defined in the PACKAGES MASTER file). See page 206 for an explanation of the actions you can take for the *run*, *msguser*, and *msgop* categories.

### Example

To package account the entry point ENTRY1 in the text file MYTEXT and charge usage to the package PACKG1, enter:

```
vmjpktxt mytext entry1 packg1 run,msg,msgop run,msg,msgop
```



## VMJPKENT EXEC

VMJPKENT lets you install a package accounting stub for a secondary entry point or alias on a TXTLIB member.

|          |                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJPKENT | <i>member entry library packageid run<sub>1</sub>,msguser<sub>1</sub>,msgop<sub>1</sub> ...<br/>... run<sub>2</sub>,msguser<sub>2</sub>,msgop<sub>2</sub></i> |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

***member***

is the name of the real member (CSECT) of a TXTLIB.

***entry***

is the name of the secondary entry point or alias.

***library***

is the TXTLIB name.

***packageid***

is the name Unicenter VM:Account uses to identify the software package.

***run<sub>1</sub>,msguser<sub>1</sub>,msgop<sub>1</sub>***

defines the action to take if Unicenter VM:Account is not available. See page 206 for an explanation of the actions you can take for the *run*, *msguser*, and *msgop* categories.

***run<sub>2</sub>,msguser<sub>2</sub>,msgop<sub>2</sub>***

defines the action to take if the package is invalid (that is, not defined in the PACKAGES MASTER file). See page 206 for an explanation of the actions you can take for the *run*, *msguser*, and *msgop* categories.

### Example

To package account the entry point ENTRY1 in MYLIB TXTLIB charging usage to the package PACK1, follow these steps:

1. Look at the TXTLIB map and get the name of the member (or CSECT) where the secondary entry point is located. In this example, CSECT1 is the member name where ENTRY1 is located.
2. Copy the TXTLIB to the A-disk.
3. Use the VMJPKG utility to package account the main entry point.
4. Package account the secondary entry point with:  
  
**vmjpkent csect1 entry1 mylib packg1 run,msg,msgop run,msg,msgop**
5. The package accounted TXTLIB is now on your A-disk. Move it back to its previous location.

## VMJPKG Installation Utility (VMJPKINS)

The VMJPKG Installation utility enables you to set the name of the Unicenter VM:Account service virtual machine in the VMJPKC MODULE and VMJPKG MODULE if you change the name of the Unicenter VM:Account service virtual machine after completing installation.

If you change the name of the Unicenter VM:Account machine, you must rename the VMACCT MODULE to the new name of the Unicenter VM:Account service virtual machine.

If you are doing SQL/DS accounting, you must also run the VMJSQINS utility.

|          |                |
|----------|----------------|
| VMJPKINS | <i>vmjusid</i> |
|----------|----------------|

### ***vmjusid***

is the new name of the Unicenter VM:Account service virtual machine.

# Accounting Data Conversion Utility (VMJRAW)

The VMJRAW utility creates a file of standard CP accounting records you can use as input to another accounting program.

Because Unicenter VM:Account generates more accounting records than are normally generated, and because it creates new types of records, VMJRAW reads a RAWDATA \$\$ymmdd file and produces a reduced set of standard CP accounting records. The Unicenter VM:Account special records are not in the new file, and multiple occurrences of certain records are compressed into single records that define a single terminal session.

VMJRAW accumulates information about a user's session until it detects logoff. VMJRAW detects logoff when it reads a new userid's record or when it recognizes that a user has started a new session. It detects new sessions when a session's start time is more than four seconds past the end time of the previous session.

Run VMJRAW from an EXEC that punches the accounting data to its final destination. For example, you can sort the output by date and time and then punch it to the old accounting virtual machine's reader for processing.

After adding control file records for userids for which VMJRAW did not find an account number, run VMJRAW against the VMJRAW REJECTS file.

|        |                                                                                                                                                                               |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJRAW | <i>infilename infiletype infilemode ...<br/>... outfilename outfiletype outfilemode [ ( options )</i><br><br><b>Options:</b><br>[ DIRECT vaddr ]<br>[ CONTROL ]<br>[ APPEND ] |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**infilename infiletype infilemode**  
is the filename, filetype, and filemode of the input file. The input file must be a RAWDATA \$\$ymmdd file from the Unicenter VM:Account service virtual machine and must be sorted by userid, date, and time. If you use CMS SORT, the sort field parameters are:

1 8 21 22 17 20 23 28

**outfilename outfiletype outfilemode**  
is the filename, filetype, and filemode of the output file. It can be used as input to other accounting programs. The output filename, filetype, and filemode cannot be the same as the input filename, filetype, and filemode.

**[ DIRECT *vaddr* ]**

is the virtual device address for the full-pack minidisk where the CP object directory (VM SYSRES) resides. Because Unicenter VM:Account changes a user's account number dynamically in the VMDBK to reflect such things as project accounting, VMJRAW needs to read the directory to extract the userid's true account number. This option is required unless you run VMJRAW with a control file listing all the userids that Unicenter VM:Account may encounter along with their account numbers. The userid running VMJRAW requires a read-only link to the CP object directories.

**[ CONTROL ]**

specifies that VMJRAW uses a control file when the utility finds a userid not in the object directory or when the utility is run without the DIRECT option. The control file must have a fileid of VMJRAW CONTROL. It contains a list of userids and their account numbers (in USERID ACCT# format).

VMJRAW replaces the encoded account numbers in the Unicenter VM:Account accounting records with the account number specified in the control file.

If you need to change the directory, do it after you run VMJRAW against a control file containing the userids and account numbers you want to delete from the directory. If you change the directory, add the deleted userids to the VMJRAW CONTROL file.

**[ APPEND ]**

specifies that VMJRAW appends records to the output file and the rejects file if they already exist. The output file is specified on the command line. The rejects file is named VMJRAW REJECTS. Records are sent to the rejects file if the utility finds a record for which it cannot find an account number.

## Recost Utility (VMJRCS)

If you change your COSTABLE and MASTER files, you will want to recost your accounting data. The recost utility, VMJRCS, selectively recosts previously costed accounting data using current cost tables and master description files.

VMJRCS does not use the Miscellaneous Charges and Credits cost table when it processes a Miscellaneous (MISCCHGS) accounting record (Unicenter VM:Account datatype A5). Instead, VMJRCS uses the number of units and cost per unit that are already on the record to calculate the cost.

Also, VMJRCS does not recalculate BEGTIME, BEGDATE, or SHIFT for files that have been compressed by the VMJCMP utility.

|        |                                                                                                       |
|--------|-------------------------------------------------------------------------------------------------------|
| VMJRCS | <i>infilename infiletype [ infilemode ] ...<br/>... [specfilename specfiletype [ specfilemode ] ]</i> |
|--------|-------------------------------------------------------------------------------------------------------|

### ***infilename infiletype [ infilemode ]***

specifies the filename, filetype, and filemode of the PERIODTE file that contains the data to recost. The default file mode is A.

### ***[ specfilename specfiletype [ specfilemode ] ]***

is the filename, filetype, and filemode of the specification file that contains keyword records. VMJRCS uses these criteria to select data to recost. The default filemode is A. If you do not specify this file, VMJRCS recosts all recostable records. Refer to *VMJRCS Specification Control File* (page 214) for detailed information about the VMJRCS specification file.

## Running the VMJRCS Utility

To run the VMJRCS utility:

1. Use the UPDATE command to change the appropriate COSTABLE and master description files.
2. Log on to VMACCT.
3. Terminate VMACCT with the END command.
4. Create a VMJRCS specification control file, if needed. Refer to *VMJRCS Specification Control File* on page 214 for more information.
5. Run the VMJRCS utility. This utility initializes Unicenter VM:Account and shuts it down when processing is complete.

The output from this utility is placed in a file named PERIODTE RECOSTED and is always placed on the same minidisk as the input file.

6. To check your results, run the desired Unicenter VM:Account COBOL reports using the PERIODTE RECASTED file as the input file.
7. Rename the PERIODTE RECASTED file to PERIODTE CURRENT if the costs are satisfactory. If not, erase the RECASTED file and repeat the above procedures.
8. Reinitialize Unicenter VM:Account.

## Example

You changed your cost tables and you need to recost the January 1902 PERIODTE file. You do not have a specification file. Enter:

**vmjracs periodte jan02**

The utility displays the recosted data:

| CUSTOMER     | PRECOSTED<br>TOTAL | SELECTED<br>TOTAL | RECASTED<br>TOTAL | CHARGE/<br>CREDIT | FINAL<br>TOTAL |
|--------------|--------------------|-------------------|-------------------|-------------------|----------------|
| ACCOUNTING   | 9166               | 9166              | 18332             | -350              | 17982          |
| CATCH-ALL    | 196296             | 196296            | 392592            | +2245             | 394837         |
| SYSTEM TOTAL | 205462             | 205462            | 410924            | 1905              | 412819         |

| Column          | Contains                                                                                                                                                                                                           |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRECOSTED TOTAL | Total dollar amount of the items in the specified PERIODTE file                                                                                                                                                    |
| SELECTED TOTAL  | Total dollar amount of the items selected for recosting based on a specification file. (A specification file was not used in this example. Therefore, every item in the PERIODTE file was selected for recosting.) |
| RECASTED TOTAL  | Total dollar amount of the items from the selected total after recosting                                                                                                                                           |
| CHARGE/CREDIT   | Total dollar amount of the sum of all CHARGE/CREDIT items in the PERIODTE file                                                                                                                                     |
| FINAL TOTAL     | Total dollar amount of the sum of the recosted items and those items that were not recosted                                                                                                                        |

## VMJRCS Specification Control File

The VMJRCS specification file defines the data you want the VMJRCS utility to recost in a PERIODTE file. The specification file also indicates if recosted records should receive new customer, account, or project associations according to changes made to the master description files.

The specification control file must be fixed format with an LRECL of 80. The specification control file's default filetype is CONTROL.

You can use records in any order. You can specify only one value per record. You can specify multiple records except for the FROM, TO, RUNTYPE, NEWACCT, NEWPROJ, and NEWCUST records. Accounting records must meet all of the criteria in the specification file or they are ignored.

VMJRCS cannot recost a record for a userid that does not have a directory entry. It treats these records according to the RUNTYPE option specified.

Record Definitions

**USER *userid***  
selects for recosting those accounting records that contain the specified userid.

**ACCT *account number***  
selects for recosting those accounting records that contain the specified account number.

**CUST *customerid***  
selects for recosting those accounting records that contain the specified customer ID.

**PROJECT *projectname***  
selects for recosting those accounting records that contain the specified project name.

**PACKAGE *packagename***  
selects for recosting those accounting records that contain the specified package name.

**RECTYPE *recordtype***  
selects accounting *recordtype* records for recosting. Valid record types are:

|    |    |    |    |
|----|----|----|----|
| 01 | 0C | A7 | AD |
| 02 | A3 | A9 | AE |
| 03 | A4 | AA | AF |
| 05 | A5 | AB | AG |
| 07 | A6 | AC |    |

Refer to Chapter 13, *Keyword Definitions*, for a list of record types and their meanings.

**FROM *mm/dd/yy***  
selects for recosting those accounting records from *mm/dd/yy* to the *mm/dd/yy* specified on the TO parameter. The default FROM date is the beginning of the accounting period.

**TO *mm/dd/yy***  
selects for recosting those accounting records from the *mm/dd/yy* specified on the FROM parameter to *mm/dd/yy*. The default TO date is today.

**NEWACCT**

compares the userid in the accounting record with the current directory entry for the userid. If the account number has changed, VMJRCS updates the record using the new account number.

**NEWCUST**

compares the account number or project in the accounting record with the account number or project assigned to a customer ID in the CUSTOMER ACCTLIST or PROJECTS MASTER file. If the customer ID has changed, VMJRCS updates the record with the new customer ID. If you charge by account numbers, the CUSTOMER ACCTLIST file is checked. If you charge by projects, the PROJECTS MASTER file is checked.

**NEWPROJ**

compares the account number in the accounting record to the default project specified in the PROJECTS ACCTLIST file. If the default project has changed, VMJRCS updates the record using the new default project.

**RUNTYPE YES**

specifies that costable records are written to the PERIODTE RECORDED file. Uncostable records are also written to the PERIODTE RECORDED file in their original state. Uncostable records are those that Unicenter VM:Account no longer has enough information in its tables to cost.

**RUNTYPE NO**

specifies that VMJRCS terminates if it finds an uncostable record. It puts uncostable records into the RECORDED REJECTS file.

When VMJRCS writes records that cannot be costed to the RECORDED REJECTS file, it also writes the reason for the rejection. Records in the RECORDED REJECTS file now have a record length of 320 columns (240 columns allocated to the record and 80 to the error message).

These messages are the same 700 series messages currently documented for normal Unicenter VM:Account processing of REJECTS records.

**RUNTYPE REJECT**

specifies that VMJRCS writes uncostable records to the RECORDED REJECTS file and writes costable records to the PERIODTE RECORDED file. This is the default if you did not specify a RUNTYPE record or there is no specification file. If a RECORDED REJECTS file already exists, VMJRCS appends the rejected records to that file.

When VMJRCS writes records that cannot be costed to the RECORDED REJECTS file, it behaves in the same way it does for RUNTYPE NO.



## Example

The VMJRCS specification control file below is named JAN CONTROL and it resides on the Unicenter VM:Account A-disk. The control file recosts all minidisk (record type A4) records for userid GEORGE from January 1, 2002 through January 31, 2002. The NEWACCT record specifies that if GEORGE's account number has changed, his recosted minidisk records are updated with the new account number.

```
USER GEORGE  
RECTYPE A4  
FROM 01/01/02  
TO 01/31/02  
NEWACCT
```

To execute the utility using this control file, enter:

```
vmjrsc periodte jan02 a jan control a
```

## Security Violations Report Utility (VMJRSE)

The VMJRSE utility creates up to six reports on the security accounting records created by illegal logon or autolog attempts and by valid and invalid links to a user's minidisk. Unauthorized logon or link attempts occur when an invalid password is specified with a LOGON, AUTOLOG, or LINK command.

Use this utility if you are interested in detecting potential security violations. Run it daily because you might not keep the input RAWDATA \$\$ymmdd file for the entire accounting period. (The retention period for RAWDATA files is set by the HOLD parameter on the COLLECT record in the VMACCT CONFIG file.)

VMJRSE extracts data for the report from the invalid logon/autolog, links, and invalid links records (datatype 04). If the RAWDATA files do not contain the required records, no report is generated. VMJRSE needs a link to the VMACCT minidisk specified on the COLLECT record.

Depending on how the VM system is defined, the operating system may or may not produce CP 04, 05, and 06 records. See the IBM *Planning and Administration* manual for information about creating these journaling accounting records.

|        |                                                                                                                                                                                                                                                                                                                                           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJRSE | <pre>infilename infiletype infilemode [ ( [ SUPPRESS ] [ reports ] [ dest ] )</pre> <p><b>Report Options (reports):</b></p> <pre>[ ALL ]<br/>[ ILINKBL ]<br/>[ ILINKBO ]<br/>[ ILOGONBT ]<br/>[ ILOGONBU ]<br/>[ VLINKBL ]<br/>[ VLINKBO ]</pre> <p><b>Destination Options (dest):</b></p> <pre>[ DISK ]<br/>[ PRINT ]<br/>[ TERM ]</pre> |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***infilename infiletype infilemode***

is the filename, filetype, and filemode of the input file. The input file can either be a RAWDATA \$\$ymmdd file or a file produced by the VMJRAW utility. The default filemode is \*, which means that all accessed minidisks are searched for the input file.

### **[ SUPPRESS ]**

specifies that attempted passwords should be suppressed on the reports that VMJRSE generates.

## Report Options

[ ALL ] [ ILINKBL ] [ ILINKBO ] [ ILOGONBT ] [ ILOGONBU ]  
[ VLINKBL ] [ VLINKBO ]

specify which reports to produce. Specify one or more of the following to generate a specific report:

| <b>This option:</b> | <b>Produces this report:</b>                                                   |
|---------------------|--------------------------------------------------------------------------------|
| ALL                 | All the reports                                                                |
| ILINKBL             | Invalid links sorted by linking userid, date, and time                         |
| ILINKBO             | Invalid links sorted by owning userid, virtual address, date, and time         |
| ILOGONBT            | Invalid LOGON/AUTOLOG attempts sorted by terminal address, date, and time      |
| ILOGONBU            | Invalid LOGON/AUTOLOG attempts sorted by the attempting userid, date, and time |
| VLINKBL             | Valid links sorted by linking userid, date, and time                           |
| VLINKBO             | Valid links sorted by owning userid, virtual address, date, and time           |

## Destination Options

[ DISK | **PRINT** | TERM ]

specify where VMJRSE is to send the reports:

| <b>This option:</b> | <b>Sends the reports to this location:</b> |
|---------------------|--------------------------------------------|
| DISK                | CMS file named VMJRSE LISTING A            |
| PRINT               | Printer                                    |
| TERM                | Terminal                                   |

## Example

This command produces the following report:

**vmjrse rawdata \$\$020131 (print ilogonbt**

FILE:

RAWDATA \$\$020131HCOMPUTER ASSOCIATES  
 VM:ACCOUNT SECURITY REPORTING SYSTEM  
 INVALID AUTOLOGS/LOGONS BY TERMINAL CUU

| <u>TERMINAL<br/>ADDR</u> | <u>DATE</u> | <u>TIME</u> | <u>USERID</u> | <u>ATTEMPTED<br/>PASSWORD</u> | <u>ACTING<br/>USERID</u> | <u>COUNT</u> | <u>LIMIT</u> |
|--------------------------|-------------|-------------|---------------|-------------------------------|--------------------------|--------------|--------------|
| 082                      | 01/31/02    | 16:47:29    | JACKSON       |                               | (LOGON)                  | 02           | 02           |
| 090                      | 01/31/02    | 15:40:39    | STUART        |                               | (LOGON)                  | 02           | 02           |
|                          | 01/31/02    | 16:33:25    | STUART        |                               | (LOGON)                  | 02           | 02           |
|                          | 01/31/02    | 16:33:25    | STUART        |                               | (LOGON)                  | 02           | 02           |
| 0A8                      | 01/31/02    | 15:40:39    | HAMPTON       |                               | (LOGON)                  | 02           | 02           |
| 0AF                      | 01/31/02    | 16:33:25    | PICKET        |                               | (LOGON)                  | 02           | 02           |
|                          | 01/31/02    | 16:33:25    | PICKET        |                               | (LOGON)                  | 02           | 02           |
| 0B3                      | 01/31/02    | 16:33:25    | DHHILL        |                               | (LOGON)                  | 02           | 02           |
|                          | 01/31/02    | 16:33:25    | DHHILL        |                               | (LOGON)                  | 02           | 02           |
| LE1B                     | 01/31/02    | 16:33:25    | APHILL        |                               | (LOGON)                  | 02           | 02           |

# Installation Aid Utility (VMJSCD)

The Unicenter VM:Account Installation Aid utility (VMJSCD) helps establish customer, account, and project name relationships. This utility scans the VM source directory and prints a sorted list of existing account and userid assignments.

You can sort the list of userids and account numbers by userid or account number, or maintain the order they have in the directory. The listing is produced in the form of a worksheet and displays any invalid characters found in userids and account numbers. Errors are summarized at the end of the worksheet.

Use the worksheet generated by this utility to modify the CUSTOMER MASTER, CUSTOMER ACCTLIST, PROJECTS MASTER, and PROJECTS ACCTLIST files.

Run **directxa filename (edit)** to check the syntax of the directory statements before you run VMJSCD. For more information about the DIRECTXA command, refer to the appropriate planning and system generation guide for your operating system.

You must resolve any E (error) messages listed on the report before you can initialize Unicenter VM:Account, and the VM source directory must be on an accessed minidisk. If you have Computer Associates's eTrust VM:Secure or eTrust VM:Director installed, you can forego the requirement for access to the VM source directory by using the eTrust VM:Secure or eTrust VM:Director EXTRACT command. This creates a condensed source directory file that VMJSCD can use as an input file. Refer to the *Component Interface Guide* for more information about the Unicenter VM:Account interface to eTrust VM:Secure or eTrust VM:Director.

|        |                                                                                                                                                   |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJSCD | [ filename [ filetype [ filemode ] ] ] [ ( options ]<br><br><b>Options:</b><br>[ SORT [ ACCOUNT   USERID   NO ] ]<br>[ CUSTOMER ]<br>[ PROJECTS ] |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|

**[ filename [ filetype [ filemode ] ] ]**  
is the VM source directory filename, filetype, and filemode. The default is USER DIRECT \*.

**[ SORT [ ACCOUNT | USERID | NO ] ]**  
indicates whether to sort the report and, if so, how.

| Option  | Has this action                                                                                                                                     |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| ACCOUNT | Report is sorted by account number. When VMJSCD encounters duplicates while sorting by account number, the account number appears only once a page. |
| USERID  | Report is sorted by userid. VMJSCD can detect duplicate userids only if you select SORT USERID, or if the userids have identical account numbers.   |

(continued)

| Option | Has this action                                                                                                          |
|--------|--------------------------------------------------------------------------------------------------------------------------|
| NO     | Report is not sorted. The report shows the account and userid assignments in the order they are listed in the directory. |

#### [ CUSTOMER ]

builds a CUSTOMER ACCTLIST file on the issuer's A-disk that contains a record for each unique account number in the directory. The worksheet is printed and it is sorted by account number.

#### [ PROJECTS ]

builds a PROJECTS ACCTLIST file on the issuer's A-disk that contains a record for each unique account number in the directory. The worksheet is printed and it is sorted by account number.

## Example

To produce a VMJSCD report sorted by userid, enter:

**vmjscd user direct \* (sort userid**

The report looks like this:

| DIRECTORY SCAN RESULTS SORTED BY USERID FILE: USER DIRECT A0 |          |                                   |                |                            |                                 | PAGE: 1            |
|--------------------------------------------------------------|----------|-----------------------------------|----------------|----------------------------|---------------------------------|--------------------|
| USERID                                                       | ACCOUNT  | NOTES OR<br>ACCOUNT<br>CORRECTION | CUSTOMER<br>ID | DEFAULT<br>PROJECT<br>NAME | GENERATES<br>ACCOUNT<br>RECORDS | INVOICE<br>ADDRESS |
| EARLY                                                        | 58000080 | _____                             | _____          | _____                      | _____                           | _____              |
| HAMPTON                                                      | 58000050 | _____                             | _____          | _____                      | _____                           | _____              |
| JACKSON                                                      | 58000060 | _____                             | _____          | _____                      | _____                           | _____              |
| VMJSCD990I                                                   |          | 3 USERIDS REPORTED.               |                |                            |                                 |                    |

## Record Selection Utility (VMJSEL)

The Unicenter VM:Account Record Selection utility (VMJSEL) enables you to create a control file containing criteria for selecting records from an input file. The selected records can be included in a report or written to an output file.

VMJSEL can also sort the selected data if a sort package other than CMS SORT is available.

You can run VMJSEL as a standalone module or it can be called from COBOL reports (those that Computer Associates provides and those that you write).

|        |                                                                                               |
|--------|-----------------------------------------------------------------------------------------------|
| VMJSEL | <i>ctrlfilename</i> [ <i>ctrlfiletype</i> [ <i>ctrlfilemode</i> ] ] ( [ EDIT ]<br>[ PRINT ] ) |
|--------|-----------------------------------------------------------------------------------------------|

### ***ctrlfilename* [ *ctrlfiletype* [ *ctrlfilemode* ] ]**

specifies the filename, filetype, and filemode of the control file. The default filetype and filemode are CONTROL A.

### **[ EDIT ]**

verifies the control file and issues appropriate error messages with return code 8 or with return code 0 if there are no errors.

### **[ PRINT ]**

specifies that VMJSEL sends messages it issues to a print spool file rather than to the console.

## VMJSEL Control File

The VMJSEL control file defines record selection and rejection criteria, sort parameters, input file identification, output disposition, and parameter information to be passed to a program that uses Unicenter VM:Account accounting records.

The VMJSEL control file is composed of fixed-length, 80-byte records. Only columns 1 through 72 are examined. You can continue any record onto the next line except for the TITLE1, TITLE2, and TITLE3 records by placing any non-blank character in column 72 of the continued record. You can use up to 16 continuation lines for a record. Continued records may begin in any column, but words may not be broken across lines.

You can use comments by placing an asterisk in the first column of a record. Comments can occur anywhere in the control file.

The VMJSEL control file contains one or more of these records:

| Record   | See page |
|----------|----------|
| INFILE   | 224      |
| OUTFILE  | 225      |
| PARMS    | 225      |
| PRESORT  | 228      |
| SELECT   | 229      |
| IGNORE   | 229      |
| SORT     | 230      |
| TITLE    | 232      |
| OUTHEADR | 233      |

## INFILE Record

This record specifies input files. You must specify at least one INFILE record. If you specify more than one input file, you must specify each file on a separate INFILE record. You can specify up to 12 input files for a Unicenter VM:Account report, unless you are using CMS SORT. If you are using the PRESORT record or CMS SORT, you can specify only one input file.

The records in the input file must be in the same format and length as the PERIODTE file records (fixed-format records with a logical record length of 240 bytes).

|        |                                                                                                                                     |
|--------|-------------------------------------------------------------------------------------------------------------------------------------|
| INFILE | $\left\{ \begin{array}{l} \text{filename filetype [ filemode ]} \\ \text{TAPE volserlist [ DSN datasetname ]} \end{array} \right\}$ |
|--------|-------------------------------------------------------------------------------------------------------------------------------------|

### **filename filetype [ filemode ]**

specifies the filename, filetype, and filemode of the input file. The default filemode is \*, which means that all accessed minidisks are searched for the input file.

### **TAPE volserlist [ DSN datasetname ]**

specifies that the input file is on the standard label tapes whose volsers are identified by *volserlist*. Specify more than one volser only if the input file spans more than one tape.

If you use BrightStor VM:Tape, it allocates drives and requests mounts for you. Otherwise, you must attach a drive at virtual address 181. Refer to *Using Tapes* on page 102 for more information.

DSN *datasetname* identifies the data set that contains the input file. If you are using BrightStor VM:Tape and the volumes are owned by Unicenter VM:Account, you must specify a data set name.



## OUTFILE Record

This record specifies the output file.

The OUTFILE record is optional if you use VMJSEL with one of the Unicenter VM:Account reports. If you use VMJSEL as a standalone utility, you must specify an OUTFILE record. If you do not specify an OUTFILE record, VMJSEL creates a temporary output file and erases it when processing is completed.

|         |                                                                                                                                                                                                        |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OUTFILE | $\left\{ \begin{array}{l} \text{filename [ filetype [ filemode ] ]} \\ \text{TAPE [ volser}_1 \text{ [ volser}_2 \text{ ... volser}_n \text{ ] [ DSN name ] ]} \\ \text{SCRATCH} \end{array} \right\}$ |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### **filename [ filetype [ filemode ] ]**

specifies the filename, filetype, and filemode of the output file. The default filetype and filemode are OUTFILE A.

### **TAPE [ volser<sub>1</sub> [ volser<sub>2</sub> ... volser<sub>n</sub> ] [ DSN name ] ]**

#### **TAPE [ SCRATCH ]**

specifies that the output file is written to a standard label tape.

You can use the volser list to specify the volsers of one or more tapes on which to write the output file and DSN *name* to specify the data set name to use for the output file. The data set name can be up to 44 characters long.

SCRATCH specifies that the output file can be written to any SCRATCH volume. If you specify SCRATCH as the last element of a volser list, and you did not specify enough volsers to write the output file, Unicenter VM:Account uses scratch volumes to complete the job.

If you use BrightStor VM:Tape, it allocates drives and requests mounts for you. Otherwise, you must attach a drive at virtual address 182. Refer to *Using Tapes* on page 102 for more information.

## PARMS Record

This record specifies data to pass to a program calling VMJSEL. VMJSEL does not examine this data for content. This record is not allowed if you are running VMJSEL as a standalone module.

The Unicenter VM:Account reports use VMJSEL control files for specifying record selection criteria, sort fields, input data, output data, report titles, and PARMS records. You may specify multiple PARMS records.

### Date Range Parameters

You can specify only one date range PARMS record in the VMJSEL control file.

|       |                                                                                                                                                                |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PARMS | $\left\{ \begin{array}{l} \text{RANGE } mm/dd/yy-mm/dd/yy \\ \text{MONTH } mm/dd/yy \\ \text{QUARTER } mm/dd/yy \\ \text{YEAR } mm/dd/yy \end{array} \right\}$ |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Shift Parameters

You can specify only one shift PARMS record in the VMJSEL control file.

|       |                      |
|-------|----------------------|
| PARMS | SHIFT <i>shiftid</i> |
|-------|----------------------|

### Report Parameters

You can specify multiple report PARMS records in the VMJSEL control file.

|       |                                                                      |
|-------|----------------------------------------------------------------------|
| PARMS | CHARGES   RESOURCES<br>NOVECTOR   <u>VECTOR</u><br>SUMMARY<br>TOTALS |
|-------|----------------------------------------------------------------------|

### Destination Parameters

You can specify only one destination PARMS record in the VMJSEL control file.

|       |                                                                                                   |
|-------|---------------------------------------------------------------------------------------------------|
| PARMS | $\left\{ \begin{array}{l} \text{DISK [ } filemode \text{ ]} \\ \text{PRINT} \end{array} \right\}$ |
|-------|---------------------------------------------------------------------------------------------------|

## Date Ranges

Dates specify the chronological limits of the data in a report. If a date is not specified, the report programs use the header record in the input file to determine the begin and end dates. If the input data file does not have a header record and you do not specify a date range, the begin date prints as 00/00/00, and the end date prints as yesterday's date.

The dates specified on PARMS records also appear in the report title lines.

### **RANGE *mm/dd/yy-mm/dd/yy***

specifies the begin and end dates for the data to include in a report. Use this format when you are using a single input file. When this keyword is specified, the header record begin and end dates are checked against *mm/dd/yy-mm/dd/yy*.

### **MONTH *mm/dd/yy***

specifies a monthly date range. The variable *mm/dd/yy* is the first day of the month in a specified year. The report program calculates the end date. You can use the MONTH keyword on all reports except for the Quarterly VM Utilization Report (VMJQRTR).

### **QUARTER *mm/dd/yy***

specifies a quarterly (three month) date range. The variable *mm/dd/yy* is the first day of the first month in the quarter in a specified year. The report program calculates the end date. QUARTER is valid for all reports except the Monthly VM Utilization Report (VMJMONTH).

### **YEAR *mm/dd/yy***

specifies an annual report. The variable *mm/dd/yy* is the first day of the first month in the specified year. The report program calculates the end date. YEAR is valid for all reports except VMJMONTH and VMJQRTR.

## Shifts

### **SHIFT *shiftid***

specifies a shift, where *shiftid* is a 1- to 8-character shift name as specified on the SHIFT record in the VMACCT CONFIG file. Use SHIFT if you want to restrict the data in the report to a specific shift. SHIFT is valid with the VMJMONTH, VMJQRTR, VMJRSCS, VMJRUT, and VMJTREND reports.

## Reports

### **CHARGES**

specifies a report of accrued charges. CHARGES is valid on the VMJMONTH, VMJQRTR, and VMJTREND reports.

### **RESOURCES**

specifies a report of resource usage. RESOURCES is valid on the VMJMONTH, VMJQRTR, and VMJTREND reports.

**NOVECTOR | VECTOR**

specifies whether virtual, overhead, and total vector CPU usage are to be added to the virtual, overhead, and total CPU usage, respectively. NOVECTOR means that the vector usage is not to be added. VECTOR means that the vector usage is to be added. NOVECTOR and VECTOR are valid on the VMJRUT report.

**SUMMARY**

specifies a report of summary information. SUMMARY is valid on the VMJCHRGs, VMJMDISK, VMJMONTH, and VMJQRTR reports.

**TOTALS**

specifies a report that includes totals for all control breaks as well as a grand total page. TOTALS is valid on the VMJORVW report only.

## Destinations

**DISK [ *filemode* ] | PRINT**

indicates where to send the report. DISK sends the report to a minidisk. If you do not specify a filemode, the program defaults to the first read/write minidisk it finds in CMS search order. PRINT sends the report to the virtual printer.

**PRESORT Record**

This record specifies that the input file was sorted before VMJSEL was called.

The PRESORT record defines the sort fields and specifies the input file for the Unicenter VM:Account report programs. Using a PRESORT record means that VMJSEL will not sort the input file with Unicenter VM:Sort or another sort utility.

Using the PRESORT record with the NOSORT report execution option enables you to sort a file once and use it as input to multiple report programs, saving time and system resources. Refer to *Executing the Reports* on page 269 for more information about the NOSORT option.

If you use a PRESORT record for running one of the Unicenter VM:Account reports, the input file is sorted using CMS SORT. If you use CMS SORT, you must use a PRESORT record.

The PRESORT and SORT records are mutually exclusive. VMJSEL verifies the control file to ensure that it does not contain both.

|         |                                                                                                         |
|---------|---------------------------------------------------------------------------------------------------------|
| PRESORT | <i>keyword<sub>1</sub> [keyword<sub>2</sub> ... keyword<sub>n</sub>] [ ( inname intype [ inmode ] ]</i> |
|---------|---------------------------------------------------------------------------------------------------------|

***keyword<sub>1</sub> [ keyword<sub>2</sub> ... keyword<sub>n</sub> ]***

specifies the keywords (as described in Chapter 13, *Keyword Definitions*) used as sort fields. You must specify at least one keyword. The keywords identify the sort sequence to the Unicenter VM:Account report programs whether sorting is performed or not. Separate multiple keywords with a space.

If you are using a PRESORT record with one of the Unicenter VM:Account reports, refer to the individual report descriptions for valid keyword combinations.

**[ *inname intype [ inmode ]* ]**

specifies the filename, filetype, and filemode of the file that contains the records that will be sorted. The default filemode is \*, which means that all accessed minidisks are searched for the input file.

If you use CMS SORT, the filename, filetype, and filemode specified on the PRESORT and INFILE records must be different. The file specified on the PRESORT record is sorted in ascending order by the keywords identified in *keyword<sub>1</sub> [ keyword<sub>2</sub> ... keyword<sub>n</sub> ]*. The sorted file is given the filename specified on the INFILE record.

If you use the NOSORT option, the filename, filetype, and filemode specified on the PRESORT record is the same as the filename, filetype, and filemode on the INFILE record.

**SELECT and IGNORE Records**

These records specify the conditions under which input records are selected or rejected.

|        |                                                                                                                                                                  |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SELECT | [ NOT ] <i>condition<sub>1</sub></i> [ { AND   OR } [ NOT ] <i>condition<sub>2</sub> ...</i> ] ...<br>... [ { AND   OR } [ NOT ] <i>condition<sub>16</sub></i> ] |
| IGNORE | [ NOT ] <i>condition<sub>1</sub></i> [ { AND   OR } [ NOT ] <i>condition<sub>2</sub> ...</i> ] ...<br>... [ { AND   OR } [ NOT ] <i>condition<sub>16</sub></i> ] |

**[ NOT ]**

reverses the result of the logical expression immediately following it.

***condition<sub>1</sub> condition<sub>2</sub> ... condition<sub>12</sub>***

are logical expressions in the format *keyword operator value*:

|                 |                                                                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>keyword</i>  | Keyword as described in Chapter 13, <i>Keyword Definitions</i>                                                                                                      |
| <i>operator</i> | Any of these operators:<br>EQ   equal to<br>NE   not equal to<br>GT   greater than<br>LT   less than<br>LE   less than or equal to<br>GE   greater than or equal to |

(continued)

*value* Constant against which a data field in an input record (as defined by *keyword*) is evaluated. NULL means that a blank field will be used in the evaluation against the data field. You can specify generic values by using an asterisk immediately followed by a blank. If an asterisk is part of the value, enclose the entire value in single quotes. Values in quotes cannot use asterisks as masks. Quotes are allowed as part of a constant value except when immediately followed by a blank.

### **{ AND|OR }**

specifies the logical operator to use between logical expressions. AND specifies that the conditions preceding and following it are evaluated together, as a set. OR specifies that the conditions preceding and following it are evaluated separately. Each condition in a set must be true for the whole set to be true.

You can include up to 16 logical conditions on a single SELECT or IGNORE record.

### Examples

- To find all accounting records for jobs run on Unicenter VM:Batch with a job number of 1637, use this statement in the VMJSEL control file:

```
SELECT DATAFLAG EQ VMBATCH AND VMHJOBNO EQ 1637
```

- These two records are equivalent:

```
SELECT A AND B AND C OR D OR E AND F AND G OR H  
SELECT (A AND B AND C) OR D OR (E AND F AND G) OR H
```

First, the condition (A and B and C) is checked. Second, condition D is checked. Third, the condition (E and F and G) is checked. Last, condition H is checked.

If any of the conditions is met, the record is selected. If none of the conditions is met, the record is not selected.

### **SORT Record**

This record specifies sort fields to be sorted by Unicenter VM:Sort or another sort utility. If you want to use CMS SORT or if you do not want to sort the input file, use the PRESORT record.

If you want to use a sort utility such as Unicenter VM:Sort, you must link to and access the sort utility's minidisk. A GLOBAL TXTLIB command must be issued for the sort utility if VMJSEL is executed as a standalone utility.

The PRESORT and SORT records are mutually exclusive. VMJSEL verifies the control file to ensure that it does not contain both records.

|      |                                                                            |
|------|----------------------------------------------------------------------------|
| SORT | <i>keyword<sub>1</sub> [ keyword<sub>2</sub> ... keyword<sub>n</sub> ]</i> |
|------|----------------------------------------------------------------------------|

***keyword<sub>1</sub> [ keyword<sub>2</sub> ... keyword<sub>n</sub> ]***

is a list of valid keywords as described in Chapter 13, *Keyword Definitions*. The records are sorted in ascending order by the list of keywords.

If you are using a SORT record with one of the Unicenter VM:Account reports, refer to the individual report descriptions for valid keyword combinations.

### Examples

- You want to create a report on just records with the customer ID FINANCE. The report is to be sorted by project and userid using Unicenter VM:Sort. The input file is the PERIODTE CURRENT file, and you want to report on the date range 01/01/02 through 01/15/02.

```
SELECT CUSTOMER EQ FINANCE
SORT PROJECT USERID
INFILE PERIODTE CURRENT *
PARMS RANGE 01/01/02-01/15/02
```

- You run the Invoice and Invoice Ledger Reports (VMJINVCE) using the following control file. The PERIODTE CURRENT file is sorted by Unicenter VM:Sort, and VMJSEL creates the output file FINANCE CURRENT A (as specified on the OUTFILE record), containing records with a customer ID of FINANCE for the first half of January 2002.

```
SELECT CUSTOMER EQ FINANCE
SORT CUSTOMER PROJECT USERID ACCOUNT
INFILE PERIODTE CURRENT *
OUTFILE FINANCE CURRENT A
PARMS RANGE 01/01/02-01/15/02
```

- Now you want to run the Miscellaneous Charges/Credits Report for the same users and for the same date range.
  - Use XEDIT to create a new control file named VMJMISC CONTROL.
  - Add an INFILE record specifying the output file from the previous example.
  - Add a SELECT record to choose the Miscellaneous Charges/Credits records (type A5) from the file.

- d. Add a PRESORT record and specify the same fields used to sort the original input file. Because you have already created a sorted file in the previous example, there is no need to sort it again.
- e. Add a PARMs RANGE record and specify the date range you want the report to cover.
- f. File the control file. The control file should look like this:

```
INFILE FINANCE CURRENT A
SELECT DATATYPE EQ 'A5'
PRESORT CUSTOMER PROJECT USERID ACCOUNT (PERIODTE CURRENT
PARMS RANGE 01/01/02-01/15/02
```

- g. Enter this command to run the Miscellaneous Charges/Credits Report:

**vmjmisc vmjmisc control \* (nosort**

Refer to *Executing the Reports* on page 269 for more information about report execution options.

- This example produces the same results as the previous example. The PERIODTE CURRENT file is sorted by CMS SORT and the FINANCE DATA file is produced. VMJSEL selects records with a customer ID of FINANCE.

```
SELECT CUSTOMER EQ FINANCE
PRESORT PROJECT USERID (PERIODTE CURRENT
INFILE FINANCE DATA A
PARMS RANGE 01/01/02-01/15/02
```

## TITLE Records

These records specify up to three 60-character report title lines.

When a title line is passed to the calling program, it is centered in a temporary 60-byte data field. The temporary field starts in column 10.



Each TITLE record may be specified only once.

|        |        |
|--------|--------|
| TITLE1 | 'text' |
|--------|--------|

|        |        |
|--------|--------|
| TITLE2 | 'text' |
|--------|--------|

|        |        |
|--------|--------|
| TITLE3 | 'text' |
|--------|--------|

**'text'**  
is 1 to 60 characters of data to be passed to a report program for a report title. The data must be enclosed in single quotes. Data within quotes is interpreted as the title.

**OUTHEADR Record**

The OUTHEADR record specifies that the OUTFILE created during VMJSEL processing will have a header record placed in the file. The record is useful only if an OUTFILE record is placed in the control file. If you do not specify any parameters on the OUTHEADR record, VMJSEL places the header record from the first INFILE in the OUTFILE. If there is no header record on the first input file, VMJSEL builds one.

Specify the OUTHEADR record if you plan to use the OUTFILE created by VMJSEL as input to a Unicenter VM:Account utility or a Unicenter VM:Account COBOL report.

---

**Note:** When the OUTHEADR record from a report control file is used, VMJSEL ignores the LABEL and DATES parameters. The label and dates on the header record from the input file are copied to the output file.

---

|          |                                                    |
|----------|----------------------------------------------------|
| OUTHEADR | LABEL <i>name</i><br>DATES <i>mm/dd/y-mm/dd/yy</i> |
|----------|----------------------------------------------------|

**LABEL *name***  
causes VMJSEL to override the label on the header record (columns 127-134) that is placed in the OUTFILE. If you specify LABEL but do not specify *name*, SELECTED is used.

**DATES mm/dd/yy-mm/dd/yy**

causes VMJSEL to override the begin and end dates on the header record (columns 139-150) that is placed in the OUTFILE. If you do not specify DATES, 01/01/84-current date is used.

As with the LABEL option, use the DATES option to uniquely identify a file. Also, use the DATES option to ensure that the date range of the records contained in a file is reflected on the header record. Use the DATES option if multiple INFILES or PARMS RANGE is specified.

VMJSEL checks that the values for the DATES option are valid dates; *you* must ensure that the range specified accurately spans all the dates within the file.

### Examples

- You want to create a test PERIODTE file with all the records containing dates in February and March; you want to name the file FEBMAR; and you want the header record to properly reflect the selected date range. The VMJSEL control file should look like this:

```
OUTHEADR LABEL FEBMAR DATES 02/01/02-03/31/02
INFILE PERIODTE YEARLY B
OUTFILE PERIODTE FEBMAR A
SELECT BEGDATE GE 02/01/02 AND BEGDATE LE 03/31/02
```

- You have written your closed PERIODTE file to tape and want to move it to a minidisk without losing the PERIODTE header record. The VMJSEL control file should look like this:

```
OUTHEADR
INFILE TAPE X00186
OUTFILE PERIODTE RECOVERD A
```

## SQL/DS Installation Utility (VMJSQINS)

VMJSQINS sets the name of the Unicenter VM:Account service virtual machine in the SQL/DS ARIUXIT user exit. Use this utility only if you change the name of the Unicenter VM:Account service virtual machine after installation is complete and before installing ARIUXIT on the SQL machine.

When you change the name of the Unicenter VM:Account service virtual machine, you must run the VMJSQINS utility, the VMJPKINS utility, and rename the VMACCT MODULE to the name of the Unicenter VM:Account service virtual machine.

|          |               |
|----------|---------------|
| VMJSQINS | <i>vmacct</i> |
|----------|---------------|

### ***vmacct***

specifies the name of the Unicenter VM:Account service virtual machine.

## SQL/DS DBSPACE Accounting Utility (VMJSQL)

VMJSQL enables you to charge users for the amount of SQL database space they use to store data. To use this utility, you must have the REXX interface to SQL/DS (RXSQL) installed.

Unicenter VM:Account maintains an event file, VMJSQL ACCTCRD, to store information about the last time the utility was run. There is one record in this file for each database processed. If there is no record corresponding to a database, VMJSQL has never been run against that database and adds its information to the file.

Run VMJSQL from the userid identified on the SPECIAL SQLSTOR record in the VMACCT CONFIG file. Run VMJSQL during off-peak hours. VMJSQL uses the SQL/DS command SHOW DBSPACE to gather information and is resource intensive. (The SPECIAL configuration file record is explained on page 176.)

Refer to *Charging for SQL/DS DBSPACE Usage* on page 42 for more information.

|        |                                                                                                                                                                                                                                                                                                          |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJSQL | <b><i>dbname<sub>1</sub></i></b> [ <b><i>dbname<sub>2</sub></i></b> ... <b><i>dbname<sub>n</sub></i></b> ] [ ( <i>options</i> ) ]<br><br><b>Options:</b><br>[ VMACCT <i>userid</i> ]<br>[ FROM <i>yyddd</i> ]<br>[ TO <i>mm/dd/yy</i> ]<br>[ DAYS <i>number</i> ]<br>[ CLASS <i>class</i> ]<br>[ FORCE ] |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

***dbname<sub>1</sub>*** [ ***dbname<sub>2</sub>*** ... ***dbname<sub>n</sub>*** ]  
is a list of 1 to 10 SQL databases.

[ **VMACCT** *userid* ]  
specifies the name of the Unicenter VM:Account service virtual machine. The default is VMACCT.

[ **FROM** *mm/dd/yy* ]  
specifies the beginning accounting date.

[ **TO** *mm/dd/yy* ]  
specifies the ending accounting date.

[ **DAYS** *number* ]  
specifies the number of days to account for.

[ **CLASS** *class* ]  
specifies the class of the punch file created by the utility and sent to the Unicenter VM:Account service virtual machine. The default is A.

[ **FORCE** ]  
lets you run VMJSQL for the same database more than once on any given day.

Do not use the FROM, TO, and DAYS options at the same time. You may, however, use any two of them together.

Use the FROM, TO, and DAYS options only to override the default number of days. Without these options, VMJSQL performs accounting from the last time the utility was run until the current date.

The first time you run this utility, the default number of days is 1.

## VMJSQL CONTROL File

The VMJSQL utility uses the VMJSQL CONTROL file to create SQL/DS ownership accounting records. The VMJSQL CONTROL file is composed of fixed-length, 80-byte records. You can specify only one SQL/DS database on a record.

If Unicenter VM:Account cannot find a VMJSQL CONTROL file, VMJSQL assumes a control file with one record of six asterisks and creates the appropriate accounting records.

Unicenter VM:Account charges any PUBLIC DBSPACE that does not match a record in the VMJSQL CONTROL file to userid PUBLIC. Unicenter VM:Account charges any PRIVATE DBSPACE that does not match a record in the VMJSQL CONTROL file to SQL owner-authorization-id.

### Format

Each record must contain the following six fields, separated by a blank space, in the order they are presented:

1. The SQL/DS database name to charge for this space, or an asterisk for all databases
2. The name of the DBSPACE to charge for this space, or an asterisk to ignore this criterion
3. The SQL owner-authorization ID to charge for the space, or an asterisk to ignore this criterion
4. An asterisk to ignore this criterion
5. A VM userid to charge for the space, or an asterisk to ignore this criterion
6. An account number to charge for the space, or an asterisk to ignore this criterion

### Examples

- This VMJSQL CONTROL file charges:
  - All database space for SQL database PLAY to userid GRANT and account number 05333333
  - All database space for SQL database WORK to userid LEE and account number 12345678

- Records cut for all other SQL databases to their SQL owner-authorization-id

**PLAY \*\*\* GRANT 05333333**  
**WORK \*\*\* LEE 12345678**

► This VMJSQ SQL CONTROL file charges:

- All PUBLIC DBSPACES to userid IKE and account number 44444444
- All PRIVATE DBSPACES to their SQL owner-authorization-id

**\*\* PUBLIC \* IKE 44444444**

► This VMJSQ SQL CONTROL file charges:

- DBSPACES XYZ and HELPFIL within SQL database PLAY to userid PATTON and account number 75757575
- All other DBSPACES within SQL database PLAY to userid PLAY
- DBSPACES with SQL owner-authorization-id JOE\_L or TBLEAD within SQL database WORK to userid CTEST and account number 11111111
- Records cut for all other DBSPACES within SQL database WORK to their SQL owner-authorization-id
- All records cut for any other SQL database to their SQL owner-authorization-id

**PLAY XYZ \* \* PATTON 75757575**  
**PLAY HELPFIL \* \* PATTON 75757575**  
**PLAY \* \* \* PLAY \***  
**WORK \* JOE\_L \* CTEST 11111111**  
**WORK \* TBLEAD \* CTEST 11111111**

## VMJSQ SQL ACCTRC D File

If you have databases on minidisks other than SQLDBA 195, create a file named VMJSQ SQL ACCTRC D. Use one record for each database.

### Format

Each record in the VMJSQ SQL ACCTRC D file contains the following five fields, separated by a blank spaces:

1. Database name
2. *mm/dd/yy* set this to the first day for which you want to account; it will be reset after each execution of VMJSQ SQL and will then represent the date of the last accounting for this database
3. Userid of the SQL/DS production minidisk
4. Virtual address of the SQL/DS production minidisk

5. Discontiguous Shared Segment (DCSS) name containing SQL code for the database, if any, or blank if none

### Example

This record in the VMJSQ ACCTRC file specifies that the PLAY database is to be accounted for starting on April 23, 2002. The SQL/DS production minidisk is SQLDBA22's 195 disk.

**PLAY 04/23/02 SQLDBA22 195**

## Tape Storage Accounting Utility (VMJTVA)

The VMJTVA utility creates tape Volumes accounting records (datatype A3).

Storage of work tapes cannot be accounted for because they remain in scratch status and never become saved tapes.

VMJTVA maintains a *vmtapeid* ACCTRCD file on the issuing userid's A-disk. This file identifies the last time tape accounting was done. Do not erase or modify this file.

Use the options for VMJTVA when you need to charge for tape storage through the end of an accounting period or for a specified number of days. Normally, accounting records contain information from the creation date of the input file through yesterday's date or the date specified with the TO option.

The userid running VMJTVA must be specified on the SPECIAL TAPEVOLS record in the VMACCT CONFIG file. (See page 176 for more information about the SPECIAL configuration file record.)

The VMTAPE TMC file must be on an accessed minidisk at run time.

|        |                                                                                                                                                                                                                                                                                                                                |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMJTVA | <i>ddname<sub>1</sub></i> [ <i>ddname<sub>2</sub></i> ... <i>ddname<sub>n</sub></i> ] [ ( <i>options</i> ) ]<br><br><b>Options:</b><br>[ VMACCT <i>userid</i> ]<br>[ FROM <i>yyddd</i> ]<br>[ TO <i>yyddd</i> ]<br>[ TO TODAY ]<br>[ DAYS <i>number</i> ]<br>[ VMTAPEID <i>userid</i> ]<br>[ CLASS <i>class</i> ]<br>[ FORCE ] |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### ***ddname<sub>1</sub>* [ *ddname<sub>2</sub>* ... *ddname<sub>n</sub>* ]**

specifies up to ten 1- to 8-character data definition names (ddnames) of input files that VMJTVA is to process. The input files must be in VMTAPE TMC file format and can reside on OS- or CMS-formatted disks, or on tape. FILEDEF commands specifying these ddnames must be issued before executing VMJTVA.

### **[ VMACCT *userid* ]**

specifies the userid to receive the generated accounting records. This must be the userid of the Unicenter VM:Account service virtual machine. The default is VMACCT.

### **[ FROM *yyddd* ]**

VMJTVA accounts for tape volumes from the Julian date, *yyddd*, through midnight of the day before the run date or the TO value, whichever comes first.



**[ TO *yyddd* ]**

VMJTVA accounts for tape volumes from the previous run (or the FROM value) through midnight on *yyddd*. If TO *yyddd* is not specified, the default is yesterday's date.

**[ TO TODAY ]**

VMJTVA accounts for tape volumes from the previous run through the current date and time. If the TO option is not specified, the default is yesterday's date.

**[ DAYS *number* ]**

VMJTVA accounts for tape volumes for *number* days. The number of volume-days is accumulated for each user so that at the end of processing only one accounting record is generated for each user.

**[ VMTAPEID *userid* ]**

specifies the userid of the BrightStor VM:Tape service virtual machine that maintains the TMC. The default is VMTAPE.

**[ CLASS *class* ]**

specifies the 1-character reader class of the accounting records sent to Unicenter VM:Account. The default is class A. This reader class must be the same as that specified on the COLLECT record in the VMACCT CONFIG file.

**[ FORCE ]**

allows a user to deliberately force the system to charge customers double using the FROM/TO options. Without this, double charging causes an error message and a return to CMS.

Do not use the FROM, TO, and DAYS options at the same time. You may, however, use any two of them together.



# User Exits

There are sample user exits written in assembler and REXX on the Computer Associates distribution tape. They are loaded to the VMRMaint 170 minidisk when Unicenter VM:Account is installed or upgraded. You need to modify, rename, and, when necessary, compile the sample user exits before using them.

Unicenter VM:Account supports user exits written in assembler, REXX, or any high-level language that uses standard OS linkage.

Table 13 lists Unicenter VM:Account user exits and briefly describes them.

*Table 13. User Exit Quick Reference*

| User Exit | Description                                                                                                                                                                                                                                                                                  | Page |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| ACCTDATA  | Modifies accounting data before Unicenter VM:Account costs a record.                                                                                                                                                                                                                         | 248  |
| BUDGET    | Specifies an action when users exceed their budget. Unicenter VM:Account calls this user exit when users exceed the percentage of their budget specified on the BUDGET YES configuration file record. The budget's dollar amount must be greater than 0 or the user exit will not be called. | 249  |
| COMMAND   | Changes any part of a command, including the command itself, overrides the Unicenter VM:Account authorization check, and sets up your own command authorization scheme.                                                                                                                      | 251  |
| COSTING   | Overrides costs set by Unicenter VM:Account and costs user-defined records.                                                                                                                                                                                                                  | 253  |
| ENDCMD    | Starts another command or overrides the return code from the command just completed. Unicenter VM:Account calls this exit at the end of command execution to provide you control then.                                                                                                       | 254  |
| QUERY     | Continues or cancels QUERY USAGE commands. Unicenter VM:Account calls this exit after it performs its own validation and selects the QUERY records to be processed, but before it checks the size limits.                                                                                    | 255  |
| RAWDATA   | Modifies the raw accounting data.                                                                                                                                                                                                                                                            | 257  |

*(continued)*

Table 13. User Exit Quick Reference (continued)

| User Exit | Description                                                                                                                                                                                                                                                                                                                                          | Page |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| SHIFT     | Issues commands at shift change. Unicenter VM:Account calls this exit during initialization and at shift change to provide you control then.                                                                                                                                                                                                         | 259  |
| VMJCMPX2  | Examines, modifies, deletes, or inserts records after sorting and before compression by the VMJCMP utility. This gives you additional control over the algorithms that govern compression. Unlike the other user exits, VMJCMPX2 is called from VMJCMP. Refer to <i>PERIODTE File Compression Utility (VMJCMP)</i> on page 185 for more information. |      |

## Implementing User Exits

1. Write a user exit or customize one of the samples.
2. Put your user exits on the Unicenter VM:Account service virtual machine 191 minidisk to ensure that Unicenter VM:Account uses the correct user exit each time. This also protects the user exits from being overlaid during upgrades.
3. Add a USEREXIT record to the VMACCT CONFIG file for each user exit you want to install. The only exception is the compression user exit, VMJCMPX2, which is called from VMJCMP. You have to run the utility to invoke the user exit.
4. Create, if necessary, other supporting configuration file records. For example, you cannot call a BUDGET user exit unless you have a BUDGET configuration record in the VMACCT CONFIG file.
5. If the user exit is written in a high level language, link and access the minidisks where the run-time libraries reside.
6. Issue a CMS GLOBAL command for all run-time libraries before initializing Unicenter VM:Account.
7. Reinitialize Unicenter VM:Account or issue the REFRESH command to load a new or modified user exit.

## Requirements

Do not prefix Unicenter VM:Account commands with VMACCT when you use a Unicenter VM:Account command in a user exit. Use only the command name.

## User Exit Processing

Except for the compression user exit, the user exits can be divided into three groups: user exits that affect commands, user exits that affect processes, and user exits that affect data. Below are lists of the user exits and how Unicenter VM:Account processes them.

### Command User Exits

The COMMAND, ENDCMD, and QUERY user exits affect commands.

This is the sequence of events that occurs during processing of command user exits:

1. The command is issued.
2. Unicenter VM:Account validates the command.
3. Unicenter VM:Account calls the COMMAND user exit.
4. Unicenter VM:Account calls the QUERY user exit.
5. The command finishes processing.
6. Unicenter VM:Account calls the ENDCMD user exit.
7. Processing ends.

### Process User Exits

The SHIFT user exit affects processes.

This is the sequence of events that occurs during processing of the SHIFT user exit:

1. The shift changes.
2. Unicenter VM:Account calls the SHIFT user exit.
3. Processing ends.

### Data User Exits

The ACCTDATA, BUDGET, COSTING, and RAWDATA user exits affect data. These user exits are called when records are processed and when you run the recost utility, VMJRCS. Keep this in mind when you code the user exits. If the user exits manipulate data when it is initially processed, you may not want to manipulate it in the same way during recost processing.

Unicenter VM:Account performs this sequence of events when it processes the data user exits:

1. Receives data.
2. Calls the RAWDATA user exit.
3. Calculates additional record fields such as shift ID, customer ID, and project ID.

4. Calls the ACCTDATA user exit.
5. Calculates cost.
6. Calls the COSTING user exit.
7. Updates the budget.
8. Calls the BUDGET user exit.
9. Processing ends.

## Writing User Exits Using OS Linkage

Unicenter VM:Account allows you to use OS standard linkages to communicate between the component and the user exits. It uses the following registers:

| Register | Usage                                                                                                                                                                                                                                                                                              |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1       | Unicenter VM:Account user exits use this register to point to a parameter list consisting of six address words. The first four words point to the parameters unique to the user exit. The fifth word points to the name of the user exit. The sixth word points to a 512-character user work area. |
| R13      | User exits use this register to point to the register save area.                                                                                                                                                                                                                                   |
| R14      | User exits use this register to store the address of the Unicenter VM:Account process to which control returns when the user exit completes.                                                                                                                                                       |
| R15      | Unicenter VM:Account uses this register as the entry address of the user exit so that it can be used as the base address.                                                                                                                                                                          |

To pass information to Unicenter VM:Account, update the parameter pointed to by R1. If the return code from your user exit is zero, Unicenter VM:Account checks this data and takes whatever action is indicated. In each of the user exit reference sections, there are tables that describe the return codes for each user exit and the action Unicenter VM:Account takes based on the value.

## Writing User Exits in REXX

Because REXX is an interpreted language, programs written in it run more slowly than those written in languages such as assembler, COBOL, and FORTRAN. As a result, REXX user exits cause a degradation in Unicenter VM:Account response time. Write your user exits using one of the other languages if you are dealing with many accounting records.

Unicenter VM:Account passes information directly to REXX. It passes five pieces of information: the first four are parameters related to that user exit and the fifth corresponds to the user exit name. The REXX user exit receives this information using the PARSE ARG statement.

To send information back to Unicenter VM:Account, use the expression parameter of either the RETURN (*expression*) or EXIT (*expression*) statement. You may also push one piece of information onto the program stack using the REXX PUSH statement.

---

**WARNING:** Unicenter VM:Account checks only the top element of the stack.

---

Each user exit section gives sample parameter lists of the statements you use to receive information from Unicenter VM:Account in each of your REXX user exits. These parameters correspond to the ones defined for the OS Linkage user exits. Periods appear where the parameter is useful only to the OS Linkage user exits.

## Compiled REXX

Unicenter VM:Account supports compiled REXX user exits. These compiled REXX programs must have a filetype of EXEC.

## ACCTDATA User Exit

The ACCTDATA user exit enables you to modify the 240 bytes of PERIODTE-format records, but its main objective is to gather information to fill the extended record fields for project, customer, shift, and package for locally defined records. Computer Associates provides a set of callable service routines to help you do this.

For the rest of the records, the user exit enables you to modify any of the fields before Unicenter VM:Account does costing.

### Calling Parameters

|          |                                                                              |
|----------|------------------------------------------------------------------------------|
| ACCTDATA | <i>account_record flags reserved<sub>1</sub> reserved<sub>2</sub> exitid</i> |
|----------|------------------------------------------------------------------------------|

### Parameter List Addresses

| Length | Description                                                                                                                                                                                                                                                                                        |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 240    | Accounting data record Unicenter VM:Account has expanded                                                                                                                                                                                                                                           |
| 4      | Set of four flags: <ul style="list-style-type: none"><li>- Whether Unicenter VM:Account is recosting the record (Y or N)</li><li>- How Unicenter VM:Account is configured (A = CHGCUST ACCOUNT, P = CHGCUST PROJECT)</li><li>- Reserved for future use</li><li>- Reserved for future use</li></ul> |
| 34     | Reason Unicenter VM:Account rejected this record, if one exists                                                                                                                                                                                                                                    |
| 1      | Reserved for future use                                                                                                                                                                                                                                                                            |

### Return Codes

| Value in R15 | Action                     |
|--------------|----------------------------|
| 0            | Accepts record and changes |
| ≠0           | Rejects record             |



## BUDGET User Exit

When users exceed their budgets by the percentage specified on the BUDGET configuration file record, the BUDGET user exit is called. You can code the user exit to tell Unicenter VM:Account what to do to the userid, customer, account number, or project.

For example, you can increase the customer budget limit if there are still funds available at the time the record is processed. Or you could prevent a user who has exceeded the budget from logging on by changing the userid's password to NOLOG.

### Calling Parameters

|        |                                                  |
|--------|--------------------------------------------------|
| BUDGET | <i>recaddr flags limitsusage reserved exitid</i> |
|--------|--------------------------------------------------|

### Parameter List Addresses

| Length | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 240    | Accounting data record being processed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 12     | Set of 12 flags:<br>Flags 1 through 4 indicate whether the customer, project, or account number is the element over budget. Their values can be: <ul style="list-style-type: none"><li>- Y Element is over budget</li><li>- W Element is within the warning percentage</li><li>- N Element is within budget</li></ul> Flags 5 through 11 are Y/N flags that indicate whether Unicenter VM:Account should perform the specified budget enforcement action for each these elements: <ul style="list-style-type: none"><li>- Customer</li><li>- Customer and Account Number</li><li>- Project</li><li>- Project and Account Number</li><li>- Send a message to the user</li><li>- FORCE the user</li><li>- Change the user's password to NOLOG</li><li>- Change CUSTOMER budget</li><li>- Change the CUSTOMER/ACCOUNT budget</li><li>- Change the PROJECT budget</li><li>- Change the PROJECT/ACCOUNT budget</li><li>- Reserved for future use</li></ul> |

(continued)

| <b>Length</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 32            | <p>Eight words contain the budget limit and usage for this userid:</p> <ul style="list-style-type: none"> <li>- Word 1 = Customer Limit</li> <li>- Word 2 = Customer and Account Number Limit</li> <li>- Word 3 = Project Limit</li> <li>- Word 4 = Project and Account Number Limit</li> <li>- Word 5 = Customer Usage</li> <li>- Word 6 = Customer and Account Number Usage</li> <li>- Word 7 = Project Usage</li> <li>- Word 8 = Project and Account Number Usage</li> </ul> |
| 130           | Message to send to the user                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Return Codes

| <b>Value in<br/>R15</b> | <b>Action</b>                |
|-------------------------|------------------------------|
| 0                       | Acts on budget control flags |
| ≠0                      | No action                    |

## COMMAND User Exit

Unicenter VM:Account treats the COMMAND user exit call as if it were a function call, but does not require you to return information.

---

**Note:** The COMMAND exit disables VMCF and IUCV interrupts in control register 2 for the duration of an immediate command. This means that a COMMAND exit cannot make use of VMCF or IUCV either directly or indirectly. To avoid unpredictable results, do not enable interrupts.

---

### Calling Parameters

|         |                                          |
|---------|------------------------------------------|
| COMMAND | <i>userid command parms flags exitid</i> |
|---------|------------------------------------------|

### Parameter List Addresses

| Length | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8      | Userid issuing the command                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 8      | Name of the command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 256    | Parameters for the command                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4      | Set of four flags: <ul style="list-style-type: none"><li>- Whether the command is a valid Unicenter VM:Account command (Y or N)</li><li>- How the command was issued<ul style="list-style-type: none"><li>I = Immediate command</li><li>F = Full-screen command; you cannot modify parameters for full-screen commands</li><li>L = Line-mode command</li></ul></li><li>- Where the command came from (U = Utility, L = Local, T = Terminal)</li><li>- Bit mask of user's current authorization</li></ul> |

### Return Codes

| Value in R15            | Action                                                                                                                                                                                                                                                                                                          |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -1                      | Cancels command                                                                                                                                                                                                                                                                                                 |
| $\geq 0$ but $\neq 255$ | User may execute the command; the two low-order bytes of the return code can modify the user's subsequent authorization for the remainder of execution of the current command; the change in authorization has no effect on other commands issued by the same user, even if those commands execute concurrently |
| 255                     | Allows user to invoke command without changing authorizations                                                                                                                                                                                                                                                   |

REXX exits return the character decimal value equivalent. If the value is not one of the EBCDIC hex strings described below, a return code of 0 is assumed and the returned string is treated as a replacement for the user specified command and operands.

Authorization changes are specified in the form of two bit masks in the two low-order bytes of the return code:

|                    |                 |                 |                |                 |
|--------------------|-----------------|-----------------|----------------|-----------------|
| <b>Return Code</b> | <b>00000000</b> | <b>00000000</b> | <b>OR_mask</b> | <b>AND_mask</b> |
| <b>Byte</b>        | <b>0</b>        | <b>1</b>        | <b>2</b>       | <b>3</b>        |

Authorizations are formed by ORing the user's current privilege level with the mask in byte 2 and ANDing the result with byte 3. In this way, privileges can be added or withdrawn in any combination.

## Authorization Hex Codes

Authorizations are encoded in the masks as follows:

|                      |                 |
|----------------------|-----------------|
| <b>Authorization</b> | <b>Hex Code</b> |
| SYSADMIN             | X'80'           |
| MANAGER              | X'40'           |
| PROJLDR              | X'20'           |
| CHGADMIN             | X'10'           |
| AUDITOR              | X'08'           |
| OPERATOR             | X'04'           |
| ANYUSER              | X'00'           |

## Example Return Codes

The following are examples of various return codes and their effect on authorization:

|                    |                                                                                    |
|--------------------|------------------------------------------------------------------------------------|
| <b>Return Code</b> | <b>Effect on Authorization</b>                                                     |
| X'00000000'        | Withdraws all special privileges                                                   |
| X'000000FF'        | No effect on privileges                                                            |
| X'000004FF'        | Adds OPERATOR; other settings unaffected                                           |
| X'000000FB'        | Removes OPERATOR; other settings unaffected                                        |
| X'00000404'        | Sets OPERATOR on, all others off; initial settings have no influence on the result |
| X'0000247F'        | Adds PROJLDR and OPERATOR, removes SYSADMIN                                        |

These strings must be converted using the X2D (Hexadecimal to Decimal) function when writing the COMMAND exit in REXX.

## COSTING User Exit

The COSTING user exit enables you to modify the costing fields of PERIODTE-format records after Unicenter VM:Account fills them. You should cost locally defined records with the COSTING user exit.

### Calling Parameters

|         |                                                                              |
|---------|------------------------------------------------------------------------------|
| COSTING | <i>account_record flags reserved<sub>1</sub> reserved<sub>2</sub> exitid</i> |
|---------|------------------------------------------------------------------------------|

### Parameter List Addresses

| Length | Description                                                                                                                                                                                                                                                                                                          |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 240    | Accounting data record Unicenter VM:Account has expanded                                                                                                                                                                                                                                                             |
| 4      | Set of four flags: <ul style="list-style-type: none"><li>- Whether Unicenter VM:Account is recosting the record (Y or N)</li><li>- How Unicenter VM:Account is configured (A = CHGCUST ACCOUNT, P = CHGCUST PROJECT)</li><li>- Whether the record type is valid (Y or N)</li><li>- Reserved for future use</li></ul> |
| 34     | Reason Unicenter VM:Account rejected this record, if one exists                                                                                                                                                                                                                                                      |
| 1      | Reserved for future use                                                                                                                                                                                                                                                                                              |

### Return Codes

| Value in R15 | Action                             |
|--------------|------------------------------------|
| 0            | Accepts the record and any changes |
| ≠0           | Rejects the record                 |

## ENDCMD User Exit

When a Unicenter VM:Account command has finished executing, Unicenter VM:Account calls this user exit before passing control back to the user. The ENDCMD user exit receives the issuing userid, command, parameters, and return code. You can begin other actions based on this information. For example, if you get a bad return code from a project command, you can notify the user or operator by sending a message. Unicenter VM:Account can also start another process.

---

**Note:** The ENDCMD user exit disables VMCF and IUCV interrupts for the duration of an immediate command. This means that an ENDCMD user exit cannot make use of VMCF or IUCV either directly or indirectly. To avoid unpredictable results, do not enable either VMCF or IUCV when using an ENDCMD user exit.

---

## Calling Parameters

|        |                                            |
|--------|--------------------------------------------|
| ENDCMD | <i>userid command parms retcode exitid</i> |
|--------|--------------------------------------------|

---

**Note:** The parameter *retcode* in the ENDCMD user exit is in binary when Unicenter VM:Account passes it to REXX. You must convert it to a usable format using the REXX C2D (Character to Decimal) function for use in your program and back to binary using the D2C (Decimal to Character) function to send it back to Unicenter VM:Account.

---

## Parameter List Addresses

| Length | Description                    |
|--------|--------------------------------|
| 8      | Userid that issued the command |
| 8      | Name of the command            |
| 256    | Parameters for the command     |
| 4      | Return code from the command   |

## Return Codes

| Value in R15 | Action                           |
|--------------|----------------------------------|
| 0            | Checks for change in return code |
| ≠0           | No action                        |

## QUERY User Exit

Use the QUERY user exit to restrict query usage privileges. For example, if you want userid SUZY to be able to query userid SALES but not userid SUPPORT, give System Administrator authority to SUZY to query everyone and then control exceptions through this user exit.

### Calling Parameters

|       |                                                         |
|-------|---------------------------------------------------------|
| QUERY | <i>userid authority reccounts selectcriteria exitid</i> |
|-------|---------------------------------------------------------|

### Parameter List Addresses

| Length | Description                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8      | Userid issuing the QUERY USAGE command                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 8      | Highest authority assigned to the userid                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 12     | Set of three fields:                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | <ul style="list-style-type: none"> <li>▶ Number of records Unicenter VM:Account needs must read to process this query</li> <li>▶ Warning limit specified on the QRLIMIT record in the VMACCT CONFIG file</li> <li>▶ Final limit specified on the QRLIMIT record in the VMACCT CONFIG file</li> </ul>                                                            |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 96     | QUERY USAGE selection criteria:                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        | <ul style="list-style-type: none"> <li>▶ DBQCUST</li> <li>▶ DBQACCT</li> <li>▶ DBQUSER</li> <li>▶ DBQPROJ</li> <li>▶ DBQPKG</li> <li>▶ DBQDAT1</li> <li>▶ DBQDAT2</li> <li>▶ DBQSHFT</li> <li>▶ DBQCUSTL</li> <li>▶ DBQACCTL</li> <li>▶ DBQUSERL</li> <li>▶ DBQPROJL</li> <li>▶ DBQPKGGL</li> <li>▶ DBQDAT1L</li> <li>▶ DBQDAT2L</li> <li>▶ DBQSHFTL</li> </ul> | <ul style="list-style-type: none"> <li>▶ CL12</li> <li>▶ CL8</li> <li>▶ CL8</li> <li>▶ CL24</li> <li>▶ CL8</li> <li>▶ CL6</li> <li>▶ CL6</li> <li>▶ CL8</li> <li>▶ H</li> <li>▶ H</li> <li>▶ H</li> <li>▶ H</li> <li>▶ H</li> <li>▶ H</li> <li>▶ H</li> <li>▶ H</li> </ul> | <ul style="list-style-type: none"> <li>▶ Customer name</li> <li>▶ Account number</li> <li>▶ Userid</li> <li>▶ Project ID</li> <li>▶ Package name</li> <li>▶ Begin date (yyymmdd)</li> <li>▶ End date (yyymmdd)</li> <li>▶ Shift number</li> <li>▶ Customer generic length</li> <li>▶ Account generic length</li> <li>▶ Userid generic length</li> <li>▶ Project generic length</li> <li>▶ Package generic length</li> <li>▶ Begin date generic length</li> <li>▶ End date generic length</li> <li>▶ Shift generic length</li> </ul> |

## Return Codes

| Value | Description         |
|-------|---------------------|
| 0     | Accepts QUERY USAGE |
| ≠0    | Cancels QUERY USAGE |



## RAWDATA User Exit

The RAWDATA user exit receives a copy of an incoming record without any modification or extension. This exit enables you to modify the record, accept it, reject it, or ignore it. You can also transform an incoming record into any other type of record.

After this user exit executes, any record being accepted has to be:

- A standard CP record other than C0

The values in the fields could have been modified but the structure of the record is not changed.

- A C0 record supported by Unicenter VM:Account

The values in the fields could have been modified but the structure of the record is not changed. Examples of these types of records are the C0s produced by RSCS, TSAF, SFS virtual machines, and Computer Associates products like BrightStor VM:Archiver and Unicenter VM:Spool. Unicenter VM:Account changes these records to record types after the RAWDATA user exit completes processing, so they begin with the letter A.

- A locally defined record type

Usually it is a C0 record, sent to the CP accounting stream by a virtual machine executing an X'4C' diagnose instruction, or any record type punched from an authorized virtual machine. Normally, these records will be converted by the user exit into new user selected record types. For this kind of record, during the execution of the RAWDATA user exit, the user must verify that the accepted record has the accounting ending date in columns 17-22 (in *mmdyy* format) followed by the time. The date will be converted to *yymmdd* format and compared to the beginning date on the PERIODTE CURRENT header. The record will be rejected if its date is before the one on the header.

The third flag passed to the RAWDATA user exit is assigned a function. The possible values of this flag are Y or N meaning that Unicenter VM:Account recognizes the record as a valid record or as an invalid record. If the RAWDATA user exit is not present, Unicenter VM:Account uses the information in this flag to accept or reject a record. However if the user exit is present, a record to be rejected, according to this flag, could be a user record. Because Unicenter VM:Account passes every record to the user exit, it is the responsibility of the user to ensure that strange records are kept from getting to the PERIODTE file.

A simplified approach of the flow inside the RAWDATA is illustrated in the following pseudocode:

```
If this is a user record or the record we want to treat
  then modify the record
  else if third-flag = 'Y'
    then accept the record
    else reject the record
```

The use of this new flag is demonstrated in the sample user exits provided with Unicenter VM:Account.

Calling Parameters

|         |                                                                          |
|---------|--------------------------------------------------------------------------|
| RAWDATA | <i>raw_record flags reserved<sub>1</sub> reserved<sub>2</sub> exitid</i> |
|---------|--------------------------------------------------------------------------|

Parameter List Addresses

| Length | Description                                                                                                                                                                                                                                                                                                            |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 80     | Raw data record CP sent to Unicenter VM:Account                                                                                                                                                                                                                                                                        |
| 4      | A set of four flags: <ul style="list-style-type: none"><li>- Whether Unicenter VM:Account is recosting the record (Y or N)</li><li>- How Unicenter VM:Account is configured (A = CHGCUST ACCOUNT, P = CHGCUST PROJECT)</li><li>- Whether the record type is valid (Y or N)</li><li>- Reserved for future use</li></ul> |
| 34     | Reason Unicenter VM:Account rejected this record, if one exists                                                                                                                                                                                                                                                        |
| 1      | Reserved for future use                                                                                                                                                                                                                                                                                                |

Return Codes

| Value in R15 | Action                     |
|--------------|----------------------------|
| 0            | Accepts record and changes |
| >0           | Rejects record             |
| <0           | Ignores record             |

## SHIFT User Exit

When Unicenter VM:Account cuts a shift, it executes the commands for shift processing and then calls the SHIFT user exit. Unicenter VM:Account passes the user exit the current date and time, the name of the shift that is ending, and the name of the shift that is starting. You can use the SHIFT user exit to run your daily reports at the end of your main shift, for example.

### Calling Parameters

|       |                                         |
|-------|-----------------------------------------|
| SHIFT | <i>datetime old new reserved exitid</i> |
|-------|-----------------------------------------|

### Parameter List Addresses

| Length | Description             |
|--------|-------------------------|
| 16     | Current date and time   |
| 8      | Old shift name          |
| 8      | New shift name          |
| 1      | Reserved for future use |

### Return Codes

| Value in R15 | Action    |
|--------------|-----------|
| 0            | No action |
| ≠0           | No action |

## Callable Service Routines

Unicenter VM:Account offers callable service routines for you to use when you write user exits. Table 14 presents the names of the routines and describes their functions.

Table 14. Callable Service Routines

| Entry Point Name<br>(OS Linkage Languages) | Service Routine<br>(REXX) | Function                                                                                                                                                                                                                                                                                    |
|--------------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UEXACCT                                    | DFLTACCT                  | Returns the default account number for a specified userid                                                                                                                                                                                                                                   |
| UEXPROJ                                    | DFLTPROJ                  | Returns the default project ID for the specified account number                                                                                                                                                                                                                             |
| UEXCUST                                    | CUSTOMER                  | Returns the customer ID associated with the specified account number and project ID                                                                                                                                                                                                         |
| UEXSHIFT                                   | SHIFT                     | Returns the shift associated with the specified date and time                                                                                                                                                                                                                               |
| UEXPJNM                                    | PROJNAME                  | Returns the project name for the specified project ID (4 bytes hexadecimal)                                                                                                                                                                                                                 |
| UEXPKNM                                    | PKGNAME                   | Returns the package name for a specified package ID (2 bytes hexadecimal)                                                                                                                                                                                                                   |
| UEXBATI                                    | BATINFO                   | Returns the Unicenter VM:Batch job information for the specified Unicenter VM:Batch job number (2 bytes hexadecimal)                                                                                                                                                                        |
| UEXAUTH                                    | AUTHORIT                  | Returns the highest authorization defined in the VMACCT CONFIG for a specified userid as a string corresponding to the authorization keyword as specified in the AUTHORIZ record (refer to <i>AUTHORIZ Record</i> on page 145 for possible values); for a general user, blanks are returned |
| UEXCMND                                    | NEWCMND                   | Starts a command process                                                                                                                                                                                                                                                                    |
| UEXFREE                                    | Not used                  | Performs storage allocation (assembler for your process only)                                                                                                                                                                                                                               |
| UEXFRET                                    | Not used                  | Releases storage allocations (assembler for your process only)                                                                                                                                                                                                                              |

The following sections demonstrate how to use the callable service routines with assembler, COBOL, and REXX.

## Assembler Example

Use these statements in your assembler user exits:

```
PLIST      DC A(PARM1)
           DC A(PARM2)
           DC A(PARM3)
LA         R1,PLIST
L          R15,V(routinename)
BALR      R14,R15
LTR       R15,R15
```

Table 15 displays the contents of each element of the PLIST for each service routine:

*Table 15. PLIST Contents for Service Routines*

| <b>Routine</b> | <b>PLIST Contents</b>                             |
|----------------|---------------------------------------------------|
| UEXACCT        | <i>A(userid), A(account_result)</i>               |
| UEXPROJ        | <i>A(account), A(project_result)</i>              |
| UEXCUST        | <i>A(account), A(project), A(customer_result)</i> |
| UEXSHFT        | <i>A(date_time), A(shift_result)</i>              |
| UEXPJNM        | <i>A(proj_index), A(projname_result)</i>          |
| UEXPKNM        | <i>A(pkg_index), A(pkgname_result)</i>            |
| UEXBATI        | <i>A(vmbatch_jobnumber), A(32_bytes_info)</i>     |
| UEXAUTH        | <i>A(userid), A(auth_result)</i>                  |
| UEXCMD         | <i>A(command_string)</i>                          |
| UEXFREE        | <i>R0 ⇒ dwords R1 ⇒ addr</i>                      |
| UEXFRET        | <i>R0 ⇒ dwords R1 ⇒ addr</i>                      |

## COBOL Example

Use this statement to call service routines from your COBOL user exits:

**CALL *routinename* USING PARM1, RESULT**

The only exceptions to this format are the UEXCMND and UEXCUST routines. UEXCMND uses only one variable following the USING keyword and UEXCUST uses three.

Remember to add appropriate GLOBAL commands to the PROFILE EXEC of the Unicenter VM:Account service virtual machine before loading and using a COBOL user exit.

## REXX Example

Use these statements in your REXX user exits to call the service routines:

```
accountnumber = DFLTACCT(user)  
projectid = DFLTPROJ(accountnumber)  
customerid = CUSTOMER(accountnumber, projectid)  
shiftid = SHIFT(datetime)  
projectname = PROJNAME(projectid)  
batchinfo = BATINFO (vmbatchjobnumber)  
packagename = PKGNAME(packageid)  
authorization = AUTHORIT(user)  
retcode = NEWCMND(commandstring)
```

### BATINFO Format

Unicenter VM:Account supplied the following information in the 32-bytes it returned from the UEXBAT1-BATINFO service routine:

| Byte  | Field    | Description             |
|-------|----------|-------------------------|
| 1-8   | USERID   | Userid                  |
| 9-16  | ACCOUNT  | Account                 |
| 17-24 | JOBNAME  | Job name                |
| 25    | JOBCLASS | Job class               |
| 26    | JOBPRIOR | Job priority            |
| 27-32 |          | Reserved for future use |

### SHIFT Format

Send the date and time information to Unicenter VM:Account in *yymmdd* (date) and *hhmmss* (time) format.

## Functions Returning Blanks

When called from REXX, all functions except NEWCMND will return blanks if the input parameters cannot be used to get the desired information. This will allow the following:

```
shift_id = SHIFT(date_time)  
If shift_id = " then signal SHIFT_ERROR
```

# COBOL Reports

Unicenter VM:Account produces standardized data center accounting reports. Run these reports monthly, quarterly, annually, or to coincide with your business calendar. The Unicenter VM:Account reports allow you to organize detail and summary accounting information by customer, account, package, project, shift, userid, and other keywords. You can also produce customer invoices, an invoice register, customer account detail and summary reports.

Unicenter VM:Account reports use the Record Selection utility (VMJSEL) for selecting records from the input file. Refer to page 223 for more information about this utility.

Table 16 lists the reports that are included with Unicenter VM:Account and briefly describes them.

Table 16. COBOL Reports Quick Reference

| Report   | Title                         | Function                                                                                                                 | Page |
|----------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------|------|
| VMJCHRG  | Charge Summary                | Lists resource charges summarized by the fields specified when the report is generated                                   | 271  |
| VMJINVCE | Invoice and Invoice Ledger    | Prints customer invoices and an invoice ledger                                                                           | 274  |
| VMJMDISK | Minidisk Utilization Summary  | Lists minidisk utilization summarized by the fields specified when the report is generated                               | 277  |
| VMJMISC  | Miscellaneous Charges/Credits | Lists charges and credits by customer ID                                                                                 | 279  |
| VMJMONTH | Monthly VM Utilization        | Displays monthly resource utilization for a year                                                                         | 281  |
| VMJORVW  | Operations Overview           | Lists resource utilization and charges by resource type, summarized by the fields specified when the report is generated | 283  |
| VMJQRT   | Quarterly VM Utilization      | Displays quarterly resource utilization for a year                                                                       | 286  |
| VMJRSCS  | RSCS Utilization              | Displays utilization information for RSCS                                                                                | 288  |

(continued)

Table 16. COBOL Reports Quick Reference (continued)

| Report   | Title                      | Function                                                                                   | Page |
|----------|----------------------------|--------------------------------------------------------------------------------------------|------|
| VMJRUT   | Resource Utilization       | Displays resource utilization from session records at user-defined sort and summary fields | 290  |
| VMJTREND | Utilization Trend Analysis | Depicts resource utilization for two specified periods of time                             | 291  |

Table 17 summarizes the steps you must perform to produce a report.

Table 17. Report Generation Checklist

| Step | Action                                                                                                    | Page |
|------|-----------------------------------------------------------------------------------------------------------|------|
| 1    | Review the introductory material in this chapter.                                                         |      |
| 2    | Create or access a control file for the report you are running. See the section Control Files.            | 265  |
| 3    | Obtain links to the minidisks identified in the section Minidisk Requirements.                            | 265  |
| 4    | Establish a read link to the disk containing the input files for the report. See the section Input Files. | 265  |
| 5    | Access the COBOL or COBOL II run-time library.                                                            |      |
| 6    | Run the report.                                                                                           | 269  |
| 7    | View the report's output.                                                                                 |      |

## Overview

These items reside on the VMRMAINT 170 minidisk:

- ▶ Report program TEXT files
- ▶ VMJSEL MODULE and TEXT files
- ▶ EXECs to run each report program
- ▶ Default control files for the reports



## Control Files

The report programs use control files to define record selection criteria, sort fields, input data, output data, report titles, and parameter (PARMS) records. The report programs use PARMS records to specify date ranges, shifts, minidisk, and print information. Refer to *Record Selection Utility (VMJSEL)* on page 223 for more information about the selection utility and control file.

When you run the reports, you can have Unicenter VM:Account prompt you for modifications to the control file. If you want, you can save these changes in a new control file.

Sample control files for each report are included on the distribution tape.

## Input Files

The report programs can be run using the PERIODTE CURRENT file, closed PERIODTE files, trend files, or a selected subset of any of these.

To use the PERIODTE CURRENT file as input:

1. Issue the SUSPEND command.
2. Reaccess the minidisk containing the PERIODTE CURRENT file. This minidisk is specified on the COLLECT configuration file record.
3. Run the report.
4. Issue the RESUME command.

If you want to run a report on a closed accounting period, include the complete fileid on an INFILE control file record in the report control file.

You can use from 1 to 12 input files for reporting on resource utilization over many accounting periods.

Use trend files as input to report on long-range usage trends. Trend files are particularly useful for reports that contain resource/charge information for a one-year period on a monthly and quarterly basis, or for comparing two accounting periods.

## Minidisk Requirements

- ▶ Establish a read link to the VMRMaint 170 minidisk.
- ▶ Establish a read link to the VMRMaint 192 minidisk for the VMNUMS MODULE and TEXT files.
- ▶ Establish a read link to the Unicenter VM:Account code minidisk for the VMACCT MESSAGES file. This minidisk is usually the 192, unless you are using alternate minidisk support.

- Make sure your input files and control file are on an accessed minidisk. The filemode of the PERIODTE CURRENT file is specified on the COLLECT record in the VMACCT CONFIG file.
- If you specify the PROMPT command line option to edit a control file, the minidisk containing the file must be accessed read/write. The VMJINVCE and VMJMISC report programs always need the control file to reside on a read/write minidisk to update invoice numbers and the SORT/PRESORT records.
- Minidisk space requirements depend on the options that are specified in the report control file. If you specify the DISK *filemode* option on the PARMS record in the control file, the *filemode* minidisk must be accessed read/write with enough space to contain the report output listing. When you do not specify the *filemode* parameter, the report program uses the first read/write minidisk it finds in the CMS search order.
- You need access to the minidisks where the COBLIBVS (or VSC2LTXT or SCEELKED) and VMSLIB (or CMSLIB) TXTLIBS files reside.

## Modifying the Reports

You can modify the COBOL report programs to meet your needs. The section *COBOL* on page 4 identifies the compiler you need to modify the programs.

The COBOL source programs are not automatically loaded when you install Unicenter VM:Account. Loading these programs is a separate step. Instructions for loading them are in the *CA VM:Manager Reference Manual*.

## Compiler Options

There are numerous compiler options on the COBOL command so that you can customize programs.

The indicated options are required for the Unicenter VM:Account COBOL TEXT files to execute and interact with the subroutine EXECs, TEXTs, and MODULEs:

|          | If you are using<br>IBM COBOL for<br>MVS and VM | If you are using<br>VS COBOL II | If you are using<br>OS/VS COBOL |
|----------|-------------------------------------------------|---------------------------------|---------------------------------|
| APOST    | ✓                                               | ✓                               | ✓                               |
| DUMP     | ✓                                               | ✓                               | ✓                               |
| LIB      | ✓                                               | ✓                               | ✓                               |
| LOAD     |                                                 |                                 | ✓                               |
| NOADV    | ✓                                               | ✓                               | ✓                               |
| NODYNAM  | ✓                                               | ✓                               | ✓                               |
| NOENDJOB |                                                 |                                 | ✓                               |
|          |                                                 |                                 | (continued)                     |

|            | If you are using<br>IBM COBOL for<br>MVS and VM | If you are using<br>VS COBOL II | If you are using<br>OS/VS COBOL |
|------------|-------------------------------------------------|---------------------------------|---------------------------------|
| NORESIDENT |                                                 |                                 | ✓                               |
| NOTEST     | ✓                                               | ✓                               | ✓                               |
| NOTRUNC    |                                                 |                                 | ✓                               |
| OBTECT     | ✓                                               | ✓                               |                                 |
| OPTIMIZE   |                                                 | ✓                               | ✓                               |

Consult the *IBM CMS User's Guide for COBOL and OS/VS COBOL Compiler and Library Programmer's Guide* for a description of the compiler options, special considerations, and restrictions on using OS/VS COBOL under CMS. If you are using IBM COBOL for MVS and VM, consult the *COBOL MVS & VM Programming Guide*.

## Accounting Record Data Descriptions

The data descriptions of the input accounting records used in the WORKING-STORAGE SECTION of the COBOL programs are included in a macro library named VMJCOPY MACLIB located on the VMRMAINT 170 minidisk; the record descriptions appear in Chapter 16, *Unicenter VM:Account Records*. The member name specified on the COPY COBOL statement is VMJRRECS.

## Compile Time

You must enter several GLOBAL commands at compile time. The first is:

**global maclib vmjcopy**

The next command you enter depends on the compiler you use.

If you use VS COBOL II, enter: **global txtlib vsc2ctxt vsc2ltxt vsc29txt**

If you use OS/VS COBOL, enter: **global txtlib cobolvs coblibvs**

If you use IBM COBOL for MVS & VM, enter: **global txtlib sceelkd**

The CMS interface to COBOL automatically issues a FILEDEF command for VMJCOPY MACLIB when it is on the compiling userid's A-disk with the filetype MACLIB. If the VMJCOPY MACLIB is on another minidisk you must issue a FILEDEF command for it before compiling the modified program. For example:

**filedef syslib disk vmjcopy maclib \***

The filename of the COBOL report must be compiled with the same filename because the report EXECs issue the LOAD VMJname command to statically load the object program at run time. For example, if you want to compile the VMJINVCE report on a VS COBOL II compiler, enter:

**cobol2 vmjinvce (apost dump lib noadv nodynam notest optimize**

## Record Sorting and Selection

The SORT and PRESORT records in the control files are used to specify the sort fields and the control break summary levels for each report. See the VMJSEL utility for more information about the SORT and PRESORT records.

### Report Execution Under Unicenter VM:Sort and CMS SORT

The reports execute differently if the user has Unicenter VM:Sort (or another sorting package) or CMS SORT. When you use CMS SORT, the VMJSRTCK EXEC performs an estimate by calculation on the requirements for virtual storage sort workspace and a minidisk large enough to accommodate the sorted file.

The VMJSEL utility calls Unicenter VM:Sort to sort the records if the control file contains a SORT record. VMJSEL selects/ignores and passes the records to the COBOL report program. Unicenter VM:Sort dynamically allocates temporary disk space (TDISK) for sort work files based on values in the TDISKS and TDISKADR records in the VMSORT CONFIG file; therefore, it is not necessary to allow for minidisk sort workspace. Unicenter VM:Sort uses sort work files when there is not enough virtual storage space for an incore (in user storage) sort. For more information, refer to the *Unicenter VM:Sort User's Guide*.

Sorting the input file for the reports using CMS SORT requires a minidisk to be accessed read/write with enough space to contain the selected/sorted file. When you use Unicenter VM:Sort or a similar sorting utility, no extra minidisk workspace is necessary. When the OUTFILE record is specified in the control file, the VMJSEL utility will write an output file of selected/sorted records to the first minidisk accessed read/write found in the CMS search order.

### Eliminating Unnecessary Sorting

Resource accounting data files can be quite large and require a large amount of time and system resources for sorting. Because reporting is generally done with groups of reports that are generated to coincide with your business calendar, you can improve performance by implementing the OUTFILE feature of Unicenter VM:Account.

With the OUTFILE feature you can eliminate unnecessary sorting for several reports by:

- ▶ Specifying the fileid of the selected/sorted file to be created on the OUTFILE record in the first report's control file.
- ▶ Specifying the same fileid on the INFILE record in each successive report's control file.
- ▶ Using the NOSORT command line option when executing the successive reports.

This does not eliminate all the sorting steps, but several of the reports can use the same sorted input files because sorting keyword sequences are the same.

## Using Other Sorting Utilities

If you wish to use a sort utility other than Unicenter VM:Sort, you must go to the VMJSGLOB EXEC and find the line that reads:

```
$sorttxt = 'VMSLIB'
```

Then change it to this, where *sorttextlib* is the name of your sort text library:

```
$sorttxt = 'sorttextlib'
```

## Running the Report

Use this command to run a report.

|                   |                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------|
| <i>reportname</i> | [ <i>cntlfilename</i> [ <i>cntlfiletype</i> [ <i>cntlfilemode</i> ] ] ] ( [ PROMPT ]<br>[ NOSORT ] ) |
|-------------------|------------------------------------------------------------------------------------------------------|

### ***reportname***

is the name of the report you want to run. Refer to Table 16 on page 263 for a list of the reports.

### **[ *cntlfilename* [ *cntlfiletype* [ *cntlfilemode* ] ] ]**

is the filename, filetype, and filemode of the control file for this report. The default fileid is *reportname* CONTROL \*. Refer to *Record Selection Utility (VMJSEL)* on page 223 for more information about control files.

### **[ PROMPT ]**

lets you modify the control file when the report is executed. This option puts you in an XEDIT screen for a control file named VMJUT1 CONTROL, which is a copy of the *reportname* CONTROL file. After modifying the control file, you can replace the *reportname* CONTROL file with the modified version, or only use the modified version for this execution of the report. You can also rename and save the modified version to use in a subsequent report run.

### **[ NOSORT ]**

specifies that the input file for the report has already been sorted and is specified on the INFILE record. The control file must have a PRESORT record indicating the fields on which the input file was sorted, and the original fileid of the file that was sorted.

## Error Reporting

Errors encountered during execution of the reports create a console spool file that is spooled to the requesting userid's virtual reader. The console spool file contains all system messages describing the error conditions encountered and the return code. The console spool file is named:

***rprtmmdd ERRnn***

where:

*rprt*

is the name of the report

*mmdd*

is the month and day the report was run

*ERRnn*

is the return code returned by the report

For example, if the VMJORVW report, run on August 22, had a return code of 28 during execution, the console file name would be:

***ORVW0822 ERR28***

COBOL program interrupts are intercepted by the VMNCOB subroutine and a dump is automatically taken. If a COBOL abend occurs, please contact Computer Associates Technical Support.

## Examples

- ▶ This command runs the VMJRUT report using the default control file, VMJRUT CONTROL:

***vmjrut***

- ▶ This command runs the VMJRUT report using the control file VMJRUT1 CONTROL:

***vmjrut vmjrut1***

- ▶ This command lets you change the VMJRUT1 CONTROL file before executing the report:

***vmjrut vmjrut1 (prompt***

## Charge Summary Report (VMJCHRGs)

The Charge Summary report lists charges accumulated for a specified period of time by a specified summary level. You can summarize charges by customer-id, project, userid, shift number, package, account number, and date. You can specify multiple summary levels.

### Control File Records

You can use any combination of up to eight sort fields in any order. Valid keyword specifications for the SORT and PRESORT record include:

- ▶ ACCOUNT
- ▶ BEGDATE (Begin date)
- ▶ CUSTOMER
- ▶ NODE
- ▶ PACKAGE
- ▶ PROJECT
- ▶ SHIFT
- ▶ USERID

Valid keyword specifications for the PARMS record include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ YEAR

## Sample Report

Figure 16 shows a sample of this report for May, 2002 with charges summarized by customer, userid, and project.

|                               |                  |                                    |                                |                                 |             |                              |                       |                  |
|-------------------------------|------------------|------------------------------------|--------------------------------|---------------------------------|-------------|------------------------------|-----------------------|------------------|
| DATE RANGE: 05/01/02-05/31/02 |                  | VM:ACCOUNT RESOURCE BILLING SYSTEM |                                |                                 |             |                              | PAGE: 1               |                  |
| REPORT DATE: 06/02/02         |                  | CHARGE SUMMARY                     |                                |                                 |             |                              | REPORT TIME: 16:15:10 |                  |
|                               |                  | BY: CUSTOMER                       |                                |                                 |             |                              |                       |                  |
| CUSTOMER: DEVELOPMENT         |                  |                                    |                                |                                 |             |                              |                       |                  |
|                               | <u>CPU USAGE</u> | <u>I/O</u><br><u>ACTIVITY</u>      | <u>COMBND</u><br><u>ONLINE</u> | <u>COMBND</u><br><u>OFFLINE</u> | <u>COMM</u> | <u>DED</u><br><u>DEVICES</u> | <u>OTHER</u>          | <u>T O T A L</u> |
| USERID : USER1                |                  |                                    |                                |                                 |             |                              |                       |                  |
| PROJECT : CSS,UNSPECIFIED     | \$0.00           | \$0.00                             | \$341.00                       | \$0.00                          | \$0.00      | \$0.00                       | \$0.00                | \$341.00         |
| PROJECT : DEV,VMJ             | \$1,708.07       | \$118.22                           | \$469.11                       | \$211.34                        | \$307.78    | \$0.00                       | \$0.00                | \$2,814.52       |
| PROJECT : DVL,VMJ             | \$0.00           | \$0.00                             | \$312.90                       | \$0.00                          | \$0.00      | \$141.72                     | \$0.00                | \$454.62         |
| PROJECT : VMJ,DEV             | \$581.32         | \$558.92                           | \$0.00                         | \$0.00                          | \$285.82    | \$0.00                       | \$25.70               | \$1,451.76       |
|                               | =====            | =====                              | =====                          | =====                           | =====       | =====                        | =====                 | =====            |
| USERID : USER1 TOTALS         | \$2,289.39       | \$677.14                           | \$1,123.01                     | \$211.34                        | \$593.60    | \$141.72                     | \$25.70               | \$5,061.90       |
|                               |                  |                                    |                                |                                 |             |                              |                       |                  |
| USERID : USER2                |                  |                                    |                                |                                 |             |                              |                       |                  |
| PROJECT : DEV,VMJ             | \$1,708.07       | \$118.22                           | \$469.11                       | \$211.34                        | \$307.78    | \$0.00                       | \$0.00                | \$2,814.52       |
| PROJECT : DVL,VMJ             | \$0.00           | \$0.00                             | \$312.90                       | \$0.00                          | \$0.00      | \$141.72                     | \$0.00                | \$454.62         |
| PROJECT : VMJ,DEV             | \$581.32         | \$558.92                           | \$0.00                         | \$0.00                          | \$285.82    | \$0.00                       | \$25.70               | \$1,451.76       |
|                               | =====            | =====                              | =====                          | =====                           | =====       | =====                        | =====                 | =====            |
| USERID : USER2 TOTALS         | \$2,289.39       | \$677.14                           | \$782.01                       | \$211.34                        | \$593.60    | \$141.72                     | \$25.70               | \$4,720.90       |
|                               |                  |                                    |                                |                                 |             |                              |                       |                  |
| USERID : USER3                |                  |                                    |                                |                                 |             |                              |                       |                  |
| PROJECT : DEV,VMJ             | \$1,708.07       | \$118.22                           | \$469.11                       | \$211.34                        | \$307.78    | \$0.00                       | \$0.00                | \$2,814.52       |
| PROJECT : DVL,VMJ             | \$0.00           | \$0.00                             | \$312.90                       | \$0.00                          | \$0.00      | \$141.72                     | \$0.00                | \$454.62         |
| PROJECT : VMJ,DEV             | \$581.32         | \$558.92                           | \$0.00                         | \$0.00                          | \$285.82    | \$0.00                       | \$25.70               | \$1,451.76       |
|                               | =====            | =====                              | =====                          | =====                           | =====       | =====                        | =====                 | =====            |
| USERID : USER3 TOTALS         | \$2,289.39       | \$677.14                           | \$782.01                       | \$211.34                        | \$593.60    | \$141.72                     | \$25.70               | \$4,720.90       |
|                               |                  |                                    |                                |                                 |             |                              |                       |                  |
| CUSTOMER: DEVELOPMENT TOTALS  |                  |                                    |                                |                                 |             |                              |                       |                  |
|                               | =====            | =====                              | =====                          | =====                           | =====       | =====                        | =====                 | =====            |
|                               | \$6,868.17       | \$2,031.42                         | \$2,687.03                     | \$634.02                        | \$1,780.80  | \$425.16                     | \$77.10               | \$14,503.70      |

Figure 16. Charge Summary Report (VMJCHRGs)



DATE RANGE: 05/01/02-05/31/02  
REPORT DATE: 06/02/02

VM:ACCOUNT RESOURCE BILLING SYSTEM  
CHARGE SUMMARY  
BY: CUSTOMER

PAGE: 2  
REPORT TIME: 16:15:10

|          | <u>CPU USAGE</u> | <u>I/O</u><br><u>ACTIVITY</u> | <u>COMBND</u><br><u>ONLINE</u> | <u>COMBND</u><br><u>OFFLINE</u> | <u>COMM</u> | <u>DED</u><br><u>DEVICES</u> | <u>OTHER</u> | <u>TOTAL</u> |
|----------|------------------|-------------------------------|--------------------------------|---------------------------------|-------------|------------------------------|--------------|--------------|
| OVERALL  | =====            | =====                         | =====                          | =====                           | =====       | =====                        | =====        | =====        |
| TOTALS : | \$6,868.17       | \$2,031.42                    | \$2,687.03                     | \$634.02                        | \$1,780.80  | \$425.16                     | \$77.10      | \$14,503.70  |

-----  
CATEGORY BREAK DOWN BY RECORD CODES AND DESCRIPTIONS

|  | <u>CPU USAGE</u> | <u>I/O</u><br><u>ACTIVITY</u> | <u>COMBND</u><br><u>ONLINE</u> | <u>COMBND</u><br><u>OFFLINE</u> | <u>COMM</u> | <u>DED</u><br><u>DEVICES</u> | <u>OTHER</u> |
|--|------------------|-------------------------------|--------------------------------|---------------------------------|-------------|------------------------------|--------------|
|--|------------------|-------------------------------|--------------------------------|---------------------------------|-------------|------------------------------|--------------|

Figure 16. Charge Summary Report (VM)CHRGs)(continued)

## Invoice and Invoice Ledger Reports (VMJINVCE)

This report creates customer invoices and an Invoice Ledger report. Invoices list resource charges, miscellaneous charges, credits, and total operating charges for the accounting period. The Invoice Ledger report is a list of the invoices.

The program generates an invoice for each unique sort field specification. For example, SORT CUSTOMER USERID creates a separate invoice for each userid under the control of the customer.

### Control File Records

You can use any combination of up to eight sort fields. The CUSTOMER sort field is required and must be the first sort field specified. Valid sort field keywords for the SORT or PRESORT records are:

- ▶ ACCOUNT
- ▶ BEGDATE (Begin date)
- ▶ CUSTOMER
- ▶ NODE
- ▶ PACKAGE
- ▶ PROJECT
- ▶ SHIFT
- ▶ USERID

Valid specifications for the PARMS record include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ YEAR

### Invoice Numbers

VMJINVCE creates invoice numbers sequentially. Use the \*INVOICE control file record for specifying the beginning invoice number. This is the format of the \*INVOICE record, where *nnnnnnnn* is an eight-digit integer specifying the next available invoice number to the COBOL report:

**\*INVOICE *nnnnnnnn***

The value of the \*INVOICE record is automatically updated by the report program. When the report is executed again for the next accounting period, VMJINVCE uses the updated number. Change the \*INVOICE record if you want to begin a new sequence. If VMJINVCE cannot find the \*INVOICE record, a default record is created in the control

file and *nnnnnnnn* is set to 00000001. If the invoice number ever exceeds 99,999,999 during processing or is equal to 99,999,999 after processing, *nnnnnnnn* is set to 00000001.

Keep your VMJINVCE control file on a read/write minidisk so the program can update the file.

## Sample Report

Figure 17 shows sample invoice and invoice ledger reports.

| VM:Account RESOURCE BILLING SYSTEM I N V O I C E |                       |                      |               |
|--------------------------------------------------|-----------------------|----------------------|---------------|
| PERIOD DATE                                      | : 06/01/02 - 06/30/02 | REPORT DATE          | : 07/02/02    |
| CUSTOMER NAME                                    | : J. P. Acme          | CUSTOMER ID          | : DEVELOPMENT |
| CUSTOMER ADDR                                    | : Acme Steel          | INVOICE NO           | : 00000037    |
|                                                  | Systems Development   | PAGE NO              | : 1 OF 1      |
|                                                  | Steeltown, PA         |                      |               |
| <u>RESOURCE</u>                                  |                       | <u>CHARGES</u>       |               |
| CENTRAL PROCESSOR:                               | Connect Time          |                      | \$9.02        |
|                                                  | Virtual CPU           |                      | \$32.32       |
|                                                  | Overhead CPU          |                      | \$129.32      |
|                                                  | Paging                |                      | \$120.00      |
|                                                  |                       | =====                |               |
|                                                  |                       |                      | \$290.66      |
| ONLINE STORAGE:                                  | Minidisk              |                      | \$40.58       |
|                                                  | Tempdisk              |                      | \$312.90      |
|                                                  |                       | =====                |               |
|                                                  |                       |                      | \$353.48      |
| SHARED FILE SYSTEM                               | Primary Storage       |                      | \$50.00       |
|                                                  | Mig. FRA Storage      |                      | \$30.00       |
|                                                  | Mig. Tape Storage     |                      | \$8.00        |
|                                                  |                       | =====                |               |
|                                                  |                       | Filepool Storage     | \$88.00       |
|                                                  |                       | Active Time          | \$80.00       |
|                                                  |                       | CPU Usage            | \$90.00       |
|                                                  |                       | Physical I/O Request | \$65.54       |
|                                                  |                       | =====                |               |
|                                                  |                       |                      | \$323.54      |
| TAPE MOUNTS                                      |                       |                      | \$2.50        |
| RSCS                                             |                       |                      | \$1,234.41    |
| VSCS                                             |                       |                      | \$273.18      |
|                                                  |                       | =====                |               |
| TOTAL PROCESS CHARGES                            |                       |                      | \$265,975.11  |
| ADDITIONAL CHARGES AND CREDITS                   |                       |                      | \$0.00        |
|                                                  |                       | =====                |               |
| TOTAL OPERATING CHARGES THIS PERIOD              |                       |                      | \$265,975.11  |

Figure 17. Invoice and Invoice Ledger Reports (VMJINVCE)

|                                |                      |                                    |                               |                                              |              |
|--------------------------------|----------------------|------------------------------------|-------------------------------|----------------------------------------------|--------------|
| DATE RANGE: 06/01/02-06/30/02  |                      | VM:ACCOUNT RESOURCE BILLING SYSTEM |                               | PAGE: 1                                      |              |
| REPORT DATE: 07/02/02          |                      | INVOICE LEDGER                     |                               | REPORT TIME: 19:01:29                        |              |
| <u>CUSTOMER</u><br><u>ID</u>   | <u>CUSTOMER NAME</u> | <u>INVOICE</u><br><u>NUMBER</u>    | <u>USAGE</u><br><u>CHARGE</u> | <u>MISCELLANEOUS</u><br><u>CHARGE/CREDIT</u> | <u>TOTAL</u> |
| DEVELOPMENT                    | J.P. Acme            | 00000037                           | \$323.54                      | \$0.00                                       | \$323.54     |
| FINANCE                        | Meghan Iber          | 00030023                           | \$200.46                      | \$10.00                                      | \$210.46     |
|                                |                      | :                                  |                               |                                              |              |
|                                |                      | :                                  |                               |                                              |              |
| GRAND TOTAL FOR ALL CUSTOMERS: |                      |                                    | =====                         | =====                                        | =====        |
|                                |                      |                                    | \$6,273.51                    | \$100.00                                     | \$6,373.51   |

Figure 17. Invoice and Invoice Ledger Reports (VMJINVCE)(continued)

## Minidisk Utilization Summary Report (VMJMDISK)

The Minidisk Utilization Summary report displays minidisk utilization summarized at the level of detail specified on SORT or PRESORT control file statements. Summary fields include customer-id, project, account, userid, date, and device.

### Control File Records

You can use any combination of up to seven sort fields. Valid sort field keywords for the SORT or PRESORT records are:

- ▶ ACCOUNT
- ▶ BEGDATE
- ▶ CUSTOMER
- ▶ MDSKDTYP (DASD device type)
- ▶ NODE
- ▶ PROJECT
- ▶ USERID

Valid keyword specifications for the PARMS record include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ SUMMARY
- ▶ YEAR

The SUMMARY keyword specifies that a summary total detail line of minidisk usage is to be printed for the first sort field control break only. For example, if USERID is a sort field, the report would only print a total for a userid's minidisks. Detailed information about each minidisk is not printed. The user can select the amount of detail to include in the report. The default is a separate line for each minidisk.

## Sample Report

Figure 18 shows a sample of this report sorted by node.

| DATE RANGE: 06/01/02-06/30/02                 |           | VM:ACCOUNT RESOURCE BILLING SYSTEM |              |              |        |          | PAGE: 1               |                  |       |
|-----------------------------------------------|-----------|------------------------------------|--------------|--------------|--------|----------|-----------------------|------------------|-------|
| REPORT DATE: 07/02/02                         |           | MINIDISK UTILIZATION SUMMARY       |              |              |        |          | REPORT TIME: 19:04:16 |                  |       |
| SEQUENCE: NODE,PROJ,CUST,ACCT,USER,DEVC,DATE. |           |                                    |              |              |        |          | BY: NODE              |                  |       |
| NODE                                          | PROJECT   | CUSTOMER                           | ACCOUNT      | USERID       | DEVICE | DATE     | SPACE<br>OWNED        | VOLSER           | VADDR |
| ADMIN2                                        | CATCH-ALL | CATCH-ALL                          | \$\$ALLOC    | \$\$ALLOC    | 3380   | 06/30/02 | 1 CYLS                | VOL001           | 1194  |
|                                               |           |                                    |              |              |        |          | 1 CYLS                | VOL002           | 1194  |
|                                               |           |                                    |              |              |        |          | 1 CYLS                | VOL003           | 1194  |
|                                               |           |                                    |              |              |        |          | 1 CYLS                | VOL004           | 1194  |
|                                               |           |                                    |              |              |        |          | 1 CYLS                | VOL005           | 1194  |
|                                               |           |                                    | \$\$ALLOC    | \$\$ALLOC    | 3380   | 06/30/02 | 5,697                 | THOUSAND BYTES   |       |
|                                               |           |                                    | \$\$\$SAVSYS | \$\$\$SAVSYS | FB-512 | 06/30/02 | 11,391                | BLKS VOL009 1194 |       |
|                                               |           |                                    |              |              | FB-512 | 06/30/02 | 5,832                 | THOUSAND BYTES   |       |
|                                               |           |                                    |              |              | 3380   | 06/30/02 | 25                    | CYLS VOL005 1194 |       |
|                                               |           |                                    |              |              | 3380   | 06/30/02 | 17,804                | THOUSAND BYTES   |       |
|                                               |           |                                    | \$\$\$SAVSYS | \$\$\$SAVSYS |        |          | 23,636                | THOUSAND BYTES   |       |
|                                               |           |                                    | \$VIRTCP     | \$VIRTCP     | 3380   | 06/30/02 | 6                     | CYLS VOL002 1194 |       |
|                                               |           |                                    | \$VIRTCP     | \$VIRTCP     | 3380   | 06/30/02 | 4,273                 | THOUSAND BYTES   |       |
|                                               |           |                                    | MYMAMA       | PETE         | 3380   | 06/30/02 | 1                     | CYLS VOL010 1194 |       |
|                                               |           |                                    |              |              |        |          | 6                     | CYLS VOL010 1194 |       |
|                                               |           |                                    | MYMAMA       | PETE         | 3380   | 06/30/02 | 4,985                 | THOUSAND BYTES   |       |
|                                               |           |                                    | T35757       | EAST034      | 3380   | 06/30/02 | 1                     | CYLS VOL001 1194 |       |
|                                               |           |                                    | T35757       | EAST034      | 3380   | 06/30/02 | 712                   | THOUSAND BYTES   |       |
|                                               |           |                                    | VMHCS3       | VMHCS3       | 3380   | 06/30/02 | 5                     | CYLS VOL001 1194 |       |
|                                               |           |                                    |              |              |        |          | 1                     | CYLS VOL001 1194 |       |
|                                               |           |                                    |              |              |        |          | 1                     | CYLS VOL003 1194 |       |
|                                               |           |                                    | VMHCS3       | VMHCS3       | 3380   | 06/30/02 | 7,834                 | THOUSAND BYTES   |       |

Figure 18. Minidisk Utilization Summary Report (VMJMDISK)

## Miscellaneous Charges/Credits Report (VMJMISC)

The Miscellaneous Charges/Credits report lists by customer-id the charges and credits created with the CHARGE or CREDIT command.

### Control File Records

You can use up to six sort fields in any order. Valid sort keywords for the SORT and PRESORT records are:

- ▶ ACCOUNT
- ▶ BEGDATE (Begin date)
- ▶ CUSTOMER
- ▶ NODE
- ▶ PROJECT
- ▶ USERID

Valid specifications for the PARMS record include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ YEAR

### Sample Report

Figure 19 shows a sample of this report.

DATE RANGE: 06/01/02-06/30/02  
 REPORT DATE: 07/02/02  
 CUSTOMER: DEVELOPMENT

VM:ACCOUNT RESOURCE BILLING SYSTEM  
 MISCELLANEOUS CHARGES/CREDITS REPORT

PAGE: 1  
 REPORT TIME: 18:53:13

| LOG<br>NUMBER | ----CHARGE/CREDIT---- | UNIT<br>PRICE | ---CHARGE/CREDIT POSTING---   | USER-ID  |
|---------------|-----------------------|---------------|-------------------------------|----------|
| ID            | DESCRIPTION           | QTY           | AMOUNT DATE TIME              |          |
| USERID: LUCY  |                       |               |                               |          |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |
| 3             | MISC-                 | 1             | 3.596- \$5.00- 06/30/02 15:00 | VMJADMIN |
| 1             | MISC+                 | 1             | 1.000 \$1.00 06/30/02 14:37   | VMJADMIN |
| 2             | MISC-                 | 1             | 1.000- \$1.00- 06/30/02 14:37 | VMJADMIN |

Figure 19. Miscellaneous Charges/Credits Report (VMJMISC)



## Monthly VM Utilization Report (VMJMONTH)

The Monthly VM Utilization report displays resource charges or resource utilization, by month, for a year. Subtotals are by the month, the first six months, and the second six months. There is also an annual total.

This report is generally run against data from more than one accounting period. Your system's performance may improve if you compress the closed accounting files with the VMJCMP utility before running VMJMONTH. This reduces processing time and minidisk space requirements.

### Control File Records

You can use any combination of two sort fields in any order, or just one sort field. Valid keywords for the SORT or PRESORT records are:

- ▶ ACCOUNT
- ▶ CUSTOMER
- ▶ NODE
- ▶ PACKAGE
- ▶ PROJECT
- ▶ USERID

Specify the first day of the first month to appear in the report on a PARMs record with the MONTH keyword. The starting date is required and there is no default. The program dynamically sets begin and end dates for each month for a one year period. For example, to produce a report for the calendar year 2002, specify:

**PARMS MONTH 01/01/02**

Other valid keyword specifications for the PARMs record include:

- ▶ CHARGES
- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ RESOURCES
- ▶ SHIFT
- ▶ SUMMARY

If the report format parameters CHARGES, RESOURCES, and SUMMARY are not specified, RESOURCES is the default and only accrued charges at the summary subtotal level are printed. For example, on a CHARGES detail report, the field ONLINE STORAGE would be broken down into CKD minidisks, FBA minidisks, CKD tempdisk, and FBA tempdisk, with a subtotal for all four fields. If the SUMMARY option is specified, only the subtotal for ONLINE STORAGE is printed.

## Sample Report

Figure 20 shows a sample of this report with resources sorted by customer.

| FOR YEAR BEGINNING: 01/01/02 |                  | VM:ACCOUNT RESOURCE BILLING SYSTEM |                        |                  |                  |              | PAGE: 1A              |                        |
|------------------------------|------------------|------------------------------------|------------------------|------------------|------------------|--------------|-----------------------|------------------------|
| SHIFT: **                    |                  | MONTHLY VM UTILIZATION REPORT      |                        |                  |                  |              | REPORT DATE: 04/02/02 |                        |
| CUSTOMER DEVELOPMENT         |                  | RESOURCES BY CUSTOMER              |                        |                  |                  |              | REPORT TIME: 16:21:15 |                        |
| <u>R E S O U R C E</u>       | <u>U N I T S</u> | <u>J A N U A R Y</u>               | <u>F E B R U A R Y</u> | <u>M A R C H</u> | <u>A P R I L</u> | <u>M A Y</u> | <u>J U N E</u>        | <u>S U B T O T A L</u> |
| <b>CENTRAL PROCESSOR</b>     |                  |                                    |                        |                  |                  |              |                       |                        |
| Connect Time                 | Hour:min         | 540:57                             | :00                    | :00              | 540:57           | :00          | :00                   | 1,081:54               |
| Virtual CPU                  | Seconds          | 388                                | 0                      | 0                | 388              | 0            | 0                     | 776                    |
| Overhead CPU                 | Seconds          | 97                                 | 0                      | 0                | 97               | 0            | 0                     | 194                    |
| Virt Vector CPU              | Seconds          | 0                                  | 0                      | 0                | 0                | 0            | 0                     | 0                      |
| Ovhd Vector CPU              | Seconds          | 23                                 | 0                      | 0                | 0                | 0            | 0                     | 23                     |
| Paging                       | Pages            | 359,970                            | 0                      | 0                | 359,970          | 0            | 0                     | 719,940                |
| <b>SESSION I/O</b>           |                  |                                    |                        |                  |                  |              |                       |                        |
| Reader Spool                 | Records          | 236,772                            | 0                      | 0                | 236,772          | 0            | 0                     | 473,544                |
| Printer Spool                | Records          | 173,808                            | 0                      | 0                | 173,808          | 0            | 0                     | 347,616                |
| Punch Spool                  | Records          | 187,584                            | 0                      | 0                | 187,584          | 0            | 0                     | 375,168                |
| Disk/Tape                    | SIOs             | 240,216                            | 0                      | 0                | 240,216          | 0            | 0                     | 480,432                |
| <b>SFS</b>                   |                  |                                    |                        |                  |                  |              |                       |                        |
| Active Time                  | Hour:min         | 24:00                              | :00                    | :00              | 24:00            | :00          | :00                   | 48:00                  |
| CPU Usage                    | Seconds          | 5,400                              | 0                      | 0                | 5,400            | 0            | 0                     | 10,800                 |
| Physical I/O                 | Requests         | 196,608                            | 0                      | 0                | 196,608          | 0            | 0                     | 393,216                |
| Filepool                     | Blk-days         | 11,520                             | 0                      | 0                | 11,520           | 0            | 0                     | 23,040                 |
| Primary                      | Blk-days         | 6,000                              | 0                      | 0                | 6,000            | 0            | 0                     | 12,000                 |
| Mig. FRA                     | Blk-days         | 5,000                              | 0                      | 0                | 5,000            | 0            | 0                     | 10,000                 |
| Mig. Tape                    | Blk-days         | 520                                | 0                      | 0                | 520              | 0            | 0                     | 1,040                  |
| <b>ONLINE STORAGE</b>        |                  |                                    |                        |                  |                  |              |                       |                        |
| CKD Minidisk                 | Cyl-days         | 201                                | 0                      | 0                | 201              | 0            | 0                     | 402                    |
| FBA Minidisk                 | Blk-days         | 49,812                             | 0                      | 0                | 49,812           | 0            | 0                     | 99,624                 |
| CKD Tempdisk                 | Cyl-hours        | 2,811                              | 0                      | 0                | 2,811            | 0            | 0                     | 5,622                  |
| FBA Tempdisk                 | Blk-hours        | 167,750                            | 0                      | 0                | 167,750          | 0            | 0                     | 335,500                |

Figure 20. Monthly VM Utilization Report (VMJMONTH)

## Operations Overview Report (VMJORVW)

The Operations Overview report lists total resource usage and charges by resource type. You can summarize the report by customer-id, project, userid, shift number, package, account number, and date. A new page is printed for the lowest level sort control field. For example, if the last sort control field specified is *account*, a new report page is generated for each account number. Optionally, VMJORVW also gives subtotals for all control breaks and produces a grand total page.

### Control File Records

You can use any combination of up to eight sort fields. Valid sort field keywords for the SORT or PRESORT records are:

- ▶ ACCOUNT
- ▶ BEGDATE (Begin date)
- ▶ CUSTOMER
- ▶ NODE
- ▶ PACKAGE
- ▶ PROJECT
- ▶ SHIFT
- ▶ USERID

Valid specifications for the PARMS record include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ TOTALS
- ▶ YEAR

## Sample Report

Figure 21 shows a sample grand total from an Operations Overview report.

| VM:ACCOUNT (TM) COPYRIGHT 1994, COMPUTER ASSOCIATES |                   |                                    |           |                       |
|-----------------------------------------------------|-------------------|------------------------------------|-----------|-----------------------|
| DATE RANGE: 06/01/02 - 06/30/02                     |                   | VM:ACCOUNT RESOURCE BILLING SYSTEM |           | PAGE: 14A             |
| REPORT DATE: 07/02/02                               |                   | OPERATIONS OVERVIEW                |           | REPORT TIME: 10:45:37 |
| GRAND TOTAL                                         |                   |                                    |           |                       |
| RESOURCE                                            |                   | QUANTITY                           | UNIT      | CHARGES               |
| CENTRAL PROCESSOR                                   | Connect Time      | 39827:48:29                        | hh:mm:ss  | \$4,706.26            |
|                                                     | Virtual CPU       | 225,667.4                          | Seconds   | \$37,706.17           |
|                                                     | Overhead CPU      | 92,628.7                           | Seconds   | \$19,776.55           |
|                                                     | Paging            | 150,186,316                        | Pages     | \$0.00                |
|                                                     |                   |                                    |           | =====                 |
|                                                     |                   |                                    |           | \$62,188.98           |
| ONLINE STORAGE                                      | CKD Minidisk      | 903,971.0                          | Cyl-days  | \$8,239.08            |
|                                                     | FBA Minidisk      | 6,825,622.0                        | Blk-days  | \$614.31              |
|                                                     | CKD Tempdisk      | 53,453.6                           | Ckl-hours | \$412.61              |
|                                                     | FBA Tempdisk      | 7,144,841.6                        | Blk-hours | \$114.41              |
|                                                     |                   |                                    |           | =====                 |
|                                                     |                   |                                    |           | \$9,380.41            |
| SHARED FILE SYSTEM                                  | Primary Storage   | 300                                | Blk-days  | \$3.00                |
|                                                     | Mig. FRA Storage  | 100                                | Blk-days  | \$1.00                |
|                                                     | Mig. Tape Storage | 8                                  | Blk-days  | \$0.08                |
|                                                     | -----             | -----                              | -----     | -----                 |
|                                                     | Filepool Storage  | 408                                | Blk-days  | \$4.08                |
|                                                     | Active Time       | 02:06:42                           | hh:mm:ss  | \$6.32                |
|                                                     | CPU Usage         | 2,775.9                            | Seconds   | \$138.77              |
|                                                     | Physical I/O      | 0                                  | Requests  | \$0.00                |
|                                                     |                   |                                    |           | =====                 |
|                                                     |                   |                                    |           | \$149.17              |

Figure 21. Operations Overview Report (VMJORVW)--Grand Total, Page 1

|                      |                  |            |           |          |
|----------------------|------------------|------------|-----------|----------|
| DEDICATED DEVICES    | CKD Disk         | 0.0        | Hours     | \$0.00   |
|                      | FBA Disk         | 0.0        | Hours     | \$0.00   |
|                      | Tape             | 261.7      | Hours     | \$12.52  |
|                      | Unit Record      | 0.0        | Hours     | \$0.00   |
|                      | Local Terminals  | 451.2      | Hours     | \$136.12 |
|                      | Remote Terminals | 0.0        | Hours     | \$0.00   |
|                      | Other            | 0.0        | Hours     | \$0.00   |
|                      |                  |            |           | =====    |
|                      |                  |            |           | \$148.64 |
| SESSION I/O ACTIVITY | Reader Spool     | 14,320,521 | Records   | \$0.00   |
|                      | Printer Spool    | 15,748,728 | Records   | \$0.00   |
|                      | Punch Spool      | 12,601,743 | Records   | \$0.00   |
|                      | Disk/Tape        | 37,201,446 | SIOs      | \$0.00   |
|                      |                  |            |           | =====    |
|                      |                  |            |           | \$0.00   |
| VM:ARCHIVER STORAGE  | Staged           | 1,575,260  | Kbyte-hrs | \$88.41  |
|                      | Online           | 0          | Kbyte-hrs | \$0.00   |
|                      | Offline          | 0          | Kbyte-hrs | \$0.00   |
|                      |                  |            |           | =====    |
|                      |                  |            |           | \$88.41  |

Figure 21. Operations Overview Report (VMJORVW)--Grand Total, Page 1 (continued)

## Quarterly VM Utilization Report (VMJQRTR)

The Quarterly VM Utilization report displays resource charges or resource utilization, by quarter, for a year. Subtotals are given quarterly. There is also an annual total.

This report is generally run against data from more than one accounting period. Your system's performance may improve if you compress the closed accounting files with the VMJCMP utility before running VMJMONTH. This reduces processing time and minidisk space requirements.

### Control File Records

You can use any combination of two sort fields in any order, or just one sort field. Valid keywords for the SORT or PRESORT records are:

- ▶ ACCOUNT
- ▶ CUSTOMER
- ▶ NODE
- ▶ PACKAGE
- ▶ PROJECT
- ▶ USERID

Specify the first day of the first month in the starting quarter to appear in the report on a PARMs record with the QUARTER keyword. The starting date is required and there is no default. The program dynamically sets begin and end dates for each quarter for a one year period. For example, to produce a quarterly report for the calendar year 2002, specify:

**PARMS QUARTER 01/01/02**

Other valid keyword specifications for the PARMs record include:

- ▶ CHARGES
- ▶ DISK
- ▶ PRINT
- ▶ QUARTER
- ▶ RESOURCES
- ▶ SHIFT
- ▶ SUMMARY

If the report format parameters CHARGES, RESOURCES, and SUMMARY are not specified, RESOURCES is the default. The SUMMARY option is valid only when preceded by CHARGES. It causes only accrued charges at the summary subtotal level to be printed. For example, for the online storage category, only the subtotal for entire category is printed.

## Sample Report

Figure 22 shows a sample of this report, showing resource use by customer.

|                              |                  |                                    |                      |                      |                      |                       |
|------------------------------|------------------|------------------------------------|----------------------|----------------------|----------------------|-----------------------|
| FOR YEAR BEGINNING: 01/01/02 |                  | VM:ACCOUNT RESOURCE BILLING SYSTEM |                      |                      |                      | PAGE: 1A              |
| SHIFT: **                    |                  | QUARTERLY VM UTILIZATION REPORT    |                      |                      |                      | REPORT DATE: 01/03/02 |
| CUSTOMER: DEVELOPMENT:       |                  | RESOURCES BY CUSTOMER              |                      |                      |                      | REPORT TIME: 09:52:48 |
| <u>R E S O U R C E</u>       | <u>U N I T S</u> | <u>J A N - M A R</u>               | <u>A P R - J U N</u> | <u>J U L - S E P</u> | <u>O C T - D E C</u> | <u>T O T A L</u>      |
| CENTRAL PROCESSOR            |                  |                                    |                      |                      |                      |                       |
| Connect Time                 | Hour:min         | 540:57                             | 540:57               | 540:57               | 540:57               | 2,163:48              |
| Virtual CPU                  | Seconds          | 388                                | 388                  | 388                  | 388                  | 1,552                 |
| Overhead CPU                 | Seconds          | 97                                 | 97                   | 97                   | 97                   | 388                   |
| Virt Vector CPU              | Seconds          | 0                                  | 0                    | 0                    | 0                    | 0                     |
| Ovhd Vector CPU              | Seconds          | 23                                 | 0                    | 0                    | 0                    | 23                    |
| Paging                       | Pages            | 359,970                            | 359,970              | 359,970              | 359,970              | 1,439,880             |
| SESSION I/O                  |                  |                                    |                      |                      |                      |                       |
| Reader Spool                 | Records          | 236,772                            | 236,772              | 236,772              | 236,772              | 947,088               |
| Printer Spool                | Records          | 173,808                            | 173,808              | 173,808              | 173,808              | 695,232               |
| Punch Spool                  | Records          | 187,584                            | 187,584              | 187,584              | 187,584              | 750,336               |
| Disk/Tape                    | SIOs             | 240,216                            | 240,216              | 240,216              | 240,216              | 960,864               |
| SFS                          |                  |                                    |                      |                      |                      |                       |
| Active Time                  | Hour:min         | 24:00                              | 24:00                | 24:00                | 24:00                | 96:00                 |
| CPU Usage                    | Seconds          | 5,400                              | 5,400                | 5,400                | 5,400                | 21,600                |
| Physical I/O                 | Requests         | 196,608                            | 196,608              | 196,608              | 196,608              | 786,432               |
| Filepool                     | Blk-days         | 11,520                             | 11,520               | 11,520               | 11,520               | 46,080                |
| Primary                      | Blk-days         | 6,000                              | 6,000                | 6,000                | 6,000                | 24,000                |
| Mig. FRA                     | Blk-days         | 5,000                              | 5,000                | 5,000                | 5,000                | 20,000                |
| Mig. Tape                    | Blk-days         | 520                                | 520                  | 520                  | 520                  | 2,080                 |
| ONLINE STORAGE               |                  |                                    |                      |                      |                      |                       |
| CKD Minidisk                 | Cyl-days         | 201                                | 201                  | 201                  | 201                  | 804                   |
| FBA Minidisk                 | Blk-days         | 49,812                             | 49,812               | 49,812               | 49,812               | 199,248               |
| CKD Tempdisk                 | Cyl-hours        | 2,811                              | 2,811                | 2,811                | 2,811                | 11,244                |
| FBA Tempdisk                 | Blk-hours        | 167,750                            | 167,750              | 167,750              | 167,750              | 671,000               |

Figure 22. Quarterly VM Utilization Report (VMJQRTR)

# RSCS Utilization Report (VMJRSCS)

The RSCS Utilization report displays resource utilization information for RSCS.

## Control File Records

You can specify any four of the following keywords in any order. Valid keyword specifications for the SORT or PRESORT records include:

- ▶ ACCOUNT
- ▶ BEGDATE (Begin date)
- ▶ CUSTOMER
- ▶ PROJECT
- ▶ RSCSCLS (Spool file class)
- ▶ RSCSDEST (Destination location userid)
- ▶ RSCSDEV (Origin device type)
- ▶ RSCSID (Userid of the RSCS service virtual machine)
- ▶ RSCSLCID (Local destination ID)
- ▶ RSCSORID (Origin location ID)
- ▶ USERID

Valid keyword specifications for the PARMS include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ SHIFT
- ▶ YEAR

## Sample Report

Figure 23 shows a sample of this report, sorted by the RSCS Origin Location ID.



DATE RANGE: 01/01/02-12/31/02  
SHIFT: \*\*

VM:ACCOUNT RESOURCE BILLING SYSTEM  
RSCS UTILIZATION REPORT

PAGE: 1  
REPORT DATE: 07/13/02

| <u>ORG</u><br><u>LOC</u> | <u>ORG</u><br><u>CLA</u> | <u>ORG</u><br><u>DVC</u> | <u>DEST</u><br><u>LOCAL-ID</u> | <u>CUSTOMER</u> | <u>ACCOUNT</u> | <u>USERID</u> | <u>RSCS-ID</u> | <u>PROJECT</u> | <u>DEST</u><br><u>USERID</u> | <u>DATE</u> | <u>TIME</u> | <u>RECORDS</u> | <u>S</u><br><u>R</u> |
|--------------------------|--------------------------|--------------------------|--------------------------------|-----------------|----------------|---------------|----------------|----------------|------------------------------|-------------|-------------|----------------|----------------------|
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 15:33:40    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 11:22:33    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 11:22:33    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 15:33:40    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 11:22:33    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 15:33:40    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 11:22:33    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 15:33:40    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | PAUL          | RSCS           | MAINT          | PAUL                         | 11/20/95    | 10:43:42    | 125,799        | S                    |
| ADMIN1                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | PAUL          | RSCS           | MAINT          | PAUL                         | 11/20/95    | 10:43:42    | 125,799        | S                    |
| -----                    | ---                      | ---                      | ---                            | -----           | -----          | -----         | -----          | -----          | -----                        | -----       | -----       | -----          | -                    |
| ADMIN1                   | A                        | PUN                      | 6670                           |                 |                |               |                |                | RSCS RECORDS SENT            |             |             | 1,509,588      | S                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 17:28:47    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 08:00:00    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | PAUL          | RSCS           | MAINT          | PAUL                         | 11/20/95    | 03:29:31    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 08:00:00    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | PAUL          | RSCS           | MAINT          | PAUL                         | 11/20/95    | 03:29:31    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 17:28:47    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | PAUL          | RSCS           | MAINT          | PAUL                         | 11/20/95    | 03:29:31    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 17:28:47    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 08:00:00    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | PAUL          | RSCS           | MAINT          | PAUL                         | 11/20/95    | 03:29:31    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | CYRIL         | RSCS           | MAINT          | CYRIL                        | 03/23/95    | 17:28:47    | 489,762        | R                    |
| ADMIN2                   | A                        | PUN                      | 6670                           | SALES           | 50002000       | LUCY          | RSCS           | MAINT          | LUCY                         | 07/01/95    | 08:00:00    | 489,762        | R                    |
| -----                    | ---                      | ---                      | ---                            | -----           | -----          | -----         | -----          | -----          | -----                        | -----       | -----       | -----          | -                    |
| ADMIN2                   | A                        | PUN                      | 6670                           |                 |                |               |                |                | RSCS RECORDS SENT            |             |             | 0              | S                    |

Figure 23. RSCS Utilization Report (VMJRSCS)

# Resource Utilization Report (VMJRUT)

The Resource Utilization report displays resource utilization for session records (datatype 01), using sort and summary fields defined in a report control file.

## Control File Records

You can use any combination of the sort fields listed below. The USERID sort field is required and must be the last sort field specified. You can use a minimum of one and a maximum of three sort fields.

Valid keyword specifications for the SORT or PRESORT records include:

- ▶ ACCOUNT
- ▶ CUSTOMER
- ▶ NODE
- ▶ PACKAGE
- ▶ PROJECT
- ▶ USERID

Valid keyword specifications for the PARMS record include:

- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ SHIFT
- ▶ VECTOR or NOVECTOR
- ▶ YEAR

## Sample Report

Figure 24 shows a sample VMJRUT report, summarized by PACKAGE.

|                                     |                     |                                    |                 |                  |              |               |               |            |                       |            |
|-------------------------------------|---------------------|------------------------------------|-----------------|------------------|--------------|---------------|---------------|------------|-----------------------|------------|
| DATE RANGE: 01/01/02-03/31/02       |                     | VM:ACCOUNT RESOURCE BILLING SYSTEM |                 |                  |              |               |               |            | PAGE: 1               |            |
| SHIFT: **                           |                     | RESOURCE UTILIZATION SUMMARY       |                 |                  |              |               |               |            | REPORT DATE: 04/02/02 |            |
| BY: NODE                            |                     |                                    |                 |                  |              |               |               |            | REPORT TIME: 14:56:23 |            |
| <u>USER ID</u>                      | <u>CONN TIME</u>    | <u>VIRT CPU</u>                    | <u>OVHD CPU</u> | <u>TOTAL CPU</u> | <u>PAGE</u>  | <u>PAGE</u>   | <u>NON-SP</u> | <u>PUN</u> | <u>PRT</u>            | <u>RDR</u> |
| <u>NODE NODE2:</u>                  | <u>HH.HHH:MM:SS</u> | <u>SECONDS</u>                     | <u>SECONDS</u>  | <u>SECONDS</u>   | <u>READS</u> | <u>WRITES</u> | <u>I/O</u>    | <u>I/O</u> | <u>I/O</u>            | <u>I/O</u> |
| PROJECT VMJ,DEV:                    |                     |                                    |                 |                  |              |               |               |            |                       |            |
| GRANT                               | 180:18:56           | 129.312                            | 32.328          | 161.640          | 58,738       | 61,252        | 80,072        | 62,528     | 57,936                | 78,924     |
| FORREST                             | 180:18:56           | 129.312                            | 32.328          | 161.640          | 58,738       | 61,252        | 80,072        | 62,528     | 57,936                | 78,924     |
| -----                               |                     |                                    |                 |                  |              |               |               |            |                       |            |
|                                     | 360:37:52           | 258.624                            | 64.656          | 323.280          | 117,476      | 122,504       | 160,144       | 125,056    | 115,872               | 157,848    |
| RESOURCE UTILIZATION FOR ALL NODES: |                     |                                    |                 |                  |              |               |               |            |                       |            |
| TOTAL:                              | 360:37:52           | 258.624                            | 64.656          | 323.280          | 117,476      | 122,504       | 160,144       | 125,056    | 115,872               | 157,848    |

Figure 24. Resource Utilization Report (VMJRUT)

## Utilization Trend Analysis (VMJTREND)

The Utilization Trend Analysis is a graph of resource utilization or accrued charges for two specified periods of time or shifts. To reduce processing time and space requirements, compress the input files with the VMJCMP utility before running the report.

### Control File Records

The input files for this report do not require sorting. Do not use SORT and PRESORT records in a VMJTREND control file.

Valid keyword specifications for the PARMS record include:

- ▶ CHARGES
- ▶ DISK
- ▶ MONTH
- ▶ PRINT
- ▶ QUARTER
- ▶ RANGE
- ▶ RESOURCES
- ▶ SHIFT
- ▶ YEAR

There are two ways to produce this report.

- ▶ Use two input files and specify no time comparison (month, quarter, range, shift, year) in the control file. VMJTREND creates the graph using the data in the input files. For example, if the first input file is named PERIODTE MAR95 and the second input file is named PERIODTE APR95, the data from PERIODTE MAR95 will be graphed against that of PERIODTE APR95. Figure 25 shows a sample of the report produced in this manner.
- ▶ Use from 1 to 12 input files and specify a time comparison in the control file. If a single input file is used, the PARMS record tells the report program how to divide the file into date ranges to get two time periods. For example, specify two date ranges on the PARMS record, one for each of the periods to graph on the report.

You can specify RESOURCES on the PARMS record if you want the report to display resource utilization information. Specify CHARGES on the PARMS record if you want the report to display charge information. RESOURCES is the default.

| VM:ACCOUNT RESOURCE BILLING SYSTEM      |          |                            |    |    |    |    |    |    |    |    |    |                       |    |    |    | PAGE: 1 |    |    |    |    |       |
|-----------------------------------------|----------|----------------------------|----|----|----|----|----|----|----|----|----|-----------------------|----|----|----|---------|----|----|----|----|-------|
| ** = RANGE 03/01/02-03/31/02 SHIFT: **  |          | UTILIZATION TREND ANALYSIS |    |    |    |    |    |    |    |    |    | REPORT DATE: 05/03/02 |    |    |    |         |    |    |    |    |       |
| '-' = RANGE 04/01/02-04/30/02 SHIFT: ** |          | RESOURCES                  |    |    |    |    |    |    |    |    |    | REPORT TIME: 12:17:36 |    |    |    |         |    |    |    |    |       |
| RESOURCE                                | COUNT    | 5                          | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55                    | 60 | 65 | 70 | 75      | 80 | 85 | 90 | 95 | SCALE |
|                                         |          |                            | +  |    | +  |    | +  |    | +  |    | +  |                       | +  |    | +  |         | +  |    | +  |    |       |
| -PROCESSOR-                             |          |                            |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| Conn. Time                              | 1,081:54 | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 100   |
| (hrs:mins)                              | 540:57   | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| Virt. CPU                               | 776      | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10    |
| (seconds)                               | 388      | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| CP Overhead                             | 194      | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10    |
| (seconds)                               | 97       | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| Pages                                   | 719,940  | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10K   |
|                                         | 359,970  | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| -- I/Os --                              |          |                            |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| RDR                                     | 473,544  | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10K   |
|                                         | 236,772  | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| PRT                                     | 347,616  | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10K   |
|                                         | 173,808  | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| PUN                                     | 375,168  | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10K   |
|                                         | 187,584  | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |
| SIO                                     | 480,432  | *****                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    | 10K   |
|                                         | 240,216  | -----                      |    |    |    |    |    |    |    |    |    |                       |    |    |    |         |    |    |    |    |       |

Figure 25. Utilization Trend Analysis Report (VMJTREND)

|            |         |       |     |
|------------|---------|-------|-----|
| -- SFS --  |         |       |     |
| Act. Time  | 48:00   | ***** | 1K  |
| (hrs:mins) | 24:00   | ----- |     |
| CPU Usage  | 10,800  | ***** | 1K  |
| (seconds)  | 5,400   | ----  |     |
| Phys. I/O  | 393,216 | ***** | 10K |
| (requests) | 196,608 | ----- |     |
| Filepool   | 6,000   | ***** | 100 |
| (blk-days) | 4,000   | ----- |     |
| Primary    | 3,000   | ***** | 100 |
| (blk-days) | 2,000   | ----- |     |
| Mig. FRA   | 1,500   | ***** | 100 |
| (blk-days) | 500     | ----  |     |
| Mig. Tape  | 1,500   | ***** | 100 |
| (blk-days) | 1,500   | ----- |     |

Figure 25. Utilization Trend Analysis Report (VMJTREND)(continued)



# Keyword Definitions

This chapter defines the keywords used in Unicenter VM:Account COBOL reports, the VMJSEL utility, and the full-screen QUERY USAGE command.

The keywords in Table 18 apply to any Unicenter VM:Account record. The table presents the keywords in the order in which they appear in the records.

The remaining tables in this chapter describe keywords that apply to records in PERIODTE format. (Chapter 16, *Unicenter VM:Account Records*, contains layouts of these records.)

Table 18. *Keywords Common to All Unicenter VM:Account Records*

| Keyword   | Description                                                                                                                                                                                                                                |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USERID    | Userid to whom this accounting data belongs. Maximum length is eight alphanumeric characters.                                                                                                                                              |
| ACCOUNT   | Account number to which this data belongs. Maximum length is eight alphanumeric characters.                                                                                                                                                |
| ENDDATE   | End date for the accounting data. This is the date the accounting record was actually created in <i>mm/dd/yy</i> format.                                                                                                                   |
| ENDTIME   | End time for the accounting data. This is the time the accounting record was actually created in <i>hh:mm:ss</i> format.                                                                                                                   |
| DATATYPE  | Accounting data type represented in columns 79-80 of a PERIODTE-format accounting record. Values for this keyword are shown in the first two columns of Table 69 (page 353). For example, SESSION and 01 select the same records.          |
| RECDDTYPE | Original record type code represented in columns 81-82 of a PERIODTE-format accounting record. Values for this keyword are shown in the first and third columns of Table 69 (page 353). For example, DEDEV and 02 select the same records. |
| BEGDATE   | Begin date for the accounting data. This is the date used for charging purposes in <i>mm/dd/yy</i> format.                                                                                                                                 |
| BEGTIME   | Begin time for the accounting data in <i>hh:mm:ss</i> format. This is the time used for charging purposes.                                                                                                                                 |
| SHIFT     | Shift name used for charging purposes. It is based on the BEGTIME and the SHIFT configuration file record. The maximum length is eight characters.                                                                                         |
| WEEKDAY   | A value from 1-7. Sunday corresponds to 1 and Saturday corresponds to 7.                                                                                                                                                                   |

(continued)

Table 18. Keywords Common to All Unicenter VM:Account Records (continued)

| Keyword   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------|----------|------------------------------------------------|----------|-------------------------------------------|----------|------------------------------------------------------------------------------------------|----------|-------------------------------------------------------|---------|------------------------------------------------------------------------------------------|
| CUSTOMER  | Customer ID being charged. The maximum length is 12 alphanumeric characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| PROJECT   | Project ID to which the charges were attributed. If no project was in effect, this field is blank. The maximum length is 24 alphanumeric characters.                                                                                                                                                                                                                                                                                                                                                                                                              |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| PACKAGE   | Package ID to which the charges were attributed. If no package was in effect, this field is blank. The maximum length is eight alphanumeric characters.                                                                                                                                                                                                                                                                                                                                                                                                           |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| NODE      | RSCS node ID on which the job ran. The node can be up to eight characters long.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| DATAFLAG  | Flags that indicate the following conditions and their associated acceptable values: <table> <tr> <th>Condition</th><th>Meaning</th></tr> <tr> <td>VMBATCH</td><td>Charges were part of a Unicenter VM:Batch job.</td></tr> <tr> <td>BILLACCT</td><td>System is configured for CHGCUST ACCOUNT.</td></tr> <tr> <td>BILLPROJ</td><td>System is configured for CHGCUST PROJECT. This flag and BILLACCT are mutually exclusive.</td></tr> <tr> <td>RECODED</td><td>This data has been recoded.</td></tr> </table>                                                    | Condition | Meaning | VMBATCH  | Charges were part of a Unicenter VM:Batch job. | BILLACCT | System is configured for CHGCUST ACCOUNT. | BILLPROJ | System is configured for CHGCUST PROJECT. This flag and BILLACCT are mutually exclusive. | RECODED  | This data has been recoded.                           |         |                                                                                          |
| Condition | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| VMBATCH   | Charges were part of a Unicenter VM:Batch job.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| BILLACCT  | System is configured for CHGCUST ACCOUNT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| BILLPROJ  | System is configured for CHGCUST PROJECT. This flag and BILLACCT are mutually exclusive.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| RECODED   | This data has been recoded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| UEXITFLG  | Flag that identifies whether user exits modified the record. Values for this flag can be: <table> <tr> <th>Value</th><th>Meaning</th></tr> <tr> <td>RAWDATA</td><td>RAWDATA user exit modified the record.</td></tr> <tr> <td>ACCTDATA</td><td>ACCTDATA user exit modified the record.</td></tr> <tr> <td>COSTING</td><td>COSTING user exit modified the record.</td></tr> <tr> <td>USERCSTD</td><td>User record entirely costed by the COSTING user exit.</td></tr> </table>                                                                                     | Value     | Meaning | RAWDATA  | RAWDATA user exit modified the record.         | ACCTDATA | ACCTDATA user exit modified the record.   | COSTING  | COSTING user exit modified the record.                                                   | USERCSTD | User record entirely costed by the COSTING user exit. |         |                                                                                          |
| Value     | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| RAWDATA   | RAWDATA user exit modified the record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| ACCTDATA  | ACCTDATA user exit modified the record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| COSTING   | COSTING user exit modified the record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| USERCSTD  | User record entirely costed by the COSTING user exit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| SURCGFLG  | Flag that identifies the type of surcharging that affects the costing of this record. Values can be: <table> <tr> <th>Surcharge</th><th>Meaning</th></tr> <tr> <td>SURCHDAY</td><td>Surcharging for a specific day.</td></tr> <tr> <td>SURCHHOL</td><td>Surcharging for a holiday.</td></tr> <tr> <td>SURCHPKG</td><td>Surcharging for a package.</td></tr> <tr> <td>SURCHBAT</td><td>Surcharging for a batch job.</td></tr> <tr> <td>VMBATCH</td><td>Surcharging for a Unicenter VM:Batch job. This flag and SURCHBAT are mutually exclusive.</td></tr> </table> | Surcharge | Meaning | SURCHDAY | Surcharging for a specific day.                | SURCHHOL | Surcharging for a holiday.                | SURCHPKG | Surcharging for a package.                                                               | SURCHBAT | Surcharging for a batch job.                          | VMBATCH | Surcharging for a Unicenter VM:Batch job. This flag and SURCHBAT are mutually exclusive. |
| Surcharge | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| SURCHDAY  | Surcharging for a specific day.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| SURCHHOL  | Surcharging for a holiday.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| SURCHPKG  | Surcharging for a package.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| SURCHBAT  | Surcharging for a batch job.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |
| VMBATCH   | Surcharging for a Unicenter VM:Batch job. This flag and SURCHBAT are mutually exclusive.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |         |          |                                                |          |                                           |          |                                                                                          |          |                                                       |         |                                                                                          |

(continued)



Table 18.    *Keywords Common to All Unicenter VM:Account Records (continued)*

| <b>Keyword</b> | <b>Description</b>                                 |
|----------------|----------------------------------------------------|
| JOBNO          | Unicenter VM:Batch job number                      |
| JOBCLASS       | The one-character Unicenter VM:Batch job class     |
| JOBPRIOR       | The numeric (0-99) Unicenter VM:Batch job priority |
| JOBNAME        | The eight-character Unicenter VM:Batch job name    |

Table 19. Keywords for Session Records--Datatype 01

| Keyword   | Description                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------|
| CONNTIME  | Number of seconds connected to the CPU. Maximum eight numeric digits. No decimal places allowed.                   |
| TOTCPU    | CPU time used. Maximum eight numeric digits including maximum of three decimal places (nnnnn.nnn).                 |
| VIRTCPU   | Virtual CPU time used. Maximum eight numeric digits including maximum of three decimal places (nnnnn.nnn).         |
| PAGERDS   | Total page reads. Maximum eight numeric digits. No decimal places allowed.                                         |
| PAGEWRTS  | Total page writes. Maximum eight numeric digits. No decimal places allowed.                                        |
| SIO       | SIO count for non-spoiled I/O. Maximum eight numeric digits. No decimal places allowed.                            |
| PUNLINES  | Virtual card counts--spoiled punch. Maximum eight numeric digits. No decimal places allowed.                       |
| PRTLINES  | Virtual line count--spoiled printer. Maximum eight numeric digits. No decimal places allowed.                      |
| RDRLINES  | Virtual record count--spoiled reader. Maximum eight numeric digits. No decimal places allowed.                     |
| CONN\$    | Connect time charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).               |
| OVHDCPU\$ | Overhead CPU time charges. Maximum eight numeric digits including Maximum two decimal places (nnnnnn.nn).          |
| VIRTCPU\$ | Virtual CPU time charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).           |
| PAGERD\$  | Page reads charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).                 |
| PAGEWRT\$ | Page writes charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).                |
| SIO\$     | Non-spoiled SIO charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).            |
| PUN\$     | Virtual spoiled punch charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).      |
| PRT\$     | Virtual spoiled print-line charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |
| RDR\$     | Virtual spoiled card-read charges. Maximum eight numeric digits including Maximum two decimal places (nnnnnn.nn).  |
| TOTVPU    | Total vector processing time. Maximum eight numeric digits including maximum of three decimal places (nnnnn.nnn).  |

(continued)

Table 19. Keywords for Session Records--Datatype 01 (continued)

| Keyword   | Description                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------|
| VIRTVPU   | Virtual vector processing time. Maximum eight numeric digits including maximum of three decimal places (nnnnn.nnn).             |
| OVHDVPU\$ | Change for total vector processing time. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).         |
| VIRTVPU\$ | Charge for total virtual vector processing time. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |

Table 20. Keywords for Dedicated Device Records--Datatype 02

| Keyword  | Description                                                                                                   |
|----------|---------------------------------------------------------------------------------------------------------------|
| DEDVTIME | Number of seconds connected to the dedicated device. Maximum eight numeric digits. No decimal places allowed. |
| DEDVCLAS | Device class code. Any valid dedicated device class.                                                          |
| DEDVDTYP | Device type code. Any valid dedicated device type.                                                            |
| DEDV\$   | Charge for dedicated device. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).   |

Table 21. Keywords for TDISK Records--Datatype 03

| Keyword  | Description                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------|
| TDSKTIME | Number of seconds connected to the temporary disk. Maximum eight numeric digits. No decimal places allowed. |
| TDSKCLAS | TDISK class code. Any valid TDISK class.                                                                    |
| TDSKDTYP | TDISK type code. Any valid TDISK type.                                                                      |
| TDSKSIZE | Size of TDISK space. Maximum eight numeric digits. No decimal places allowed.                               |
| TDSK\$   | Charge for temporary disk. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).   |

Table 22. Keywords for Successful Link Records--Datatype 05

| Keyword  | Description                                                                                     |
|----------|-------------------------------------------------------------------------------------------------|
| LINKTERM | Terminal address. Minimum three hexadecimal characters. Maximum four hexadecimal characters.    |
| LINKOWNR | Minidisk owner userid. Maximum eight alphanumeric characters.                                   |
| LINKVADR | Minidisk address. Must be exactly three hexadecimal characters.                                 |
| LINK\$   | Charge for link. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |

Table 23. Keywords for VSCS Records--Datatype 07

| Keyword   | Description                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------|
| VSCSOVF1  | Overflow counter 1. Input Request Units. Maximum value is a decimal number of 225.                             |
| VSCSOVF2  | Overflow counter 2. Input Bytes. Maximum value is a decimal number of 225.                                     |
| VSCSOVF3  | Overflow counter 3. Output Request Units. Maximum value is a decimal number of 225.                            |
| VSCSOVF4  | Overflow counter 4. Output Bytes. Maximum value is a decimal number of 225.                                    |
| VSCSCTR1  | Counter 1. Input Request Units. Maximum eight numeric digits. No decimal places allowed.                       |
| VSCSCTR2  | Counter 2. Input Bytes. Maximum eight numeric digits. No decimal places allowed.                               |
| VSCSCTR3  | Counter 3. Output Request Units. Maximum eight numeric digits. No decimal places allowed.                      |
| VSCSCTR4  | Counter 4. Output Bytes. Maximum eight numeric digits. No decimal places allowed.                              |
| VSCSCTR5  | Counter 5. Console lines. Maximum eight numeric digits. No decimal places allowed.                             |
| VSCSCTR6  | Counter 6. Copies. Maximum eight numeric digits. No decimal places allowed.                                    |
| VSCSINR\$ | Cost for input resource units. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).  |
| VSCSINB\$ | Cost for input bytes. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn).           |
| VSCSOTR\$ | Cost for output resource units. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |

(continued)

Table 23. Keywords for VSCS Records--Datatype 07 (continued)

| Keyword   | Description                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------|
| VSCSOTB\$ | Cost for output bytes. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn).  |
| VSCSCON\$ | Cost for console lines. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn). |
| VSCSCP\$  | Cost for copies. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn).        |

Table 24. Keywords for Guest I/O Records--Datatype 0C

| Keyword  | Description                                                                                                |
|----------|------------------------------------------------------------------------------------------------------------|
| GIOCTNIC | Count of bytes transferred via virtual network interface card (vNIC; also known as Guest LAN).             |
| GIOCTCTC | Count of bytes transferred via channel-to-channel adapter (CTCA).                                          |
| GIOCTIUC | Count of bytes transferred via IUCV.                                                                       |
| GIO\$NIC | Cost of kilobytes transferred via vNIC. Maximum eight numeric digits with five decimal places (nnn.nnnnn). |
| GIO\$CTC | Cost of kilobytes transferred via CTCA. Maximum eight numeric digits with five decimal places (nnn.nnnnn). |
| GIO\$IUC | Cost of kilobytes transferred via IUCV. Maximum eight numeric digits with five decimal places (nnn.nnnnn). |

Table 25. Keywords for Volumes Records--Datatype A3

| Keyword  | Description                                                                                           |
|----------|-------------------------------------------------------------------------------------------------------|
| VOLSUSER | Volume owner userid. Maximum eight alphanumeric characters.                                           |
| VOLSNDAY | Number of days the volume was owned. Maximum eight numeric digits. No decimal places allowed.         |
| VOLSDTYP | Volume device type name. Any valid DASD name or TAPE.                                                 |
| VOLS\$   | Volume usage charges. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn). |

Table 26. Keywords for MDISK Records--Datatype A4

| Keyword  | Description                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------|
| MDSKVOL  | Volser of the real disk. Maximum six alphanumeric characters.                                                      |
| MDSKNDAY | Number of days minidisk was owned. Maximum five numeric digits. No decimal places allowed. Must not exceed 65,535. |
| MDSKDTYP | Device type of the real disk. Any valid DASD device type.                                                          |
| MDSKVADR | Minidisk virtual address. Maximum of four hexadecimal characters.                                                  |
| MDSK\$   | Minidisk usage charges. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn).            |

Table 27. Keywords for Miscellaneous Charges and Credits Records--Datatype A5

| Keyword  | Description                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------|
| MISCUSTO | Userid to whom charges and credits apply. Maximum eight alphanumeric characters.                                  |
| MISCUSBY | Userid who applied charges and credits. Maximum eight alphanumeric characters.                                    |
| MISCTRAN | Miscellaneous transaction identifier. Maximum eight alphanumeric characters.                                      |
| MISCODE  | Miscellaneous transaction code. Maximum eight alphanumeric characters.                                            |
| MISCEA\$ | Cost per unit. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn).                    |
| MISCUNIT | Number of units. Maximum five numeric digits. No decimal places. Must not exceed 65,535.                          |
| MISCDESC | Miscellaneous transaction description. Maximum 24 alphanumeric characters.                                        |
| MISC\$   | Miscellaneous transaction amount. Maximum eight numeric digits including maximum two decimal places (nnnnnnn.nn). |

Table 28. Keywords for BrightStor VM:Tape Mount Records--Datatype A6

| Keyword  | Description                                                                                        |
|----------|----------------------------------------------------------------------------------------------------|
| TAPMUSER | Userid who requested the tape mount. Maximum eight alphanumeric characters.                        |
| TAPMVOL  | Volser mounted. Maximum eight alphanumeric characters.                                             |
| TAPMLBL  | Label type. Any of the following: SL, NL, SUL, BLP, NSL, CTM, AL, and AUL.                         |
| TAPMTYPE | Mount type. Either R or W.                                                                         |
| TAPM\$   | Tape mount charges. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |

Table 29. Keywords for RSCS Records--Datatype A7

| Keyword  | Description                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------|
| RSCSORG# | Origin spool fileid. Minimum one numeric digit. Maximum four numeric digits.                                              |
| RSCSLCL# | Local spool fileid. Minimum one numeric digit. Maximum four numeric digits.                                               |
| RSCSORID | Origin location ID. Maximum eight alphanumeric characters.                                                                |
| RSCSLCID | Local destination ID. Maximum eight alphanumeric characters.                                                              |
| RSCSCLS  | Class. Must be one character, alphanumeric. No special characters.                                                        |
| RSCSDEV  | Origin device type. Either PRINTER or PUNCH.                                                                              |
| RSCSRCDS | Number of records in the file. Maximum eight numeric digits. No decimal places allowed.                                   |
| RSCSDEST | Destination location userid. Maximum eight alphanumeric characters.                                                       |
| RSCSTCOD | Transaction code. Either SEND or RECEIVE.                                                                                 |
| RSCS\$   | Cost for sending and receiving RSCS files. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |
| RSCSID   | Userid of RSCS service virtual machine. Maximum eight alphanumeric characters.                                            |

Table 30. Keywords for BrightStor VM:Archiver Usage Records--Datatype A9

| Keyword  | Description                                                                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ARCHNHRS | Archive hours billed. Maximum of five numeric digits. No decimal places are allowed and the value must not exceed 65,535.                                                   |
| ARCHSIZE | Number of bytes archived. Maximum of eight numeric digits allowed. No decimal places are allowed.                                                                           |
| ARCHATYP | Archive type specified as STAGED, TAPE, DASD, or CART (cartridge).                                                                                                          |
| ARCHTPDN | Tape device information in one of four densities: 800, 1600, 6250, or 38K. If used with ARCHATYP, ARCHTPDN can be specified only if ARCHATYP does not equal STAGED or DASD. |
| ARCHDCLS | Any valid dedicated device class. If used with ARCHATYP, ARCHDCLS can be specified only if ARCHATYP does not equal TAPE.                                                    |
| ARCHDTYP | Any valid dedicated device type. If used with ARCHATYP, ARCHDTYP can be specified only if ARCHATYP does not equal TAPE.                                                     |
| ARCH\$   | Charges for BrightStor VM:Archiver usage. Maximum of eight numeric digits, including a maximum of two decimal places (nnnnnn.nn).                                           |



Table 31. Keywords for SQL/DS Usage Records--Datatype AA

| Keyword   | Description                                                                                                                             |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|
| SQLDBASE  | Database name. Maximum of eight alphanumeric characters.                                                                                |
| SQLUSRID  | SQL/DS user identifier. Maximum of eight alphanumeric characters.                                                                       |
| SQLVMID   | Database machine user identifier. Maximum of eight alphanumeric characters.                                                             |
| SQLPROG   | Access module last active. Also referred to as prepname or program name. Maximum of eight alphanumeric characters.                      |
| SQLACTV   | SQL/DS active time is seconds of time connected to a real SQL agent. Maximum of eight numeric digits. No decimal places are allowed.    |
| SQLCPU    | SQL/DS CPU usage is milliseconds of actual processor time. Maximum of eight numeric digits, including three decimal places (nnnnn.nnn). |
| SQLPBUFF  | Number of page buffer requests (LPAGBUFF). Maximum of eight numeric digits. No decimal places are allowed.                              |
| SQLACTV\$ | Cost for active time. Maximum of eight numeric digits, including two decimal places (nnnnnn.nn).                                        |
| SQLCPU\$  | Cost for CPU usage. Maximum of eight numeric digits, including two decimal places (nnnnnn.nn).                                          |
| SQLPBUF\$ | Cost for page buffer requests. Maximum of eight numeric digits, including two decimal places (nnnnnn.nn).                               |

Table 32. Keywords for Unicenter VM:Spool Usage Records--Datatype AB

| Keyword  | Description                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------|
| SPLORIG  | Spool file origin. Maximum eight alphanumeric characters.                                                   |
| SPLFNAME | Spool file filename. Maximum eight alphanumeric characters.                                                 |
| SPLFTYPE | Spool file filetype. Maximum eight alphanumeric characters.                                                 |
| SPLDIST  | Spool file distribution code. Maximum eight alphanumeric characters.                                        |
| SPLSECS  | Number of seconds owned. Maximum eight numeric digits. No decimal places allowed.                           |
| SPLRECS  | Logical record count. Maximum eight numeric digits. No decimal places allowed.                              |
| SPLRECL  | Logical record length. Maximum five numeric digits. No decimal places allowed. Must not exceed 65,535.      |
| SPLBLKS  | Link block count. Maximum eight numeric digits. No decimal places allowed.                                  |
| SPLTYPE  | Spool file type specified as CONSOLE, PRINT, PUNCH, VMDUMP, CPDUMP, CPTRAP, MONITOR, ACCOUNT, or UNKNOWN.   |
| SPLCLASS | Spool file class. Maximum one uppercase alphanumeric character. No special characters allowed.              |
| SPL\$    | Cost for spool record hours. Maximum eight numeric digits including maximum two decimal places (nnnnnn.nn). |

Table 33. Keywords for TSAF Records--Datatype AC

| Keyword   | Description                                                                           |
|-----------|---------------------------------------------------------------------------------------|
| TSAFRSRC  | Resource name.                                                                        |
| TSAFVMID  | Userid of the TSAF service virtual machine.                                           |
| TSAFCONT  | Connect time. Maximum eight numeric digits. No decimal places.                        |
| TSAFSENT  | Bytes sent. Maximum eight numeric digits. No decimal places.                          |
| TSAFRCVD  | Bytes received. Maximum eight numeric digits. No decimal places.                      |
| TSAFCON\$ | Charge for connect time. Maximum eight numeric digits including two decimal places.   |
| TSAFSNT\$ | Charge for bytes sent. Maximum eight numeric digits including two decimal places.     |
| TSAFRCV\$ | Charge for bytes received. Maximum eight numeric digits including two decimal places. |

Table 34. Keywords for SQL/DS Storage Records--Datatype AD

| Keyword   | Description                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------|
| SQLOWNID  | SQL owner identifier. This can be the same as userid; it identifies the person owning the DBSPACE. |
| SQLDBNAM  | Name of the SQL database.                                                                          |
| SQLSPOOL  | Storage pool number. Maximum five numeric digits. No decimal places.                               |
| SQLSTYPE  | Identifies the type of DBSPACE.                                                                    |
| PUBLIC    | Anyone can access this information.                                                                |
| PRIVATE   | Only the owner can access this information.                                                        |
| SQLSNAML  | Length of the DBSPACE name. Two numeric digits.                                                    |
| SQLSNAME  | Name of the DBSPACE. Maximum 18 characters.                                                        |
| SQLSPACE  | A number assigned to the DBSPACE to uniquely identify it.                                          |
| SQLPAGES  | Pages of storage owned.                                                                            |
| SQLDAYS   | Number of days you are charged for owning the DBSPACE.                                             |
| SQLSTOR\$ | Charge for pages owned.                                                                            |

Table 35. Keywords for SFS Usage Records--Datatype AE

| Keyword  | Description                                                                  |
|----------|------------------------------------------------------------------------------|
| SFSSRVR  | SFS Server machine ID, maximum of eight alphanumeric characters.             |
| SFSUPOOL | SFS Current filepool name, maximum of eight alphanumeric characters.         |
| SFSCONT  | Time connected to SFS, maximum of eight numeric characters.                  |
| SFSCPU   | SFS CPU usage, maximum of eight numeric characters with three decimals.      |
| SFSIOREQ | Physical I/O requests, maximum of eight numeric characters.                  |
| SFSCON\$ | Cost for active time, maximum of eight numeric characters with two decimals. |
| SFSCPU\$ | Cost for CPU time, maximum of eight numeric characters with two decimals.    |
| SFSIOR\$ | Cost for physical I/Os, maximum eight numeric characters with two decimals.  |

Table 36. Keywords for SFS Storage Records--Datatype AF

| Keyword   | Description                                                                      |
|-----------|----------------------------------------------------------------------------------|
| SFSJWRKR  | VM:Account slave worker ID, maximum of eight alphanumeric characters.            |
| SFSDPOOL  | SFS FILEPOOL name, maximum of eight alphanumeric characters.                     |
| SFSSTGRP  | SFS group name, maximum of eight alphanumeric characters.                        |
| SFSMXBLK  | Maximum blocks allowed, maximum of eight numeric characters, no decimals.        |
| SFSBLKS   | Current number of blocks used, maximum of eight numeric characters, no decimals. |
| SFSDAYS   | Number of days owned, maximum of five characters, less than 65,535.              |
| SFSWARNP  | Warning limit days, maximum of five numeric characters less than 65,535.         |
| SFSDASD\$ | Cost for pages used, maximum of eight numeric characters, with two decimals.     |

Table 37. Keywords for CA-VM:Webgateway Records--Datatype AG

| Keyword   | Description                                                                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------------------|
| WEBSERVER | Userid of web server service virtual machine, maximum eight alphanumeric characters.                                       |
| WEBSVIP   | Web server IP address ( <i>nnn.nnn.nnn.nnn</i> ).                                                                          |
| WEBSVPOR  | Web server TCP port, maximum of five digits not to exceed 65,535.                                                          |
| WEBCLIP   | Client IP address ( <i>nnn.nnn.nnn.nnn</i> ).                                                                              |
| WEBCLPOR  | Client TCP port, maximum of five digits not to exceed 65,535.                                                              |
| WEBTRAN#  | Number of transactions represented by the card, maximum of five numeric digits not to exceed 65,535.                       |
| WEBBYTES  | Number of bytes served out of TCP, maximum of eight digits.                                                                |
| WEBSVCPU  | Web server virtual processor time in milliseconds, maximum of eight digits, including three decimals ( <i>nnnnn.nnn</i> ). |
| WEBSVIO   | Web server I/O requests, maximum of eight digits.                                                                          |
| WEBWKCPU  | Worker virtual processor time in milliseconds, maximum of eight digits, including three decimals ( <i>nnnnn.nnn</i> ).     |
| WEBWKIO   | Worker I/O request, maximum of eight digits.                                                                               |
| WEBBYTE\$ | Rate for 1000 bytes of data through TCP, maximum of eight digits, including two decimals ( <i>nnnnnn.nn</i> ).             |
| WEBSVCP\$ | Rate for virtual CPU usage by server, maximum of eight digits, including two decimals ( <i>nnnnnn.nn</i> ).                |
| WEBSVIO\$ | Rate for I/O requests by server, maximum of eight digits, including two decimals ( <i>nnnnnn.nn</i> ).                     |
| WEBWKCP\$ | Rate for virtual CPU usage by worker, maximum of eight digits, including two decimals ( <i>nnnnnn.nn</i> ).                |
| WEBWKIO\$ | Rate for I/O requests by worker, maximum of eight digits, including two decimals ( <i>nnnnnn.nn</i> ).                     |



# Resource Costing Files

---

This chapter contains descriptions and layouts for the files that Unicenter VM:Account uses to expand an 80-byte accounting record into a 240-byte record. For most files, the first two characters of each record *must* contain the record type code that Unicenter VM:Account uses during external processing. Blank records are not allowed.

These files are supplied in sample form on the product distribution tape. You must modify them with the UPDATE command before using them.

Unicenter VM:Account uses the resource costing files only if they are on the minidisk record specified on the CTLDISK record in the VMACCT CONFIG file. These files are located on the Unicenter VM:Account 1C0 minidisk.

If you use the PROJECTS ACCTLIST file, you must modify the PROJECTS MASTER file using the UPDATE command before modifying the PROJECTS ACCTLIST file.

If a customer ID is deleted from the CUSTOMER MASTER file, it should be removed from the PROJECTS MASTER file and CUSTOMER ACCTLIST file. If a customer ID is in the PROJECTS MASTER file or CUSTOMER ACCTLIST file and it is not in the CUSTOMER MASTER file, Unicenter VM:Account will not initialize.

Table 38. Resource Costing Files Quick Reference

| File                                        | Filename | Filetype             | Page |
|---------------------------------------------|----------|----------------------|------|
| <b>Master Description Files (page 313)</b>  |          |                      |      |
| Customer Master File                        | CUSTOMER | MASTER               | 313  |
| Packages Master File                        | PACKAGES | MASTER               | 314  |
| Projects Master File                        | PROJECTS | MASTER               | 315  |
| Daily Events File                           | DAILY    | EVENTS <sub>yy</sub> | 316  |
| Customer Accounts List File                 | CUSTOMER | ACCTLIST             | 316  |
| Projects Accounts List File                 | PROJECTS | ACCTLIST             | 317  |
| Holidays Validation File                    | HOLIDAYS | MASTER               | 318  |
| Miscellaneous Charges/Credits File          | MISCCHGS | MASTER               | 320  |
| <b>Cost Table Files (page 320)</b>          |          |                      |      |
| Session Costing File                        | SESSION  | COSTABLE             | 326  |
| Dedicated Device Costing File               | DEDEVICE | COSTABLE             | 327  |
| Temporary Disk Costing File                 | TDISK    | COSTABLE             | 328  |
| Link Charges Costing File                   | LINKS    | COSTABLE             | 329  |
| Minidisk Costing File                       | MDISK    | COSTABLE             | 330  |
| Package Surcharges Costing File             | PACKAGES | COSTABLE             | 331  |
| Tape Mount Charges Costing File             | TAPMOUNT | COSTABLE             | 333  |
| Volumes (Disk/Tape) Costing File            | VOLUMES  | COSTABLE             | 334  |
| RSCS Charges Costing File                   | RSCS     | COSTABLE             | 335  |
| VSCS Charges Costing File                   | VSCS     | COSTABLE             | 336  |
| Guest I/O Charges Costing File              | LGAI     | COSTABLE             | 337  |
| BrightStor VM:Archiver Charges Costing File | ARCHIVE  | COSTABLE             | 338  |
| SQL/DS Charges Costing File                 | SQL-DS   | COSTABLE             | 339  |
| Unicenter VM:Spool Charges Costing File     | SPOOL    | COSTABLE             | 340  |
| Unicenter VM:Batch Costing File             | VMBATCH  | COSTABLE             | 341  |
| CA-VM:Webgateway Costing File               | WEB      | COSTABLE             | 342  |
| TSAF Costing File                           | TSAF     | COSTABLE             | 343  |
| SQL/DS Storage Costing File                 | DBSPACE  | COSTABLE             | 344  |
| SFS Usage Costing File                      | SFS      | COSTABLE             | 345  |
| SFS Storage Costing File                    | SFSDASD  | COSTABLE             | 346  |



## Master Description Files

The master description files contain customer information such as name, address, phone number, customer ID, account numbers, project names, and budget limits. These files and their file layouts are presented below. Note that all numeric fields must be right-justified and zero-filled. Budget limits are specified in whole figures.

### Customer Master File

LRECL = 176  
RECFM = F  
FILEID = CUSTOMER MASTER

The CUSTOMER MASTER file contains customer information, such as address and phone number, that Unicenter VM:Account uses when accumulating resources by customer ID and for producing invoices.

This file must contain at least one record even if it is an arbitrary customer ID.

Table 39. CUSTOMER MASTER File

| Column | Length | Description                      | Justified | Notes         |
|--------|--------|----------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (D0)            | -         | -             |
| 3      | 12     | Customer ID                      | L         | No blanks     |
| 15     | 2      | Reserved for Computer Associates | -         | -             |
| 17     | 8      | Customer budget limit            | R         | Leading zeros |
| 25     | 20     | Customer name                    | L         | -             |
| 45     | 20     | Address, part 1                  | L         | -             |
| 65     | 20     | Address, part 2                  | L         | -             |
| 85     | 6      | Reserved for Computer Associates | -         | -             |
| 91     | 20     | City & state                     | L         | -             |
| 111    | 9      | Zip code                         | L         | -             |
| 120    | 20     | Contact name                     | L         | -             |
| 140    | 10     | Telephone number                 | L         | -             |
| 157    | 27     | Reserved                         | -         | -             |

## Packages Master File

```
LRECL = 32  
RECFM = F  
FILEID = PACKAGES MASTER
```

The PACKAGES MASTER file contains the package IDs of software packages for which resource usage can be separately accumulated and optionally surcharged or discounted.

The PACKAGES MASTER file can also be used to limit the number of users that can execute a package accounting program by specifying the limit when updating the file.

This file is built using the UPDATE command and should *never* be modified using a file editor.

Table 40. PACKAGES MASTER File

| Column | Length | Description                      | Justified | Notes     |
|--------|--------|----------------------------------|-----------|-----------|
| 1      | 2      | Record-type code (K0 or KD)      | -         | -         |
| 3      | 6      | Internal project number          | L         | No blanks |
| 9      | 8      | Package name                     | -         | -         |
| 17     | 6      | Maximum number of users          | L         | -         |
| 23     | 4      | Cross check of index field       | L         | -         |
| 27     | 8      | Reserved for Computer Associates | -         | -         |

## Projects Master File

```
LRECL = 80  
RECFM = F  
FILEID = PROJECTS MASTER
```

The PROJECTS MASTER file contains the names of projects for which resource usage can be separately accumulated.

This file is built using the UPDATE command and should *never* be modified using a file editor.

Table 41. PROJECTS MASTER File

| Column | Length | Description                      | Justified | Notes       |
|--------|--------|----------------------------------|-----------|-------------|
| 1      | 2      | Record-type code (J0 or JD)      | -         | -           |
| 3      | 8      | Internal project number          | L         | No blanks   |
| 11     | 24     | Project name                     | L         | -           |
| 35     | 12     | Customer ID                      | L         | -           |
| 47     | 8      | Project budget limit             | R         | Zero filled |
| 55     | 4      | Cross check for index            | R         | Zero filled |
| 59     | 6      | Reserved for Computer Associates | -         | -           |
| 65     | 8      | Yearly budget limit              | R         | Zero filled |
| 73     | 4      | Posted budget usage              | R         | Zero filled |
| 77     | 4      | Reserved for Computer Associates | -         | -           |

## Daily Events File

```
LRECL = 366  
RECFM = F  
FILEID = DAILY EVENTSyy
```

The DAILY EVENTS<sub>yy</sub> file is a work file for Unicenter VM:Account. It contains information indicating when Unicenter VM:Account facilities, such as DASDACCT and period processing, were last completed. It also contains identifiers for Saturdays, Sundays, and holidays. Holidays are written to this file based on the contents of the HOLIDAYS MASTER file at the time the file is created. It is not updated if the HOLIDAYS MASTER is updated.

You should *never* modify the DAILY EVENTS<sub>yy</sub> file except with supervision from a Computer Associates Customer Services Representative.

## Customer Accounts List File

```
LRECL = 64  
RECFM = F  
FILEID = CUSTOMER ACCTLIST
```

The CUSTOMER ACCTLIST file is optional if the CHGCUST PROJECT record is specified in the Unicenter VM:Account configuration file; otherwise, it is required. Unicenter VM:Account uses the CUSTOMER ACCTLIST file to associate a site-defined customer ID with an account number defined in the CP user directory. If a customer ID not included in the CUSTOMER MASTER file is found in this file, Unicenter VM:Account terminates and displays the invalid record number.

The CUSTOMER ACCTLIST file should contain a default customer ID (also defined in the CUSTOMER MASTER file) with an asterisk in the account number field, and a budget limit of 99999999. This record is used where an unidentified account number is encountered by Unicenter VM:Account, preventing the record from being rejected by Unicenter VM:Account. When the Master Files are eventually updated to reflect such account numbers, the Recost utility can be executed to ensure that the appropriate customer ID is charged.

Table 42. CUSTOMER ACCTLIST File

| Column | Length | Description                      | Justified | Notes         |
|--------|--------|----------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (D1)            | -         | -             |
| 3      | 12     | Customer ID                      | L         | No blanks     |
| 15     | 2      | Reserved for Computer Associates | -         | -             |
| 17     | 8      | Account number (or * suffix)     | L         | -             |
| 25     | 8      | Budget limit for this account    | R         | Leading zeros |
| 33     | 31     | Reserved for Computer Associates | -         | -             |

## Projects Accounts List File

```
LRECL = 64
RECFM = F
FILEID = PROJECTS ACCTLIST
```

Build this file only after using the UPDATE command to identify project names by customer ID to Unicenter VM:Account. This information is in the PROJECTS MASTER file.

The PROJECTS ACCTLIST file is required unless the PROJECT NOVERIFY record is specified in the Unicenter VM:Account configuration file. Unicenter VM:Account uses the PROJECTS ACCTLIST file as a list of valid project names by account number.

If PROJECT VERIFY is specified in the Unicenter VM:Account configuration file, there *must* be a default project name specified for each account number that Unicenter VM:Account might encounter; otherwise a default project is optional. If PROJECT VERIFY is specified, records with no default project are sent to a reject file. The default project name is used for all logon sessions when the PROJECT command has not been specifically issued. A default project will ensure that all accounting records contain a valid project name. The budget field must be filled in. If budget accounting will not be used, enter 99999999 in this field.

This file should contain a default project name starting in column 3, an asterisk in column 19, and 99999999 starting in column 29. This record is used where an unidentified account number is encountered by Unicenter VM:Account. This prevents the record from being rejected by Unicenter VM:Account. The Recost utility could be executed after the Master Files are updated to reflect this account number, and the appropriate customer ID and project will be charged.

Table 43. PROJECTS ACCTLIST File

| Column | Length | Description                      | Justified | Notes         |
|--------|--------|----------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (J1)            | -         | -             |
| 3      | 24     | Project name                     | L         | No blanks     |
| 27     | 8      | Account number (or * suffix)     | L         | -             |
| 35     | 1      | Reserved for Computer Associates | -         | -             |
| 36     | 1      | (*) if this is a default project | -         | -             |
| 37     | 8      | Account/project budget limit     | R         | Leading zeros |
| 45     | 20     | Reserved for Computer Associates | -         | -             |

## Holidays Validation File

```
LRECL = 60
RECFM = F
FILEID = HOLIDAYS MASTER
```

Unicenter VM:Account uses the HOLIDAYS MASTER file to list the dates that your site defines as holidays. The PACKAGES COSTABLE file applies a discount or surcharge for these days using the \*HOLIDAY keyword. This file can contain any number of records.

Table 44. HOLIDAYS MASTER File

| Column | Length | Description                      | Justified | Notes         |
|--------|--------|----------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (H0)            |           | -             |
| 3      | 2      | Year the record applies to       | -         | -             |
| 5      | 1      | Reserved for Computer Associates | -         | -             |
| 6      | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 10     | 1      | Reserved for Computer Associates | -         | -             |
| 11     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 15     | 1      | Reserved for Computer Associates | -         | -             |
| 16     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 20     | 1      | Reserved for Computer Associates | -         | -             |
| 21     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 25     | 1      | Reserved for Computer Associates | -         | -             |

(continued)

Table 44. HOLIDAYS MASTER File (continued)

| Column | Length | Description                      | Justified | Notes         |
|--------|--------|----------------------------------|-----------|---------------|
| 26     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 30     | 1      | Reserved for Computer Associates | -         | -             |
| 31     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 35     | 1      | Reserved for Computer Associates | -         | -             |
| 36     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 40     | 1      | Reserved for Computer Associates | -         | -             |
| 41     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 45     | 1      | Reserved for Computer Associates | -         | -             |
| 46     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 50     | 1      | Reserved for Computer Associates | -         | -             |
| 51     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 55     | 1      | Reserved for Computer Associates | -         | -             |
| 56     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 60     | 1      | Reserved for Computer Associates | -         | -             |
| 61     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 65     | 1      | Reserved for Computer Associates | -         | -             |
| 66     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 70     | 1      | Reserved for Computer Associates | -         | -             |
| 71     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 75     | 1      | Reserved for Computer Associates | -         | -             |
| 76     | 4      | <i>mmdd</i> date of holiday      | R         | Leading zeros |
| 80     | 1      | Reserved for Computer Associates | -         | -             |

## Miscellaneous Charges/Credits File

```
LRECL = 44  
RECFM = F  
FILEID = MISCCHGS MASTER
```

Unicenter VM:Account uses the MISCCHGS MASTER file to apply debits or credits to the PERIODTE CURRENT file based on a transaction code specified on the CHARGE or CREDIT commands.

The unit price field is specified in tenths of a cent.

Table 45. MISCCHGS MASTER File

| Column | Length | Description                          | Justified | Notes         |
|--------|--------|--------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (M0)                | -         | -             |
| 3      | 8      | Transaction code                     | L         | No blanks     |
| 11     | 24     | Charge/credit description            | L         | -             |
| 35     | 1      | + = Charge<br>- = Credit indicator   | -         | -             |
| 36     | 1      | Y=YES<br>N=NO override on unit price | -         | -             |
| 37     | 8      | Default unit price                   | R         | Leading zeros |

## COSTABLE Files

The following files are the site-created costing files that Unicenter VM:Account uses to apply charges to a resource. The last 20 characters contain an optional description that you can associate with each charge. Unicenter VM:Account uses the record with the latest effective start date if there are multiple records (unless that start date is later than today's date).

You maintain the following COSTABLE files with the UPDATE command. All numeric fields must be right-justified and zero-filled. All dollar amounts are right-justified with leading zeros. Valid shift identifiers are a 1- to 8-character name and an asterisk. The asterisk indicates that the rate applies to all shifts not specifically defined in the COSTABLE file. Shift 00 is not a valid shift for specifying rate differentials by shift. It is considered a pseudoshift for specifying that minidisk processing is to occur at midnight.

When a rate is applied to an accounting record, the cost is rounded to the nearest cent.



## Valid Device Types

There should be one record for each chargeable device type in the DEDEVICE, TDISK, MDISK, and VOLUMES COSTABLE files. Otherwise, Unicenter VM:Account will send the resource record for the unidentified device to the reject file.

The valid device types allowed in these files are shown in the following tables. The device type specified in the COSTABLE file can be selected from either the Device Type or Equivalent Device Category in the figures. Default device types exist for each device category. These can be specified in all COSTABLE files except the MDISK COSTABLE file. The MDISK COSTABLE file has no default device type. The COSTABLE files should not contain both a device type and an equivalent device type for devices that have equivalent types. An error will be generated if device types are duplicated in a COSTABLE file, and Unicenter VM:Account will not initialize.

Table 46. Valid Device Types and Equivalents

| Device Type             | Equivalent Device | Notes                                             |
|-------------------------|-------------------|---------------------------------------------------|
| <b>Terminal Devices</b> |                   |                                                   |
| TERM                    | -                 | Can be used in place of any valid terminal device |
| BSC                     | -                 | -                                                 |
| IBM1                    | -                 | -                                                 |
| SDLC                    | -                 | -                                                 |
| TELE2                   | TTY               | -                                                 |
| TYPSS                   | -                 | -                                                 |
| 1050                    | -                 | -                                                 |
| 2700                    | 2955              | -                                                 |
| 2741                    | -                 | -                                                 |
| 3210                    | 1052, 2150, 3215  | -                                                 |
| <b>Special Devices</b>  |                   |                                                   |
| SPECIAL                 | -                 | Can be used in place of any valid special device  |
| CTCA                    | 3088              | -                                                 |
| SRF                     | -                 | -                                                 |
| UNSUPRTD                | -                 | -                                                 |
| 3704                    | 3705              | -                                                 |
| 3851                    | -                 | -                                                 |

(continued)

Table 46. Valid Device Types and Equivalents (continued)

| Device Type                      | Equivalent Device                    | Notes                                                      |
|----------------------------------|--------------------------------------|------------------------------------------------------------|
| <b>Graphic Devices</b>           |                                      |                                                            |
| GRAF                             | -                                    | Can be used in place of any valid graphic device           |
| HFGD                             | -                                    | -                                                          |
| 2053                             | -                                    | -                                                          |
| 2250                             | -                                    | -                                                          |
| 2260                             | -                                    | -                                                          |
| 2265                             | -                                    | -                                                          |
| 3066                             | -                                    | -                                                          |
| 3277                             | 3138, 3148, 3158                     | -                                                          |
| 3278                             | 3279                                 | -                                                          |
| 3278-2                           | 3279-2                               | -                                                          |
| 3278-3                           | 3279-3                               | -                                                          |
| 3278-4                           | -                                    | -                                                          |
| 3278-5                           | -                                    | -                                                          |
| 3284                             | 3286, 3287, 3288, 3289, 4250, 3286-2 | -                                                          |
| 3284-2                           | -                                    | -                                                          |
| <b>Remote Graphic Devices</b>    |                                      |                                                            |
| REM-GRAF                         | -                                    | Can be used in place of any valid remote graphic device    |
| REM-3275                         | -                                    | -                                                          |
| REM-3276                         | -                                    | -                                                          |
| REM-3277                         | -                                    | -                                                          |
| REM-3278                         | -                                    | -                                                          |
| REM-3279                         | -                                    | -                                                          |
| <b>Input Unit Record Devices</b> |                                      |                                                            |
| UR-IN                            | -                                    | Can be used in place of any valid input Unit Record device |
| READER                           | -                                    | -                                                          |
| TIMER                            | -                                    | -                                                          |
| TR                               | -                                    | -                                                          |

(continued)

Table 46. Valid Device Types and Equivalents (continued)

| Device Type                                  | Equivalent Device | Notes                                                             |
|----------------------------------------------|-------------------|-------------------------------------------------------------------|
| <b>Input Unit Record Devices</b> (continued) |                   |                                                                   |
| 1017                                         | -                 | -                                                                 |
| 1442R                                        | -                 | -                                                                 |
| 2495                                         | -                 | -                                                                 |
| 2501                                         | -                 | -                                                                 |
| 2520R                                        | -                 | -                                                                 |
| 2540R                                        | -                 | -                                                                 |
| 2671                                         | -                 | -                                                                 |
| 3505                                         | -                 | -                                                                 |
| <b>Remote Input Unit Record Device Type</b>  |                   |                                                                   |
| REMSPOOL                                     | -                 | Can be used in place of any valid remote input unit record device |
| <b>Output Unit Record Devices</b>            |                   |                                                                   |
| UR-OUT                                       | -                 | Can be used in place of any valid output unit record device       |
| PRINTER                                      | -                 | -                                                                 |
| PUNCH                                        | -                 | -                                                                 |
| TP                                           | -                 | -                                                                 |
| 1018                                         | -                 | -                                                                 |
| 1403                                         | -                 | -                                                                 |
| 1442P                                        | -                 | -                                                                 |
| 1443                                         | -                 | -                                                                 |
| 2520P                                        | -                 | -                                                                 |
| 2540P                                        | -                 | -                                                                 |
| 3203                                         | -                 | -                                                                 |
| 3211                                         | -                 | -                                                                 |
| 3262                                         | -                 | -                                                                 |
| 3289E                                        | -                 | -                                                                 |
| 3525                                         | -                 | -                                                                 |
| 3800                                         | -                 | -                                                                 |
| 4245                                         | -                 | -                                                                 |

(continued)

Table 46. Valid Device Types and Equivalents (continued)

| Device Type                              | Equivalent Device      | Notes                                                              |
|------------------------------------------|------------------------|--------------------------------------------------------------------|
| <b>Remote Output Unit Record Devices</b> |                        |                                                                    |
| REM-PRTR                                 | -                      | Can be used in place of any valid remote output unit record device |
| <b>Tape Devices</b>                      |                        |                                                                    |
| TAPE                                     | -                      | Can be used in place of any valid tape device                      |
| 2400                                     | 2401, 2402, 2403, 2404 | -                                                                  |
| 2415                                     | -                      | -                                                                  |
| 2420                                     | -                      | -                                                                  |
| 3410                                     | 3411                   | -                                                                  |
| 3420                                     | -                      | -                                                                  |
| 3420-3                                   | -                      | -                                                                  |
| 3420-4                                   | -                      | -                                                                  |
| 3420-5                                   | -                      | -                                                                  |
| 3420-6                                   | -                      | -                                                                  |
| 3420-7                                   | -                      | -                                                                  |
| 3420-8                                   | -                      | -                                                                  |
| 3430                                     | -                      | -                                                                  |
| 3480                                     | 3490                   | -                                                                  |
| 3590                                     | -                      | -                                                                  |
| 8809                                     | -                      | -                                                                  |
| <b>CKD and FBA Devices</b>               |                        |                                                                    |
| DASD                                     | DISK                   | DASD and DISK can be used in place of any CKD device               |
| FB-512                                   | -                      | Can be used in place of any FBA device                             |
| 2305                                     | -                      | -                                                                  |
| 2311                                     | 2301, 2303, 2321       | -                                                                  |
| 2314                                     | 2319                   | -                                                                  |
| 3310                                     | -                      | -                                                                  |
| 3330                                     | 3333                   | -                                                                  |
| 3330-1                                   | -                      | -                                                                  |
| 3330-2                                   | -                      | -                                                                  |

(continued)

Table 46. Valid Device Types and Equivalents (continued)

| Device Type                            | Equivalent Device | Notes                                                                   |
|----------------------------------------|-------------------|-------------------------------------------------------------------------|
| <b>CKD and FBA Devices</b> (continued) |                   |                                                                         |
| 3330-11                                | -                 | -                                                                       |
| 3340                                   | -                 | -                                                                       |
| 3340-1                                 | -                 | -                                                                       |
| 3340-2                                 | -                 | -                                                                       |
| 3350                                   | -                 | -                                                                       |
| 3370                                   | -                 | -                                                                       |
| 3375                                   | -                 | -                                                                       |
| 3380                                   | 3390              | When the 3390 is in 3380 emulation mode, the 3390 is equivalent to 3380 |
| 3380C-13                               | -                 | -                                                                       |
| 3380C-23                               | -                 | -                                                                       |
| 3380E                                  | -                 | -                                                                       |
| 3380J                                  | -                 | -                                                                       |
| 3380K                                  | -                 | -                                                                       |
| 3390                                   | -                 | -                                                                       |
| 9336                                   | -                 | -                                                                       |

Default device types of DASD or DISK are not valid for the MDISK COSTABLE file.

Device type is used for Dedicated Device record processing. DASDACCT command processing does not check the device model or perform surcharge/discount processing. This is because DASDACCT uses the CP object directory as its source of information and the CP object directory does not keep device model information.

## Session Costing File

LRECL = 120  
 RECFM = F  
 FILEID = SESSION COSTABLE

The SESSION COSTABLE file applies rates to resources identified on datatype 01 session accounting records.

The rate fields are specified in tenths of a cent.

Table 47. SESSION COSTABLE File

| Column | Length | Description                            | Justified | Notes       |
|--------|--------|----------------------------------------|-----------|-------------|
| 1      | 2      | Record-type code (B1)                  | -         | -           |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -           |
| 9      | 8      | Shift identifier or *                  | L         | -           |
| 17     | 12     | Applicable customer ID (or * mask)     | L         | No blanks   |
| 29     | 6      | Connect rate (per hour)                | R         | Zero filled |
| 35     | 6      | Overhead CPU rate (per second)         | R         | Zero filled |
| 41     | 6      | Virtual CPU rate (per second)          | R         | Zero filled |
| 47     | 6      | Page reads rate (per 100)              | R         | Zero filled |
| 53     | 6      | Page writes rate (per 100)             | R         | Zero filled |
| 59     | 6      | Non-spool SIO rate (per 1000)          | R         | Zero filled |
| 65     | 6      | Virtual punch rate (per 1000)          | R         | Zero filled |
| 71     | 6      | Virtual print rate (per 1000)          | R         | Zero filled |
| 77     | 6      | Virtual reader rate (per 1000)         | R         | Zero filled |
| 83     | 6      | Virtual VPU rate (per second)          | -         | -           |
| 89     | 6      | Overhead VPU rate (per second)         | R         | Zero filled |
| 95     | 6      | Reserved for Computer Associates       | R         | Zero filled |
| 101    | 20     | Optional user comment/description      | L         | -           |

## Dedicated Device Costing File

```
LRECL = 100  
RECFM = F  
FILEID = DEDEVICE COSTABLE
```

Unicenter VM:Account uses the DEDEVICE COSTABLE file to cost datatype 02 records that indicate use of a dedicated device.

The rate field is specified in thousandths of a cent.

Table 48. DEDEVICE COSTABLE File

| Column | Length | Description                            | Justified | Notes         |
|--------|--------|----------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (B2)                  | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -             |
| 9      | 8      | Shift identifier or *                  | L         | -             |
| 17     | 12     | Applicable customer ID (or * mask)     | L         | No blanks     |
| 29     | 8      | Device type name                       | L         | -             |
| 37     | 8      | Rate (per hour)                        | R         | Leading zeros |
| 45     | 36     | Reserved for Computer Associates       | -         | -             |
| 81     | 20     | Optional user comments                 | L         | -             |

## Temporary Disk Costing File

```
LRECL = 100  
RECFM = F  
FILEID = TDISK COSTABLE
```

Unicenter VM:Account uses the TDISK COSTABLE file to cost datatype 03 records that indicate use of temporary minidisk storage. The rate field is specified in thousandths of a cent.

CKD devices rate is per cylinder per hour. FBA devices rate is per 100/blocks per hour.

Table 49. TDISK COSTABLE File

| Column | Length | Description                                | Justified | Notes         |
|--------|--------|--------------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (B3)                      | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> )     | -         | -             |
| 9      | 8      | Shift identifier or *                      | L         | -             |
| 17     | 12     | Applicable customer ID (or * mask)         | L         | No blanks     |
| 29     | 8      | Device type name                           | L         | -             |
| 37     | 8      | Rate (per cylinder or 100 blocks per hour) | R         | Leading zeros |
| 45     | 36     | Reserved for Computer Associates           | -         | -             |
| 81     | 20     | Optional user comment/description          | L         | -             |



## Link Charges Costing File

```
LRECL = 100  
RECFM = F  
FILEID = LINKS COSTABLE
```

Unicenter VM:Account uses the LINKS COSTABLE file to cost datatype 05 records that indicate that a link to another user's minidisk was performed.

The rate field is specified in tenths of a cent. Computer Associates recommends that the rate be specified in cents. Rates specified to tenths of a cent are rounded to the nearest cent when the rate is applied.

Table 50. LINKS COSTABLE File

| Column | Length | Description                            | Justified | Notes         |
|--------|--------|----------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (B5)                  | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -             |
| 9      | 8      | Shift identifier or *                  | L         | -             |
| 17     | 12     | Applicable customer ID (or * mask)     | L         | No blanks     |
| 29     | 8      | Linked disk owner (or * mask)          | L         | -             |
| 37     | 4      | Linked disk address (or * mask)        | R         | Leading zeros |
| 41     | 8      | Rate (per link)                        | R         | Leading zeros |
| 49     | 32     | Reserved for Computer Associates       | -         | -             |
| 81     | 20     | Optional user comment/description      | L         | -             |

## Minidisk Costing File

```
LRECL = 100  
RECFM = F  
FILEID = MDISK COSTABLE
```

Unicenter VM:Account uses the MDISK COSTABLE file to cost datatype A4 records generated by DASDACCT processing.

The rate field is specified in thousandths of a cent.

CKD devices rate is per cylinder per day. FBA devices rate is per 100/blocks per day.

Table 51. MDISK COSTABLE File

| Column | Length | Description                                | Justified | Notes         |
|--------|--------|--------------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (B6)                      | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> )     | -         | -             |
| 9      | 8      | Reserved for Computer Associates           | -         | -             |
| 17     | 12     | Applicable customer ID (or * mask)         | L         | No blanks     |
| 29     | 8      | Device type name                           | L         | -             |
| 37     | 8      | Rate (per cylinder or 100 blocks per hour) | R         | Leading zeros |
| 45     | 36     | Reserved for Computer Associates           | -         | -             |
| 81     | 20     | Optional user comment/description          | L         | -             |

## Package Surcharges Costing File

```
LRECL = 110
RECFM = F
FILEID = PACKAGES COSTABLE
```

Unicenter VM:Account uses the PACKAGES COSTABLE file to apply surcharges or discounts to the charges associated with package use when a record is received that is identified as a record for a package-accounted software package. The package name \*BATCH specifies that all session records created for jobs that run in a batch environment receive a special surcharge or discount.

The package name \*HOLIDAY specifies that all records with dates that fall on holidays, as identified in the HOLIDAYS MASTER file, receive a special surcharge or discount. The package names \*MON, \*TUE, \*WED, \*THU, \*FRI, \*SAT, or \*SUN specify that you can apply surcharges and discounts based on the day of the week when resources were used.

If the package name field contains an asterisk, all packages not specifically identified by name in the PACKAGES COSTABLE file receive the corresponding discounts or surcharges.

---

**Note:** This file should be modified after the UPDATE command has been used to identify a specific package name.

---

Table 52. PACKAGES COSTABLE File

| Column | Length | Description                                    | Justified | Notes       |
|--------|--------|------------------------------------------------|-----------|-------------|
| 1      | 2      | Record-type code (B8)                          | -         | -           |
| 3      | 6      | Effective start date (yyymmdd)                 | -         | -           |
| 9      | 8      | Shift identifier or *                          | L         | -           |
| 17     | 12     | Applicable customer ID (or * mask)             | L         | No blanks   |
| 29     | 8      | Package name or (*HOLIDAY, *SAT, *SUN, *BATCH) | L         | No blanks   |
| 37     | 1      | Virtual CPU sign (+ = surcharge, - = discount) | -         | -           |
| 38     | 3      | Virtual CPU percent surcharge/discount         | R         | Zero filled |
| 41     | 1      | Overhead CPU sign                              | -         | -           |
| 42     | 3      | Overhead CPU percentage                        | R         | Zero filled |
| 45     | 1      | Connect time sign                              | -         | -           |
| 46     | 3      | Connect time percentage                        | R         | Zero filled |
| 49     | 1      | Page-reads sign                                | -         | -           |

(continued)

Table 52. PACKAGES COSTABLE File (continued)

| Column | Length | Description                       | Justified | Notes       |
|--------|--------|-----------------------------------|-----------|-------------|
| 50     | 3      | Page-reads percentage             | R         | Zero filled |
| 53     | 1      | Page-writes sign                  | -         | -           |
| 54     | 3      | Page-writes percentage            | R         | Zero filled |
| 57     | 1      | Start-I/O sign (nonspool)         | -         | -           |
| 58     | 3      | Start-I/O percentage              | R         | Zero filled |
| 61     | 1      | Punch-I/O sign                    | -         | -           |
| 62     | 3      | Punch-I/O percentage              | R         | Zero filled |
| 65     | 1      | Print-I/O sign                    | -         | -           |
| 66     | 3      | Print-I/O percentage              | R         | Zero filled |
| 69     | 1      | Reader-I/O sign                   | -         | -           |
| 70     | 3      | Reader-I/O percentage             | R         | Zero filled |
| 73     | 1      | Virtual VPU sign                  | -         | -           |
| 74     | 3      | Virtual VPU percentage            | -         | -           |
| 77     | 1      | Overhead VPU sign                 | -         | -           |
| 78     | 3      | Overhead VPU percentage           | -         | -           |
| 81     | 10     | Reserved for Computer Associates  | -         | -           |
| 91     | 20     | Optional user comment/description | L         | -           |

## Tape Mount Charges Costing File

```
LRECL = 100  
RECFM = F  
FILEID = TAPMOUNT COSTABLE
```

Unicenter VM:Account uses the TAPMOUNT COSTABLE file to apply charges to tape mount records (datatype A6) created by the BrightStor VM:Tape user exit VMTEXT4. This user exit is provided on the BrightStor VM:Tape distribution tape.

The rate field is specified in tenths of a cent. Computer Associates recommends that the rate be specified in cents. Rates specified to tenths of a cent are rounded to the nearest cent when the rate is applied.

Table 53. TAPMOUNT COSTABLE File

| Column | Length | Description                            | Justified | Notes         |
|--------|--------|----------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BA)                  | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -             |
| 9      | 8      | Shift identifier or *                  | L         | -             |
| 17     | 12     | Applicable customer ID (or * mask)     | L         | No blanks     |
| 29     | 8      | Cost per mount                         | R         | Leading zeros |
| 37     | 44     | Reserved for Computer Associates       | -         | -             |
| 44     | 20     | Optional user comment/description      | L         | -             |

## Volumes (Disk/Tape) Costing File

```
LRECL = 100  
RECFM = F  
FILEID = VOLUMES COSTABLE
```

Unicenter VM:Account uses the VOLUMES COSTABLE file to apply charges to datatype A3 records created for disk volumes and tape volumes by the VMJDVA and VMJTVA utilities.

The rate field is specified in tenths of a cent.

Table 54. VOLUMES COSTABLE File

| Column | Length | Description                            | Justified | Notes         |
|--------|--------|----------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BB)                  | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -             |
| 9      | 8      | Reserved for Computer Associates       | -         | -             |
| 17     | 12     | Applicable customer ID (or * mask)     | L         | No blanks     |
| 29     | 8      | Device type name                       | L         | -             |
| 37     | 8      | Charge per day of ownership            | R         | Leading zeros |
| 45     | 36     | Reserved for Computer Associates       | -         | -             |
| 81     | 20     | Optional user comment/description      | L         | -             |

## RSCS Charges Costing File

```
LRECL = 100  
RECFM = F  
FILEID = RSCS COSTABLE
```

Unicenter VM:Account uses the RSCS COSTABLE file to apply charges to RSCS datatype A7 records.

The rate fields are specified in tenths of a cent.

*Table 55. RSCS COSTABLE File*

| Column | Length | Description                           | Justified | Notes       |
|--------|--------|---------------------------------------|-----------|-------------|
| 1      | 2      | Record-type code (BC)                 | -         | -           |
| 3      | 6      | Effective start date (yyymmdd)        | -         | -           |
| 9      | 8      | Shift identifier or *                 | -         | -           |
| 17     | 12     | Applicable customer ID<br>(or * mask) | L         | No blanks   |
| 29     | 8      | Cost per 100 records sent             | R         | Zero filled |
| 37     | 8      | Cost per 100 records received         | R         | Zero filled |
| 45     | 36     | Reserved for Computer Associates      | -         | -           |
| 81     | 20     | Optional user<br>comment/description  | L         | -           |

## VSCS Charges Costing File

LRECL = 100  
RECFM = F  
FILEID = VSCS COSTABLE

Unicenter VM:Account uses the VSCS COSTABLE file to apply charges to VSCS datatype 07 records.

The rate fields are specified in tenths of a cent.

Table 56. VSCS COSTABLE File

| Column | Length | Description                        | Justified | Notes       |
|--------|--------|------------------------------------|-----------|-------------|
| 1      | 2      | Record-type code (BE)              | -         | -           |
| 3      | 6      | Effective start date (yyymmdd)     | -         | -           |
| 9      | 8      | Shift identifier or *              | -         | -           |
| 17     | 12     | Applicable customer ID (or * mask) | L         | No blanks   |
| 29     | 8      | Cost per 100 input request units   | R         | Zero filled |
| 37     | 8      | Cost per 1000 input bytes          | R         | Zero filled |
| 45     | 8      | Cost per 100 output request units  | R         | Zero filled |
| 53     | 8      | Cost per 1000 output bytes         | R         | Zero filled |
| 61     | 8      | Cost per 100 console output lines  | R         | Zero filled |
| 69     | 8      | Cost per 100 copy requests         | R         | Zero filled |
| 77     | 4      | Reserved for Computer Associates   | -         | -           |
| 81     | 20     | User comments/description          | L         | -           |



## Guest I/O Charges Costing File

LRECL = 100  
RECFM = F  
FILEID = LGAI COSTABLE

Unicenter VM:Account uses the LGAI COSTABLE file to apply charges to Guest I/O datatype 0C records. These records are generated by z/VM starting with Version 4 Release 3.0.

Table 57. LGAI COSTABLE File

| Column | Length | Description                        | Justified | Notes       |
|--------|--------|------------------------------------|-----------|-------------|
| 1      | 2      | Record-type code (BQ)              | -         | -           |
| 3      | 6      | Effective start date (yyymmdd)     | -         | -           |
| 17     | 12     | Applicable customer ID (or * mask) | L         | No blanks   |
| 29     | 8      | Cost per 1000 bytes via vNIC       | R         | Zero filled |
| 37     | 8      | Cost per 1000 bytes via CTCA       | R         | Zero filled |
| 45     | 8      | Cost per 1000 bytes via IUCV       | R         | Zero filled |
| 53     | 28     | Reserved for Computer Associates   | -         | -           |
| 81     | 20     | User comments/description          | L         | -           |

## BrightStor VM:Archiver Charges Costing File

```
LRECL = 100  
RECFM = F  
FILEID = ARCHIVE COSTABLE
```

Unicenter VM:Account uses the ARCHIVE COSTABLE file to apply charges to BrightStor VM:Archiver datatype A9 records. These records are generated if the Unicenter VM:Account interface to BrightStor VM:Archiver is implemented.

The rate field is specified in thousandths of a cent.

Table 58. ARCHIVE COSTABLE File

| Column | Length | Description                        | Justified | Notes         |
|--------|--------|------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BF)              | -         | -             |
| 3      | 6      | Effective start date (yyymmdd)     | -         | -             |
| 9      | 8      | Reserved for Computer Associates   | -         | -             |
| 17     | 12     | Applicable customer ID (or * mask) | L         | No blanks     |
| 29     | 8      | Archival type                      | -         | -             |
| 37     | 8      | Reserved for Computer Associates   | -         | -             |
| 45     | 8      | Rate (per 1000 bytes per hour)     | R         | Leading zeros |
| 53     | 28     | Reserved for Computer Associates   | -         | -             |
| 81     | 20     | Optional user comment/description  | L         | -             |

## SQL/DS Charges Costing File

LRECL = 100  
RECFM = F  
FILEID = SQL-DS COSTABLE

Unicenter VM:Account uses the SQL-DS COSTABLE file to apply charges to SQL/DS datatype AA records.

The rate fields are specified in thousandths of a cent.

Table 59. SQL-DS COSTABLE File

| Column | Length | Description                        | Justified | Notes         |
|--------|--------|------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BG)              | -         | -             |
| 3      | 6      | Effective start date (yyymmdd)     | -         | -             |
| 9      | 8      | Shift identifier or *              | L         | -             |
| 17     | 12     | Applicable customer ID (or * mask) | L         | No blanks     |
| 29     | 8      | Database name                      | -         | -             |
| 37     | 8      | Reserved for Computer Associates   | -         | -             |
| 45     | 8      | Rate per minute of connect time    | R         | Leading zeros |
| 53     | 8      | Rate per second of CPU usage       | R         | Leading zeros |
| 61     | 8      | Rate per 1000 page buffer looks    | R         | Leading zeros |
| 69     | 12     | Reserved for Computer Associates   | -         | -             |
| 81     | 20     | Optional user comment/description  | L         | -             |

## Unicenter VM:Spool Charges Costing File

```
LRECL = 100  
RECFM = F  
FILEID = SPOOL COSTABLE
```

Unicenter VM:Account uses the VMSPPOOL COSTABLE file to apply charges to Unicenter VM:Spool datatype AB records. The rate field is specified in thousandths of a cent.

Table 60. SPOOL COSTABLE File

| Column | Length | Description                       | Justified | Notes         |
|--------|--------|-----------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BG)             | -         | -             |
| 3      | 6      | Effective start date (yyymmdd)    | -         | -             |
| 9      | 8      | Reserved for Computer Associates  | -         | -             |
| 17     | 12     | Customer ID                       | L         | -             |
| 29     | 7      | Spool file type                   | L         | -             |
| 36     | 1      | Class                             | -         | -             |
| 37     | 8      | Distribution code                 | L         | -             |
| 45     | 8      | Rate per hour per 100 records     | R         | Leading zeros |
| 53     | 12     | Reserved for Computer Associates  | -         | -             |
| 81     | 20     | Optional user comment/description | L         | -             |

## Unicenter VM:Batch Costing File

```
LRECL = 132
RECFM = F
FILEID = VMBATCH COSTABLE
```

Unicenter VM:Account uses the VMBATCH COSTABLE file to apply charges to Unicenter VM:Batch record type C1 records.

The rate fields are specified in tenths of a cent.

Table 61. VMBATCH COSTABLE File

| Column | Length | Description                             | Justified | Notes |
|--------|--------|-----------------------------------------|-----------|-------|
| 1      | 2      | Record-type code (BK)                   | -         | -     |
| 3      | 6      | Effective start date ( <i>yyymmdd</i> ) | -         | -     |
| 9      | 8      | Shift identifier                        | -         | -     |
| 17     | 12     | Customer ID                             | L         | -     |
| 29     | 1      | Job class                               | -         | -     |
| 30     | 2      | Job priority                            | -         | -     |
| 32     | 8      | Job name                                | -         | -     |
| 40     | 1      | Reserved for Computer Associates        | -         | -     |
| 41     | 6      | Connect rate (per hour)                 | -         | -     |
| 47     | 6      | Overhead CPU rate (per second)          | -         | -     |
| 53     | 6      | Virtual CPU rate (per second)           | -         | -     |
| 59     | 6      | Page-read rate (per 100)                | -         | -     |
| 65     | 6      | Page-write rate (per 100)               | -         | -     |
| 71     | 6      | Non-spooled SIOs rate (per 1000)        | -         | -     |
| 77     | 6      | Virtual punch rate (per 1000)           | -         | -     |
| 83     | 6      | Virtual print rate (per 1000)           | -         | -     |
| 89     | 6      | Virtual reader rate (per 1000)          | -         | -     |
| 95     | 6      | Virtual VPU rate (per second)           | -         | -     |
| 101    | 6      | Overhead VPU rate (per second)          | -         | -     |
| 107    | 6      | Reserved for Computer Associates        | -         | -     |
| 113    | 20     | Comments                                | -         | -     |

## CA-VM:Webgateway Costing File

```
LRECL = 120  
RECFM = F  
FILEID = WEB COSTABLE
```

CA-VM:Webgateway uses the WEB COSTABLE file to apply charges to CA-VM:Webgateway record type C0 records.

The rate fields are specified in tenths of a cent.

Table 62. WEB COSTABLE File

| Column | Length | Description                       | Justified | Notes         |
|--------|--------|-----------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BP)             | -         | -             |
| 3      | 6      | Effective start date (yymmdd)     | -         | -             |
| 9      | 9      | Reserved                          | -         | -             |
| 17     | 12     | Applicable customer ID or *       | L         | No blanks     |
| 29     | 8      | Web server name or *              | L         | -             |
| 37     | 6      | TCP Port or *                     | R         | Leading zeros |
| 43     | 8      | Rate per 1000 bytes thru TCP      | R         | Leading zeros |
| 51     | 8      | Rate per second of CPU SVM        | R         | Leading zeros |
| 59     | 8      | Rate per 1000 I/Os on SVM         | R         | Leading zeros |
| 67     | 8      | Rate per second of CPU worker     | R         | Leading zeros |
| 75     | 8      | Rate per 1000 I/Os on worker      | R         | Leading zeros |
| 83     | 18     | Reserved                          | -         | -             |
| 101    | 20     | Optional user comment/description | L         | -             |

## TSAF Costing File

```
LRECL = 100  
RECFM = F  
FILEID = TSAF COSTABLE
```

Unicenter VM:Account uses the TSAF COSTABLE file to apply charges to TSAF datatype AC records.

The rate fields are specified in thousandths of a cent.

Table 63. TSAF COSTABLE File

| Column | Length | Description                            | Justified | Notes         |
|--------|--------|----------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BL)                  | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -             |
| 9      | 12     | Shift identifier                       | -         | -             |
| 17     | 8      | Customer ID                            | L         | -             |
| 29     | 8      | Resource name                          | L         | -             |
| 37     | 8      | Rate per minute connect time           | -         | -             |
| 45     | 8      | Rate per 1000 bytes sent               | R         | Leading zeros |
| 53     | 8      | Rate per 1000 bytes received           | R         | Leading zeros |
| 61     | 20     | Reserved for Computer Associates       | -         | -             |
| 81     | 20     | Comments                               | -         | -             |

## SQL/DS Storage Costing File

LRECL = 100  
RECFM = F  
FILEID = DBSPACE COSTABLE

Unicenter VM:Account uses the DBSPACE COSTABLE file to apply charges to SQL/DS DBSPACE datatype AD records.

The rate field is specified in thousandths of a cent.

*Table 64. DBSPACE COSTABLE File*

| Column | Length | Description                      | Justified | Notes |
|--------|--------|----------------------------------|-----------|-------|
| 1      | 2      | Record-type code (BM)            | -         | -     |
| 3      | 6      | Effective start date (yyymmdd)   | -         | -     |
| 9      | 8      | Reserved for Computer Associates | -         | -     |
| 17     | 12     | Customer ID                      | L         | -     |
| 29     | 8      | Database name                    | -         | -     |
| 37     | 6      | Storage pool number              | -         | -     |
| 43     | 7      | DBSPACE type (PUBLIC or PRIVATE) | -         | -     |
| 50     | 1      | Reserved for Computer Associates | -         | -     |
| 51     | 8      | Rate per 100 pages per day       | -         | -     |
| 59     | 22     | Reserved for Computer Associates | -         | -     |
| 81     | 20     | Comments                         | -         | -     |



## SFS Usage Costing File

```
LRECL = 100  
RECFM = F  
FILEID = SFS COSTABLE
```

Unicenter VM:Account uses the SFS COSTABLE file to apply charges to SFS Usage (datatype AE) records.

The rate fields are specified in thousandths of a cent.

Table 65. SFS COSTABLE File

| Column | Length | Description                            | Justified | Notes         |
|--------|--------|----------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BN)                  | -         | -             |
| 3      | 6      | Effective start date ( <i>yymmdd</i> ) | -         | -             |
| 9      | 8      | Shift identifier or *                  | L         | -             |
| 17     | 12     | Applicable customer ID (or * mask)     | L         | No blanks     |
| 29     | 8      | File pool name                         | -         | -             |
| 37     | 8      | Reserved for Computer Associates       | -         | -             |
| 45     | 8      | Rate per minute of connect time        | R         | Leading zeros |
| 53     | 8      | Rate per second of CPU usage           | R         | Leading zeros |
| 61     | 8      | Rate per physical I/O request          | R         | Leading zeros |
| 69     | 12     | Reserved for Computer Associates       | -         | -             |
| 81     | 20     | Comments                               | -         | -             |

## SFS Storage Costing File

```
LRECL = 100  
RECFM = F  
FILEID = SFSDASD COSTABLE
```

Unicenter VM:Account uses the SFSDASD COSTABLE file to apply charges to SFS Storage (datatype AF) records.

The rate field is specified in thousandths of a cent.

Table 66. SFSDASD COSTABLE File

| Column | Length | Description                                          | Justified | Notes         |
|--------|--------|------------------------------------------------------|-----------|---------------|
| 1      | 2      | Record-type code (BO)                                | -         | -             |
| 3      | 6      | Effective start date ( <i>yyymmdd</i> )              | -         | -             |
| 9      | 8      | Shift identifier                                     | -         | -             |
| 17     | 12     | Customer ID (or * mask)                              | L         | No blanks     |
| 29     | 8      | File pool name                                       | -         | -             |
| 37     | 6      | Storage group number                                 | R         | Leading zeros |
| 43     | 8      | Reserved for Computer Associates                     | -         | -             |
| 51     | 8      | Daily rate per 100 blocks of data in primary storage | -         | -             |
| 59     | 8      | Daily rate per 100 blocks of data migrated to FRA    | -         | -             |
| 67     | 8      | Daily rate per 100 blocks of data migrated to tape   | -         | -             |
| 75     | 6      | Reserved for Computer Associates                     | -         | -             |
| 81     | 20     | Comments                                             | -         | -             |

# Data Collection Files

Unless otherwise specified, all the Unicenter VM:Account data collection files reside on the Unicenter VM:Account minidisk specified on the COLLECT record in the VMACCT CONFIG file.

Table 67. Data Collection Files Quick Reference

| File                             | Filename | Filetype          | Page |
|----------------------------------|----------|-------------------|------|
| Accounting Data Workfile         | ACCTCRDS | <i>ddmmspf#</i>   | 347  |
| Current Period-To-Date File      | PERIODTE | CURRENT           | 348  |
| Invalid Reader File              | yymmdd   | INVFILES          | 349  |
| Rejected Accounting Records File | yymmdd   | REJECTS           | 349  |
| Accepted Accounting Records File | RAWDATA  | <i>\$\$yymmdd</i> | 350  |
| Messages File                    | VMACCT   | MESSAGES          | 350  |

## Accounting Data Workfile

```
LRECL = 4096
RECFM = F
FILEID = ACCTCRDS ddmmspf#
```

The ACCTCRDS file is an exact image of the spool file that Unicenter VM:Account received. This file is located on the Unicenter VM:Account collection minidisk. It will be erased once the accounting data contained in the spool file has been successfully processed.

This file temporarily holds reader files read in by Unicenter VM:Account. The file is erased after the reader files are processed.

The format of the filetype shows the day *dd*, the minute *mm*, and the spool file number *spf#* of the reader file.

One ACCTCRDS file is created for each reader file sent to Unicenter VM:Account. After the records are processed and written to the PERIODTE CURRENT file, the ACCTCRDS file is erased. Because of the special method Unicenter VM:Account uses to keep track of records that have been processed, no data is lost or duplicated if Unicenter VM:Account comes down because of a CP or Unicenter VM:Account abend. If an ACCTCRDS file

exists on the Unicenter VM:Account Primary Collect minidisk (1B0 accessed as B), the next reader file Unicenter VM:Account receives will cause the ACCTCRDS file to be processed.

## Current Period-to-Date File

```
LRECL = 240  
RECFM = F  
FILEID = PERIODTE CURRENT
```

This file contains the costed records processed by Unicenter VM:Account from the beginning of the accounting period. This file is used by reports run during the current accounting period and by the QUERY USAGE command.

The first 80 bytes of a PERIODTE CURRENT record contain the same information as the RAWDATA record it came from, although some fields may be in a different order or in a different format. The last 160 bytes of a PERIODTE CURRENT record contain customer, package, project, and charge information.

Dates in PERIODTE CURRENT are in *yyymmdd* format, although the raw data received from CP contains dates in *mmddyy* format. Unicenter VM:Account converts the format to *yyymmdd* when the record is costed.

The first record in the PERIODTE CURRENT file must always be the header record. This record is padded with binary zeros and it contains the BEGINDATE, ENDDATE, and FILENAME for the accounting period.

When the PERIOD command specifies end-of-period processing, a file is created containing the data for the days before the date specified on the PERIOD command. Data for that day and the days following is kept in the PERIODTE CURRENT file. This data represents the beginning of the current accounting period. The file VMJARECS COPY on the VMRMAINT 170 minidisk shows the format of each record type contained in this file.

If a record is in PERIODTE CURRENT, it is also in RAWDATA *\$\$yyymmdd*. The opposite is not necessarily true.

## Invalid Reader File

```
LRECL = 4096  
RECFM = F  
FILEID = yymmdd INVFILES
```

Invalid reader files contain records sent by a userid not authorized to send accounting records. Userids authorized to send files to Unicenter VM:Account are specified on the ACCTCRDS, PRODUCT, or SPECIAL record in the VMACCT CONFIG file. The INVFILES file can also contain records that have been sent to Unicenter VM:Account using the CP TRANSFER command.

One INVFILES file is created for each day on which Unicenter VM:Account is sent invalid reader files. The format of the filename shows the year *yy*, month *mm*, and day *dd* Unicenter VM:Account receives the file.

The VMJIFR utility uses these files as input to generate a report containing information about invalid reader files. If the INVFILES file was sent by an unauthorized user (say, with the CP TRANSFER command) but contains valid accounting records, this utility can produce a file that can be sent back to the Unicenter VM:Account reader for processing.

## Rejected Accounting Records File

```
LRECL = 160  
RECFM = F  
FILEID = yymmdd REJECTS
```

Unicenter VM:Account creates a REJECTS file when an accounting record is rejected. Accounting records are rejected for one of several reasons:

- ▶ The accounting record originated from a userid not defined on the ACCTCRDS, FILEPOOL, PRODUCT, SPECIAL, or WORKER configuration file records.
- ▶ A rate was not specified in the COSTABLE file for the particular device, project, package, or customer.

The format of the filename shows the year *yy*, the month *mm*, and the day *dd* when the file was created. The first 80 characters of each record contain the accounting record exactly as Unicenter VM:Account received it. Columns 81 to 160 contain the error code and the reason for rejection.

To have these files reprocessed by Unicenter VM:Account:

1. Copy the REJECTS file to a userid that has ACCTCRDS authorization.
2. Erase the REJECTS file from the VMACCT userid.

3. Make corrections based on the reason for rejection. For example, add a rate for the device, project, package, or customer in the appropriate COSTABLE file.
4. Change the record length of the REJECTS file to 80.
5. Spool the punch to Unicenter VM:Account specifying the class included on the COLLECT configuration file record.
6. Punch the file to Unicenter VM:Account.

## Accepted Accounting Records File

```
LRECL = 60  
RECFM = F  
FILEID = RAWDATA $$yyymmdd
```

The RAWDATA file contains all the data received by Unicenter VM:Account for a day, including records that are *ignored* by specifications in the VMACCT CONFIG file.

Record types that are ignored from processing are specified on the IGNORE configuration file record. These ignored records are written to the RAWDATA file for the date they are processed. The format of the filetype shows the year *yy*, month *mm*, and day *dd* the data was created.

One file is created for each day that Unicenter VM:Account processes accounting records. These files are used as input to the VMJCPR, VMJRSE, and VMJRAW utilities. These utilities provide capacity planning reports and security violation reports. The utilities also can convert the RAWDATA files for use in other accounting systems.

The HOLD parameter of the COLLECT configuration file record determines how many days the files are kept. A twin of the files can be kept on another minidisk if two filemodes are specified on the COLLECT record. When RAWDATA files have expired, Unicenter VM:Account will automatically purge both RAWDATA files if twin filemodes are specified.

## Messages File

This file contains all the system messages that Unicenter VM:Account can issue. The individual messages can be changed to better reflect your site's terminology as long as the order of the substitutable fields in each message is retained. Unicenter VM:Account uses substitutable fields to display error codes and other variable information.

# Unicenter VM:Account Records

This chapter provides record layouts for the records Unicenter VM:Account produces and uses.

Figure 2 (page 11) illustrates the flow of accounting data through the system and shows how an 80-byte raw record becomes a 240-byte record in PERIODTE format.

## Description of Records

This chapter presents record layouts in pairs. Most pairs contain one layout in raw data format and another in PERIODTE format.

### Raw Data Format

The first layout in a pair shows the 80-byte record containing raw data from CP. These records are said to be in *raw data format*.

Most dates are presented in *mmddyy* format (a few are in Julian [*yyddd*] format).

### PERIODTE Format

The second layout in a pair shows the reformatted 240-byte record that Unicenter VM:Account produces. Records in this format contain raw data plus additional Unicenter VM:Account information (such as customer ID, project, shift, and package). These records are said to be in *PERIODTE format*.

Dates are presented in *yymmdd* format.

Table 68 provides the general layout of the PERIODTE-format records. The remainder of this section provides detail for some of the fields in those records.

Table 68. Accounting Record Layout (PERIODTE Format)

| From                                                 | To | Data           |
|------------------------------------------------------|----|----------------|
| Original data from 80-byte record in standard format |    |                |
| 1                                                    | 8  | Userid         |
| 9                                                    | 16 | Account number |
| 17                                                   | 22 | End date       |

(continued)

Table 68. Accounting Record Layout (PERIODTE Format) (continued)

| From             | To  | Data                      |
|------------------|-----|---------------------------|
| 23               | 28  | End time                  |
| 29               | 78  | Datatype-specific data    |
| 79               | 80  | Datatype                  |
| Record extension |     |                           |
| 81               | 82  | Record type               |
| 83               | 86  | Flag fields               |
| 87               | 92  | Begin date                |
| 93               | 98  | Begin time                |
| 99               | 106 | Shift ID                  |
| 107              | 114 | Node ID                   |
| 115              | 122 | Reserved                  |
| 123              | 134 | Customer ID               |
| 135              | 158 | Project name              |
| 159              | 166 | Package name              |
| 167              | 174 | Link-back code            |
| 175              | 184 | Unicenter VM:Batch fields |
| 185              | 228 | Cost fields               |
| 229              | 240 | Reserved                  |

## The First 80 Bytes

The first 80 characters of the record contain raw data in a standard format. For example, columns 1 through 8 always contain a userid, regardless of where the userid was located on the original (raw data format) record. Standardizing the placement of data fields simplifies the process of writing reports.

## Datatype and Record Type

Table 69 summarizes the values that the datatype field (columns 79-80) and record type field (columns 81-82) can have.



Table 69. Datatypes and Record Types in PERIODTE-Format Records

| Name     | Datatype | Record Type | See Page |
|----------|----------|-------------|----------|
| SESSION  | 01       | 01 or C1    | 357      |
| DEDEV    | 02       | 02 or C2    | 359      |
| TDISK    | 03       | 03 or C3    | 361      |
| n/a      | 04       | 04 or C4    | 363      |
| LINKS    | 05       | 05 or C5    | 364      |
| n/a      | 06       | 06 or C6    | 366      |
| VSCS     | 07       | 07 or C7    | 367      |
| LGAI     | 0C       | 0C          | 369      |
| VOLS     | A3       | C0          | 371      |
| MDISK    | A4       | C0          | 373      |
| MISCCHGS | A5       | C0          | 375      |
| TAPMNTS  | A6       | C0          | 377      |
| RSCS     | A7       | C0          | 379      |
| VMARCH   | A9       | C0          | 381      |
| SQL/DS   | AA       | C0          | 383      |
| VMSPPOOL | AB       | C0          | 385      |
| TSAF     | AC       | C0          | 387      |
| SQLSTOR  | AD       | C0          | 388      |
| SFS      | AE       | C0          | 390      |
| SFSDASD  | AF       | C0          | 392      |
| WEB      | AG       | C0          | 394      |

As Table 69 shows, some records can have one of two record types. The record has the first record type (0*n*) if the operating system creates it. The record has the second record type (C*n*) if a service virtual machine issues a DIAGNOSE X'4C' to create it. For example, Unicenter VM:Batch issues a DIAGNOSE X'4C' when performing a task for a submitting userid.

The fact that the two sets of values (0-series and C-series) exist gives you more control when using keywords while running reports or using the VMJSEL utility. For example:

| <b>If you are interested in ...</b>                                 | <b>Specify this keyword ...</b> |
|---------------------------------------------------------------------|---------------------------------|
| Only those session records generated by the operating system        | SELECT RECDTYPE = 01            |
| Only those session records generated by the service virtual machine | SELECT RECDTYPE = C1            |
| All session records                                                 | SELECT DATATYPE = 01            |

Datatypes A3 through AF share the same record type (C0) because they are all created by a service virtual machine issuing a DIAGNOSE X'4C' or are created by a Unicenter VM:Account administrator running a utility that produces accounting records (for example, VMJTVA).

Table 18 on page 295 contains information about the DATATYPE and RECDTYPE keywords.

## User Exit Flag

This table decodes the values in the User Exit flag field (column 83):

| <b>Code Value</b> | <b>Description</b>                         |
|-------------------|--------------------------------------------|
| X'01'             | Data modified by the RAWDATA user exit     |
| X'02'             | Data modified by the ACCTDATA user exit    |
| X'04'             | Costing done by the COSTING user exit      |
| X'08'             | Post-costing done by the COSTING user exit |

## Billing/Data Flag

This table decodes the values in the Billing/Data flag field (column 84):

| <b>Code Value</b> | <b>Description</b>                                  |
|-------------------|-----------------------------------------------------|
| X'01'             | Billing by project                                  |
| X'02'             | Billing by account number                           |
| X'10'             | Processing done on Unicenter VM:Batch               |
| X'20'             | Unicenter VM:Batch marked this job as of RJE origin |
| X'80'             | Data has been recosted                              |

## Surcharge Flag

This table decodes the values in the Surcharge flag field (column 85):

| Code Value | Description                                      |
|------------|--------------------------------------------------|
| X'01'      | Surcharge for day                                |
| X'02'      | Surcharge for holiday                            |
| X'10'      | Surcharge for package                            |
| X'20'      | Surcharge for batch                              |
| X'80'      | Charged as Unicenter VM:Batch (VMBATCH COSTABLE) |

## Time of Accounting (Begin)

If there is a connect time on the record, this field (columns 93-98) is calculated by subtracting connect time from end time. If there is no connect time on the record, the begin time would be the same as the end time. An example of a record with no connect time would be a link (datatype 05) record or an MDISK (datatype A4) record.

## Shift ID

The value in this field (columns 99-106) is calculated using the begin time. Unicenter VM:Account looks at the begin time and compares it to the shifts defined in the VMACCT CONFIG file. For example, if the Prime shift is defined as 8 a.m. to 4 p.m. and a userid logs on at 3 p.m., Unicenter VM:Account gives the record a shift ID of Prime.

This field also goes back to your costables where you can charge a different rate based on shift.

The connect time, which is calculated and placed on an accounting record by CP, can contain one extra second. This situation could cause Unicenter VM:Account to give the record a shift ID before the one in which the work was done. To prevent this situation, Unicenter VM:Account performs an additional check in which it compares the connect time of the accounting record with the shifts defined in the VMACCT CONFIG file. If the extra second is detected, it will be deleted from the PERIODTE record but not from the RAWDATA record. This adjustment ensures that the record actually belongs to the shift that the connect and end times of the configuration file indicate.

## Link-Back Code

The *Link-back code to project, package, and Unicenter VM:Batch job number* field (columns 167-174) shows one of the following:

- ▶ If the first byte of the field (column 167) equals X'00', the next seven bytes contain one or more of the following:
  - Project index (columns 168-170, data type/length is XL3)
  - Package index (171-172, H)
  - Unicenter VM:Batch job number (173-174, H)
- ▶ If the first byte of the field is not equal to X'00', the field contains the original account number as it existed in the raw data format.

## Record Layouts

This chapter's tables contain a column called Data Type/Length that describes a field in a record. The chart below explains the values in this column.

| Value  | Description                                                                                                                                                                                      |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C      | The field is one character                                                                                                                                                                       |
| CL $n$ | The C means the data in that field is of type character. The $Ln$ means the character string is $n$ bytes long. For example, a field described as CL8 contains eight bytes of character data.    |
| F      | Full word                                                                                                                                                                                        |
| H      | Half word                                                                                                                                                                                        |
| X      | Hexadecimal data                                                                                                                                                                                 |
| XL $n$ | The X means the data in that field is hexadecimal. The $Ln$ means the field is $n$ bytes long. For example, a field described as XL2 contains two bytes of data, otherwise known as a half-word. |
| X'nn'  | A specific one-byte hexadecimal value                                                                                                                                                            |

---

**Note:** Record types 08, C8, 09, C9, 0A, CA, OB and CB are written to the RAWDATA \$\$ymmdd file (where *ymmdd* is the year, month, and day for the accounting record). However, because Unicenter VM:Account never references these record types (in a report, for example), they are not written to a PERIODTE-format record. See the *IBM Planning and Administration* document for the raw data format layout of these records.

---

## Session Record Layouts

Table 70. Session Record Layout--Datatype 01 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                            |
|--------|----------------------|----------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid                                                                                 |
| 9-16   | CL8                  | Userid accounting number                                                               |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>                                                 |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                 |
| 29-32  | 1F                   | Number of seconds connected                                                            |
| 33-36  | 1F                   | Milliseconds of CPU time used                                                          |
| 37-40  | 1F                   | Milliseconds of virtual CPU time used                                                  |
| 41-44  | 1F                   | Total page reads                                                                       |
| 45-48  | 1F                   | Total page writes                                                                      |
| 49-52  | 1F                   | Number of requested virtual I/O starts for non-spoiled I/O (successful + unsuccessful) |
| 53-56  | 1F                   | Virtual card count - spoiled punch                                                     |
| 57-60  | 1F                   | Virtual line count - spoiled printer                                                   |
| 61-64  | 1F                   | Virtual card count - spoiled reader                                                    |
| 65-68  | 1F                   | Total CPU time in VECTOR processor                                                     |
| 69-72  | 1F                   | Virtual CPU time in VECTOR processor                                                   |
| 73-76  | 1F                   | Number of successful virtual I/O starts for non-spoiled I/O                            |
| 77-78  | H                    | CPU address (for the SYSTEM VMDBK, this is the real processor address)                 |
| 79-80  | CL2                  | Record type code (01 or C1)                                                            |

### Note Concerning the PERIODTE Format of This Datatype

If the SIOCOUNT SUCCESS record is present in VMACCT CONFIG, Unicenter VM:Account flips the values in columns 49-52 and 73-76. That is, under these conditions columns 49-52 contain the number of successful virtual SIOs and columns 73-76 contain the number of requested virtual SIOs.

Table 71. Session Record Layout--Datatype 01 (PERIODTE Format)

| Column | Data Type/<br>Length | Description                            |
|--------|----------------------|----------------------------------------|
| 1-8    | CL8                  | Userid                                 |
| 9-16   | CL8                  | Userid accounting number               |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i> |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i> |

(continued)

Table 71. Session Record Layout--Datatype 01 (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 29-32   | 1F               | Number of seconds connected                                                                              |
| 33-36   | 1F               | Milliseconds of CPU time used                                                                            |
| 37-40   | 1F               | Milliseconds of virtual CPU time used                                                                    |
| 41-44   | 1F               | Total page reads                                                                                         |
| 45-48   | 1F               | Total page writes                                                                                        |
| 49-52   | 1F               | Number of requested virtual I/O starts for non-spoiled I/O                                               |
| 53-56   | 1F               | Virtual card count; spoiled punch                                                                        |
| 57-60   | 1F               | Virtual line count; spoiled printer                                                                      |
| 61-64   | 1F               | Virtual card count; spoiled reader                                                                       |
| 65-68   | 1F               | Virtual CPU time in VECTOR processor                                                                     |
| 69-72   | 1F               | Total CPU time in VECTOR processor                                                                       |
| 73-76   | 1F               | Number of completed virtual I/O starts for non-spoiled I/O                                               |
| 77-78   | H                | CPU address (for the SYSTEM VMDBK, this is the real processor address)                                   |
| 79-80   | CL2              | Datatype code (01)                                                                                       |
| 81-82   | XL2              | Record type code (01 or C1)                                                                              |
| 83      | X                | User exit flags (values are shown on page 354)                                                           |
| 84      | X                | Billing/data flags (values are shown on page 354)                                                        |
| 85      | X                | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6              | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6              | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8              | Shift ID                                                                                                 |
| 107-114 | CL8              | Node on which work was done                                                                              |
| 115-122 | CL8              | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12             | Customer ID                                                                                              |
| 135-158 | CL24             | Project this record applies to                                                                           |
| 159-166 | CL8              | Package name                                                                                             |
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-182 | CL8              | Unicenter VM:Batch job name                                                                              |
| 183     | CL1              | Unicenter VM:Batch job class                                                                             |
| 184     | XL1              | Unicenter VM:Batch job priority                                                                          |
| 185-188 | 1F               | Connect time charges                                                                                     |
| 189-192 | 1F               | Overhead CPU time charge                                                                                 |
| 193-196 | 1F               | Virtual CPU time charges                                                                                 |
| 197-200 | 1F               | Page reads charges                                                                                       |
| 201-204 | 1F               | Page writes charges                                                                                      |
| 205-208 | 1F               | Non-spoiled SIO charges                                                                                  |

(continued)

Table 71. Session Record Layout--Datatype 01 (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                        |
|---------|------------------|------------------------------------|
| 209-212 | 1F               | Virtual spooled punch charges      |
| 213-216 | 1F               | Virtual spooled print-line charges |
| 217-220 | 1F               | Virtual spooled card-read charges  |
| 221-224 | 1F               | Virtual vector CPU charges         |
| 225-228 | 1F               | Overhead vector CPU charges        |
| 229-234 | XL6              | (Reserved for Computer Associates) |
| 235-240 | XL6              | User data                          |

For information about the keywords used with Table 71, see page 298.

## Dedicated Device Record Layouts

Table 72. Dedicated Device Record Layout--Datatype 02 (Raw Data Format)

| Column | Data Type/Length | Description                            |
|--------|------------------|----------------------------------------|
| 1-8    | CL8              | Userid                                 |
| 9-16   | CL8              | Userid accounting number               |
| 17-22  | CL6              | Date of accounting (end) <i>mmddyy</i> |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i> |
| 29-32  | 1F               | Number of seconds connected            |
| 33     | X                | Device class code                      |
| 34     | X                | Device type code                       |
| 35     | X                | Device model, if any                   |
| 36     | X                | Device features code, if any           |
| 37-78  | XL42             | (Reserved for IBM)                     |
| 79-80  | CL2              | Record type code (02 or C2)            |

Table 73. Dedicated Device Record Layout--Datatype 02 (PERIODTE Format)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 1-8     | CL8              | Userid                                                                                                   |
| 9-16    | CL8              | Userid accounting number                                                                                 |
| 17-22   | CL6              | Date of accounting (end) <i>yymmdd</i>                                                                   |
| 23-28   | CL6              | Time of accounting (end) <i>hhmmss</i>                                                                   |
| 29-32   | 1F               | Number of seconds connected                                                                              |
| 33      | X                | Device class code                                                                                        |
| 34      | X                | Device type code                                                                                         |
| 35      | X                | Device model, if any                                                                                     |
| 36      | X                | Device features code, if any                                                                             |
| 37-78   | XL42             | (Reserved for IBM)                                                                                       |
| 79-80   | CL2              | Datatype code (02)                                                                                       |
| 81-82   | XL2              | Record type code (02 or C2)                                                                              |
| 83      | X                | User exit flags (values are shown on page 354)                                                           |
| 84      | X                | Billing/ data flags (values are shown on page 354)                                                       |
| 85      | X                | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6              | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6              | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8              | Shift ID                                                                                                 |
| 107-114 | CL8              | Node on which work was done                                                                              |
| 115-122 | CL8              | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12             | Customer ID                                                                                              |
| 135-158 | CL24             | Project this record applies to                                                                           |
| 159-166 | CL8              | Package name                                                                                             |
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-182 | CL8              | Unicenter VM:Batch job name                                                                              |
| 183     | CL1              | Unicenter VM:Batch job class                                                                             |
| 184     | CL1              | Unicenter VM:Batch job priority                                                                          |
| 185-188 | F                | Charge for device                                                                                        |
| 189-234 | XL46             | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6              | User data                                                                                                |

For information about the keywords used with the table above, see Table 20 on page 299.



## TDISK Record Layouts

Table 74. TDISK Record Layout--Datatype 03 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                          |
|--------|----------------------|------------------------------------------------------|
| 1-8    | CL8                  | Userid                                               |
| 9-16   | CL8                  | Userid accounting number                             |
| 17-22  | CL6                  | Date of accounting (end) <i>mmdyy</i>                |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>               |
| 29-32  | 1F                   | Number of seconds connected                          |
| 33     | X                    | Device class code                                    |
| 34     | X                    | Device type code                                     |
| 35     | X                    | Device model, if any                                 |
| 36     | X                    | Device features code, if any                         |
| 37-38  | H                    | Number of cylinders for CKD (count-key-data) devices |
| 39-40  | H                    | (Reserved for IBM)                                   |
| 41-44  | F                    | Number of 4Kb pages used                             |
| 45-78  | XL34                 | (Reserved for IBM)                                   |
| 79-80  | CL2                  | Record type code (03 or C3)                          |

### Notes Concerning the Raw Data Format of This Datatype

If this record is for a FBA device, columns 37-40 contain the number of blocks and the field has a data type/length of F.

### Note Concerning the PERIODTE Format of This Datatype

If this record is for a FBA device, columns 37-40 contain the number of blocks and the field has a data type/length of F.

Table 75. TDISK Record Layout--Datatype 03 (PERIODTE Format)

| Column | Data Type/<br>Length | Description                            |
|--------|----------------------|----------------------------------------|
| 1-8    | CL8                  | Userid                                 |
| 9-16   | CL8                  | Userid accounting number               |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i> |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i> |
| 29-32  | 1F                   | Number of seconds connected            |
| 33     | X                    | Device class code                      |
| 34     | X                    | Device type code                       |

(continued)

Table 75. TDISK Record Layout--Datatype 03 (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 35      | X                | Device model, if any                                                                                     |
| 36      | X                | Device features code, if any                                                                             |
| 37-40   | H                | Number of cylinders for CKD (count-key-data) devices                                                     |
| 41-44   | F                | Number of 4Kb pages used                                                                                 |
| 45-78   | XL34             | (Reserved for IBM)                                                                                       |
| 79-80   | CL2              | Datatype code (03)                                                                                       |
| 81-82   | XL2              | Record type code (03 or C3)                                                                              |
| 83      | X                | User exit flags (values are shown on page 354)                                                           |
| 84      | X                | Billing/ data flags (values are shown on page 354)                                                       |
| 85      | X                | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6              | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6              | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8              | Shift ID                                                                                                 |
| 107-114 | CL8              | Node on which work was done                                                                              |
| 115-122 | CL8              | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12             | Customer ID                                                                                              |
| 135-158 | CL24             | Project this record applies to                                                                           |
| 159-166 | CL8              | Package name                                                                                             |
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-182 | CL8              | Unicenter VM:Batch job name                                                                              |
| 183     | CL1              | Unicenter VM:Batch job class                                                                             |
| 184     | CL1              | Unicenter VM:Batch job priority                                                                          |
| 185-188 | F                | Charge for device                                                                                        |
| 189-234 | XL46             | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6              | User data                                                                                                |

For information about the keywords used with the table above, see Table 21 on page 299.

## Invalid Logon/Autolog Record Layouts

Datatype 04 records are created when (a) CP detects that a user has issued enough LOGON, AUTOLOG, XAUTOLOG, or APPCVM CONNECT invocations with an invalid password to reach or exceed an installation-defined threshold value, and (b) CP journalling is turned on.

Table 76. Invalid Logon/Autolog Record Layout--Datatype 04 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                                        |
|--------|----------------------|----------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid specified on the command                                                                    |
| 9-16   | CL8                  | (Reserved for IBM)                                                                                 |
| 17-22  | CL6                  | Date of accounting (end) <i>mmdyy</i>                                                              |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                             |
| 29-32  | F                    | Terminal address                                                                                   |
| 33-40  |                      | Invalid password or, if the entered password is more than eight characters, the literal "TOO LONG" |
| 41-48  | CL8                  | Userid that entered AUTOLOG, XAUTOLOG, APPCVM CONNECT, or the BYUSER ID that entered LOGON         |
| 49-51  | CL3                  | (Reserved for IBM)                                                                                 |
| 52-53  |                      | Current invalid password count in hexadecimal                                                      |
| 54-55  |                      | Accounting record limit in hexadecimal                                                             |
| 56-70  | CL15                 | (Reserved for IBM)                                                                                 |
| 71-78  |                      | LUNAME for SNA terminal                                                                            |
| 79-80  | CL2                  | Record type code (04 or C4)                                                                        |

### Note Concerning the PERIODTE Format of This Datatype

Datatype 04 records are not costed and are not written to the costed data file (PERIODTE CURRENT). Therefore, no layout is presented for the PERIODTE format of this datatype.

## Successful Link Record Layouts

Datatype 05 records are created when (a) CP detects that a user has successfully entered a LINK command to a minidisk protected by a password, (b) the user does not own the minidisk, and (c) CP journalling is turned on.

Table 77. Successful Link Record Layout--Datatype 05 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                                                     |
|--------|----------------------|-----------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid that entered the command                                                                                 |
| 9-16   | CL8                  | Userid accounting number                                                                                        |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>                                                                          |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                          |
| 29-32  | F                    | Terminal address                                                                                                |
| 33-40  |                      | (Reserved for IBM)                                                                                              |
| 41-48  | CL8                  | Userid of the user owning the minidisk                                                                          |
| 49-52  | CL3                  | Minidisk address for which the LINK command was entered                                                         |
| 53     | X                    | Type of minidisk linked (X'00' = link is to a user's minidisk, X'10' = link is to a full-pack overlay minidisk) |
| 54-70  | CL17                 | (Reserved for IBM)                                                                                              |
| 71-78  |                      | LUNAME for SNA terminal                                                                                         |
| 79-80  | CL2                  | Record type code (05 or C5)                                                                                     |

Table 78. Successful Link Record Layout--Datatype 05 (PERIODTE Format)

| Column | Data Type/<br>Length | Description                                                                                                     |
|--------|----------------------|-----------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid that entered the command                                                                                 |
| 9-16   | CL8                  | Userid accounting number                                                                                        |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i>                                                                          |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                          |
| 29-32  | F                    | Terminal address                                                                                                |
| 33-40  |                      | (Reserved for IBM)                                                                                              |
| 41-48  | CL8                  | Userid of the user owning the minidisk                                                                          |
| 49-52  | CL3                  | Minidisk address for which the LINK command was entered                                                         |
| 53     | X                    | Type of minidisk linked (X'00' = link is to a user's minidisk, X'10' = link is to a full-pack overlay minidisk) |
| 54-70  | CL17                 | (Reserved for IBM)                                                                                              |
| 71-78  |                      | LUNAME for SNA terminal                                                                                         |
| 79-80  | CL2                  | Datatype code (05)                                                                                              |

(continued)

Table 78. Successful Link Record Layout--Datatype 05 (PERIODTE Format) (continued)

| Column  | Data Type/<br>Length | Description                                                                                              |
|---------|----------------------|----------------------------------------------------------------------------------------------------------|
| 81-82   | XL2                  | Record type code (05 or C5)                                                                              |
| 83      | X                    | User exit flags (values are shown on page 354)                                                           |
| 84      | X                    | Billing/data flags (values are shown on page 354)                                                        |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8                  | Shift ID                                                                                                 |
| 107-114 | CL8                  | Node on which work was done                                                                              |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12                 | Customer ID                                                                                              |
| 135-158 | CL24                 | Project this record applies to                                                                           |
| 159-166 | CL8                  | Package name                                                                                             |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-182 | CL8                  | Unicenter VM:Batch job name                                                                              |
| 183     | CL1                  | Unicenter VM:Batch job class                                                                             |
| 184     | CL1                  | Unicenter VM:Batch job priority                                                                          |
| 185-188 | F                    | Charge for link                                                                                          |
| 189-192 | F                    | Count for link, if compressed                                                                            |
| 193-234 | XL42                 | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6                  | User data                                                                                                |

For information about the keywords used with the table above, see Table 22 on page 300.

## Unsuccessful Link Record Layouts

Datatype 06 records are created when (a) CP detects that a user has entered enough LINK commands with an invalid password to reach or exceed an installation-defined threshold value, and (b) CP journalling is turned on.

Table 79. Unsuccessful Link Record Layout--Datatype 06 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                                        |
|--------|----------------------|----------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid that entered the command                                                                    |
| 9-16   | CL8                  | Account number                                                                                     |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>                                                             |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                             |
| 29-32  | F                    | Terminal address                                                                                   |
| 33-40  |                      | Invalid password or, if the entered password is more than eight characters, the literal "TOO LONG" |
| 41-48  | CL8                  | Userid of the user that owns the minidisk                                                          |
| 49-51  | CL3                  | (Reserved for IBM)                                                                                 |
| 52-53  |                      | Invalid password count in hexadecimal                                                              |
| 54-55  |                      | Invalid password limit in hexadecimal                                                              |
| 56     | CL1                  | (Reserved for IBM)                                                                                 |
| 57-60  |                      | Minidisk address for which the LINK command was entered                                            |
| 61-70  | CL10                 | (Reserved for IBM)                                                                                 |
| 71-78  |                      | LUNAME for SNA terminal                                                                            |
| 79-80  | CL2                  | Record type code (06 or C6)                                                                        |

### Note Concerning the PERIODTE Format of This Datatype

Datatype 06 records are not costed and are not written to the costed data file (PERIODTE CURRENT). Therefore, no layout is presented for the PERIODTE format of this datatype.

## VSCS Record Layouts

Table 80. VSCS Record Layout--Datatype 07 (Raw Data Format)

| Column | Data Type/<br>Length | Description                       |
|--------|----------------------|-----------------------------------|
| 1-8    | CL8                  | Userid                            |
| 9-16   | CL8                  | Userid accounting number          |
| 17     | X                    | Overflow counter 1                |
| 18     | X                    | Overflow counter 2                |
| 19     | X                    | Overflow counter 3                |
| 20     | X                    | Overflow counter 4                |
| 21-24  | F                    | Counter 1                         |
| 25-28  | F                    | Counter 2                         |
| 29-32  | F                    | Counter 3                         |
| 33-36  | F                    | Counter 4                         |
| 37-40  | F                    | Counter 5                         |
| 41-44  | F                    | Counter 6                         |
| 45-48  | F                    | Logon time; packed format         |
| 49-52  | F                    | Logon date; Julian packed format  |
| 53-56  | F                    | Logoff time; packed format        |
| 57-60  | F                    | Logoff date; Julian packed format |
| 61-78  | CL18                 | (Reserved for IBM)                |
| 79-80  | CL2                  | Record type code (07 or C7)       |

Table 81. VSCS Record Layout--Datatype 07 (PERIODTE Format)

| Column | Data Type/<br>Length | Description                            |
|--------|----------------------|----------------------------------------|
| 1-8    | CL8                  | Userid                                 |
| 9-16   | CL8                  | Userid accounting number               |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i> |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i> |
| 29     | X                    | Overflow counter 1                     |
| 30     | X                    | Overflow counter 2                     |
| 31     | X                    | Overflow counter 3                     |
| 32     | X                    | Overflow counter 4                     |
| 33-36  | F                    | Input request units                    |
| 37-40  | F                    | Input bytes                            |
| 41-44  | F                    | Output request units                   |
| 45-48  | F                    | Output bytes                           |
| 49-52  | F                    | Console lines                          |

(continued)

Table 81. VSCS Record Layout--Datatype 07 (PERIODTE Format) (continued)

| Column  | Data Type/<br>Length | Description                                                                                              |
|---------|----------------------|----------------------------------------------------------------------------------------------------------|
| 53-56   | F                    | Copies                                                                                                   |
| 57-78   | XL22                 | (Reserved for Computer Associates)                                                                       |
| 79-80   | CL2                  | Datatype code (07)                                                                                       |
| 81-82   | XL2                  | Record type code (07 or C7)                                                                              |
| 83      | X                    | User exit flags (values are shown on page 354)                                                           |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                                       |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8                  | Shift ID                                                                                                 |
| 107-114 | CL8                  | Node on which work was done                                                                              |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12                 | Customer ID                                                                                              |
| 135-158 | CL24                 | Project this record applies to                                                                           |
| 159-166 | CL8                  | Package name                                                                                             |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-182 | CL8                  | Unicenter VM:Batch job name                                                                              |
| 183     | CL1                  | Unicenter VM:Batch job class                                                                             |
| 184     | CL1                  | Unicenter VM:Batch job priority                                                                          |
| 185-188 | F                    | Cost for input resource units                                                                            |
| 189-192 | F                    | Cost for input bytes                                                                                     |
| 193-196 | F                    | Cost for output resource units                                                                           |
| 197-200 | F                    | Cost for output bytes                                                                                    |
| 201-204 | F                    | Cost for console lines                                                                                   |
| 205-208 | F                    | Cost for copies                                                                                          |
| 209-234 | XL26                 | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6                  | User data                                                                                                |

For information about the keywords used with the table above, see Table 23 on page 300.



## Guest I/O Record Layouts

Table 82. Guest I/O Record Layout--Datatype 0C (Raw Data Format)

| Column | Data Type/Length | Description                                                               |
|--------|------------------|---------------------------------------------------------------------------|
| 1-8    | CL8              | Userid                                                                    |
| 9-16   | CL8              | Userid accounting number                                                  |
| 17-22  | CL6              | Date of accounting (end) -- <i>mmddyy</i>                                 |
| 23-28  | CL6              | Time of accounting (end) -- <i>hhmmss</i>                                 |
| 29-50  |                  | Type-specific fields (vNIC, CTCA, IUCV)                                   |
|        |                  | <b>vNIC:</b>                                                              |
| 29-30  | XL2              | vNIC base device address                                                  |
| 31-34  | XL4              | Default IP address                                                        |
| 35-42  | CL8              | Userid of LAN owner                                                       |
| 43-50  | CL8              | LAN name                                                                  |
|        |                  | <b>CTCA:</b>                                                              |
| 29-30  | XL2              | Local CTCA VDEV address                                                   |
| 31-34  | CL4              | (Reserved for IBM)                                                        |
| 35-42  | CL8              | Userid of remote CTCA owner                                               |
| 43-44  | XL2              | Remote CTCA VDEV address                                                  |
| 45-50  | CL6              | (Reserved for IBM)                                                        |
|        |                  | <b>IUCV:</b>                                                              |
| 29-34  | CL6              | (Reserved for IBM)                                                        |
| 35-42  | CL8              | Connected IUCV userid                                                     |
| 43-50  | CL8              | (Reserved for IBM)                                                        |
| 51-58  | FL8              | Bytes sent                                                                |
| 59-66  | FL8              | Bytes received                                                            |
| 67-76  | CL10             | (Reserved for IBM)                                                        |
| 77     | XL1              | Byte count type flags                                                     |
| 78     | XL1              | Virtual connection type (00 = vNIC, 01 = virtual CTCA, 02 = IUCV or APPC) |
| 79-80  | CL2              | Record type code (0C)                                                     |

Table 83. Guest I/O Record Layout--Datatype 0C (PERIODTE Format)

| Column | Data Type/Length | Description                             |
|--------|------------------|-----------------------------------------|
| 1-8    | CL8              | Userid                                  |
| 9-16   | CL8              | Userid accounting number                |
| 17-22  | CL6              | Date of accounting (end) <i>yyymmdd</i> |

(continued)

Table 83. Guest I/O Record Layout--Datatype 0C (PERIODTE Format) (continued)

| Column  | Data Type/<br>Length | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 29-50   |                      | Type-specific fields (vNIC, CTCA, IUCV)<br><b>vNIC:</b><br>29-30 XL2 vNIC base device address<br>31-34 XL4 Default IP address<br>35-42 CL8 Userid of LAN owner<br>43-50 CL8 LAN name<br><b>CTCA:</b><br>29-30 XL2 Local CTCA VDEV address<br>31-34 CL4 (Reserved for IBM)<br>35-42 CL8 Userid of remote CTCA owner<br>43-44 XL2 Remote CTCA VDEV address<br>45-50 CL6 (Reserved for IBM)<br><b>IUCV:</b><br>29-34 CL6 (Reserved for IBM)<br>35-42 CL8 Connected IUCV userid<br>43-50 CL8 (Reserved for IBM) |
| 51-58   | FL8                  | Bytes sent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 59-66   | FL8                  | Bytes received                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 67-76   | CL10                 | (Reserved for IBM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 77      | XL1                  | Byte count type flags                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 78      | XL1                  | Virtual connection type (00 = vNIC, 01 = virtual CTCA, 02 = IUCV or APPC)                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 79-80   | CL2                  | Record type code (0C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 81-82   | XL2                  | Record type code (0C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 83      | X                    | User exit flags (values are shown on page 354)                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 87-92   | CL6                  | Date of accounting (begin) <i>yyymmdd</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 99-106  | CL8                  | Shift ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 107-114 | CL8                  | Node on which work was done                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 123-134 | CL12                 | Customer ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 135-158 | CL24                 | Project this record applies to                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 159-166 | CL8                  | Package name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356)                                                                                                                                                                                                                                                                                                                                                                                                    |

(continued)

Table 83. Guest I/O Record Layout--Datatype 0C (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                         |
|---------|------------------|-------------------------------------|
| 175-182 | FL8              | Bytes transferred via vNIC          |
| 183-190 | FL8              | Bytes transferred via CTCA          |
| 191-198 | FL8              | Bytes transferred via IUCV          |
| 199-200 |                  | Unused                              |
| 201-204 | F                | Cost for bytes transferred via vNIC |
| 205-208 | F                | Cost for bytes transferred via CTCA |
| 209-212 | F                | Cost for bytes transferred via IUCV |
| 213-240 | CL30             | (Reserved for Computer Associates)  |

For information about the keywords used with the table above, see Table 23 on page 300.

## Volumes Record Layouts

Datatype A3 records are created by the VMJDVA and VMJTVA utilities.

Table 84. Volumes Record Layout--Datatype A3 (Raw Data Format)

| Column | Data Type/Length | Description                                     |
|--------|------------------|-------------------------------------------------|
| 1-8    | CL8              | Userid that ran VMJTVA or VMJDVA                |
| 9-16   | CL8              | Userid accounting number                        |
| 17-22  | CL6              | Date of accounting (end) <i>mmddyy</i>          |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i>          |
| 29-36  | CL8              | Userid that the volumes usage charge applies to |
| 37-40  | F                | Volume days                                     |
| 41-48  | CL8              | Volume name (tape or DASD type)                 |
| 49-72  | CL24             | Project name (optional)                         |
| 73-74  | XL2              | (Reserved for Computer Associates)              |
| 75-76  | XL2              | Datatype code (A3)                              |
| 77-78  | XL2              | Transaction type (A3)                           |
| 79-80  | CL2              | Record type code (C0)                           |

Table 85. Volumes Record Layout--Datatype A3 (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                                                                                 |
|---------|----------------------|-------------------------------------------------------------------------------------------------------------|
| 1-8     | CL8                  | Userid that the volumes usage charge applies to                                                             |
| 9-16    | CL8                  | Userid accounting number                                                                                    |
| 17-22   | CL6                  | Date of accounting (end) <i>yymmdd</i>                                                                      |
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                      |
| 29-36   | CL8                  | Userid that the volumes usage charge applies to                                                             |
| 37-40   | F                    | Volume days                                                                                                 |
| 41-48   | CL8                  | Volume name (tape or DASD type)                                                                             |
| 49-72   | CL24                 | Project name (optional)                                                                                     |
| 73-74   | XL2                  | (Reserved for Computer Associates)                                                                          |
| 75-76   | XL2                  | Datatype code (A3)                                                                                          |
| 77-78   | XL2                  | Transaction type (A3)                                                                                       |
| 79-80   | CL2                  | Datatype code (A3)                                                                                          |
| 81-82   | XL2                  | Record type code (C0)                                                                                       |
| 83      | X                    | User exit flags (values are shown on page 354)                                                              |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                                          |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                              |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                         |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                    |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                    |
| 99-106  | CL8                  | Shift ID                                                                                                    |
| 107-114 | CL8                  | Node on which work was done                                                                                 |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                          |
| 123-134 | CL12                 | Customer ID                                                                                                 |
| 135-158 | CL24                 | Project this record applies to                                                                              |
| 159-166 | CL8                  | Package name                                                                                                |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter<br>VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10                 | (Reserved for Computer Associates)                                                                          |
| 185-188 | F                    | Volume ownership charges                                                                                    |
| 189-234 | XL46                 | (Reserved for Computer Associates)                                                                          |
| 235-240 | XL6                  | User data                                                                                                   |

For information about the keywords used with the table above, see Table 25 on page 301.

## MDISK Record Layouts

Datatype A4 records are created by the DASDACCT GENERATE and DASDACCT SCAN commands.

Table 86. MDISK Record Layout--Datatype A4 (Raw Data Format)

| Column | Data Type/Length | Description                                                                                                      |
|--------|------------------|------------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8              | If this record obtained via the CP stream: Userid to charge<br>If this is an exception record: DASDACCT workerid |
| 9-16   | CL8              | Userid accounting number                                                                                         |
| 17-22  | CL6              | Date of accounting (end) <i>mmdyy</i>                                                                            |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i>                                                                           |
| 29-32  | XL4              | (Reserved for Computer Associates)                                                                               |
| 33-36  | XL4              | DVC class/type/model/feature codes                                                                               |
| 37-42  | CL6              | Volser of real disk                                                                                              |
| 43-44  | H                | Number of days the minidisk was owned                                                                            |
| 45-48  | F                | Number of cylinders/blocks                                                                                       |
| 49-52  | F                | Cyl/blk relocation factor                                                                                        |
| 53-60  | CL8              | Real device type                                                                                                 |
| 61-64  | CL4              | Minidisk virtual address                                                                                         |
| 65-67  | CL3              | Access mode                                                                                                      |
| 68     | CL1              | (Reserved for Computer Associates)                                                                               |
| 69-76  | CL8              | Userid to charge                                                                                                 |
| 77-78  | XL2              | Hold area for datatype (A4)                                                                                      |
| 79-80  | CL2              | Record type code (C0)                                                                                            |

Table 87. MDISK Record Layout--Datatype A4 (PERIODTE Format)

| Column | Data Type/Length | Description                            |
|--------|------------------|----------------------------------------|
| 1-8    | CL8              | Userid                                 |
| 9-16   | CL8              | Userid accounting number               |
| 17-22  | CL6              | Date of accounting (end) <i>yymmdd</i> |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i> |
| 29-32  | XL4              | (Reserved for Computer Associates)     |
| 33-36  | XL4              | DVC class/type/model/feature codes     |
| 37-42  | CL6              | Volser of real disk                    |
| 43-44  | H                | Number of days MDISK owned             |
| 45-48  | F                | Number of cylinders/blocks             |
| 49-52  | F                | Cyl/blk relocation factor              |
| 53-60  | CL8              | Real device type                       |

(continued)

Table 87. MDISK Record Layout--Datatype A4 (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 61-64   | CL4              | Minidisk virtual address                                                                                 |
| 65-67   | CL3              | Access mode                                                                                              |
| 68      | CL1              | (Reserved for Computer Associates)                                                                       |
| 69-76   | CL8              | Hold area for original userid                                                                            |
| 77-78   | XL2              | Hold area for datatype (A4)                                                                              |
| 79-80   | CL2              | Datatype code (A4)                                                                                       |
| 81-82   | XL2              | Record type code (C0)                                                                                    |
| 83      | X                | User exit flags (values are shown on page 354)                                                           |
| 84      | X                | Billing/ data flags (values are shown on page 354)                                                       |
| 85      | X                | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6              | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6              | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8              | Shift ID                                                                                                 |
| 107-114 | CL8              | Node on which work was done                                                                              |
| 115-122 | CL8              | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12             | Customer ID                                                                                              |
| 135-158 | CL24             | Project this record applies to                                                                           |
| 159-166 | CL8              | Package name                                                                                             |
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10             | (Reserved for Computer Associates)                                                                       |
| 185-188 | F                | Minidisk ownership charges                                                                               |
| 189-234 | CL46             | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6              | User data                                                                                                |

For information about the keywords used with the table above, see Table 26 on page 302.

## Miscellaneous Charges and Credits Record Layouts

Datatype A5 records are created by the CHARGE and CREDIT commands.

Table 88. *Miscellaneous Charges and Credits Record Layout--Datatype A5 (Raw Data Format)*

| Column | Data Type/<br>Length | Description                                                |
|--------|----------------------|------------------------------------------------------------|
| 1-8    | CL8                  | Unicenter VM:Account service virtual machine               |
| 9-16   | CL8                  | Account number that the charge or credit applies to        |
| 17-22  | CL6                  | Date of accounting (end) <i>mmdyy</i>                      |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                     |
| 29-36  | CL8                  | Userid that the charge or credit applies to                |
| 37-44  | CL8                  | Userid that issued the CHARGE or CREDIT command            |
| 45-52  |                      | Transaction number                                         |
| 53-60  | CL8                  | Charge or credit code (must be defined in MISCCHGS MASTER) |
| 61-64  | F                    | Charge or credit per unit                                  |
| 65-66  | H                    | Units                                                      |
| 67-68  | H                    | Package code                                               |
| 69-71  | H                    | Project code                                               |
| 72-74  |                      | Date created                                               |
| 75-76  | XL2                  | Unicenter VM:Account datatype (A5)                         |
| 77-78  | XL2                  | Unicenter VM:Account datatype (A5)                         |
| 79-80  | CL2                  | Record type code (C0)                                      |

Table 89. *Miscellaneous Charges and Credits Record Layout--Datatype A5 (PERIODTE Format)*

| Column | Data Type/<br>Length | Description                                  |
|--------|----------------------|----------------------------------------------|
| 1-8    | CL8                  | Userid that the charge or credit applies to  |
| 9-16   | CL8                  | Account that the charge or credit applies to |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i>       |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>       |
| 29-36  | CL8                  | Userid that the charge or credit applies to  |
| 37-44  | CL8                  | Userid that applied charges or credits       |
| 45-52  | CL8                  | User's transaction log number                |
| 53-60  | CL8                  | Miscellaneous charge ID code                 |
| 61-64  | F                    | Charge per unit                              |
| 65-66  | H                    | Units                                        |
| 67-68  | H                    | Package code                                 |

(continued)

Table 89. *Miscellaneous Charges and Credits Record Layout--Datatype A5 (PERIODTE Format) (continued)*

| Column  | Data Type/<br>Length | Description                                                                                    |
|---------|----------------------|------------------------------------------------------------------------------------------------|
| 69-71   | XL3                  | Project code                                                                                   |
| 72-74   | XL3                  | Date charge was created                                                                        |
| 75-76   | XL2                  | Hold area for datatype (A5)                                                                    |
| 77-78   | XL2                  | Hold area for datatype (A5)                                                                    |
| 79-80   | CL2                  | Datatype code (A5)                                                                             |
| 81-82   | XL2                  | Record type code (C0)                                                                          |
| 83      | X                    | User exit flags (values are shown on page 354)                                                 |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                             |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                 |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                            |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                       |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                       |
| 99-106  | CL8                  | Shift ID                                                                                       |
| 107-114 | CL8                  | Node on which work was done                                                                    |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                             |
| 123-134 | CL12                 | Customer ID                                                                                    |
| 135-158 | CL24                 | Project this record applies to                                                                 |
| 159-166 | CL8                  | Package name                                                                                   |
| 167-174 | CL8                  | Link-back code to project, package, and VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10                 | (Reserved for Computer Associates)                                                             |
| 185-188 | F                    | Charge or credit in dollars; computed by multiplying number of units by cost per unit          |
| 189-212 | CL24                 | Charge description                                                                             |
| 213-234 | XL22                 | (Reserved for Computer Associates)                                                             |
| 235-240 | XL6                  | User data                                                                                      |

For information about the keywords used with the table above, see Table 27 on page 302.



## BrightStor VM:Tape Mount Record Layouts

Datatype A6 records are created by the BrightStor VM:Tape user exit VMTEXT4.

Table 90. BrightStor VM:Tape Mount Record Layout--Datatype A6 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                     |
|--------|----------------------|-------------------------------------------------|
| 1-8    | CL8                  | The userid of the SVM that generated the record |
| 9-16   | CL8                  | Account number with link code                   |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>          |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>          |
| 29-36  | CL8                  | Userid that the tape mount was performed for    |
| 37-42  | CL6                  | Volser mounted                                  |
| 43-45  | CL3                  | Label type                                      |
| 46     | CL1                  | Mount type (R=read, W=write)                    |
| 47-74  | XL28                 | (Reserved for Computer Associates)              |
| 75-76  | XL2                  | Hold area for datatype (A6)                     |
| 77-78  | XL2                  | Hold area for transaction code (A6)             |
| 79-80  | CL2                  | Record type code (C0)                           |

Table 91. BrightStor VM:Tape Mount Record Layout--Datatype A6 (PERIODTE Format)

| Column | Data Type/<br>Length | Description                                       |
|--------|----------------------|---------------------------------------------------|
| 1-8    | CL8                  | Userid that the tape mount was performed for      |
| 9-16   | CL8                  | Account number                                    |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i>            |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>            |
| 29-36  | CL8                  | Userid that the tape mount was performed for      |
| 37-42  | CL6                  | Volser mounted                                    |
| 43-45  | CL3                  | Label type                                        |
| 46     | CL1                  | Mount type (R=read, W=write)                      |
| 47-74  | XL28                 | (Reserved for Computer Associates)                |
| 75-76  | XL2                  | Hold area for datatype (A6)                       |
| 77-78  | XL2                  | Hold area for transaction code (A6)               |
| 79-80  | CL2                  | Datatype code (A6)                                |
| 81-82  | XL2                  | Record type code (C0)                             |
| 83     | X                    | User exit flags (values are shown on page 354)    |
| 84     | X                    | Billing/data flags (values are shown on page 354) |
| 85     | X                    | Surcharge flags (values are shown on page 355)    |

(continued)

Table 91. *BrightStor VM:Tape Mount Record Layout--Datatype A6 (PERIODTE Format)*  
(continued)

| Column  | Data Type/<br>Length | Description                                                                                                 |
|---------|----------------------|-------------------------------------------------------------------------------------------------------------|
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                         |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                    |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                    |
| 99-106  | CL8                  | Shift ID                                                                                                    |
| 107-114 | CL8                  | Node on which work was done                                                                                 |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                          |
| 123-134 | CL12                 | Customer ID                                                                                                 |
| 135-158 | CL24                 | Project this record applies to                                                                              |
| 159-166 | CL8                  | Package name                                                                                                |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter<br>VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10                 | (Reserved for Computer Associates)                                                                          |
| 185-188 | F                    | Charge for mount                                                                                            |
| 189-192 | F                    | Mount count (if compressed)                                                                                 |
| 193-234 | XL42                 | (Reserved for Computer Associates)                                                                          |
| 235-240 | XL6                  | User data                                                                                                   |

For information about the keywords used with the table above, see Table 28 on page 303.

## RSCS Record Layouts

Table 92. RSCS Record Layout--Datatype A7 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                |
|--------|----------------------|--------------------------------------------|
| 1-8    | CL8                  | Userid of the RSCS service virtual machine |
| 9-16   | CL8                  | Userid to which the charge applies to      |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>     |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>     |
| 29-30  | XL2                  | Origin spool file ID                       |
| 31-32  | XL2                  | Local spool file ID                        |
| 33-40  | CL8                  | Origin location ID                         |
| 41-48  | CL8                  | Local destination ID                       |
| 49     | CL1                  | Class                                      |
| 50     | X                    | Origin device type (8N=PUN, 4N=PRT)        |
| 51-52  | XL2                  | (Reserved for IBM)                         |
| 53-56  | F                    | Number of records in file                  |
| 57-64  | CL8                  | Destination location userid                |
| 65-72  | CL8                  | (Reserved for IBM)                         |
| 73-77  | CL5                  | Serial and model                           |
| 78     | X                    | Transaction code (01=send, 02=receive)     |
| 79-80  | CL2                  | Record type code (C0)                      |

Table 93. RSCS Record Layout--Datatype A7 (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                                                                              |
|---------|----------------------|----------------------------------------------------------------------------------------------------------|
| 1-8     | CL8                  | Userid to which the charge applies                                                                       |
| 9-16    | CL8                  | Accounting number of the userid being charged                                                            |
| 17-22   | CL6                  | Date of accounting (end) <i>yymmdd</i>                                                                   |
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                   |
| 29-30   | XL2                  | Origin spool file ID                                                                                     |
| 31-32   | XL2                  | Local spool file ID                                                                                      |
| 33-40   | CL8                  | Origin location ID                                                                                       |
| 41-48   | CL8                  | Local destination ID                                                                                     |
| 49      | CL1                  | Class                                                                                                    |
| 50      | X                    | Origin DVC-TYP (8N=PUN, 4N=PRT)                                                                          |
| 51-52   | XL2                  | (Reserved for IBM)                                                                                       |
| 53-56   | F                    | Number of records in file                                                                                |
| 57-64   | CL8                  | Destination location userid                                                                              |
| 65-72   | CL8                  | (Reserved for IBM)                                                                                       |
| 73-77   | CL5                  | Serial and model                                                                                         |
| 78      | X                    | Trans code (01=send, 02=receive)                                                                         |
| 79-80   | CL2                  | Datatype code (A7)                                                                                       |
| 81-82   | XL2                  | Record type code (C0)                                                                                    |
| 83      | X                    | User exit flags (values are shown on page 354)                                                           |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                                       |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8                  | Shift ID                                                                                                 |
| 107-114 | CL8                  | Node on which work was done                                                                              |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12                 | Customer ID                                                                                              |
| 135-158 | CL24                 | Project this record applies to                                                                           |
| 159-166 | CL8                  | Package name                                                                                             |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10                 | (Reserved for Computer Associates)                                                                       |
| 185-188 | F                    | Cost for send/receive                                                                                    |
| 189-234 | XL46                 | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6                  | User data                                                                                                |

For information about the keywords used with the table above, see Table 29 on page 303.

## BrightStor VM:Archiver Usage Record Layouts

Datatype A9 records are created by the BrightStor VM:Archiver ACCOUNT command.

Table 94. BrightStor VM:Archiver Usage Record Layout--Datatype A9 (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                                                                                                                                    |
|--------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid of the BrightStor VM:Archiver SVM                                                                                                                                                       |
| 9-16   | CL8                  | User's normal account number                                                                                                                                                                   |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>                                                                                                                                                         |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                                                                                                         |
| 29-40  | CL12                 | Preset customer ID                                                                                                                                                                             |
| 41-48  | CL8                  | Userid the file was archived for (that is, the userid to which the charge applies)                                                                                                             |
| 49-52  | F                    | Preset project index                                                                                                                                                                           |
| 53-56  | F                    | Hours billed for                                                                                                                                                                               |
| 57-60  | F                    | Number of kilobytes archived                                                                                                                                                                   |
| 61-64  |                      | See <i>Notes Concerning the Raw Data and PERIODTE Formats of this Datatype</i> , below                                                                                                         |
| 65     | X                    | Archive flag (X'01' = Record modified by accounting exit, X'10' = File archived on DASD, X'20' = File archived on tape cartridge, X'40' = File archived on tape reel, X'80' = File now staged) |
| 66     | X                    | Batch/realtime flag (X'01' = Record created in batch mode, X'02' = Record created real-time)                                                                                                   |
| 67-74  | XL8                  | (Reserved for Computer Associates)                                                                                                                                                             |
| 75-76  | XL2                  | Unicenter VM:Account datatype (A9)                                                                                                                                                             |
| 77-78  | XL2                  | Unicenter VM:Account datatype (A9)                                                                                                                                                             |
| 79-80  | CL2                  | Record type code (C0)                                                                                                                                                                          |

### Notes Concerning the Raw Data and PERIODTE Formats of This Datatype

The contents of columns 61 through 64 vary depending on how the record was produced.

| Column | If data were archived to tape                                                                     | If data were archived to DASD |
|--------|---------------------------------------------------------------------------------------------------|-------------------------------|
| 61     | Tape density<br>X'CB' = 800 BPI<br>X'C3' = 1600 BPI<br>X'D3' = 6250 BPI<br>X'DB' = Tape cartridge | Device class code             |
| 62     | Reserved for Computer Associates                                                                  | Device type code              |
| 63     | Reserved for Computer Associates                                                                  | Device model code             |
| 64     | Reserved for Computer Associates                                                                  | Device feature code           |

Table 95. BrightStor VM:Archiver Usage Record Layout--Datatype A9 (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                                                                                                                                                                    |
|---------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-8     | CL8                  | Userid the file was archived for (that is, the userid to which the charge applies)                                                                                                             |
| 9-16    | CL8                  | Account number of the userid the file was archived for                                                                                                                                         |
| 17-22   | CL6                  | Date of accounting (end) <i>yymmdd</i>                                                                                                                                                         |
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                                                                                                         |
| 29-40   | CL12                 | Preset customer ID                                                                                                                                                                             |
| 41-48   | CL8                  | Real/owner userid                                                                                                                                                                              |
| 49-52   | F                    | Preset project index                                                                                                                                                                           |
| 53-56   | F                    | Hours billed for                                                                                                                                                                               |
| 57-60   | F                    | Number of kilobytes archived                                                                                                                                                                   |
| 61-64   |                      | See Notes Concerning the Raw Data and PERIODTE Formats of this Datatype on the previous page                                                                                                   |
| 65      | X                    | Archive flag (X'01' = Record modified by accounting exit, X'10' = File archived on DASD, X'20' = File archived on tape cartridge, X'40' = File archived on tape reel, X'80' = File now staged) |
| 66      | X                    | Batch/realtime flag (X'01' = Record created in batch mode, X'02' = Record created real-time)                                                                                                   |
| 67-74   | XL8                  | (Reserved for Computer Associates)                                                                                                                                                             |
| 75-76   | XL2                  | Hold area for datatype (A9)                                                                                                                                                                    |
| 77-78   | XL2                  | Hold area for transaction code (A9)                                                                                                                                                            |
| 79-80   | CL2                  | Datatype code (A9)                                                                                                                                                                             |
| 81-82   | XL2                  | Record type code (C0)                                                                                                                                                                          |
| 83      | X                    | User exit flags (values are shown on page 354)                                                                                                                                                 |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                                                                                                                             |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                                                                                                                 |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                                                                                                            |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                                                                                                       |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                                                                                                       |
| 99-106  | CL8                  | Shift ID                                                                                                                                                                                       |
| 107-114 | CL8                  | Node on which work was done                                                                                                                                                                    |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                                                                                                             |
| 123-134 | CL12                 | Customer ID                                                                                                                                                                                    |
| 135-158 | CL24                 | Project this record applies to                                                                                                                                                                 |
| 159-166 | CL8                  | Package name                                                                                                                                                                                   |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356)                                                                                       |
| 175-182 | CL8                  | Unicenter VM:Batch job name                                                                                                                                                                    |
| 183     | CL1                  | Unicenter VM:Batch job class                                                                                                                                                                   |
| 184     | CL1                  | Unicenter VM:Batch job priority                                                                                                                                                                |

(continued)

Table 95. *BrightStor VM:Archiver Usage Record Layout--Datatype A9 (PERIODTE Format) (continued)*

| Column  | Data Type/<br>Length | Description                              |
|---------|----------------------|------------------------------------------|
| 185-188 | F                    | Charges for BrightStor VM:Archiver usage |
| 189-234 | XL46                 | (Reserved for Computer Associates)       |
| 235-240 | XL6                  | User data                                |

For information about the keywords used with the table above, see Table 30 on page 304.

## SQL/DS Usage Record Layouts

Table 96. *SQL/DS Usage Record Layout--Datatype AA (Raw Data Format)*

| Column | Data Type/<br>Length | Description                                                                                                                                               |
|--------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Userid                                                                                                                                                    |
| 9-16   | CL8                  | Userid accounting number                                                                                                                                  |
| 17-24  | CL8                  | SQL user identifier                                                                                                                                       |
| 25-32  | CL8                  | Userdata account number. This field contains a value only if the Computer Associates version of ARIUXIT TEXT is installed; otherwise, the field is blank. |
| 33-40  | CL8                  | Userdata database name. This field contains a value only if the Computer Associates version of ARIUXIT TEXT is installed; otherwise, the field is blank.  |
| 41-46  | CL6                  | End date                                                                                                                                                  |
| 47-52  | CL6                  | End time                                                                                                                                                  |
| 53-60  | CL8                  | SQL/DS access module last active                                                                                                                          |
| 61-64  | F                    | SQL/DS active time (seconds)                                                                                                                              |
| 65-68  | F                    | SQL/DS CPU usage (milliseconds)                                                                                                                           |
| 69-72  | F                    | Count of page buffer reads                                                                                                                                |
| 73-74  | CL2                  | (Reserved for IBM)                                                                                                                                        |
| 75     | C                    | SQL/DS type code (U)                                                                                                                                      |
| 76-78  | CL3                  | SQL/DS record identifier (SQL)                                                                                                                            |
| 79-80  | CL2                  | Record type code (C0)                                                                                                                                     |

## Notes for the Raw Data Format of This Datatype

The ARIUXIT TEXT file (mentioned in Table 96) is a text file that Unicenter VM:Account supplies to be used as a SQL/DS user exit.

If there is no ARIUXIT user exit, the layout has these differences:

- ▶ Columns 25-28 contain the CMS work unit
- ▶ Columns 29-40 are reserved for IBM

Table 97. SQL/DS Usage Record Layout--Datatype AA (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                                                                              |
|---------|----------------------|----------------------------------------------------------------------------------------------------------|
| 1-8     | CL8                  | Userid                                                                                                   |
| 9-16    | CL8                  | Userid accounting number                                                                                 |
| 17-22   | CL6                  | Date of accounting (end) <i>yymmdd</i>                                                                   |
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                   |
| 29-36   | CL8                  | SQL/DS database name                                                                                     |
| 37-44   | CL8                  | SQL/DS user identifier                                                                                   |
| 45-52   | CL8                  | SQL/DS database machine userid                                                                           |
| 53-60   | CL8                  | SQL/DS access module last active                                                                         |
| 61-64   | F                    | SQL/DS active time (seconds)                                                                             |
| 65-68   | F                    | SQL/DS CPU usage (milliseconds)                                                                          |
| 69-72   | F                    | Count of page buffer reads                                                                               |
| 73-74   | CL2                  | (Reserved for IBM)                                                                                       |
| 75      | C                    | SQL/DS type code (U)                                                                                     |
| 76-78   | CL3                  | Record identifier (SQL)                                                                                  |
| 79-80   | CL2                  | Datatype code (AA)                                                                                       |
| 81-82   | XL2                  | Record type code (C0)                                                                                    |
| 83      | X                    | User exit flags (values are shown on page 354)                                                           |
| 84      | X                    | Billing/data flags (values are shown on page 354)                                                        |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8                  | Shift ID                                                                                                 |
| 107-114 | CL8                  | Node on which work was done                                                                              |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12                 | Customer ID                                                                                              |
| 135-158 | CL24                 | Project this record applies to                                                                           |
| 159-166 | CL8                  | Package name                                                                                             |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-182 | CL8                  | Unicenter VM:Batch job name                                                                              |

(continued)



Table 97. SQL/DS Usage Record Layout--Datatype AA (PERIODTE Format) (continued)

| Column  | Data Type/<br>Length | Description                        |
|---------|----------------------|------------------------------------|
| 183     | CL1                  | Unicenter VM:Batch job class       |
| 184     | CL1                  | Unicenter VM:Batch job priority    |
| 185-188 | F                    | Cost for active time               |
| 189-192 | F                    | Cost for CPU usage                 |
| 193-196 | F                    | Cost for page buffer reads         |
| 197-234 | XL38                 | (Reserved for Computer Associates) |
| 235-240 | XL6                  | User data                          |

For information about the keywords used with the table above, see Table 31 on page 305.

## Unicenter VM:Spool Usage Record Layouts

Table 98. Unicenter VM:Spool Usage Record Layout--Datatype AB (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                                                  |
|--------|----------------------|--------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Unicenter VM:Spool worker virtual machine                                                                    |
| 9-16   | CL8                  | VM userid being charged                                                                                      |
| 17-22  | CL6                  | Accounting end date <i>mmdyy</i>                                                                             |
| 23-28  | CL6                  | Accounting end time <i>hhmmss</i>                                                                            |
| 29-36  | CL8                  | Spool file origin                                                                                            |
| 37-44  | CL8                  | Spool file filename                                                                                          |
| 45-52  | CL8                  | Spool file filetype                                                                                          |
| 53-60  | CL8                  | Spool file distribution code                                                                                 |
| 61-64  | F                    | Logical record count                                                                                         |
| 65-68  | F                    | SPLINK block count (if known)                                                                                |
| 69-72  | F                    | Seconds owned                                                                                                |
| 73-74  | H                    | Logical record length                                                                                        |
| 75     | CL1                  | Spool file type (0=Unknown, 1=Console, 2=Print, 3=Punch, 4=VMDUMP, 5=CPDUMP, 6=CPTRAP, 7=Monitor, 8=Account) |
| 76     | CL1                  | Spool file class                                                                                             |
| 77-78  | XL2                  | Unicenter VM:Account datatype (AB)                                                                           |
| 79-80  | CL2                  | Record type code (C0)                                                                                        |

Table 99. Unicenter VM:Spool Usage Record Layout--Datatype AB (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                                                                                  |
|---------|----------------------|--------------------------------------------------------------------------------------------------------------|
| 1-8     | CL8                  | Userid of spool file owner being charged                                                                     |
| 9-16    | CL8                  | Account number of the userid being charged                                                                   |
| 17-22   | CL6                  | Accounting end date <i>yymmdd</i>                                                                            |
| 23-28   | CL6                  | Accounting end time <i>hhmmss</i>                                                                            |
| 29-36   | CL8                  | Spool file origin                                                                                            |
| 37-44   | CL8                  | Spool file filename                                                                                          |
| 45-52   | CL8                  | Spool file filetype                                                                                          |
| 53-60   | CL8                  | Spool file distribution code                                                                                 |
| 61-64   | F                    | Logical record count                                                                                         |
| 65-68   | F                    | SPLINK block count                                                                                           |
| 69-72   | F                    | Seconds owned                                                                                                |
| 73-74   | H                    | Logical record length                                                                                        |
| 75      | CL1                  | Spool file type (0=Unknown, 1=Console, 2=Print, 3=Punch, 4=VMDUMP, 5=CPDUMP, 6=CPTRAP, 7=Monitor, 8=Account) |
| 76      | CL1                  | Spool file class                                                                                             |
| 77-78   | XL2                  | Hold area for datatype (AB)                                                                                  |
| 79-80   | CL2                  | Datatype code (AB)                                                                                           |
| 81-82   | XL2                  | Record type code (C0)                                                                                        |
| 83      | X                    | User exit flags (values are shown on page 354)                                                               |
| 84      | X                    | Billing/ data flags (values are shown on page 354)                                                           |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                               |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                          |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                     |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                     |
| 99-106  | CL8                  | Shift ID                                                                                                     |
| 107-114 | CL8                  | Node on which work was done                                                                                  |
| 115-122 | CL8                  | (Reserved for Computer Associates)                                                                           |
| 123-134 | CL12                 | Customer ID                                                                                                  |
| 135-158 | CL24                 | Project this record applies to                                                                               |
| 159-166 | CL8                  | Package name                                                                                                 |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356)     |
| 175-184 | CL10                 | (Reserved for Computer Associates)                                                                           |
| 185-188 | F                    | Charges for spool usage                                                                                      |
| 189-234 | XL46                 | (Reserved for Computer Associates)                                                                           |
| 235-240 | XL6                  | User data                                                                                                    |

For information about the keywords used with the table above, see Table 32 on page 306.

## TSAF Record Layouts

Datatype AC records are created by the TSAF service virtual machine.

Table 100. TSAF Record Layout--Datatype AC (Raw Data Format)

| Column | Data Type/<br>Length | Description                                            |
|--------|----------------------|--------------------------------------------------------|
| 1-8    | CL8                  | TSAF service virtual machine                           |
| 9-16   | CL8                  | VM userid that the charge applies to                   |
| 17-22  | CL6                  | Date of accounting (end) <i>mmddyy</i>                 |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                 |
| 29-36  | CL8                  | TSAF resource name                                     |
| 37-40  | F                    | Seconds connected to TSAF                              |
| 41-44  | F                    | Bytes of data sent through TSAF                        |
| 45-48  | F                    | Bytes of data received through TSAF                    |
| 49     |                      | Type of resource name (R=global, G=gateway, U=private) |
| 50-74  | CL25                 | (Reserved for IBM)                                     |
| 75     | C                    | TSAF type code (S)                                     |
| 76-78  | CL3                  | Record identifier (ATS)                                |
| 79-80  | CL2                  | Record type code (C0)                                  |

### Note for the Raw Data Format of This Datatype

Columns 9-16 contain binary zeros if the security level of the conversation was SECURITY (NONE) for connections to a private or global resource.

Table 101. TSAF Record Layout--Datatype AC (PERIODTE Format)

| Column | Data Type/<br>Length | Description                                                |
|--------|----------------------|------------------------------------------------------------|
| 1-8    | CL8                  | Userid that the charge applies to                          |
| 9-16   | CL8                  | Accounting number of the userid that the charge applies to |
| 17-22  | CL6                  | Date of accounting (end) <i>yymmdd</i>                     |
| 23-28  | CL6                  | Time of accounting (end) <i>hhmmss</i>                     |
| 29-36  | CL8                  | TSAF resource name                                         |
| 37-40  | F                    | Seconds connected to TSAF                                  |
| 41-44  | F                    | Bytes of data sent through TSAF                            |
| 45-48  | F                    | Bytes of data received through TSAF                        |
| 49-74  | CL26                 | (Reserved for IBM)                                         |
| 75     | C                    | TSAF type code (S)                                         |
| 76-78  | CL3                  | Record identifier (ATS)                                    |

(continued)

Table 101. TSAF Record Layout--Datatype AC (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 79-80   | CL2              | Datatype code (AC)                                                                                       |
| 81-82   | XL2              | Record type code (C0)                                                                                    |
| 83      | X                | User exit flags (values are shown on page 354)                                                           |
| 84      | X                | Billing/ data flags (values are shown on page 354)                                                       |
| 85      | X                | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6              | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6              | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8              | Shift ID                                                                                                 |
| 107-114 | CL8              | Node on which work was done                                                                              |
| 115-122 | CL8              | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12             | Customer ID                                                                                              |
| 135-158 | CL24             | Project this record applies to                                                                           |
| 159-166 | CL8              | Package name                                                                                             |
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10             | (Reserved for Computer Associates)                                                                       |
| 185-188 | F                | Cost for connect time                                                                                    |
| 189-192 | F                | Cost for bytes sent                                                                                      |
| 193-196 | F                | Cost for bytes received                                                                                  |
| 197-234 | XL38             | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6              | User data                                                                                                |

For information about the keywords used with the table above, see Table 33 on page 306.

## SQL/DS Storage Record Layouts

Datatype AD records are created by the VMJSQLE utility.

Table 102. SQL/DS Storage Record Layout--Datatype AD (Raw Data Format)

| Column | Data Type/Length | Description                            |
|--------|------------------|----------------------------------------|
| 1-8    | CL8              | VM userid to charge or PUBLIC          |
| 9-16   | CL8              | Account number                         |
| 17-22  | CL6              | Date of accounting (end) <i>mmdyy</i>  |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i> |

(continued)

Table 102. SQL/DS Storage Record Layout--Datatype AD (Raw Data Format) (continued)

| Column | Data Type/Length | Description                                                                  |
|--------|------------------|------------------------------------------------------------------------------|
| 29-36  | CL8              | SQL/DS owner ID                                                              |
| 37-44  | CL8              | SQL/DS database name                                                         |
| 45-46  | H                | Storage pool number                                                          |
| 47     | X                | DBSPACE type (X'01' = Private database space, X'02' = Public database space) |
| 48     | X                | DBSPACE name length                                                          |
| 49-66  | CL18             | DBSPACE name                                                                 |
| 67-68  | H                | DBSPACE number                                                               |
| 69-72  | F                | DBSPACE pages used                                                           |
| 73-74  | H                | Days owned                                                                   |
| 75-76  | XL2              | (Reserved for Computer Associates)                                           |
| 77-78  | XL2              | Unicenter VM:Account datatype (AD)                                           |
| 79-80  | CL2              | Record type code (C0)                                                        |

Table 103. SQL/DS Storage Record Layout--Datatype AD (PERIODTE Format)

| Column | Data Type/Length | Description                                                                  |
|--------|------------------|------------------------------------------------------------------------------|
| 1-8    | CL8              | Userid                                                                       |
| 9-16   | CL8              | Userid accounting number                                                     |
| 17-22  | CL6              | Date of accounting (end) <i>yymmdd</i>                                       |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i>                                       |
| 29-36  | CL8              | SQL/DS owner ID                                                              |
| 37-44  | CL8              | SQL/DS database name                                                         |
| 45-46  | H                | Storage pool number                                                          |
| 47     | X                | DBSPACE type (X'01' = Private database space, X'02' = Public database space) |
| 48     | X                | DBSPACE name length                                                          |
| 49-66  | CL18             | DBSPACE name                                                                 |
| 67-68  | H                | DBSPACE number                                                               |
| 69-72  | F                | DBSPACE pages used                                                           |
| 73-74  | H                | Days owned                                                                   |
| 75-76  | XL2              | (Reserved for Computer Associates)                                           |
| 77-78  | CL2              | Record identifier (AD)                                                       |
| 79-80  | CL2              | Datatype code (AD)                                                           |
| 81-82  | XL2              | Record type code (C0)                                                        |
| 83     | X                | User exit flags (values are shown on page 354)                               |
| 84     | X                | Billing/data flags (values are shown on page 354)                            |

(continued)

Table 103. SQL/DS Storage Record Layout--Datatype AD (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 85      | X                | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6              | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6              | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8              | Shift ID                                                                                                 |
| 107-114 | CL8              | Node on which work was done                                                                              |
| 115-122 | CL8              | (Reserved for Computer Associates)                                                                       |
| 123-134 | CL12             | Customer ID                                                                                              |
| 135-158 | CL24             | Project this record applies to                                                                           |
| 159-166 | CL8              | Package name                                                                                             |
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10             | (Reserved for Computer Associates)                                                                       |
| 185-188 | F                | Cost for pages used                                                                                      |
| 189-234 | XL46             | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6              | User data                                                                                                |

For information about the keywords used with the table above, see Table 34 on page 307.

## SFS Usage Record Layouts

Table 104. SFS Usage Record Layout--Datatype AE (Raw Data Format)

| Column | Data Type/Length | Description                                 |
|--------|------------------|---------------------------------------------|
| 1-8    | CL8              | SFS service virtual machine                 |
| 9-16   | CL8              | VM userid to charge                         |
| 17-32  |                  | Site-defined data or blank                  |
| 33-38  | CL6              | Date of accounting (end) <i>mmdyy</i>       |
| 39-44  | CL6              | Time of accounting (end) <i>hhmmss</i>      |
| 45-48  | F                | Active time connected to SFS                |
| 49-52  | F                | Processor time used                         |
| 53-56  | F                | Physical I/O DASD requests                  |
| 57-60  | CL4              | (Reserved for IBM)                          |
| 61-64  |                  | Number of 4Kb file blocks read by userid    |
| 65-68  |                  | Number of 4Kb file blocks written by userid |
| 69-74  | CL6              | (Reserved for IBM)                          |

(continued)

Table 104. SFS Usage Record Layout--Datatype AE (Raw Data Format) (continued)

| Column | Data Type/<br>Length | Description             |
|--------|----------------------|-------------------------|
| 75     | C                    | SFS type code (U)       |
| 76-78  | CL3                  | Record identifier (SFS) |
| 79-80  | CL2                  | Record type code (C0)   |

Table 105. SFS Usage Record Layout--Datatype AE (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                        |
|---------|----------------------|----------------------------------------------------|
| 1-8     | CL8                  | Userid                                             |
| 9-16    | CL8                  | Userid accounting number                           |
| 17-22   | CL6                  | Date of accounting (end) <i>yymmdd</i>             |
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>             |
| 29-36   | CL8                  | SFS current filepool name                          |
| 37-44   | CL8                  | SFS server machine ID                              |
| 45-48   | F                    | Time connected to SFS (seconds)                    |
| 49-52   | F                    | SFS CPU usage (milliseconds)                       |
| 53-56   | F                    | Physical I/O requests                              |
| 57-60   | CL4                  | (Reserved for IBM)                                 |
| 61-64   |                      | Number of 4Kb file blocks read by userid           |
| 65-68   |                      | Number of 4Kb file blocks written by userid        |
| 69-74   | CL6                  | (Reserved for IBM)                                 |
| 75      | C                    | SFS type code (U)                                  |
| 76-78   | CL3                  | Record identifier (SFS)                            |
| 79-80   | CL2                  | Datatype code (AE)                                 |
| 81-82   | XL2                  | Record type code (C0)                              |
| 83      | X                    | User exit flags (values are shown on page 354)     |
| 84      | X                    | Billing/ data flags (values are shown on page 354) |
| 85      | X                    | Surcharge flags (values are shown on page 355)     |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>           |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>           |
| 99-106  | CL8                  | Shift ID                                           |
| 107-114 | CL8                  | Node on which work was done                        |
| 115-122 | CL8                  | Group name                                         |
| 123-134 | CL12                 | Customer number                                    |
| 135-158 | CL24                 | Project this record applies to                     |
| 159-166 | CL8                  | Package name                                       |

(continued)

Table 105. SFS Usage Record Layout--Datatype AE (PERIODTE Format) (continued)

| Column  | Data Type/Length | Description                                                                                              |
|---------|------------------|----------------------------------------------------------------------------------------------------------|
| 167-174 | CL8              | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10             | (Reserved for Computer Associates)                                                                       |
| 185-188 | F                | Cost for active time                                                                                     |
| 189-192 | F                | Cost for CPU time                                                                                        |
| 193-196 | F                | Cost for physical I/Os                                                                                   |
| 197-234 | XL38             | (Reserved for Computer Associates)                                                                       |
| 235-240 | XL6              | User data                                                                                                |

For information about the keywords used with the table above, see Table 35 on page 308.

## SFS Storage Record Layouts

Datatype AF records are created by the DASDACCT GENERATE and DASDACCT SCAN commands.

Table 106. SFS Storage Record Layout--Datatype AF (Raw Data Format)

| Column | Data Type/Length | Description                                   |
|--------|------------------|-----------------------------------------------|
| 1-8    | CL8              | VM userid to charge                           |
| 9-16   | CL8              | Link-back code (i.e., encoded account number) |
| 17-22  | CL6              | Date of accounting (end) <i>mmddyy</i>        |
| 23-28  | CL6              | Time of accounting (end) <i>hhmmss</i>        |
| 29-36  | CL8              | VM userid to charge                           |
| 37-44  | CL8              | SFS filepool name (unresolved)                |
| 45-46  | H                | Storage group number                          |
| 47-48  | H                | (Reserved for Computer Associates)            |
| 49-52  | F                | Maximum blocks allowed                        |
| 53-56  | F                | Total blocks committed                        |
| 57-58  | H                | Number of days owned                          |
| 59-60  | H                | Warning limit percentage                      |
| 61-64  | F                | Current number of blocks in primary           |
| 65-68  | F                | Current number of blocks migrated to FRA      |
| 69-72  | F                | Current number of blocks migrated to tape     |
| 73-76  | XL4              | (Reserved for Computer Associates)            |
| 77-78  | CL2              | Unicenter VM:Account datatype (AF)            |
| 79-80  | CL2              | Record type code (C0)                         |



Table 107. SFS Storage Record Layout--Datatype AF (PERIODTE Format)

| Column  | Data Type/<br>Length | Description                                                                                              |
|---------|----------------------|----------------------------------------------------------------------------------------------------------|
| 1-8     | CL8                  | Userid                                                                                                   |
| 9-16    | CL8                  | Userid accounting number                                                                                 |
| 17-22   | CL6                  | Date of accounting (end) <i>yymmdd</i>                                                                   |
| 23-28   | CL6                  | Time of accounting (end) <i>hhmmss</i>                                                                   |
| 29-36   | CL8                  | Unicenter VM:Account slave worker ID                                                                     |
| 37-44   | CL8                  | SFS filepool name (unresolved)                                                                           |
| 45-46   | H                    | Storage group number                                                                                     |
| 47-48   | H                    | (Reserved for Computer Associates)                                                                       |
| 49-52   | F                    | Maximum blocks allowed                                                                                   |
| 53-56   | F                    | Total blocks committed                                                                                   |
| 57-58   | H                    | Number of days owned                                                                                     |
| 59-60   | H                    | Warning limit percentage                                                                                 |
| 61-64   | F                    | Current number of blocks in primary                                                                      |
| 65-68   | F                    | Current number of blocks migrated to FRA                                                                 |
| 69-72   | F                    | Current number of blocks migrated to tape                                                                |
| 73-76   | XL4                  | (Reserved for Computer Associates)                                                                       |
| 77-78   | CL2                  | Record identifier (AF)                                                                                   |
| 79-80   | CL2                  | Datatype code (AF)                                                                                       |
| 81-82   | XL2                  | Record type code (C0)                                                                                    |
| 83      | X                    | User exit flags (values are shown on page 354)                                                           |
| 84      | X                    | Billing/data flags (values are shown on page 354)                                                        |
| 85      | X                    | Surcharge flags (values are shown on page 355)                                                           |
| 86      | C                    | Day of week number (1-7) (1=Sunday)                                                                      |
| 87-92   | CL6                  | Date of accounting (begin) <i>yymmdd</i>                                                                 |
| 93-98   | CL6                  | Time of accounting (begin) <i>hhmmss</i>                                                                 |
| 99-106  | CL8                  | Shift ID                                                                                                 |
| 107-114 | CL8                  | Node on which work was done                                                                              |
| 115-122 | CL8                  | Group name                                                                                               |
| 123-134 | CL12                 | Customer number                                                                                          |
| 135-158 | CL24                 | Project this record applies to                                                                           |
| 159-166 | CL8                  | Package name                                                                                             |
| 167-174 | CL8                  | Link-back code to project, package, and Unicenter VM:Batch job number (values are explained on page 356) |
| 175-184 | CL10                 | (Reserved for Computer Associates)                                                                       |
| 185-188 | F                    | Cost for blocks in primary                                                                               |
| 189-192 | F                    | Cost for blocks in FRA                                                                                   |
| 193-196 | F                    | Cost for blocks on tape                                                                                  |
| 197-240 | XL44                 | (Reserved for Computer Associates)                                                                       |

For information about the keywords used with the table above, see Table 36 on page 308.

## CA-VM:Webgateway Record Layouts

Datatype AG records are created by CA-VM:Webgateway to report on web server usage when retrieving data. The record format is the same regardless of whether a post-processor was used.

### Customization Note

CA-VM:Webgateway supplies sample logic that can run on a post-processor userid to combine like records, and enable you to swap the chargeable/non-chargeable userid fields, and convert the date/time format in the TOD clock field to show a human-readable format of *mmmdyyhhmmss*.

- If you make these changes you will need to set the appropriate processing flags in column 75 of the CA-VM:Webgateway accounting record. This flag tells Unicenter VM:Account what processing changes were made. For information about the post-processor and the sample program logic for changing the values and setting flags, see the CA-VM:Webgateway online documentation.
- If you do not convert the date/time format in the TOD clock field of the post-processor, Unicenter VM:Account converts the date and time when it processes the accounting data from CA-VM:Webgateway.

Table 108. CA-VM:Webgateway Record Layout--Datatype AG (Raw Data Format)

| Column | Data Type/<br>Length | Description                                                                                                                                 |
|--------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1-8    | CL8                  | Web server userid                                                                                                                           |
| 9-16   | CL8                  | Chargeable Userid, defaults to data owner†                                                                                                  |
| 17-28  | XL12                 | TOD clock(XL8) plus 4 pad bytes†                                                                                                            |
| 29-36  | CL8                  | Non-chargeable userid, defaults to client userid. This field may be blank (or null) if the user is not prompted for a userid and password.† |
| 37-40  | XL4                  | IP address of client                                                                                                                        |
| 41-42  | XL2                  | TCP port of client                                                                                                                          |
| 43-46  | XL4                  | IP address of SVM                                                                                                                           |
| 47-48  | XL2                  | TCP port of SVM                                                                                                                             |
| 49-52  | XL4                  | VIWLOG counter value                                                                                                                        |
| 53-56  | XL4                  | SVM process virtual CPU ms                                                                                                                  |
| 57-60  | XL4                  | SVM process I/Os                                                                                                                            |
| 61-64  | XL4                  | Worker process virtual CPU ms                                                                                                               |
| 65-68  | XL4                  | Worker process I/O                                                                                                                          |
| 69-72  | XL4                  | Bytes served out TCP                                                                                                                        |
| 73-74  | XL2                  | Number of transactions represented                                                                                                          |

(continued)

† This field can be modified to customize accounting.

Table 108. CA-VM:Webgateway Record Layout--Datatype AG (Raw Data Format)  
(continued)

| Column | Data Type/<br>Length | Description                                                                                                                                                                                                                                                                                          |
|--------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 75-75  | XL1                  | Processing flags (see Customization Note above):<br>X'10' - Worker I/O and CPU totals are inaccurate by logoff<br>X'08' - TOD conversion performed†<br>X'04' - Data owner and client userids swapped†<br>X'02' - Non-VM userid truncated<br>X'01' - Client userid is pre-authenticated by web server |
| 76-76  | XL1                  | Reserved                                                                                                                                                                                                                                                                                             |
| 77-78  | CL2                  | Data type code (AG) (supplied by CA-VM:Webgateway)                                                                                                                                                                                                                                                   |
| 79-80  | CL2                  | Record type code (C0)                                                                                                                                                                                                                                                                                |

† This field can be modified to customize accounting.

Table 109. CA-VM:Webgateway Record Layout--Datatype AG (PERIODTE Format)

| Column | Data Type/<br>Length | Description                          |
|--------|----------------------|--------------------------------------|
| 1-8    | CL8                  | Chargeable Userid                    |
| 9-16   | CL8                  | Account Number                       |
| 17-22  | CL6                  | Date of accounting end <i>yymmdd</i> |
| 23-28  | CL6                  | Time of accounting end <i>hhmmss</i> |
| 29-36  | CL8                  | Web server userid                    |
| 37-40  | XL4                  | IP address of client                 |
| 41-42  | XL2                  | TCP port of client                   |
| 43-46  | XL4                  | IP address of SVM                    |
| 47-48  | XL2                  | TCP port of SVM                      |
| 49-52  | XL4                  | VIWLOG counter value                 |
| 53-56  | XL4                  | SVM process virtual CPU ms           |
| 57-60  | XL4                  | SVM process I/Os                     |
| 61-64  | XL4                  | Worker process virtual CPU ms        |
| 65-68  | XL4                  | Worker process I/O                   |
| 69-72  | XL4                  | Bytes served out TCP                 |
| 73-74  | XL2                  | Number of transactions represented   |
| 75-75  | XL1                  | Processing flags                     |
| 76-76  | XL1                  | Reserved                             |
| 77-78  | CL2                  | Record identifier (AG)               |

(continued)

Table 109. CA-VM:Webgateway Record Layout--Datatype AG (PERIODTE Format)  
(continued)

| Column  | Data Type/<br>Length | Description                                       |
|---------|----------------------|---------------------------------------------------|
| 79-80   | CL2                  | Data type code (AG)                               |
| 81-82   | CL2                  | Record type code (C0)                             |
| 83-83   | XL1                  | User exit flags (values are shown on page 354)    |
| 84-84   | XL1                  | Billing/data flags (values are shown on page 354) |
| 85-85   | XL1                  | Surcharge flags (values are shown on page 355)    |
| 86-86   | CL1                  | Day of week number (1-7) (Sunday=1)               |
| 87-92   | CL6                  | Date of accounting begin <i>yymmdd</i>            |
| 93-98   | CL6                  | Time of accounting begin <i>hhmmss</i>            |
| 99-106  | CL8                  | Shift ID                                          |
| 107-114 | CL8                  | Node ID                                           |
| 115-122 | CL8                  | Reserved for future use                           |
| 123-134 | CL12                 | Customer ID                                       |
| 135-158 | CL24                 | Project ID                                        |
| 159-166 | CL8                  | Package name                                      |
| 167-174 | CL8                  | Link-back code                                    |
| 175-184 | CL10                 | (Reserved for Computer Associates)                |
| 185-188 | F                    | Cost for 1000 bytes served through TCP            |
| 189-192 | F                    | Cost for virtual CPU time on web server           |
| 193-196 | F                    | Cost for physical I/Os on web server              |
| 197-200 | F                    | Cost for virtual CPU time on worker               |
| 201-204 | F                    | Cost for physical I/Os on worker                  |
| 205-240 | XL36                 | Reserved                                          |

For information about the keywords used with the table above, see Table 37 on page 309.

# Frequently Asked Questions

This chapter presents some of the questions system administrators frequently ask Computer Associates Customer Services about Unicenter VM:Account.

**1. Is the device address in the VM accounting data real or virtual?**

The VM accounting data contains the virtual address.

**2. What processes are suspended when the SUSPEND command is issued?**

Only reader file processing is suspended. All other processes continue to operate normally. QUERY USAGE commands issued during suspension reflect resources consumed up to the time Unicenter VM:Account was suspended.

**3. What happens to CP-generated accounting records when Unicenter VM:Account is not operating?**

Accounting records accumulate in the VMACT reader. These records are processed immediately after the next initialization of Unicenter VM:Account. Records are not lost.

**4. What happens to a site's accounting data if CP crashes?**

If the retrieval userid is up and running, the data will be saved on that userid's 191 minidisk.

**5. We run MVS as a guest operating system under VM. Can we get information about individual jobs run under MVS?**

No. Individual job accounting information for jobs run under MVS cannot be captured by CP.

**6. Are there any differences in the total resources reported for MVS on individual jobs and MVS as a virtual machine running under VM?**

Total resources, such as virtual and overhead CPU time, reported by CP are greater than those reported for MVS. VM accumulates the virtual and overhead CPU time associated with individual jobs running under MVS as well as the CPU time utilized by the actual accounting process.

**7. Can we define a shift that spans midnight?**

Yes. Unicenter VM:Account has a default SHIFT (00 00:00:00) that causes a CP ACNT CLOSE ALL at midnight. This is important when a virtual machine is logged on spanning midnight; the resources utilized before midnight and after midnight can be attributed to the actual date they were used rather than the date the machine was logged off.

**8. Can more than one userid be assigned the same project name? Can more than one project name be used by one userid?**

Yes. Project name defaults are assigned in the PROJECTS ACCTLIST file. Project defaults are assigned by account number, so more than one userid can have the same default project name. Also, different project names can be assigned to the same account number.

**9. What is a package to Unicenter VM:Account? How does Unicenter VM:Account identify a package-accounted program?**

A package is any MODULE, LOADLIB member, TEXT file, or TXTLIB. Any of these residing in a DCSS can also be package-accounted. Packages are identified to Unicenter VM:Account in the PACKAGES MASTER file.

**10. How does Unicenter VM:Account do package and project accounting? What actually occurs when a PROJECT or PACKAGE command is issued or a package-accounted program is run?**

The user enters a project name with the PROJECT command. The PROJECT command notifies Unicenter VM:Account, and if project validation is in effect, Unicenter VM:Account checks the PROJECTS ACCTLIST file to see if the user is authorized to use the project. If the project passes validation, accounting is closed (causing the accumulators to be reset for that userid). The user's account number is changed in the VMDBK to reflect the project.

This procedure is also used for package-accounted programs (using the VMJPKG utility) and for the PACKAGE command. The only difference is that validation is done with the PACKAGES MASTER file.

**11. Are more accounting records generated to do package accounting?**

Yes. An additional SESSION accounting record (type 01) is created each time a package-accounted program is executed. A PACKAGE START command generates an accounting record for resources used up to when the PACKAGE START command was issued. The PACKAGE END command generates an accounting record for resources used during package execution.

**12. What happens when a user issues an HX (halt execution) command while running a package-accounted program?**

Unicenter VM:Account terminates package accounting normally.

**13. What happens when a user calls one package from within another package and both are package-accounted?**

A record is generated for each package. You can use up to eight levels of package-accounted software.

**14. Are surcharges and discounts cumulative?**

Yes. If a package-accounted program (using a 10 percent discount) runs on Saturday (using a 5 percent discount), the resulting discount for the accounting record is 15 percent.

**15. What happens during end-of-period processing?**

- a. Unicenter VM:Account renames the PERIODTE CURRENT file to PERIODT\$ WORKING.
- b. Unicenter VM:Account creates a new PERIODTE CURRENT file.
- c. Unicenter VM:Account reads the PERIODT\$ WORKING file. Records are written to the PERIODTE CURRENT file based on the BEGDATE in the record. The records that have a BEGDATE not belonging in the new accounting period remain in the PERIODT\$ WORKING file.
- d. The copied records in PERIODT\$ WORKING are zeroed out with binary zeros.
- e. Unicenter VM:Account renames PERIODT\$ WORKING with the name of the closed accounting period. It takes this information from the header record in the file.
- f. Unicenter VM:Account starts a database initialization process and rebuilds the database indexes and budget information.

**16. What is the difference in report operation if Unicenter VM:Sort is used instead of CMS SORT?**

The reports execute differently if a site uses CMS SORT rather than Unicenter VM:Sort or another sorting package. If CMS SORT is used, the VMJSRTCK EXEC checks for the minidisk space needed for the sort. It estimates the space needed by calculating the requirements for virtual storage workspace and a minidisk large enough to accommodate the sorted file.

If Unicenter VM:Sort or another sorting package is available and the control file contains a SORT record, the record selection utility (VMJSEL) calls it to sort the records. The record selection utility either selects or ignores the sorted records and passes them to the COBOL program.

Unicenter VM:Sort dynamically allocates T-disk space for sort work files. Unicenter VM:Sort uses sort work files when there is not enough virtual storage to sort the file. When the OUTFILE record is specified in the control file, the record selection utility writes that output file to the first minidisk accessed R/W found in the CMS search order. If the OUTFILE record is not specified, the minidisk requirement is the same, but the selected and sorted file is temporary and is erased after the report is generated.

**17. Can I install Unicenter VM:Account concurrently with my existing accounting system?**

Yes. You can do either of the following:

- Have Unicenter VM:Account receive the accounting records from CP and send the raw data to your current accounting system after processing from the VMJRAW utility.
- Have your current accounting system punch a copy of the raw accounting records to Unicenter VM:Account for processing.

**18. How do I back up the PERIODTE CURRENT file?**

Add a PRODUCT VMBACKUP record to the VMACCT CONFIG file. Then, set up a BrightStor VM:Backup exception file for your daily system backup jobs to quiesce the Unicenter VM:Account COLLECT minidisk. (Quiescing ensures that all read/write activity on a minidisk is suspended.) The Unicenter VM:Account COLLECT minidisk is usually the 1B0 minidisk.

**19. I received an ERROR 16 FROM SORTING ROUTINE when I tried to run a report. What does this error message mean?**

This message results from several sorting errors. Two common causes are that the sorting product may not have enough:

- Virtual storage to start the sort
- T-disk available to complete the sort

If you are using Unicenter VM:Sort as your sorting product, you can get more information about why the sort failed if you use the diagnostic below. Enter the diagnostic and then run your report again. The diagnostic will show all the Unicenter VM:Sort messages associated with the sort.

**filedef vmsctl disk \$aa \$aa a (perm**



# Index

## Symbols

., xxii  
,, xxii  
:, xxii  
(, xxii  
( ), xxii  
[ ], xxii  
{ }, xxii  
%, 111  
-, xxii  
\*, xxii, 77, 111  
\*BATCH, 331  
\*FRI, 331  
\*HOLIDAY, 331  
\*MON, 331  
\*SAT, 331  
\*SUN, 331  
\*THU, 331  
\*TUE, 331  
\*WED, 331  
=, xxii

## Numbers

01 datatype. *See* Session record  
02 datatype. *See* Dedicated Device record  
03 datatype. *See* TDISK record  
04 datatype. *See* Invalid Logon/ Autolog record

05 datatype. *See* Successful Link record  
06 datatype. *See* Unsuccessful Link record  
07 datatype. *See* VSCS record  
240-byte record layouts, 351  
370 Accommodation Feature, 4  
80-byte record layouts, 351

## A

A3 datatype. *See* Volumes record  
A4 datatype. *See* MDISK record  
A5 datatype. *See* Miscellaneous Charges and Credits record  
A6 datatype. *See* VM:Tape Mount record  
A7 datatype. *See* RSCS record  
A9 datatype. *See* VM:Archiver Usage record  
AA datatype. *See* SQL/DS Usage record  
AB datatype. *See* VM:Spool Usage record  
ABEND command, overview, 113  
AC datatype. *See* TSAF record  
accepted accounting records, 350  
accessing VM:Account, 13  
account number accounting  
    benefits, 21  
    definition of, 21  
    example, 22  
    implementing, 21  
    reallocating costs, 100  
    restrictions, 21  
account numbers  
    customer IDs and, 18

- definition of, 18
- report listing account and userid assignments, 222
- userids and, 18
- ACCOUNT option
  - CHARGE command, 115
  - CREDIT command, 115
  - QUERY command, 128
- ACCOUNT parameter
  - CHGCUST configuration file record, 148
  - DBINDEX configuration file record, 158
  - QUERY command, 126
- accounting data
  - creating a copy, 72
  - recosting, 213
- Accounting Data Conversion utility (VMJRAW), 211
- accounting period
  - closing, 61
  - compressing old data, 185
- accounting records
  - CMSBATCH, 53
  - locally defined, 99
  - minidisks, 32
  - RSCS, 52
  - TSAF, 51
  - VM:Archiver, 44, 45
  - VM:Batch, 44
  - VM:Spool, 45
  - VM:Tape tape mounts, 45
  - VM:Tape tape volumes, 46
- accounting structure
  - changing, 20
  - charging by account number, 21
  - charging by project, 23
  - definition of, 20
- accounting systems (other than VM:Account), 400
- ACCT record (VMJRCS specification control file), 215
- ACCTCRDS configuration file record
  - and creating locally defined accounting records, 100
  - and INVFILES data collection file, 349
  - overview, 144
- ACCTCRDS file
  - and system overview, 10
  - overview, 347
- ACCTDATA user exit
  - and execution sequence, 245
  - overview, 248
  - processing locally defined accounting records, 100
- ACCTRCD file, 240
- AD datatype. *See* SQL/DS Storage record
- ADD parameter
  - PROJECT configuration file record, 169
  - UPDATE command, 133
- AE datatype. *See* SFS Usage record
- AF datatype. *See* SFS Storage record
- ALL option, VMJRSE utility, 219
- ALL parameter, SIOCOUNT configuration file record, 175
- allocation tables, converting, 118, 198
- analyzing long-term trends, 75
- AND parameter, SELECT and IGNORE records (VMJSEL control file), 230
- APPEND option
  - QUERY command, 127
  - VMJRAW utility, 212
- ARCHIVE COSTABLE file, layout and overview, 338
- archived files, charging strategies, 44
- ARISLKMC text file, 41
- ARISQLLD LOADLIB, 41
- ARIEXIT EXIT
  - and effect on SQL/DS Usage records, 384
  - and updating SQL/DS service virtual machines, 41
  - changing VM:Account service virtual machine name in, 235
- ARIEXIT TEXT file, 384
- assumptions made in this book, 4
- AUTHORIZ configuration file record
  - charging for non-machine resources, 53
  - overview, 145
- authorization
  - summary table, 146
  - userids running VM:Account commands, 145
  - userids sending accounting records to VM:Account, 180
- autologs, reporting on illegal attempts, 218

## B

- backing up PERIODTE CURRENT file, 400
- backup data and disk, 72
- batch charging
  - and PACKAGES COSTABLE file, 331
  - strategies, 44
- BEGDATE parameter, DBINDEX configuration file record, 158
- billing/budget files
  - CUSTOMER ACCTLIST, 22, 73
  - CUSTOMER MASTER, 22, 73
  - modifying with UPDATE command, 85
  - PROJECTS ACCTLIST, 73
  - PROJECTS MASTER, 73
- BOTH parameter, QROUTPUT configuration file record, 171
- braces, xxi
- brackets, xxi
- BUDGET configuration file record
  - BUDGET user exit, relationship with, 73
  - example of use, 74
  - overview, 147
- BUDGET parameter, QUERY command, 125
- BUDGET user exit
  - and execution sequence, 245
  - BUDGET configuration file record, relationship with, 73
  - example of use, 74
  - overview, 249
- budgets
  - definition of, 73
  - getting information with QUERY BUDGET command, 125
  - implementation of, 74
  - limits, monitoring and enforcing, 249
  - overview, 73
- BUSINESS parameter, SHIFT configuration file record, 173

## C

- callable service routines for user exits, 260
- Capacity Planning report, 197
- Capacity Planning utility (VMJCPR), 196

- case (upper or lower) and entering commands, xxii
- CHANGE parameter, UPDATE command, 133
- changing, VM:Account service virtual machine, 210, 235
- characters, pattern matching, 111
- CHARGE command
  - charging for non-machine resources, 52
  - full-screen version, 115
  - line-mode version, 114
- Charge Summary report (VMJCHRGs), 271
- CHARGES parameter, PARMS record (VMJSEL control file), 227
- charging
  - and VM:Archiver, 44
  - and VM:Batch, 44
  - and VM:Migrate, 45
  - and VM:Spool, 45
  - by account number, 21
  - by project, 23
  - customer differential, 58
  - daily/holiday differential, 59
  - day of week, 331
  - determining a method, 27
  - for CMSBATCH usage, 53
  - for DASD ownership, 32
  - for disk volumes, 199
  - for Guest I/O usage, 54
  - for locally defined expenses, 99
  - for mountable disk usage, 43, 199
  - for non-machine resources, 52
  - for package use, 29
  - for RSCS usage, 52
  - for SFS usage, 38
  - for spool space, 45
  - for SQL/DS DBSPACE, 42, 236
  - for SQL/DS usage, 39
  - for tape volumes, 240
  - for TSAF usage, 51
  - holiday, 331
  - holiday/daily differential, 59
  - implementation of, 28
  - purpose of, 27
  - rates, determining, 27
  - shift differential, 58
  - tape mounts, 45
  - tape volumes, storing, 45, 240
  - weekend, 331

- CHGCUST configuration file record
  - and CUSTOMER ACCTLIST file, 316
  - overview, 148
  - setting up account number accounting, 21
  - setting up project accounting, 25
- CLASS option
  - VMJDVA utility, 200
  - VMJSQJ utility, 236
  - VMJTVA utility, 241
- CLASS parameter, COLLECT configuration file record, 149
- CLOSE parameter, SMSG command, 5
- closing an accounting period, 61
- CMS command, overview, 117
- CMS commands, entering, 117
- CMS EXECs, running, 117
- CMS FILEDEF, 103
- CMS SORT
  - and VMJCMP utility, 185
  - example of usage, 71
  - used with reports rather than VM:Sort, 399
- CMSBATCH accounting, 53
- COBOL
  - abends, handling, 270
  - requirements for, 4
- COBOL reports
  - modifying, 266
  - overview, 7, 263
- COLLECT configuration file record
  - and creating a copy of accounting data, 72
  - and creating locally defined accounting records, 100
  - and data collection files, 347
  - and determining rates, 27
  - number of days to keep RAWDATA files, 350
  - overview, 149
- COLLECT-TWIN minidisk, 149
- COLLECT-TWIN record in VMACCT MDISKS file, 72
- COMMAND parameter, VERIFY command, 140
- COMMAND user exit
  - and execution sequence, 245
  - overview, 251
- commands, general
  - authorizing userids to run, 145
  - default values, xxii
  - entering, 110
  - format conventions, xxi
  - minimum abbreviation, xxii
  - optional entries, xxii
  - pattern matching characters, 111
  - required entries, xxii
- commands, specific
  - ABEND, 113
  - CHARGE, 114
  - CMS, 117
  - CREDIT, 114
  - DASDACCT, 118
  - END, 120
  - PACKAGE, 121
  - PERIOD, 122
  - PROJECT, 124
  - QUERY, 125
  - REFRESH, 130
  - RESUME, 131
  - SUSPEND, 132
  - TIMEZONE, 183
  - UPDATE, 133
  - VERIFY, 140
- comment statement
  - in a query, 77
  - in selection utility control file, 223
- compiled REXX, 247
- compiler, COBOL, 267
- compiling COBOL report programs, 267
- COMPRESS record (VMJCMP utility control file)
  - example of usage, 63
  - overview, 193
- compressing old accounting data
  - example, 64
  - fields not saved, 189
  - key fields, 187
  - PERIODTE File Compression utility, 185
- configuration file records
  - ACCTCRDS, 144
  - AUTHORIZ, 145
  - BUDGET, 147
  - changing, 130
  - CHGCUST, 148
  - COLLECT, 149
  - CONSOLE, 151
  - COSTSYMB, 152
  - CTLDISK, 153
  - DASDACCT, 154
  - DBDISK, 157

- DBINDEX, 158
- DBSPACE, 160
- DIRECT, 162
- DUMP, 163
- explanation of, 141
- FILEPOOL, 164
- IGNORE, 165
- MESSAGE, 166
- PRODUCT, 167
- PROJECT, 169
- QRLIMIT, 170
- QROUTPUT, 171
- RSCSNODE, 172
- SHIFT, 173
- SIOCOUNTER, 175
- SPECIAL, 176
- SYSOPER, 177
- TRNDFILE, 178
- USEREXIT, 179
- WORKER, 180
- CONSOLE configuration file record, overview, 151
- continuation statement in a query, 77
- control files
  - for compressing data, 63
  - for queries, 79, 126
  - VMACCT DASDINFO file, 34
  - VMJCOMP utility, 193
  - VMJDVA utility, 200
  - VMJQRTR report, 66
  - VMJRCS utility, 214
  - VMJSEL utility, 223
  - VMJSQJ utility, 237
- CONTROL option, VMJRAW utility, 212
- conventions
  - default values, xxii
  - examples, xxiii
  - minimum abbreviation, xxii
  - optional entries, xxii
  - required entries, xxii
  - syntax, xxi
- converting
  - file pool allocation tables, 198
  - VM:Account raw data to standard CP format, 211
- copy of accounting data, creating, 72
- copyright screen, removing, 13
- cost tables
  - See also* COSTABLE files
  - and system overview, 10, 11
  - definition of, 20
  - file layouts, 312
  - modifying with UPDATE command, 85, 133
  - search order, 57
- COSTABLE files
  - See also* cost tables
  - ARCHIVE, 338
  - DBSPACE, 344
  - DEDEVICE, 327
  - definition of, 20, 320
  - establishing, 28
  - LGAI, 337
  - LINKS, 329
  - MDISK, 330
  - PACKAGES, 331
  - PACKAGES MASTER, 29
  - PACKAGES SURCHARGES, 30, 44, 53, 59
  - RSCS, 52, 335
  - SESSION, 53, 59, 326
  - SFS, 345
  - SFSDASD, 346
  - SPOOL, 340
  - SQL/DS, 339
  - TAPMOUNT, 333
  - TDISK, 328
  - TSAF, 343
  - VMATCH, 341
  - VOLUMES, 43, 334
  - VSCS, 336
  - WEB, 342
- costing files, 311
- COSTING user exit
  - and execution sequence, 245
  - overview, 253
  - processing locally defined accounting records, 100
- COSTS parameter, QROUTPUT configuration file record, 171
- costs, reallocating, 100
- COSTSYMB configuration file record, overview, 152
- CP commands, entering, 117
- CP MSG command, 166
- CP MSGNOH command, 166
- CP parameter
  - CMS command, 117
  - DUMP configuration file record, 163

- CP TRANSFER command, 349
- CP WNG command, 166
- CPU usage, reporting on
  - Capacity Planning utility, 196
  - example, 70
- creating
  - copy of accounting data, 72
  - locally defined accounting records, 99
- CREDIT command
  - correcting overcharges, 52
  - full-screen version, 115
  - line-mode version, 114
- CTLDISK configuration file record
  - and resource costing files, 311
  - overview, 153
- CUST record (VMJRCS specification control file), 215
- CUSTOMER ACCTLIST file, 148
  - and budgeting, 73
  - layout and overview, 316
  - setting up account number accounting, 22
- customer ID, 17
- CUSTOMER MASTER file, 22, 148
  - and budgeting, 73
  - layout and overview, 313
- CUSTOMER option
  - QUERY command, 128
  - VMJSCD utility, 222
- CUSTOMER parameter
  - DBINDEX configuration file record, 158
  - QUERY command, 125
- customers
  - charging different rates, 58
  - definition of, 17

## D

- DAILY EVENTSyy file, layout and overview, 316
- DAILY parameter, DASDACCT configuration file record, 155
- DASD, charging for ownership, 32
- DASDACCT command
  - and charging for DASD ownership, 32
  - overview, 118
- DASDACCT configuration file record
  - and charging for DASD ownership, 33

- overview, 154
- DASDACCT parameter, WORKER configuration file record, 180
- DASDACCT worker machine
  - See also* VMJDASD
  - and system overview, 10, 11
  - creation, 180
  - use with DASDACCT command, 118
- DASDINFO file, 34
- data collection files, 347
- Data System Control (DSC) component, SQL/DS, 41
- database
  - index files, 157
  - indices, 178
  - storage, 160
- DATATYPE keyword
  - example of use, 354
  - overview, 295
- datatypes, 352
- DATE option
  - CHARGE command, 115
  - CREDIT command, 115
  - QUERY command, 128
- date, verifying, 183
- DATES parameter, OUTHEADR record (VMJSEL control file), 234
- days, setting daily rates, 59
- DAYS option
  - VMJDVA utility, 200
  - VMJSQL utility, 236
  - VMJTVA utility, 241
- DBDISK configuration file record, overview, 157
- DBINDEX configuration file record, overview, 158
- DBSPACE configuration file record, overview, 160
- DBSPACE COSTABLE file, layout and overview, 344
- DEDEVICE COSTABLE file, layout and overview, 327
- Dedicated Device record (datatype 02)
  - COSTABLE file, 327
  - keywords, 299
  - layouts, 359

default values, format conventions, xxii

#### definitions

- account number, 18
- accounting structure, 20
- cost tables, 20
- COSTABLE file, 20
- customer, 17
- projects, 19

DELETE parameter, UPDATE command, 133

#### DETAIL option

- QUERY command, 128
- VMJIFR utility, 202

#### device types

- CKD and FBA, 324, 325
- graphic, 322
- input U/R, 322, 323
- output unit record, 323
- remote graphic, 322
- remote input U/R, 323
- remote output U/R, 324
- tape, 324, 325
- terminal, 321

devices, real, dynamic deletion of, 5

DIRECT configuration file record, overview, 162

DIRECT option, VMJRAW utility, 212

#### discounts

- applying for days of the week or holidays, 59
- applying for use of a package, 29
- applying to CMSBATCH, 54
- applying with PACKAGE command, 121
- PACKAGES COSTABLE file, 331

#### DISK option

- PERIOD command, 122
- QUERY command, 127
- VMJCPR utility, 196
- VMJIFR utility, 202
- VMJRSE utility, 219

DISK parameter, PARMS record (VMJSEL control file), 228

Disk Volume Accounting utility (VMJDVA), 199

DISK VOLUMES inventory file, 44

DISKFULL parameter, COLLECT configuration file record, 150

DISKVOLS parameter, SPECIAL configuration file record, 176

DMSTVI module, 102

documentation, other VM:Account, xxiii

#### DSN parameter

- INFILE record (VMJSEL control file), 224
- OUTFILE record (VMJCMP control file), 194
- VMJCMP utility, 185

DUMP configuration file record, overview, 163

dynamic deletion of real devices, 5

## E

#### EDIT option

- VMJCMP utility, 185
- VMJSEL utility, 223

#### END command

- example of usage, 28
- overview, 120

#### END parameter

- DBSPACE configuration file record, 160
- PACKAGE command, 121
- SMSG command, 5

end-of-period processing, 399

end-of-year processing, and budgets, 73

#### ENDCMD user exit

- and execution sequence, 245
- overview, 254

entering commands, 110

ESA mode, 4

EVERY parameter, DASDACCT configuration file record, 155

#### examples

- conventions, xxiii
- system responses and prompts, xxiii
- user entries, xxiii

EXCLUDE option, VMJCPR utility, 196

EXCLUDE record (VMACCT DASDINFO control file), 35

#### EXEC parameter

- CMS command, 117
- USEREXIT configuration file record, 179

EXECs, running, 117

## F

FAQs (frequently asked questions), 397

FIFO parameter, QUERY command, 126

- file descriptions
  - data collection files, 347
  - resource costing files, 311
- File Pool Allocation Table Conversion utility (VMJCVTBL), 198
- file pools
  - charging for ownership, 32
  - converting SFS allocation tables, 118
- FILEDEFS, 103
- FILEPOOL configuration file record
  - and charging for DASD ownership, 33
  - overview, 164
- files, modifying, 85
- FORCE option
  - VMJDVA utility, 200
  - VMJSQL utility, 236
  - VMJTVA utility, 241
- format conventions
  - default values, xxii
  - minimum abbreviation, xxii
  - optional entries, xxii
  - required entries, xxii
- FRIDAY parameter, SHIFT configuration file record, 173
- FROM option
  - VMJDVA utility, 199
  - VMJSQL utility, 236
  - VMJTVA utility, 240
- FROM record (VMJRCS specification control file), 215

## G

- GENERATE parameter
  - DASDACCT command, 118
  - DASDACCT configuration file record, 154
- Guest I/O
  - charges costing file (LGAI), 337
  - charging for, 54
  - recost record type in VMJRCS, 215
- Guest I/O record (datatype 0C)
  - keywords, 301
  - layouts, 369

## H

- help
  - with commands, 111
  - with screens and menus, 15
- HOLD parameter, COLLECT configuration file record, 150
- holidays
  - adding with UPDATE command, 133
  - applying a surcharge or discount, 59
- HOLIDAYS MASTER file, 60
  - layout and overview, 318

## I

- IDRC (Improved Data Recording Capability)
  - feature, 103
- IGNORE configuration file record
  - and RAWDATA data collection file, 350
  - overview, 165
- IGNORE record (VMJSEL utility control file), 229
- IGNORE statement (full-screen query), 77
- ILINKBL option, VMJRSE utility, 219
- ILINKBO option, VMJRSE utility, 219
- illegal logon or autolog attempts, reporting on, 218
- ILOGONBT option, VMJRSE utility, 219
- ILOGONBU option, VMJRSE utility, 219
- implementing user exits, 244
- Improved Data Recording Capability (IDRC)
  - feature, 103
- index files, and system overview, 11
- index for database, 158
- INFILE record (VMJSEL utility control file)
  - example of usage, 66, 105
  - overview, 224
- initialization, failed, 311
- Installation Aid utility (VMJSCD)
  - overview, 221
  - setting up account number accounting, 22
- interactive resource usage, charging strategies, 44
- Invalid Autologs/Logons report, 219
- Invalid File report, 203



- Invalid File Report utility (VMJIFR), 202
- Invalid Logon/ Autolog record (datatype 04)
  - layout, 363
  - reporting on, 218
- invalid reader file, 349
- invalid spool files, reporting on, 202
- INVFILES file
  - and system overview, 9, 10
  - overview, 349
- Invoice and Invoice Ledger report (VMJINVCE), 274
- INVPKGID option, VMJPKG utility, 206

## K

- keywords
  - and full-screen Query command, 77
  - and VMJSEL's IGNORE record, 229
  - and VMJSEL's PRESORT record, 228
  - and VMJSEL's SELECT record, 229
  - and VMJSEL's SORT record, 231
  - common to all VM:Account records, 295
  - Dedicated Device record (02), 299
  - Guest I/O record (0C), 301
  - MDISK record (A4), 302
  - Miscellaneous Charges and Credits record (A5), 302
  - RSCS record (A7), 303
  - Session record (01), 298
  - SFS Storage record (AF), 308
  - SFS Usage record (AE), 308
  - SQL/DS Storage record (AD), 307
  - SQL/DS Usage record (AA), 305
  - Successful Link record (05), 300
  - TDISK record (03), 299
  - TSAF record (AC), 306
  - VM:Archiver Usage record (A9), 304
  - VM:Spool Usage record (AB), 306
  - VM:Tape Mount record (A6), 303
  - VM:WebGateway record (AG), 309
  - Volumes record (A3), 301
  - VSCS record (07), 300

## L

- LABEL parameter, OUTHEADR record (VMJSEL control file), 233
- LABLEDEFs, 103

- layout of VM:Account records, 351
- LGAI COSTABLE file, 337
  - layout and overview, 337
- LGAI record (datatype 0C), COSTABLE file, 337
- LIFO parameter, QUERY command, 126
- limiting use of packages, 68
- link-back code in PERIODTE-format record, 356
- LINKS COSTABLE file, layout and overview, 329
- Linux guest accounting. *See* Guest I/O
- loading files from tape to minidisk, 103
- locally defined accounting records, creating, 99
- LOGNUM option
  - CHARGE command, 115
  - CREDIT command, 115
- logons, reporting on illegal attempts, 218
- lower case and entering commands, xxii

## M

- macro library for COBOL report programs, 267
- making a copy of accounting data, 72
- marking a software package for accounting (example), 68
- master description files
  - and system overview, 10, 11
  - deleting information from, 88
  - modifying with UPDATE command, 85
- MAXCONN value
  - for VMACCT machine, 40
  - for WORKER machine, 33
- MDISK COSTABLE file, layout and overview, 330
- MDISK record (datatype A4)
  - created by DASDACCT command, 32, 118
  - creation with SCAN, 154
  - keywords, 302
  - layouts, 373
  - Minidisk Utilization Summary report, 277
- MESSAGE configuration file record, overview, 166
- messages, sending to specific usersids, 177
- midnight, shifts spanning, 397
- migrated data, charging strategies, 45

Minidisk record (datatype A4), COSTABLE file, 330

Minidisk Utilization Summary report (VMJMDISK), 277

minidisks, charging for ownership, 32

minimum abbreviation, format conventions, xxii

MISCCHGS MASTER file, 114  
     example of modifying, 52  
     layout and overview, 320

Miscellaneous Charge Facility screen, 115

Miscellaneous Charges and Credits record (A5)  
     created by CHARGE and CREDIT commands, 52, 114  
     keywords, 302  
     layouts, 375  
     Miscellaneous Charges/Credits report, 279

Miscellaneous Charges/Credits report (VMJMISC), 279

miscellaneous files  
     HOLIDAYS MASTER, 60  
     MISCCHGS MASTER, 52  
     modifying with UPDATE command, 85

MO (months) parameter, TRNDFILE record (VMJCMP control file), 194

model of resource usage, building, 27

modifying  
     COBOL reports, 266  
     costing fields on PERIODTE-format records, 253  
     fields on PERIODTE-format records, 248  
     fields on raw accounting records, 257  
     tables and files, 85

MONDAY parameter, SHIFT configuration file record, 173

MONTH parameter, PARMS record (VMJSEL control file), 227

Monthly VM Utilization report (VMJMONTH), 281

mountable disk accounting, charging for with VMJDVA utility, 199

mountable disks, charging for, 43

MSG parameter, MESSAGE configuration file record, 166

MSGNOH parameter, MESSAGE configuration file record, 166

multiple entry points (package accounting), 31, 208

## N

NEWACCT record (VMJRCS specification control file), 216

NEWCUST record (VMJRCS specification control file)  
     example of usage, 101  
     overview, 216

NEWDFLT parameter, PROJECT configuration file record, 169

NEWPROJ record (VMJRCS specification control file), 216

NO parameter, BUDGET configuration file record, 147

non-machine resources, charging for, 52

non-reentrant code and package accounting, 204

NOSORT option, when running reports, 269

NOT parameter, SELECT and IGNORE records (VMJSEL control file), 229

notational conventions, xxi

notations  
     examples, xxiii  
     syntax, xxi

NOTAVAIL option, VMJPKG utility, 206

NOVECTOR parameter, PARMS record (VMJSEL control file), 228

NOVERIFY parameter, PROJECT configuration file record, 169

## O

OFF parameter, DUMP configuration file record, 163

ON PERIOD parameter, DASDACCT configuration file record, 154

operating modes supported, 4

Operations Overview report (VMJORVW), 283

OPERATOR option, VMCLOCK utility, 183

optional entries, format conventions, xxii

OR parameter, SELECT and IGNORE records (VMJSEL control file), 230

- OS linkage, 246
- OUTFILE record
  - and VMJCMP utility control file, 105, 194
  - and VMJSEL utility, 399
  - and VMJSEL utility control file, 225
  - reduce sort time when running reports, 268
- OUTHEADR record (VMJSEL utility control file), 233
- overcharges, correcting, 52
- OVERLAP record (VMACCT DASDINFO control file), 36

## P

- package accounting
  - implementation example, 67
  - implementation of, 29
  - marking packages, 30
  - multiple entry points, 31, 208
  - non-reentrant code, 204
  - screen, image of, 207
  - secondary entry points, 31
  - VMJPKG utility, 204
  - when VM:Account is shut down, 120
- PACKAGE command
  - overview, 121
  - tracking a package's use, 31
- package ID
  - \*BATCH, 44, 54
  - \*FRI, 59
  - \*HOLIDAY, 59
  - \*MON, 59
  - \*SAT, 59
  - \*SUN, 59
  - \*THU, 59
  - \*TUE, 59
  - \*WED, 59
- PACKAGE option
  - CHARGE command, 115
  - CREDIT command, 115
  - QUERY command, 128
- PACKAGE parameter, DBINDEX configuration file record, 158
- PACKAGE record (VMJRCS specification control file), 215
- Package Surcharge option on System Files Update Selection menu, 30

- packages
  - defined, 398
  - limiting use of, 68
- PACKAGES COSTABLE file
  - and applying surcharges or discounts for package use, 331
  - applying a surcharge or discount, 121
  - layout and overview, 331
- PACKAGES MASTER file
  - and charging for software package use, 29
  - example of updating, 68
  - layout and overview, 314
- PACKAGES SURCHARGES cost table, 59
  - and charging for CMSBATCH usage, 53
  - and charging for VM:Batch usage, 44
- PARMS record (VMJSEL utility control file)
  - example of usage, 66
  - overview, 225
- pattern matching
  - characters, 111
  - definition, 111
- PERIOD command
  - and closing an accounting period, 62
  - overview, 122
  - sending a file to tape, 103, 122
- PERIOD parameter, DASDACCT configuration file record, 154
- PERIODTE CURRENT file
  - and flow of data through system, 11
  - and system overview, 10
  - backing up with VM:Backup, 400
  - during end-of-period processing, 399
  - overview, 348
- PERIODTE file (closed)
  - and system overview, 10
  - compressing, 185
- PERIODTE File Compression utility (VMJCMP), 185
- PERIODTE format of VM:Account records, 351
- PERIODTE INITIAL file, 122
- PF keys
  - on query screens, 76
  - on update screens, 89
  - standard on VM:Account screens, 14
- PKGID option, VMJPKG utility, 205
- PRESORT record (VMJSEL utility control file), 228

- PRINT option
  - QUERY command, 127
  - VMJCPR utility, 196
  - VMJRSE utility, 219
  - VMJSEL utility, 223
- PRINT parameter, PARMS record (VMJSEL control file), 228
- PRODUCT configuration file record and INVFILES data collection file, 349
  - overview, 167
- project accounting
  - benefits, 24
  - definition of, 23
  - example, 26
  - implementing, 25
  - reallocating costs, 101
  - restrictions, 24
- PROJECT command
  - overview, 124
  - use during a terminal session, 19
- PROJECT configuration file record
  - overview, 169
  - setting up account number accounting, 21
  - setting up project accounting, 25
- project name verification, 169
- PROJECT option
  - CHARGE command, 115
  - CREDIT command, 115
  - QUERY command, 128
- PROJECT parameter
  - CHGCUST configuration file record, 148
  - DBINDEX configuration file record, 158
  - QUERY command, 125
  - VERIFY command, 140
- PROJECT record (VMJRCS specification control file), 215
- projects
  - account numbers and, 19
  - customer IDs and, 19
  - definition of, 19
- PROJECTS ACCTLIST file, 124, 148
  - and budgeting, 73
  - layout and overview, 317
  - project-level security, 169
- PROJECTS MASTER file, 124, 148
  - and budgeting, 73
  - layout and overview, 315

- PROJECTS option, VMJSCD utility, 222
- PROMPT option, when running reports, 269

## Q

- QRLIMIT configuration file record, overview, 170
- QROUTPUT configuration file record, overview, 171
- QUARTER parameter, PARMS record (VMJSEL control file), 227
- Quarterly VM Utilization report (VMJQRTR), 286
- queries
  - control files, 79
  - restricting privileges, 255
- QUERY command
  - See also* QUERY USAGE command
  - limiting number of records it processes, 170
  - limiting output, 171
  - overview, 125
- Query Usage Additional Selection Criteria screen, 76
- QUERY USAGE command
  - See also* QUERY command
  - control files, 79
  - how it works, 78
  - overview (full-screen version), 76
  - overview (line-mode version), 126
  - performance considerations, 158
- Query Usage Selection screen, 76, 80
- QUERY user exit
  - and execution sequence, 245
  - overview, 255
- questions and answers about VM:Account, 397
- quick references
  - COBOL reports, 263
  - commands, 109
  - configuration file records, 141
  - data collection files, 347
  - resource costing files, 312
  - user exits, 243
  - utilities, 181
- quiescing minidisks, 400

## R

RANGE parameter, PARMS record (VMJSEL control file), 227

### rates

- applying to existing data, 28
- determining what to charge for resources, 27
- for DASD ownership, 32
- initial entry, 28

raw data format of VM:Account records, 351

### RAWDATA file

- and flow of data through system, 11
- and system overview, 9, 10
- copy of, 72
- overview, 350

### RAWDATA user exit

- and execution sequence, 245
- and system overview, 11
- overview, 257
- processing locally defined accounting records, 100

real devices, dynamic deletion of, 5

reallocating costs, 100

### RECDTYPE keyword

- example of use, 354
- overview, 295

### record layouts

- Dedicated Device (02), 359
- Guest I/O (0C), 369
- Invalid Logon/ Autolog (04), 363
- MDISK (A4), 373
- Miscellaneous Charges and Credits (A5), 375
- PERIODTE format, 351
- raw data format, 351
- RSCS (A7), 379
- Session (01), 357
- SFS Storage (AF), 392
- SFS Usage (AE), 390
- SQL/DS Storage (AD), 388
- SQL/DS Usage (AA), 383
- Successful Link (05), 364
- TDISK (03), 361
- TSAF (AC), 387
- Unsuccessful Link (06), 366
- VM:Archiver Usage (A9), 381
- VM:Spool Usage (AB), 385
- VM:Tape Mount (A6), 377
- Volumes (A3), 371
- VSCS (07), 367

### Record Selection utility (VMJSEL)

- and VM:Sort during report generation, 399
- overview, 223

record types, 352

### records

- selecting for a query, 77
- selecting for a report or output file, 223

Recost utility (VMJRCS), 213

### recosting accounting data

- example, 28
- VMJRCS utility, 213

RECTYPE record (VMJRCS specification control file), 215

references, xxiii

REFRESH command, overview, 130

registers, 246

rejected accounting records, 349

### REJECTS file

- and system overview, 9, 10
- overview, 349

related documentation, xxiii

remote system usage, charging for, 44

removing copyright screen, 13

renaming, VM:Account service virtual machine, 210, 235

REPORT option, VMJIFR utility, 202

### reports, general

- compiling, 267
- example of running, 65
- input from tape, 106
- list of account and userid assignments, 222
- modifying, 266
- requirements, 264
- selecting records for, 223
- sorting tools, 399

### reports, specific

- Capacity Planning report, 197
- Charge Summary report, 271
- Invalid Autologs/ Logons report, 219
- Invalid File report, 203
- Invoice and Invoice Ledger report, 274
- Minidisk Utilization Summary report, 277
- Miscellaneous Charges/ Credits report, 279
- Monthly VM Utilization report, 281
- Operations Overview report, 283
- Quarterly VM Utilization report, 286

- Resource Utilization report, 290
- RSCS Utilization report, 288
- Utilization Trend Analysis report, 291
- VMJCHRGs, 271
- VMJINVCE, 274
- VMJMDISK, 277
- VMJMISC, 279
- VMJMONTH, 281
- VMJORVW, 283
- VMJQRTR, 286
- VMJRSCS, 288
- VMJRUT, 290
- VMJTREND, 291
- required entries, format conventions, xxii
- requirements
  - COBOL, 4
  - for producing reports, 264
  - userids, 4
  - VM releases, 4
- resource costing files, 311
- resource usage
  - building a model for, 27
  - querying, 126
  - tracking before determining rates, 27
- Resource Utilization report (VMJRUT), 290
- RESOURCES parameter
  - PARMS record (VMJSEL control file), 227
  - QROUTPUT configuration file record, 171
- responses, xxiii
- restricting query privileges, 255
- RESUME command, overview, 131
- Retriever machine, and system overview, 11
- REXX programming language
  - compiled, 247
  - writing user exits in, 246
- RSCS
  - charging for usage, 52
  - specifying userids that run RSCS program product, 176
- RSCS COSTABLE file, layout and overview, 335
- RSCS node processing, 172
- RSCS option, VMJCPR utility, 196
- RSCS parameter, SPECIAL configuration file record, 176
- RSCS record (datatype A7)
  - COSTABLE file, 335

- keywords, 303
- layouts, 379
- RSCS Utilization report, 288
- RSCS Utilization report (VMJRSCS), 288
- RSCSNODE configuration file record
  - charging for RSCS usage, 52
  - overview, 172
- running VM:Account, 5
- RUNTYPE record (VMJRCS specification control file), 216

## S

- SATURDAY parameter, SHIFT configuration file record, 173
- SCAN parameter
  - DASDACCT command, 119
  - DASDACCT configuration file record, 154
- scenarios of common VM:Account tasks, 61
- SCRATCH option, PERIOD command, 122
- SCRATCH parameter
  - OUTFILE record (VMJCMP control file), 194
  - OUTFILE record (VMJSEL control file), 225
- scratch tapes, 122
- screens
  - copyright, 13
  - getting help, 15
  - using, 13
- secondary entry points (package accounting), 31
- security, project-level, 169
- security violations, reporting on, 218
- Security Violations Report utility (VMJRSE), 218
- SELECT record (VMJSEL utility control file), 229
- SELECT statement (full-screen query), 77
- selecting records
  - for a query, 77
  - for a report or output file, 223
- service virtual machine (VM:Account), renaming, 210, 235
- SESSION cost table
  - and applying a surcharge or discount, 59
  - and charging for CMSBATCH usage, 53
- SESSION COSTABLE file, layout and overview, 326



- Session record (datatype 01)
  - COSTABLE file, 326
  - keywords, 298
  - layouts, 357
  - Resource Utilization report, 290
- SET parameter, QUERY command, 126
- SETPROJ record (VMACCT DASDINFO control file), 36
- SFS COSTABLE file, layout and overview, 345
- SFS file pools, charging for ownership, 32
- SFS Storage record (datatype AF)
  - COSTABLE file, 346
  - created by DASDACCT command, 32, 118
  - keywords, 308
  - layouts, 392
- SFS usage, charging for, 38
- SFS Usage record (datatype AE)
  - COSTABLE file, 345
  - keywords, 308
  - layouts, 390
- SFSDASD COSTABLE file, layout and overview, 346
- SHIFT configuration file record
  - charging different rates for different shifts, 58
  - overview, 173
- SHIFT option, QUERY command, 126, 128
- SHIFT parameter
  - DBINDEX configuration file record, 158
  - PARMS record (VMJSEL control file), 227
- SHIFT user exit
  - and execution sequence, 245
  - overview, 259
- shifts
  - and COSTABLE files, 320
  - defining, 58
  - differential rates, 58
  - spanning midnight, 397
- SHUTDOWN option, VMCLOCK utility, 183
- SIOCOUNT configuration file record, overview, 175
- SMSG command, 5
- software package accounting. *See* package accounting
- Software Package Accounting utility (VMJPKG)
  - full-screen version, 207
  - line-mode version, 205
  - overview, 204
- Software Package Accounting Utility screen, 207
- SORT. *See* CMS SORT
- SORT option, VMJSCD utility, 221
- SORT record (VMJSEL utility control file), 230
  - example of usage, 66
- sorting accounting data
  - example, 70
  - improving performance, 268
- special characters
  - defined, xxi
  - pattern matching, 111
- SPECIAL configuration file record
  - and INVFILES data collection file, 349
  - charging for disk volumes, 199
  - charging for mountable disk usage, 43
  - charging for RSCS usage, 52
  - charging for SQL database space, 236
  - charging for SQL/DS DBSPACE usage, 42
  - charging for SQL/DS usage, 40
  - charging for tape volumes, 240
  - charging for TSAF usage, 51
  - overview, 176
- SPOOL COSTABLE file, layout and overview, 340
- spool files, reporting on invalid, 202
- SPOOL parameter, SPECIAL configuration file record, 176
- spool usage, charging for, 45
- SQL database space, charging for, 236
- SQL/DS
  - charging for usage, 39
  - Data System Control (DSC) component, 41
  - initializing, 42
  - service virtual machine, updating, 40
- SQL-DS COSTABLE file, layout and overview, 339
- SQL/DS DBSPACE, charging users for owning, 42
- SQL/DS DBSPACE Accounting utility (VMJSQ), 236
- SQL/DS Installation utility (VMJSQINS), 235
- SQL/DS parameter, SPECIAL configuration file record, 176
- SQL/DS Storage record (datatype AD)
  - COSTABLE file, 344

- created by VMJSQ utility, 237
- keywords, 307
- layouts, 388
- SQL/DS Usage record (datatype AA)
  - COSTABLE file, 339
  - keywords, 305
  - layouts, 383
- SQLSTART EXEC, 42
- SQLSTOR parameter, SPECIAL configuration file record, 176
- STACK option, QUERY command, 127
- STACK parameter, QUERY command, 126
- START parameter, PACKAGE command, 121
- STATE parameter, QUERY command, 126
- SUCCESS parameter, SIOCOUNT configuration file record, 175
- Successful Link record (datatype 05)
  - COSTABLE file, 329
  - keywords, 300
  - layouts, 364
- SUMMARY option
  - QUERY command, 128
  - VMJCPR utility, 197
- SUMMARY parameter, PARMS record (VMJSEL control file), 228
- SUNDAY parameter, SHIFT configuration file record, 173
- SUPPRESS option, VMJRSE utility, 218
- surcharges
  - applying for days of the week or holidays, 59
  - applying for use of a package, 29
  - applying to CMSBATCH, 54
  - applying with PACKAGE command, 121
  - PACKAGES COSTABLE file, 331
- SUSPEND command, 397
  - overview, 132
- syntax, conventions, xxi
- SYSACNT MACRO, 5
- SYSOPER configuration file record, overview, 177
- System Date Verification utility (VMCLOCK), 183
- System Files Update Selection menu, 85
- system overview (figure), 10
- system responses and prompts, xxiii

## T

- tables, modifying, 85
- tape I/O, 122
- TAPE option, PERIOD command, 122
- TAPE parameter
  - INFILE record (VMJSEL control file), 224
  - OUTFILE record (VMJCMP control file), 194
  - OUTFILE record (VMJSEL control file), 225
  - VMJCMP utility, 185
- Tape Storage Accounting utility (VMJTVA), 240
- tapes
  - and reports, 106
  - charging for storing volumes, 46, 240
  - using, 102
- TAPEVOLS parameter, SPECIAL configuration file record, 176
- TAPMOUNT COSTABLE file, layout and overview, 333
- TDISK COSTABLE file, layout and overview, 328
- TDISK record (datatype 03)
  - COSTABLE file, 328
  - keywords, 299
  - layouts, 361
- TERM option
  - QUERY command, 127
  - VMJRSE utility, 219
- TEXT parameter, USEREXIT configuration file record, 179
- THURSDAY parameter, SHIFT configuration file record, 173
- TIME option, VMCLOCK utility, 183
- time, verifying, 183
- TIMEZONE command, 183
- TITLE record (VMJSEL utility control file)
  - example of usage, 66
  - overview, 232
- TO option
  - VMJDVA utility, 200
  - VMJSQ utility, 236
  - VMJTVA utility, 241
- TO record (VMJRCS specification control file), 215
- TOTALS parameter, PARMS record (VMJSEL control file), 228



- trend file
  - and system overview, 10
  - example of use, 62
  - identifying with TRNDFILE configuration file record, 178
  - writing to, 194
- trends
  - analyzing, 75
  - definition of, 7
- TRNDFILE configuration file record
  - example of use, 75
  - overview, 178
- TRNDFILE record (VMJCMP utility control file)
  - example of usage, 63
  - example of use, 75
  - overview, 194
- troubleshooting, 397
- TSAF
  - accounting, 51
  - service virtual machine, identifying, 176
- TSAF COSTABLE file, layout and overview, 343
- TSAF parameter, SPECIAL configuration file record, 176
- TSAF record (datatype AC)
  - COSTABLE file, 343
  - created by TSAF service virtual machine, 51
  - keywords, 306
  - layouts, 387
- TUESDAY parameter, SHIFT configuration file record, 173
- twin minidisk. *See* COLLECT-TWIN minidisk
- TXTLIB option, VMJPKG utility, 206

## U

- UNITCOST option
  - CHARGE command, 115
  - CREDIT command, 115
- Unsuccessful Link record (datatype 06), layouts, 366
- UPDATE command
  - charging different rates for different customers, 58
  - charging different rates for different shifts, 58
  - charging different rates for different weekdays and holidays, 59
  - creating and maintaining COSTABLE files, 20

- full-screen version, 85
- line-mode version, 133
- maintaining COSTABLE files, 28
- overview, 133
- setting up account number accounting, 22
- setting up project accounting, 25, 26
- Update screen, fields, description of, 90
- upper case and entering commands, xxii
- usage model, building, 27
- USAGE parameter, QUERY command, 126
- user entries, xxiii
- user exits, general
  - and flow of data through system, 11
  - callable service routines, 260
  - execution sequence, 245
  - implementing, 244
  - overview, 243
  - processing locally defined accounting records, 100
  - USEREXIT configuration file record, 179
  - using OS linkage to communicate with VM:Account, 246
- user exits, specific
  - ACCTDATA, 245, 248
  - BUDGET, 245, 249
  - COMMAND, 245, 251
  - COSTING, 245, 253
  - ENDCMD, 245, 254
  - QUERY, 245, 255
  - RAWDATA, 245, 257
  - SHIFT, 245, 259
  - VMJCMPX2, 190, 244
  - VMTEXIT4 (VM:Tape), 333
- USER parameter, QUERY command, 126
- USER record (VMJRCS specification control file), 215
- USEREXIT configuration file record
  - implementing user exits with, 244
  - overview, 179
- USERID option, QUERY command, 128
- USERID parameter, DBINDEX configuration file record, 158
- userid
  - authorize to run specific VM:Account commands, 145
  - report listing account and userid assignments, 222
  - specify for DASDACCT worker machine, 180

- specifying which get system messages, 177
- utilities
  - VMCLOCK, 183
  - VMJCMP, 185
  - VMJCPR, 196
  - VMJCVTBL, 118, 198
  - VMJDVA, 199
  - VMJIFR, 202
  - VMJPKG, 204
  - VMJPKINS, 210
  - VMJRAW, 211
  - VMJRCS, 213
  - VMJRSE, 218
  - VMJSCD, 221
  - VMJSEL, 223
  - VMJSQINS, 235
  - VMJSQL, 236
  - VMJTVA, 240
  - VMTTVI, 102
- Utilization Trend Analysis report (VMJTREND), 291

## V

- VALIDATE parameter, DASDACCT command, 119
- VECTOR parameter, PARMS record (VMJSEL control file), 228
- VERIFY command, overview, 140
- VERIFY parameter, PROJECT configuration file record, 169
- virtual guest system I/O accounting. *See* Guest I/O
- VLINKBL option, VMJRSE utility, 219
- VLINKBO option, VMJRSE utility, 219
- VM object directory, 162
- VM product publications, xxiii
- VM:Account
  - backup processing, 72
  - how it works, 3
  - installed concurrently with another accounting system, 400
  - interface with VM:Archiver, advantages of, 44
  - interface with VM:Batch, advantages of, 44
  - interface with VM:Migrate, advantages of, 45
  - interface with VM:Spool, advantages of, 45
  - interface with VM:Tape, advantages of, 45, 102
  - introduction to, 3

- options, 141
- record layouts, 351
- reports, 263
- requirements, 4
- RSCS node support, 172
- service virtual machine (renaming), 210, 235
- service virtual machine (restarting), 131
- service virtual machine (suspending), 132
- system overview (figure), 10
- VM:Account files
  - CUSTOMER ACCTLIST, 22
  - CUSTOMER MASTER, 22
  - DISK VOLUMES, 44
  - HOLIDAYS MASTER, 60
  - PACKAGES MASTER, 29
  - PACKAGES SURCHARGES, 30, 44
  - RAWDATA \$\$ymmdd, 72
  - VOLUMES, 43
- VM:Archiver
  - and VM:Account PRODUCT record, 167
  - interface with VM:Account, advantages of, 44
  - VM:Archiver Usage (A9) record layouts, 381
  - VM:Archiver Usage record keywords, 304
- VM:Archiver Usage record (datatype A9)
  - COSTABLE file, 338
  - keywords, 304
  - layouts, 381
- VM:Backup, and VM:Account PRODUCT record, 167
- VM:Batch
  - and VM:Account PRODUCT record, 167
  - interface with VM:Account, advantages of, 44
  - job number in link-back code, 356
- VM:Director, and VM:Account PRODUCT record, 167
- VM:Migrate, interface with VM:Account, advantages of, 45
- VM:Secure, and VM:Account PRODUCT record, 168
- VM:Sort
  - and VMJCMP utility, 185
  - example of setting up package accounting for, 67
  - used with reports rather than CMS SORT, 399
- VM:Spool
  - and VM:Account PRODUCT record, 168
  - interface with VM:Account, advantages of, 45
  - VM:Spool Usage (AB) record layouts, 385
  - VM:Spool Usage record keywords, 306

- worker machine userid, specifying, 176
- VM:Spool Usage record (datatype AB)
  - COSTABLE file, 340
  - keywords, 306
  - layouts, 385
- VM:Tape
  - and VM:Account PRODUCT record, 168
  - interface with VM:Account, advantages of, 45, 102
  - tape mount accounting, 45
  - tape volume accounting, 46
  - VM:Tape Mount (A6) record layouts, 377
  - VM:Tape Mount record keywords, 303
  - VMTEXT4 user exit, 333
- VM:Tape Mount record (datatype A6)
  - COSTABLE file, 333
  - created by VMTEXT4 user exit, 333
  - keywords, 303
  - layouts, 377
- VM:Webgateway, and VM:Account PRODUCT record, 168
- VM:WebGateway record (datatype AG),
  - keywords, 309
- VM/ESA, VMJRET EXEC, 5
- VM/ESA (ESA feature), PRODUCT VMJRTRVR record, 7
- VMACCT CONFIG file
  - PRODUCT VMBACKUP record, 400
  - PRODUCT VMJRTRVR record, 7
  - summary of, 141
- VMACCT COPYRGHT file, 13
- VMACCT DASDINFO control file, 34
- VMACCT MESSAGES file, overview, 350
- VMACCT MODULE, 210
- VMACCT option
  - VMJDVA utility, 199
  - VMJSQJ utility, 236
  - VMJTVJ utility, 240
- VMBATCH COSTABLE file, layout and overview, 341
- VMCLOCK utility, overview, 183
- VMDUMP parameter, DUMP configuration file record, 163
- VMJARECS COPY file, 348
- VMJCHRGs (Charge Summary report), 271
- VMJCMP utility
  - and TRNDFILE configuration file record, 178
  - and Utilization Trend Analysis report, 291
  - control file, 193
  - example of usage, 64
  - output to tape, 105
  - overview, 185
  - VMJCMPX2 user exit, 190
- VMJCMPX2 user exit, overview, 190
- VMJCOPY MACLIB macro library, 267
- VMJCPR utility
  - and building a resource usage model, 27
  - and RAWDATA data collection files, 350
  - example of usage, 72
  - overview, 196
- VMJCVTBL utility
  - discussion of use, 118
  - overview, 198
- VMJDASD (VM:Account worker machine)
  - See also* DASDACCT worker machine
  - and charging for DASD ownership, 32
  - creation, 180
- VMJDSA module, 32
- VMJDVA utility
  - and charging for mountable disk usage, 43
  - control file, 200
  - overview, 199
  - specifying userids that run this utility, 176
- VMJIFR utility
  - and INVFILES data collection file, 349
  - overview, 202
  - processing records put in INVFILES file, 144
- VMJINVCE (Invoice and Invoice Ledger report), 274
- VMJMDISK (Minidisk Utilization Summary report), 277
- VMJMDISK allocation table, 198
- VMJMISC (Miscellaneous Charges/Credits report), 279
- VMJMONTH (Monthly VM Utilization report), 281
- VMJORVW (Operations Overview report)
  - and building a resource usage model, 28
  - overview, 283
- VMJPKENT EXEC
  - non-reentrant code, 204
  - overview, 31, 209

VMJPKG Installation utility (VMJPKINS), 210

VMJPKG utility

- full-screen version (example of use), 68
- full-screen version (overview), 207
- line-mode version, 205
- non-reentrant code, 204
- overview, 204
- tracking a package's use, 30

VMJPKINS utility, overview, 210

VMJPKTXT EXEC

- non-reentrant code, 204
- overview, 31, 208

VMJQRR EXEC, 127

VMJQRTR (Quarterly VM Utilization report)

- building a control file, 66
- overview, 286

VMJQUERY OUTPUT file, 127

VMJQUT1 CONTROL file, 79

VMJRAW utility

- and other accounting systems, 400
- and RAWDATA data collection files, 350
- example of usage, 71
- overview, 211

VMJRCS utility

- control file, 214
- example of usage, 29, 101
- overview, 213
- user exits it calls, 245

VMJRET EXEC, 5

VMJRSCS (RSCS Utilization report), 288

VMJRSE utility

- and RAWDATA data collection files, 350
- overview, 218

VMJRTRVR, and VM:Account PRODUCT record, 168

VMJRUT (Resource Utilization report), 290

VMJSCD utility

- overview, 221
- setting up account number accounting, 22
- setting up project accounting, 26

VMJSEL utility

- and VM:Sort during report generation, 399
- control file, 223
- input from tape, 105
- overview, 223

VMJSQINS utility

- and charging for SQL/DS usage, 40
- overview, 235

VMJSQI utility

- control file, 237
- overview, 236

VMJSRTCK EXEC utility, 399

VMJTREND (Utilization Trend Analysis report), 291

VMJTVA utility

- and charging for tape storage, 46
- overview, 240
- specifying userids that execute this utility, 176

VMSISERV parameter, PRODUCT configuration file record, 168

VMTAPEID option, VMJTVA utility, 241

VMTEXT4 user exit

- and charging for tape mounts, 46
- charging for records it creates, 333

VMTTVI utility, 102

VOLUMES cost table, 43

VOLUMES COSTABLE file, layout and overview, 334

Volumes record (datatype A3)

- COSTABLE file, 334
- created by VMJDVA utility, 199
- created by VMJTVA utility, 240
- keywords, 301
- layouts, 371

VSCS COSTABLE file, layout and overview, 336

VSCS record (datatype 07)

- COSTABLE file, 336
- keywords, 300
- layouts, 367

## W

WARN parameter, DBSPACE configuration file record, 160

WEB COSTABLE file, layout and overview, 342

WEDNESDAY parameter, SHIFT configuration file record, 173

WEEKDAY parameter, SHIFT configuration file record, 173

weekdays, setting daily rates, 59

WEEKEND parameter, SHIFT configuration file  
record, 173

WNG parameter, MESSAGE configuration file  
record, 166

WORKER configuration file record  
and charging for DASD ownership, 34  
overview, 180

worker machine  
and charging for DASD ownership, 32  
and system overview, 10  
DASDACCT and its userid, 180  
specifying with WORKER configuration file  
record, 180

worksheet listing account and userid  
assignments, 221

## Y

YEAR parameter, PARMS record (VMJSEL  
control file), 227

YES parameter, BUDGET configuration file  
record, 147

yymmdd REJECTS file, 149

