MAX MVS/UTIL

MAX Data/Util V3.4.0

User Reference Manual

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Release 3.4.0 (November 2005)

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REVISIONS

Release 3.4.0: November 2005

- **CLEARFILE** command.
- Turn off logging for performance during **DELETE**s.

Release 3.3.0: March 2004

- Code page support for output of data transformation.
- Performance enhancements for data transformation.

Release 3.2.1: August 2003

- Support for **SORT** of the output of the **COPY** command.
- Support for record **DELETE** during update.

Release 3.2.0: March 2003

- Online interface to data transformation, supporting XML, comma separated data, tab delimited data or a user-defined format.
- Support in **COPY** option to write transformed data to UNIX files.
- Option to change the order of field presentation within a copybook when viewing data with Mapping Criteria.
- Copybook support for building **COMPARE** selection criteria.
- Choose type of **COMPARE** synchronization by key, one-to-one or read-ahead.
- Browse and edit members of a PDS in formatted mode.
- Access copybooks in a non-PDS when **EXIT** is in use.

Release 3.1.0: June 2002

- Extensive support for HIPAA.
- **COPY** & **UPDATE** expanded to support **EDIT**, **CHANGE**, **TRANSLATE**, **SCRAMBLE**, **UNSCRAMBLE**, **CALCDATE**, and **CALCAMT**.
- Copybook support for Building Copy and Update Selection Criteria.
- Support for VSAM LRECL of 99999.

Release 2.5.0: July 2001

- Improve performance in horizontal mode.
- Improve performance when using mapping criteria.
- Extract COPYBOOK for larger piece of code.
- Increase selection criteria from 16 to 32.
- Support for **FIND FIRST**, **NEXT**, **LAST** and **PREV**.
- Internal support for compressed sequential files.
- Warning if record longer than copybook.
- Allow Before line command for block moves and copies.
- Improved performance in **COUNT** command when using selection criteria.
- Allow allocation of output file during **COPY** option.
- Improved messages for copybook processing errors.
- Allow for **OCCURS** to 9999 in COBOL.
- Selection criteria interchangeable between **COPY**, **UPDATE** and **EDIT** and **BROWSE**.
- Allow **FIND** command while process block **MOVE** or **DELETE**.
- Implementation of **FIND** text command.
- Allow for symbolic operators in record selection criteria.
- Replication of a record multiple times using Repeat line command.
- Specification of a pad character when expanding a file during **COPY** option.

Release 2.4.0: September 2000

- Record exit processing expanded to **UPDATE**, **COPY** and **COMPARE** options.
- Member selection list optionally presented when retrieving selection criteria for **COPY**, **UPDATE** and **COMPARE** options.
- Support for multiple 01 levels within a single copybook.
- Support for COBOL '**COPY**' statement within copybook processing.
- More consistent record positioning when switching between presentation formats on **EDIT** and **BROWSE**.
- Pass input PDS to MSL for processing. Allow for PDS member to be input to the **COPY** option.
- Retain display format option across **EDIT** and **BROWSE** sessions.

Release 1.5.4: August 1999

- Copybook expansion for print or display purposes expands an `OCCURS DEPENDING ON` to the maximum number of occurrences.*
- **LOCATE FIELD** command enhanced to search for a character string through an entire field name. Example: **LF NAME** will find the next fieldname with the value `NAME` anywhere in the field name.*
- Duplicate field names found within a copybook are displayed between slashes. They are no longer converted to FILLER names. Example: `/DUP-FIELD-NAME/`.
- Copybook print and display are enhanced to show field position, accumulate lengths of group level fields, and indicate GROUP fields as such.
- When specific Copybook member names are not known, a generic pattern request may be entered. A list of all members that match the pattern request criteria is then displayed. The copybook member can then be chosen from this list.
- The print destination for records or copybooks is no longer limited to an ISPF print file. A panel allows you to choose between the ISPF list data set or to direct it to the JES spool. The class, form, destination, and FCB parameters may be specified.
- All VSAM files are verified prior to **OPEN**. This eliminates a possible positioning problem that could occur if another job did not close the file properly.
- The following convention is followed when displaying numeric data in a copybook. If the data contains a plus (`'C'`) sign, the value is formatted with a plus (+) sign preceding the data. If the data contains a minus (`'D'`) sign, the value is formatted with a minus (-) sign preceding the data. Data with the sign of `'F'` will be formatted with no leading sign indicator.
- A **FIND NEP** (Find Not Equal Pack) command is available in both **EDIT** and **BROWSE** modes. The command will position to the next record in the file that does not contain packed data at the specified position.

Note: FILLER names will be presented with a dash as opposed to an underscore.

Release 1.5.3.A: May 1999

- Incorporated general information changes.

Release 1.5.3: November 1998

- COBOL field names display with dashes.
- Find packed data command added to edit and browse.
- Count command added to edit and browse providing both a total record count, and a count of records matching selection criteria, if selection criteria option is in effect.
- Online file compare with a batch **SUBMIT** option.

Release 1.5.2: July 1998

- Preview output prior to copy data set.
- Create batch job using MAX/Batch for both **COPY** and **UPDATE** that can be submitted to run in batch.

Release 1.5.1: April 1998

- Horizontal format display for edit and browse.
- **MOVE** and **COPY** line commands.
- Block **MOVE**, **COPY** and **DELETE** line commands.
- Field selection using Mapping Criteria.

Release 1.3.8: January 1997

- Select by field name in formatted browse or edit.
- Update data file directly using Boolean logic.

Release 1.3.0: May 1996

- Prepare **Reformatting criteria** option added. Reformat uses Copybooks and field names to identify input and output record layout to be used to reformat a file.
- **SAVE**/**COPY** "Select/Change criteria" to/from an external data set.
- Reformatting criteria may be used during the copy function.
- Performance enhancements that significantly improve the performance of the Browse, Edit, and Copy functions.
- A locate field command was added to the formatted browse and edit functions.

Release 1.2.0: March 1995

- PL/I copybook support is provided.
- Select with change criteria during copy.
- Column range capability added to selection criteria for browse and edit functions.
- Performance enhancements that significantly improve the performance of the **BROWSE**, **EDIT**, and **COPY** functions.
- Print capability added to **BROWSE** and **EDIT** functions.
- **CUT** (copy records) command added to **BROWSE** and **EDIT** functions.
- **PASTE** (insert **CUT** records) command added to **EDIT** function.

Release 1.1.0: March 1994

- Initial release.

PREFACE

This book provides a guide and reference about the various functions of MAX Data/Util for MVS. Use this book to learn and use the MAX Data/Util product.

It describes:

- An introduction to the product.
- Guideline information on data functions.
- Command syntax and descriptions.
- Command operand syntax along with a description of the Operands.
- Numerous examples.
- Return code information.

Who Should Read This Book

This book is for programmers, data base administrators, system programmers, or other technical persons who perform file manipulation on ISPF, SAM or VSAM data sets.

File manipulation includes record selection, modification and printing. Users are expected to have knowledge of COBOL and/or PL/I.

Notational Conventions

The following notational conventions are used in this manual:

- Uppercase commands and their operand(s) should be entered as shown but need not be in uppercase.
- Operand(s) shown in lower case are variables and a value should be substituted for them.
- Operand(s) shown in brackets [ ] are optional, with choices indicated by a vertical bar |. One or none may be chosen; the defaults are underscored.
- Operand(s) shown in braces { } are alternatives; one must be chosen.
- An ellipsis (...) indicates that the parameter shown may be repeated to specify additional items of the same category.

How This Book is Organized

This book contains the following chapters:

Chapter 1: Introduction to MAX Data/Util
describes the need and overall benefits and uses for MAX Data/Util.

Chapter 2: How to Use MAX Data/Util
gives an overview of how the product functions.

Appendix A: Copybook Support
lists support details for COBOL and PL/I copybooks.

Appendix B: Changing Installation Defaults
describes how to change the defaults that exist in MAX Data/Util.

Appendix C: Security Considerations
describes the security considerations that exist in MAX Data/Util.

CHAPTER 1: INTRODUCTION TO MAX DATA/UTIL

DATA Functions

One of the shortcomings in ISPF is the inability to process VSAM files and large Sequential files. These file types, called data files (as opposed to text files), have to be processed outside ISPF (typically with a batch utility), and require knowledge of special tools to process them.

Programmers often need to view and/or change records in a data file in order to prepare for a test. To perform this process outside ISPF can be a burdensome process for a programmer.

MAX Data/Util provides support for the following types of data files:

- SAM data sets with maximum LRECL of 32760;
- VSAM data sets with a maximum LRECL of 99999;
- VSAM data sets of the types KSDS, ESDS, RRDS, and VRRDS.

Spanned files are supported in block mode only, updates are limited to changes in existing records. Alteration to the record length of spanned files is not allowed. The 32760 size limitation applies to `BLKSIZE` for spanned files.

Support is provided for members of a PDS. The member can be browsed and edited. However, in **EDIT** mode, no inserts or deletes of records are allowed, updates are limited to changes of existing records only. This allows for changes to members using copybooks to define the record.

MAX Data/Util provides data file browse and edit facilities so that these types of files can be browsed and edited with the same ease that programmers browse and edit text type files within ISPF now. The MAX Data/Util data file Browse and Edit facilities have the same look and feel as the ISPF text browse and edit facilities.

Data files differ considerably from text files in that:

- Data files can contain large numbers of records while text files usually don't exceed more than a few thousand.
- Data files often contain very wide records while text files usually contain 80-byte records.
- Data files usually contain binary and packed data while text files usually contain only alphanumeric, and a few special characters.
- Data files can contain multiple record types, have complex record layouts, and can even contain embedded tables.
- Data files often require that a rigid sequence be maintained.

Despite these differences, programmers still want to process data files with the same ease as they process their text files now. The MAX Data/Util data browse and edit facilities were specially designed to accommodate these differences. MAX Data/Util has four options for browsing and editing data files:

- a traditional looking Unformatted Editor;
- a Formatted Editor that uses a Copybook to map the data next to its corresponding Copybook field name;
- a Formatted Editor using Copybook support with the fields presented in a Horizontal mode, with data from multiple records displayed below the corresponding field names;
- a dump Editor that displays one record at a time in hexadecimal/character mode.

The MAX Data/Util data file browse and edit facilities include the following features that programmers are already familiar with having used the ISPF text browse and edit facilities.

- PF (program function) key scrolling.
- **FIND** and **CHANGE** commands.
- Hex mode displays.
- Line commands for deleting, inserting, repeating, moving and copying.

These functions were added to accommodate the special needs of data files.

- Process files with large LRECLs; 32760 for SAM, 99999 for VSAM.
- Invoke browse and edit interchangeably from any place in a file.
- Position directly to a specific record within a file.
- Limit, through a special command, only the data desired to be viewed.

Data files often contain quite complex record structures including embedded tables. MAX Data/Util has the ability to display records using a Copybook layout to map the data to fields. All that is needed is to specify the name of the Copybook and library in which it is contained.

Copybook support is available for both COBOL and PL/I copybooks. Refer to "*Appendix A: Copybook Support*" on page 113 for details.

The Dump and Formatted browse and edit facilities offer all the same commands and capabilities as the Unformatted and Horizontal Panel facilities except that one record is presented at a time. Records are scrolled forward and backward with the `LEFT` and `RIGHT` scroll keys.

Formatted and Horizontal Option features include:

- Data is edited with related picture clauses.
- Data that does not conform to its format is displayed in a hex format.
- A data field that does not fit on one row is wrapped to the next row (Formatted).
- The **COBOL OCCURS** statement as well as the **OCCURS DEPENDING ON** statement are supported (see "*Appendix A: Copybook Support*" on page 113).
- Multiple record type files are supported with the capability of matching specific record types to associated copybooks.
- Selective Field Display is supported by using Mapping Criteria. This limits the data to be viewed to that of the selected fields only.
- Reorder the fields being displayed using Mapping Criteria. This allows for moving high priority fields to the top of the display.

IDCAMS Functions

MAX Data/Util users can accomplish most important IDCAMS tasks online. Users no longer have to type complicated and confusing control parameters. Instead, IDCAMS options are presented to the user based on the functions requested. The user "fills in the blanks" and the selections are processed. IDCAMS functions are performed faster, with greater accuracy and virtually no chance for errors.

Eliminates the need to reference cumbersome and complex IDCAMS manuals to process IDCAMS commands. MAX Data/Util contains a comprehensive system of online prompts and context-sensitive help panels that make IDCAMS exceptionally easy to use and understand.

Supports the following IDCAMS functions: **DELETE**, **DEFINE**, **ALTER**, **REPRO**, **BLDINDEX**, **VERIFY**, **List** entries, and detailed **Information** display of a single entry.

The IDCAMS feature of MAX Data/Util supports the following entry types: Clusters (KSDS, ESDS, RRDS, VRRDS, Linear), Generation Data Groups (GDG), ALIAS, Alternate-index (AIX), Path and User-catalogs (UCAT). See "*IDCAMS*" on page 52.

COPY Function

MAX Data/Util users can copy one data file to another. Full Boolean selection criteria may be used to select just the specific records needed. Other record selection options such as begin and ending record keys, count, and frequency may be used to optimize or randomize the copied data.

MAX Data/Util users can **SORT** the output of the **COPY** function. Once records have been selected and/or changed by the selection options and change criteria, the resulting data can be sorted.

MAX Data/Util provides for data being transformed to XML, comma separated, tab delimited or a user-defined format to be copied to a UNIX file as its output destination.

The record data may be reformatted from one record layout into another record layout during this copy. This requires the reformatting criteria to be previously prepared with option 7. Build Reformat Criteria. This allows fields to be easily added, removed, or re-sized during the copy function. Submission to batch for background processing is an option. See the section titled "*5. Copy/Extract Data Set*" on page 85.

UPDATE Function

MAX Data/Util users can update a data file directly. Full Boolean selection criteria may be used to select just the specific records to be updated. There is the ability to preview the changed records prior to actual update. Submission to batch for background processing is an option. See the section titled "*4. Update Data Set*" on page 62.

Records can be selected for deletion using the **UPDATE** function. By specifying the **DELETE** command, records chosen for processing will be deleted from the file.

COMPARE Function

MAX Data/Util users can compare two data files online. Record selection and compare criteria can be used to restrict the compare to specific records or fields. Submission to batch for background processing is an option. See the section titled "*8. COMPARE Files/Reports*" on page 99.

CHAPTER 2: HOW TO USE MAX DATA/UTIL

MAX Data/Util operates like ISPF, using the same PF keys, online tutorial access, split panel capabilities, and panel moving procedures. The conventions used in MAX Data/Util are similar to ISPF conventions. In addition, MAX Data/Util is supported by extensive online tutorial panels that may be accessed at any time by pressing the HELP PF (program function) key.

The main point of entry to MAX Data/Util is the Data Set Name panel. The following is a sample of the Data Set Name panel.

```
MAX DATA/UTIL ------------- SPECIFY A DATASET NAME -------- MAX DATA/UTIL V320
 COMMAND ===>

 Select one of the following. Then press Enter.
 ___  0. Profile parameters            4. Update/search/count data set
      1. Browse data set (default)     5. Copy/extract data set
      2. Edit data set                 6. build Mapping criteria
      3. Data set utilities            7. build Reformat criteria
                                       8. compAre files/reports

 Sequential data set, or VSAM cluster:
    DATA SET NAME ===> 'MXS.TEST.FILE'
    VOLUME SERIAL ===>             (If not cataloged)
    RCD EXIT NAME ===>             (If special record handling required)

 INITIAL DISPLAY  ===> FORMATTED   (Dump, Formatted, Unformatted, Horizontal)
 RECORD SELECTION ===> NO          (No, Yes)

 Specify copybook, or mapping criteria library and member (formatted mode)
    DATA SET NAME ===> 'MXS.TEST.COPYLIB(CBINDEX)'
    COPYBOOK TYPE ===> COBOL       (Cobol, P11)

        (c) Copyright MAX SOFTWARE LLC. 1993 - 2003. All rights reserved.
```

Figure 1: Specify A Data Set Name panel

Primary Commands

Enter primary commands at the `COMMAND ===>` prompt located in the upper left corner of a panel. Primary command abbreviations will be indicated within parentheses in this manual.

Utilize the following guidelines when entering primary commands:

- Enter a blank to separate operands, **do not use the CURSOR keys**.
- Insert or expand operands using the system insert mode.
- Enter multiple commands in the `COMMAND` field by entering the character defined as the command delimiter in your ISPF settings between each command. This process is known as "command stacking".

Entering Strings

Various commands require a string of data to be supplied. In most cases, the string may either be a character string, quoted string or hexadecimal string. For example, `FIND "test"` is a command that searches for the character string "`test`".

The conventions to enter quoted strings and HEX strings are explained below.

Quoted Strings

A quoted string begins and ends with single quotes (') or double quotes (") . The use of quotes is not always required but is always valid.

Quotes are required when a string:

1. contains a command, space, comma, single quote, or double quote;
2. is all numeric;
3. is to remain case sensitive.

Normal ISPF syntax rules for quoted strings must be followed:

1. strings that contain single quotes must begin and end with double quotes;
2. strings that contain double quotes must begin and end with single quotes;
3. strings that do not contain any quotes may start and end with either single or double quotes.

HEX Strings

HEX strings are quoted strings of hexadecimal digits preceded by or ending with an "X" as illustrated in the example below. Rules for HEX strings are:

1. Valid hexadecimal digits allowed are (0-9, A-F).
2. There must be an even number of digits.

FIND	`"it's back"`	Will search for "`it's back`"
FIND	`"it's back'`	Invalid - missing ending double quote
FIND	`'it's back'`	Invalid - must begin and end with double quotes
FIND	`X'F0F0'`	Will search for the hexadecimal string `F0F0`
FIND	`'F0F0'X`	Will search for the hexadecimal string `F0F0`
FIND	`X'F0F'`	Invalid - uneven number of hexadecimal digits
FIND	`'FG10'X`	Invalid - not valid hexadecimal digits
FIND	`'F0F1F2F3F4F5F6F7F8'X`	Invalid - hexadecimal string too long (8 is the maximum)

Line Commands

Enter executable line commands in the command area to the left of the line. Single-character line commands operate on individual lines. Double-character line commands are considered block commands, and are processed in pairs.

The following pages are detailed descriptions of each option as displayed in *Figure 1: Specify A Data Set Name panel* on page 5.

```
0. Profile parameters              4. Update/search/count data set
1. Browse data set (default)       5. Copy/extract data set
2. Edit data set                   6. build Mapping criteria
3. Data set utilities              7. build Reformat criteria
                                   8. compAre files/reports
```

0. Profile Parameters

```
MAX ---------------------- DATA/UTIL PROFILE OPTIONS --------------------- MAX
 COMMAND ===>

 Edit log data set work unit name  . . . . . . . . SYSALLDA   (Exam: SYSALLDA)
   Primary number cylinders. . . . . . . . . . . . 1          (0 = No logging)
   Secondary number cylinders. . . . . . . . . . . 1

 Search limit (prevent run away searches). . . . . 500        (0 = No limit)

 "COPYBOOK" special processing TSO procedure name.            (Exam: MAXEXIT1)

 Subsystem for processing copybooks. . . . . . . .

 Special record handling to be used. . . . . . . . NO         (Yes, No)

 Specify character set to be used. . . . . . . . . DEFAULT    (DEFAULT, CP870,
                                                               CP838)
 Specify internal work space size (in meg) . . . . 10         (default = 10 meg)
```

Figure 2: Data/Util Profile Options panel

Field Definitions for selected functions:

Edit log data set work unit name: Enter a work unit for the data set on which you wish to log additions, changes and deletions.

Primary number cylinders: Enter the amount of prime DASD (in cylinders) you wish to allocate to the log data set. A value of 0 (zero) will disable edit logging.

Secondary number cylinders: Enter the amount of secondary DASD (in cylinders) you wish to allocate to the log data set.

Search limit: Enter the number of records to which you wish to limit searches. The number may be 0 - 99999999. A value of 0 (zero) will disable any search limits.

"COPYBOOK" special processing TSO procedure name: Enter the name of the routine assigned to pre-process copybooks prior to MAX accessing them. This can be used if copybooks reside in a non-standard database. This exit is activated by use of the ISPF SELECT CMD service. See the sample MAXEXIT1 distributed in the installation.EXECS data set. (See also the subsystem option below.)

Subsystem for processing copybooks: If copybooks are stored in a non-standard database maintained by a library support system (such as Librarian), the product may supply a subsystem that allows such files to be accessed with the standard PDS access method. If this situation exists, provide the subsystem name in this field. All copybook access will be done using this subsystem.

Special record handling exit: Indicates special record handling may be performed. This requires creating a record handling exit program. This record handling exit program could allow the processing of compressed, encrypted, segmented non VSAM/SAM files, or any other record that would otherwise not be supported. Record exit programs must be written in Assembler language. See the sample program, RXPXIT1, in the installation.JCL library.

Note: By specifying YES in the profile panel, a record exit is not required. However, by specifying YES it enables the user to type an exit name on the primary panel when a file is being processed by **EDIT**/**BROWSE**, as input to a **COPY** or **UPDATE**, or as primary input to a **COMPARE**. In addition, the **COPY** and **COMPARE** panels will allow entry of a record exit name for processing the output of the **COPY** or the secondary input to the **COMPARE**.

Specify character set to be used: Indicates character set to be used to translate data for presentation during **EDIT** and **BROWSE**. Options are default (US English), CP870 (Czech character set), or CP838 (Thai character set).

Specify internal work space size (in meg): Use this option to allocate sufficient internal work space to be used for storage of information necessary to provide for the cancellation of any changes. This value is specified in megabytes and must be in the range of 1 to 999.

Edit Logging Feature

After logging is activated in the **PROFILE** (see Primary number cylinders on page 8), any changes made during the edit session will be logged. Upon ending the edit session and committing the updates, a panel will be presented prompting for the disposition of the edit logging data set.

```
MAX ---------------------- LOG DATA SET DISPOSITION  -------------- Data saved
 Command ===>

 Select one of the following.

  __ P.  Print data set without deleting.
     PD. Print data set and delete
     D.  Delete data set without printing
     K.  Keep data set (allocate same data set in next session)
     KN. Keep data set and allocate new data set in next session)

 Specify print options:
 Log data set . . . .  MX11002.MAX.DATAUTIL.LOG001
 SYSOUT class . . . .: A
 Local printer ID . .: _____

 Press ENTER key to process option.
 Enter END to return.
```

Figure 3: Log Data Set Disposition panel

Field Definitions for selected function:

Specify print options:

Log data set (name): is the internally generated data set name that contains the before and after image of the records changed, inserted, or deleted in the edit session. The data set name is constructed using the TSO PREFIX as the high level qualifier. If a PREFIX has not been set, the userid is used for the high level qualifier.

SYSOUT Class: is the SYSOUT class to be used for the printed log when option **P** (print) and **PD** (print and delete) is specified.

Local printer ID: is the SYSOUT destination to be used for the printed log when option **P** (print) and **PD** (print and delete) is specified.

1. Browse Data Set (VSAM/SAM)

The VSAM/SAM Browse Facility allows you to view records on a VSAM/SAM file in four different formats:

1. Dump Display (**DD**)
2. Unformatted Display (**DU**)
3. Formatted Display (**DF**)
4. Horizontal Display (**DH**)

The Browse Facility is controlled by primary commands that are used to:

- Find and display records with specified character strings.
- Select a subset of records to display.
- Locate a specific record by key.
- Locate a field within a record layout.
- Scroll through records.
- Display column numbers.
- Display data in hexadecimal format.
- Toggle between browse and edit.
- Toggle between display options.
- Print records.
- **CUT** (copy) records to a temporary area for a subsequent **PASTE** (insert) in an **EDIT** session.
- **COUNT** all records in the data set.
- **COUNT** all records that meet the selection criteria.

Browse, Dump Display

```
MAX DUMP BROWSE 'MXS.TEST.SAM'                                    Row 1 of 9
 COMMAND ===>                                                  SCROLL ===> PAGE
 Display:  DF - Formatted  DU - Unformatted  DH - Horizontal  ED - EDit file
 Read:     N  - Next       P  - Previous                     L - Locate by RRN
 LRECL=178    KEYLEN=0       KEYPOS=0      DSORG=S     SELECT=NO    LINE 0000013
 POS   *------4 *------8 *-----12 *-----16 *-----20 * ----+----1----+----2 *
 00001 F4F9F5F9 F0F2F2F2 F540E5C1 40C48597 A3409686 * 495902225 VA Dept of *
 00021 40C99586 9640E385 83889596 939687A8 40404040 *  Info Technology     *
 00041 40404040 40F8F9F4 40E58999 87899589 8140E396 *      894 Virginia To *
 00061 A6859940 C2A48993 84899587 40404040 40404040 * wer Building         *
 00081 D985A2A3 96954040 40404040 40404040 40404040 * Reston               *
 00101 E5C1F0F2 F0F2F04D F8F0F45D 40F7F6F6 60F5F8F3 * VA02020(804) 766-583 *
 00121 F0D4A24B E3889694 81A28995 81404040 4040C796 * OMs.Thomasina     Go *
 00141 9684A699 85958388 40404040 40D79996 83A49985 * odwrench     Procure *
 00161 948595A3 405040C3 9695A399 8183A3A2 40D4     * ment & Contracts M   *
 ******************************** Bottom of data ********************************
```

Figure 4: Dump Browse panel

Browse, Unformatted Display

```
MAX UNFORMATTED BROWSE 'MXS.TEST.KSDS'            KEY            Begin of file
 COMMAND ===>                                                   SCROLL ===> PAGE
 Display:  DD - Dump Style  DF - Formatted  DH - Horizontal   ED - EDit file
                                                              L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
**********************************TOP OF DATA************************************
H011110BETTY    DOE            X555 PLAIN DR.       DENVER    CO...%1997/03/24..
H011122Juan     DOE            Y555 PLAIN DR.       DENVER    CO.M..1997/03/24..
H011123Juan     DOE            Y555 PLAIN DR.       DENVER    CO.M..1997/03/24..
H011144JAMES    JONES          S751 OAK STREET      DENVER    CO.M..1997/03/24..
H011155MATHEW   SMITH          T607 JEFFERSON STREETHARVARD   IL.M..1997/03/24..
H011166SALLY    JOHNSON        K352 INFERIOR AVE    SHAKER HT OH....1997/03/24..
H011177HENRY    MANCINI        H345 POTOMAC Ave     JOHNSTON  IL.M..1997/03/24..
H011188RACHELLE SULLIVAN        452 HOWARD Street   SLIEMA    MA. ..1997/03/24..
H011199MABEL    SHIELDS        S232 GREEN STREET    WOODSTOCK IL. ..1997/03/24..
H022211RALPH    JOHNSTON       Y432 ADAMS DRIVE     MARENGO   IL.M..1997/03/24..
H022222GARY     GABLE          Y567 HAYWARD AVE     FORT DODGEIA.M..1997/03/24..
H022233JEFF     O'KEEFE        Y743 1ST AVENUE      CHICAGO   IL.M..1997/03/24..
H022244JAMES    HARDY          Y987 SOUTH STREET    DENVER    CO.M..1997/03/24..
H022255ADAM     FIRST          Y111 GARDEN GROVE    PLAINS    NY.M..1997/03/24..
H022256ADAM     FIRST          Y111 GARDEN GROVE    PLAINS    NY.M..1997/03/24..
H022266MARCY    JAMISON        Y231 TURTLEROCK CT   DALLAS    TX. ..1997/03/24..
H022277KELLY    HUDSON         Y435 TOWER ROAD      FT WORTH  TX. ..1997/03/24..
 Press ENTER to continue or END to exit.
```

Figure 5: Unformatted Browse panel

Browse, Formatted Display

```
MAX FORMATTED BROWSE 'MXS.TEST.KSDS'              KEY            Begin of file
 COMMAND ===>                                                   SCROLL ===> PAGE
 Display:  DD - Dump Style  DU - Unformatted  DH - Horizontal ED - EDit file
 Read:     N  - Next        P  - Previous                     L - Locate by KEY
 LRECL=300    KEYLEN=7       KEYPOS=1      DSORG=K     SELECT=NO
 POS   *---------FIELD NAME---------* FORMAT *--------- FIELD CONTENTS --------*
 00001 EMPLOYEE-RECORD
 00001 EMPLOYEE-ID
 00001 RECORD-TYPE                   A    1 H
 00002 EMPLOYEE-CODE                 N    6 011110
 00008 EMPLOYEE-NAME
 00008 NAME-FIRST                    C    9 BETTY
 00017 NAME-LAST                     C   15 DOE
 00032 NAME-MIDDLE-I                 A    1 X
 00033 EMPLOYEE-ADDRESS
 00033 STREET-ADDR                   C   20 555 PLAIN DR.
 00053 CITY                          A   10 DENVER
 00063 STATE                         A    2 CO
 00065 EMPLOYEE-AMOUNT               P  5.2 +1234.56
**********************************BOTTOM OF DATA***********************************
```

Figure 6: Formatted Browse panel

The Formatted Display allows you to view a VSAM/SAM file in Formatted Display mode using related COBOL/PL/I copybook(s). When the `FIELD CONTENTS` area is not large enough to hold the field data, the data will be wrapped to the next line.

Group fields can be identified by blanks under the column heading "`FORMAT`" and data cannot be entered in the group fields.

Browse, Horizontal Display

The Horizontal Display allows you to view the file in the formatted mode (using copybooks to format fields), while allowing data from multiple records to be presented on one panel, as in unformatted mode.

```
MAX HORIZONTAL BROWSE 'MXS.TEST.KSDS'            KEY           Begin of file
 COMMAND ===>                                                 SCROLL ===> PAGE
 Display:  DD - Dump Style  DF - Formatted  DU - Unformatted  ED - EDit file
                                                             L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
 ***********************************TOP OF DATA***********************************
  RECORD-TYPE  EMPLOYEE-CODE  NAME-FIRST  NAME-LAST        NAME-MIDDLE-I  STREET
  H                   011110  BETTY       DOE             X              555 PL
  H                   011122  Juan        DOE             Y              555 PL
  H                   011123  Juan        DOE             Y              555 PL
  H                   011144  JAMES       JONES           S              751 OA
  H                   011155  MATHEW      SMITH           T              607 JE
  H                   011166  SALLY       JOHNSON         K              352 IN
  H                   011177  HENRY       MANCINI         H              345 PO
  H                   011188  RACHELLE    SULLIVAN                       452 HO
  H                   011199  MABEL       SHIELDS         S              232 GR
  H                   022211  RALPH       JOHNSTON        Y              432 AD
  H                   022222  GARY        GABLE           Y              567 HA
  H                   022233  JEFF        O'KEEFE         Y              743 1S
  H                   022244  JAMES       HARDY           Y              987 SO
  H                   022255  ADAM        FIRST           Y              111 GA
  H                   022256  ADAM        FIRST           Y              111 GA
  H                   022266  MARCY       JAMISON         Y              231 TU
 Press ENTER to continue or END to exit.
```

Figure 7: Horizontal Browse panel

Group field names are not presented. Field names in the heading line are presented for elementary items with the data formatted below the field name. Use the LEFT and RIGHT scroll keys to view the entire record.

Browse, Primary Commands

The following primary commands are discussed in this section:

Command	Description	Dump	Formatted	Unformatted	Horizontal
COL	specify columns	NO	NO	YES	NO
COUNT	count records	YES	YES	YES	YES
CUT	copy record(s)	YES	YES	YES	YES
DD	display dump mode	NO	YES	YES	YES
DF	display formatted mode	YES	NO	YES	YES
DH	display horizontal mode	YES	YES	YES	NO
DU	display unformatted mode	YES	YES	NO	YES
EDIT	edit data set	YES	YES	YES	YES
FIND	find record(s)	YES	YES	YES	YES
HEX	display hexadecimal	NO	NO	YES	YES
LOCATE	locate record(s)	YES	YES	YES	YES
LOCATEF	locate field	NO	YES	NO	YES
PRT	print record(s)	YES	YES	YES	YES
SELECT	select record(s)	YES	YES	YES	YES

DD, DF, DH, DU line commands are described in the previous pages.

COL

The **COL** command either adds or deletes the column heading. The **COL OFF** command removes the column line. The **COL ON** command adds the column line.

Example column line:

```
----+----1----+----2----+----3----+----4----+----5----+----6  etc.
```

A digit is displayed every ten positions such as 10, 20, 30 etc. Each digit on the column line corresponds to a multiplier equivalent of ten. For example: 1 = 10, 110 or 210; 2 = 20, 120 or 220.

When used with keyed files, the **COL** display can be used to emphasize the key data with the file. For example, if the key begins in column 8 for 11 positions, the column line would appear:

```
----+--<-1----+-->-2----+----3----+----4----+----5----+----6  etc.
```

The **COL** command is valid only in the Unformatted Option.

The **COL** command has the following format:

COL [ON|OFF]

COUNT

The **COUNT** command will provide a count of all records in the file. It can be entered at any time during the browse or edit of a file. Record positioning remains the same.

If selection criteria is in effect at the time of the **COUNT**, a count of all records meeting the selection criteria will be presented. If no selection criteria is in effect, all records are considered as selected.

The **COUNT** command has the following format:

COUNT

CUT

The **CUT** command is used to copy selected records to a temporary area. The records may be subsequently pasted into the same or another data set. The **CUT R** command will replace any records previously **CUT** but not pasted. Otherwise, each **CUT** command will append the records to any previously **CUT** records.

The **CUT** command has the following format:

CUT **[nnn] [R]**

Operand definitions

nnn is the number of records to be copied starting with the current record displayed at the top of the panel. A maximum value of 32,767 is allowed.

R will replace any records previously **CUT** but not pasted.

EDIT

The **EDIT** command is used to present the file for editing, thus, the edit commands are enabled allowing the file to be changed. The current position of the file is maintained as well as any selection criteria in effect. The file must be available to 'open for update'.

The **EDIT** command has the following format and/or aliases:

EDIT
ED

FIND

The **FIND** command searches through the records stopping at the first or next record containing the specified string. The search begins with the first position of the current display. Repeating the command, without changing the parameters, results in finding the next occurrence of the specified string. The search is in a forward direction (**NEXT**) unless **PREV** is specified; in which case the search is in a backward direction. Records will be searched inclusively from the beginning to ending columns. When no beginning or ending columns are specified, the entire record will be searched.

The **FIND** command can be used to search for packed data. When searching for packed data, the beginning column is required. A search for valid packed data of any length beginning at that position is then performed.

Use the FIND PF key to find the next occurrence of the specified character string.

The **FIND** command has the following format and/or aliases:

FIND **string [begin-col] [end-col] [PREV|FIRST|LAST|NEXT]**
FIND **P'nnn' begin-col [PREV|FIRST|LAST|NEXT]**
FIND **T'string' [begin-col] [end-col][PREV|FIRST|LAST|NEXT]**
FIND **NEP [begin-col] [end-col][PREV|FIRST|LAST|NEXT]**

Operand definitions

string is a character string, quoted string, hexadecimal string, or packed string.
A non-quoted string is case insensitive.
A quoted string will remain case sensitive.
Packed strings are coded as: **P'nn'**

NEP will search for non-packed data in the record at the specified **begin-col**. If no **end-col** is entered, the search will be for 10 bytes.

T'string' uses the text format to search for case insensitive data. Allows for case insensitive data to contain embedded blanks.

begin-col is any number not greater than the record length for which the search for the character string is to begin. In the case, where there has been no **end-col** specified then the **begin-col** is the only column searched. Default is entire record.

end-col is any number not greater than the record length for which the search for the character string will end. The **end-col** cannot be less than the begin column. The string must be found in its entirety within the limits of **begin-col** and **end-col**.

PREV causes a search in a backward direction.

FIRST causes a search for the first occurrence of the string in the file.

LAST causes a search for the last occurrence of the string in the file.

NEXT causes a search in a forward direction. This is the default.

HEX

The **HEX** command causes the records to be displayed in combined character and hexadecimal format. The **HEX** command can be used to display otherwise non-displayable data in hexadecimal format. Typing "**HEX OFF**" displays data in character format; typing "**HEX ON**" displays data in hexadecimal format. The data is displayed vertically.

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
H011110BETTY    DOE            X555 PLAIN DR.       DENVER    CO...%1997/03/24..
CFFFFFFCCEEE4444CDC444444444444EFFF4DDCCD4CD44444444CCDECD4444CD0246FFFF6FF6FF00
80111102533800004650000000000007555073195049B0000000455559000036135C199710312400
--------------------------------------------------------------------------------
```

Figure 8: HEX Format Display (Unformatted Mode)

```
MAX HORIZONTAL BROWSE 'MXS.TEST.KSDS'             KEY          Command invalid
 COMMAND ===>                                                  SCROLL ===> PAGE
 Display:  DD - Dump Style  DF - Formatted  DU - Unformatted  ED - EDit file
                                                              L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
 ********************************TOP OF DATA*********************************
  RECORD-TYPE  EMPLOYEE-CODE  NAME-FIRST  NAME-LAST        NAME-MIDDLE-I  STREET
  H            011110         BETTY       DOE             X              555 PL
  C            FFFFFF         CCEEE4444   CDC444444444444  E              FFF4DD
  8            011110         253380000   465000000000000 7              555073
 --------------------------------------------------------------------------------
  H            011123         Juan        DOE             Y              555 PL
  C            FFFFFF         DA8944444   CDC444444444444  E              FFF4DD
  8            011123         141500000   465000000000000 8              555073
 --------------------------------------------------------------------------------
  H            011144         JAMES       JONES           S              751 OA
  C            FFFFFF         DCDCE4444   DDDCE4444444444  E              FFF4DC
  8            011144         114520000   165520000000000 2              751061
 --------------------------------------------------------------------------------
  H            011155         MATHEW      SMITH           T              607 JE
  C            FFFFFF         DCECCE444   EDCEC4444444444  E              FFF4DC
  8            011155         413856000   249380000000000 3              607015
 --------------------------------------------------------------------------------
 Press ENTER to continue or END to exit.
```

Figure 9: HEX Format Display (Horizontal Mode)

The **HEX** command is valid in the Unformatted and Horizontal Display Options only.

The **HEX** command has the following format:

HEX **[ON|OFF]**

L (LOCATE)

The **L** command is used to position to a record by its Record Identification Field (RID). The RID can be specified with the **L** command. If a RID is not specified, a panel will be presented prompting for a RID.

For a KSDS/VSAM file, the RID entered can be either a full or a partial key.

For an RRDS/VSAM file, or SAM file, the RID must be a number representing the Relative Record Number (RRN).

For an ESDS/VSAM file, the RID must be a number representing the Relative Byte Address (RBA).

The **LOCATE** command has the following format:

LOCATE **[rid]**

Operand definitions

RID is a quoted, hexadecimal or character string.

LF (LOCATEF)

The **LF** command is used to position a specific field, in the current copybook. This command is valid in both the Formatted and Horizontal Display options.

The **LOCATEF** command has the following format and/or aliases:

LOCATEF **[field-name]** or, **[field-name*]** or, **(*field-name)**
LF **"**

Operand definitions

field-name is any field name that exists for the current record layout presented. The search for the field begins at the top of the current record.

'*' (asterisk) character immediately following the field name will locate the next field (search begins with field at top of display) that begins with the same characters specified.

When an '*****' is not specified, the search begins with the first field in the layout and every character of the field name must be specified.

An '*****' character preceding the character string will locate the next field that contains the string anywhere within the field name.

LOCATEF can also be used to position to a specific 01 level within a copybook that contains multiple 01 levels.

LF Enter **LF** with no field name. A panel will be presented that both allows the standard option of entering a field name and a list of all 01 levels present within the copybook.

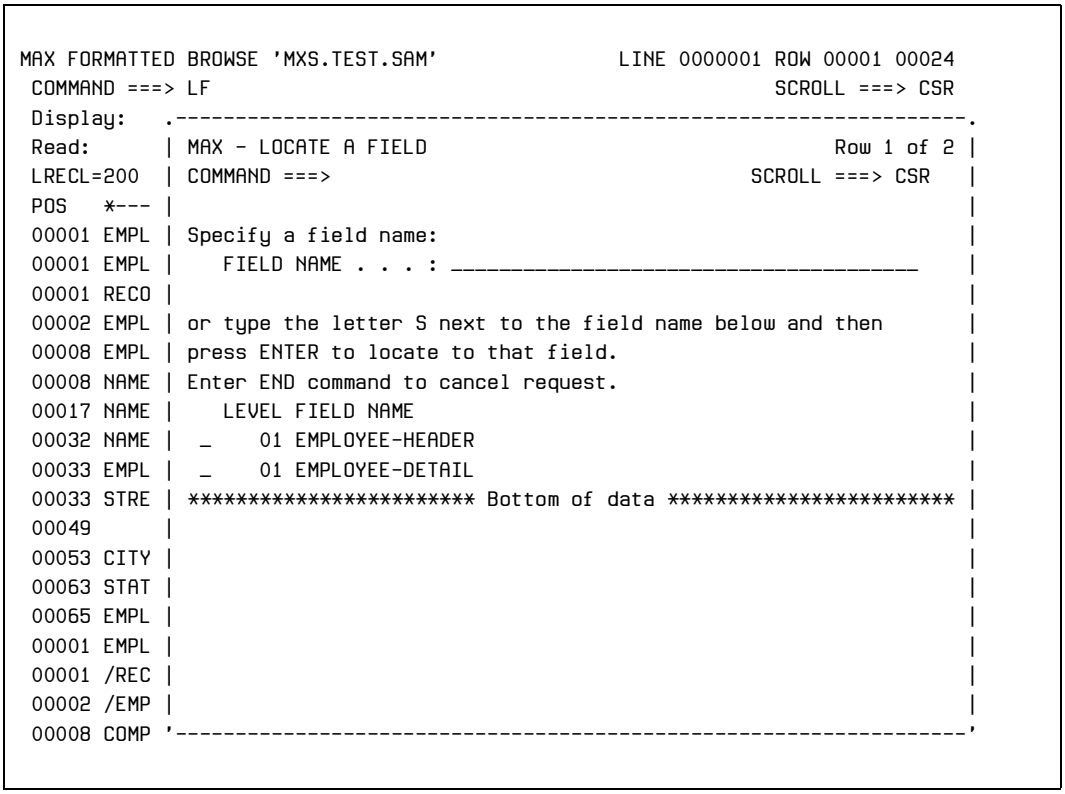

Figure 10: Locate Field panel

Type an 'S' to select the 01 level and the copybook will position to that field within the copybook.

PRT

The **PRT** command prints records starting with the record at the top of the panel. A panel is displayed prompting for the number of records to be printed and confirming the starting record ID. The record(s) may be printed to the ISPF list data set or to the JES spool. A panel is displayed providing a choice of destinations. If the JES spool is chosen, a SYSOUT class must be entered. In addition, destination, form, and FCB may be optionally entered. If the ISPF list data set is chosen, the ISPF LIST command may then be used to submit a batch job to print the records from the list data set. The format of the report depends on the current display mode in effect. When the record display is currently in Formatted or Horizontal Mode, the report will be a formatted listing of each record. Otherwise, the report will resemble the dump style display mode where both the hexadecimal and character representations of the data are listed.

The **PRT** command has the following format:

PRT

SELECT

The **SEL** command controls the use of record selection criteria. Record selection criteria is used to group a subset of records for processing. The **SEL ON** command prompts for record selection criteria. The **SEL OFF** command disables record selection criteria and all records are available for processing.

Record selection criteria can be entered in either Unformatted Mode (Unformatted and Dump display options) or Formatted Mode (Formatted and Horizontal display options).

Note: Using record selection criteria can cause an increased number of records to be read between operations that can in turn cause significant delays in response time.

Refer to the section titled "*Record Selection Criteria*" on page 42 for further information.

The **SELECT** command has the following format and/or aliases:

```
SELECT    [ON|OFF]
SEL       "
```

2. Edit Data Set (VSAM/SAM)

The VSAM/SAM Edit Facility provides editing functions for a VSAM/SAM file using four different display options using related copybooks:

1. Edit, Dump Display (**DD**)
2. Edit, Unformatted Display (**DU**)
3. Edit, Formatted Display (**DF**)
4. Edit, Horizontal Display (**DH**)

The VSAM/SAM Edit Facility is controlled by primary commands that are used to:

- Insert, delete, repeat, and change records
- Reset the display
- Find and display records with specified character strings
- Select a subset of records to display
- Locate a specific record by key
- Locate a field within a record layout.
- Scroll through records
- Display column numbers
- Display data in hexadecimal format
- Toggle between browse and edit
- Toggle between display options
- Print records
- **CUT** (copy) records to a temporary area for a subsequent **PASTE** (insert) in the same or another **EDIT** session
- **PASTE** (insert) records from a temporary area that were saved with a previous **CUT** (copy) command
- **COUNT** all records in the data set
- **COUNT** all records that meet selection criteria
- Delete all records from a file

Edit, Dump Display

```
MAX DUMP EDIT 'MXS.TEST.SAM'                                    Record updated
 COMMAND ===>                                                  SCROLL ===> PAGE
 Display:  DF - Formatted  DU - Unformatted  DH - Horizontal  BR - BRowse file
 Read:     N  - Next       P  - Previous                     L - Locate by RRN
 Actions:  AR - Add Rec    DR - Delete Rec   UR - Update Rec
 LRECL=178    KEYLEN=0       KEYPOS=0      DSORG=S     SELECT=NO    LINE 0000001
 POS   *------4 *------8 *-----12 *-----16 *-----20 * ----+----1----+----2 *
 00001 F3F9F4F8 F6F2F9F5 F940E495 89A58599 A289A3A8 * 394862959 University *
 00021 40968640 C19989A9 96958140 40404040 40404040 *  of Arizona          *
 00041 40404040 40C18494 899589A2 A39981A3 89A58540 *      Administrative  *
 00061 C3969497 A4A38599 40C38595 A3859940 40404040 * Computer Center      *
 00081 C3888983 81879640 40404040 40404040 40404040 * Chicago              *
 00101 C9D3F6F0 F6F8F04D F3F1F25D 40F5F5F6 60F2F6F9 * IL60680(312) 556-269 *
 00121 F3D4A24B D196A883 85404040 40404040 4040C885 * 3Ms.Joyce         He *
 00141 89948285 83928599 40404040 40C39695 A3998183 * imbecker     Contrac *
 00161 A3A240C1 84948995 89A2A399 81A39699 4040     * ts Administrator     *
 ******************************** Bottom of data ********************************
```

Figure 11: Dump Edit panel

Data can be modified by simply typing over either the character or hex data on the panel and entering an "**AR**" (add record) or "**UR**" (replace record) command.

Edit, Unformatted Display

```
MAX UNFORMATTED EDIT 'MXS.TEST.KSDS'              KEY +1     COL 00001 00072
 COMMAND ===>                                                  SCROLL ===> PAGE
 Display:  DD - Dump style  DF - Formatted  DH - Horizontal   BR - BRowse file
                                                              L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
 ****** ********************************TOP OF DATA*********************************
 000001 H011110BETTY    DOE            X555 PLAIN DR.       DENVER    CO...%1997
 000002 H011123Juan     DOE            Y555 PLAIN DR.       DENVER    CO.M..1997
 000003 H011144JAMES    JONES          S751 OAK STREET      DENVER    CO.M..1997
 000004 H011155MATHEW   SMITH          T607 JEFFERSON STREETHARVARD   IL.M..1997
 000005 H011166SALLY    JOHNSON        K352 INFERIOR AVE    SHAKER HT OH....1997
 000006 H011177HENRY    MANCINI        H345 POTOMAC Ave     JOHNSTON  IL.M..1997
 000007 H011188RACHELLE SULLIVAN        452 HOWARD Street   SLIEMA    MA. ..1997
 000008 H011199MABEL    SHIELDS        S232 GREEN STREET    WOODSTOCK IL. ..1997
 000009 H022211RALPH    JOHNSTON       Y432 ADAMS DRIVE     MARENGO   IL.M..1997
 000010 H022222GARY     GABLE          Y567 HAYWARD AVE     FORT DODGEIA.M..1997
 000011 H022233JEFF     O'KEEFE        Y743 1ST AVENUE      CHICAGO   IL.M..1997
 000012 H022244JAMES    HARDY          Y987 SOUTH STREET    DENVER    CO.M..1997
 000013 H022255ADAM     FIRST          Y111 GARDEN GROVE    PLAINS    NY.M..1997
 000014 H022256ADAM     FIRST          Y111 GARDEN GROVE    PLAINS    NY.M..1997
 000015 H022266MARCY    JAMISON        Y231 TURTLEROCK CT   DALLAS    TX. ..1997
 000016 H022277KELLY    HUDSON         Y435 TOWER ROAD      FT WORTH  TX. ..1997
 000017 H022288AMIELIA  ABARNATHY      Y783 7TH AVE         DENVER    CO. ..1997
 Press ENTER to continue or END to exit.
```

Figure 12: Unformatted Edit panel

This option allows you to change data by typing over existing data.

Edit, Formatted Display

```
MAX FORMATTED EDIT 'MXS.TEST.KSDS'                KEY +1     ROW 00001 00013
 COMMAND ===>                                                  SCROLL ===> PAGE
 Display:  DD - Dump style  DU - Unformatted  DH - Horizontal BR - BRowse file
 Read:     N  - Next        P  - Previous                    L - Locate by KEY
 Actions:  AR - Add Rec     DR - Delete Rec   UR - Update Rec
 LRECL=300    KEYLEN=7       KEYPOS=1      DSORG=K     SELECT=NO
 POS   *---------FIELD NAME---------* FORMAT *--------- FIELD CONTENTS --------*
 00001 EMPLOYEE-RECORD
 00001 EMPLOYEE-ID
 00001 RECORD-TYPE                    A    1 H
 00002 EMPLOYEE-CODE                  N    6 011110
 00008 EMPLOYEE-NAME
 00008 NAME-FIRST                     C    9 BETTY
 00017 NAME-LAST                      C   15 DOE
 00032 NAME-MIDDLE-I                  A    1 X
 00033 EMPLOYEE-ADDRESS
 00033 STREET-ADDR                    C   20 555 PLAIN DR.
 00053 CITY                           A   10 DENVER
 00063 STATE                          A    2 CO
 00065 EMPLOYEE-AMOUNT                P  5.2 +1234.56
 ********************************BOTTOM OF DATA*********************************
```

Figure 13: Formatted Edit panel

This option allows you to edit a file in Formatted Display mode using related COBOL or PL/I copybooks.

Editing in Formatted Edit Display Mode, data can be modified by simply typing over data in the `FIELD CONTENTS` portion of the panel and entering an "**AR**" (add record) or "**UR**" (update record) command.

Group fields can be identified by blanks under the column heading "`FORMAT`" and data cannot be entered in the group fields.

Edit, Horizontal Display

```
MAX HORIZONTAL EDIT 'MXS.TEST.KSDS'              KEY +1     FLD 00003 00013
 COMMAND ===>                                                SCROLL ===> PAGE
 Display:  DD - Dump style  DF - Formatted  DU - Unformatted  BR - BRowse file
                                                             L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
 ****** ********************************TOP OF DATA*********************************
 ****** RECORD-TYPE  EMPLOYEE-CODE  NAME-FIRST  NAME-LAST        NAME-MIDDLE-I
 000001 H                  011110  BETTY       DOE              X
 000002 H                  011123  Juan        DOE              Y
 000003 H                  011144  JAMES       JONES            S
 000004 H                  011155  MATHEW      SMITH            T
 000005 H                  011166  SALLY       JOHNSON          K
 000006 H                  011177  HENRY       MANCINI          H
 000007 H                  011188  RACHELLE    SULLIVAN
 000008 H                  011199  MABEL       SHIELDS          S
 000009 H                  022211  RALPH       JOHNSTON         Y
 000010 H                  022222  GARY        GABLE            Y
 000011 H                  022233  JEFF        O'KEEFE          Y
 000012 H                  022244  JAMES       HARDY            Y
 000013 H                  022255  ADAM        FIRST            Y
 000014 H                  022256  ADAM        FIRST            Y
 000015 H                  022266  MARCY       JAMISON          Y
 000016 H                  022277  KELLY       HUDSON           Y
 Press ENTER to continue or END to exit.
```

Figure 14: Horizontal Edit panel

This facility allows you to edit a file in Horizontal Display using related copybooks.

This option allows you to type over existing data. Data entered to change the record will be verified for proper field format.

Invalid data is displayed in hexadecimal format. Invalid data cannot be overtyped in horizontal mode. To edit the invalid data, swap the record into Formatted mode (**DF**) and make the change.

Edit, Primary Commands

The following primary commands are discussed in this section:

Command	Description	Dump	Formatted	Unformatted	Horizontal
AR	add record	YES	YES	NO	NO
BROWSE	browse records	YES	YES	YES	YES
CANCEL	cancel action	YES	YES	YES	YES
CHANGE	change record	YES	YES	YES	YES
CLEARFILE	delete all records	NO	NO	YES	YES
COL	specify columns	NO	NO	YES	NO
COUNT	count records	YES	YES	YES	YES
CUT	copy record(s)	YES	YES	YES	YES
DR	delete record	YES	YES	NO	NO
DD	display dump mode	NO	YES	YES	YES
DF	display formatted mode	YES	NO	YES	YES
DH	display horizontal	YES	YES	YES	NO
DU	display unformatted mode	YES	YES	NO	YES
FIND	find record(s)	YES	YES	YES	YES
HEX	display hexadecimal	NO	NO	YES	YES
LOCATE	locate record(s)	YES	YES	YES	YES
LOCATEF	locate field name	NO	YES	NO	YES
PASTE	insert CUT records	YES	YES	YES	YES
PRT	print record(s)	YES	YES	YES	YES
RESET	reset error condition	YES	YES	YES	YES
SELECT	select record(s)	YES	YES	YES	YES
UR	update record(s)	YES	YES	NO	NO

DD, DF, DH, DU are line commands described on previous pages.

AR (add record)

The **AR** command allows a record to be added to a file. A panel will be presented prompting for a record length and `RID` field (record key). For an ESDS/VSAM file the record will be inserted at the end of the file and may not be backed out with a subsequent **CANCEL** command.

The **AR** command is only available in Dump and Formatted display options.

The **AR** command has the following format:

AR

BROWSE

The **BROWSE** command presents the file for viewing, the edit commands are disabled and the file cannot be changed. Any uncommitted changes are committed and can no longer be removed with the **CANCEL** command. The current position of the file is maintained as well as any selection criteria in effect. The file is opened for input.

All changes are committed and may no longer be backed out.

The **BROWSE** command has the following format and/or aliases:

BROWSE
BR

CANCEL

The **CANCEL** command terminates editing and removes all uncommitted changes that have been made to the file. For ESDS/VSAM files, previously inserted records cannot be removed and an error will result.

Enter **END** to terminate editing and commit all changes that have been made to the file.

The **CANCEL** command has the following format and/or aliases:

CANCEL
CAN

CHANGE

The **CHANGE** command searches through the records for the next occurrence of a specified "**from-string**" and replaces it with a specified "**to-string**." The search begins with the first position of the current display. Repeating the command, without changing the parameters, results in the finding and changing the next occurrence of the specified string. The search is in a forward direction unless **PREV** is specified, in which case the search is in a backward direction. The records will be searched inclusively from the beginning to ending columns. When no beginning or ending columns are specified, the entire record will be searched.

Use the FIND key to find the next occurrence of the specified "**from-string**."

Use the CHANGE PF key to find and change the next occurrence of the specified character strings.

The **CHANGE** command has the following format and/or aliases:

CHANGE from-string to-string [begin-col] [end-col] [PREV]
C "

Operand definitions

from-string must be a character string, quoted string or hexadecimal string.

to-string must be a character string, quoted string or hexadecimal string.

When the **from-string** is shorter than the **to-string**, data may be overlaid.

string is a character string, quoted string or hexadecimal string.
A non-quoted string will be folded to upper case.
A quoted string will remain case sensitive

begin-col is any number that cannot be greater than the record length for which the search for the character string is to begin. In the case, where there has been no end column specified, then the beginning column is the only column searched.

end-col is any number that cannot be greater than the record length for which the search for the character string will end. The end column must not be less than the begin column.

PREV causes a search in a backward direction.

Note: The entire record will be searched when no beginning or end columns are specified.

CLEARFILE

The **CLEARFILE** command can be used to delete all records from a file. It is not valid for an ESDS file. For all other VSAM files, the file must be defined as **REUSE**.

COL

The **COL** command either adds or deletes the column heading. The **COL OFF** command removes the column line. The **COL ON** command adds the column line.

Example column line:

```
----+----1----+----2----+----3----+----4----+----5----+----6  etc.
```

A digit is displayed every ten positions such as 10, 20, 30 etc. Each digit on the column line corresponds to a multiplier equivalent of ten. For example: 1 = 10, 110 or 210; 2 = 20, 120 or 220.

When used with keyed files, the **COL** display can be used to emphasize the key data with the file. For example, if the key begins in column 8 for 11 positions, the column line would appear:

```
----+--<-1----+-->-2----+----3----+----4----+----5----+----6  etc.
```

The **COL** command is valid only in the Unformatted Edit Option.

The **COL** command has the following format:

COL [ON/OFF]

COUNT

This command will provide a count of all records in the file. It can be entered at any time during the browse or edit of a file. Record positioning remains the same.

If selection criteria is in effect at the time the **COUNT** command is issued, a count of all records meeting the selection criteria will be presented. If no selection criteria is in effect, all records are included in the total.

The **COUNT** command has the following format:

COUNT

CUT

The **CUT** command is used to copy selected records to a temporary area. The records may be subsequently pasted into the same or another data set. The **CUT R** command will replace any records previously **CUT** but not pasted. Otherwise, each **CUT** command will append the records to any previously **CUT** records.

The **CUT** command has the following format:

CUT **[nnn] [R]**

Operand definitions

nnn is the number of records to be copied starting with the current record displayed at the top of the panel. The maximum number of records to cut is 32,767.

R will replace any records previously **CUT** but not pasted.

DR (delete record)

The **DR** command causes one or more records to be deleted from a file. Records cannot be deleted from an ESDS/VSAM file.

The **DR** command is only available in Dump and Formatted display options.

The **DR** command has the following format:

DR

A panel is then presented that allows the entry of a count of records to be deleted. It presents the starting record number for confirmation. The starting record number can be changed on this panel.

FIND

The **FIND** command searches through the records stopping at the first or next record containing the specified string. The search begins with the first position of the current display. Repeating the command, without changing the parameters, results in finding the next occurrence of the specified string. The search is in a forward direction (**NEXT**) unless **PREV** is specified; in which case the search is in a backward direction. Records will be searched inclusively from the beginning to ending columns. When no beginning or ending columns are specified, the entire record will be searched.

The **FIND** command can be used to search for packed data. When searching for packed data, the beginning column is required. A search for valid packed data of any length beginning at that position is then performed.

Use the **FIND** PF key to find the next occurrence of the specified character string.

The **FIND** command has the following format and/or aliases:

FIND	**string [begin-col] [end-col] [PREV|FIRST|LAST|NEXT]**
FIND	**P'nnn' begin-col [PREV|FIRST|LAST|NEXT]**
FIND	**T'string'[begin-col] [end-col][PREV|FIRST|LAST|NEXT]**
FIND	**NEP [begin-col] [end-col][PREV|FIRST|LAST|NEXT]**

Operand definitions

string is a character string, quoted string, hexadecimal string, or packed string.
A non-quoted string is case insensitive.
A quoted string will remain case sensitive.
Packed strings are coded as: **P'nn'**

NEP will search for non-packed data in the record at the specified begin-col. If no **end-col** is entered, the search will be for 10 bytes.

T'string' uses the text format to search for case insensitive data. Allows for case insensitive data to contain embedded blanks.

begin-col is any number not greater than the record length for which the search for the character string is to begin. In the case, where there has been no **end-col** specified then the **begin-col** is the only column searched. Default is entire record.

end-col is any number not greater than the record length for which the search for the character string will end. The **end-col** cannot be less than the begin column. The string must be found in its entirety within the limits of **begin-col** and **end-col**.

PREV causes a search in a backward direction.

FIRST causes a search for the first occurrence of the string in the file.

LAST causes a search for the last occurrence of the string in the file.

NEXT causes a search in a forward direction. This is the default.

HEX

The **HEX** command causes the records to be displayed in combined character and hexadecimal format. The **HEX** command can be used to display otherwise non-displayable data in hexadecimal format. Typing "**HEX OFF**" displays data in character format; typing "**HEX ON**" displays data in hexadecimal format and each character of data displays horizontally.

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
H011110BETTY    DOE            X555 PLAIN DR.       DENVER    CO...%1997/03/24..
CFFFFFFCCEEE4444CDC444444444444EFFF4DDCCD4CD44444444CCDECD4444CD0246FFFF6FF6FF00
80111102533800004650000000000007555073195049B0000000455559000036135C199710312400
--------------------------------------------------------------------------------
```

Figure 15: Hexadecimal Data Display in Unformatted Mode

```
MAX HORIZONTAL BROWSE 'MXS.TEST.KSDS'             KEY          Command invalid
 COMMAND ===>                                                  SCROLL ===> PAGE
 Display:  DD - Dump Style  DF - Formatted  DU - Unformatted  ED - EDit file
                                                              L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
 ************************************TOP OF DATA************************************
  RECORD-TYPE  EMPLOYEE-CODE  NAME-FIRST  NAME-LAST        NAME-MIDDLE-I  STREET
  H            011110         BETTY       DOE             X              555 PL
  C            FFFFFF         CCEEE4444   CDC444444444444  E              FFF4DD
  8            011110         253380000   465000000000000 7              555073
 --------------------------------------------------------------------------------
  H            011123         Juan        DOE             Y              555 PL
  C            FFFFFF         DA8944444   CDC444444444444  E              FFF4DD
  8            011123         141500000   465000000000000 8              555073
 --------------------------------------------------------------------------------
  H            011144         JAMES       JONES           S              751 OA
  C            FFFFFF         DCDCE4444   DDDCE4444444444  E              FFF4DC
  8            011144         114520000   165520000000000 2              751061
 --------------------------------------------------------------------------------
  H            011155         MATHEW      SMITH           T              607 JE
  C            FFFFFF         DCECCE444   EDCEC4444444444  E              FFF4DC
  8            011155         413856000   249380000000000 3              607015
 --------------------------------------------------------------------------------
 Press ENTER to continue or END to exit.
```

Figure 16: Hexadecimal Format for Horizontal Mode

The **HEX** command is valid in the Unformatted and Horizontal Display Options only.

The **HEX** command has the following format:

HEX [ON|OFF]

LOCATE

The **LOCATE** command is used to position to a record by its record identification field (`RID`). The `RID` can be specified with the **L** command. If a `RID` is not specified, a panel will be presented prompting for a `RID`.

For a KSDS/VSAM file, the `RID` entered can be either a full or a partial key.

For an RRDS/VSAM file or SAM file, the `RID` must be a number representing the Relative Record Number (RRN).

For an ESDS/VSAM file, the `RID` must be a number representing the Relative Byte Address (RBA).

The **LOCATE** command has the following format:

LOCATE **[rid]**

Operand definitions

RID is a quoted, hexadecimal or character string.

LOCATEF

The **LOCATEF** command is used to position a specific field in the current record, to the top or left of the display. This command is valid in both the Formatted and Horizontal Display Options.

The **LOCATEF** command has the following format and/or aliases:

LOCATEF **[field-name] or, [field-name*] or, (*field-name)**
LF **"**

Operand definitions

field-name is any field name that exists for the current record layout presented.

'*****' (asterisk) character immediately following the field name will locate the next field (search begins with field on top of display) that begins with the same characters specified.

When an '*****' is not specified, the search begins with the first field in the layout and every character of the field name must be specified.

An '*****' character preceding the character string will locate the next field that contains the string anywhere within the field name.

LOCATEF can also be used to position to a specific 01 level within a copybook that contains multiple 01 levels.

LF Enter **LF** with no field name. A panel will be presented that both allows the standard option of entering a field name and a list of all 01 levels present within the copybook.

```
MAX FORMATTED BROWSE 'MXS.TEST.SAM'              LINE 0000001 ROW 00001 00024
 COMMAND ===> LF                                          SCROLL ===> CSR
 Display:   .-------------------------------------------------------------------.
 Read:      | MAX - LOCATE A FIELD                                  Row 1 of 2 |
 LRECL=200  | COMMAND ===>                                  SCROLL ===> CSR   |
 POS   *--- |                                                                 |
 00001 EMPL | Specify a field name:                                           |
 00001 EMPL |    FIELD NAME . . . : ________________________________          |
 00001 RECO |                                                                 |
 00002 EMPL | or type the letter S next to the field name below and then      |
 00008 EMPL | press ENTER to locate to that field.                            |
 00008 NAME | Enter END command to cancel request.                            |
 00017 NAME |    LEVEL FIELD NAME                                             |
 00032 NAME |  _    01 EMPLOYEE-HEADER                                        |
 00033 EMPL |  _    01 EMPLOYEE-DETAIL                                        |
 00033 STRE | ********************** Bottom of data ********************** |
 00049      |                                                                 |
 00053 CITY |                                                                 |
 00063 STAT |                                                                 |
 00065 EMPL |                                                                 |
 00001 EMPL |                                                                 |
 00001 /REC |                                                                 |
 00002 /EMP |                                                                 |
 00008 COMP '-------------------------------------------------------------------'
```

Figure 17: **LOCATEF** panel

Type an 'S' to select the 01 level and the copybook will position to that field within the copybook.

PASTE

The **PASTE** command is used to insert records that were previously captured with the **CUT** command. A panel will be presented prompting for the record ID to be used to insert the records. When the data set is KSDS/VSAM, a panel will be presented prompting for the record key for each record to be inserted.

Optionally a "**K**" (keep) parameter may be specified to keep the record in the temporary area so that a subsequent **PASTE** command may be used on the same records.

The **PASTE** command has the following format:

PASTE **[K]**

Operand definitions

K parameter indicates to keep the records in the **CUT** area following the **PASTE** command to be available for a subsequent **PASTE** command.

PRT

The **PRT** command prints records starting with the record at the top of the panel. A panel is displayed prompting for the number of records to be printed and confirming the starting record ID. The record(s) may be printed to the ISPF list data set or to the JES spool. A panel is displayed providing a choice of destinations. If the JES spool is chosen, a `SYSOUT` class must be entered. In addition, destination, form, and FCB may be optionally entered. If the ISPF list data set is chosen, the ISPF LIST command may then be used to submit a batch job to print the records from the list data set. The format of the report depends on the current display mode in effect. When the record display is currently in Formatted or Horizontal Mode, the report will be a formatted listing of each record. Otherwise, the report will resemble the Dump style display mode where both the hexadecimal and character representations of the data are listed.

The **PRT** command has the following format:

PRT

RESET

The **RESET** command resets the display. When invalid data or an invalid line command is entered other commands may become disabled until the error situation is corrected. The **RESET** command can be used to reset the panel thus removing the error condition.

The **RESET** command has the following format and/or aliases:

RESET
RES

SELECT

The **SELECT** command controls the use of record selection criteria. Record selection criteria is used to group a subset of records for processing. The **SEL ON** command prompts for record selection criteria. The **SEL OFF** command disables record selection criteria and all records are available for processing.

Record selection criteria can be entered in either Unformatted Mode (Unformatted and Dump display options) or Formatted Mode (Formatted and Horizontal display options).

Note: Using record selection criteria can cause an increased number of records to be read between operations that can in turn cause significant delays in response time. Refer to the section titled "*Record Selection Criteria*" on page 42 for further information.

The **SELECT** command has the following format and/or aliases:

```
SELECT    [ON|OFF]
SEL       "
```

UR (replace record)

The **UR** command replaces a record in a file and is only available in Dump and Formatted display options.

The **UR** command has the following format:

```
UR
```

Edit, Line Commands

The following line commands discussed in this section are available in Unformatted (**DU**) and Horizontal (**DH**) modes.

A	AFTER
C or **CC**	COPY
D or **DD**	DELETE
I	INSERT
M or **MM**	MOVE
R	REPEAT
Rnn	REPEAT multiple

A(fter)

To indicate the target position in the file to place records being copied or moved, type `A` in the line command area of the record after which the copied or moved record(s) is to be written.

For SAM files, when you press ENTER upon completion of the copy or move line command, the records will be copied or moved after this position in the file.

Note: Spanned files and PDS members are not supported by this command.

For VSAM files, a warning will appear on the panel that provides information on record placement.

For ESDS files, records are added after the last record in the file.

For KSDS files, you will be prompted for each key as the records are written to the file.

For RRDS and VRRDS files, if the relative record number is available, the record will be written; if the relative record number is not available, you will be prompted to enter an available record number.

C or CC (block copy)

To copy a record, type `C` in the line command area of the record to be copied.

To copy a series of records, type `CC` in the line command area of both the first and the last records to be copied. Optionally, type `C`**nn** in the line command area of the first record to be copied. The **nn** indicates the number of records to be copied. If the **nn** value ends in a zero, use a blank to delimit the value. For example, on a line with a number such as `000002` type `C20 02` to copy 20 records.

When you press ENTER after completing the copy command and indicating the target position with the **A**(fter) line command, the record(s) will be copied to that position.

For restrictions on the placement of the records being copied, refer to the **A(fter)** line command.

Note: Spanned files and PDS members are not supported by this command.

D or DD (block delete)

To delete a record, type `D` in the line command area of the record to be deleted.

To delete a series of records, type `DD` in the line command area of both the first and the last records to be deleted. Optionally, type `D`**nn** in the line command area of the first record to be deleted. The **nn** indicates the number of records to be deleted. If the **nn** value ends in a zero, use a blank to delimit the value. For example, on a line with a number such as `000002` type `D30 02` to delete 30 records. When using the `D`**nn** form of the command and you request more than one record to be deleted, a confirmation panel will appear asking you to confirm the request.

This line command deletes the selected record(s) from a file. Records in ESDS or spanned files cannot be deleted.

Note: Spanned files and PDS members are not supported by this command.

Note: When requesting to delete more than 1,000 records and no record selection criteria is in use, you can optionally turn off the logging of data records. However, once this option is chosen, you cannot cancel out of the update and restore the file to its original state. Caution should be used any time logging is turned off.

I(nsert)

To insert a record, type `I` in the line command area. This line command inserts a record into a file. A panel is presented requesting the KEY and record length, and a PAD character for the record to be inserted.

For a KSDS/VSAM file, the location of the inserted record is determined by the sequence of the key within the file.

For an ESDS/VSAM file, the record will be inserted at the end of the file and may not be backed out with a subsequent **CANCEL** command.

Note: Spanned files and PDS members are not supported by this command.

M or MM (block move)

To move a record, type `M` in the line command area of the record to be moved.

To move a series of records, type `MM` in the line command area of both the first and the last records to be moved. Optionally, type `M`**nn** in the line command area of the first record to be moved. The **nn** indicates the number of records to be moved. If the nn value ends in a zero, use a blank to delimit the value. For example, on a line with a number such as `000002` type `M20 02` to move 20 records.

When you press ENTER after completing the move command and indicating the target position with the **A**(fter) line command, the record(s) will be moved to that position.

For restrictions on the placement of records being moved, refer to the **A(fter)** line command. For ESDS files, records are copied not moved, as delete from an ESDS file is not supported.

Note: Spanned files and PDS members are not supported by this command.

R(epeat)

To repeat a record, type `R` in the line command area.

To repeat a record multiple times, type `R`**nn** in the line command area of the record to be repeated. The **nn** indicates the number of records to be repeated. If the **nn** value ends in a zero, use a blank to delimit the value. For example, on a line with a number such as `000003` type `R20 03` to repeat a record 20 times.

This line command repeats the record(s) in the file. A panel is presented requesting the KEY and record length, and the PAD character for the record(s) to be repeated.

For a KSDS/VSAM file the location of the repeated record(s) is determined by the sequence of the key within the file.

For an ESDS/VSAM file the record(s) will be inserted at the end of the file and may not be backed out with a subsequent **CANCEL** command.

Note: Spanned files and PDS members are not supported by this command.

Record Selection Criteria

Record Selection Criteria may be specified for **BROWSE** or **EDIT** functions. It is invoked by specifying record **SELECTION ON** in the main Data Set Name panel, or entering the **SEL** command while in **BROWSE** or **EDIT**.

Unformatted

The Unformatted Selection Criteria panel is presented when browsing or editing a file in either unformatted or dump display. Up to 32 conditions may be entered using combinations of AND and OR. Unformatted selection criteria can be used by the **COPY** and **UPDATE** options.

```
MAX SELECTION CRITERIA 'MXS.TEST.KSDS'
 COMMAND ===>

 Valid commands: SAVE, COPY, RESET.
 Valid C/LEN conditions are: EQ, NE, GT, GE, LT, LE; 0 to 32760
                             =   <>  >   >=  <   <=  (0=thru end of record)
 Press ENTER to select records, or END to return without selecting.

 POS   C/LEN  DATA                                                          And/Or
                                                                   More:     +
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
 _____ _____ ___________________________________________________________   ___
```

Figure 18: Record Selection panel (Unformatted)

Field Definitions for selected parameters:

POS: The beginning column, or beginning of a range of columns, in which to search for data.

C/LEN: To search a range of columns for an equal condition, specify the number of columns to search, starting with the column entered as any POS. Enter 0 to search through the end of the record. To search the POS column for a specific condition, enter the logical operator. Valid operators are:

EQ|=	(equal)
NE|<>	(not equal)
GT|>	(greater than)
LT|<	(less than)
GE|>=	(greater than or equal to)
LE|<=	(less than or equal to)

DATA: Data may be specified in hexadecimal, quoted strings, or character strings.

- A non-quoted string is case insensitive.
- A quoted string will remain case sensitive.
- A non-quoted string must not contain blanks.
- Data can also be entered in the following formats:

X'nnnn'	hexadecimal data
P'nnn'	packed data string
C'nnn'	case sensitive character string
T'nnnn'	case insensitive character string

And/Or: Enter connector of AND or OR. If neither is entered, AND is considered the default.

Conditions: Conditions are tested in sequence. No nesting capability is provided. To select records with multiple conditions, it is possible that a test may have to be repeated.

For example, a file contains the following records:

```
MAX UNFORMATTED BROWSE 'MXS.TEST.KSDS'            KEY            Begin of file
 COMMAND ===>                                                    SCROLL ===> CSR
 Display:  DD - Dump Style  DF - Formatted  DH - Horizontal   ED - EDit file
                                                               L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=NO
**********************************TOP OF DATA************************************
H011111BETTY    DOE            J555 PLAIN DR.       DENVER    CO....1997/03/24..
H011122JOHN     DOE            H555 PLAIN DR.       DENVER    CO....1997/03/24..
H011133JOANNE   JONES          F751 OAK STREET      DENVER    CO...%1997/03/24..
H011144JOHN     JONES          S751 OAK STREET      DENVER    CO....1997/03/24..
H011155MATHEW   SMITH          J607 JEFFERSON STREETHARVARD   IL....1997/03/24..
H011166SALLY    JOHNSON        K352 SUPERIOR AVE    SHAKER HT OH. ..1997/03/24..
H011177HENRY    MANCINI        H345 POTOMAC AVE     JOHNSTON  IL.M..1997/03/24..
H011188RACHELLE SULLIVAN        452 HOWARD STREET   SLIEMA    MA. ..1997/03/24..
H011190Justin   Case           S404 Lower Case BLVD Fresno    CA. ..1999/03/24..
H011199MABEL    SHIELDS        S232 GREEN STREET    WOODSTOCK IL. ..1997/03/24..
H022211RALPH    JOHNSTON       H432 ADAMS DRIVE     MARENGO   IL....1997/03/24..
H022222GARY     GABLE          G567 HAYWARD AVE     FORT DODGEIA....1997/03/24..
H022233JEFF     O'KEEFE        J743 1ST AVENUE      CHICAGO   IL....1997/03/24..
H022235Georgia  O'Keefe        J909 Santa Fe Trail  Pecos     NM....1999/05/20..
H022237Miles    O'Keefe        J910 Maximus Pkwy    San Diego CA....1999/05/20..
H022244JAMES    HARDY          J987 SOUTH STREET    DENVER    CO....1997/03/24..
H022255ADAM     FIRST          T111 GARDEN GROVE    PLAINS    NY....1997/03/24..
 Press ENTER to continue or END to exit.
```

Figure 19: Sample screen of selected records (Unformatted)

If the following selection criteria are entered:

```
MAX SELECTION CRITERIA 'MXS.TEST.KSDS'
 COMMAND ===>

 Valid commands: SAVE, COPY.
 Valid C/LEN conditions are: EQ, NE, GT, GE, LT, LE; 0 to 32760
                             =   <>  >   >=  <   <=  (0=thru end of record)
 Press ENTER to select records, or END to return without selecting.

 POS   C/LEN  DATA                                                    And/Or
                                                                More:    +
 17    EQ     t'doe'                                                  AND
 8     EQ     t'betty'                                                OR
 8     EQ     t'john'                                                 AND
 _____ _____ ____________________________________________________________  ___
 _____ _____ ____________________________________________________________  ___
 _____ _____ ____________________________________________________________  ___
```

Figure 20: Example 1, Record selection criteria

The following records will be chosen:

```
MAX UNFORMATTED BROWSE 'MXS.TEST.KSDS'            KEY +1     COL 00001 00080
 COMMAND ===>                                                 SCROLL ===> CSR
 Display:  DD - Dump Style  DF - Formatted  DH - Horizontal   ED - EDit file
                                                              L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=YES
**********************************TOP OF DATA***********************************
H011111BETTY    DOE            J555 PLAIN DR.       DENVER    CO....1997/03/24..
H011122JOHN     DOE            H555 PLAIN DR.       DENVER    CO....1997/03/24..
H011144JOHN     JONES          S751 OAK STREET      DENVER    CO....1997/03/24..
********************************BOTTOM OF DATA**********************************
```

Figure 21: Example 1, Record selection criteria output

Note: The first selection was combined using AND with the second selection. The OR following the second selection caused the third selection to stand alone. Therefore, BETTY DOE was chosen, but JOHN was not combined with any other test.

If the selection criteria are entered as follows:

```
MAX SELECTION CRITERIA 'MXS.TEST.KSDS'
 COMMAND ===>

 Valid commands: SAVE, COPY.
 Valid C/LEN conditions are: EQ, NE, GT, GE, LT, LE; 0 to 32760
                             =   <>  >   >=  <   <=  (0=thru end of record)
 Press ENTER to select records, or END to return without selecting.

 POS   C/LEN  DATA                                                    And/Or
                                                                More:    +
 17    eq     t'doe'                                                 AND
 8     eq     t'betty'                                               OR
 17    eq     t'doe'                                                 AND
 8____ eq___  t'john'_______________________________________________  ___
 _____ _____ ___________________________________________________________  ___
 _____ _____ ___________________________________________________________  ___
```

Figure 22: Example 2, Record selection criteria

Once the first set of criteria that are ANDed together fail, then the test moves to the OR and the second pair of criteria connected with an AND are evaluated. The result in this case:

```
MAX UNFORMATTED BROWSE 'MXS.TEST.KSDS'            KEY +1     COL 00001 00080
 COMMAND ===>                                                SCROLL ===> CSR
 Display:  DD - Dump Style  DF - Formatted  DH - Horizontal   ED - EDit file
                                                             L - Locate by KEY
 MAXLRECL=300       KEYLEN=7       KEYPOS=1      FILETYPE=K     SELECT=YES
*********************************TOP OF DATA**********************************
H011111BETTY    DOE            J555 PLAIN DR.       DENVER    CO....1997/03/24..
H011122JOHN     DOE            H555 PLAIN DR.       DENVER    CO....1997/03/24..
*******************************BOTTOM OF DATA*********************************
```

Figure 23: Example 2, Record selection criteria output

Formatted

The Record Selection Criterian panel (Formatted) is presented when viewing the file in either formatted or horizontal mode.

If mapping criteria is being used, the copybook for the currently viewed record will be displayed. Refer to the section titled "*6. Build Mapping Criteria* on page 91 for further information.

```
MAX SELECTION CRITERIA 'MXS.TEST.SAM'
 COMMAND ===>                                                SCROLL ===> PAGE
 Valid commands: SAVE, COPY.
 Enter GO to process record selection. Enter END to return without selection.
 Valid CONDitions are: EQ, NE, GT, GE, LT, LE.
                       =, <>,  >, >=,  <, <=     Valid CONnectors are: AND, OR
 POS   *---------FIELD NAME---------* FORMAT COND *----------DATA----------*CON
 00001 EMPLOYEE-RECORD                          __  _________________________  ___
 00001 EMPLOYEE-ID                              __  _________________________  ___
 00001 RECORD-TYPE                    C    1    __  _________________________  ___
 00002 EMPLOYEE-CODE                  N    6    __  _________________________  ___
 00008 EMPLOYEE-NAME                            __  _________________________  ___
 00008 NAME-FIRST                     C    9    __  _________________________  ___
 00017 NAME-LAST                      C   15    __  _________________________  ___
 00032 NAME-MIDDLE-I                  A    1    __  _________________________  ___
 00033 EMPLOYEE-ADDRESS                         __  _________________________  ___
 00033 STREET-ADDR                    C   20    __  _________________________  ___
 00053 CITY                           A   10    __  _________________________  ___
 00063 STATE                          A    2    __  _________________________  ___
 00065 EMPLOYEE-AMOUNT                P  5.2    __  _________________________  ___
 ******************************** Bottom of data ********************************
```

Figure 24: Record Selection Criterian panel (Formatted)

Field Definitions for selected parameters:

Valid commands: **COPY**, **SAVE**. See following pages for detailed descriptions of these primary commands used in this option.

COND: Logical operator - EQ (equal), NE (not equal), GT (greater than), LT (less than), GE (greater than or equal to) or LE (less than or equal). Logical Operators may be ANDed and/or ORed.

DATA: Data may be specified in hexadecimal, quoted strings or character strings. In formatted mode, all strings entered remain case sensitive.

- Data entered is validated against the defined format for that field.
- Blanks must be entered as a quoted string.

CON: AND/OR connector. If nothing is entered, the default is AND.

Record selection criteria is retained while within an **EDIT** or **BROWSE** session. It is also possible to save this criteria for use in a later session by use of the **SAVE** command. Subsequent retrieval of the criteria is accomplished by use of the **COPY** command. Selection criteria can be maintained as either a sequential file or as a member of a PDS.

COPY

This command restores a previously saved Selection Criteria data so that it may be used in this session. A panel will be presented prompting for the name of the data set containing the control records.

Note: Formatted and Unformatted selection criteria are NOT interchangeable and will return with an error if you attempt to mix the modes at this point. Once into the display records, you can freely switch between display formats.

If the criteria has been saved as a member of a PDS, use of a generic member name will provide the user with a list of members from which to choose. For example, enter the data set name as `MXS.TEST.COPYMEMS(A*)` and a list of all members beginning with the character 'A' will be presented. The member name can then be chosen from this list.

```
MAX SELECTION CRITERIA 'MXS.TEST.KSDS'                          Row 1 of 13
 C .-------------------------------------------------------------------. GE
 V | MAX - COPY SELECT CRITERIA                                        |
 E | COMMAND ===>                                                      |
 V |                                                                   | OR
 P | Specify "FROM" data set below.                                    | ON
 0 |                                                                   | __
 0 | From partitioned or sequential data set:                          | __
 0 |    DATA SET NAME. . : _____________________________               | __
 0 |    VOLUME SERIAL. . : ______      (If not cataloged)              | __
 0 |                                                                   | __
 0 | "FROM" data set options:                                          | __
 0 |   AUTO SAVE CHANGES . . . . . . . . . . . . . . . : YES    (Yes, No)  | __
 0 |                                                                   | __
 0 |    Press ENTER to perform copy request.                           | __
 0 |    Enter END command to cancel copy request.                      | __
 0 '-------------------------------------------------------------------' __
 00063 STATE                          A    2  EQ  CO                    ___
 00065 EMPLOYEE-AMOUNT                P  5.2  __  _________________________  ___
 ******************************** Bottom of data ********************************
```

Figure 25: Copy Select Criteria panel

Field Descriptions for selected functions:

AUTO SAVE CHANGES: When selection criteria changes in this session, automatically rewrite the selection criteria to this same data set.

SAVE

This command saves Selection Criteria data so that it may be used in a subsequent session. A panel will be presented prompting for the name of the data set to save the control records. The data set that is to contain the control records must have a record length of at least 80. Selection criteria can be saved as a member of a PDS.

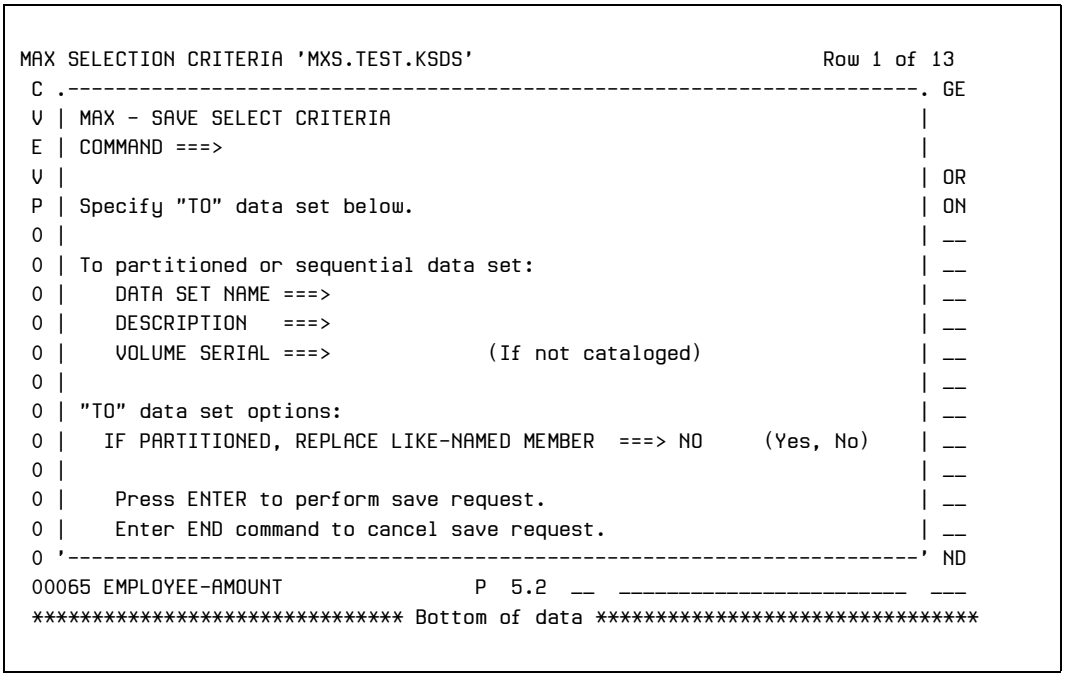

Figure 26: **SAVE** Select Criteria panel

RESET

This command will clear any selection criteria currently displayed on the panel. The panel will be displayed with no data, allowing entry of new selection criteria.

3. Data Set Utilities

The Data Set Utilities panel allows the execution of Data Set Utility functions. The Select Data Set Utility panel is presented as a "pop-up" when the Data Set Utilities option is selected on the Data Set Name panel.

```
MAX DATA/UTIL ------------- SPECIFY A DATASET NAME ------------- MAX DATA/UTIL
 COMMAND ===>

 Select one of the following. Then press Enter.
 3    0. Profile parameters            4. Update/search/count data set
.-------------------------------------------------------------------.
| MAX ----------------- SELECT DATA SET UTILITY ---------------- MAX  |
| COMMAND ===>                                                      |
|                                                                   |
| Select one of the following. Then press Enter.                    |
|                                                                   |
| _  A. Allocate new data set        C. Catalog data set            |
|    R. Rename entire data set       U. Uncatalog data set          |
|    D. Delete entire data set       I. data set Information        |
|    X. compress data set            M. Enhanced data set allocation | ntal)
|    V. IDCAMS utilities (VSAM)      B. copyBook display/print      |
|                                                                   |
| DATA SET NAME ===> 'MXS.TEST.KSDS'                                | e)
| VOLUME SERIAL ===> ______                                         |
'-------------------------------------------------------------------'


        (c) Copyright MAX SOFTWARE LLC. 1993 - 2000. All rights reserved.
         NOTICE: For demonstration purposes only, not for productive use.
```

Figure 27: Select Data Set Utility panel

Field Descriptions for selected functions:

A. Allocate new data set: Use this option to allocate a new data set. A panel will be displayed requesting the attributes for the new data set. The display data set information may be invoked prior to allocate in order to set the default attributes for the new data set. Only NON-VSAM data sets may be allocated with this function.

R. Rename entire data set: Use this to rename an entire data set. A panel will be displayed requesting the new name for the data set. Only NON-VSAM data sets may be renamed.

D. Delete entire data set: A conformation panel will be displayed before the data set is deleted. Once deleted there is no way to undelete the data set. Only data sets that are NON-VSAM or not password protected may be deleted.

X. compress data set: The compress utility recovers wasted (unused) space within a partitioned data set and makes it available for use.

V. IDCAMS utilities (VSAM): Use this option to transfer to the IDCAMS Utility for VSAM panel to invoke the IDCAMS Utility for VSAM data set processing. Refer to the section titled "*IDCAMS*" on page 52 for details on this option.

C. Catalog data set: A VOLSER must be specified to catalog a data set. Only NON-VSAM data sets may be cataloged.

U. Uncatalog data set: Only NON-VSAM data sets may be uncataloged.

I. data set Information: A panel will be displayed showing the attributes of the data set. The data set information display may be invoked prior to Allocate to set the default attributes for the data set to be allocated. Only NON-VSAM data sets have data set information displayed.

M. Enhanced data set allocation (of SMS controlled data sets).

B. copyBook display/print: This provides the following information about a copybook:

- position of the field
- length of the field
- level number
- field name
- field format.

IDCAMS

When the IDCAMS Utilities option is invoked, the IDCAMS Utility panel is displayed.

```
MAX --------------------------- IDCAMS UTILITY --------------------------- MAX
 COMMAND ===>

 Select one of the following. Then press Enter.
    A. Alter data set                    R. Repro data set
    B. Build alternate indexes           V. Verify data set
    D. Define data set                   I. data set Information
    E. dElete data set                   L. List data sets
    N. reName data set

 Specify entry name:
        Entry name ===> 'MXS.TEST.KSDS'
        Entry type ===>             (KSDS, ESDS, RRDS, LINEAR, VRRDS,
                                     AIX, ALIAS, GDG, NONVSAM, PATH, UCAT)
      Catalog name ===>

 Specify MODEL entry name (valid for DEFINE option only):
        Entry name ===>
      Catalog name ===>

 Parameter display ===> SHORT       (Full, Short)

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```

Figure 28: IDCAMS Utility panel

Field Descriptions for selected functions:

Command ===>: Select and enter desired function in this field. There are eight functions to select from:

A	ALTER data set	R	REPRO data set
B	Build alternate indexes	V	Verify data set
D	DEFINE data set	I	data set INFORMATION
E	DELETE data set	L	LIST data sets
N	RENAME data set		

See "*Major Functions*" on page 54 for further information.

Specify Entry Name: All IDCAMS utility services require an entry name to be supplied. The **LIST** data sets function allows a generic entry name to be entered.

Specify Entry Type: the following entry types are supported:

ALIAS	An entry that relates an alias (alternate entry name) to the real entry name in a User-catalog.
AIX	An Alternate IndeX is conceptually a key sequenced cluster that provides an alternate access to a base cluster. An AIX entry points to data and index components, as well as a base cluster entry.
KSDS	Key Sequenced VSAM Data Set is a data set whose records are loaded in a key sequence and controlled by an index. Includes data and index components.
ESDS	Entry Sequenced VSAM Data Set. is a data set whose records are loaded without respect to their contents. New records are always added to the end of the data set. Contains a data component only.
RRDS	Relative Record VSAM Data Set. A data set whose records are fixed length and are loaded without respect to their contents. Each record may be accessed via a relative record number assigned to it when loaded. Contains data component only.
VRRDS	Variable length RRDS VSAM data set that operates similar to the fixed length RRDS data set. An index component is used to control Relative Record Number processing. Includes data and index component.
LINEAR	A linear data set is a VSAM data set with a control interval size of 4096 to 32768 bytes in increments of 4096. It does not have embedded control information: all bytes are data bytes and it is processed in a similar manner to an ESDS with restrictions.
GDG	An entry which permits non-VSAM data sets to be associated (to maintain a historical collection) with other non-VSAM data set with the same name.
NONVSAM	A non-VSAM data set which may reside on tape or DASD.
PATH	An alias name that identifies an AIX and its base cluster.
UCAT	Pointed to by the Master-catalog and is used to alleviate contention on the Master-catalog and to facilitate volume portability.

`Specify MODEL Entry Name`: A MODEL entry name may be supplied to pre-load the parameter values for the **DEFINE** function. The equivalent may be accomplished by first requesting an **INFORMATION** function for an entry followed immediately by the **DEFINE** function.

`Parameter Display`: A full or short parameter display may be requested. '`FULL`' displays a complete list of the parameters supported. '`SHORT`' displays a minimum list of the most widely used parameters.

Major Functions

Major functions are invoked by selecting one of the eight major functions available on the IDCAMS Utility panel.

Function	Description
A. Alter data set	The **ALTER data set** function modifies the attributes of previously defined catalog entries. Entries may be renamed, volumes added or deleted, and various other parameters may be changed.
B. Build alternate indexes	The **BUILD alternate indexes** function builds alternate indexes for existing data sets.
D. Define data set	The **DEFINE data set** function defines (creates) new entries. The entry type may be Alternate-index (AIX), ALIAS, Clusters (KSDS, ESDS, RRDS, VRRDS, or LINEAR), Generation Data Group (GDG), Non-VSAM, Path, or User Catalog (UCAT). See *Figure 29: Define Data Set Function panel* on page 55.
E. dElete data set	The **DELETE data set** function deletes Catalogs, VSAM data sets, and non-VSAM data sets.
N. reName data set	The **RENAME data set** function will rename a VSAM data set. The cluster, as well as the data and index (if present) entries will be renamed.
R. Repro data set	The **REPRO data set** function copies VSAM and non-VSAM data sets, copies catalogs, and unloads and reloads VSAM catalogs.
V. Verify data set	The **VERIFY data set** function ensures the catalog correctly reflects the end of the data set after an error has occurred closing the data set.
I. data set Information	The **data set INFORMATION** function creates a complete detailed listing of a catalog entry.
L. List data sets	When the **LIST data sets** function is invoked a list of data sets that match the entry name and entry type specified is displayed. Creates a list of entry names from a high-level qualifier.

Once a major function has been selected and the appropriate panel is presented to the user, parameter entry is accomplished by moving the cursor to the desired parameter and over-typing data to modify.

Scrolling may be used to view other parameters not displayed on current panel. See the following example.

```
MAX DEFINE KSDS='MXS.TEST.MARKSDS' --------------------------- MODEL PROCESSED
 COMMAND ===>                                                  SCROLL ===> PAGE
 Commands . . CHECK      (Syntax check parameters)
              RUN        (run IDCAMS)
              SAVE       (save parameters in data set)

 Type over data to modify parameters, use SCROLLING to view others. Position
 cursor to a parameter and press Enter to view detail description.

 CLUSTER'S ENTRYNAME. . . . . . . MXS.TEST.MARKSDS
  KEYED-SEQUENCED DATA SET. . . . INDEXED
  REUSE|NOREUSE . . . . . . . . . NOREUSE
  SHARE CROSS REGION, SYSTEM  N,N 2,3
 ENTRYNAME OF THE DATA COMPONENT. MXS.TEST.MARKSDS.DATA
  CYLINDERS|RECORDS|TRACKS. . . . TRACK
   DATA PRIMARY SPACE ALLOCATION. 1
   DATA SECONDARY SPACE ALLOC . . 1
  DATA CONTROL INTERVAL SIZE. . . 22528
  DATA CI-PERCENT FREE. . . . . . 10
  DATA CA-PERCENT FREE. . . . . . 10
  KEY LENGTH. . . . . . . . . . . 7
  KEY OFFSET. . . . . . . . . . . 0
  AVERAGE RECORD SIZE . . . . . . 72
  MAXIMUM RECORD SIZE . . . . . . 300
```

Figure 29: Define Data Set Function panel

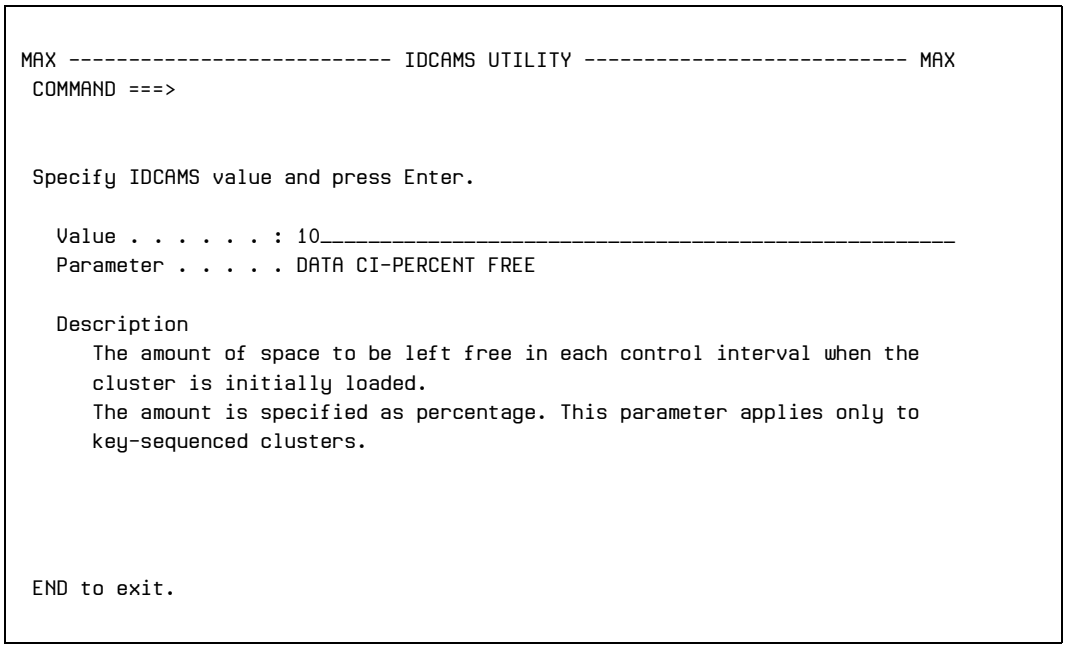

Figure 30: Detailed Parameter Description panel

Parameter Verification (Parameter Errors)

Each parameter entered on a Major Function panel is verified as it is entered. If a parameter does not pass the verification criteria, a panel similar to the following is displayed along with a message indicating the problem.

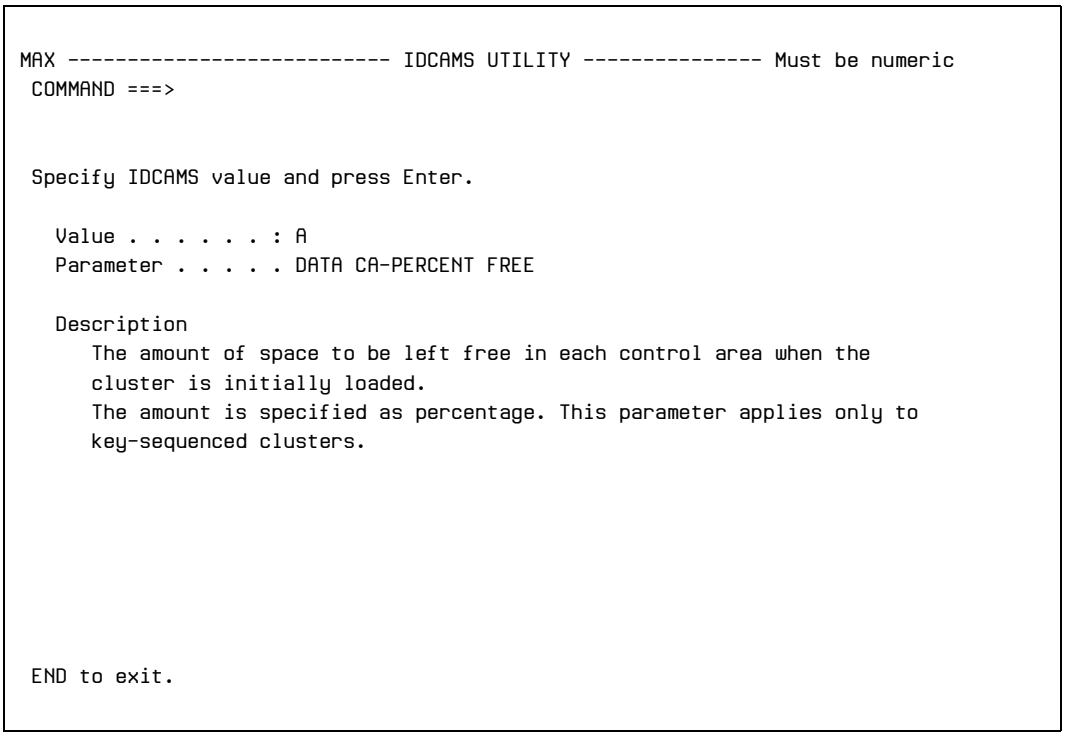

Figure 31: Parameter Verification panel

Parameter Entry Primary Commands

When all the necessary parameters' values have been entered and/or modified, a primary command may be entered to **CHECK**, **RUN** or **SAVE** the parameters.

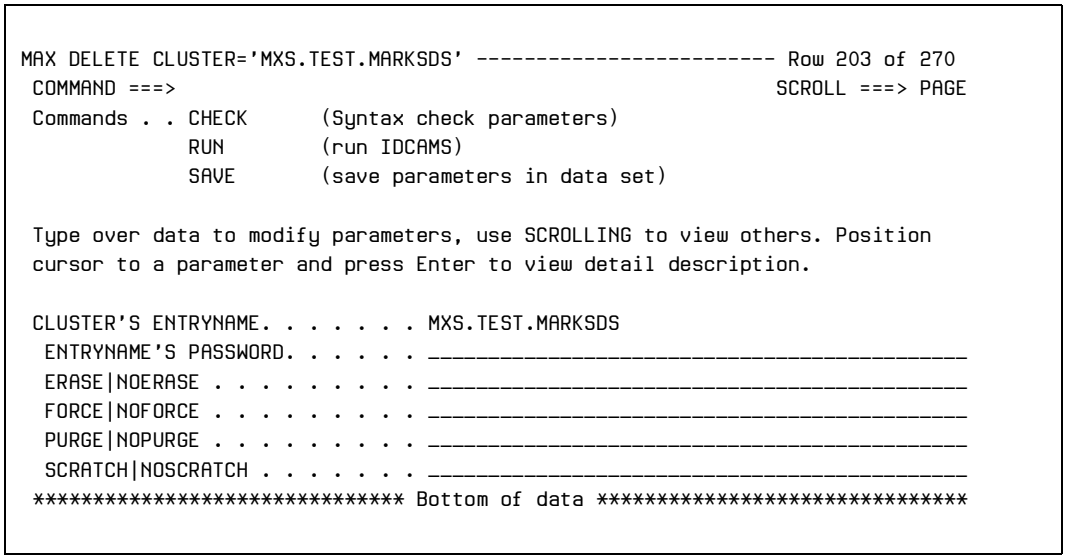

Figure 32: Delete Data Set Function panel

Parameter Entry Primary Command Panels

The following panels show the formats of the panels displayed for each Parameter Entry Primary Command:

CHECK, **RUN** and **SAVE**

CHECK

This command invokes only a syntax check on the parameters. The IDCAMS parameter listing will be presented in browse mode to allow further examination of the parameters. Upon return from the browse, if an error was detected, the parameter that caused the error will be positioned to the top of the entry display along with a message. If no error was detected, the display panel will be positioned as it was preceding the **CHECK** command.

```
Menu  Utilities  Compilers  Help
 ------------------------------------------------------------------------------
 BROWSE    SYS01039.T105208.RA000.MX11002.R0116113    Line 00000000 Col 001 080
 Command ===>                                           Scroll ===> PAGE
******************************** Top of Data ********************************


             DELETE                                                 -00000000
             (MXS.TEST.MARKSDS,                                     -00000191
             )                                                      -00000193
             CLUSTER                                                 00000191

 /* ************************************************************** */ 00000191
 /* END CONTROL CARDS GENERATED BY THE MAX/IDCAMS UTILITY          */ 00000191
 /* ************************************************************** */ 00000191


IDC0002I IDCAMS PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS 0
******************************** Bottom of Data ******************************
```

Figure 33: Parameter Entry panel, **CHECK** Primary Command

RUN

This command invokes IDCAMS to run the parameters. If a problem is detected the IDCAMS listing will be presented in browse mode to allow further investigation of the problem. Upon return from browse, the parameter that caused the error will be positioned to the top of the display along with a message.

```
Menu  Utilities  Compilers  Help
 ------------------------------------------------------------------------------
 BROWSE    SYS01039.T105033.RA000.MX11002.R0116106    Line 00000000 Col 001 080
 Command ===>                                            Scroll ===> PAGE
******************************** Top of Data ********************************

             DELETE                                                  -00000000
             (MXS.TEST.MARKSDS,                                      -00000191
             )                                                       -00000193
             CLUSTER                                                  00000191
IDC0550I ENTRY (D) MXS.TEST.MARKSDS.DATA DELETED
IDC0550I ENTRY (I) MXS.TEST.MARKSDS.INDEX DELETED
IDC0550I ENTRY (C) MXS.TEST.MARKSDS DELETED
IDC0001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0

 /* ************************************************************ */ 00000191
 /* END CONTROL CARDS GENERATED BY THE MAX/IDCAMS UTILITY        */ 00000191
 /* ************************************************************ */ 00000191
IDC0002I IDCAMS PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS 0
******************************** Bottom of Data ********************************
```

Figure 34: Parameter Entry panel, **RUN** Primary Command

SAVE

This command generates the IDCAMS control records and saves them in a data set. A panel will be presented prompting for the name of the data set to receive the control records. The data set that is to contain the control records must have a record length of at least 80.

```
MAX --------------------------- IDCAMS UTILITY --------------------------- MAX
 COMMAND ===>


 SPECIFY "TO" DATA SET BELOW. (Only if option 2 selected)

 TO PARTITIONED OR SEQUENTIAL DATA SET:
    DATA SET NAME ===>
    VOLUME SERIAL ===>              (If not cataloged)

 "TO" DATA SET OPTIONS:
   IF PARTITIONED, REPLACE LIKE-NAMED MEMBER  ===> NO      (YES or NO)
   IF SEQUENTIAL, "TO" DATA SET DISPOSITION   ===> OLD     (OLD or MOD)
   SPECIFY PACK OPTION FOR "TO" DATA SET      ===>         (YES, NO or blank)
   COPY AND LOCK MEMBER                       ===>         (YES, NO or blank)

    Enter END command to cancel this operation.
```

Figure 35: Parameter Entry panel, **SAVE** Primary Command

4. Update Data Set

The Update Data Set option is used to update selected records in a data set. Record select/change criteria may be specified to change a subset of records. The changes can be verified prior to the actual update. Note that if the special record handling exit option was set to YES on the **PROFILE** panel, and the name of the record exit was entered on the "Specify A Data Set Name" panel, the exit will be invoked to process the update of this file.

```
.-------------------------------------------------------------------------.
| MAX UPDATE DSN='MXS.TEST.SAM'                                           |
| COMMAND ===>                                                            |
|                                                                         |
| Verify data set below.                                                  |
| Sequential data set or VSAM cluster:                                    |
|   Data Set Name ===> 'MXS.TEST.SAM'                                     |
|   Volume Serial ===>                  (If not cataloged)                |
|                                                                         |
| Update, delete, count, or verify request:                               |
|   Action Request        ===> VERIFY   (Verify-preview changes only)     |
|                                       (Count -preview changes, count all) |
|                                       (Update-process changes)          |
|                                       (Delete-process deletes)          |
|                                       (Submit-build MAX/BATCH job)      |
|   For VERIFY request:                                                   |
|     Preview Count       ===> 200      (0=preview all records)           |
|     Preview Format      ===> LIST     (List,Dump,Formatted)             |
|                                                                         |
|     The COUNT request will provide a count of all records to be changed. |
|                                                                         |
|   Enter GO  command to initiate UPDATE request.                         |
|   Enter END command to cancel request.                                  |
'-------------------------------------------------------------------------'
```

Figure 36: Update Data Set panel

Field Descriptions for Update select/change panel

DATA SET NAME: The data set name entered on the main panel will display on this panel. It is now possible to change the name of the data set to be updated.

VOLUME SERIAL: If the data set to be updated is not cataloged, the volume serial number is required.

ACTION REQUEST:

VERIFY: Will display all selected records and changes in a Browse display (no actual updating will be performed). If this option is selected, you must specify the maximum count of records to be browsed in the preview count field. No actual updates or deletions will be made to the file.

COUNT: Will count the number of records in the file that would be selected by this request. Again, no actual changes are made to the file, but a count of ALL records in the file that would be selected is returned, along with the total count of records in the file.

UPDATE: Will perform the update to the file. Enter this option once the changes have been verified and the update is to be processed.

DELETE: Will delete selected records while in update mode. All records that are selected for processing will be deleted. To see a list of records that will be deleted, use **VERIFY**. All records selected will be shown in a Browse display but they will not be deleted from the file until the **DELETE** request is entered.

SUBMIT: Will build a batch job using MAX/Batch for you to review and submit for processing. This requires MAX/Batch be installed on the system.

Note: When **SUBMIT** is the request, the batch job will be generated with the **UPDATE** command. If this is to be a batch Delete, simply change the command to **DELETE** prior to submitting the job.

PREVIEW COUNT: Enter the number of records to be verified. This is the number of records chosen or changed to be viewed in Browse mode to assist in verifying that the changes are correct prior to performing the actual update. This value is required when ACTION REQUEST = VERIFY is chosen.

Enter 0 (zero) to verify **ALL** records are to be changed.

PREVIEW FORMAT: Enter the format for the presentation of the data in VERIFY. The default is LIST, this option will present each record in character format. Choose DUMP to have the records presented in both hexadecimal and character formats. To present the data along with a copybook, choose the FORMATTED option. The copybook or map name entered on the main panel will be used to format the data.

Once all options are complete on this panel, enter GO to proceed to the panel to enter the update and change criteria. See the following section Update/Copy Select and Change Criteria for details on this criteria. Enter END to return without executing the update.

Update/Copy Select and Change Criteria

For all **UPDATE**s and any **COPY** where `RECORD SELECT AND CHANGE` is set to `YES`, the following panel will be presented for entry of this criteria.

```
MAX COPY SELECTION for 'MXS.TEST.KSDS'
 COMMAND ===>
 Enter GO to select and change data, or END to return without selecting.
 Valid commands: GO, RESET, SAVE, COPY, MAP
 Enter ? in any field for entry assistance.
           COND/
    BEGIN  LENGTH SEARCH DATA                                          And/Or
                                                              More:     +
 1. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 2. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 3. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 4. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 5. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 6. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 7. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
 8. _____  _____  ____________________________________________________  ___
    Action:  REPLACE     ____________________________________________
```

Figure 37: Select and Change Criteria panel

This criteria uses full Boolean logic to select records for processing. At the same time, it allows for record changes and modifications to be made using any of the following actions: **REPLACE**, **EDIT**, **CHANGE**, **TRANSLATE**, **SCRAMBLE**, **UNSCRAMBLE**, **CALCAMT** (calculate amount) and **CALCDATE** (calculate date). The panel allows for up to 32 selections and actions to be performed.

Valid primary commands

The following commands are valid as primary commands on this panel.

GO: Enter the **GO** command once all of the selection and change criteria have been entered. This command initiates the **UPDATE** or **COPY** request.

END: Enter the **END** command to cancel the request and return to the prior panel.

RESET: Enter the **RESET** command to clear all select and change data that has been entered on the panel.

SAVE: The **SAVE** command allows you to write the select and change criteria to a data set and member. This criteria can be used for subsequent **UPDATE** or **COPY** options. The selection options can also be used as select options for **EDIT** and **BROWSE**.

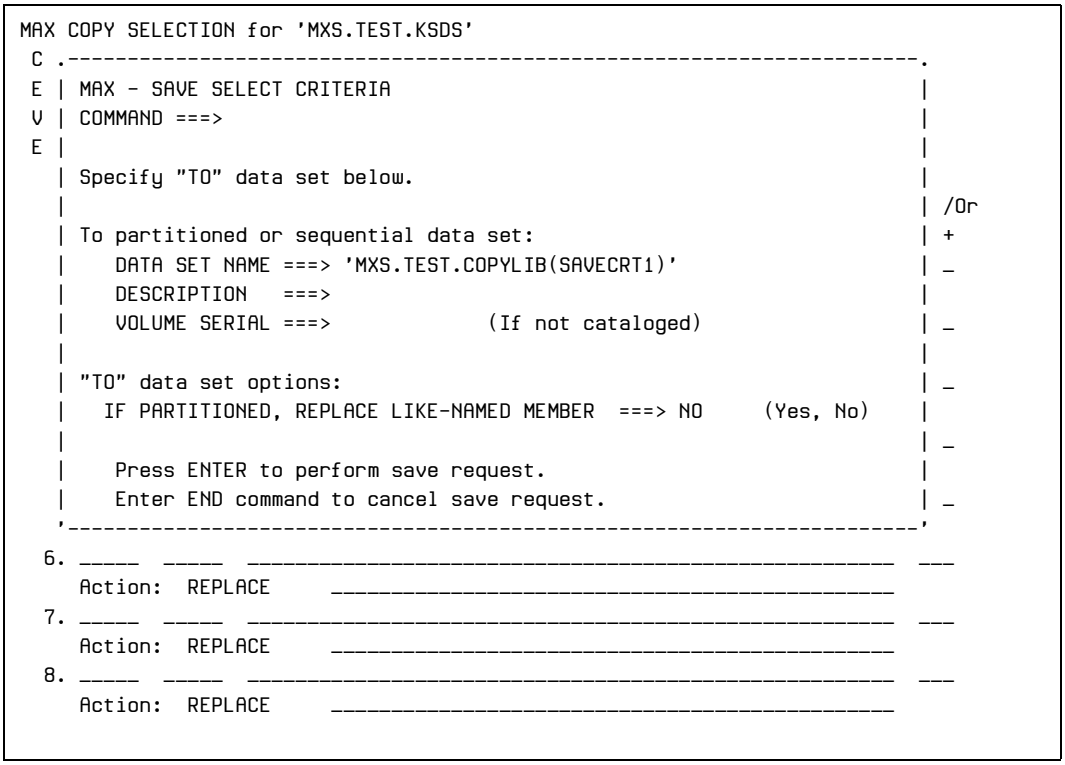

Figure 38: **SAVE** Select and Change Criteria panel

Enter the data set name (and member) of where to save the record selection criteria. Note this data set must have a record length of at least 80 bytes.

Enter an optional description to identify this criteria.

If the data set is not cataloged, enter the volume serial number for the data set.

Optionally choose to replace or not to replace a member with the same name if the data set is a PDS.

COPY: Use the **COPY** primary command to retrieve prior saved select and change criteria. Enter the **COPY** primary command and the following panel will be presented.

```
MAX COPY SELECTION for 'MXS.TEST.KSDS'
 C .-------------------------------------------------------------------------.
 E | MAX - COPY SELECT CRITERIA                                              |
 V | COMMAND ===>                                                            |
 E |                                                                         |
   | Specify "FROM" data set below.                                          |
   |                                                                         | /Or
   | From partitioned or sequential data set:                                | +
   |    DATA SET NAME. . : ___________________________________               | _
   |    VOLUME SERIAL. . : ______      (If not cataloged)                    |
   |                                                                         | _
   | "FROM" data set options:                                                |
   |   AUTO SAVE CHANGES . . . . . . . . . . . . . . . : YES    (Yes, No)    | _
   |                                                                         |
   |    Press ENTER to perform copy request.                                 | _
   |    Enter END command to cancel copy request.                            |
   '-------------------------------------------------------------------------' _
     Action:  REPLACE     ____________________________________________
  6. _____  _____  ____________________________________________________  ___
     Action:  REPLACE     ____________________________________________
  7. _____  _____  ____________________________________________________  ___
     Action:  REPLACE     ____________________________________________
  8. _____  _____  ____________________________________________________  ___
     Action:  REPLACE     ____________________________________________
```

Figure 39: **COPY** Select and Change Criteria panel

Enter the data set name of where the criteria has been saved. If the criteria has been saved as a member of a PDS, a generic member name will result in a selection list from which the correct member can be chosen.

For example: To retrieve a list of all members with the first two characters of CB, type the entry as: DSN.QUAL.NAME(CB*)

"FROM" data set options:

AUTOSAVE CHANGES: Enter YES in this option and, when the selection criteria is changed during this session, it will automatically be updated on the data set. Enter NO to prevent automatic updates of the criteria.

MAP: Entry of the primary command **MAP** will take you to Option 6. Build Mapping Criteria. This command is useful once you begin to select fields to be processed and discover you have not entered the correct mapping criteria member on the initial panel. Use this command to change to the correct mapping member while retaining your position in the **Update** or **Copy** option. Refer to the section titled "*6. Build Mapping Criteria* on page 91 for further details.

Field Descriptions for selected parameters

?: For all parameters in this section of the panel, detailed entry assistance is available by simply typing a '?' into the field. Details of the use of this '?' follow throughout the remainder of this topic.

BEGIN: Enter the position in the record, not greater than the record length, of where the search is to begin. If this position is not known, enter a '?' in this field as shown below.

```
MAX COPY SELECTION for 'MXS.TEST.KSDS'
 COMMAND ===>
 Enter GO to select and change data, or END to return without selecting.
 Valid commands: GO, RESET, SAVE, COPY, MAP
 Enter ? in any field for entry assistance.
           COND/
    BEGIN  LENGTH SEARCH DATA                                          And/Or
                                                                More:     +
  1. ?____  _____  ____________________________________________________  ___
    Action:  REPLACE     _______________________________________________
```

Figure 40: **BEGIN** Prompt panel

The first time a '?' is entered into the **BEGIN** field, you will be asked to confirm the map or copybook name. It is at this point that the **MAP** primary command may need to be used to change the map name. Once the map or copybook name is confirmed, if the member is found to be a map, the following panel is presented.

```
MAX - Choose Copybook from Map                                  Row 1 of 2
 COMMAND ===>                                                SCROLL ===> PAGE

 Enter the id number of the copybook you wish to expand ==>
 Enter END to return with no selection.

   1    Data set name  MAX.MP3000.COPYLIB(CBHDR)
         Record DESC.: HEADER (H) RECORD              Copybook type COBOL
   2    Data set name  MAX.MP3000.COPYLIB(CBDTL)
         Record DESC.: Detail type I                  Copybook type COBOL
 ******************************** Bottom of data ********************************
```

Figure 41: Copybook Selection panel

Enter the number of the copybook to use for selection of begin position. The copybook will then be presented. If the initial entry was a copybook as opposed to a map, the '?' will take you directly to the copybook screen that follows.

```
MAX - Choose Copybook from Map                                    Row 1 of 2
  .-------------------------------------------------------------------------.
  | MAX COPYBOOK FIELD SELECTION                          Please select entry |
  | COMMAND ===>                                            SCROLL ===> PAGE  |
  |                                                                           |
  | A record is to be selected only if a test CONDition for the SEARCH DATA   |
  | string is true. Select a field within the recprd copybook to identify the |
  | BEGIN position of the SEARCH DATA string.                                 |
  |                                                                           |
  |                                                                           |
  | Type S next to the desired entry and press ENTER to select; or            |
  | Enter the END command to return without selection                         |
  |         FIELD                                                             |
  | SELECT  POSN      LEVEL  *---------FIELD NAME---------*  FORMAT  LENGTH  |
  |   _     00001      01    EMPLOYEE-RECORD                 GROUP   00083   |
  |   _     00001      05    EMPLOYEE-ID                     GROUP   00007   |
  |   _     00001      10    RECORD-TYPE                     A     1 00001   |
  |   _     00002      10    EMPLOYEE-CODE                   N     6 00006   |
  |   _     00008      05    EMPLOYEE-NAME                   GROUP   00025   |
  |   _     00008      10    NAME-FIRST                      A     9 00009   |
  |   _     00017      10    NAME-LAST                       A    15 00015   |
  |   _     00032      10    NAME-MIDDLE-I                   A     1 00001   |
  |   _     00033      05    EMPLOYEE-ADDRESS                GROUP   00032   |
  '-------------------------------------------------------------------------'
```

Figure 42: Field Selection panel

At this point, typing 'S' in the column next to an entry will select that value to be placed in the field in which the '?' was entered. Entering the **END** command will return without selecting any value.

The **LF** (locate field) command may be entered to position the list to a specific or generically specified copybook field name. The **LF** command (long format **LOCATEF**) can be used to quickly locate any field within a copybook to generically position to the next fieldname beginning with a specified character string, or to position to the next field with a specified character string anywhere within the field.

For example: `LF NAME-FIELD`

As a result of this command, the copybook will be repositioned with the requested field at the top of the screen. If you are working with a PL/I copybook, you should enter the underscores as appropriate for the fieldnames defined: `LF PL_ONE_FIELD_NAME`.

To locate a field generically, enter the command as `LF NAME*`. This command would cause a search forward from the current field at the top of the screen and redisplay the copybook with the first occurrence of a field that begins with these characters positioned at the top of the screen.

To locate a field containing a specific character string, enter the command as LF *NAME. This format of the command would cause a search forward from the current field at the top of the present screen and redisplay the copybook with the first occurrence of a field that contains these characters anywhere within the field name. The syntax is:

```
COMMAND ===> LF fieldname  or
COMMAND ===> LF characters* or
COMMAND ===> LF *characters
```

Once the field is 'S'elected, you will return to the Select and Change Criteria panel with the begin value entered into the field. For example, if the field selected on the prior panel was EMPLOYEE-CODE, the panel would appear as follows.

```
MAX COPY SELECTION for 'MXS.TEST.KSDS'                          Invalid value
 COMMAND ===>
 Enter GO to select and change data, or END to return without selecting.
 Valid commands: GO, RESET, SAVE, COPY, MAP
 Enter ? in any field for entry assistance.
           COND/
    BEGIN  LENGTH SEARCH DATA                                          And/Or
                                                                More:     +
  1. 2      _____  ____________________________________________________  AND
     Action:  REPLACE     _____________________________________________
  2. _____  _____  ____________________________________________________  ___
```

Figure 43: Selection panel

COND/LENGTH: Enter a logical operator (EQ, NE, GT, GE, LT, LE) or numeric. If numeric, a scan starting at the BEGIN position for an equal match to DATA will be performed for this LENGTH. Specify 0 (zero) to scan the remainder of the record.

As with the BEGIN field, if not sure about exactly what to enter into the COND/LENGTH field, type a '?' and press ENTER.

```
MAX COPY SELECTION for 'MXS.TEST.SAM'
  .-------------------------------------------------------------------------.
  | MAX TEST CONDITION SELECTION                          Please select entry |
  | COMMAND ===>                                            SCROLL ===> PAGE  |
  |                                                                           |
  | A record is to be selected only if a test CONDition for the SEARCH DATA   |
  | string at BEGIN position 2 is true. Select the test CONDition to be       |
  | performed from the list below. Enter a "?" for entry assistance.          |
  |                                                                           |
  |                                                                           |
  | Type S next to the desired entry and press ENTER to select; or            |
  | Enter the END command to return without selection                         |
  |         TEST                                                              |
  | SELECT  COND       DESCRIPTION                                            |
  |   _     EQ         Retrieved data EQUAL to search data                    |
  |   _     NE         Retrieved data NOT EQUAL to search data                |
  |   _     GT         Retrieved data GREATER THAN search data                |
  |   _     GE         Retrieved data GREATER THAN OR EQUAL to search data    |
  |   _     LT         Retrieved data LESS THAN search data                   |
  |   _     LE         Retrieved data LESS THAN OR EQUAL to search data       |
  |   _     nn         SCAN LENGTH=nn bytes from BEGIN pos for EQUAL match    |
  |   _     0          SCAN REST OF DATA from BEGIN pos for EQUAL match       |
  |   _     =          Retrieved data EQUAL to search data                    |
  '-------------------------------------------------------------------------'
```

Figure 44: Test Condition Selection panel

A scrollable panel explaining the various options will be presented. Choose the appropriate option or END to return without selecting an option.

SEARCH DATA: The search for string can be a character string, quoted, string, packed string, or hexadecimal string. Quoted strings are case sensitive while non-quoted strings are case insensitive.

This field will also accept the '?'. However, in the case of data strings, this must be entered as the first character in the field. In all other positions, the '?' character is considered to be part of the entered search data string. Entry of a '?' in the first position will present templates of the various formats that are accepted in this field. Choose the appropriate template, then on return to the Select and Change Criteria panel, modify the template with the data you want to search for in the record.

ACTION: The default action, as shown on the Select and Change Criteria panel, is REPLACE. However, several options are available. The ACTION is only relevant once a change to data string is entered. If no change to data is entered, simply skip the ACTION field. Multiple selection conditions can be combined before an action is performed.

The following are valid actions:

REPLACE: Replaces search data with new data overlaying any following characters if necessary.

EDIT: Edits search data text with new data preserving following nonblank characters by removing repeating spaces and shifting.

CHANGE: Changes search data with new data shifting any following characters left/right to accommodate missing/extra bytes.

TRANSLATE: Substitutes specified characters in a designated string with corresponding characters in another target string or table.

SCRAMBLE: Encodes a specified string to maximize data privacy.

UNSCRAMBLE: Decodes a specified string that was encoded with **SCRAMBLE**.

CALCAMT: Recalculates an amount field using constants or another field.

CALCDATE: Recalculates a date field forward/backward by a number of days.

At entry time, if uncertain of the action, enter a '?' in the ACTION field. A list of valid actions along with a brief description will be presented. Choose an action from this list or END to return without a selection.

CHANGE TO: If the action is **REPLACE**, **EDIT**, or **CHANGE**, the change to field may be a character string, quoted, string, packed string, or hexadecimal string. Alternatively, for any of the actions, the actual MAX MVS/UTIL Batch operand format corresponding to the specified action may be entered directly enclosed in parentheses.

If using **REPLACE**, enter a '?' in the first position of the `change to` data field. The following panel will appear.

```
MAX COPY SELECTION for 'MXS.TEST.SAM'
  .-------------------------------------------------------------------------.
  | MAX REPLACE STRING                                                      |
  | COMMAND ===>                                                            |
  |                                                                         |
  | REPLACE will overlay a SEARCH DATA string in the record with a NEW      |
  | DATA string if a test CONDition is true.  Any characters immediately    |
  | following the replaced string will also be overlayed if necessary.      |
  | Enter ? in any field for entry assistance.                              |
  |                                                                         |
  | Replace criteria:                                                       |
  |   BEGIN POSITION   ===> 2           (1-32760)                           |
  |   COND/LENGTH      ===> EQ                                              |
  |                                                                         |
  | Search data:                                                            |
  |   CHARACTER STRING ===> T'ABC'_____________________________________     |
  |                                                                         |
  | New data:                                                               |
  |   CHARACTER STRING ===> ___________________________________________     |
  |                                                                         |
  |   Enter GO  command to generate replace request.                        |
  |   Enter END command to cancel request.                                  |
  |                                                                         |
  '-------------------------------------------------------------------------'
```

Figure 45: **REPLACE** String panel

This panel shows the begin position, the cond/length and the search for character string. An explanation of **REPLACE** is provided explaining that the replacement data will overlay the record at the position of the found search string. No adjustments will be made to the record. If the replacement string is longer than the search string, it will overlay data beyond the end of the search string.

You can enter the new data directly at this point. However, if you are not sure of the format, enter a '?' in the first position. A panel will be presented showing templates for the possible data formats. Select a template and return to the prior panel to enter the data into the template. Enter `GO` to generate the replace format on the selection panel.

Both **CHANGE** and **EDIT** are similar to the **REPLACE** action. However, instead of simply overlaying the record at the position of the match of the search for string, **CHANGE** will shift the resulting data left/right to accommodate for the missing/extra bytes of data in the record. **EDIT** is a text processing `ACTION`; data is shifted by adding or removing spaces as necessary.

Entering a '?' in the first character of the `change to` string when the action is **TRANSLATE**, the following panel will display.

```
MAX COPY SELECTION for 'MXS.TEST.SAM'
 .-------------------------------------------------------------------------.
 | MAX TRANSLATE CHARACTERS IN RECORD                                      |
 | COMMAND ===>                                                            |
 |                                                                         |
 | TRANSLATE will substitute selected characters in the record with the    |
 | corresponding replacement characters beginning at the entered POSITION  |
 | for the entered LENGTH.  Enter ? in any field for entry assistance.     |
 |                                                                         |
 | Translate criteria:                                                     |
 |   BEGIN POSITION   ===> 2          (1-32760)                            |
 |   LENGTH           ===>            (0-32760, 0=Remainder of segment)    |
 |                                                                         |
 | Selected characters to be replaced (Blank=ALL characters):              |
 |   CHARACTER STRING ===> ____________________________________________    |
 |                                                                         |
 | Replacement characters (Specify character string OR external table):    |
 |   CHARACTER STRING ===> ____________________________________________    |
 |   EXTERNAL TABLE   ===> ________   (Contained in MAXDFLTS table)        |
 |   PAD CHARACTER    ===> _______    (Default replacement character)      |
 |                                                                         |
 |   Enter GO  command to generate translate request.                      |
 |   Enter END command to cancel request.                                  |
 '-------------------------------------------------------------------------'
```

Figure 46: **TRANSLATE** Character panel

Following the same format as **REPLACE**, **CHANGE** and **EDIT**, a brief explanation of the **TRANSLATE** action is presented. A more detailed explanation is available by pressing the HELP key.

TRANSLATE: Will substitute selected characters in the record with the corresponding replacement characters beginning at the entered position for the entered length. Again on this panel, a '?' in any field will provide detail on that field.

Additional information required for the **TRANSLATE** action consists of length, characters to be replaced, replacement characters which can be specified or contained in an external translate table, and a pad character which is used when no replacement character exists for a selection character. External translate tables are contained in the MAXDFLTS module. By entering a '?' in the EXTERNAL TABLE entry, a list of tables available in the MAXDFLTS module will be provided. See Appendix B on page 107 for details of this module.

Enter the following for length, selection characters, and target characters and type GO.

```
Translate criteria:
   BEGIN POSITION   ===> 2          (1-32760)
   LENGTH           ===> 25         (0-32760, 0=Remainder of segment)

 Selected characters to be replaced (Blank=ALL characters):
   CHARACTER STRING ===> C'ABCDEFGH'_____________________________________

 Replacement characters (Specify character string OR external table):
   CHARACTER STRING ===> C'abcdefgh'_____________________________________
```

Figure 47: **TRANSLATE** panel, Example

The **TRANSLATE** will contain the correct syntax for the MAX MVS/UTIL Batch utility.

```
1. 2      EQ     T'ABC'                                                  AND
    Action:  TRANSLATE   (2,25,C'abcdefgh',C'ABCDEFGH')
```

Figure 48: **TRANSLATE** Results panel

At any time, you can type the formats directly on the selection panel. However, use of the detail entry panels ensures valid formats.

The **SCRAMBLE** and **UNSCRAMBLE** actions are used in concert to encode and decode data.

SCRAMBLE: This action will substitute specified characters in a selected record with encoded characters beginning at the requested position for a given length. An advanced algorithm formulated to maximize data privacy is used to encode the data. This data can then be decoded with the **UNSCRAMBLE** action.

When entering a '?' in the first position of the change to field, the following panel displays.

```
MAX COPY SELECTION for 'MXS.TEST.SAM'
  .-------------------------------------------------------------------------.
  | MAX SCRAMBLE CHARACTERS IN RECORD                                       |
  | COMMAND ===>                                                            |
  |                                                                         |
  | SCRAMBLE will substitute selected characters in the record with the     |
  | encoded characters beginning at the entered POSITION for the entered    |
  | LENGTH using an advanced algorithm formulated to MAXimize data privacy. |
  | Enter ? in any field for entry assistance.                              |
  |                                                                         |
  | Scramble criteria:                                                      |
  |   BEGIN POSITION   ===> 108          (1-32760)                          |
  |   LENGTH           ===>              (0-32760, 0=Remainder of segment)  |
  |                                                                         |
  | Selected characters to be scrambled (Blank=ALL characters):             |
  |   CHARACTER STRING ===> _____________________________________________   |
  |                                                                         |
  |   One of the following reserved words may also be specified:            |
  |   ALPHA,UPPER,LOWER,ALPHAMERIC,NUMERIC,PACKED                           |
  |                                                                         |
  |   Enter GO  command to generate scramble request.                       |
  |   Enter END command to cancel request.                                  |
  |                                                                         |
  '-------------------------------------------------------------------------'
```

Figure 49: **SCRAMBLE** Character panel

Enter the length of the field to be translated, type a '?' in the CHARACTER STRING field and press ENTER. A scrollable list of all the options for selecting the characters to the scramble is displayed.

```
MAX COPY SELECTION for 'MXS.TEST.SAM'
  .-------------------------------------------------------------------------.
  | MAX SCRAMBLE CHARACTER SELECTION                            Row 1 of 9 |
  | COMMAND ===>                                              SCROLL ===> PAGE  |
  |                                                                         |
  | A SCRAMBLE action will be performed on the record beginning at position    |
  | 108 for length 20. While all is the default, a set or type of character    |
  | (e.g. NUMERIC) may be identified to scramble. Select an entry from the     |
  | list below identifying the SELECTED CHARACTER set.                        |
  |                                                                         |
  | Type S next to the desired entry and press ENTER to select; or             |
  | Enter the END command to return without selection                          |
  |         CHARACTER                                                       |
  | SELECT  SET        DESCRIPTION                                          |
  |   _     Blank      ALL characters            - case sensitive           |
  |                    Every character encountered                          |
  |   _     NUMERIC    NUMERIC characters        - numeric characters       |
  |                    Any numeric character 0-9                            |
  |   _     PACKED     PACKED decimal format     - including sign           |
  |                    Valid packed decimal format with low order sign      |
  |   _     ALPHAMERIC ALPHA NUMERIC characters  - case sensitive           |
  |                    Any lowercase a-z, uppercase A-Z, numeric 0-9 character |
  |   _     ALPHA      ALPHABETIC characters     - case sensitive           |
  '-------------------------------------------------------------------------'
```

Figure 50: **SCRAMBLE** Character Selection panel

```
CHARACTER
 SELECT  SET        DESCRIPTION
   _     ALPHA      ALPHABETIC characters     - case sensitive
                    Any lowercase a-z, uppercase A-Z character
   _     UPPER      UPPERCASE characters      - case insensitive
                    Any uppercase A-Z character
   _     LOWER      LOWERCASE characters      - case insensitive
                    Any lowercase a-z character
   _     C'abc'     CHARACTER string template - case sensitive
                    Contains any valid character, space, double quote
```

Figure 51: **SCRAMBLE** Character Selection panel *(continued)*

```
CHARACTER
SELECT  SET         DESCRIPTION
  _     X'F0F1'     HEX string template       - preceded by X
                    Contains even number of hex characters 0-9 A-F
****************************** Bottom of data ******************************
```

Figure 52: **SCRAMBLE** Character Selection panel *(continued)*

Data chosen to be encoded can be entered specifically as character or hexadecimal strings or as any one of several key words listed. Absence of entry (or choice of Blank) will cause all characters to be scrambled. Key words for selecting characters for scrambling are:

NUMERIC: Any numeric 0-9.

PACKED: Valid packed decimal format with low order sign.

ALPHAMERIC: Any lowercase (a-z), uppercase (A-Z) or numeric (0-9) character.

ALPHA: Any lowercase (a-z) or uppercase (A-Z) character.

UPPER: Any uppercase (A-Z) character.

LOWER: Any lowercase (a-z) character.

After choosing the options and typing GO, the formatted data will be present on the selection panel.

```
2. 108    EQ     C'0123'                                              AND
    Action:  SCRAMBLE    (108,20,ALPHA)
```

Figure 53: **SCRAMBLE** Format panel

UNSCRAMBLE: This operation is used to reverse any prior **SCRAMBLE**. Note that it is imperative that the operand is built identically to the **SCRAMBLE** to correctly reverse the data to its original value.

Both **SCRAMBLE** and **UNSCRAMBLE** require a PIN number to encode and decode the data. In addition to the PIN number, the algorithm can be more secure by using either the KEY or data option. When either a **SCRAMBLE** or **UNSCRAMBLE** is encountered in the selection data, the following panel is presented.

```
MAX UPDATE SELECTION for 'MXS.TEST.LITMAR'
 C .-------------------------------------------------------------------------.
 E | MAX - PRIVACY PIN PROMPT                                                |
 V | COMMAND ===>                                                            |
 E |                                                                         |
   | The UPDATE request includes SCRAMBLE or UNSCRAMBLE actions requiring    |
   | a PRIVACY PIN number to be entered.  Two options are available which    | Or
   | ensure a more effective algorithm.  The KEY option will use the key     |
   | value of each record in the keyed data set for the randomizing.  For    |
   | non keyed files, data position and length can be entered, data from     |
   | each record will be used in the randomizing.  UNSCRAMBLE requires       |
   | the same PRIVACY PIN and options that were used during SCRAMBLE.        |
   |                                                                         |
   |   PRIVACY PIN      ===>              (1-999999)                         |
   |   KEY OPTION       ===> NO           (Yes, No)                          |
   |    < or >                                                               |
   |   DATA POSITION    ===>              (1-32760)                          |
   |   DATA LENGTH      ===>              (1-32760)                          |
   |                                                                         |
   |   Requested SCRAMBLE actions: 1   UNSCRAMBLE actions: 0                 |
   |                                                                         |
   |   Press ENTER to proceed with UPDATE request.                           |
   |   Enter END command to cancel request.                                  |
   '-------------------------------------------------------------------------'
```

Figure 54: Privacy PIN Prompt panel

On this panel, you enter `PIN` number used for encoding or decoding the data as described in any **SCRAMBLE** or **UNSCRAMBLE** entry. In addition to the PIN number, data from each record can be used in conjunction with the `PIN` number to uniquely encode or decode each record. This can be done in one of two ways. You can choose the `KEY` option by entering `YES` into this field. If the data set is a keyed file (KSDS/VSAM), the value of each key will be used. For any non-keyed file, choose the second option and enter the `DATA POSITION` and the `DATA LENGTH`. Any time a keyed file has been copied to a non-keyed file, the position and length of the key must be referenced on the non-keyed file.

Use of the '?' in the DATA POSITION field will allow you to view a copybook for making the position and length entry. For example, if you copy a KSDS file to a SAM file and **SCRAMBLE** the data using the KEY option, you will need to know the position and length of the key to **UNSCRAMBLE** the data. Type the '?' into the DATA POSITION field and, once confirmed, a panel with the copybook will display.

```
MAX UPDATE SELECTION for 'MXS.TEST.LITMAR'
  .-------------------------------------------------------------------------.
  | MAX COPYBOOK FIELD SELECTION                          Please select entry |
  | COMMAND ===>                                            SCROLL ===> PAGE  |
  |                                                                           |
  | A record is to be selected only if a test CONDition for the SEARCH DATA   |
  | string is true. Select a field within the recprd copybook to identify the |
  | BEGIN position of the SEARCH DATA string.                                 |
  |                                                                           |
  |                                                                           |
  | Type S next to the desired entry and press ENTER to select; or            |
  | Enter the END command to return without selection                         |
  |         FIELD                                                             |
  | SELECT  POSN      LEVEL  *---------FIELD NAME---------*  FORMAT  LENGTH   |
  |   _     00001      01    EMPLOYEE-RECORD                 GROUP   00068    |
  |   _     00001      05    EMPLOYEE-ID                     GROUP   00007    |
  |   _     00001      10    RECORD-TYPE                     A     1 00001    |
  |   s     00002      10    EMPLOYEE-CODE                   N     6 00006    |
  |   _     00008      05    EMPLOYEE-NAME                   GROUP   00025    |
  |   _     00008      10    NAME-FIRST                      A     9 00009    |
  |   _     00017      10    NAME-LAST                       A    15 00015    |
  |   _     00032      10    NAME-MIDDLE-I                   A     1 00001    |
  |   _     00033      05    EMPLOYEE-ADDRESS                GROUP   00032    |
  '-------------------------------------------------------------------------'
```

Figure 55: Copybook Field Selection panel

Select the EMPLOYEE-CODE as the key field and press ENTER.

```
    < or >                                                          |
   DATA POSITION    ===> 2           (1-32760)                      |
   DATA LENGTH      ===> 6           (1-32760)                      |
                                                                    |
   Requested SCRAMBLE actions: 1   UNSCRAMBLE actions: 0            |
```

Figure 56: PIN Position/Length panel

Upon return to the Privacy PIN Prompt panel, the data position and length will be entered into the appropriate fields.

Two calculation actions are also available for use in the **UPDATE** and **COPY** options. **CALCAMT** can be used to calculate new values, convert value formats and move values to new positions within the record.

Enter a '?' into the first position of the "to data" field to display the following panel.

```
MAX UPDATE SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX RE-CALCULATE AMOUNT FIELD IN RECORD                                 |
  | COMMAND ===>                                                            |
  |                                                                         |
  | CALCAMT will re-calculate an amount FIELD-1 in a designated FORMAT      |
  | located at the entered POSITION in the record using FIELD-2 and         |
  | an arithmetic operator. Enter a ? in any field for entry assistance.    |
  |                                                                         |
  | Calculate amount criteria:      Result = Field-1 <Operator> Field-2     |
  |   FIELD-1:   BEGIN POSITION     ===> 10        (1-32760)                |
  |              FORMAT             ===>           (Pn.n,Un.n.Zn.n,Nn.n,H,F,D) |
  |   OPERATOR:                     ===> +         (*,+,-,/)                |
  |                                                                         |
  |   FIELD-2:   CONSTANT VALUE     ===>           (+nnnnn.nn,-nnnnn.nn)    |
  |              or BEGIN POSITION  ===>           (1-32760)                |
  |                 FORMAT          ===>           (Pn.n,Un.n.Zn.n,Nn.n,H,F,D) |
  |                                                                         |
  |   RESULT:    BEGIN POSITION     ===>           (1-32760)                |
  |              FORMAT             ===>           (Pn.n,Un.n.Zn.n,Nn.n,H,F,D) |
  |                                                                         |
  |   Enter GO  command to generate calcamt request.                        |
  |   Enter END command to cancel request.                                  |
  '-------------------------------------------------------------------------'
```

Figure 57: Calculate Amount Field panel

This panel will guide you through the options necessary to create the proper format for the **CALCAMT** action. BEGIN POSITION is initially set to the value of the BEGIN POSITION for the selection entry, but this can be changed. For any of the FIELD positions, type a '?' into the field to allow selection of a field name from a copybook to determine the BEGIN POSITION. The data in FIELD-1 can be adjusted (add, subtract, multiply, divide) by a constant value or data at another location within the same record, FIELD-2. Use of this panel requires that you enter the BEGIN POSITION and FORMAT of the result. If the value is to replace the initial value, simply re-type the same BEGIN POSITION and FORMAT.

For example, for all records with Denver in position 10, multiply the Tax amount in position 100 (which is packed 7.2) by the constant value of 1.15 and overlay the original value.

On this panel, enter the BEGIN POSITION and FORMAT of both FIELD-1 and FIELD-3 as the same, enter the constant value in lieu of FIELD-2.

```
MAX UPDATE SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX RE-CALCULATE AMOUNT FIELD IN RECORD                                 |
  | COMMAND ===>                                                            |
  |                                                                         |
  | CALCAMT will re-calculate an amount FIELD-1 in a designated FORMAT      |
  | located at the entered POSITION in the record using FIELD-2 and         |
  | an arithmetic operator. Enter a ? in any field for entry assistance.    |
  |                                                                         |
  | Calculate amount criteria:      Result = Field-1 <Operator> Field-2     |
  |   FIELD-1:   BEGIN POSITION     ===> 100       (1-32760)                |
  |              FORMAT             ===> P7.2      (Pn.n,Un.n.Zn.n,Nn.n,H,F,D) |
  |   OPERATOR:                     ===> *         (*,+,-,/)                |
  |                                                                         |
  |   FIELD-2:   CONSTANT VALUE     ===> 1.15      (+nnnnn.nn,-nnnnn.nn)    |
  |              or BEGIN POSITION  ===>           (1-32760)                |
  |                 FORMAT          ===>           (Pn.n,Un.n.Zn.n,Nn.n,H,F,D) |
  |                                                                         |
  |   RESULT:    BEGIN POSITION     ===> 100       (1-32760)                |
  |              FORMAT             ===> P7.2      (Pn.n,Un.n.Zn.n,Nn.n,H,F,D) |
  |                                                                         |
  |   Enter GO  command to generate calcamt request.                        |
  |   Enter END command to cancel request.                                  |
  '-------------------------------------------------------------------------'
```

Figure 58: Calculate Amount Field panel

After completing the entry, type GO and press ENTER. The **CALCAMT** operand will be formatted as requested.

```
1. 10     EQ     C'Denver'                                                AND
    Action:  CALCAMT     (100,P7.2,*,1.15,,,100,P7.2)
```

Figure 59: Calculate Amount Field Result

Date calculations are the final action supported by the selection criteria for **COPY** and **UPDATE**. The action for this is **CALCDATE**. By typing a '?' into position 1 of the to data field on the selection criteria panel and pressing ENTER, the following panel will be presented.

```
MAX UPDATE SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX RE-CALCULATE DATE FIELD IN RECORD                                   |
  | COMMAND ===>                                                            |
  |                                                                         |
  | CALCDATE will re-calculate a date field in a designated FORMAT located  |
  | at the entered POSITION in the record by adding or subtracting a        |
  | specified NUMBER OF DAYS.  Enter a ? in any field for entry assistance. |
  |                                                                         |
  | Calculate date criteria:                                                |
  |   BEGIN POSITION       ===> 10          (1-32760)                       |
  |   DATE FORMAT          ===>             (J1,J2,G1,G2,G3,EM=edit mask)   |
  |   NUMBER OF DAYS       ===>             (+nnnnn,-nnnnn)                 |
  |                                                                         |
  |   DATA FIELD FORMAT    ===> ZONED       (Packed,Zoned)                  |
  |   SIGN INCLUDED        ===> NO          (Yes,No)                        |
  |   SEPARATOR INCLUDED   ===> NO          (Yes,No)                        |
  |   CENTURY INCLUDED     ===> NO          (Yes,No)                        |
  |   EXIT PROGRAM NAME    ===>             (Example: MAXPDXIT)             |
  |   EDIT MASK            ===>             (valid chars are M,D,Y,C,/)     |
  |                                                                         |
  |   Enter GO  command to generate calcdate request.                       |
  |   Enter END command to cancel request.                                  |
  '-------------------------------------------------------------------------'
```

Figure 60: Calculate Date panel

As with amount calculations, all of the entries of this panel can be further explained by typing a '?' into the field. BEGIN POSITION will present a copybook from which to select the date field position in the record.

The date can be in any one of the five pre-defined formats. Type '?' into the DATE FORMAT field and press ENTER. An explanation of each format will be provided. Select the format that matches your date, or EDIT MASK if none match.

```
MAX UPDATE SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX DATE FORMAT SELECTION                                    Row 1 of 6 |
  | COMMAND ===>                                              SCROLL ===> PAGE  |
  |                                                                         |
  | CALCDATE will re-calculate a date field in a designated format beginning   |
  | at position 10 in the record by adding or subtracting a specified number   |
  | of days. Select a DATE FORMAT from the list below to be used by CALCDATE.  |
  |                                                                         |
  |                                                                         |
  | Type S next to the desired entry and press ENTER to select; or             |
  | Enter the END command to return without selection                          |
  |         DATE                                                            |
  | SELECT  FORMAT     DESCRIPTION                                          |
  |         J1         YYDDD     - year,day in Julian format                |
  |   _     J2         DDYYY     - day,year in Julian format                |
  |   _     G1         YYMMDD    - year,month,day in Gregorian format       |
  |   _     G2         MMDDYY    - month,day,year in Gregorian format       |
  |   _     G3         DDMMYY    - day,month,year in Gregorian format       |
  |   _     EM         EDIT MASK - format provided by separate mask string  |
  | ****************************** Bottom of data ****************************** |
  |                                                                         |
  |                                                                         |
  '-------------------------------------------------------------------------'
```

Figure 61: Date Format Selection panel

If EDIT MASK is the selection, enter the actual format of the date into the EDIT MASK field on the Recalculate Date panel.

Enter the NUMBER OF DAYS to advance or reverse the date. Use of the + (plus) key will advance a date, while use of the - (minus) key will move the date in a backward direction.

Further fields allow for specification of the FIELD FORMAT as packed or zoned numeric data. Indicate if the date field is signed, if it includes separator characters, or if the century is included.

The **CALCDATE** action allows use of a user-written exit to further process the date. The program provided in the installation JCL library, MAXPDXIT, can be used as a model for the installation specific exit. For example, if special accounting rules are to be applied to the newly calculated date, then it can be put into a user exit that will then receive control each time a date is recalculated with this operand.

For example, to advance a date in the zoned numeric format as DD/MM/YY, enter:

```
MAX UPDATE SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX RE-CALCULATE DATE FIELD IN RECORD                                   |
  | COMMAND ===>                                                            |
  |                                                                         |
  | CALCDATE will re-calculate a date field in a designated FORMAT located  |
  | at the entered POSITION in the record by adding or subtracting a        |
  | specified NUMBER OF DAYS.  Enter a ? in any field for entry assistance. |
  |                                                                         |
  | Calculate date criteria:                                                |
  |   BEGIN POSITION       ===> 90          (1-32760)                       |
  |   DATE FORMAT          ===> em          (J1,J2,G1,G2,G3,EM=edit mask)   |
  |   NUMBER OF DAYS       ===> +100        (+nnnnn,-nnnnn)                 |
  |                                                                         |
  |   DATA FIELD FORMAT    ===> ZONED       (Packed,Zoned)                  |
  |   SIGN INCLUDED        ===> NO          (Yes,No)                        |
  |   SEPARATOR INCLUDED   ===> NO          (Yes,No)                        |
  |   CENTURY INCLUDED     ===> NO          (Yes,No)                        |
  |   EXIT PROGRAM NAME    ===>             (Example: MAXPDXIT)             |
  |   EDIT MASK            ===> dd/mm/yy    (valid chars are M,D,Y,C,/)     |
  |                                                                         |
  |   Enter GO  command to generate calcdate request.                       |
  |   Enter END command to cancel request.                                  |
  '-------------------------------------------------------------------------'
```

Figure 62: Recalculate Date Entry panel

Type GO and press ENTER. The **CALCDATE** operand will be formatted as follows:

```
1. 1809   EQ     C'Denver'                                              AND
    Action:  CALCDATE    (90,EM,+100,,DD/MM/YY)
```

Figure 63: Calculate Date Result panel

Once all selection entries have been completed, type GO and press ENTER to proceed with the **COPY** or **UPDATE** option.

5. Copy/Extract Data Set

The Copy/Extract Data Set option is used to copy selected records from a data set to a specified TO MVS data set or UNIX file. The **COPY** command can be used to copy data from one file type to another. For example, data can be 'unloaded' from a keyed VSAM file to a sequential file. A sequential file can be sorted into sequence and copied to a keyed VSAM file.

The **COPY** command can copy data from one record format to another record format. If the output format record length is less than the input record length, the output will be truncated. A count of truncated records is provided when the command completes. The default return code for the step with truncated records is '4'. This is an installation default and can be changed (see Appendix B: Changing Installation Defaults on page 115 for further information). If the **COPY** is to a fixed format output file and the record length of the output is larger than the input record, the record is padded to the end with the specified pad character. The default pad character is 'X'00''.

The **COPY** command can be used to transform MVS data to another format such as XML, CSV (comma-separated values), TAB (tab-delimited) or user-defined format. By default, the transformation is done utilizing code page 37, EBCDIC, US English. Optionally, the user can enter an alternate code page value.

Record select/change criteria may be specified to group and optionally change a subset of records during copy. Reformat criteria may be used to reformat data by field names. Output of the copy can be sorted into a new sequence by specifying YES to the optional **SORT** request.

Note that if the special record handling exit option was set to YES on the **PROFILE** panel, and the name of the record exit was optionally entered on the Specify A Data Set Name panel, the exit program will be invoked to process the input to the **COPY**. If a record exit program is to be used to process the output of the **COPY**, and the special record handling exit was set to YES on the **PROFILE** panel, the following "COPY From" panel will contain a field in which to enter this program name.

In addition, record frequency, maximum number, beginning and ending record identification fields (RID) may be specified as copy options. The **COPY** can take place online or, if MAX/Batch is installed, a batch job will be built that can subsequently be submitted to run in a batch partition. Prior to actually copying the records, the result can be previewed so that you can verify the changes.

If the output file DCB parameters indicate that records could possible be truncated during the **COPY** operation, a warning panel will be presented. A decision to proceed with the copy can be indicated by pressing ENTER or END to cancel. If the output file DCB parameters indicate that the output records will be larger than the input records, a panel will be presented that allows you to cancel the **COPY**, or enter a PAD character to be used in the expanded output, press ENTER and proceed with the **COPY**.

```
MAX COPY FROM DSN='MXS.TEST.MARIN2'
 COMMAND ===>

 "TO" sequential data set, VSAM cluster or UNIX file name:
   DSN/UNIX name ===>

 "TO" data set options:
   If VSAM KSDS, replace like-keyed records ===> NO        (Yes or No)
   Data Set disposition                     ===> OLD       (Old, Mod or New)
 Copy criteria/Format Options:
   Record select and change                 ===> NO        (Yes or No)
   Use reformatting criteria                ===> NO        (Yes or No)
   Record frequency                         ===>           (Blank=NONE)
   Maximum number of records to copy        ===>           (Blank=ALL)
   Begin record key                         ===>
   End record key                           ===>
   SORT the output of the copy              ===> NO        (Yes or No)
   Transformation Format                    ===>           (XML,TAB,CSV,other)
   Output Code Page                         ===>        (1-65534;use!? to list)
 COPY online, VERIFY and review the output,
   or SUBMIT to batch                       ===> VERIFY    (Copy,Verify,Submit)
      Preview count (for VERIFY)            ===> 200       (0=all records)
      Preview format(for VERIFY)            ===> LIST      (List,Dump,Formatted)
 Enter GO command to initiate COPY request, or  END command to cancel request.
```

Figure 64: **COPY** From/To panel

It is necessary to scroll UP and DOWN to view all of the options on this panel.

Explanation of parameters

"TO" sequential data set, VSAM cluster or UNIX file name:

Specify either the data set name for sequential or VSAM files or the UNIX file name that is to receive the output of the copy operation. If the UNIX file name exceeds the field size, a confirmation panel will be presented into which the entire name can be typed. In addition, this panel can be used to change the output file name. The panel will ask for confirmation any time you change the 'TO' destination value.

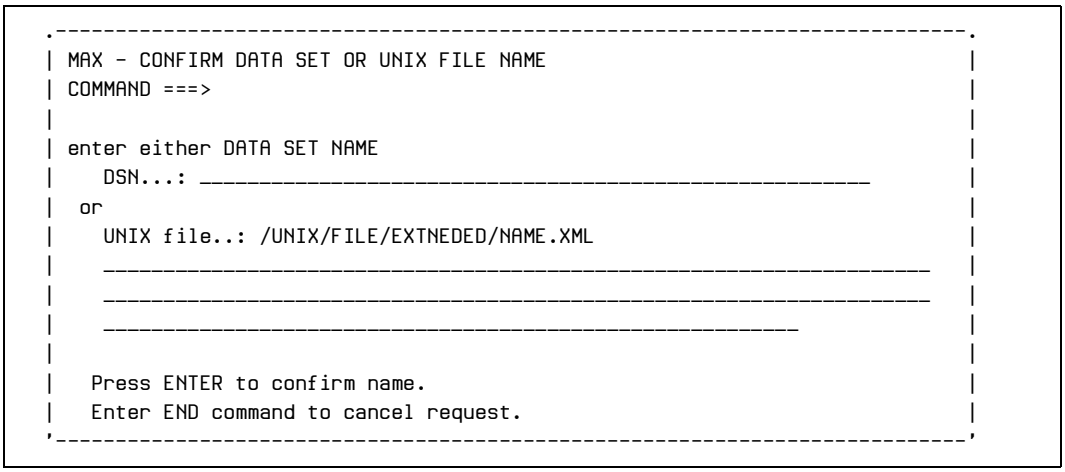

Figure 65: File Name Confirmation panel

`RCD Exit Name` (optional field) can be used to enter the record exit program name for processing the output if the output is a data set name.

Note: This field will only appear if "Special Record Handling" is set to `Yes` on the **PROFILE** panel.

`"TO" data set options`:

Use `YES` or `NO` to indicate if records are to be replaced if like-keys are found (output is KSDS).

Or specify the disposition for a SAM file to be used during allocation. When `OLD` is specified for a VSAM file, the data set must have been previously defined with the `REUSE` option.

Use `NEW` for data set disposition when the data set does not exist. The Select Data Set Utility panel, as shown on page 50, will be presented, allowing the user to allocate the new output file prior to the copy.

`Copy criteria/Format Options`:

`RECORD SELECT AND CHANGE` This criteria can be used to select and optionally change a subset of records during the copy operation. Enter `YES` to transfer to a panel to enter this criteria. See "*Update/Copy Select and Change Criteria*" on page 64 for details on record select and change criteria.

`USE REFORMATTING CRITERIA`: This can be used to specify the use of reformatting criteria during **COPY**. Reformatting criteria must have been previously prepared using the **BUILD REFORMATTING CRITERIA** option. Enter `YES` to pop up a panel to specify the reformat criteria options. See the section titled "*7. Build Reformat Criteria*" on page 96 for more information on this option.

`RECORD FREQUENCY`: Use this field to cause every `nth` record to be copied. To create a subset of a file, you can select every `nth` record to be written to the output data set. For example, to create a file with 10% of the data, enter `10` (ten) into the frequency field. During the **COPY**, every 10th record chosen will be written to the output data set.

`MAXIMUM NUMBER OF RECORDS TO COPY`- Use this field to limit the size of the output data set.

BEGIN/END RECORD KEY: May be a quoted, hexadecimal or character string. For a KSDS VSAM file, the RID entered can be either a full or partial key. For an RRDS VSAM file, or SAM file, the RID must be a number representing the relative record number. For an ESDS VSAM file, the RID can be a number, or a 4-byte hex string, representing the relative byte address.

SORT the output of the copy: When the output of the copy operation is an MVS data set, the output can be sorted into a different sequence once it has been selected and changed. The **SORT** is only performed if the selection option is **COPY** or **SUBMIT**. **SORT** is not valid with **VERIFY**.

Transformation Format: Is the format to write the output to the UNIX file. This is required if the output is a UNIX file, and is optional if the output is a data set. Formats available are XML, CSV (comma separated values) and TAB (tab delimited fields). The formats are built using the Copybook or Mapping Criteria entered on the main panel. Note that it is not possible to both reformat the data and transform the data in the same copy operation.

Output Code Page: Is an additional field that is used to indicate the code page value to be used for output data transformation. If no value is specified, the output will be transformed using code page 37, EBCDIC, US English. Enter a '?' to obtain a list of valid values. A scrollable panel will be presented and allow you to choose a valid code page.

```
MAX Data/Util ------------- CODE PAGE SELECTION LIST ------------- Row 1 of 96
 COMMAND ===>                                                SCROLL ===> PAGE

 Enter a / next to a code page to select.  Use END to use default.

    Page Description
      37 EBCDIC USA, Canada, Australia, New Zealand, Netherlands, Brazil, Portu
     273 EBCDIC Austria, Germany
     274 EBCDIC Belgium
     275 EBCDIC Brazil
     277 EBCDIC Denmark, Norway
     278 EBCDIC Finland, Sweden
     280 EBCDIC Italy
     281 EBCDIC Japanese English
     284 EBCDIC Spanish
     285 EBCDIC United Kingdom
     290 EBCDIC Japanese Katakana
     297 EBCDIC France
     367 ASCII US-ASCII-7
     420 EBCDIC Arabic
     423 EBCDIC Greek
     424 EBCDIC Hebrew
     437 ASCII DOS USA
     500 EBCDIC Latin-1
```

Figure 66: Code page selection panel

COPY online, VERIFY and review the output, or SUBMIT to batch: Use this field to select the appropriate action to take.

COPY: This will cause the copy of the data set to take place online immediately.

VERIFY This will allow you to preview the output prior to actually making the changes.

SUBMIT This will prepare a batch job using MAX/Batch (if the product is installed on your system) for you to review and submit for processing.

PREVIEW COUNT: Enter the number of records you would like to see in **VERIFY** mode. Use 0 (zero) to indicate all output records are to be previewed. Note that if a value is entered in the MAXIMUM NUMBER OF RECORDS TO COPY field above that is less than this value, this value will be changed to the lesser value.

PREVIEW FORMAT: Enter the format for the presentation of the data in **VERIFY**. The default is LIST, this option will present each record in character format. Choose DUMP to have the records presented in both hexadecimal and character formats. To present the data along with a copybook, choose the Formatted option. The copybook or map name entered on the main panel will be used to format the data.

Once all the information is complete on this panel, enter GO to proceed to the next step. If record select and change criteria was indicated, a panel to enter these options will be presented. See "*Update/Copy Select and Change Criteria*" on page 64 for details on this criteria. Enter END to return without processing the **COPY** option.

Entering SORT Parameters

Once the **SORT** option has been set to YES, and the GO command has been entered, the **SORT** parameters will have to be entered. The following panel will be presented:

```
MAX COPY FROM DSN='MXS.TEST.SAM'
 COMMAND ===> GO
  .-------------------------------------------------------------------------------.
  | MAX - ENTER PARAMETERS FOR THE SORT                                           |
  | COMMAND ===>                                                                  |
  |                                                                               |
  | enter the SORT parameters below:                                              |
  |    SORT..: _____________________________________________________________      |
  |                                                                               |
  |   Press ENTER to pass parameters to the SORT.                                 |
  |   Enter END command to cancel request.                                        |
  |                                                                               |
  |                                                                               |
  '-------------------------------------------------------------------------------'
   If VSAM KSDS, replace like-keyed records ===> NO        (Yes or No)
   Data Set disposition                     ===> OLD       (Old, Mod or New)
```

Figure 67: Enter parameters for the **SORT** panel

Use this panel to enter parameters for the **SORT**. For example, to sort the file into ascending sequence by the value in a field in position 12 for a length of 6, type FIELDS(12,6,CH,A) and press ENTER. If at this point you decide not to sort the output, press the END key to cancel the command.

Use Reformatting Criteria

A mapping criteria data set, or a COBOL/PL/I copybook, must be specified along with a **Reformatting Criteria** data set. If multiple record types are to be reformatted in a single copy, the Mapping criteria data set is required (see the section titled "*6. Build Mapping Criteria*" on page 91 for further information). Otherwise, the copybook of the input file must be specified.

The control records in the **Reformatting Criteria** data set will control the reformatting of records. The Reformatting Criteria data set must have been previously prepared using the Build Reformat Criteria option (see the section titled "*7. Build Reformat Criteria*" on page 96 for further information).

```
MAX COPY FROM DSN='MXS.TEST.KSDS'
 C .-------------------------------------------------------------------------.
   | SPECIFY/CONFIRM INPUT COPYBOOK/MAPPING CRITERIA AND REFORMAT CRITERIA |
 " | COMMAND ===>                                                          |
   |                                                                       |
   | Specify copybook, or mapping criteria library and member:             |
 " |    MAPPING CRITERIA : 'MXS.P390.COPYLIB(CBHDR)'                       |
   |         and TYPE. . : COBOL   (cobol or pli)                          |
   |                                                                       |
   | Specify reformat criteria library and member:                         |
 C |    DATA SET NAME. . : 'MXS.TEST.QAJOBS(TSTRFMT)'                      |
   |                                                                       |
   |   Press ENTER to confirm data set name specified.                     |
   |   Enter END command to cancel request.                                |
   '-----------------------------------------------------------------------'
   BEGIN RECORD KEY                        ===> _____________________________
   END RECORD KEY                          ===> _____________________________

 COPY online, VERIFY and review the output,
   or SUBMIT to batch                      ===> COPY      (Copy,Verify,Submit)
      PREVIEW COUNT (for VERIFY)           ===> 200       (0=all records)

   Press ENTER to perform request.
   Enter END command to cancel request.
```

Figure 68: Use Reformatting Criteria panel

6. Build Mapping Criteria

Mapping Criteria provides several capabilities when processing files with the Formatted or Horizontal display options or when copying data sets using the Reformat Option. First of all, Mapping Criteria is used when a data set contains multiple record types. With each record type being identified by a different copybook, Mapping Criteria is used to associate each record with its correct copybook. Mapping criteria can also be used to **HIDE** fields from the display on the panel. By excluding fields, the amount of information displayed can be reduced. Mapping Criteria can also be used to re-order the fields within a copybook. This allows the user to set the order of field presentation when the record is displayed.

A "Copybook" library and member name is specified along with selection criteria for each record type in a multiple record type data set.

This mapping criteria information is saved in a specified data set name and may then be entered in place of an individual copybook data set for the Formatted and Horizontal browse and edit functions.

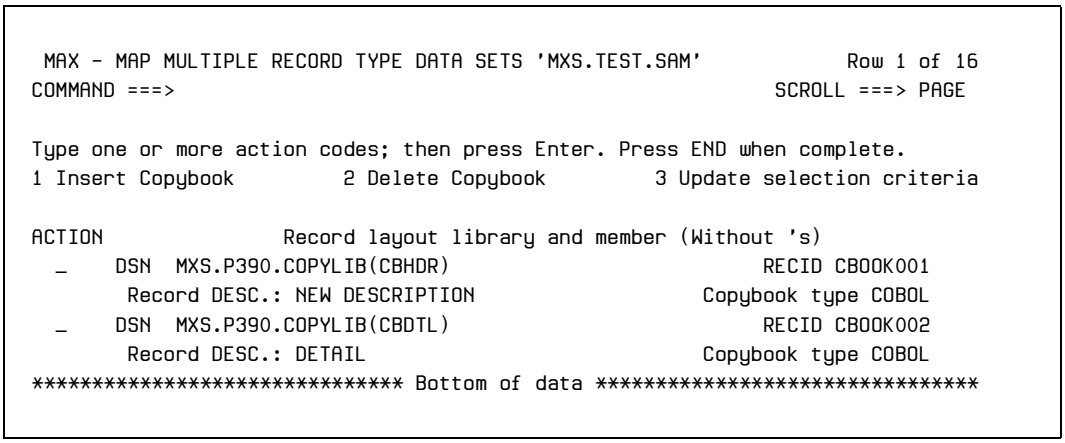

Figure 69: Map Multiple Record Type Data Sets panel

Insert Layout

The **INSERT LAYOUT** function is used to insert a new record layout to map specific records.

```
MAX - MAP MULTIPLE RECORD TYPE DATA SETS 'MXS.TEST.SAM'            Row 1 of 16
 COMMAND ===>                                                   SCROLL ===> PAGE
    .-------------------------------------------------------------------------.
 Ty | MAX - INSERT LAYOUT INTO MAPPING CRITERIA                               |
 1  | COMMAND ===>                                                            |
    |                                                                         |
 AC | Specify a layout library and member:                                    |
    |    DATA SET NAME. . : MXS.P390.COPYLIB(CBDTL)                           |
    |    COPYBOOK TYPE. . : COBOL       (Cobol, P11)                          |
    |    Record DESC. . . : DETAIL                                            |
    |    Record ID. . . . : CBOOK002                                          |
 ** |                                                                         |
    | Optional-Enter the text string for locating the start of the COPYBOOK:  |
    |    Position . . . . : __      Length . . . : __   (0=scan to end)       |
    |    Text : ____________________________________________________________  |
    |                                                                         |
    | Optional-Enter the text string for locating the end of the COPYBOOK:    |
    |    Position . . . . : __      Length . . . : __   (0=scan to end)       |
    |    Text : ____________________________________________________________  |
    |                                                                         |
    |   Press ENTER to specify selection criteria.                            |
    |   Enter END command to cancel request.                                  |
    '-------------------------------------------------------------------------'
```

Figure 70: Insert Layout panel

Field Descriptions of selected functions

DATA SET NAME: Is the partitioned data set and member name that contains a COBOL or PL/I Copybook.

COPYBOOK TYPE: Indicates whether the copybook is COBOL or PL/I.

Record DESC: This field is used to enter descriptive text that will be displayed in the heading of the formatted browse or edit when this layout is selected to map the record.

Note: All descriptions within a map must be unique.

Record ID: Is a unique 8 character record identification that can be used to identify this record format within the Mapping Criteria.

Optional - Enter the text string for locating the start of the COPYBOOK:

Position: Is the column number to begin search for text string.

Length: Length of record to scan, enter 0 to scan the entire record.

Text: Enter the text data, example: EMPLOYEE-CODE, the copybook expansion will begin once this field is found.

Note: The field name chosen as the first in the record is assumed to be the first field of the record and will assume the position value of one. Do not use this technique to eliminate the display of initial fields in the record. Always choose the first field in the record to begin the record definition. Use the INclude/EXclude field options described in the following figure to indicate which fields are to be displayed.

Optional - Enter the text string for locating the end of the COPYBOOK:

Position: Is the column number to begin search for text string.

Length: Length of record to scan, enter 0 to scan the entire record.

Text: Enter the text data to stop expansion of a copybook. The field name matching this text will be the final field in the copybook.

Update Layout

```
MAX - MAP MULTIPLE RECORD TYPE DATA SETS 'MXS.TEST.SAM'            Row 1 of 16
 COMMAND ===>                                                   SCROLL ===> PAGE
    .-------------------------------------------------------------------------.
 Ty | MAX - UPDATE COPYBOOK ENTRY                                              |
 1  | COMMAND ===>                                                            |
    |                                                                         |
 AC | Library and member:                                                     |
    |    DATA SET NAME. . . MXS.P390.COPYLIB(CBHDR)                           |
    |    COPYBOOK TYPE. . . COBOL                                             |
    |    Record DESC. . . : NEW DESCRIPTION                                   |
    |    Record ID. . . . : CBOOK001                                          |
 ** |                                                                         |
    | Optional-Enter the text string for locating the start of the COPYBOOK:  |
    |    Position . . . . : __      Length . . . : __   (0=scan to end)       |
    |    Text : _____________________________________________________________ |
    |                                                                         |
    | Optional-Enter the text string for locating the end of the COPYBOOK:    |
    |    Position . . . . : __      Length . . . : __   (0=scan to end)       |
    |    Text : _____________________________________________________________ |
    |                                                                         |
    |   Press ENTER to proceed forward to copybook layout.                    |
    |   Enter END command to cancel request.                                  |
    '-------------------------------------------------------------------------'
```

Figure 71: Update Layout panel

The **Update Selection Criteria**, as illustrated in *Figure 69: Map Multiple Record Type Data Sets panel* on page 91, is used to modify the description record ID, starting and ending text data and any detail mapping criteria data. Data Set name, member and type cannot be updated. Use the **DELETE** function to eliminate any copybook data set and member no longer a part of the map.

Mapping Criteria

Mapping criteria is specified that will connect a layout to specific records or to provide specific information on field selection.

Specify a default for a field display. If the majority of the fields are to be displayed (or all of the fields), specify `IN`clude as the default. Any fields that are not to be displayed can then be marked as `EX` in the copybook detail. If only a small number of fields are to be displayed, enter `EX`clude as the default. Any field to be displayed can then be chosen with the `IN` on the detail line. During Formatted or Horizontal edit/browse, only included fields will be displayed.

For each field name displayed, enter either `EX` (exclude) or `IN` (include) to reverse the default field selection value.

To change the order of the fields on the display, use the ORDER column on the panel. Enter an 'M' in the **ORDER** number of the field to be moved. Enter an 'A' in the **ORDER** number of the field that the moved field is to follow. Continue to move the fields until they are in the order that they are to appear in the Formatted and Horizontal display panels.

To select a copybook to be displayed with a specific record type, the data must be entered exactly as it appears in the formatted browse or edit mode display. The data specified must match the format description of the data items format. For example, if the format indicates "P 5" (Packed-decimal 5 significant positions), the corresponding data must be all numeric and no longer than 5 (five) positions (leading zeros should not be specified).

```
MAX - LAYOUT SELECTION CRITERIA DESC=NEW DESCRIPTION              Row 1 of 13
COMMAND ===>                                                  SCROLL ===> PAGE
Specify the layout selection criteria.
Default field display is INCLUDE or EXCLUDE: INCLUDE   Press END when complete.
Valid CONDitions are: EQ, NE, GT, GE, LT, LE.
ORDER I/E *--------FIELD NAME--------* FORMAT COND *----------DATA----------*
00001  EX  EMPLOYEE-RECORD                        __  ____________________________
00002  EX  EMPLOYEE-ID                           __  ____________________________
00003  EX  EMPLOYEE-CODE               N    6    __  ____________________________
00004  IN  EMPLOYEE-NAME                         __  ____________________________
00005  IN  NAME-FIRST                  C    9    __  ____________________________
00006  IN  NAME-LAST                   C   15    __  ____________________________
00007  EX  RECORD-TYPE                 C    1    EQ  H
00008  IN  NAME-MIDDLE-I               A    1    __  ____________________________
00009  IN  EMPLOYEE-ADDRESS                      __  ____________________________
00010  EX  STREET-ADDR                 C   20    __  ____________________________
00011  EX  CITY                        A   10    __  ____________________________
00012  EX  STATE                       A    2    __  ____________________________
00013  IN  EMPLOYEE-AMOUNT             P  5.2    __  ____________________________
```

Figure 72: Layout Selection Criteria panel

Fields will be displayed in the final order that is selected if the INclude option has been entered for that field.

7. Build Reformat Criteria

Reformat Criteria may be specified so that when copying a file, either online or in batch, input and output record layouts are used to reformat records. The Reformat Criteria created using this option may be referenced during the online copy or during a MAX/Batch batch copy.

Input and output copybook library and member names are specified along with reformat criteria for each record type to be reformatted. When multiple record types are to be reformatted, a "Mapping Criteria member should be specified during the copy function as well (see "*6. Build Mapping Criteria*" on page 91).

This Reformat Criteria information is saved in a specified data set name and may be referenced during an online (see "*Use Reformatting Criteria*" on page 90) or batch copy.

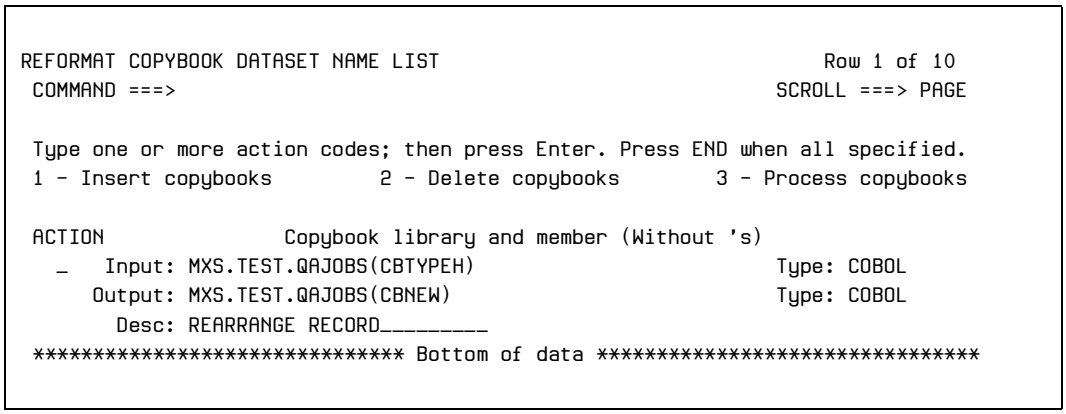

Figure 73: Build Reformat Criteria panel

Insert Copybooks

The **INSERT COPYBOOKS** function is used to insert the input and output record layout to reformat a specific record.

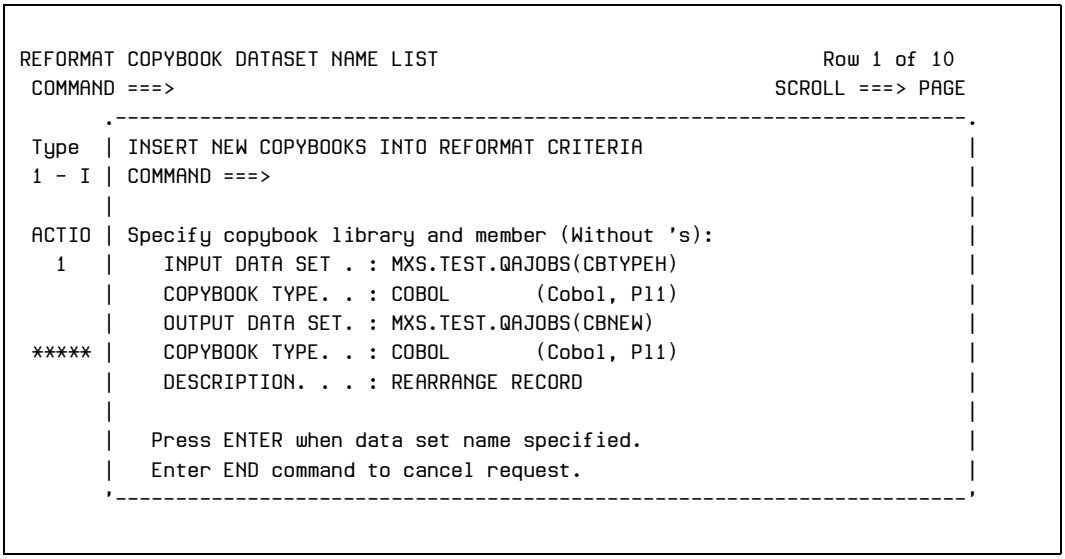

Figure 74: **Insert Copybooks** panel

Explanation of parameters

Data Set NAME: Is the partitioned data set and member name that contains a COBOL or PL/I Copybook.

COPYBOOK TYPE: Indicates whether the copybook is COBOL or PL/I.

DESCRIPTION: Is the descriptive text that is in the reformat Copybook criteria.

Process Copybooks

PROCESS COPYBOOKS allows Reformatting Criteria to be specified. Output fields are assigned to input fields, or to an initial value.

Either the input or output layout may be scrolled, or both sides may be scrolled in unison.

Use the LEFT or RIGHT PF keys once to assign the corresponding sides to scroll.

Use the LEFT or RIGHT PF keys twice to assign both columns to scroll in unison.

The output field is assigned to an input field by entering the input fields sequence number into the output fields Seq= column. Any non-numeric character may be entered into the output fields Seq= column to assign an initial value rather than an input field. A panel will appear where the initial value may be entered.

```
REFORMAT - FIELD SELECT
 COMMAND ===>                                    SIDE = BOTH  SCROLL ===> PAGE
 Assign output field name to a SEQuence number of input field name.
 'MXS.TEST.QAJOBS(CBTYPEH)'              'MXS.TEST.QAJOBS(CBNEW)'
 Seq  *---- Input field name ----* Frmt  Seq= *--- Output field name ----* Frmt
 0001 EMPLOYEE-RECORD                        EMPLOYEE-RECORD-L
 0002 EMPLOYEE-ID                            EMPLOYEE-ID-L
 0003 RECORD-TYPE                 A    1 ____ RECORD-TYPE-L                A    1
 0004 EMPLOYEE-CODE               N    6 ____ EMPLOYEE-CODE-L              N    6
 0005 EMPLOYEE-NAME                          EMPLOYEE-ADDRESS-L
 0006 NAME-FIRST                  A    9 ____ STREET-ADDR-L                C   20
 0007 NAME-LAST                   A   15 ____ CITY-L                       A   10
 0008 NAME-MIDDLE-I               A    1 ____ STATE-L                      A    2
 0009 EMPLOYEE-ADDRESS                       EMPLOYEE-NAME-L
 0010 STREET-ADDR                 C   20 ____ NAME-FIRST-L                A    9
 0011 CITY                        A   10 ____ NAME-LAST-L                 A   15
 0012 STATE                       A    2 ____ NAME-MIDDLE-L                A    1
 0013 EMPLOYEE-DATA                          EMPLOYEE-DATA-L
 0014 /FILLER-1/                  C    4 ____ FILLER-L                     C    4
 0015 HIRE-DATE                   C   10 ____ HIRE-DATE-L                 C   10
 ************END OF COPYBOOK************ ************END OF COPYBOOK************


 Choose one or both sides, use  UP | DOWN to scroll. Press END to exit.
```

Figure 75: Reformat Record Criteria panel

WARNING: It is highly recommended that two distinct copybooks be used in this process. If the same copybook is used for both input and output, be aware that assignments are made in the order of the output copybook fields. Using the same copybook for both input and output and using sequence numbers to swap fields may cause unwanted results.

8. COMPARE Files/Reports

The **COMPARE** file/reports option is used to compare two data files. Record and/or field selection criteria can be used to compare only selected records in the files, or comare only selected fields in the file records.

Note that if the special record handling exit option was set to YES on the **PROFILE** panel, and the name of the record exit was optionally entered on the Specify A Data Set Name panel, the **EXIT** program will be invoked to process the primary input to the **COMPARE**. If a record exit program is to be used to process the 'NEW' file to be compared and the special record handling exit was set to YES on the **PROFILE** panel, the following **COMPARE** panel will contain a field in which to enter the program name.

The **COMPARE** option can be run online, or if MAX/Batch is installed, can be submitted to run in the batch environment. Control parameters generated can be saved, then reused to compare files again at a later time. See the **COMPARE** options with "*Record Selection Criteria* on page 42.

```
MAX COMPARE changed file (COMPFILE) DSN='MXS.TEST.SAM'
 COMMAND ===>

 Base File (INFILE) to compare against:
   Data Set Name ===>
   Volume Serial ===>                  (If not cataloged)

 Compare options:
   Report Format ===> CHARACTER        (Character, Formatted or Hex)
   Report Detail ===> DIFFERENCES      (Differences, Summary or Long)
   Record and/or Field Selection         ===> NO      (Yes or No)
   Begin KEY/RCD# Base file(INFILE)      ===> ________________________________
   Begin KEY/RCD# Changed file(COMPFILE) ===> ________________________________
   Limit Records Read                    ===>         (0 = no LIMIT.)
   Technique     ===> 50               (S=Sync; K=sync by Key; nn=Read Ahead)

 Compare ONLINE or SUBMIT to batch       ===> ONLINE  (Online, Submit)

   Enter GO  command to initiate COMPARE request.
   Enter END command to cancel request.
```

Figure 76: **COMPARE** panel

Field descriptions for COMPARE panel

Base File (INFILE) to compare against: Specify the data set name of the file to compare against the data set named at the top of the panel. This data set can be a sequential file or a VSAM cluster.

If the data set is not cataloged, specify the volume serial number where it is allocated.

RCD Exit Name (optional field) optionally enter the record exit program name for processing the 'NEW' file to be compared.

Note: This field will only appear if Special Record Handling is set to Yes on the **PROFILE** panel.

COMPARE Options:

Report Format: Use this to specify the format of the output from the compare. Data can be presented in character, hexadecimal, or formatted using the specified mapping criteria or copybook. The default format is CHARACTER. If the FORMATTED is chosen, the copybook or mapping member specified on the primary panel is used to format the data.

Report Detail: Use this to request the amount of detail in the compare output report. Differences will provide a print of all records that mismatch or are inserted or deleted. Long will provide all records with differences, but will also report on all records that match. Summary will provide a count of matches, mismatches, inserts, and deletes. It will not report on the specific records.

Record and/or Field Selection: Use YES or NO to indicate if records are to be selected by specific criteria and/or only specific fields are to be compared. If YES is entered, a panel will be presented for entering this information. See the following page for further detail of this option.

Starting Key/Rcd # in "Master" file: and Starting Key/Rcd# in "New" file: The starting key or record number can be specified for each file. For SAM data sets, this is the actual record number. For RRDS, this is the relative record number. For ESDS, this must be a 4 (four) byte hexadecimal RBA (X'hhhhhhhh'). For KSDS, this is either character or hexadecimal, full or partial key.

Limit Records Read: Enter the number of input records to be processed from each file. A value of zero will cause all records to be read. This value is helpful when initially checking the **COMPARE** to see if it is set up properly.

Technique: Specify a number greater than 1 to perform a read-ahead compare. Choose 'S' to compare the records one to one. Choose 'K' to synchronize the records by key value.

Compare ONLINE or SUBMIT to batch: Use this to indicate the mode of running the **COMPARE**. The **COMPARE** can be run online, returning the results in browse mode. When ONLINE is selected, use the limit count to terminate the compare after processing the requested number of records.

Enter GO to proceed forward with the **COMPARE**, enter END to cancel and return to the primary panel.

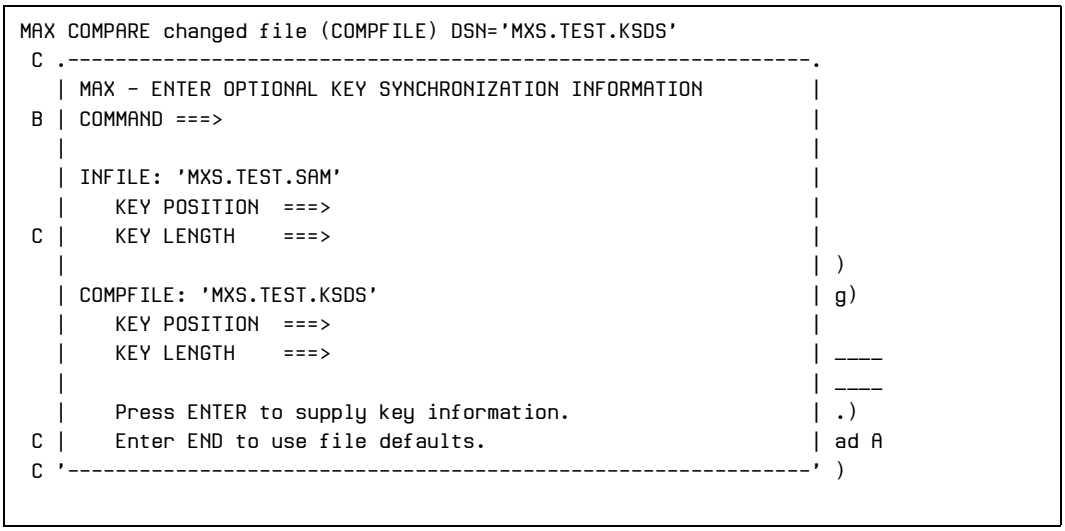

Figure 77: Enter Optional KEY Synchronization Information panel

If the KEY option is chosen for synchronization, the above panel will be presented. You can specify key information for the files at this point. If one or both of the files contain keys, KSDS, then this information is not required. The rules for key position and key length are as follows:

1. If the key position and length are entered on the panel for the INFILE, they are used for the INFILE.
2. If the key position and length are entered on the panel for the COMPFILE, they are used for the COMPFILE.
3. If both files are KSDS and no values are entered, the values are used from the OPEN of each file.
4. If one file is KSDS and the other is not and no specific values are entered, use the values for the keyed file for both files.

RECORD and/or FIELD Selection

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.SAM'
 COMMAND ===>

 Enter GO to select and change data, or END to return without selecting.
 Valid commands: GO, RESET, SAVE, COPY, MAP

 POS   COND DATA     IN-COL  LENGTH  COMP-COL                           And/Or
                                                                 More:     +
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
```

Figure 78: **COMPARE** Record Selection panel

Field Descriptions of selected parameters

'?': Use the '?' for all parameters in this section of the panel. Detailed entry assistance is available by simply typing a '?' into the field. Details of the use of this '?' follow throughout the remainder of this topic.

POS: Is any number, not greater than the record length, to search for the input data. Enter a '?' in this field.

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.KSDS'
 COMMAND ===>

 Valid commands: SAVE, COPY.
 Valid CONDitions are: EQ, =, NE, <>, GT, >, GE, >=, LT, <, LE, <=.

 Press ENTER to select and compare records, or END to return without selecting.
 POS   COND DATA     IN-COL  LENGTH  COMP-COL                          And/Or
                                                              More:     +
 ?____  ___ ____________________________________________________________  ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________  ___
```

Figure 79: **SAVE** and **COPY** Record Selections in **COMPARE** panel

The first time a '?' is entered into the POS field, you will be asked to confirm the map or the copybook name. It is at this point that the **MAP** primary command may need to be used to change the map name. Confirmation will be requested at this point for the map or the copybook name.

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.KSDS'
 C .-------------------------------------------------------------------------.
   | MAX - CONFIRM MAPPING CRITERIA DATA SET                                 |
 V | COMMAND ===>                                                            |
 V |                                                                         |
   | Confirm MAPPING criteria library and member:                            |
 P |    DATA SET NAME. . : 'MXS.TEST.MAAPDS(CBMAP2)'                         | g.
 P |                                                                         | /Or
   |   Press ENTER to confirm data set name specified.                       | +
 ? |   Enter END command to cancel request.                                  | _
   '-------------------------------------------------------------------------'
```

Figure 80: Confirm Mapping Criteria Data Set in **COMPARE** panel

Once the map or the copybook name is confirmed, if the member is found to be a map, the following panel is presented:

```
MAX - Choose Copybook from Map                                    Row 1 of 2
 COMMAND ===>                                                  SCROLL ===> PAGE

 Enter the id number of the copybook you wish to expand ==>
 Enter END to return with no selection.

   1    DSN  MXS.P390.COPYLIB(CBHDR)                          RECID
         Record DESC.: NEW DESCRIPTION                  Copybook type COBOL
   2    DSN  MXS.P390.COPYLIB(CBDTL)                          RECID
         Record DESC.: DETAIL                           Copybook type COBOL
 ******************************** Bottom of data ********************************
```

Figure 81: Choose Copybook from Map panel

Enter the number of the copybook to use for selection of the begin position. The copybook will then be presented. If the initial entry was a copybook, as opposed to a map, the '?' will take you directly to the copybook screen that follows.

To locate a field containing a specific character string, enter the command as `LF *NAME`. This format of the command would cause a search forward from the current field at the top of the present screen and redisplay the copybook with the first occurrence of a field that contains these characters anywhere within the field name. The syntax is:

```
COMMAND ==> LF fieldname  or

COMMAND ==> LF characters*  or

COMMAND ==> LF *characters
```

One the field is 'S'elected, you will return to the **COMPARE** Record Selection panel with the begin `POS` value entered into the field. For example, if the field selected on the prior panel was `EMPLOYEE-CODE`, the panel would appear as follows:

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.KSDS'                Invalid value
 COMMAND ===>

 Valid commands: SAVE, COPY.
 Valid CONDitions are: EQ, =, NE, <>, GT, >, GE, >=, LT, <, LE, <=.

 Press ENTER to select and compare records, or END to return without selecting.
 POS   COND DATA     IN-COL  LENGTH  COMP-COL                              And/Or
                                                                  More:     +
 2      ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
```

Figure 82: **COMPARE** Record Selection panel, with `POS` Value

COND: Enter a logical operator (EQ, NE, GT,GE, LT, LE) or numeric. If numeric, a scan starting at the POS position for an equal match to DATA will be performed for this LENGTH. Specify '0' (zero) to scan the remainder of the record.

As with POS, if not sure exactly what to enter into the COND field, type a '?' and press ENTER.

A scrollable panel explaining the various options will be presented. Choose the appropriate option or END to return without selection an option.

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX TEST CONDITION SELECTION                          Please select entry |
  | COMMAND ===>                                            SCROLL ===> PAGE  |
  |                                                                           |
  | A record is to be selected only if a test CONDition for the SEARCH DATA   |
  | string at BEGIN position 2 is true. Select the test CONDition to be       |
  | performed from the list below.                                            |
  |                                                                           |
  |                                                                           |
  | Type S next to the desired entry and press ENTER to select; or            |
  | Enter the END command to return without selection                         |
  |         TEST                                                              |
  | SELECT  COND       DESCRIPTION                                            |
  |   _     EQ         Retrieved data EQUAL to search data                    |
  |   _     NE         Retrieved data NOT EQUAL to search data                |
  |   _     GT         Retrieved data GREATER THAN search data                |
  |   _     GE         Retrieved data GREATER THAN OR EQUAL to search data    |
  |   _     LT         Retrieved data LESS THAN search data                   |
  |   _     LE         Retrieved data LESS THAN OR EQUAL to search data       |
  |   _     nn         SCAN LENGTH=nn bytes from BEGIN pos for EQUAL match    |
  |   _     0          SCAN REST OF DATA from BEGIN pos for EQUAL match       |
  |   _     =          Retrieved data EQUAL to search data                    |
  '-------------------------------------------------------------------------'
```

Figure 83: Test Condition Selection panel

DATA: The search for string can be a character string, quoted string, packed string or hexadecimal string. Quoted strings are case sensitive while non-quoted strings are case insenstive.

This field will also accept the '?'. However, in the case of data strings, this must be entered as the first character in the field. In all other positions, the '?' character is considered to be part of the entered search data string. Entry of a '?' in the first position will present templates of the various formats that are accepted in this field. Choose the appropriate template, then on return to the Selection Panel, modify the template with the data you want to search for in the record. This panel is also scrollable to present all of the various templates.

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.KSDS'
  .-------------------------------------------------------------------------.
  | MAX SEARCH DATA SELECTION FOR RECORD                  Please select entry |
  | COMMAND ===>                                            SCROLL ===> PAGE  |
  |                                                                           |
  | A record is to be selected only if a test CONDition for the SEARCH DATA   |
  | string at BEGIN position 2 is true. Select a template for entering a      |
  | SEARCH DATA string from the list below.                                   |
  |                                                                           |
  |                                                                           |
  | Type S next to the desired entry and press ENTER to select; or            |
  | Enter the END command to return without selection                         |
  |         STRING                                                            |
  | SELECT  TYPE       TEMPLATE DESCRIPTION                                   |
  |   _     ABC        UNQUOTED string      - case insensitive, same as T'ABC' |
  |                    Contains any alphanumeric character                    |
  |                    Example: HIPAA001                                      |
  |   _     'abc'      QUOTED string        - case sensitive, same as C'abc'  |
  |                    Contains any valid character, space, double quote      |
  |                    Example: 'Test1, Test2'                                |
  |   _     T'ABC'     TEXT string          - case insensitive, same as ABC   |
  |                    Contains any valid character, space, double quote      |
  |                    Example: T'TEST 1'                                     |
  '-------------------------------------------------------------------------'
```

Figure 84: Search Data Selection for Record panel

IN-COL: enter any number, not greater than the record length, indicating the first position of the compare data in the base (INFILE) file. This field will also accept a '?' and present the copybook from which to choose. However, in this case, if you choose a field, such as NAME-FIRST:

```
MAX - Choose Copybook from Map                                    Row 1 of 2
  .-------------------------------------------------------------------------.
  | MAX COPYBOOK FIELD SELECTION FOR RECORD              Please select entry |
  | COMMAND ===>                                          SCROLL ===> PAGE  |
  |                                                                         |
  | A field in the record located at the entered COLumn and LENGTH is to be |
  | compared to a field in the compare-to file. Select a field within the   |
  | record copybook to use it's POSITION attribute.                         |
  |                                                                         |
  |                                                                         |
  | Type S next to the desired entry and press ENTER to select; or          |
  | Enter the END command to return without selection                       |
  |         FIELD                                                           |
  | SELECT  POSN      LEVEL  *---------FIELD NAME---------*  FORMAT  LENGTH |
  |   _     00001      01    EMPLOYEE-RECORD                 GROUP   00068  |
  |   _     00001      05    EMPLOYEE-ID                     GROUP   00007  |
  |   _     00001      10    RECORD-TYPE                     C     1 00001  |
  |   _     00002      10    EMPLOYEE-CODE                   N     6 00006  |
  |         00008      05    EMPLOYEE-NAME                   GROUP   00025  |
  |   s     00008      10    NAME-FIRST                      C     9 00009  |
  |   _     00017      10    NAME-LAST                       C    15 00015  |
  |   _     00032      10    NAME-MIDDLE-I                   A     1 00001  |
  |   _     00033      05    EMPLOYEE-ADDRESS                GROUP   00032  |
  '-------------------------------------------------------------------------'
```

Figure 85: Copybook Field Selection for Record panel

Once you choose a field from the copybook, if no data has been entered into the LENGTH or COMP-COL fields, then the length of the chosen field will be entered into the LENGTH field and the corresponding position entered into the COMP-COL field. As shown, the first name is in position 8 for a length of 9:

```
MAX COMPARE RECORD SELECTION for 'MXS.TEST.KSDS'
 COMMAND ===>

 Valid commands: SAVE, COPY.
 Valid CONDitions are: EQ, =, NE, <>, GT, >, GE, >=, LT, <, LE, <=.

 Press ENTER to select and compare records, or END to return without selecting.
 POS   COND DATA     IN-COL  LENGTH  COMP-COL                          And/Or
                                                              More:     +
 2      EQ  T"MARCIA"                                                  ___
            Compare: 8       9       8
 _____  ___ ____________________________________________________________  ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________  ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________  ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________  ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________  ___
            Compare: _____   _____   _____
```

Figure 86: Record Selection Criteria, Example

LENGTH: Enter the length of the data to be compared. This length value applies to both files. If the length was provided when the IN-COL was selected, it can be left as is, re-entered, or a '?' can be entered to choose another field name and that length will be inserted into this field. If a length of zero is entered, the length will be calculated as the length from the IN-COL to the end of the record.

COMP-COL: Enter a number, not greater than the record length indicating the first position of the compare data in the changed (COMPFILE) file. Again, if this has been filled in from the original entry of the IN-COL, it does not have to be changed. However, as before, a '?' will present a copybook to aid you in selecting a starting position in the changed file.

Note: Record select and field compare criteria can be used to optionally select records, and/or fields within records, to be compared. A position, condition, "search for" data, with AND/OR information are entered to control the selection of a subset of records. Then compare field requests may be entered. When the select criteria is satisfied, the compare field requests are honored.

Compare request may appear before any position, condition, "search for" data, and AND/OR specifications. In this manner, all records will be compared in the fields selected.

Position, condition, "search for" data, and AND/OR requests may appear without any compare requests. In these cases, the selected records will be compared for all positions.

Compare requests may follow one or more position, condition, "search for" data, and AND/OR specifications. With this construct, the field compares will only be performed for those records that are selected.

Select and Change Criteria is saved while the user is in the **COMPARE** option. Commands are available to save the criteria and retrieve it at a later time.

COMPARE options with Selection Criteria

If Selection Criteria and/or Field Compare criteria is entered, additional options are available.

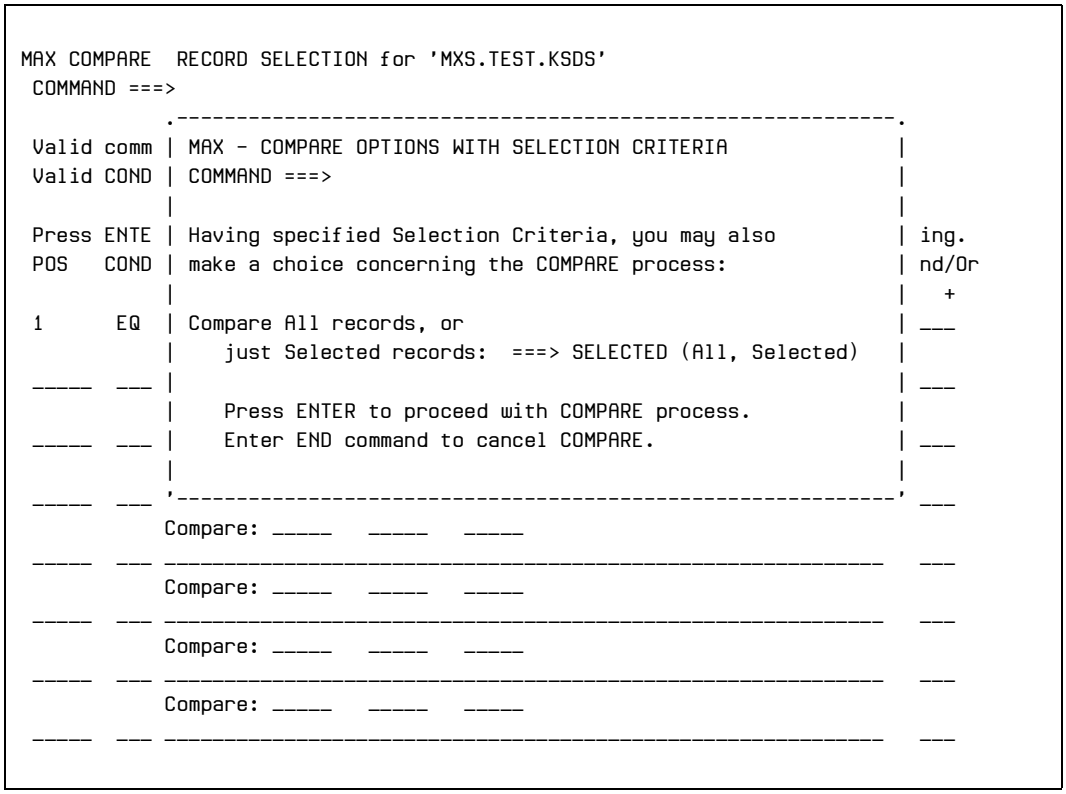

Figure 87: **COMPARE** options with Selection Criteria panel

Field Descriptions of selected parameters

Compare All records or just Selected records: If record selection criteria was entered, this option refers to those records not selected.

If SELECTED is entered, only those records chosen by the record selection criteria are compared. All other records are bypassed.

If ALL' is entered, those records not selected will be compared in their entirety.

Display Entire record or just the selected Columns: This option is presented when field selection has been requested. It applies to both character and hexadecimal format of the output report.

If ENTIRE is chosen, once a record fails the compare, it is reported on in its entirety, even if only selected fields were used in the compare.

If COLUMNS is chosen, then only the sections of the record that were compared are reported.

COPY

This command restores previously saved Compare Criteria data so that it may be used in this session. A panel will be presented prompting for the name of the data set containing the control records, as shown below.

If the data has been saved as a member of a PDS, a generic member name will result in a selection list from which the user can select the correct member, For example, to retrieve a list of all members with the starting characters of CB enter DSN.name(CB*) in the data set name field.

```
MAX COMPARE  RECORD SELECTION for 'MXS.TEST.KSDS'
 C .-------------------------------------------------------------------------.
   | MAX - COPY SELECT CRITERIA                                              |
 V | COMMAND ===>                                                            |
 V |                                                                         |
   | Specify "FROM" data set below.                                          |
 P |                                                                         | g.
 P | From partitioned or sequential data set:                                | /Or
   |    DATA SET NAME. . : ____________________________________________      | +
 _ |    VOLUME SERIAL. . : ______      (If not cataloged)                    | _
   |                                                                         |
 _ | "FROM" data set options:                                                | _
   |   AUTO SAVE CHANGES . . . . . . . . . . . . . . . : YES    (Yes, No)    |
 _ |                                                                         | _
   |    Press ENTER to perform copy request.                                 |
 _ |    Enter END command to cancel copy request.                            | _
   '-------------------------------------------------------------------------'
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
            Compare: _____   _____   _____
 _____  ___ ____________________________________________________________   ___
```

Figure 88: **COPY COMPARE** Criteria panel

Field Descriptions of selected parameters

AUTO SAVE CHANGES: When selection criteria changes in this session automatically re-write the selection criteria to this same data set.

GO

When all of the **COMPARE** selection and change criteria have been entered, type GO and press ENTER to proceed forward with the **COMPARE**.

MAP

If the map that was provided on the primary option panel is not the map to be used with these files, enter the **MAP** command. This will allow you to switch into option 6. Build Mapping Criteria to select a different map for processing without returning to the Primary Option panel to make this change.

RESET

To clear all of the data entered on the **COMPARE** Record Selection panel, enter the **RESET** command. This will clear data from all fields on this panel.

SAVE

This command saves Compare Criteria data so that it may be used in a subsequent session. A panel will be presented prompting for the name of the data set to save the control records. The data set that is to contain the control records must have a record length of a least 80.

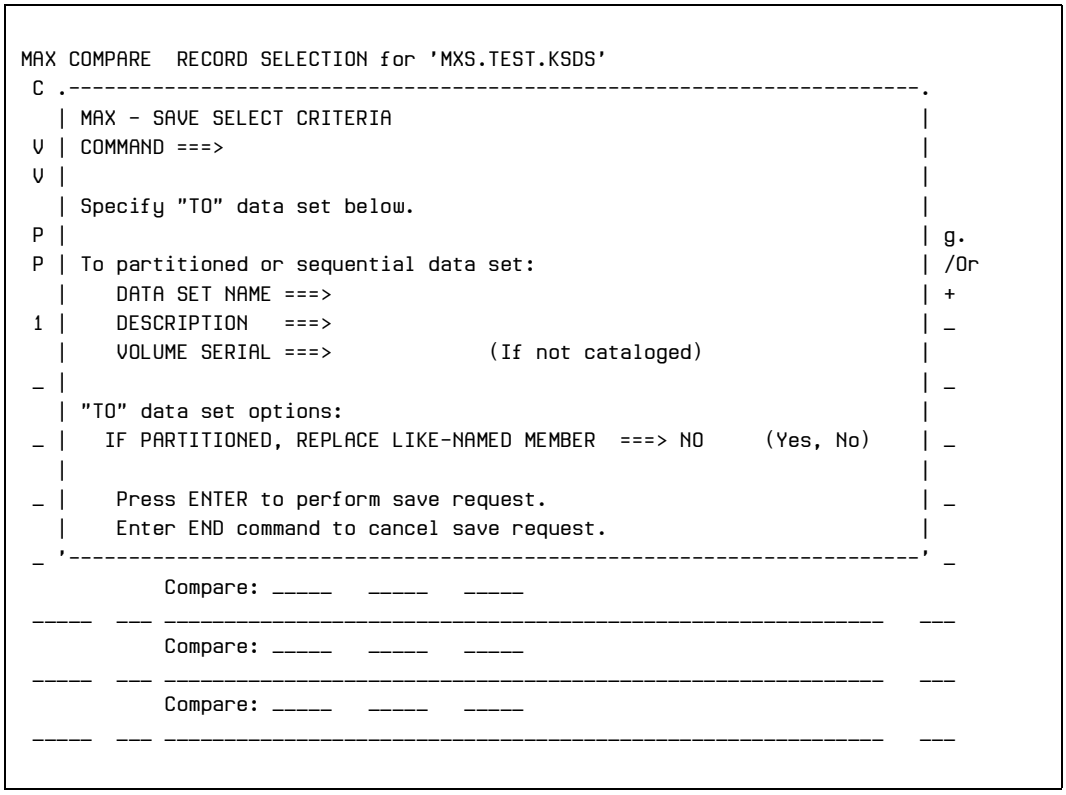

Figure 89: **SAVE COMPARE** Criteria panel

APPENDIX A: COPYBOOK SUPPORT

COBOL Copybook Support

COBOL copybooks are supported as follows:

- Field names to 40 bytes in length.
- REDEFINES up to 10 levels.
- OCCURS up to 9999 occurrences.
- USAGE types of `BINARY`, `COMPUTATIONAL`, `COMPUTATIONAL-1`, `COMPUTATIONAL-2`, `COMPUTATIONAL-3`, `COMPUTATIONAL-4`, `COMP`, `COMP-1`, `COMP-2`, `COMP-3`, `COMP-4`, `DISPLAY`, `PACKED-DECIMAL`.
- PIC clause characters supported:
  `B 0 / , . + - CR DB Z * $ 9 A X S V P`
  Duplicate field names supported as FILLER
- Support for copybooks containing multiple 01 levels. See "*LF (LOCATEF)*" on page 20 and "*LOCATEF*" on page 35.
- Support for **COPY** statements within copybook.

PL/I Copybook Support

PL/I copybooks are supported as follows:

- Field names up to 31 characters.
- Multi dimensional arrays with up to 999 occurrences.
- Data types as follows:

`BITS`	`BIN`	`BINARY FIXED`	`BIN FLOAT`
`CHAR`	`DEC`	`DEC FIXED`	`FIXED`
`FIXED DEC`	`DEC FLOAT`	`FIXED BINARY`	`FLOAT`
`FLOAT BIN`	`FLOAT DEC`	`PICTURE`	

APPENDIX B: CHANGING INSTALLATION DEFAULTS

The member MAXDFLTS, in the installation JCL library, is available for the user to change defaults as they exist in the MAX/Batch product. As shipped, this member contains the standard defaults for each of the options that can be changed.

To run the product with the standard defaults, no action is required.

To change one or more of the standard defaults, edit the member, make the changes as noted, and submit the job. Once this module is linked into the load library containing the MAXBAT module, the new options will be in effect.

Option	Standard default
Input data file name	SYSUT1
RC - records truncated during **COPY**	4
RC - no records selected from input	4
RC - input file is empty	8
RC - not all records compare	4
RDW Value	3
Character translation	DEFAULT (USA English)[1]
Lines per page	60
Illogic indicator[2]	N
Input disposition	C = close between commands
Output disposition	C = close between commands
RC - if no copybook found with FPRINT command[3]	
Number of external Translate tables[4]	3
Table name and pointer[4]	3 default tables
Translate tables[4]	256 byte tables

1.Valid character sets include CP870 (Czech) and CP838 (Thai).

2.Use this indication to receive error (Y) if illogical operand sequences are found. If an OR follows and operand other than another OR, an IF or an AND it is considered illogical. The OR in this series will begin a new IF sequence. Set the indicator to Y to detect these situations.

3.This applies only to the **FPRINT** command. If a copybook is not found and the record is printed in DUMP format, a special return code can be set.

4.The placement and coding of the translate tables must follow the example shown in the MAXDFLTS member that is shipped with MAXBAT. The fullword value in NUM#TRT must indicate the number of tables (full 256 byte tables) that follow. This fullword is followed immediately with each 8 byte table name and its 4 byte address pointer. Follow this with the full 256 byte translate tables. The tables shipped with this are examples that can be used as is or modified by the user.

APPENDIX C: SECURITY CONSIDERATIONS

The MAX MVS/UTIL product honors all standard security interfaces. For example, if a user attempts to use the product to update a data set to which they have been denied access, the following screen will appear:

```
ICH408I USER(your_userid ) GROUP(xyz     ) NAME(####################)
  SYS1.SAMPLIB CL(DATASET ) VOL(Z4RES1)
  INSUFFICIENT ACCESS AUTHORITY
  FROM SYS1.* (G)
  ACCESS INTENT(UPDATE )  ACCESS ALLOWED(READ   )
IEC150I
913-38,IFG0194E,your_userid,ISPFPROC,ISP14273,0A80,Z4RES1,SYS1.SAMPLIB
***
```

Figure 90: Security considerations panel

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