

CA Verify[®] Automated Regression Testing for VTAM

User Guide

Version 9.0.00



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CA Technologies Product References

This document references the following CA Technologies products:

CA ACF2™

CA IDMS™

CA InterTest™ Batch

CA Top Secret®

CA Verify® Automated Regression Testing for VTAM (CA Verify for VTAM)

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Chapter 1: Introduction

This section contains the following topics:

[About CA Verify for VTAM](#) (see page 15)

[Benefits of CA Verify for VTAM](#) (see page 15)

[Additional Features](#) (see page 16)

[Types of Testing](#) (see page 17)

[Security Considerations](#) (see page 17)

[How to Get Started](#) (see page 18)

About CA Verify for VTAM

CA Verify Automated Regression Testing for VTAM, (CA Verify for VTAM), an automated quality assurance testing tool, ensures that new or revised application and system changes are thoroughly tested so they function correctly in production.

CA Verify for VTAM is a testing tool for *all* applications running under VTAM. That means you can use CA Verify for VTAM with IMS/DC, TSO, CICS, CMS, and CA IDMS/DC environments.

CA Verify for VTAM *automates* testing by capturing a sequence of input and output screens from live sessions. The captured screens constitute a *test stream*. After an application or system change, you can re-execute the test stream. CA Verify for VTAM compares the current output screens with the original output screens and displays all differences (*mismatches*) online. You can also use CA Verify for VTAM to run test streams in batch and print the differences.

CA Verify for VTAM also permits *rules* and *rulesets* to be defined and applied to captured test streams. The rules notify CA Verify for VTAM in advance of expected test stream differences and how to handle them. The rules feature makes it easy to run captured test streams against new releases of an application, by eliminating the need to stop for expected changes.

Benefits of CA Verify for VTAM

Here are some of the benefits when you use CA Verify for VTAM for testing:

- You will not have to re-key data during test sessions because CA Verify for VTAM saves the original input screens with the data already entered.
- You will not have to compare test results manually. Manual *before* and *after* comparisons, always tedious and error-prone, are eliminated.

- Once you have captured a test stream, you can modify it directly or establish rules that model and handle expected changes, as your testing needs change.
- You can simulate production conditions — for example, you can:
 - Use real, rather than contrived, test data
 - Execute similar or identical transactions which try to perform the same task at the same time
 - Simulate high-volume activity *without* tying up system resources or affecting response time because CA Verify for VTAM uses *virtual* terminals

Additional Features

Other important CA Verify for VTAM features include:

- A user exit interface that lets you customize CA Verify for VTAM. For example, you can call an external security system or modify screen data when a test stream is executed.
- The ability to process command lists which can be used to open files, verify CICS initialization, and perform CICS termination tasks
- A powerful rules function to give advance notification to CA Verify for VTAM of expected test stream differences and how to handle them. This feature is particularly useful in filtering out the anticipated changes of a new release from the unexpected changes.
- The ability to convert test streams to REXX and execute them under a CA Verify REXX Command Environment.
- An online demo session that helps users quickly learn how to use CA Verify for VTAM
- Menus and PF keys which follow ISPF standards, so new users find it easy to use
- An automated signon and signoff capability which eliminates the need to capture required security transactions in every test stream
- A TSO interface that lets you use the Browse, Edit, Maintain Rules, and Utility functions under TSO

Types of Testing

CA Verify for VTAM is the ideal tool for all of the following types of testing:

Unit:

Test a program change and see how it affects the rest of the program

Integration:

Test whether a modified program works properly in conjunction with other programs

Concurrency:

Test what happens when two or more transactions try to perform the same task at the same time; for example, update a record

Regression:

Test whether a system performs as usual after a change to one component of that system

Stress:

Test how your system behaves under heavy loads and determine how increased transaction volume affects response time

Migration:

Test whether existing applications perform as expected following hardware or system changes; for example, a new disk drive or a new release of CICS

See the Chapter "Testing" for suggestions on how to perform different types of testing.

Security Considerations

Because CA Verify for VTAM is a VTAM application, it is subject to whatever VTAM security system you are using. In addition, CA Verify for VTAM performs its own internal checking based on operator ID to ensure that test streams are accessed only by authorized users.

CA Verify for VTAM provides important safeguards to protect against unauthorized use.

- Interfaces to most operating system security packages, such as RACF, CA ACF2 and CA Top Secret, are provided. These interfaces can be used to restrict access to authorized users.
- You can specify read, write, or print protection for test streams and rulesets

- You can specify that CA Verify for VTAM not display the contents of dark (non-display) screen fields.
- Specific applications can be globally excluded from test streams. Moreover, when you create an individual test stream, you can specify which applications to include or exclude.

How to Get Started

If you are a new user, read the *Getting Started* and *Testing with CA Verify for VTAM* chapters and then perform the demo session located in the chapter "Install Verification Procedure and Demo Session". Then you will have all the information you need to begin creating your own test streams.

To perform simple tests, you will only need to see the:

- Log Function chapter for instructions on creating a test stream
- Run Function chapter for instructions on executing a test stream

See the "Browse Function" chapter to learn how to examine test streams online.

To begin using the rules function, see the *Rules Primer*, and the chapter "Rules Function" in this guide.

As you become more expert in using CA Verify for VTAM, you will want to see other chapters which explain more complex functions.

Chapter 2: Getting Started

This chapter describes functions and explains which ones to use to perform different types of testing; it also describes the contents of a test stream and the types of comparisons CA Verify for VTAM can perform.

This section contains the following topics:

[Invoke CA Verify for VTAM](#) (see page 19)

[Function Overview](#) (see page 21)

[Types of Screens](#) (see page 23)

[Test Stream Contents](#) (see page 24)

[Types of Comparisons](#) (see page 25)

[Panels](#) (see page 26)

[Commands and PF Keys](#) (see page 27)

[Using TSO](#) (see page 30)

Invoke CA Verify for VTAM

Follow these steps:

1. Type the following command:

```
VERIFY
```

CA Verify for VTAM displays either the signon menu or the Primary Options Menu, depending on options specified at installation.

The signon menu is illustrated next.

```
CCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCC
CCCC
CCCC  AAAAAAAAAA
CCCC  AAAAAAAAAA
CCCC  AAAA  AAAA
CCCC  AAAA  AAAA
CCC  AAAA  AAAA
C  AAAACCCCCCCCCC
  AAAACCCCCCCCCC
  AAAA  AAAA
  AAAA  AAAA
  AAAA  AAAA

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  USERID  ==>
  PASSWORD ==>
  NEW PASSWORD ==>

ENTER THE ABOVE INFORMATION AND PRESS ENTER TO CONTINUE OR F3 TO END
```

2. Type your userid, password, and, optionally, a new password and press Enter.

CA Verify for VTAM displays the Primary Options Menu.

Note: If your installation is using a security package (for example, RACF, CA Top Secret, or CA ACF2) with CA Verify for VTAM:

- The security package will verify your password
- The new password option may or may not be functional, depending on how security was implemented

- If your installation is not using a security package, just type your name. CA Verify for VTAM will use it for its own internal security (see the Test Stream Protection option in the chapter "Log Function").

```

Version 9.0.00----- CA VERIFY PRIMARY OPTIONS MENU -----10:29:28
ENTER COMMAND ==>                                     TERM: A68L904
                                                         OPER: VERIFY

  L LOG A TEST STREAM

  B BROWSE A TEST STREAM

  R RUN A TEST STREAM

  E EDIT A TEST STREAM

  M MAINTAIN RULES

  I INQUIRY/TERMINATION OF FUNCTIONS

  U UTILITIES

  T TUTORIAL

  X EXIT
    *** ENTER "KEYS" COMMAND TO SEE PF KEY ASSIGNMENTS ***

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```

The previous menu lists the CA Verify for VTAM functions, which are described in the next section. To select a function, type its letter in the Enter Command field and press Enter.

Bypass the Primary Options Menu

You can access a function without returning to the Primary Options Menu by entering `=x` on the command line of any menu except those displayed when a test stream is running. Replace `x` with the letter identifying the function. For example:

`=B`

Accesses the Browse function.

Function Overview

Log a Test Stream

The Log function is the process by which CA Verify for VTAM captures input screens as they are received from the terminal and output screens as they are sent to the terminal. The captured records constitute a *test stream*.

Browse a Test Stream

The Browse function lets you examine a test stream you have logged or run. You can look at any of the screens and any information saved when the test stream was run.

Run a Test Stream

The Run function is the process by which CA Verify for VTAM re-executes a test stream. CA Verify for VTAM sends the captured input screens to the application, compares the output screens generated by the application with the original output screens, and flags any differences.

Edit a Test Stream

The Edit function lets you modify a test stream you have logged or run. For example, you can delete screens or change input data.

Maintain Rules

The Maintain Rules function lets you create, modify, and delete rulesets and rules that can be applied to one test stream, all test streams within an application, and/or all test streams in a system. Rulesets and rules tell CA Verify for VTAM, in advance, what changes you expect to see when running a test stream in a modified application or environment. When using rulesets, CA Verify for VTAM will not flag the differences accounted for by the rules, which greatly streamlines the testing of new releases with existing test streams.

In addition to controlling the changes made within a test stream, you can use the Rules function while logging to control which terminals, applications, or users should be logged.

Inquiry and Termination of Active Functions

The Inquiry function lets you display the status of all active and suspended functions and terminate Log functions.

Utilities

The Utilities let you manipulate test streams. Using the Utilities, you can:

- Update a test stream's directory information
- Append screens from one test stream to the end of another test stream
- Insert screens from one test stream into another test stream
- Merge two test streams
- Copy a test stream from one name to a new name, and, optionally, copy its ruleset at the same time
- Rename a test stream and its associated ruleset
- Delete a test stream and its associated ruleset

Tutorial

Use the Tutorial to learn how to use CA Verify for VTAM.

Exit CA Verify for VTAM

Use the Exit function to exit from CA Verify for VTAM.

Types of Screens

While using CA Verify for VTAM, you will encounter three types of screens:

Original Screen

Displays the record from the originally logged test stream with no changes applied.

Expected Screen

Displays the original screen with rules applied.

Current Screen

Shows the screen that results from the test stream being run.

In most cases, you can use PF2 (Rotate) to switch the display from Expected to Current to Original and then back to Expected.

Test Stream Contents

Each record in a test stream created by the Log function contains either an input or output screen. Records in test streams created (or updated) by the Run function may also contain additional information: an original screen or mismatch signoff comments.

Each test stream record consists of one or more parts, as illustrated next.

Input Record	Output Record
Current input screen	Current output screen
Original input screen (optional)	Original output screen (optional)
	Mismatch Data (optional)
	Applied Rules (optional)
	Expected Screen (optional)

Input Record

Current Input Screen

The current input screen always appears in a test stream. It is the input from the log or most recent run.

Original Input Screen

The original input screen appears in a test stream created by the Run function only if it differs from the current input screen and record history was specified.

Output Record

Applied Rules Screen

Shows the rules applied to the original screen to obtain the expected screen. This screen is similar to the Rules Applied During Run screen.

Current Output Screen

The current output screen always appears in the test stream. It is the output from the log or most recent run.

Expected Output Screen

The original output screen showing any rules that have been applied.

Original Output Screen

The original output screen appears in a test stream created by the Run function only if it differs from the current output screen and record history was specified.

Signoff Data

This information is specified by the user during the Run function to explain the mismatch.

Mismatch signoff information is available only if this option was specified during the most recent run.

Record Numbers

A record number identifies every record in the test stream. This is a sequential number associated with each current input or output screen. For example, if a test stream consists of one input screen, followed by one output screen, followed by one input screen, followed by one output screen, all input screens will be odd numbered and all output screens will be even numbered.

Types of Comparisons

When CA Verify for VTAM runs a test stream, it compares the original output screens with the current screens. You can specify one of the following comparison types:

Screen

Compares corresponding rows of two screens to see if they are the same; comparison base includes all output screens between two input screens.

This type of comparison *must* be used when processing a test stream with a ruleset.

Logical

Screens to see if they are the same. Variation in bytes transmitted to the terminal is allowed as long as the end result is the same.

A logical comparison also allows for variable fields (that is, fields you would expect to be different, such as run date or time-of-day).

Note: A logical comparison is not supported for non-3270 terminals.

Physical

Compares 80-byte segments of the data streams.

Use this type of comparison for non-3270 terminal test streams and for test streams that use graphics.

During a logical, physical, or screen comparison, CA Verify for VTAM halts the run if it detects any difference between the original and current screens. At this point you have many different options. For example, you can ignore the mismatch, define additional rules, or terminate the run.

Panels

Most panels have the same header format. A sample panel is shown next, followed by an explanation of the common areas.

```
1          2          3
SAMPLE.TEST.001 ----- BROWSE: DIRECTORY INFORMATION -----10:41:46

ENTER COMMAND ==>4
5
DESCRIPTION: SAMPLE TEST STREAM OF CAROL'S COOKIES COMPANY

          LOG:          RUN:          EDIT:          TEST STREAM:          IN:  OUT:
INVOKED BY: DORI
INVOKED ON: 02/09/1999
START TIME: 10:41:01
DURATION: 00:00:38 00:00:16
SYSTEM: A04IC9NA
STATUS: NORMAL
TERMINAL: A60L2049
VSAM CI'S: 2

AVERAGE THINK TIME: 00:00:02.437
AVERAGE RESPONSE TIME: 00:00:01.417
MAXIMUM SCREEN SIZE: 24 BY 80
PROTECTION STATUS:
ORIGINATING TEST STREAM:
                                OWNER: DORI
                                CREATED BY FUNCTION: LOG

F1-HELP  F3-END  F4-RETURN
```

1 - name area

Indicates the name of the test stream when a specific test stream is being processed; otherwise, it contains dashes.

2 - title

Identifies the menu.

3 - message area

Contains an error or informational message; otherwise, contains the time.

4 - command area

Use this field to type a command, option, or parameter.

5 - extended message area

Displays an extended, numbered message if you type the Help (PF1) command when an error message appears in the message area 3. At other times, instructions on how to proceed will appear.

Commands and PF Keys

The following commands can be used with all functions. Commands that apply to a specific function are discussed in the appropriate chapters. All commands except Redisplay can be entered in the command area.

Where applicable, the default PF key that can be used instead of the command is listed.

Caps On/Off

Translates lowercase characters to uppercase on menus with the following fields that support lowercase:

Edit function

Field and Hex format input

Browse and Edit functions

Find and Change command parameters

Rules function

All values and description fields

Log and Utility functions

Terminal names

End (PF3)

Ends processing of the current menu and returns to prior processing level.

Help (PF1)

If a brief error message is displayed, replaces that message with a more detailed, numbered message on the third line of the menu. If an error message is not displayed, displays the Tutorial panel for the current function.

Keys (PF12)

Displays a list of PF key assignments.

OPTS

Displays the options as currently set in the OPTIONS module.

Redisplay (PA2, CLEAR, PFn)

Refreshes the last menu displayed. Invoke this command by pressing the PA2 key, Clear, or the assigned PF key.

Resume

Continues processing from the point of suspension. This command is valid only from the Primary Options Menu. See Suspend.

Return (PF4)

Ends processing of the current menu and returns to the Primary Options Menu. During Run Mismatch processing, this command is treated as the End command.

Shutdown

Shuts down the control task. If the installation option SHUTDOWN has been set to YES, anyone can issue this command on any menu as long as he is the only person using the control task. If the installation option SHUTDOWN has been set to NO (the default), only a security administrator or console operator can shut down the control task.

Size Def/Alt

Directs CA Verify for VTAM to use the default or alternate screen size for its menus. Both the default and alternate sizes are defined during installation. The sizes supported are dependent on terminal models. If this command is specified without either parameter, CA Verify for VTAM toggles between the default and alternate sizes.

Suspend

Suspends current processing and displays the Primary Options Menu. The suspended function will appear on the menu, followed by (SUSPENDED). Only one Suspend command may be issued from a terminal. This command is not valid from the Primary Options Menu. See Resume.

The following chart lists the commands for which default PF keys are assigned. Default PF key assignments are determined when CA Verify for VTAM is installed. Minimum abbreviations are underlined>.

Default PF Key	Command
PF1	Help
PF2	Rotate
PF3	End
PF4	Return
PF5	Prev
PF6	Next
PF7	Up
PF8	Down
PF9	Format
PF10	Left
PF11	Right
PF12	Keys

Note: Defaults for PF keys 13-24 are the same as for PF keys 1-12.

See the preceding section for an explanation of commands used with all functions. Commands for specific functions are discussed in the appropriate chapters.

Be aware of the following:

- If a PF key command is not appropriate to the function you are performing, CA Verify for VTAM treats it as the Enter key.
- If a command requires parameters, type them in the command area.
- If you type more parameters than a command requires, CA Verify for VTAM ignores them.

Display PF Key Assignments

Type the Keys (PF12) command on any menu to display a list of PF key assignments.

```

----- CA VERIFY PF KEY ASSIGNMENTS -----10:31:13
                                             HK

      KEY  ASSIGNMENT                KEY  ASSIGNMENT

PF1:  HELP                          PF13: HELP
PF2:  ROTATE                         PF14: ROTATE
PF3:  END                            PF15: END
PF4:  RETURN                         PF16: RETURN
PF5:  PREV                           PF17: PREV
PF6:  NEXT                           PF18: NEXT
PF7:  UP                             PF19: UP
PF8:  DOWN                           PF20: DOWN
PF9:  FORMAT                         PF21: FORMAT
PF10: LEFT                           PF22: LEFT
PF11: RIGHT                          PF23: RIGHT
PF12: KEYS                           PF24: KEYS
                                       PA2:  REDISPLAY

      PRESS ANY PF KEY TO RETURN TO THE PRIOR MENU

```

Using TSO

You can use the Browse, Edit, Utility, and Tutorial functions under TSO. A data set can be allocated and then CA Verify for VTAM can be invoked either by:

```
CALL 'VERIFY.LOADLIB(XTCAMAIN)'
```

or as a command processor:

```
XTCAMAIN
```

If you invoke CA Verify for VTAM as a command processor, the load modules must be in a STEPLIB.

Note: The Suspend and Resume commands are not supported.

Chapter 3: Testing

This chapter discusses using CA Verify for VTAM to perform unit, integration, concurrency, regression, stress, and migration testing.

This section contains the following topics:

[Testing in Many Environments](#) (see page 31)

[Unit Testing](#) (see page 32)

[Integration Testing](#) (see page 32)

[Concurrency Testing](#) (see page 33)

[Regression Testing](#) (see page 36)

[Stress Testing](#) (see page 36)

[Migration Testing](#) (see page 37)

[Automated Batch Testing](#) (see page 38)

Testing in Many Environments

Testing programs without CA Verify for VTAM is difficult because your test region differs significantly from your production environment. For example, it is very hard to replicate the:

- Number of terminals
- Types of terminals
- Program activity

With CA Verify for VTAM, it is easy to simulate production conditions. That means you can perform all types of testing; unit, integration, concurrency, regression, stress, and migration, so you know your application will perform as expected. This chapter explains in detail how to use CA Verify for VTAM to perform these types of testing.

To test applications effectively, you need well-constructed tests. CA Verify for VTAM greatly simplifies the task of creating these tests. All you have to do is log test streams. Optionally, you can edit these test streams to meet your testing needs. For example, you can combine test streams, alter the input data to test a variety of conditions, or delete a sequence of screens. As you save test streams, you'll create a library of tests that will always be available to test application and system changes.

You can test all applications that run under MVS VTAM, including IMS/DC, CICS, TSO, and CA IDMS/DC applications. For example, you can create a system test to run after an IMS or MVS upgrade. Or, use CA Verify for VTAM to test VM applications running under Netview or to capture TSO SPUFI sessions. You can even automate batch testing by logging a test stream which submits and reviews batch jobs under TSO.

You can even log applications that run under multiple environments. For example, suppose you have a CICS application that passes data to another CICS application. However, before the data is passed, it is sorted in batch. You can use CA Verify for VTAM to log all three steps: the first CICS application, the middle TSO application that submits the batch job, and the second CICS application. If any step changes, you can test the entire job.

To further streamline the testing of application or system changes, CA Verify for VTAM provides a powerful Rules function to use with your library of test streams. Rulesets let you identify the expected changes to the existing test stream due to application or system changes. By running the test stream in the new application with a specified ruleset, you can eliminate the need to stop at the expected changes, greatly streamlining your testing.

Unit Testing

Unit testing is the most common type of testing. You change individual *units of work* and test each change. A unit of work may be a program, a sequence of events, or just an input/output screen. However, unit testing does not test how a program interacts with other programs or its effect on the system.

Follow these steps:

1. Create a test stream by logging the screens connected with the change. If the program is small, you may want to log all the screens.

If you already have a test stream that tests this unit of work, you will not need to create a new one.

2. Change the screen in the application.
3. Run the logged test stream. CA Verify for VTAM compares the output produced by the program *before* the change with the output produced *after* the change.

CA Verify for VTAM flags all differences. You expect *one* difference — the difference in the single field, which you changed. Otherwise, the original and current screens should be the same.

4. If you find any unexpected differences, make corrections and rerun the logged test stream until you are sure the modified program is functioning as anticipated.

Integration Testing

Integration testing determines if a program works properly with other programs. A program can pass unit testing — and then fail when executed in conjunction with other programs that were not part of the unit test. For example, if several programs update the same file, a change to one program may have unexpected effects on the others.

Follow these steps:

1. Create a test stream logging all affected programs — that is, the program that changed and all programs run in conjunction with it. Or, use a previously logged test stream that tests this application.

The logged test stream can be created by one of the following methods:

- Capturing a series of transactions in your production region
- Combining several unit test streams. Use the Append or Insert utilities if you want the test streams to run sequentially, or the Merge utility if you want the test streams to run concurrently.

2. Change the screen in the application.
3. After the changed program passes unit testing, run the logged test stream. CA Verify for VTAM compares the output produced by all the programs *before* the change with the output produced *after* the change.

CA Verify for VTAM automatically flags all differences. You expect *one* difference — the difference in the single field, which you changed. Otherwise, all the original and current screens should be the same.

4. If you find any unexpected differences, make corrections and rerun the logged test stream until you are sure the modified program and all programs connected to it are functioning as anticipated.

Repetition Testing

Another form of integration testing is *repetition* testing. This type of testing ensures that programs remain re-usable and is generally used to test reentrancy. To perform repetition testing, simply re-execute a test stream a few times to make sure that each execution is successful and produces the same results.

Concurrency Testing

Concurrency testing determines what happens when similar or identical transactions execute at the same time and try to perform the same task, such as processing the same file or data base record.

Manual concurrency testing is virtually impossible. You would have to have multiple users simultaneously enter the same transaction on different terminals. Even if that were practical, network and access method processing would affect how CICS processes the transactions. With CA Verify for VTAM, however, concurrency testing is both easy and accurate because CA Verify for VTAM automatically ensures that the transactions are processed concurrently.

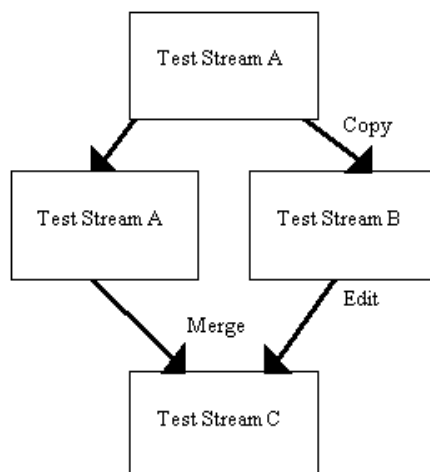
Follow these steps:

1. Create a test stream by logging the screens when a transaction updates an inventory file. Or, use an existing test stream.
2. Merge the test stream with itself. The new test stream consists of two identical sets of records, each assigned to a different terminal. If necessary, you can merge the new test stream with itself again, creating four identical sets of records assigned to four terminals.
3. Optionally, you can edit the test stream to alter the test data. For example, you may want to alter the inventory file key to ensure that the test stream updates different records. You can edit the test stream by copying it before the merge, editing one test stream, and then merging the two test streams. Or, you can first create the merged test stream and then edit it.
4. Run the merged test stream.
 - CA Verify for VTAM sends the first input screen from terminal 1 to the application. Then, CA Verify for VTAM sends the first input screen from terminal 2 to the application. These are, of course, identical screens unless you edited one.
 - Next, the application sends the first output screen from the application to terminal 1. Then, the application sends the first output screen from the application to terminal 2.
 - CA Verify for VTAM continues to run the test stream. You can easily determine how the application concurrently processes these requests.

When CA Verify for VTAM runs a single terminal test stream that has been merged into itself, it ensures that all output screens are received by the terminals before it sends the next input screens. Using this method, a multiple terminal test stream always produces consistent results.

The following diagrams illustrate two ways in which you can edit the test stream:

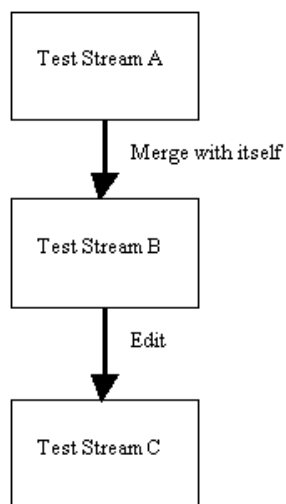
Example 1



In Example 1:

1. The test stream is copied.
2. One of the copies is edited.
3. The two test streams are merged.

Example 2



In Example 2:

1. The test stream is merged with itself.
2. The merged test stream is edited.

Regression Testing

Regression testing ensures that a change to a component of a system does not have unexpected effects on the rest of the system.

For regression testing, you create a benchmark test and then re-execute the system *using the same test data*. CA Verify for VTAM compares the results with the benchmark results to determine if there are any unexpected differences.

With CA Verify for VTAM, it is easy to create and maintain standardized tests for all your systems. Whenever you make a change, you can quickly determine whether or not the system still performs as expected.

Follow these steps:

1. Create a test stream by logging a standard set of payroll transactions, or use an existing test stream. This test stream will be your benchmark test for the payroll system.
2. Change the program.
3. Unit test the program to make sure the change is working as expected.
4. Run the logged payroll test stream. The only difference CA Verify for VTAM should detect is the single program change.

Stress Testing

Stress testing lets you find out how your system behaves under heavy loads and how increased transaction volume affects response time. System programmers can use this information to tune the system. Capacity planners can use it to determine when and how to expand system capability to meet projected growth estimates. Because CA Verify for VTAM uses *virtual* terminals instead of real terminals, you can simulate system activity *without* tying up valuable system resources.

Follow these steps:

1. Create one or more multiple terminal test streams by logging many terminals at once. For example, you may want to log all the terminals in a particular department or all the terminals in a region.
2. Create a large-volume test stream by merging the test stream with itself or by merging several test streams. The screens from one test stream are interspersed among the screens from a second test stream.

3. Run the merged test stream either online or as a batch job.
 - When CA Verify for VTAM runs in batch, it brings up a CICS region in which it is the only user. Because there is no resource contention, transactions execute under optimal conditions. Such information may be valuable for optimization or tuning.
 - To simulate increased stress, reduce the operator think time. For example, you can request that input screens be sent to the application twice as quickly as the operators originally sent them. You can even specify no operator think time. Reducing think time is a good way to simulate a stress test even with moderate transaction activity.
 - Because you're not concerned with program changes, instruct CA Verify for VTAM *not* to compare the original and current screens. Of course, if you logged only input screens, no comparison will take place.

Note: To test an incremental increase in transaction volume, run a test stream containing the additional volume during peak periods.

Migration Testing

Migration testing ensures that existing applications perform as expected when you have major hardware or software changes; for example, upgrading from one release of CICS to another, adding disk packs, or even migrating from VSE to MVS.

Follow these steps:

1. Create a test stream by logging several critical hours of activity for as many terminals as you believe are necessary to provide a realistic "slice of life." For example, you may want to log all the terminals in a particular branch or department. Or, you may want to create a controlled test by combining and/or editing many unit tests.

Remember, once you create this test stream, you can use it again and again to test system or software upgrades.
2. At night or on a weekend, run the logged test stream, either from a terminal or as a batch job. Specify no operator think time so the test completes as quickly as possible.
3. If the transactions execute normally and the output is correct, you can assume that the hardware or software change won't have any unexpected impact on production.

Automated Batch Testing

CA Verify for VTAM can speed up batch testing by making it possible to automatically submit and review jobs.

To test batch jobs, log a test stream which consists of the following tasks:

1. Logon to TSO.
2. Edit the batch job.
3. Submit the batch job. Use the NOTIFY parameter so a message is issued when the job completes.
4. If you are using a full-screen product like ISPF to submit the job, exit from ISPF to await notification that the job has completed.
5. Review the job output under TSO. Use the FIND command to position yourself after the job informational messages which may vary from one execution to another.
6. Delete the output.

Running this test stream will submit the job and automatically review the output and identify any differences. You can use one test stream to submit and review many jobs in succession.

Chapter 4: Log Function

This chapter explains how to create a test stream.

This section contains the following topics:

[Overview](#) (see page 39)

[How the Log Function Works](#) (see page 40)

[Invoke the Log Function and Specify Terminal Options](#) (see page 41)

[Log One or More Terminals](#) (see page 42)

[Log an Application](#) (see page 50)

[Apply Rules to the Logging Session](#) (see page 57)

[Terminate the Log Function](#) (see page 67)

Overview

The Log function is used to create a test stream of input and output terminal screens for an application or system. Once a test stream has been logged, it can be run and rerun to test changes to the underlying program.

For example, suppose you modify an application and want to check for changes and errors in the application that may have been unintentionally introduced. You can log a test stream on the original program and run that test stream on the new version. CA Verify for VTAM will compare the logged output screens with the new output screens and flag any differences, making it easy to spot and correct errors. Alternatively, if you install new disk drives or a new release of CICS, you can run your logged test streams to make sure all your applications perform as expected.

You can log a test stream from one or more terminals. Logging a test stream from multiple terminals provides the tools you need for stress testing. You can also run such a test stream under varying conditions to gauge the impact on your system.

As you log test streams, you'll be creating a library of benchmark tests you can use over and over again to test application and system changes. For this reason, you'll want to make sure the test streams you create are as complete as possible.

Note: Test streams can be browsed and edited. For example, you can change a test stream so you can test different input, or you can merge test streams to create a new test case.

How the Log Function Works

Follow these steps:

1. You initiate logging.
2. The first output from USS or the routing application to the terminal being logged will usually be the *first* screen for that terminal in the test stream. That screen will be followed by input and output screens in any order.
3. Logging continues until you explicitly terminate it.

CA Verify for VTAM can log:

- Single session test streams; for example, a TSO session
- Multiple session test streams; for example, a CICS session followed by a TSO session followed by an IMS/DC session
- An application which passes terminals to other applications
- Multiple test streams at the same time. These test streams can be logged from the same or different terminals. For example, two users can request at the same time that terminal A be logged. CA Verify for VTAM would then create two test streams.

You won't even be aware that logging is taking place. CA Verify for VTAM does *not* tie up a terminal that is being logged. A single control task, which does *not* use a terminal, records the screens for *all* logging.

Invoke the Log Function and Specify Terminal Options

Follow these steps:

1. Type L on the Primary Options Menu.
CA Verify for VTAM displays the Log Options Menu.

```
----- LOG OPTIONS MENU -----10:31:39
ENTER COMMAND ==> L
  T THIS TERMINAL
  O ANOTHER TERMINAL
  M MULTIPLE TERMINALS
  A AN APPLICATION

F1-HELP  F3-END  F4-RETURN
```

2. Indicate which terminals CA Verify for VTAM should log by specifying one of the following:

T

Your terminal

O

Another terminal

M

Multiple terminals

A

All terminals associated with a specific application

3. Press Enter.

CA Verify for VTAM displays the menu for the option you have specified.

Note: You can bypass the Log Options Menu by typing L.T, L.O, L.M, or L.A on the Primary Options Menu.

Log One or More Terminals

You have the option of logging a test stream on the terminal where you are operating CA Verify for VTAM, on another terminal, on multiple terminals, or all terminals associated with a specific application.

Logging Your Terminal

If you specify **T** on the Log Options Menu or **L.T** on the Primary Options Menu, CA Verify for VTAM displays the Single Terminal Log menu.

```

----- SINGLE TERMINAL LOG -----13:45:18
ENTER COMMAND ==>
                                                    L1

LOG TEST STREAM AS:
  DDNAME      ==> TCADS
  APPLICATION ==>
  MEMBER      ==>
  VERSION     ==> 001

DESCRIPTION ==>
            ==>
            ==>

STOP OPTION           ==> DISC (DISC, MAN, PF__, PA_, OR CLEAR)
PROCESS WITH RULES   ==> N   (Y/N)
TEST STREAM PROTECTION ==>   (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N   (Y/N)
EXTEND TEST STREAM   ==> N   (Y/N)
VIRTUAL TERMINAL     ==>   (TO USE A SPECIFIC VIRTUAL TERMINAL)

RULESET NAME:

F1-HELP   F3-END   F4-RETURN
    
```

Default values, specified when CA Verify for VTAM is installed, will appear for the following fields: DDname, Application, Version, Stop Option, and Extend Test Stream.

The DDname, Application, Member, Version, and Description fields are required to identify the test stream.

DDNAME

The ddname of the file to which the test stream will be logged. Specify one to eight alphanumeric or national characters. The first character cannot be numeric. This file must be allocated in the JCL for CICS.

APPLICATION

The group to which the test stream belongs; for example, an application, department, project, and so on. Specify one to eight alphanumeric or national characters. The first character cannot be numeric.

MEMBER

The specific test stream; for example, a screen or program. Specify one to eight alphanumeric or national characters. The first character cannot be numeric.

VERSION

The test stream version when multiple versions of the test stream have the same name. Specify one to three numeric characters.

DESCRIPTION

The comments that describe the test stream. Specify up to three lines of information. You may want to use this field to document files which must be restored when the test stream is run. This field is ignored when the Extend Test Stream option is Y.

STOP OPTION

The option which will terminate logging:

DISC

Logging terminates when the session is disconnected. This is the default; it can be overridden by modifying the options module.

DISC prevents multiple session test streams because logging terminates when you disconnect from the first session.

MAN

Logging terminates when you manually stop logging in one of two ways:

- Clear your screen and type XTCA STOP
- Use the Inquiry function to display a list of all active logging and select the logging you wish to terminate. See the Inquiry function for more details.

Only the person who invoked logging or a security administrator can terminate logging using the Inquiry function.

Note: The MAN option can always be used to stop logging even if you select another Stop option.

Pfxx/Pax

Logging terminates when you press the specified PF or PA key.

CLEAR

Logging terminates when you clear your screen.

PROCESS WITH RULES

This field allows you to apply a ruleset to this logging session. If **Y** is typed in this field, a list of available rulesets will appear when you press Enter. These rulesets contain rules that specify user IDs, terminals, or transaction IDs that are to be included or excluded from the test stream. If you do not wish to apply a ruleset to this logging session, leave **N** as the default.

Note: **L.T** only applies application rule actions; terminal and user rule actions are ignored.

TEST STREAM PROTECTION

Sets protection options for the test stream. Valid options are:

R

Read: the test stream cannot be browsed, edited, run, appended to, inserted into, or merged into another test stream by anyone except its owner or a security administrator. If the test stream is copied or renamed, read protection is extended to the new test stream.

W

Write: the test stream cannot be extended, replaced (during the Run function), edited, renamed, deleted, appended to, inserted or merged into another test stream, nor can its directory be updated, by anyone except its owner or a security administrator

P

Print: the test stream cannot be printed

You can use any combination of options; for example, RW, WP, RWP.

To change the protection option, use the Utilities Update Directory function.

Note: A read-protected Autsign (automated signon and signoff) test stream can be invoked by any user for Autsign purposes; it cannot be read in any other way except by its owner or a security administrator. See the *Installation Guide* for information about Autsign test streams.

LOG INPUT SCREENS ONLY

Type **Y** to log just input screens; otherwise, leave **N** as the default. Use **Y** with caution, because it means there will be no output screens to compare during a Run. Selecting **Y** also diminishes the usefulness of CA Verify for VTAM as a regression testing tool, and makes problem determination difficult if the application does not perform as expected. However, when you have a completely predictable test stream, logging just the input screens can reduce the size of the test stream.

EXTEND TEST STREAM

Type **Y** to append additional logging to an existing test stream (identified in the ddname, Application, Member, and Version fields); otherwise, leave **N** as the default.

If you extend a test stream, the current logging should be compatible with the existing test stream as follows:

- The current terminal should be the same type as the terminal originally used to create the test stream
- The existing test stream should end with a clear screen. If not, use the Online Utilities to copy the existing test stream. You can then truncate the copied version after a clear screen.

VIRTUAL TERMINAL

Specify a specific or generic virtual terminal name. Use = as a generic character to replace any character. For example, if you specify VTERM==, CA Verify for VTAM will use any virtual terminal beginning with the characters VTERM followed by up to two characters; for example, VTERM6, VTERM01, VTERM02, and so on.

Assigning a virtual terminal is important if the application you are logging has terminal name or other terminal characteristic dependencies. The virtual terminal specification will be saved with the test stream so that CA Verify for VTAM can use the *same assignment* when the test stream is run. A generic specification is recommended to avoid conflicts when test streams specifying the same virtual terminal are run concurrently.

You can change the virtual terminal assignment by editing the test stream.

Leave this option blank if it doesn't matter which virtual terminal is used for logging. In this case, CA Verify for VTAM will use a virtual terminal specified at installation.

RULESET NAME

Displays the name of the ruleset selected. A name only appears if you have selected **Y** for Process With Rules and have selected a ruleset.

Initiate Logging on Your Terminal

When you have completed this menu, press Enter.

- If you typed **N** to Process With Rules, CA Verify for VTAM will display either the USS menu, or the menu from your routing application. The first output screen is not logged. Logging begins with whatever you type next (for example, the application you specify).
- If you typed **Y**, the next screen to display will be the Specify Ruleset Name panel.

See [Apply Rules to the Logging Session](#) (see page 57) for details.

Log Another Terminal

If you type **O** on the Log Options Menu or L.O on the Primary Options Menu, CA Verify for VTAM displays the Other Terminal Log menu.

```

----- OTHER TERMINAL LOG -----11:20:10
ENTER COMMAND ==> L2

LOG TEST STREAM AS:
  DDNAME      ==> TCADS
  APPLICATION ==>
  MEMBER      ==>
  VERSION     ==> 001

DESCRIPTION ==>
             ==>
             ==>

TERMINAL TO BE LOGGED ==>
STOP OPTION           ==> DISC      (DISC, MAN, PF__, PA_,OR CLEAR)
PROCESS WITH RULES   ==> N         (Y/N)
TEST STREAM PROTECTION ==>         (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N      (Y/N)
EXTEND TEST STREAM   ==> N      (Y/N)
VIRTUAL TERMINAL     ==>         (TO USE A SPECIFIC VIRTUAL TERMINAL)
INTERRUPT SESSION    ==> QUEUE    (NO, QUEUE, REQUEST, UNCOND, OR FORCE)
RULESET NAME:

F1-HELP      F3-END      F4-RETURN
    
```

This menu is identical to the Single Terminal Log menu except for two additional fields: Terminal to be Logged, and Interrupt Session. Also, the Stop option is interpreted differently and the Process With Rules field only applies certain rule actions.

TERMINAL TO BE LOGGED

The name of the terminal to be logged. If the terminal is in use by a user, logging will not begin until the user exits from CA Verify for VTAM.

STOP OPTION

How logging will be terminated. See the [Logging Your Terminal](#) (see page 42) section for an explanation of the options.

Remember that the Stop option you select applies to the terminal being logged, not to your terminal. For example, if you select PF12, the operator of the terminal being logged must press PF12 to terminate logging. If the operator at that terminal is unaware of the logging, select MAN as the Stop option. Then you can use the Inquiry function to terminate logging.

PROCESS WITH RULES

If Y is typed in this field and L.O is specified, application and user rule actions are applied, while terminal rule actions are ignored.

INTERRUPT SESSION

If the terminal to be logged is already in a session, this option determines the type of deactivation that should occur to terminate this session.

No

Do not interrupt the current session and do not queue a session for the terminal. Logging will not begin until the user at the terminal to be logged ends the current session and logs onto CA Verify for VTAM.

Queue

Do not interrupt the current session. Logging will begin when the current session ends. This is the default.

Request

Request that the application currently in session with the terminal terminate the session. The application may deny this request.

Uncond

Instruct the application currently in session with the terminal that it must terminate the session. CA Verify for VTAM waits for the application to formally terminate the session before beginning to log the terminal.

Force

Force termination of the session. Generally, this type of deactivation is not recommended; however, it may be advisable for terminals in sessions that do not terminate when the Request or Uncond parameters are in effect.

The default for this option is specified at installation. The five parameters represent five levels of interruption, with No as the lowest level and Force as the highest. Only a security administrator can specify a higher level of interruption on this menu than the installation default.

For example, if the installation default is Uncond, users (other than a security administrator) can change the parameter to No, Queue, or Request, but *not* to Force.

Initiate Logging on Another Terminal

When you have completed this menu, press Enter.

- If you typed **N** to Process With Rules, CA Verify for VTAM redisplay the Log Options Menu and informs you that logging has begun.
- If you typed **Y**, the next screen to display will be the Specify Ruleset Name panel.

See [Apply Rules to the Logging Session](#) (see page 57) for details.

Log Multiple Terminals

If you type **M** on the Log Options Menu or **L.M** on the Primary Options Menu, CA Verify for VTAM displays the Multiple Terminal Log menu.

```
----- MULTIPLE TERMINAL LOG -----11:20:43
"
ENTER COMMAND ==>                                     L3

LOG TEST STREAM AS:
  DDNAME      ==> TCADS
  APPLICATION ==>
  MEMBER      ==>
  VERSION     ==> 001

DESCRIPTION ==>
             ==>
             ==>

PROCESS WITH RULES      ==> Y          (Y/N)
TEST STREAM PROTECTION ==>           (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N          (Y/N)
INTERRUPT SESSIONS     ==> QUEUE     (NO, QUEUE, REQUEST, UNCOND, OR FORCE)

RULESET NAME:

F1-HELP      F3-END      F4-RETURN
```

This menu is similar to the Single Terminal Log and Other Terminal Log menus with these exceptions:

- There is no Stop option because you must terminate logging *manually* using the Inquiry function.
- There is no Extend Test Stream option because multiple terminal test streams cannot be extended. Use the Append utility to extend multiple test streams (see the "Utilities" chapter).
- The Process With Rules option is *automatically* set to **Y**. The terminals to be logged *must* be listed in a LOGGING ruleset. See [Apply Rules to the Logging Session](#) (see page 57) for instructions.
Note: L.M applies all three rule actions: application, user, and terminal.
- There is no Virtual Terminal option. You can assign virtual terminals through the Terminal ID Logging rule option.

When you have completed this menu, press Enter to display the Specify Ruleset Name panel. See [Apply Rules to the Logging Session](#) (see page 57) for instructions on completing this panel.

Multiple Terminal Logging Considerations

When logging multiple terminals:

- The terminals to be logged MUST be listing in a LOGGING Ruleset. See [Add a Multiple Terminal Logging Rule Action](#) (see page 63).
- Bear in mind that at least 8 KB per terminal for the Run function and 2 KB to 8 KB for the Print and Browse functions are required. You can reduce the Run requirements to 100 bytes per terminal by using the Batch Run function or the online Run function with the Stop at Mismatches option set to N.
- CA Verify for VTAM tries to ensure that the same concurrences exist when test streams are run as when they were logged. However, timing considerations could possibly cause problems because CA Verify for VTAM runs test streams so much faster than when they were logged.

For example, suppose an operator at Terminal **A** adds an item to a file. Next, an operator at terminal B inquires on the same item. If the inquiry occurs *after* a confirmation message has been sent to Terminal A, CA Verify for VTAM guarantees the correct sequence during the Run function. However, if the inquiry occurs *before* the confirmation message has been sent, during the Run function the inquiry may actually occur *before* the item has been added.

CICS/ESA FEPI Considerations

CA Verify for VTAM can log and run *front-end* CICS/ESA FEPI applications that are terminal oriented. When you run a logged test stream for a front-end application, both the front-end and back-end applications are executed.

To test back-end FEPI applications independently of the front-end applications, you must use CA Verify for CICS. CA Verify for VTAM cannot log a FEPI back-end application because it does not recognize FEPI virtual terminals.

Log an Application

If you type **A** on the Log Options Menu or **L.A** on the Primary Options Menu, CA Verify for VTAM displays the Application Log menu.

```

----- APPLICATION LOG -----11:21:05
ENTER COMMAND ==> LP

LOG TEST STREAM AS:
DDNAME      ==> TCADS
APPLICATION ==>
MEMBER      ==>
VERSION     ==> 001

DESCRIPTION ==>
            ==>
            ==>

REAL APPLID      ==> (APPLID USERS WILL LOGON TO)
VIRTUAL APPLID  ==> (APPLID USED BY THE APPLICATION)
PROCESS WITH RULES ==> N (Y/N)
TEST STREAM PROTECTION ==> (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N (Y/N)

RULESET NAME:

F1-HELP      F3-END      F4-RETURN
    
```

Complete the DDname, Application, Member, Version, Description, Process with Rules, Test Stream Protection, and Log Input Screens Only fields as described in the Logging a Terminal section earlier in this chapter. Complete the other fields as follows:

REAL APPLID

Specify the applid to which users will log on. CA Verify for VTAM will communicate with users using this applid.

VIRTUAL APPLID

Specify the applid the application will be using. The virtual terminals will communicate with the application using this applid.

Note: See [How to Use the Log an Application Function](#) (see page 51) later in this section for instructions on specifying the Real and Virtual Applids. If you use Method 1 or Method 3, you will specify an alias applid in the Real Applid field, and the normal applid in the Virtual Applid field.

Initiate Logging

Follow these steps:

1. Press Enter.
 - If you typed **N** to Process With Rules, CA Verify for VTAM redisplay the Log Options Menu and informs you that logging has begun.
 - If you typed **Y**, the next screen to display will be the Specify Ruleset Name panel.

See [Apply Rules to the Logging Session](#) (see page 57) for details.

How to Use the Log an Application Function

Logging an application allows you to log *all* the terminals for a particular application without specifying most of the terminal names and without incurring the overhead associated with logging all the terminals in a network.

There are three ways to log an application. Use *one* of the following three methods:

Method 1: Log on to an Alias Applid

Follow these steps:

1. Access the Application Log menu and specify an alias applid as the Real Applid (for example, IMSTEST). Specify the application's normal applid as the Virtual Applid (for example, IMS). A sample Application Log menu follows.

```
----- APPLICATION LOG -----11:21:05
ENTER COMMAND ==> LP

LOG TEST STREAM AS:
DDNAME ==> TCADS
APPLICATION ==> IMSTEST
MEMBER ==> LA
VERSION ==> 001

DESCRIPTION ==> LOG USERS OF IMS
==> NOTE: HAVE USERS LOG ON TO APPLID IMSTEST
==>

REAL APPLID ==> IMSTEST (APPLID USERS WILL LOGON TO)
VIRTUAL APPLID ==> IMS (APPLID USED BY THE APPLICATION)
PROCESS WITH RULES ==> N (Y/N)
TEST STREAM PROTECTION ==> (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N (Y/N)

RULESET NAME:

F1-HELP F3-END F4-RETURN
```

2. Begin logging and instruct users to log on to the alias applid (IMSTEST).

Method 2: Modify the Application's Applid

Follow these steps:

1. Bring down the application.
2. Modify its applid to an alias (for example, MSTEST).
3. Bring the application back up using the alias applid.

4. Access the Application Log menu. Specify the application's normal applid (for example, IMS) as the Real Applid and specify the alias applid (IMSTEST) as the Virtual Applid. A sample Application Log menu follows.

```
----- APPLICATION LOG -----11:21:40
ENTER COMMAND ==> LP

LOG TEST STREAM AS:
DDNAME ==> TCADS
APPLICATION ==> IMSTEST
MEMBER ==> LA
VERSION ==> 002

DESCRIPTION ==> LOG USERS OF IMS
==> NOTE: MODIFY IMS TO USE APPLID IMSTEST. USERS WILL
==> LOG ON TO APPLID IMS AS USUAL.

REAL APPLID ==> IMS (APPLID USERS WILL LOGON TO)
VIRTUAL APPLID ==> IMSTEST (APPLID USED BY THE APPLICATION)
PROCESS WITH RULES ==> N (Y/N)
TEST STREAM PROTECTION ==> (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N (Y/N)

RULESET NAME:

F1-HELP F3-END F4-RETURN
```

5. When users log on to the normal applid (IMS), logging will begin.

Method 3: Modify the USS Table or Routing Application

Follow these steps:

1. Modify your USS table or routing application to translate the application's normal applid to an alias (for example, IMS to IMSTEST).
2. Access the Application Log menu and specify the alias applid (for example, IMSTEST) as the Real Applid and the normal applid (for example, IMS) as the Virtual Applid. A sample Application Log menu follows.

```
----- APPLICATION LOG -----11:25:03"
ENTER COMMAND ==> LP

LOG TEST STREAM AS:
DDNAME ==> TCADS
APPLICATION ==> IMSTEST
MEMBER ==> LA
VERSION ==> 003

DESCRIPTION ==> LOG USERS OF IMS
==> NOTE: MODIFY USS TO TRANSLATE LOGONS TO APPLID IMS
==> INTO LOGONS TO APPLID IMSTEST.

REAL APPLID ==> IMSTEST (APPLID USERS WILL LOGON TO)
VIRTUAL APPLID ==> IMS (APPLID USED BY THE APPLICATION)
PROCESS WITH RULES ==> N (Y/N)
TEST STREAM PROTECTION ==> (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N (Y/N)

RULESET NAME:

F1-HELP F3-END F4-RETURN
```

3. Initiate logging.
4. When users log on to the normal applid (IMS), the applid will be translated to the alias applid (IMSTEST) and logging will begin.

Log Printers or Acquired Devices

Follow these steps:

1. Bring down the application.
2. Modify your application so that it acquires CA Verify for VTAM's virtual terminals instead of real devices.

3. Access the Application Log menu. Fill in the Real Applid and Virtual Applid fields as illustrated in the following three screens and press Enter.

```

----- APPLICATION LOG -----10:32:3
6
ENTER COMMAND ==> LP

LOG TEST STREAM AS:
DDNAME ==> TCADS
APPLICATION ==> IMSTEST
MEMBER ==> LA
VERSION ==> 001

DESCRIPTION ==> LOG USERS OF IMS
==> NOTE: HAVE USERS LOG ON TO APPLID IMSTEST. ALSO LOG
==> PRINTER PRT01 AND ACQUIRED TERMINALS TRM001 & TRM002

REAL APPLID ==> IMSTEST (APPLID USERS WILL LOGON TO)
VIRTUAL APPLID ==> IMS (APPLID USED BY THE APPLICATION)
PROCESS WITH RULES==> Y (Y/N)
TEST STREAM PROTECTION ==> (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> NO (Y/N)

RULESET NAME:

ENTER PRINTERS AND OTHER ACQUIRED TERMINALS: PF: 7-UP 8-DOWN
==> PRT01 ==> TRM001 ==> TRM002 ==>
==> ==> ==> ==>
==> ==> ==> ==>
==> ==> ==> ==>

ENTER THE ABOVE INFORMATION AND PRESS ENTER TO CONTINUE OR PF3 TO END

```

CA Verify for VTAM displays the Virtual Terminal Assignment menu.

- Specify the virtual terminals that correspond to the real devices as per your application modifications in Step 2. A sample Virtual Terminal Assignment menu, which assigns virtual terminals to PRT01, TRM001, and TRM002, follows.

```
----- VIRTUAL TERMINAL ASSIGNMENT -----14:13:3
4
ENTER COMMAND ==> LV

LEAVE VIRTUAL TERMINAL ASSIGNMENTS BLANK TO USE INSTALLATION DEFAULTS
OR SPECIFY SPECIFIC VIRTUAL TERMINAL ASSIGNMENTS:

REAL    VIRTUAL    REAL    VIRTUAL    REAL    VIRTUAL
PRT01   ==> VTRM1   TRM001  ==> VTERM2  TRM002  ==> VTERM3
==>
==>
==>

PRESS ENTER TO CONTINUE OR PF3 TO MODIFY LIST
PF: 3-END 7-UP 8-DOWN
```

- Press Enter to begin the log.
- Bring the application back up. The application will acquire CA Verify for VTAM's virtual terminals and CA Verify for VTAM, in turn, will acquire the real devices.

Note: You can use the TCAXLATE macro, which is coded at installation time, to automatically pick the virtual terminals. However, verify that the macro is coded to pick the virtual terminals you have specified to your application.

Considerations When Logging an Application

If you are logging an application that will run under a different APPLID from the logged APPLID, review the considerations which follow. If the logged application runs under the same APPLID, the considerations do not apply.

Run an Application Log Test Stream with a Changed APPLID

You must use an automated signon (AUTSIGN) test stream, as described in the *Installation Guide*. This is necessary because the application log test stream does not begin until the user signs on to the application. Consequently, the connection sequence – for example, LOGON APPLID(applid) – is not logged. Therefore, you must create an application-based automated signon test stream (AUTSIGN=APPLICATION) to perform the connection when the test stream is run.

Be aware of possible mismatches and missing output the first time you run an application log test stream. Because the automated signon test stream has already connected to the application, welcome screens and signon menus will have been encountered already. Either accept the mismatches as permanent changes or use the TCAEXCLD macro to exclude such screens from logging.

Log with Multiple Sessions

Whenever possible, avoid multiple session test streams; i.e., test streams in which a terminal logs on more than once. Because the automated signon test stream connects all terminals to the application, subsequent connections are not made and mismatches will occur when the test stream is run.

If multiple sessions must be logged, edit the test stream in one of the following ways:

- Delete the terminal's logoff sequence, disconnection and connection records, and subsequent signon screens.
or
- Insert a connection sequence after the disconnection record to reconnect the terminal to the application. Also, insert any signon screens.

Apply Rules to the Logging Session

Before initiating a logging session, you can choose to apply a set of rules to this session. Logging rules allow you to specify a list of user IDs, terminals, or application IDs that are to be included or excluded from the test stream. Logging rules can be created in system, application, or test stream rulesets.

Important! You cannot add a new ruleset when you are setting up for the Log function. You must create the ruleset using the Maintain Rules selection from the Primary Options menu before performing the log session.

To apply a ruleset to the logging session, type Y in the Process With Rules field on the Terminal Log Screen, as explained in the section [Log One or More Terminals](#) (see page 42). When you complete the logging information on the screen and press Enter, you will be prompted to select or specify the name of the ruleset to apply to this session.

Note: There is a hierarchy in applying rulesets. During logging, system rulesets are applied first, application next, and test stream rulesets last. During a run, test stream rulesets are applied first, application next, and system rulesets last.

Specify a Ruleset to Apply

The first screen to appear when you press Enter on the Terminal Log screen is the Log: Specify Ruleset Name panel, shown next. Application and system rulesets do not need to be specified during a logging session; if they exist, they are automatically applied. You also cannot exclude application and system rulesets from a logging session.

```
----- LOG: SPECIFY RULESET NAME-----15:53:
10
ENTER COMMAND ==>
S-SELECT    B-BROWSE    E-EDIT

  _ TEST STREAM RULESET
  - DDNAME      ==> TCADS
  APPLICATION ==>
  MEMBER      ==>
  VERSION     ==>
                                     (LEAVE APPLICATION, MEMBER,
                                     OR VERSION BLANK AND PRESS
                                     ENTER FOR A SELECTION LIST)

APPLICATION RULESET:  TCADS.application.#RULESET.001
DESCRIPTION:

SYSTEM RULESET:  TCADS.SYSTEM.#RULESET.001
DESCRIPTION:

F1-HELP    F3-END    F4-RETURN
```

Rulesets are identified by DDname, Application, Member, and Version information. If you know the name of the ruleset you want to apply, type the information in the Test Stream Ruleset fields. If you do not know the name of the ruleset, see the next section for instructions on selecting a ruleset from a list.

When you are finished, type **S** to the left of the ruleset name and press Enter. You will return to the Terminal Log panel and the information you specified will appear in the Ruleset Name field. To initiate logging, press Enter from this panel.

Edit the Ruleset

To view or modify your specified ruleset before selecting it to apply, type the information, type B to browse or E to edit to the left of the ruleset and press Enter. The Edit Rules—Summary screen will appear with the details of your selected ruleset. See the section [Add or Edit a Logging Rule](#) (see page 60) for information on how to edit a ruleset or add a rule from this screen.

Note: You cannot create a new ruleset while using the Log function; use the Rules function to create the new ruleset first.

Select a Ruleset From a List

If you do not know the exact name of the ruleset you want to apply, leave the ruleset information fields on the Specify Ruleset Name panel blank, type B to the left of the ruleset, and press Enter. The Browse: Ruleset Selection panel will appear, displaying a list of available rulesets. You can select a ruleset from the list and return to the Specify Ruleset Name panel.

```

----- BROWSE: RULESET SELECTION -----14:07:32
ENTER COMMAND ==>
FILE: TCADS
S-SELECT

```

			--CREATED--	---BY----	--UPDATED--	---BY----	RULES	ITEMS
_	ITEST	TEST	001	04/22/1998	04/22/1998		1	1
				TEST DATAGEN				
_	LOGRULES	SAMPLE	001	05/19/1998	06/19/1998		1	3
				A BUNCH OF LOGGING RULES				
_	LOGRULES	SAMPLE	004	06/19/1998	06/19/1998		1	1
				JUST TERM RULE ACTION				
s	LOGRULES	SAMPLE	005	06/19/1998	07/07/1998	GRID001	1	2
				MULT TERM ALL ='S; COUPLE USERID'S				
_	SAMPLE	DADS	001	10/30/1997	11/04/1997		4	26
				SAMPLE RULESET USING MODELLING				
				** KEEP THIS !! DO NOT DELETE !! **				
_	SAMPLE	DADS	999	05/19/1998	05/19/1998		3	5
				SAMPLE OF DADS 3.4 TEST STREAM				
_	SYSTEM	#RULESET	001	04/14/1998	05/29/1998		1	1
				SYSTEM RULESET				
_	SYSTEM	#RULESET	998	05/19/1998			1	1

This panel lists all defined rulesets in alphabetical order by ruleset name. The information shown for each ruleset includes: member, version, date the ruleset was created and who created it, the date it was updated and who updated it, the number of rules the ruleset contains, and the number of rule actions. A description of the ruleset is displayed on the line(s) beneath the ruleset name.

To select a ruleset to be applied to this logging session, type S next to the ruleset you are selecting as shown in the previous example. Press Enter to return to your log screen (either single, other, or multiple terminal). Press Enter to begin logging.

Add or Edit a Logging Rule

Follow these steps:

1. Select a ruleset from the Ruleset Selection panel by typing **S** to the left of the ruleset name that you want to edit.
2. Press Enter. The Log: Specify Ruleset Name panel will redisplay with the name of the ruleset you selected placed in the TEST STREAM RULESET field.
3. Type **E** next to TEST STREAM RULESET and press Enter. The Edit Rules—Summary panel will appear as shown next.

```

----- EDIT RULES - SUMMARY -----
-11:34:22 ENTER COMMAND ==>

RULE NAME: LOGGING          RULESET NAME: TCADS.LOGRULES.SAMPLE.005
LINE 1 TO 5 OF 5          TEST STREAM NAME: TCADS.SAMPLE.TEST.555

S-EDIT I-INSERT D-DELETE R-REPLICATE P-PREVIEW
OBJECT      TYPE ROW COL LEN OP VALUE FROM THE MODEL SCREEN/DESCRIPTION
- RULESET   T/S                TCADS.LOGGING.RULESET.001
- RULE      LOGGING              <NO MODEL SCREEN>
- APPLID    INCL                 A04IC9NA A04IC9NC
- TERM/V    INCL                 A55TG001/
- USERID    INCL                 GRID001 BUCBR01

F1-HELP    F3-END      F4-RETURN   F7-UP      F8-DOWN
    
```

The Edit Rules—Summary panel summarizes the rules contained in your selected ruleset. It includes the following information.

OBJECT

This column lists the rules within this ruleset and the rule actions within each rule. See the chapter "Rules Function", for a list of values that can appear in the OBJECT column.

TYPE

Indicates what type of ruleset or rule this is. See the chapter "Rules Function", for a list of values that can appear in this column.

The column values for ROW, COL, LEN, OP and VALUE are taken from the panel where that particular rule action was defined.

The actions you can take from this panel include:

- Adding a logging rule or logging rule action. Type I next to an existing rule and press Enter. The Add Rules—Rule Action panel appears.
- Editing the description of the ruleset. Type S to the left of the ruleset and press Enter. The Edit Rules—Ruleset Description panel will appear. See the chapter "Rules Function" for detailed instructions on how to edit a ruleset's description.
- Editing the rule. Type S to the left of the rule to be edited and press Enter. See the chapter "Rules Function", for detailed instructions on how to edit a rule.
- Editing a logging rule action. Type S to the left of the rule action and press Enter. An Edit Rule Action screen will appear where you can edit the information for the rule action you selected.

Each logging-specific action is discussed in one of the following sections.

Add a Logging Rule and a Logging Rule Action

Follow these steps:

1. Start at the Edit Rules—Summary panel.
2. Type I next to an existing rule and press Enter to display the Add Rules—Rule Action panel.
3. Enter LOGGING as the name of the rule. The name LOGGING is required; typing a description is optional.

Note: There can only be one rule named LOGGING in a ruleset.

```

-----ADD RULES - RULE ACTIONS-----
ENTER COMMAND ==>

RULE NAME: LOGGING           RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

DESCRIPTION ==>
                ==>

      1 FIELD RECOGNITION           11 GENERATE FIELD VALUE
      2 SCREEN RECOGNITION          12 INSERT SCREENS
      3 VARIABLE FIELD              13 DELETE SCREENS
      4 DELETE FIELD                14 CUT SCREEN FIELD
      5 MOVE FIELD                  15 PASTE SCREEN FIELD
      6 CHANGE FIELD VALUE          20 USERID LOGGING
      7 NEW FIELD                   21 TERMINAL ID LOGGING
      8 CHANGE AID KEY              22 APPLICATION ID LOGGING
      9 CHANGE CURSOR LOCATION
     10 CHANGE WCC VALUES

F1-HELP      F2-PREVIEW      F3-END      F4-RETURN      F9-SELECT

```


2. Type up to 60 specific or generic terminal IDs with their optional virtual terminal assignment, to be included in the logging session in the fields provided.

The terminal ID must exactly match the one maintained in the TCTIE (it is case sensitive).

You can use = as a wildcard to replace any character. For example, if you instruct CA Verify for VTAM to log TRM==, CA Verify for VTAM will log all terminals beginning with the characters TRM followed by up to two characters; such as, TRM1, TRM01, TRM29, and so on.

Note: CA Verify for VTAM assumes the terminal name is its netname *unless* a field mark (X'1E') follows the name. In this case, CA Verify for VTAM assumes the name is the CICS terminal ID. The field mark key is labeled Field Mark or FM on most keyboards.

Specify the Virtual Terminal Assignment

For each real terminal you want to log, you can assign a specific or generic virtual terminal. These virtual terminals will also be used when the test stream is run.

Use = as a generic character to replace any character. For example, if you specify VTERM==, CA Verify for VTAM will use any virtual terminal beginning with the characters VTERM followed by up to two characters; for example, VTERM6, VTERM01, VTERM02, and so on.

Assigning a virtual terminal is important if the application you are logging has terminal name or other terminal characteristic dependencies. The virtual terminal specification will be saved with the test stream so that CA Verify for VTAM can use the *same assignment* when the test stream is run. A generic specification is recommended to avoid conflicts when test streams specifying the same virtual terminal are run concurrently.

You can change the virtual terminal assignment by editing the test stream.

Leave the virtual terminal field blank if it doesn't matter which virtual terminals are used for logging. In this case, CA Verify for VTAM will use virtual terminals specified at installation.

When you are finished, press Enter to add the information to the rule; press PF3 to return to the Rules Menu.

4. Enter up to 120 specific or generic application IDs in the fields provided. You can use = as a wildcard to replace any character.
5. Press Enter to add the information to the rule.
6. Press PF3 to return to the Rules Menu.

Edit a Logging Rule Action

Follow these steps:

1. Start at the Edit Rules—Summary panel.
2. Tab to the rule action you want to edit.
3. Type S and press Enter to display the Edit Rule Actions screen for the logging rule action you have selected. For example, if you selected an APPLID rule action to edit, the Edit Rule Actions—an APPLID Logging screen will appear showing the current definition of this rule action.
4. Add, delete, or overtype any of the current values following the same guidelines used to add this type of rule action.
5. Press Enter when you are finished to add the information to the rule. At this point, you can press PF3 to return to the Edit Rules—Summary panel to add or edit another rule in this ruleset or press PF3 to return to the Ruleset Selection panel.

Apply the Ruleset to the Logging Session

Follow these steps:

1. Once the name of the ruleset is entered in the Specify Ruleset Name panel, type **S** next to the test stream ruleset to select it for the current logging session as shown next:

```

-----SPECIFY RULESET NAME-----15:53:10
ENTER COMMAND ==>

B-BROWSE   E-EDIT
S-SELECT

S TEST STREAM RULESET
  DDNAME   ==> TCADS
  APPLICATION ==> A1           (LEAVE APPLICATION, MEMBER,
  MEMBER    ==> A1           OR VERSION BLANK AND PRESS
  VERSION   ==> 001
  ENTER FOR A SELECTION LIST)

APPLICATION RULESET: TCADS.application.#RULESET.001
DESCRIPTION:

SYSTEM RULESET: TCADS.SYSTEM.#RULESET.001
DESCRIPTION:

F1-HELP    F3-END    F4-RETURN

```

2. Press Enter to return to the Terminal Log panel where you can initiate the logging session.

Terminate the Log Function

CA Verify for VTAM stops capturing input and output screens as soon as you request log termination.

For single terminal and other terminal logging, the Stop option determines how logging is terminated. For example, if you specify a PF key, pressing that key will terminate logging.

Multiple terminal logging must be terminated manually using the Inquiry function. You can also terminate single and other terminal logging manually even if you have designated another Stop option.

Follow these steps:

1. Clear your screen
2. Type XTCA STOP or access the Primary Options Menu.
3. Select the Inquiry function.

CA Verify for VTAM displays a list of all functions, as illustrated next:

```
GENLEVEL=9809 ----- INQUIRY/TERMINATION -----12:34:58
ENTER COMMAND ==> I1

      INVOKED  AT          USING  RECORD
FUNCTION BY    TERMINAL  TIME    TERMINAL  NUMBER  TEST STREAM NAME
- INQUIRY  VERIFY  A60L2048 12:34
- OPTION   BUCBR01  A55TG001 11:56
- LOG      BUCBR01  A55TG001 11:56 2          BRUCE.LMTEST.003
- LOG      BUCBR01  A55TG001 11:55 2          BRUCE.LMTEST.002

DATA CAPTURE BUFFERS 00% FULL, NO SECONDARY BUFFERS ALLOCATED
RPLS USED (HIGH/MAX): VIRTUAL SEND: 0/50    REAL SEND: 0/50
                      REAL RECEIVE: 1/50    SESSION INIT: 0/9999

TYPE AN "S", "P", OR "D" NEXT TO YOUR LOG FUNCTION TO STOP IT
TYPE AN "I" NEXT TO A RUN FUNCTION TO INTERRUPT IT (AT ORIGINATING TERMINAL)
F1-HELP      F3-END      F4-RETURN    F7-UP       F8-DOWN
```

4. Type S, P, or D next to the log functions you want to terminate and press Enter.

S

Stops logging without disconnecting the terminal from the application.

P

Stops logging and passes the terminal to the application to which it is currently connected. This option disrupts the session and is primarily useful for non-prime time sessions or when users have been warned to expect the disruption.

D

Stops logging and disconnects the terminal from the application.

Note: If another log function is active, **P** or **D** is treated as **S**; that is, the log function is terminated but the terminal is not disconnected from the application. For a detailed explanation of this screen see the chapter "Inquiry Function".

When you request log termination, CA Verify for VTAM displays the Log Termination menu. If you are logging more than one test stream from the same terminal and you stop them by the same PF key or by typing XTCA STOP, the Log Termination screen will first display information for the most recently initiated test stream.

```

SAMPLE.TEST.001 ----- LOG TERMINATION -----11:48:32
ENTER COMMAND ==> L5

DESCRIPTION: SAMPLE TEST OF A04IC9NA, CAROL'S COOKIES COMPANY

LOG:      RUN:      EDIT:      TEST STREAM:      IN:  OUT:
INVOKED BY: DORI                                TOTAL SCREENS:    9   11
INVOKED ON: 02/09/1999                          AVERAGE BYTES:   35  315
START TIME: 11:36:44
DURATION:  00:10:49  00:04:32
SYSTEM:    A04IC9NA
STATUS:    NORMAL
TERMINAL:  A60L2049
VSAM CI'S: 2

AVERAGE THINK TIME:  00:00:41.906
AVERAGE RESPONSE TIME: 00:00:24.729
MAXIMUM SCREEN SIZE:  24 BY 80
PROTECTION STATUS:
ORIGINATING TEST STREAM:                                OWNER: DORI
                                                         CREATED BY FUNCTION: LOG

F1-HELP      F3-END      F4-RETURN
    
```

DESCRIPTION

The test stream description entered when logging was initiated.

INVOKED BY

The ID of the user who initiated logging.

INVOKED ON

The date when logging began.

START TIME

The time when logging began.

DURATION

The time, in hours, minutes, and seconds, which elapsed during logging.

SYSTEM

The VTAM applid. For a test stream consisting of multiple sessions, MULTIPLE will be displayed.

STATUS

The log completion status:

Normal

Incomplete:

CA Verify for VTAM could not log some screens because the data capture buffer overflowed

Ext:nnn:

The data stream was extended; nnn indicates the number of records that existed before the extension.

TERMINAL

The name of the logged terminal. For multiple terminal test streams, this field indicates the number of terminals logged.

VSAM CI'S

The number of control intervals used to store the test stream.

AVERAGE THINK TIME

The average time that elapsed between an output screen and the next input from the terminal.

AVERAGE RESPONSE TIME

The average time that elapsed between terminal input and the next output screen.

MAXIMUM SCREEN SIZE

The maximum screen size used during logging.

PROTECTION STATUS

The Test Stream Protection option specified when logging was initiated.

ORIGINATING TEST STREAM

No information appears in this field for a test stream that was just logged.

OWNER

The ID of the user who owns this test stream.

CREATED BY FUNCTION

LOG always appears in this field for a test stream that has just been logged.

TOTAL SCREENS IN: OUT:

The number of input and output screens.

AVERAGE BYTES IN: OUT:

The average number of bytes in the input and output data streams.

Exit Log Termination

Use the End (PF3) or Return (PF4) command to exit from the Log Termination menu.

- End redisplay the Primary Options Menu, unless you entered Log Termination from the Inquiry function. In that case, CA Verify for VTAM redisplay the Inquiry menu.
- Return redisplay the Primary Options Menu.

Chapter 5: Run Function

This chapter explains how to execute a test stream.

This section contains the following topics:

[Overview](#) (see page 73)

[How the Run Function Works](#) (see page 74)

[Invoke the Run Function](#) (see page 77)

[Select a Terminal](#) (see page 85)

[Review the Run Status](#) (see page 87)

[Terminate the Run](#) (see page 89)

[Specify Mismatch Options](#) (see page 90)

[Confirm the Mismatch](#) (see page 108)

[Display, Field, and Hex Screen Formats](#) (see page 109)

[View Connection and Disconnection Records](#) (see page 117)

[Wait for Missing Output](#) (see page 120)

[Complete the Run](#) (see page 122)

Overview

The Run function lets you re-execute an application with the same data that was captured during logging.

CA Verify for VTAM acts like a terminal operator, sending the stored input screens to the application, which responds with output. CA Verify for VTAM then compares this output with the output from the logged test stream and flags any differences.

Use the Run function to:

- Test changes in a program
 - If the run completes normally, you know that the program is still processing the input data correctly.
 - If CA Verify for VTAM interrupts the run because it detects differences between the logged screens and the current run screens, you can determine whether those differences are expected (because the program changed) or unexpected (because of an error).

Note: Most anticipated changes can be identified using the Rules function; see the chapter "Rules Function", for details.

- Test changes in hardware or system software; for example, a new disk drive or a new TSO release
- Stress test your system; for example, run a large multiple terminal test stream to see how response time is affected.

How the Run Function Works

Here's how CA Verify for VTAM runs a test stream:

- CA Verify for VTAM allocates virtual terminals for all the terminals you select. CA Verify for VTAM uses either the same virtual terminals used during logging, or virtual terminals from the same group of terminals as defined at installation.

If the applications being run in a test stream require UserID security, the virtual terminal needs to go through signon processing. See the "Security" chapter in the *Installation Guide* for details on using automated signon for virtual terminals.
- CA Verify for VTAM allocates an original display area, a modified display area, and a current display area for each selected terminal. These display areas represent the original terminal display as it appeared during logging, the original display areas as modified by any rules, and the current display as it would appear if the virtual terminal were real.
- CA Verify for VTAM then processes each screen in the test stream as follows:
 - For each input screen, CA Verify for VTAM enters the data and sends the data to the application. The input screen updates both the original and current display areas.
 - For each input screen that is affected by a rule, CA Verify for VTAM creates an expected screen showing the effect of the application of the rule.
 - For each output screen, CA Verify for VTAM updates the original display area and waits for the corresponding output from the application. When the virtual terminal receives the output, CA Verify for VTAM updates the current display area. CA Verify for VTAM then compares the two output display areas.

If CA Verify for VTAM detects a mismatch, it can:

- Interrupt the run. CA Verify for VTAM identifies the differences between the expected and current screens. You can then display all three screens (original, expected, and current), correct the differences, terminate, or continue the run.

Note: During a run, modeling can only be done on the record that has the mismatch.
- Continue the run. You can elect to save both the original and current screens so the mismatches can be viewed when you subsequently browse or print the test stream.

You determine how CA Verify for VTAM will execute the run. For example, you can specify:

- What to do with the output from the run—discard it or save it as a new test stream
- What type of comparison CA Verify for VTAM should perform—physical, logical, or screen
- What to do with anticipated changes by designing a ruleset to be used when this test stream is run
- Whether or not the operator should explain a mismatch
- The rate at which input is sent to the application, simulating operator think time

Restore Test Data

When you run a test stream, you must use the same test data that was used when you logged the test stream. For example, if the logged test stream adds a customer record, the run test stream must be able to add the same record. Sometimes this means you will have to restore your test data.

- If the application you are testing does *not* modify the test data, you can use the original data. For example, you should be able to retest an inquiry transaction using the same unrestored data.
- If the application you are testing *does* modify the test data, you can either:
 - Back up the data before testing so it can be restored
 - Construct the test stream so that all changes are reversed at the endFor example, delete any items added, add any items deleted, and reverse all updates.

Virtual Terminals

When CA Verify for VTAM runs a test stream, it allocates virtual terminals for each terminal in the test stream. If you assign a specific virtual terminal when you log the test stream, CA Verify for VTAM uses that virtual terminal when it runs the test stream; otherwise, it uses either the same virtual terminal or a terminal from the same group of terminals as defined at installation.

If an application has terminal name or other terminal characteristic dependencies, assign a virtual terminal on the Terminal Log menu or when you edit the test stream.

Using virtual terminals saves system resources and doesn't restrict testing to the number of physical terminals available.

Convert Variables to Rules

CA Verify for VTAM Release 1.2 provides three types of variables: global, auto, and local. These variables are stored with each test stream. Starting with release 1.4, these three types of variables have been incorporated into the Rules function. Variables, as well as all other types of field changes (like move field and change field value), can be defined using recognition and screen rules. See the "Rules Function" chapter for details on defining rulesets and the rules they contain.

Conversion Details

The first time a Release 1.2 test stream runs in a Release 1.4 environment, the test stream will be reviewed to see if it has existing global, auto, or local variables. If it does, these variables will be automatically converted to Release 1.4 rules that will be applied during the run. Variables are converted as follows:

- **Auto** variables translate into a rule with Field Recognition criteria
- **Local** variables translate into a rule with Screen Recognition criteria
- **Global** variables translate into a rule with no recognition criteria (neither Field or Screen)

The resulting Release 1.4 test stream will no longer contain any global, auto, or local variables, but will have a ruleset with the same name as the test stream associated with it.

In addition, if a Release 1.2 test stream is *copied* to a new test stream using the online utilities or a batch copy in a Release 1.4 environment, the global, auto, and local variables will be converted into a ruleset with a matching name—just as if the test stream had been run in a Release 1.4 environment. This is the recommended method if you have Release 1.2 test streams that will need to be manipulated using the Rules function.

Note: If a Release 1.2 test stream has run in a Release 1.4 environment, it can still run in a Release 1.2 environment; however, any test stream created in Release 1.4 *cannot* run in Release 1.2.

Invoke the Run Function

Follow these steps:

1. Type R on the Primary Options Menu.
2. Press Enter.

CA Verify for VTAM displays the Run Options menu. The default ddname, Application, and Version values appear; if necessary, these can be changed.

```

----- RUN OPTIONS -----12:54:57
ENTER COMMAND ==>

ENTER INPUT TEST STREAM NAME:
  DDNAME    ==> TCADS
  APPLICATION ==>
  MEMBER    ==>
  VERSION   ==> 001
              (LEAVE APPLICATION, MEMBER,
              OR VERSION BLANK AND PRESS
              ENTER FOR A SELECTION LIST)

CREATE NEW OUTPUT TEST STREAM:
  DDNAME    ==>
  APPLICATION ==>
  MEMBER    ==>
  VERSION   ==>
              ("*" USES NEXT AVAILABLE VERSION)

PROCESS WITH RULES    ==> Y    (Y/N OR S-SELECT)
COMPARISON TYPE      ==> S    (S-SCREEN, L-LOGICAL, P-PHYSICAL)
RECORD HISTORY       ==> Y    (Y/N)
  REQUIRE SIGNOFF DATA ==> N    (Y/N)
SIMULATED USER THINK TIME ==> NONE (NONE, NN% OF ORIGINAL, NN SECONDS)
STATUS INTERVAL      ==> 005 (SECONDS)
CANCEL INTERVAL      ==> 001 (MINUTES)
STOP AT MISMATCHES   ==> Y    (Y/N)

F1-HELP    F3-END    F4-RETURN

```

Select a Test Stream

If you know which test stream you want to run, follow these steps:

1. Type the Application name, Member name and other identifiers, if necessary.
2. Indicate whether a ruleset is to be used when this test stream is run.
3. Specify the options on this menu.
4. Press Enter.

CA Verify for VTAM runs the test stream and displays the Run Status menu.

If you don't know which test stream you want to run, follow these steps:

1. Leave the Application and Member field blank.
2. Optionally, blank out other identifiers.
3. Press Enter.

CA Verify for VTAM displays the Test Stream Selection menu.

Select a Test Stream from the Test Stream Selection Menu

The Test Stream Selection menu lists all the test streams for the specified ddname.

Your position in the list depends on your specifications on the Run Options menu.

- If both the Application and Member fields are blank, CA Verify for VTAM positions you at the first test stream for the specified ddname.
- If you leave only the Member field blank, CA Verify for VTAM positions you just before the first test stream for the specified ddname and application.
- If you type a partial name, CA Verify for VTAM positions you accordingly. For example, if you specify PAY as the Member name and blank out the Version number, CA Verify for VTAM positions you just before the first test stream whose member name begins with 'PAY'.

A sample Test Stream Selection list is illustrated in the following screen.

```

----- RUN: TEST STREAM SELECTION -----14:00:10
ENTER COMMAND ==>
FILE: TCADS
MULTI-

```

		LOG-DATE	BY	RECORDS	RUN-DATE	RESULT	TERM
_	CLIST	OPERATOR 001	01/02/1998	AJC	28	03/21/1998	LGC EQ
		CEMT INQUIRY OF ALL PROGRAMS AND FILES					
s	DEMO	DEMOPROG 001	03/22/1998	NGN	8		
		CUSTOMER MAINTENANCE DEMO PROGRAM					
_	PAYROLL	DOCUMENT 001	02/01/1998		120		
		ALL PAYROLL SCREENS FOR USER TRAINING					
_	PAYROLL	INQUIRY 001	01/16/1998	RSM	154	01/16/1998	NOT EQ
		TEST OF NEW INQUIRY MENU					
_	PAYROLL	UPDATE 002	01/28/1998		112		
		TEST OF NEW UPDATE SCREEN					
_	QA	TEST1 003	01/29/1998	NGN	1022	02/29/1998	NOT EQ
		TEST1 IN CONVERSION FROM DOS TO MVS					
_	QA	TEST2 007	02/21/1998		724		
		TEST2 IN CONVERSION FROM DOS TO MVS					
_	SYSTEMS	MIGRATE 008	02/21/1998	SAB	2380	03/14/1998	LGC EQ M
		MIGRATION TEST FOR CICS 1.7 TO 2.1					
_	SYSTEMS	STRESS1 018	03/22/1998	JSN	1502		
		STRESS TEST FOR CICS TEST REGION					
_	SYSTEMS	STRESS2 019	03/22/1998		1208		

Type S to the left of the test stream you want to run and press Enter. The Run Options menu is redisplayed with the name of the test stream you selected.

The Test Stream Selection menu provides the following information for each test stream:

- Its name: Application, Member, and Version
- The date on which it was logged
- The ID of the operator who initiated the log
- The number of records in the test stream

- The result of the last run:

LGC EQ

There was a mismatch during the run, but you did not stop at it because your variables or rules resolved it automatically

PHY EQ

The test streams are byte-for-byte physically equal

NOT EQ

There was a mismatch during the run, which you stopped at

- The description of the test stream specified when it was logged
- **M** to indicate a multiple terminal test stream.

Create new output test stream

This option controls the disposition of the run output. The following chart illustrates how these options should be specified.

Create New Output	Disposition of Run Output
Blank	Run output test stream and the output ruleset is discarded.
Specified	Run output creates new output test stream and new output ruleset (if rulesets are being used); input test stream and ruleset remain unchanged.

The default is blank (to discard the output test stream and output ruleset). To use this option you must also set the Record History option to N (because History is stored in the output test stream).

Follow these steps:

1. Specify the entire name or let CA Verify for VTAM generate it as follows:
 - Type an asterisk (*) as the first character of the ddname to generate the same test stream name with the version incremented by one.
 - Type an equal sign (=) for any part of the name — for example, ddname, Application, Member, or Version — to instruct CA Verify for VTAM to use that part of the name from the input test stream. For example, if you specify = for Member, CA Verify for VTAM will use the input Member name for the new output Member name.

2. Press Enter after specifying the new output name.

CA Verify for VTAM generates the name and redisplay the Run Options menu with the new name.

- When an input test stream contains only input screens and an output test stream is created, the output test stream will contain both input and output screens.
- When a new output test stream is created, a new output ruleset is also created (if rulesets are being used). This ruleset will match the output test stream and will contain just the recognition criteria and the variables from the input ruleset.

Specify Run Options

Most of the options on the Run Options menu shown in the previous screen contain default values selected during installation. Change these options to meet your testing needs.

PROCESS WITH RULES

Rulesets can be defined and associated with test streams to eliminate unnecessary RUN MISMATCHES of expected differences. See the chapter "Rules Function" for details on how to create and maintain rulesets and rules.

Y

Runs the test stream with the matching test stream ruleset and/or system ruleset and/or application ruleset. This is the default.

Note: The test stream ruleset must have the same name as the test stream.

N

Runs the test stream without applying any rulesets.

S

Displays the Ruleset Run Selection panel prior to initiating the run, where you can review and select the rulesets associated with the selected input test stream. See the section [Select Rulesets for a Run](#) (see page 84) for more information.

COMPARISON TYPE

Identifies the type of comparison CA Verify for VTAM will perform:

S (Screen)

A row-by-row comparison of the final screen image as presented to the user, regardless of the number of I/Os. This is the recommended comparison type for most situations.

Use S, the default, to run test streams associated with rules. This type of comparison is similar to a logical comparison which compares corresponding rows of the two screens to see if they're the same. However, the comparison base includes all output screens between two input screens.

L (Logical)

A row-by-row comparison of the screen image for each I/O.

A logical comparison compares the corresponding rows on the two screens to see if they're the same. This type of comparison allows variation in the bytes being transmitted as long as the *end result* is the same.

P (Physical)

A byte-for-byte comparison of the data stream.

Use physical to compare the data streams to determine if identical screen images were produced in the same way, for non-3270 terminals, or for test streams that use graphics. In a physical comparison, 80-byte segments of the data streams are compared.

RECORD HISTORY

Determines the contents of the output test stream after the run.

Y

The output test stream will contain the screens that will be used the next time it is run or edited, as well as historical information. Record History can include: original screens, expected screens, rules, differences, and signoff data. If you specify Y, you must create a new output test stream.

N

The output test stream will contain only the screens that will be used the next time it is run or edited.

REQUIRE SIGNOFF DATA

Y

Requires the operator to explain each mismatch when CA Verify for VTAM compares the original, expected, and current screens. For example, you may want to require an explanation during a final Quality Assurance run. This option is not valid if Record History is N (no).

N

No explanation of mismatches is required. This is the default.

Note: Only functional if Stop At Mismatches = Y

SIMULATED USER THINK TIME

Controls the rate at which CA Verify for VTAM sends input screens to the application, simulating the user's think time.

None

Specifies the minimum think time. CA Verify for VTAM will not wait before sending screens to the application. This is the default.

nnn%

Specifies the think time as a percentage of the original user think time. For example, 50% specifies half the original think time, 100% specifies the same think time, and 200% specifies twice the original think time. 200 is the maximum percentage that can be specified.

Nn

Specifies the think time in seconds. CA Verify for VTAM will wait the same number of seconds before sending each input screen. 20 seconds is the maximum specification allowed.

STATUS INTERVAL

Determines the number of seconds between updates in the Run Status menu. While the test stream is running, CA Verify for VTAM periodically updates this menu to indicate the number of records processed and the estimated remaining run time. The default is five seconds.

CANCEL INTERVAL

Determines the number of minutes between opportunities to cancel the run. During a long test stream run, CA Verify for VTAM periodically pauses, issues a terminal read, and displays a message on the Run Status menu which allows you to cancel the run. Run processing is suspended while you react to this message. The default is one minute.

You can also use the Inquiry function to interrupt a run which will not issue a terminal read for several minutes. See the chapter "Inquiry Function" for details.

STOP AT MISMATCHES**Y**

When Y is selected the run will stop if any mismatches are encountered. The default is Y.

N

When N is selected the run will not stop at mismatches.

Select Rulesets for a Run

Follow these steps:

1. Specify the run option for Process With Rules as S (SELECT).
2. Press Enter.

CA Verify for VTAM displays the Ruleset Run Selection panel, as shown next. Use this panel to review or choose which rulesets to use for this run.

```

-----RULESET RUN SELECTION-----08:20:58
ENTER COMMAND ==>

USE

Y TEST STREAM RULESET: TCADS.CCCORDER.REL63.001
  DESCRIPTION: CAROL'S COOKIES COMPANY
                CONVERSION FROM REL 6.3 TO 7.0

N APPLICATION RULESET: NOT USED
  DESCRIPTION:

Y SYSTEM RULESET:      TCADS.SYSTEM.#RULESET.001
  DESCRIPTION: GLOBAL RULES FOR ALL SCREENS

F1-HELP  F3-END  F4-RETURN

```

TEST STREAM RULESET

Contains the name of the test stream ruleset associated with this test stream. Type Y to the left of the heading if this ruleset is to be used during this run; type N if it is not to be used.

APPLICATION RULESET

Contains the name of the application ruleset associated with this test stream. An application ruleset contains rules that apply to every test stream on the TCADS file that has the same Application name. Type Y to the left of the heading if this ruleset is to be used during this run; type N if it is not to be used.

Note: If there is no application ruleset, then NOT USED appears in this field.

SYSTEM RULESET

Contains the name of the system ruleset associated with this TCADS. A system ruleset contains rules that apply to every test stream on a specific TCADS file. Type Y to the left of the heading if this ruleset is to be used during this run; type N if it is not to be used.

Note: If there is no system ruleset, then NOT USED appears in this field.

Note: Rules will be applied in the order they are specified in the ruleset you select. If you select multiple rulesets, rules in the test stream ruleset will be applied first; rules in the application ruleset will be applied second; rules in the system ruleset will be applied last.

3. To initiate the Run with the Specified Rulesets named on this panel, press Enter. Continue with the instructions in the next section, [Initiate the Run](#) (see page 85).
4. To exit back to the Run Options menu without processing the changes, press PF3 (End).

Initiate the Run

When you have finished specifying the run options, press Enter.

- If you are running a single terminal test stream, CA Verify for VTAM initiates the run.
- If you are running a multiple terminal test stream, CA Verify for VTAM displays the Terminal Selection menu.

Select a Terminal

CA Verify for VTAM displays the Terminal Selection menu before you run a multiple terminal test stream.

```

SAMPLE.MULTTERM.001 ----- RUN: TERMINAL SELECTION -----14:14:22
ENTER COMMAND ==> RT

SELECT: "S"   ORIGINAL  TERMINAL  SCREEN   ALTERNATE  VIRTUAL
INQUIRY: "I"  TERMINAL  TYPE      SIZE     SIZE       TERMINAL

      -      A60L2048  3277 REMOTE  24 BY 80  24 BY 80
      -      A60L2049  3277 REMOTE  24 BY 80  24 BY 80
      -      A60L205A  3277 REMOTE  24 BY 80  24 BY 80
      -      A60L205B  3277 REMOTE  24 BY 80  24 BY 80
      ***      END OF TERMINALS      ***

TYPE AN "S" TO SELECT TERMINAL FOR RUN      TYPE AN "I" TO VIEW TERMINAL STATUS
F1-HELP          F3-CONTINUE  F4-RETURN      F7-UP          F8-DOWN

```

For each terminal in the test stream, CA Verify for VTAM identifies its name, type, screen size, alternate size, and, if specified, the virtual terminal assignment.

You can run one, all, or a combination of terminals. You must select at least one terminal.

- Type S to the left of each terminal you want included in the run and specify Continue (PF3) to initiate the run.
- Type I and press Enter to view the Initial Terminal Status menu for a terminal. See the screen in the "Browse Function" chapter for an explanation of this menu.

When you have finished viewing the Initial Terminal Status menu, use (PF3) to redisplay the Terminal Selection menu. Press PF3, Continue, to initiate the run.

Use the following CA Verify for VTAM commands:

Assign

Inserts S to the left of each terminal

Reset

Restores the initial menu setting with an underscore to the left of each terminal

Cancel

Redisplays the Test Stream Selection list or Run Options menu

Up (PF7) Down (PF8)

Scrolls through the terminal list

Review the Run Status

During the run, CA Verify for VTAM displays the Run Status panel at the terminal where the Run function was initiated. CA Verify for VTAM updates this panel at the status interval specified on the Run Options menu.

```

----- RUN STATUS -----11:50:16
                                     R3

INPUT TEST STREAM:      TCADS.SAMPLE.TEST.001
OUTPUT TEST STREAM:    TCADS.SAMPLE.TEST.002

RULESET(S):
  TESTSTREAM: TCADS.SAMPLE.TEST.001
  APPLICATION: NOT USED
  SYSTEM:     NOT USED

CURRENTLY PROCESSING RECORD:      5
TOTAL RECORDS TO BE PROCESSED:   21
ESTIMATED REMAINING RUN TIME: 00:02:19

STATUS INTERVAL:  5 SECONDS
CANCEL INTERVAL:  1 MINUTE

DESCRIPTION: SAMPLE TEST OF A04IC9NA, CAROL'S COOLIES COMPANY
IN PROGRESS FOR A04IU001: REQSESS

F1-HELP      F3-END      ENTER-CONTINUE

```

This menu provides the following information:

Run Status	Description
INPUT TEST STREAM	Identifies the ddname, application, member, and version of the logged test stream, separated by periods.
OUTPUT TEST STREAM	Identifies the ddname, application, member, and version of the output test stream, separated by periods. None will appear if you did not specify a new name for the output test stream.

Run Status	Description
RULESET(S):	Identifies the rulesets CA Verify for VTAM will apply to the input test stream during the current run processing TESTSTREAM: Applies changes only to this test stream APPLICATION: Applies changes to every test stream on the TCADS file that contains the same application name SYSTEM: Applies changes to every test stream on a specific TCADS file.
CURRENTLY PROCESSING RECORD	Identifies the record CA Verify for VTAM is currently processing.
TOTAL RECORDS TO BE PROCESSED	Identifies the total number of records in the test stream.
ESTIMATED REMAINING RUN TIME	Estimates the amount of time required to complete the run, based on the total response time of the remaining records. Remember, this is only an estimate and may be inaccurate for many reasons; for example, for a multiple terminal test stream in which some terminals have been excluded.
STATUS INTERVAL	Indicates the number of seconds between updates of this menu.
CANCEL INTERVAL	Indicates the number of minutes between opportunities to cancel the run. When the cancel interval expires, a message at the bottom of the menu indicates that you can cancel or continue the run. Run processing is suspended while you react to this message.
DESCRIPTION	The description of the test stream specified when it was logged.

IN PROGRESS FOR terminal

When an application pauses in its communication with CA Verify for VTAM, an IN PROGRESS FOR terminal message is added to the Run Status menu, where terminal is the virtual terminal name. It is generally normal for CA Verify for VTAM to display the message once or twice and then continue the run. If the message persists, then the application should be checked for conditions such as starting up or shutting down, being swapped out, or being held in a wait state for some other reason.

To continue the run, press Enter; to cancel the run, press any PF key or type End.

Note: The command line appears on the menu only when CA Verify for VTAM displays the message allowing you to cancel the run.

Terminate the Run

If you cancel the run from the Run Status panel, CA Verify for VTAM displays the Run Termination menu. You can also access this menu by using the End (PF3) command from the Run Mismatch Options menu, and the End (PF3) command from the Missing Output menus, discussed later in this chapter.

```

----- RUN TERMINATION -----11:35:49
ENTER COMMAND ==>                RX

    1  END RUN, SAVE OUTPUT TEST STREAM

    2  CANCEL RUN, DO NOT SAVE OUTPUT TEST STREAM

INPUT TEST STREAM:
  CCCORDER.REL63.001

OUTPUT TEST STREAM:
  NONE

RULESET(S) IN USE:
  TESTSTREAM:  TCADS.CCCORDER.REL63.001
  APPLICATION: NOT USED

  SYSTEM:      NOT USED

CURRENTLY PROCESSING RECORD: 4

F1-HELP      F3-END
  
```

- Type 1 and press Enter to end the run and save the output test stream and ruleset.
- Type 2 and press Enter to cancel the run *without* saving the output test stream.
- Use the End (PF3) command to continue the run or return to the previous menu.

Specify Mismatch Options

When CA Verify for VTAM detects a mismatch during a logical, physical, or screen comparison, it stops the run and displays the Run Mismatch Options menu. The mismatch can be any of the following:

- I/O difference; for example, a write instead of a read
- Type of operation; for example, an erase/write instead of an erase/write alternate
- Cursor location
- A byte of data or an attribute
- Write control character
- Screen size

```

----- RUN MISMATCH OPTIONS -----16:08:57
ENTER COMMAND ==>                                     R6

1  1  DISPLAY RULESET SUMMARY                6  ACCEPT ORIGINAL OUTPUT
  2  DISPLAY PREVIOUS INPUT                 7  ACCEPT CURRENT OUTPUT
  3  DISPLAY NEXT INPUT                    8  CHANGE NEXT INPUT
  4  SKIP ORIGINAL OUTPUT                  9  INSERT CURRENT OUTPUT AND INPUT

  5  SKIP ORIGINAL OUTPUT AND INPUT        10  INSERT CURRENT OUTPUT

2
INPUT:  CCCORDER.REL63.001                CURRENT RECORD:  4
OUTPUT: NONE

3
RULESET: TESTSTREAM: TCADS.CCCORDER.REL63.001
          APPLICATION: NOT USED
          SYSTEM:      NOT USED

4      TYPE      OPERATION      WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE  C3   9  2   24*80   602   NN01
CURRENT:  OUTPUT  ERASE/WRITE  C3   9  2   24*80   602   VTERM001
ONLY UNEQUAL ROW: 02

                                .ORDER STATUS          .DATE.07/22/97
                                .ORDER STATUS          .DATE.09/11/1997
                                XXXXXXXXXXXXXXXX

F1-HELP  F2-ROTATE  F3-END    F7-UP    F8-DOWN

```

This menu consists of four sections:

1. Lists the available options.
2. Describes the run.
3. Contains the rulesets used for this run.
4. Identifies the differences between the original/expected, and current screens that generated the mismatch.

Mismatch Options

To specify an option, type its number (or the corresponding command) and press Enter, or press the appropriate PF key. The options consist of the following groups:

Mismatch Options	Description
option 1:	Displays the rules summary menu for viewing or updating the rules being applied to the input test stream.
options 2-3:	Displays the previous or next input
options 4-5:	Skips the original output screen, or the next output/input screen pair
options 6-7:	Ignore or accept the change; if you accept the change, the output test stream is updated for use in the next edit or run
option 8:	Displays the screen for you to update
options 9-10:	Adds a new output/input screen pair, or a new output screen

When you use options 2-3 to display screens, you can use the Format (PF9) command to view the screens in Display, Field, and Hex formats. See the [Display, Field, and Hex Screen Formats](#) (see page 109) section for a discussion of screen formats.

To scroll forward through a test stream, use the Next (PF6) command to display the next screen. However, you cannot scroll backward. If you need to see earlier screens, suspend the Run function and use the Browse function to inspect them.

The mismatch options are described next.

1 DISPLAY RULESET SUMMARY

Instructs CA Verify for VTAM to display a summary of the rulesets applied during the run. This option allows you to define a new rule or update an existing rule and save your updates to the current ruleset.

If you modify the existing ruleset and specify End (PF3), CA Verify for VTAM will repeat the comparison, taking into account your rule specification. If CA Verify for VTAM no longer detects a mismatch, it will continue the run; otherwise, it will redisplay the Run Mismatch Options menu. For example, if the run was interrupted because of a discrepancy between the dates on the original and current screens and you identify the date field as a variable field, CA Verify for VTAM will continue the run.

See the chapter "Rules Function" for instructions on how to define a ruleset and the rules it contains; see the section [Adjust Rules During a Run](#) (see page 99) for instructions on how to change or add rules to a ruleset during a run.

2 DISPLAY PREVIOUS INPUT

Instructs CA Verify for VTAM to display the last screen sent to the application. Specify End (PF3) to return to the Run Mismatch Options menu.

3 DISPLAY NEXT INPUT

Instructs CA Verify for VTAM to display the next screen to be sent to the application. Specify Next (PF6) to display subsequent screens in the input test stream; specify End (PF3) to return to the Run Mismatch Options menu.

4 SKIP ORIGINAL OUTPUT

Use this option when the input test stream has two consecutive output screens but one has been deleted by the application. This option deletes the first output screen so it will not be used the next time the output test stream is run, browsed, or edited. CA Verify for VTAM then repeats the comparison, using the next screen in the original test stream and the current screen. If there is no mismatch, the run continues; otherwise, CA Verify for VTAM redisplay the Run Mismatch Options menu.

In the previous example, if record 4 was in the test stream but had been eliminated from the application, you would use option 4 to delete it.

5 SKIP ORIGINAL OUTPUT AND INPUT

Use this option when an output and input screen have been deleted from the application. This option deletes the output screen and any input screens up to the next output screen so they will not be used the next time the output test stream is run, browsed, or edited. CA Verify for VTAM then repeats the comparison, using the next output screen in the input test stream and the current screen. If there is no mismatch, the run continues; otherwise, CA Verify for VTAM redisplay the Run Mismatch Options menu.

In the previous example, if records 2 and 3 were in the test stream but had been eliminated from the application, you would use option 5 to delete them.

6 ACCEPT ORIGINAL OUTPUT

Instructs CA Verify for VTAM to retain the original screen in the output test stream and continue the run. Use this option when the output screen generated by the application reflects an error and the original screen is correct.

7 ACCEPT CURRENT OUTPUT

Instructs CA Verify for VTAM to replace the original screen with the current screen in the output test stream and continue the run. Use this option when the application has changed and the original screen is no longer correct.

8 CHANGE NEXT INPUT

Select this option when you want to change the next *input* screen required by the application. This may be necessary when the current output screen changes the location or contents of a field which would be part of the next input screen, or when an input field has been added to the screen. Option 8 ensures that the application receives the data it expects.

For example, suppose your next input screen should select menu item C. However, your application has been updated and what was formerly item C is now item D. Option 8 lets you replace the original input screen with an updated input screen which specifies item D.

When you select option 8, CA Verify for VTAM displays the current screen. Type the necessary data and press the appropriate key (attention identifier) required by the application (like Enter or PF1). Whatever key you use will be interpreted according to the application specifications. CA Verify for VTAM sends the input to the application and will use this data the next time you run or edit the output test stream.

When you choose option 8, CA Verify for VTAM accepts the mismatch on the current screen and continues the run.

Note: Before specifying option 8, you may need to select option 3 to display the next input screen so you know what input the application expects. Use the Format (PF9) command to display the screen in Field format, which shows only the input fields and identifies the AID (attention identifier key). Then return to the Run Mismatch Options menu, select option 8, and type the required input data.

See the section [Use Options 8 and 9 With Non-3270 Devices](#) (see page 94) for additional information.

9 INSERT CURRENT OUTPUT AND INPUT

Use this option to insert an output screen and an input screen. CA Verify for VTAM displays the current output screen. Type the input data and press the appropriate key as required by the application. CA Verify for VTAM will insert the new screen into the test stream and send it to the application. CA Verify for VTAM also holds the original screen because CA Verify for VTAM assumes it will match the next output screen from the application.

In the previous example, if records 2 and 3 were not in the test stream but had been added to the application, you would use option 9 to insert them.

See the section [Use Options 8 and 9 With Non-3270 Devices](#) (see page 94) for additional information.

10 INSERT CURRENT OUTPUT

Use this option to insert the current screen into the output test stream. CA Verify for VTAM then repeats the comparison, using the next screen from the application. You can choose this option only if the application has already sent a second output screen.

In the previous example, if record 4 was not in the test stream but had been added to the application, you would use this option to add it.

Note: When new or deleted screens are anticipated, use the Rules function to identify the screens to be added or removed. The Rules function is discussed in the chapter "Rules Function".

Use Options 8 and 9 With Non-3270 Devices

Options 8 and 9 work differently with non-3270 devices:

- CA Verify for VTAM does not display the current screen, so you should use PF2 to rotate to the current screen to examine it *before* invoking option 8 or 9.
- Non-3270 data streams often contain hexadecimal control information that varies, depending on the devices and controller programs used. You must type this information with the character data. CA Verify for VTAM will expect:

X'hex data',C'character data',X'hex data' . . .

- CA Verify for VTAM will reject data that does not conform to this format and ask for the input again. To determine the format of non-3270 data at your installation, you can request a batch print of a data stream using the Hex option or you can browse it in hex format.

Description of the Run

The information next to the options on the Run Mismatch Options menu describes the run.

INPUT

Identifies the input test stream being run.

OUTPUT

Identifies the output test stream being created; NONE if you are not saving the output from the run.

CURRENT RECORD

Identifies the record number of the screen in the input test stream.

Description of the Rulesets

The information next to the run description on the Run Mismatch Options menu identifies the ruleset(s) being used when this test stream is run.

TESTSTREAM

The name of the test stream ruleset, if one is used.

APPLICATION

The name of the application ruleset, if one is used.

SYSTEM

The name of the system ruleset, if one is used.

Important! To invoke a System ruleset during a log or a run, Rulesys=Yes must be set in the TCAOPTS macro option. To invoke an Application ruleset during a log or run, Ruleapp=Yes must be set in the TCAOPTS Macro Options. For more information see the *Installation Guide*.

Description of the Screens

The information next to the Ruleset on the Run Mismatch Options menu describes the original, expected, and current screens where the mismatch occurs.

Type

Input or output. Usually, both will be output screens.

Operation type of 3270 operation; for example, write, erase/write. A logical or screen comparison does not compare the operation because any difference will be detected during the row comparison.

WCC

Two-character hex representation of the write control character. If the two WCCs differ, their meanings are listed beneath the First Unequal Row information.

Cursor

Location of the cursor by row and column. Cursor location is included in logical and screen comparisons; in a physical comparison the difference will be detected in the data stream comparison.

Size

Screen size used when the screen was received from the application. Both logical and physical comparisons compare screen size. If screens of different sizes are used, the logical comparison pads the rows and columns of the smaller screen with nulls.

Length

Number of bytes in the data stream. A physical comparison compares data length.

Terminal

Name of the terminal that received the screen from the application. CA Verify for VTAM does not compare the terminal, but this information is provided when you run a multiple terminal test stream so that you know which terminal the screens are for.

Unequal Row Information

The unequal row information at the bottom of the Run Mismatch Options menu describes the first or only mismatch between the original/expected and current screens.

- During a *logical* or *screen* comparison, CA Verify for VTAM compares the rows. When it detects a mismatch, it displays unequal row information.
- During a *physical* comparison, CA Verify for VTAM compares the two data streams without formatting them, and consequently compares 80-byte segments rather than rows. When CA Verify for VTAM detects a mismatch, it displays unequal segment information. If the two data streams are unequal in length, CA Verify for VTAM pads the shorter stream with underscores.

CA Verify for VTAM displays the unequal data when it detects a mismatch in the data or attributes. When it detects a different type of mismatch — for example, differences in the operation or write control character — it displays a message explaining the mismatch.

FIRST/ONLY UNEQUAL ROW (SEGMENT)

Identifies the row in which the first mismatch was detected. For a physical comparison, this is the offset of the first unequal segment, relative to zero.

UNEQUAL ROWS (SEGMENTS)

Identifies how many rows or segments are unequal.

OFFSET

For a physical comparison only, identifies the offset of the 80-byte segment displayed, relative to zero.

Data in Unequal Rows (Segments)

Beneath the *First/Only Unequal Row* information, CA Verify for VTAM displays three lines:

line 1

Row or segment from the original or the expected original screen

line 2

Row or segment from the current screen

line 3

Differences between the rows or segments, specified as follows:

blank

The two rows or segments contain the same characters

X

The two rows or segments contain different characters

-

Variable field; not compared

Note: In the original/expected and current rows, CA Verify for VTAM substitutes a blank for nulls and a period for unprintable characters (usually attributes). An X beneath two periods means the attributes are different; display the screens using Field format to view the attributes. An X beneath two blanks means one is a null and the other is a blank.

If the screens have more than one set of unequal rows, use the Down (PF8) and Up (PF7) commands to scroll through all the additional unequal rows. If the width of the test stream screen exceeds the width of the terminal you are using, use the Left (PF10) and Right (PF11) commands to display the entire screen.

When you page down through the sets of unequal rows, the menu you are viewing is titled *All Unequal Rows*. This menu has a column ruler to help you determine the location of the mismatch. You can type all mismatch options on this menu. Use the Rotate (PF2) command to rotate between the original, expected, and current screens and the All Unequal Rows menu.

If the following mismatches are found, CA Verify for VTAM displays this information after the last unequal screen row:

WCC

Explains the difference between the WCC's; for example:

Expected: NL/EM/CR Print Cntl, Alarm

Current: NL/EM/CR Print Cntl, Resetmdt

The Write Control Character has changed

Screen Size

Explains the difference in screen size; for example:

Expected: 24 * 80

Current: 27 * 132

The screen size in use has changed

Cursor

Explains the difference in cursor position; for example:

Expected: Row: 3 Column: 8

Current: Row: 1 Column: 1

The cursor location has changed

Operation

Explains the difference in operation; for example:

Expected: Erase/Write

Current: Erase/Write Alternate

The operation has changed

Type of Screen

If CA Verify for VTAM detects a difference in the type of screen (for example, the original screen is an input screen, the current screen is an output screen), it displays the following message:

The application has issued a write when a read was expected. Either the write has been added or a read has been eliminated. Select option 6, 8, or 10.

This is an I/O mismatch, caused by a change in the application or the deletion of an output screen during editing. Only the options identified in the message can be used. Select option:

- **6** if you don't expect the write to be issued again
- **8** to accept the current output screen and change the input screen which follows this output screen
- **10** to accept the new output screen and continue

Note: When new or deleted screens are anticipated, use the Rules function to identify the screens to be added or removed. The Rules function is discussed in Chapter 8.

Sign off on the Mismatch

If you specified **Y** for both the Record History and Require Signoff Data options on the Run Options menu, CA Verify for VTAM provides three lines beneath each mismatch in which you can explain the difference. Press PF8 from a mismatch display to view the unequal rows.

The following example illustrates how you would specify mismatch signoff information.

```

CCC.ORDERAPP.001 ----- RUN: ALL UNEQUAL ROWS -----11:18:23
ENTER COMMAND ==>                                     RL

                                RECORD:    2
                                70        80
ROW: 1-----+-----+-----+-----+-----+-----+
.DATE.02/06/1998          CAROL'S COOKIES COMPANY          .RELEASE 7.0
.DATE.02/10/1998          CAROL'S COOKIES COMPANY          .RELEASE 6.2
      XX                                     x x
SIGNOFF ==> The difference in the date field will
ON ABOVE ==> be resolved by defining a variable field
      ==>
      *** END OF UNEQUAL ROWS ***
                                OPER ==> STERI02

F1-HELP    F2-ROTATE          F3-END  F7-UP    F8-DOWN  F10-LEFT
F11-RIGHT

```

Notes:

- If you select mismatch option 6, 7, 8, or 9, you must type at least one non-blank character in the first Signoff On Above field. If there are additional mismatch rows *on the same screen*, you can specify an asterisk (*) in subsequent Signoff On Above fields to indicate that the initial information be copied. An asterisk cannot be used to copy signoff information from another screen.
- Your signon operator ID appears by default in the OPER field. If necessary, you can change this ID.

Adjust Rules During a Run

To help eliminate mismatches during a run, you may occasionally need to change an existing rule or add another rule to the ruleset for a test stream. (A common example is forgetting to create a rule for a change.)

Follow these steps:

1. Select option 1 (Display Ruleset Summary) from the Run Mismatch Options menu (shown previously).

The Applied Rules panel is displayed as shown next.

Note: When adding a rule to a ruleset, remember that rules are applied in the order specified in the ruleset.

```

----- APPLIED RULES -----14:12:16
ENTER COMMAND ==>

INPUT TEST STREAM: TCADS.CCC.ORDERAPP.001          CURRENT RECORD:  2
                                                    LINE  1 TO  6 OF  6

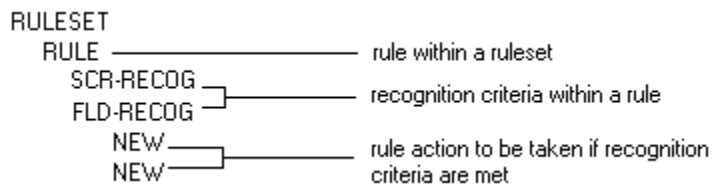
B-BROWSE  E-EDIT
OBJECT    TYPE ROW  COL LEN OP  VALUE FROM THE MODEL SCREEN/DESCRIPTION
RULESET   T/S
- RULE
- FLD-RECOG                EQ  CAROL'S COOKIES COMPANY_____ <RECOGNIZED>
-   MOVED      OUT   1   3   2   98_____ <APPLIED>
-   NEW        OUT   1  13   2   19_____ <APPLIED>
-   CHANGED    OUT   1   2   3   7.0_____ <APPLIED>

F1-HELP  F2-ROTATE  F3-END  F4-RETURN  F7-UP  F8-DOWN
    
```

This panel is similar to the Browse Rules—Summary panel, except that it lists all of the rulesets associated with this test stream and indicates which rule within those rulesets has been recognized or applied. Fields that are important for adjusting rules during a run are explained next; see Chapter 8, *Rules Function*, for an explanation of the rest of the fields.

OBJECT

This column lists the rulesets, rules, and rule actions in the order they are to be applied. Objects are arranged in hierarchical order with ruleset at the top of the hierarchy and rule actions being at the bottom. An illustration of the hierarchy appears next.



TYPE

Indicates which type of ruleset or rule this is. Valid types for ruleset are:

T/S

Test Stream

APPL

Application

SYST

System

OUT

Applies to this output screen

IN

Applies to the next input screen

<APPLIED>**<RECOGNIZED>**

These messages indicate whether the rule has been applied during this run (<APPLIED>), or whether screens have been located that match the recognition criteria specified (<RECOGNIZED>).

2. To help identify any remaining changes, use PF2 (Rotate) to switch the display from the Expected screen to the Current view to the Original test stream record and then back to the Expected screen.
 - The expected screen contains the originally-logged test stream with the rules applied.
 - The current view shows the test stream record as it is now.
 - The original test stream record displays the record from the originally-logged test stream with no changes applied.

If you have the proper security authorizations, you can take several actions from this panel. You can:

- Browse or edit any ruleset by typing a B or E to its left. From there, browse or edit as needed.
- Browse or edit any rule by typing a B or E to the left of RULE.
- Browse or edit any rule action by typing a B or E to the left of the rule action.
- Add a rule or rule action by typing an E to the left of the ruleset that will contain the rule. See the next section, [Add a Rule or Rule Action](#) (see page 102) or details.

See the chapter "Rules Function" for detailed instructions on browsing, editing, and deleting rules and rule actions. The procedure for adding a rule or rule action is covered next.

Add a Rule or Rule Action

Follow these steps:

1. From the Applied Rules panel, type **E** next to the ruleset that you want to add the rule or rule action to. Press Enter to display the Edit Rules—Summary panel.
2. Type **I** (for Insert) to the left of the object that is to immediately precede the new rule or rule action. Press Enter to display the Rules Menu.
3. Add this rule or rule action as you would any other rule or rule action. (Detailed instructions are in Chapter 8, *Rules Function*.)
Note: Rule actions are processed in the order in which they are defined, so it is important to insert a new item in the correct position.
4. After you type the specific information for this field (that is, ROW, COL, LEN), press Enter. If the add was successful, the message ADD SUCCESSFUL appears in the message area.
5. Press PF3 to return to the Edit Rules—Summary where you can check the details of the rule or rule action you just added.
6. Press PF3 to display the Applied Rules to check whether the rule or rule action was applied. (Rules and rule actions are applied as soon as you add them.)
7. Continue with the run.

Resolve Conflicts between Rule Actions

Whenever CA Verify for VTAM detects a conflict between rule actions, the run stops and the Mismatch screen is displayed. Using this screen, you must correct any conflicts between rule actions before the run can continue.

Rules Summary Status Messages

The following error messages may appear on the Rules Summary panel and the Rules Applied During Run panel after running a test stream.

<APPLIED>

Reason:

This rule or rule action has been applied.

<CONFLICT>

Reason:

One or more rule actions applied to the same location and a conflict occurred.

<ERROR>

Reason:

This is a general error code set when the reason code is unknown.

<INCOMPLETE RULE>

Reason:

The rule does not have any rule actions defined to it.

<INV DATE MASK-ERROR>

Reason:

The data in the specified data generation field does not match the mask specified in the date aging format field.

<INV NUMBER-ERROR>

Reason:

The data specified in the data generation field is not numeric.

<M,D,Y IS NOT NUM-ERROR>

Reason:

The month, day, or year in the data generation field location is not numeric.

<MULTI ACTION-ERROR>

Reason:

More than one delete screen or insert test stream rule action was specified for the same screen.

<NEGATIVE DATE-ERROR>

Reason:

The date generated has a negative value.

<NESTED ACTION-ERROR>

Reason:

A nested delete or insert test stream rule action was specified, which is not allowed.

<NO ATTR ROW-COL-ERROR>

Reason:

An attribute byte was missing for this row-column location.

<NO CUT DATA-ERROR>

Reason:

The requested cut data does not exist, so it cannot be pasted.

<NO MODEL SCREEN>

Reason:

No model screen applies to this rule.

<NOT APPLICABLE DURING RUN>

Reason:

This is a LOGGING rule action and is ignored during a run.

<NOT APPLIED>

Reason:

This rule or rule action has not been applied.

<NOT RECOGNIZED>

Reason:

The recognition criteria did not match.

<NOT RECOGNIZED-NOT APPLIED>

Reason:

The recognition criteria did not match, so the rule was not applied.

<NUM OVERFLOW-ERROR>

Reason:

An overflow condition occurs when the value of a field is too large to fit in the field length specified on the data generation rule action. Either re-specify the length or set OVERFLOW equal to YES.

<OUTBOUNDS-ERROR>

Reason:

The row, column, and length coordinates of this rule action are outside the screen size of the terminal used by Run.

<OUTBOUNDS-NOT RECOGNIZED>

Reason:

The row, column, and length coordinates of the recognition criteria are outside the screen size of the terminal used by Run.

<RECOGNIZED>

Reason:

The recognition criteria matched.

<SCREEN FAILURE-ERROR>

Reason:

A screen failure occurred because the attributes for the expected screen did not match those of the current screen. Check that all rules for deletes, moves, and changed fields are correct. The row, column, and length coordinates of this rule action overlap the position where the attribute mismatch was detected.

<SCREENID NOT EQ-NOT APPLIED>

Reason:

The specified screen ID did not match, so the rule was not applied.

<T/S EMPTY-ERROR>

Reason:

The test stream to be inserted is empty.

<T/S IN USE-ERROR>

Reason:

The test stream to be inserted is in use.

<T/S I/O-ERROR>

Reason:

An I/O error occurred reading the test stream.

<T/S IS MTTTS-ERROR>

Reason:

The test stream to be inserted is a multiple terminal test stream.

<T/S NOTAUTH-ERROR>

Reason:

The test stream to be inserted is READ protected.

<T/S NOTFOUND-ERROR>

Reason:

The test stream to be inserted is not in the TCADS.

<T/S REC#1 NOT OUTPUT-ERROR>

Reason:

The first record in the test stream is not an output record.

VARIABLE CONFLICT - WARNING

Reason:

A variable rule action overlapped row and column location with a non-variable rule action; an informational warning.

Action:

Verify that the overlap is what you intended, then continue the Run. The conflict does not have to be resolved or bypassed.

WARNING

Reason:

An informational warning.

Action:

Verify that the overlap is what you intended, then continue the Run. The conflict does not have to be resolved or bypassed.

Errors Requiring CA Support

If any of the following errors occur, you must call CA support.

<INV OPER VALUE-ERROR>

Reason:

The data generation operator value is zero or not numeric.

<JULIAN DATE MASK-ERROR>

Reason:

The Julian date mask cannot contain a month.

<MULT M,D,Y IN MASK-ERROR>

Reason:

More than one MM, DD, or YY[YY] was specified in the date mask.

<ZERO OPER VALUE-ERROR>

Reason:

The operator value was zero.

Confirm the Mismatch

If you select options 4, 6, 7, 8, or 10 on the Run Mismatch Options menu, CA Verify for VTAM validates the next input screen to check for the following conditions:

- The input data does not fit in the corresponding field in the current output screen
- The location of an input field has changed
- An input field was deleted

Any of these conditions will probably generate a mapping error (mapfail condition) when the next input screen is sent to the application. To avoid this, CA Verify for VTAM displays the Mismatch Confirmation panel.

```

----- RUN: MISMATCH CONFIRMATION -----11:49:50
ENTER COMMAND ==>                                RC
                                                RECORD NUMBER: 2
THE OPTION YOU SELECTED (6) MAY RESULT IN A MAPPING ERROR (MAPFAIL
CONDITION) WHEN THE NEXT INPUT IS SENT TO THE APPLICATION.

1 INPUT FIELD NO LONGER CORRESPONDS (BECAUSE 1 OR MORE FIELDS HAVE BEEN
MOVED, DELETED, OR SHORTENED). THE FIRST INPUT DATA WHICH DOES NOT
CORRESPOND TO ANY FIELD ON THE CURRENT SCREEN IS AT ROW 8, COLUMN 51.
IT IS 1 BYTE LONG.

MISMATCH OPTION 8 CAN BE USED TO ENTER THE NEXT INPUT INTO THE NEW SCREEN
LOCATIONS.

OPTION 5 OR 9 MAY ALSO BE APPLICABLE (IF SCREENS HAVE BEEN INSERTED OR
DELETED).

F1-HELP      F3-END

```

Usually, you can correct the error by selecting option 8 on the Run Mismatch Options menu. This option displays the current output screen so you can type the input data and submit that screen in place of the original input screen. If the error occurred because screens were removed from the application, select option 5; if the error occurred because screens were added, select option 9.

Enter the End (PF3) command to return to the Run Mismatch Options menu to select another option. Press Enter to continue the run, using the option you selected.

Display, Field, and Hex Screen Formats

When you select mismatch options 2 or 3, or use the Rotate command (PF2), CA Verify for VTAM displays an input or output screen. You can view screens in three formats:

- Display
- Field
- Hex

Change Formats

Use the Format (PF9) command to shift between the Display, Field, and Hex formats. Although parameters are not required, you can specify Format xxx, replacing xxx with one of the following:

Display

Immediately shifts to Display format

Field

Immediately shifts to Field format

Hex

Immediately shifts to Hex format

NODisplay

Disables Display format

NOField

Disables Field format

NOHex

Disables Hex format

For example, Format F displays the screen in field format.

Note: If the format being disabled is the one currently in use, CA Verify for VTAM automatically switches to the next available format. If the current format is the only one enabled, CA Verify for VTAM displays an error message and does not alter the display.

Display Format

Display format is the default format for viewing a screen. A sample screen in Display format is illustrated next.

```

CCC.ORDERAPP.001 ----- RUN: CURRENT SCREEN -----13:37:07
ENTER COMMAND ==>
          10      20      30      40      50      60      70      R5
-----+-----+-----+-----+-----+-----+-----+
| DATE 06/29/98          CAROL'S COOKIES COMPANY          RELEASE 6.2
| TIME 13:19:17          MAIN MENU
|
| 4
|
| ENTER OPTION:
|
|          1) PLACE AN ORDER
|
|          2) CHECK STATUS OF AN ORDER
|
| 12
|
| 16
|
| 20

```

CA Verify for VTAM displays four rows of information above the test stream screen:

- Title
- Command line and record number
- Two-line column number ruler

Also, CA Verify for VTAM displays a row number ruler to the left of the screen. The default row and column for Display format are both zero. Use the Up (PF7), Down (PF8), Left (PF10), and Right (PF11) commands to change the starting row and column. You can specify a number or Maximum with these commands; for example, Up 7, Right 20, Down Maximum. If you change the starting row or column, CA Verify for VTAM uses the new starting position until you change it or exit from CA Verify for VTAM.

Field Format

Field format displays the data stream transmitted to or from the terminal rather than the full screen displayed in Display format. Except on erase/writes, Field format usually does not display all the fields shown in Display format; for example, this format displays only those fields which were modified for read-modified inputs.

The Field format version of the screen illustrated previously is illustrated next.

```

CCC.ORDERAPP.001 ----- RUN: CURRENT SCREEN -----13:37:14
ENTER COMMAND ==> R4

TYPE:          OUTPUT          TRAN: XCCC          RECORD NUMBER:      2
OPERATION:     ERASE/WRITE     DATE: 06/29/1998   DATA LENGTH:       266
RESPONSE:      00:00:00.002    TIME: 13:18:56.730 SCREEN SIZE: 24 BY 80
WCC: C2: NL/EM/CR PRINT CNTL, KEYBOARD RESTORE  TERMINAL:          VV01

ORDER ROW COL ATTR LENGTH -----|-----|-----|-----|-----
SBA   7  16          0
IC
FLD   1   1 PSH      4 DATE
SF          PS      8 06/29/98
FLD   1  29 PSH     23 CAROL'S COOKIES COMPANY
FLD   1  63 PSH      7 RELEASE
SF          PSM      3 6.2
FLD   2   1 PSH      4 TIME
SF          PS      8 13:19:17
FLD   2  36 PSH      9 MAIN MENU
FLD   7   1 PSH     13 ENTER OPTION:
SF          UM      0
FLD   7  17 PS       1
FLD  10   9 PSH     17 1) PLACE AN ORDER
FLD  12   9 PSH     27 2) CHECK STATUS OF AN ORDER
    
```

Header Information

RUN OPTION

The option on the Run Mismatch Options menu selected for this screen during the last run. This information is omitted if the screen did not have a mismatch or was excluded from the last run, or if the test stream was never run.

TYPE

The type of screen; for example, input or output.

OPERATION

The type of operation; for example, read modified, read buffer, write, erase/write, and so on.

RESPONSE/THINK

For output screens, the response time; for example, the elapsed time in hours, minutes, seconds, and thousandths of seconds since the last terminal input. For input screens, the think time; for example, the elapsed time since the last output.

AID/WCC

For input screens, the attention identifier key pressed to generate input. For output screens, the write control character:

NL/EM/CR PRINT CNTL

For print operations, specifies a variable line length depending on placement of a new line, end of message, or carriage return orders in the data stream.

80 CHARACTER PRINT

For print operations, specifies an 80-character line.

64 CHARACTER PRINT

For print operations, specifies a 64-character line.

40 CHARACTER PRINT

For print operations, specifies a 40-character line.

KEYBOARD RESTORE

Restores keyboard function.

START PRINT

Initiates a printout operation.

RESETMDT

Resets all modified data tags.

ALARM

Sounds the audible alarm.

TRAN

The transaction associated with the screen.

DATE

The date the test stream was logged. This date may have been updated if the screen was edited or changed during the Run.

TIME

The time the test stream was logged. This time may have been updated if the screen was edited or changed during the Run.

RECORD NUMBER

The record number of the screen within the test stream.

DATA LENGTH

The total number of bytes transmitted to or from the terminal. For input screens, this includes three bytes for the AID and cursor position. For output screens, this includes one byte for the WCC.

SCREEN SIZE

The logged screen size.

TERMINAL

The terminal to which the screen was sent, or from which it was received.

CURSOR

For input screens, the cursor position (row and column).

Screen Display

CA Verify for VTAM starts a new row on your display for every 3270 order in the screen. If there are no orders, only one row is displayed. Data that follows the order appears under the ruler. Non-3270 data streams are displayed in 40-byte rows.

A common sequence of orders is set buffer address (SBA) followed by start field (SF). To condense the display, CA Verify for VTAM merges these orders into an FLD order type.

Each row in the display consists of:

ORDER

The 3270 order. This will be blank for the first field if the screen does not begin with an order. The most common orders are summarized next. See the *3270 Component Description* or *Programmer's Guide* for a complete description of valid orders.

SBA

Set buffer address specifies the row and column for the data which follows.

SF

Start field specifies the beginning of a field and its attributes.

IC

Insert cursor specifies cursor positioning in the current row and column.

RA

Repeat to address repeats the first character that follows up to the specified row and column.

PT

Program tab specifies the next unprotected field as the location for the data that follows. If there is any data between the program tab order and the previous order, all fields between the current display position and the destination field are set to nulls.

EUA

Erase unprotected to address sets all unprotected fields from the current display position up to the specified row and column to nulls.

ROW

The row specified by the order.

COL

The column specified by the order.

ATTR

The field attributes specified by a start field order:

U

Unprotected field — can be modified

P

Protected field — cannot be modified

N

Numeric field — only numeric data can be typed

S

Cursor will auto-skip over the field

H

High-intensity field

D

Field can be selected with a selector pen

L

Low-intensity (non-display) field

M

Field with modified data tag which will be transmitted from the terminal even if the operator makes no entry

LENGTH

The length of the data following the order.

DATA

The actual data appears next beneath the ruler.

Scrolling

The default scroll amount is 19 rows for the Up (PF7) and Down (PF8) commands and 40 columns for the Left (PF10) and Right (PF11) commands.

The Up and Down commands affect the display starting with the fifth row; for example, the header row on which Type, Tran, and Data Length information appears. The Left and Right commands affect only the ruler and the data beneath it. You can specify a number or Maximum with these commands; for example, Up 4, Right Maximum.

When data is not displayed beginning with the first character, the number of the first column appears in the ruler.

Hex Format

Hex format segments the data stream as Field format does. A new segment appears for each order for 3270 data streams. Non-3270 data streams are displayed in 40-byte increments.

Three rows are used to display each segment:

- Row 1 contains the character representation
- Rows 2 and 3 contain the hexadecimal representation

The Hex format version of the previous screen appears next.

```

CCC.ORDERAPP.001 ----- RUN: CURRENT SCREEN -----13:37:20
ENTER COMMAND ==>                                     R9
OFFSET  LENGTH  -----+-----|-----+-----|-----+-----|-----+-----RECORD:    2
   0         4   B.G?
                   C1C6
                   217F

   4         1   .
                   1
                   3

   5         9   .8DATE
                   1441FCCEC
                   100D84135

  14        10  .006/29/98
                   1FFF6FF6FF
                   D006129198

  24        28  .*.8CAROL'S COOKIES COMPANY
                   1451FCCDD7E4CDDDCCE4CDDDCDE
                   10CD831963D20366295203647158
F2-ROTATE  F3-END  F5-PRV          F7-UP  F8-DWN  F9-FORMAT  F10-LEFT  F11-RIGHT

```

This format provides the offset and length of each segment. Because this example is an output screen, the first byte of the first segment is the WCC. For an input screen, the first three bytes of the first segment would be the AID (one byte) and the cursor position (two byte binary offset relative to zero).

Scrolling

The default scroll amount is 5 segments for the Up (PF7) and Down (PF8) commands and 60 columns for the Left (PF10) and Right (PF11) commands. You can specify a number or Maximum with these commands; for example, Up 3, Right Maximum.

View Connection and Disconnection Records

In addition to viewing input and output screens, you can view connection and disconnection records.

You can display these records by specifying the Next (PF6) command when viewing the original screen (mismatch option 1), or the next input screen (mismatch option 4).

Connection records contain the Logmode and BIND images used in the connection process. Disconnection records identify the application that was disconnected and the reason for the disconnection.

A sample connection record is displayed next.

```

VERDEMO2.APR02.001 ----- RUN: CONNECTION RECORD -----11:28:54
ENTER COMMAND ==>                                         DC

TERMINAL: A68L901          DATE: 01/21/1999          RECORD:    4
APPLID:  VERDEMO          TIME: 10:27:43.757
REASON:   USER INITIATED VIA USS

BINDS:      FROM TERMINAL   TO APPLICATION   FROM APPLICATION
LOGMODE:    DSILGMOD       DSILGMOD
FM PROFILE: 02             02                 02
TS PROFILE: 02             02                 02
PLU PROTOCOL: 71          71                 71
SLU PROTOCOL: 40          40                 40
COM PROTOCOL: 2000        2000            2000
TS FIELDS:  0000 8000 8000 0000 0000 0000 0087 8700 8700
LU TYPE:    00             00                 00
EXT STREAM: 00             00                 00
RESERVED:   00000000      00000000      00000000
SIZES:      0000 0000     0000 0000     0000 0000
FLAGS:      0200          0200            0200
CRYPTOGRAPHY: 00          00                 00
LOGON DATA:

F1-HELP    F3-END    F4-RETURN  F5-PREV    F6-NEXT    F10-LEFT   F11-RIGHT
    
```

This menu provides the following information:

Field	Description
TERMINAL	The name of the terminal used to log the test stream.
APPLID	The application ID.
REASON	The reason for the connection.
DATE	The date of the connection.
TIME	The time of the connection.
RECORD NUMBER	This record's number in the test stream.
BINDS	The following fields describe the BIND request parameters from the sending terminal to CA Verify for VTAM, from CA Verify for VTAM to the application, from the application to CA Verify for VTAM, and from CA Verify for VTAM to the receiving terminal.
Logmode	Logon mode name which specifies a set of session parameters
FM Profile	Function management profiles used
TS Profile	Transmission services profile used
PLU Protocol	Primary logical unit protocols

Field	Description
SLU Protocol	Secondary logical unit protocols
COM Protocol	Common logical unit protocols
TS Fields	Transmission Services Usage fields
LU Type	Type of LU-LU session in terms of SNA protocols and options
Ext Stream	3270 extended data stream identifier
Reserved	Contents of reserved field
Sizes	Presentation space sizes
Flags	PLU and SLU flags
Cryptography	Cryptographic control
Logon Data	Logon user data (if any) from the initial logon command

To see the rest of the Logon Data, use the Right (PF11) command. Use the Left (PF10) command to redisplay the original menu.

A sample Disconnection record is illustrated next.

```

VERDEMO2.APR02.001 ----- RUN: DISCONNECTION RECORD -----11:31:18
ENTER COMMAND ==>                                         DD

TERMINAL: A68L901          DATE: 01/21/1999          RECORD: 5
APPLID:  VERDEMO          TIME: 10:27:43.761
REASON:  UNBIND RECEIVED, TYPE 002 (BIND FORTHCOMING)

F1-HELP  F3-END  F4-RETURN  F5-PREV  F6-NEXT

```

This record identifies the terminal, applid, reason, date, and time of the disconnection. Moreover, this record lists the events that followed the disconnection and the reason codes. See the *VTAM Programming Guide*, *VTAM Messages and Codes*, and SNA manuals for information on specific codes.

Wait for Missing Output

If the application does not return an output screen when expected, CA Verify for VTAM displays the Missing Output menu.

```
VERDEMO2.APR02.001 ----- RUN: MISSING OUTPUT -----11:41:23
ENTER COMMAND ==>                                     RN

TERMINAL: VTERM001                                RECORD NUMBER: 7
THE RUN FUNCTION IS WAITING FOR AN OUTPUT SCREEN. THE OUTPUT SCREEN MIGHT
HAVE BEEN ELIMINATED FROM THE APPLICATION. THE SESSION IS BETWEEN BRACKETS.

1 DISPLAY THE ORIGINAL OUTPUT SCREEN WHICH THE RUN FUNCTION IS WAITING FOR
2 WAIT ANOTHER 20 SECONDS FOR THE OUTPUT SCREEN TO BE SENT BY THE
  APPLICATION
3 IGNORE TEMPORARY CHANGE (THE OUTPUT SCREEN IS NOT EXPECTED, BUT RETAIN
  THE ORIGINAL SCREEN IN THE OUTPUT TEST STREAM)
4 ACCEPT PERMANENT CHANGE (THE OUTPUT SCREEN IS NOT EXPECTED OR WANTED,
  DELETE THE SCREEN FROM THE OUTPUT TEST STREAM)

SELECT OPTION 2 IF THE OUTPUT MIGHT BE DELAYED DUE TO POOR RESPONSE TIME

SELECT OPTION 3 OR 4 IF THE APPLICATION HAS CHANGED

F1-HELP      F3-END
```

The message at the top of the screen always indicates that the Run function is waiting for an output screen that may have been eliminated from the application. The message then indicates one of the following:

- The session is in a bracket and the application is in send, receive, or contention state.
- The session is between brackets and the application is in send, receive, or contention state.
- The application is in send, receive, or contention state.
- The session with xxxxxxxx application is no longer active.
- Application xxxxxxxx is no longer active.

Output screens may be missing for any of these reasons:

- Response time is slower than when the test stream was logged
- An input screen was deleted by the Edit function
- The application changed
- Screens from a printer were logged, but the terminal which starts the printer was not logged
- Messages from one terminal to another were logged, but both terminals were not logged

Use the End (PF3) command to end the run or choose one of the following options:

1 DISPLAY THE ORIGINAL OUTPUT SCREEN

Displays the original output screen for which the Run function is waiting. Use the End (PF3) command to return to the Missing Output menu.

2 WAIT ANOTHER nn SECONDS

Directs CA Verify for VTAM to wait for nn seconds for the missing screen. Select this option at least once to allow for poor response time unless you are sure the screen is really missing. The number of seconds CA Verify for VTAM should wait is determined at installation time.

3 IGNORE TEMPORARY CHANGE

Ignores the missing output screen and continues the run. The original output screen is retained in the output test stream. Select this option if the application will be changed to send the missing screen.

4 ACCEPT PERMANENT CHANGE

Ignores the missing output screen and continues the run. The output screen is deleted from the output test stream. Select this option when the application has changed so that it no longer sends the missing screen.

Complete the Run

When the run completes, CA Verify for VTAM displays the Run Completion panel.

```
CCORDER.REL63.001 ----- RUN COMPLETION -----13:02:28
ENTER COMMAND ==>                                     R8

OUTPUT SCREENS COMPARED:          4
PHYSICALLY EQUAL SCREENS:        1
LOGICALLY EQUAL SCREENS:         3

OUTPUT TEST STREAM: NONE

RULESET(S) USED:
  TESTSTREAM: TCADS.CCORDER.REL63.001
  APPLICATION: NONE
  SYSTEM:     TCADS.SYSTEM.#RULESET.001

F1-HELP  F3-END  F4-RETURN
```

Use the End (PF3) command to return to the Run Options menu or the Return (PF4) command to return to the Primary Options menu.

Note: If CA Verify for VTAM detects a severe error during the run — for example, an I/O error — it displays an error message instead of the Run Completion menu. In this case, the output test stream, if any, is deleted.

Chapter 6: Browse Function

This chapter describes how to examine a test stream online.

This section contains the following topics:

[Overview](#) (see page 123)

[Invoke the Browse Function](#) (see page 124)

[Browse Directory Information](#) (see page 127)

[Browse Terminal Information](#) (see page 131)

[Browse Screens](#) (see page 135)

[Browse Commands](#) (see page 139)

Overview

The Browse function displays online the input and output screens captured during the Log and Run functions. You can view:

- The original screens captured during logging
- The expected screens created during the Run function
- The current screens captured during the Run function
- The differences CA Verify for VTAM found between the expected and the current screens
- The rules that were applied to the original screen which created the expected screen
- Operator instructions to CA Verify for VTAM during the Run function when CA Verify for VTAM detected a mismatch

Use the Browse function to analyze online the results of your testing. Use the Edit function if you intend to modify the test stream; use the batch Print function if you want a hard copy.

Note: How to browse through rulesets and rules (which includes variables) is covered in the chapter "Rules Function."

Invoke the Browse Function

To browse a test stream, type B on the Primary Options Menu. CA Verify for VTAM displays the Test Stream Browse menu.

```
----- TEST STREAM BROWSE -----14:51:31
ENTER COMMAND ==>
                                     B1

ENTER TEST STREAM NAME:

  DDNAME      ==> TCADS

  APPLICATION ==>          (LEAVE APPLICATION, MEMBER,
  MEMBER      ==>          OR VERSION BLANK AND PRESS
  VERSION     ==> 001      ENTER FOR A SELECTION LIST)

HISTORY VIEWING OPTIONS:
ORIGINAL SCREENS ==> Y      (Y/N)
EXPECTED SCREENS ==> Y      (Y/N)
APPLIED RULES   ==> Y      (Y/N/O-ONLY)
DIFFERENCES    ==> Y      (Y/N/O-ONLY)
SIGNOFF DATA   ==> Y      (Y/N)

F1-HELP      F3-END      F4-RETURN
```

The default ddname, Application, and Version values appear; these can be changed.

If you know the test stream you want to browse, follow these steps:

1. Type the Application name, Member name, and other identifiers, if necessary
2. Optionally modify the History viewing options
3. Press Enter.

CA Verify for VTAM displays the Directory Information menu for that test stream.

If you don't know the test stream you want to browse, follow these steps:

1. Leave the Application and Member field blank.
2. Optionally, blank out other identifiers.
3. Press Enter.

CA Verify for VTAM displays the Test Stream Selection menu.

Select a Test Stream

The Test Stream Selection menu lists all the test streams for the specified ddname.

```

----- BROWSE: TEST STREAM SELECTION -----14:00:10
ENTER COMMAND ==>
FILE: TCADS                                     MULTI-

  _ CLIST      OPERATOR 001 01/02/1998 AJC      28   03/21/1998 LGC EQ
    CEMT INQUIRY OF ALL PROGRAMS AND FILES
s DEMO        DEMOPROG 001 03/22/1998 NGN       8
    CUSTOMER MAINTENANCE DEMO PROGRAM
  _ PAYROLL   DOCUMENT 001 02/01/1998          120
    ALL PAYROLL SCREENS FOR USER TRAINING
  _ PAYROLL   INQUIRY  001 01/16/1998 RSM     154  01/16/1998 NOT EQ
    TEST OF NEW INQUIRY MENU

  _ PAYROLL   UPDATE   002 01/28/1998          112
    TEST OF NEW UPDATE SCREEN
  _ QA        TEST1    003 01/29/1998 NGN    1022  02/29/1998 NOT EQ
    TEST1 IN CONVERSION FROM DOS TO MVS

  _ QA        TEST2    007 02/21/1998          724
    TEST2 IN CONVERSION FROM DOS TO MVS

  _ SYSTEMS  MIGRATE   008 02/21/1998 SAB     2380  03/14/1998 LGC EQ   M
    MIGRATION TEST FOR CICS 1.7 TO 2.1

  _ SYSTEMS  STRESS1   018 03/22/1998 JSN     1502
    STRESS TEST FOR CICS TEST REGION

  _ SYSTEMS  STRESS2   019 03/22/1998          1208

```

Your position in the list depends on your specifications on the Test Stream Browse menu.

- If both the Application and Member fields are blank, CA Verify for VTAM positions you at the first stream for the specified ddname.
- If you fill in a partial name, CA Verify for VTAM positions you accordingly. For example, if you specify PAY as the Member name and blank out the Version number, CA Verify for VTAM positions you just before the first test stream whose member name begins with 'PAY'.

See the second screen in the "Run Function" chapter for an explanation of the Test Stream Selection menu.

Type S to the left of the test stream you want to browse and press Enter. CA Verify for VTAM redisplay the Test Stream Browse menu with the Test Stream identifiers filled in. Specify the History viewing options and press Enter to display the Directory Information menu for the test stream.

Use the Up (PF7) and Down (PF8) commands to scroll through the Test Stream Selection list. To override the default, specify the number of lines or Maximum; for example, Down 25, Down Maximum.

Specify Browse Viewing Options

Complete the Test Stream Browse menu by specifying the Browse viewing options. Enter Y, N, or O.

If Record History was set to Y for the run that created this test stream, then original screens, rules (if available), and unequal rows will be included when you Browse.

Note: When you view input only test streams, use either Field or Hex format; do not use Display format.

When you have completed the Test Stream Browse menu, press Enter.

- If you have not specified a complete test stream name, CA Verify for VTAM displays the Test Stream Selection list.
- If you have specified a complete test stream name, CA Verify for VTAM displays the Directory Information menu for that test stream.

ORIGINAL SCREENS

Y, the default, displays the original logged screens which differ from the current screens, subject to your specifications for the Differences option. **Y** is valid only for test streams which have mismatch information recorded where the Record History option was **Y**. Enter **N** if you do not want to display the original screens.

EXPECTED SCREENS

Y, the default, displays the expected screens. The expected screen is the original screen with rules applied to it. **Y** is only valid if Record History was set to **Y** during the Run.

APPLIED RULES

Y, the default, lets you view a list of the rules that were applied to each original screen as it was processed. **Y** is only valid for test streams that have Record History set to **Y** during the Run. Enter **N** if you do not want to view the rules; type **O** if you only want to view the screens that have had rules applied to them.

DIFFERENCES

Y, the default, displays the unequal rows associated with the current screens. Enter **O** to display only those records for which CA Verify for VTAM detected a mismatch. **Y** and **O** are valid only for test streams that have mismatch information recorded where the Record History option was **Y**. Enter **N** if you don't want to display unequal row information.

SIGNOFF DATA

Y, the default, displays the information, if any, the operator supplied during the Run function when CA Verify for VTAM detected a mismatch. **Y** is valid only for test streams for which mismatch signoff information was recorded; for example, the Require Signoff Data option was **Y**. Enter **N** if you don't want to access this information.

Browse Directory Information

When you select a test stream, CA Verify for VTAM redisplay the Test Stream Browse panel with the test stream name fields completed. Press Enter to display the Browse: Directory Information panel that contains the directory information for the test stream you selected.

```

CCC.ORDERAPP.002 ---- BROWSE: DIRECTORY INFORMATION -----13:40:40
ENTER COMMAND ==>                                     B3

DESCRIPTION: CAROL'S COOKIES COMPANY DEMO PROGRAM

          LOG:      RUN:      EDIT:      TEST STREAM:      IN:  OUT:
INVOKED BY:                TOTAL SCREENS:      6    6
INVOKED ON: 06/02/1998 06/03/1998      AVERAGE BYTES:      46   315
START TIME: 13:23:04 08:34:50
DURATION: 00:02:02 00:00:00
SYSTEM: A04IC9NA A04IC9NA
STATUS:  NORMAL LOGICALLY EQUAL
TERMINAL: A60L2048
VSAM CI'S: 2

AVERAGE THINK TIME: 00:00:20.256
AVERAGE RESPONSE TIME: 00:00:00.013
MAXIMUM SCREEN SIZE: 24 BY 80
PROTECTION STATUS:
ORIGINATING TEST STREAM: CCC.ORDERAPP.001
OWNER:
CREATED BY FUNCTION: RUN

F1-HELP      F3-END      F4-RETURN

```

If you press Enter, CA Verify for VTAM displays:

- The Initial Terminal Status menu for a *single* terminal test stream
- The Terminal Selection menu for a *multiple* terminal test stream

If you type a record number in the Command field and press Enter, CA Verify for VTAM displays the record you selected.

CA Verify for VTAM provides directory information describing Log, Run, and Edit functions involving the test stream. If the Utilities were used to append, insert, or merge the test stream, the Edit heading will be replaced with the appropriate heading.

DESCRIPTION

The description associated with the test stream when it was logged. This description may have been updated by the Edit function or Update utility.

INVOKED BY

The ID of the user who initiated the function.

INVOKED ON

The date the test stream was logged, last run, or edited.

START TIME

The time the function was initiated.

DURATION

The duration of the Log function or the estimated duration of the Run function, based on total response time.

SYSTEM

The VTAM applid. For a test stream consisting of multiple sessions, 'MULTIPLE' will be displayed.

STATUS

For the Log function:

Normal

Incomplete:

CA Verify for VTAM could not log some screens because the data capture buffer overflowed or the data set became full

Ext:nnn:

The data stream was extended; nnn indicates the number of records that existed before the extension

For the Run function:

Equal:

The data streams produced by the application were physically equal to those logged

Logically Equal:

The output screens produced by the application were logically equal to those logged, but the data streams were not physically equal

Not Equal:

The output from the application was not the same as the output logged

TERMINAL

The terminal used to log the test stream. For a multiple terminal test stream, the number of terminals appears instead.

VSAM CI'S

The number of control intervals used to store the test stream.

AVERAGE THINK TIME

The average time which elapsed between an output screen and the next input from the terminal.

AVERAGE RESPONSE TIME

The average time which elapsed between terminal input and the next output screen.

MAXIMUM SCREEN SIZE

The largest screen size used in the test stream.

PROTECTION STATUS

The Test Stream Protection option specified when the test stream was logged.

ORIGINATING TEST STREAM

The source of this test stream. In other words, the test stream that was run which created this test stream.

OWNER

The person to whom this test stream belongs.

CREATED BY FUNCTION

The function that was used on the source test stream to create this test stream. Functions can be LOG, RUN, COPY, or RENAME.

Test Stream

The following fields are displayed in the Test Stream area.

TOTAL SCREENS IN: OUT:

The number of input and output screens in the test stream.

AVERAGE BYTES IN: OUT:

The average number of bytes in the input and output data streams.

Last Run

The following fields are displayed if the test stream was run.

EQUAL IN: OUT:

The number of physically or logically equal screens.

EQUIVALENT OUT:

The number of output screens which became logically equal through the definition of variable fields.

IGNORED OUT:

The number of unequal output screens which were ignored (option 6 on the Run Mismatch Options menu).

ACCEPTED OUT:

The number of unequal output screens which were accepted (option 7 on the Run Mismatch Options menu).

INSERTED IN: OUT:

The number of screens which were inserted (options 4 and 5 on the Run Mismatch Out-of-Synch Options menu).

DELETED IN: OUT:

The number of screens which were deleted (options 9 and 10 on the Run Mismatch Out-of-Synch Options menu).

CHANGED IN:

The number of input screens which were changed (option 8 on the Run Mismatch Options menu or a different buffer value when a Read Buffer is issued and the installation option READBUF=CURRENT is in effect).

NOT RUN IN: OUT:

The number of screens which were not run. The terminals associated with these screens were not selected when the test stream was run or the user terminated the run before they were processed.

Browse Terminal Information

When you type Enter on the Directory Information menu, CA Verify for VTAM displays:

- The Initial Terminal Status menu for a single terminal test stream
- The Terminal Selection menu for a multiple terminal test stream

The Initial Terminal Status menu is discussed next. See the [Select a Terminal](#) (see page 134) section for a discussion of the Terminal Selection menu.

Display the Initial Terminal Status

The Initial Terminal Status menu displays information for each terminal in the test stream.

```

CCC.ORDERAPP.001 ----- BROWSE: INITIAL TERMINAL STATUS -----12:36:51
ENTER COMMAND ==>                                             B6

TERMINAL: A60L2049

VIRTUAL TERMINAL
  ASSIGNMENT:

SCREEN SIZE: 24 BY 80                                DEVICE TYPE: LOGICAL UNIT
ALTERNATE: IN USE                                    DEVICE CHARS: C06D001033800000

FEATURES:

BIND: LOGMODE:      D4C32782                          LU TYPE:      02
    FM PROFILE:     03                                EXT STREAM:   00
    TS PROFILE:     03                                RESERVED:    00000000
    PLU PROTOCOL:   B1                                SIZES:       18500000
    SLU PROTOCOL:   90                                FLAGS:       7E00
    COM PROTOCOL:   3080                              CRYPTOGRAPHY: 09
    TS FIELDS:     000187F80000
    LOGON DATA:

F1-HELP      F3-END      F4-RETURN    F10-LEFT    F11-RIGHT

```

This menu displays information about a terminal used to log the test stream. Most of the terminal status information is determined by the system programmer when the network is defined.

If the Log function extended a test stream, the screens may be from multiple terminals. In this case, the original terminal status information is used for the entire test stream.

When you have finished browsing the terminal status information for a single terminal test stream, press Enter to display the Record Selection menu.

TERMINAL

The name of the terminal used to log the test stream.

VIRTUAL TERMINAL ASSIGNMENT

The virtual terminal (if any) assigned to the terminal when the test stream was logged or edited.

SCREEN SIZE

The default screen size.

ALTERNATE

The alternate screen size.

DEVICE TYPE

The type of terminal used during logging; for example, 3277, 3284, logical unit, etc.

DEVICE CHARS

Device characteristics; i.e., model number and physical device address.

FEATURES

Identifies the terminal as capable of supporting a 3270 extended data stream, if applicable.

BIND

The following fields describe the BIND request parameters.

Logmode

Logon mode name which specifies a set of session parameters

FM Profile

Function management profiles used

TS Profile

Transmission services profile used

PLU Protocol

Primary logical unit protocols

SLU Protocol

Secondary logical unit protocols

COM Protocol

Common logical unit protocols

TS Fields

Transmission Services Usage fields

Logon Data

Logon user data (if any) from the initial logon command

LU Type

Type of LU-LU session in terms of SNA protocols and options

Ext Stream

3270 extended data stream identifier

Reserved

Contents of reserved field

Sizes

Presentation space sizes

Flags

PLU and SLU flags

Cryptography

Cryptographic control

Select a Terminal

The Terminal Selection menu is illustrated next. This menu is displayed automatically whenever you browse a multi-terminal test stream.

```
SAMPLE.MULTTERM.001 ---- BROWSE: TERMINAL SELECTION -----14:08:56
ENTER COMMAND ==> BT

SELECT: "S" ORIGINAL TERMINAL SCREEN ALTERNATE VIRTUAL
INQUIRY: "I" TERMINAL TYPE SIZE SIZE SIZE TERMINAL

- A60L2048 3277 REMOTE 24 BY 80 24 BY 80
- A60L2049 3277 REMOTE 24 BY 80 24 BY 80
- A60L205A 3277 REMOTE 24 BY 80 24 BY 80
- A60L205B 3277 REMOTE 24 BY 80 24 BY 80
*** END OF TERMINALS ***

TYPE AN "S" TO SELECT TERMINAL FOR BROWSE TYPE AN "I" TO VIEW TERMINAL STATUS
F1-HELP F3-CONTINUE F4-RETURN F7-UP F8-DOWN
```

This menu lists all the terminals in the test stream. For each terminal, CA Verify for VTAM identifies its name, type, screen size, alternate size, and the virtual terminal (if any) assigned to that terminal.

Follow these steps:

1. Type **S** to the left of each terminal whose screens you want to browse. Then use the End (PF3) command to display the Record Selection menu.
2. Type **I** to the left of any terminal for which you want terminal status information. Then press Enter to display the Initial Terminal Status menu. When you are finished viewing the terminal status information, use the End (PF3) command to redisplay the Terminal Selection menu.
3. Use these commands as follows:

Assign

CA Verify for VTAM inserts **S** to the left of each terminal.

Reset

CA Verify for VTAM restores the initial screen setting with an underscore to the left of each terminal.

Cancel

CA Verify for VTAM cancels the browse and redisplay either the Test Stream Browse menu or the Test Stream Selection menu.

4. Use the Up (PF7) and Down (PF8) commands to scroll through the terminal list.

Browse Screens

If you select one or more terminals for browsing from the Terminal Selection menu or press Enter from the Initial Terminal Status menu (single terminal test stream only), CA Verify for VTAM displays the Record Selection menu. This menu lists the records in the test stream associated with all the terminals you selected.

```

CCC.ORDERAPP.001 ----- BROWSE: RECORD SELECTION -----12:40:4
2
ENTER COMMAND ==>                                     B7

   TERMINAL  APPLID   T/R TIME  OP  AID  VIEW  RECORD  ROW: 1 COL: 30
-   A55TG001  USS        00:01.144  EW
-   A55TG001  USS        00:20.455  RM  ENTER  2  SSOCIATES INTERNAT
-   A55TG001  USS        00:20.455  EW  3  EQUEST ACCEPTED AN
-   A55TG001  A04IC9NA   00:26.796  CON  4  EQUEST ACCEPTED AN
-   A55TG001  A04IC9NA   00:00.871  EW  5  NG MY REGION? (CIC
-   A55TG001  A04IC9NA   00:01.680  RM  CLEAR  6
-   A55TG001  A04IC9NA   00:00.000  EW  7
-   A55TG001  A04IC9NA   00:01.843  RM  ENTER  8
-   A55TG001  A04IC9NA   00:00.596  EW  9  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:01.235  RM  ENTER 10  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:00.001  EW 11  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:04.182  RM  ENTER 12  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:00.001  EW 13  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:01.703  RM  PF3   14  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:00.001  EW 15  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:00.814  RM  PF3   16  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:00.002  EW 17  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA   00:00.848  RM  PF3   18  CAROL'S COOKIES CO
TYPE AN "S" TO SELECT A RECORD
F1-HELP  F3-END  F4-RETURN  F7-UP  F8-DOWN  F9-FORMAT  F10-LEFT  F11-RIGHT

```

Follow these steps:

1. Type S to the left of the record you want to browse and press Enter.
2. Use the Prev (PF5) and Next (PF6) commands to display other records. See the chapter "Run Function", for examples of screens in Display, Field, and Hex format.

For each screen, CA Verify for VTAM identifies its:

Terminal:

The terminal name

Applid:

The VTAM applid

T/R Time:

The think time (for an input screen) or response time (for an output screen)

OP:

The operation:

W:

Write

EW:

Erase/write

EWA:

Erase/write alternate

RB:

Read buffer

RM:

Read modified

RMA:

Read modified all

EAU:

Erase all unprotected

WSF:

Write structured field

CPY:

Copy

RD:

Read

LUS:

Lustat

SIG:

Signal

DSC:

Disconnection

CON:

Connection

AID:

Attention ID used to generate input; for example, Enter, PF3

View:

Whether there are mismatches (M), rules applied (R), or both (M,R)

Record:

Record number

ROW COL:

Data from the record which appears in row 1

3. To position the display beginning with a specific record, type the record number in the Command field and press Enter.
4. Use the Left (PF10) and Right (PF11) commands to shift the display so you can view additional data from the record.
5. Use CA Verify for VTAM commands as follows:

Profile

Displays the Selection Profile so you can select which information should appear when CA Verify for VTAM redisplay the Record Selection menu. This menu is illustrated in the following screen.

Format

Changes the data display beneath the Row/Col to Display or Dump.

See the [Browse Commands](#) (see page 139) section later in this chapter for a detailed discussion of the Format command.

Change the Fields on the Record Selection Menu

Follow these steps:

1. Enter the Profile command on the Record Selection menu to display the Selection Profile menu.

```

CCC.ORDERAPP.001 ----- BROWSE: SELECTION PROFILE -----12:41:16
ENTER COMMAND ==>                                           B8

S  TERMINAL  (TERMINAL NAME)
S  APPLID    (APPLICATION ID)
S  T/R TIME  (THINK/RESPONSE TIME)
S  OP        (OPERATION)
-  LEN       (DATA LENGTH)
S  AID       (ATTENTION ID)
S  VIEW      (MISMATCH/RULES INDICATORS)
-  WCC       (WRITE CONTROL CHARACTER)
S  RECORD    (RECORD NUMBER)
-  CURSOR    (CURSOR ROW/COLUMN)
-  SIZE      (SCREEN SIZE)
-  DATE      (DATE LOGGED OR LAST CHANGED)
-  TIME      (TIME LOGGED OR LAST CHANGED)
-  RH        (REQUEST HEADER)
S  DATA     (DISPLAY OR DUMP FORMAT DATA)

TYPE AN "S" TO SELECT A FIELD FOR DISPLAY

F1-HELP      F3-END      F4-RETURN

```

This menu lists all the fields which can appear on the Record Selection menu. The currently displayed fields have an S next to them. In addition to the fields illustrated in the previous screen, you can select the following fields:

LEN:

Data length

WCC:

Write control character

Cursor:

Cursor's row and column position

Size:

Screen size

Date:

Date the record was logged or last changed by the Edit or Run functions

Time:

Time the record was logged or last changed by the Edit or Run functions

RH:

Request header

- When you have finished selecting fields, use the End (PF3) command to return to the Record Selection menu. The fields you have selected will now appear.

Browse Commands

Use the following commands to browse screens:

Command	Function
Up (PF7)	Scrolls up through a record.
Down (PF8)	Scrolls down through a record.
Left (PF10)	Scrolls left through a record.
Right (PF11)	Scrolls right through a record.
Prev (PF5)	Scrolls backward through a test stream.
Next (PF6)	Scrolls forward through a test stream.
Rotate (PF2)	Rotates between the original and current screens and mismatch information.
Enter	Scrolls forward through a test stream.
Format (PF9)	Shifts between Display, Field, and Hex formats.
Find	Scans a test stream for a character string.
Rfind	Repeats the last Find command.
Reset	Removes the Find or Change parameters specified on the menu.
End (PF3)	Ends the browse of a record and redisplay the Record Selection menu.

Most of these commands are discussed in detail in the sections which follow.

Scrolling

UP (PF7), Down (PF8), Left (PF10), Right (PF11)

Scrolls through the record for all three formats. You can enter these commands with a number to scroll a specified number of rows, columns, or segments; for example, Up 8, Left 20. You can also specify Maximum to scroll to the top, bottom, extreme left or right of the data; for example, Up Maximum.

Next (PF6), Prev (PF5)

Scrolls forward or backward through the test stream in accordance with the Browse viewing options you selected on the Test Stream Browse menu. The default is one record. You can also specify a number or Maximum with these commands. For example, if record 1 is displayed and you type Next 4, CA Verify for VTAM displays record 5. If you type Next Maximum, CA Verify for VTAM displays the last record.

You can also view a record by typing its record number in the Command field. If the record you specify cannot be viewed, the next or last viewable record will be displayed.

Rotate (PF2)

Scrolls within a record in accordance with the Browse viewing options you selected. For example, you can shift between the original output screen, the current output screen and unequal rows.

Enter

Scrolls within a record, like the Rotate command, and from the last viewable part of one record to the next viewable part of the next record in accordance with the Browse viewing options you selected.

Change Formats

Format (PF9)

Use the Format (PF9) command to shift between Display, Field, and Hex formats. Although parameters aren't required, you can also specify Format xxx, replacing xxx with one of the following:

Format (PF9) Command	Description
Display	Immediately shifts to Display format
Field	Immediately shifts to Field format
Hex	Immediately shifts to Hex format
NODisplay	Disables Display format
NOField	Disables Field format

Format (PF9) Command	Description
NOHex	Disables Hex format

For example, Format F displays the screen in Field format.

If the format being disabled is the one currently in use, CA Verify for VTAM automatically switches to the next available format. If the current format is the only one enabled, CA Verify for VTAM displays an error message and does not alter the display.

Note: Do *not* use Display format for input-only test streams.

Locate Data

Find/Rfind

Scans the test stream for a character string. You can specify these commands in all three display formats.

The Find command searches once for the specified value; the Rfind command repeats the previous Find command. Use the Rfind command to locate additional occurrences of the value *without* respecifying it.

When you enter the Find command, CA Verify for VTAM inserts the Find parameters on the menu as illustrated next.

```

CCC.ORDERAPP.001 ----- BROWSE: DISPLAY FORMAT -----14:56:22
ENTER COMMAND ==>                                     RECORD:    2

ROW      COLUMN      VALUE
==>     ==>         ==>
==>     ==>         ==>
                10      20      30      40      50      60      70      B5
-----+-----+-----+-----+-----+-----+-----+-----+
| DATE 01/04/98                CAROL'S COOKIES COMPANY                RELEASE 6.2
|
| TIME 12:49:58                MAIN MENU
|
| 4
|
| 8  ENTER OPTIONS:
|
|          1) PLACE AN ORDER
|          2) CHECK STATUS OF AN ORDER
|
| 12
|
| 16

```

The Find command has two parameters: Screen ID and Scan. You can specify values for one or both parameters. If you specify both values, both must be satisfied.

Screen ID

The value specified for this parameter applies to the screen as it appears in Display format. The Row and Column sub-parameters must be specified. CA Verify for VTAM will search for the value only in the specified row and column.

Scan

The value specified for this parameter applies to the screen in Field format. The Row and Column sub-parameters are optional. Specify a row without a column to limit the search to a single row; specify a column without a row to limit the search to a single column. Omit both row and column to search the entire screen for the value.

Although the Find and Rfind commands can be entered in Display format, the value specified in the Scan parameter applies to the screen in Field format.

Note: To find orders, specify the Find or Rfind command in Hex format, omitting the Scan parameter row and column.

If CA Verify for VTAM finds the string, it displays the record in which it was found; otherwise, the current record is redisplayed along with a message.

Specify the Value

Follow these rules when specifying the Screen ID and Scan values:

- A character value should *not* be specified in single quotes; for example, value.
- A hexadecimal value should be preceded by X and enclosed in single quotes; for example, X'value'.
- Embedded blanks are permitted within a character value; trailing blanks are ignored.

When to Use Screen ID or Scan

A difference exists between the data you view on your terminal and the data transmitted to and from your terminal for the following reasons:

- On *output*, successive transmissions can cumulatively build a terminal display.
- On *input*, only *modified* data is transmitted, not the entire display.

Although CA Verify for VTAM captures only the actual transmission, during the Browse, Run, and Edit functions the terminal display is reconstructed.

Use Screen ID to find a screen based on how it appears at a terminal (Display format). Use Scan to find a screen by the actual data transmitted to or from the terminal (Field format).

Remove Parameters

Reset

Removes the Find command parameters from the menu. These parameters are also removed when the Find command is successfully processed or when the parameters are blank.

Chapter 7: Edit Function

This chapter describes how to edit a test stream.

This section contains the following topics:

[Overview](#) (see page 145)

[Invoke the Edit Function](#) (see page 146)

[Edit Directory Information](#) (see page 148)

[Edit Terminal Information](#) (see page 149)

[Select Records](#) (see page 151)

[Edit Records](#) (see page 152)

[Edit Commands](#) (see page 155)

Overview

The Edit function lets you change input and output screens in a test stream. You can reduce your need for the Edit function by using rules the next time you upgrade your test stream or application to a new release.

Use the Edit function to:

- Change fields, such as dates, before running a test stream
- Create new test data. For example, you can copy a test stream and then revise the input data to create different test cases.

If you edit a test stream, CA Verify for VTAM also updates the log date and time stored with each record that is changed.

Note: How to edit a ruleset or rule is covered in the chapter "Rules Function".

Invoke the Edit Function

Follow these steps:

1. Type E on the Primary Options Menu.

CA Verify for VTAM displays the Test Stream Edit menu.

```
----- TEST STREAM EDIT -----13:59:34
ENTER COMMAND ==>
                                     E1

ENTER TEST STREAM NAME:
DDNAME      ==> TCADS
APPLICATION ==>
MEMBER      ==>
VERSION     ==> 001      (LEAVE APPLICATION, MEMBER,
                        OR VERSION BLANK AND PRESS
                        ENTER FOR A SELECTION LIST)

F1-HELP    F3-END    F4-RETURN
```

The default ddname and Version values appear and can be changed.

If you know the test stream you want to edit, follow these steps:

1. Type the Application and Member name and other identifiers, if necessary
2. Press Enter.

CA Verify for VTAM displays the Directory Information menu for that test stream.

If you don't know the test stream you want to edit, follow these steps:

1. Leave the Application and Member field blank.
2. Optionally, blank out other identifiers.
3. Press Enter.

CA Verify for VTAM displays the Test Stream Selection menu.

Select a Test Stream from the Test Stream Selection Menu

The Test Stream Selection menu lists all the test streams for the specified ddname.

Your position in the list depends on your specifications on the Test Stream Edit menu.

- If the Application field was blank, CA Verify for VTAM positions you at the first test stream for the specified ddname.
- If you left only the Member field blank, CA Verify for VTAM positions you just before the first test stream for the specified ddname and Application.
- If you keyed in a partial name, CA Verify for VTAM positions you accordingly. For example, if you specified PAY as the Member name without a Version number, CA Verify for VTAM positions you just before the first test stream whose member name begins with 'PAY'.

See the chapter "Browse Function" for a description of the Test Stream Selection menu.

Follow these steps:

1. Type S to the left of the test stream you want to edit and press Enter.
CA Verify for VTAM displays the Directory Information menu for that test stream.
2. Use the Up (PF7) and Down (PF8) commands to scroll through the Test Stream Selection list.

Note: The default scroll amount is 17 rows. To override the default, specify the number of lines or Maximum (for example, Down 25, Down Maximum).

Edit Directory Information

The Directory Information menu describes Log, Run, and Edit functions involving the test stream. If the Online Utilities were used to Append, Insert, or Merge the test stream, the Edit heading will be replaced with the appropriate heading.

```
CCC.ORDERAPP.002 ----- EDIT: DIRECTORY INFORMATION -----13:44:46
ENTER COMMAND ==>                                     E3

DESCRIPTION ==> CAROL'S COOKIES COMPANY DEMO PROGRAM
==>
==>

LOG:          RUN:          EDIT:          TEST STREAM:      IN:   OUT:
INVOKED BY:   TOTAL SCREENS:    6     6
INVOKED ON: 06/02/1998 06/03/1998      AVERAGE BYTES:  46   315
START TIME: 13:23:04 08:34:50
DURATION:   00:02:02 00:00:00
SYSTEM:    A04IC9NA A04IC9NA
STATUS:    NORMAL  LOGICALLY EQUAL
TERMINAL:  A60L2048
VSAM CI'S: 2
LAST RUN:   IN:   OUT:
EQUAL:      6     1
EQUIVALENT:
IGNORED:    0
ACCEPTED:   0
INSERTED:   0   0
DELETED:    0   0
CHANGED:    0
NOT RUN:    0   0
PROTECTION STATUS:
ORIGINATING TEST STREAM: CCC.ORDERAPP.001  OWNER:
CREATED BY FUNCTION: RUN

F1-HELP    F3-END    F4-RETURN
```

See the "Browse Function" chapter for a description of the Directory Information fields.

Update Directory Information

You can change the Description field by keying in a new description.

If you edit the test stream — for example, by deleting screens or changing fields, CA Verify for VTAM will update the Total Screens and Average Bytes fields when you save the edited test stream. If necessary, CA Verify for VTAM will also adjust the Duration, Average Think Time, and Average Response Time fields.

Continue the Edit Function

When you press Enter, CA Verify for VTAM displays:

- The Initial Terminal Status menu for a *single* terminal test stream
- The Terminal Selection menu for a *multiple* terminal test stream

If you type a record number in the Command field and press Enter, CA Verify for VTAM displays the record you selected—bypassing the Terminal Status and Terminal Selection panels.

Edit Terminal Information

The Initial Terminal Status menu displays information for each terminal in the test stream.

```

CCC.ORDERAPP.001 ----- EDIT: INITIAL TERMINAL STATUS -----12:41:41
ENTER COMMAND ==>                                             E6

TERMINAL ==> A55TG001

VIRTUAL TERMINAL
ASSIGNMENT ==>

SCREEN SIZE: 24 BY 80                                DEVICE TYPE: LOGICAL UNIT
ALTERNATE: IN USE                                    DEVICE CHARS: C06D000000800000

FEATURES: EXTENDED 3270 DATA STREAM

BIND: LOGMODE:      T3278M2E                          LU TYPE:      02
FM PROFILE: 03      EXT STREAM: 80
TS PROFILE: 03      RESERVED: 00000000
PLU PROTOCOL: B1    SIZES: 00000000
SLU PROTOCOL: 90    FLAGS: 0200
COM PROTOCOL: 3080  CRYPTOGRAPHY: 09
TS FIELDS: 000788888700
LOGON DATA:

F1-HELP      F3-END      F4-RETURN    F10-LEFT    F11-RIGHT

```

See the "Browse Function" chapter for a description of the fields.

Use the Enter key to display the Record Selection menu.

Two fields can be specified on this menu and are explained next.

Terminal Name

Change the terminal by overtyping the terminal name. The Record Selection menu and Field format displays will reference the old name until you save the edited test stream. For a multiple terminal test stream, the Terminal Selection menu will reference the new name if you redisplay that menu.

Virtual Terminal Assignment

Assign a virtual terminal to be used whenever the test stream is run by specifying a netname in this field. This assignment overrides installation and other specifications, such as running with real terminals or printers. Virtual terminal assignment applies only to VTAM virtual terminals and is ignored if you are using BTAM virtual terminals.

You can specify a generic netname; for example, NET===== . CA Verify for VTAM will then use any virtual terminal that fits the specification, such as NET00001, NET00002, and so on.

Select a Terminal

The Terminal Selection menu lists all the terminals in the test stream. See the "Browse Function" chapter for a description of this menu.

Follow these steps:

1. Type S to the left of each terminal whose screens you want to edit and use the End (PF3) command.

CA Verify for VTAM displays the Record Selection menu.

2. Type I to the left of any terminal for which you want terminal status information and press Enter.

CA Verify for VTAM displays the Initial Terminal Status menu, illustrated in the previous panel.

3. Use these commands:

Assign

CA Verify for VTAM inserts **S** to the left of each terminal.

Reset

CA Verify for VTAM restores the initial screen setting with an underscore to the left of each terminal.

Cancel

CA Verify for VTAM cancels the edit and redisplay either the Test Stream Edit menu or the Test Stream Selection menu.

Up (PF7)/Down (PF8)

Commands are used to scroll through the terminal list.

Select Records

The Record Selection menu lists the records in the test stream associated with all the terminals you selected and is automatically displayed whenever you select a multi-terminal test stream to browse.

```

CCC.ORDERAPP.001 ----- EDIT: RECORD SELECTION -----12:41:45
ENTER COMMAND ==>                                     E7

  TERMINAL  APPLID   T/R TIME  OP  AID  VIEW  RECORD  ROW: 1 COL: 30
-  A55TG001  USS        00:01.144  EW
-  A55TG001  USS        00:20.455  RM  ENTER  2  SSOCIATES INTERNAT
-  A55TG001  USS        00:20.455  EW  3  EQUEST ACCEPTED AN
-  A55TG001  A04IC9NA   00:26.796  CON  4  EQUEST ACCEPTED AN
-  A55TG001  A04IC9NA   00:00.871  EW  5  NG MY REGION? (CIC
-  A55TG001  A04IC9NA   00:01.680  RM  CLEAR  6
-  A55TG001  A04IC9NA   00:00.000  EW  7
-  A55TG001  A04IC9NA   00:01.843  RM  ENTER  8
-  A55TG001  A04IC9NA   00:00.596  EW  9  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:01.235  RM  ENTER 10  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:00.001  EW 11  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:04.182  RM  ENTER 12  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:00.001  EW 13  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:01.703  RM  PF3   14  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:00.001  EW 15  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:00.814  RM  PF3   16  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:00.002  EW 17  CAROL'S COOKIES CO
-  A55TG001  A04IC9NA   00:00.848  RM  PF3   18  CAROL'S COOKIES CO
TYPE AN "S" TO SELECT A RECORD
F1-HELP  F3-END  F4-RETURN  F7-UP  F8-DOWN  F9-FORMAT  F10-LEFT  F11-RIGHT

```

See the "Browse Function" chapter for a description of this menu and a list of the commands which you can type. See the "Browse Function" chapter for an explanation of the Selection Profile menu which you can use to change the fields displayed on the Record Selection menu.

Type S to the left of the record you want to edit and press Enter.

Screen Formats

The Edit function displays records in Field, Hex, and Display format. Field format is the default. The Edit function also displays Connection and Disconnection records. See the discussion of screen formats and Connection/Disconnection records in the chapter "Run Function" for more information.

Note: Do *not* use Display format for input only test streams.

Scroll through the Record

Use the Up (PF7), Down (PF8), Left (PF10), and Right (PF11) commands to display the entire record. The default scroll amounts for each screen format are described in the "Run Function" chapter.

Scroll through the Test Stream

In Display format, you can press Enter to scroll forward from one screen to another in the test stream. For example, if you select the first screen for editing, you can press Enter repeatedly to scroll forward through the entire test stream.

Use the Next (PF6) and Prev (PF5) commands to scroll to the next or previous record. You can specify a number with these commands. For example, if record 1 is displayed and you type Next 4, CA Verify for VTAM displays record 5.

Scroll directly to a record by typing its record number in the Command line. If the specified record cannot be displayed, CA Verify for VTAM will display the next or previous record which can be displayed.

Edit Records

You can type editing commands on any test stream record display. See the Edit Commands section in this chapter.

When you save a test stream which has been edited, CA Verify for VTAM updates the log date and time of each record which has been changed. The date and time are displayed when you view the record in Field format.

Change Screen Data

You can change the data transmitted to or from the terminal in Field or Hex formats. A sample screen in Field format is illustrated next.

Note: Use PF9 to rotate between the formats.

```

CCC.ORDERAPP.001 ----- EDIT: FIELD FORMAT -----12:42:14
ENTER COMMAND ==>                                         E4

TYPE:      OUTPUT                RH: 039040          RECORD NUMBER:    9
OPERATION: ERASE/WRITE           APPL: A04IC9NA    DATA LENGTH:    266
RESPONSE:  00:00:00.596         DATE: 11/03/1998  SCREEN SIZE:    24 BY 80
WCC: C2: NL/EM/CR PRINT CNTL,  TIME: 11:53:58.406  TERMINAL:      A55TG001
KEYBOARD RESTORE

ORDER  ROW  COL  ATTR  LENGTH  -----+-----+-----+-----+-----+
SBA    7   16          00000
IC                                           00000
FLD    1    1  PSH   00004  DATE
SF                                           PS   00008  11/03/98
FLD    1   29  PSH   00023  CAROL'S COOKIES COMPANY

FLD    1   63  PSH   00007  RELEASE
SF                                           PSM   00003  6.2
FLD    2    1  PSH   00004  TIME
SF                                           PS   00008  11:53:58
FLD    2   36  PSH   00009  MAIN MENU
FLD    7    1  PSH   00013  ENTER OPTION:
SF                                           UM   00000
FLD    7   17  PS    00001
FLD   10    9  PSH   00017  1) PLACE AN ORDER
FLD   12    9  PSH   00027  2) CHECK STATUS OF AN ORDER

```

The display is divided into segments determined by each order. For non-3270 terminal test streams, the Field and Hex display is divided into 40-byte segments.

Edit this screen as follows:

- Change the data under the ruler by overtyping it
- Change the length of the data by overtyping the Data Length field. CA Verify for VTAM will either truncate the data or pad it with blanks to the specified length.

The following rules apply:

- The row, column, or attribute of a field cannot be changed in Field format; use Hex format to make changes.
- Invalid 3270 characters cannot be changed in Field format; use Hex format to change them.
- Input screens which contain non-display (dark) fields and which were captured when the installation option DRKPROT=YES was in effect can be edited only in Field format.

A sample screen in Hex format appears next.

```

CCC.ORDERAPP.002 ----- EDIT: HEX FORMAT -----13:49:08
ENTER COMMAND ==>                                         E9

OFFSET  LENGTH  -----|-----|-----|-----|-----RECORD:    2
   0     00004  B G?
                   C1C6
                   217F

   4     00001
                   1
                   3

   5     00009      8DATE
                   1441FCCEC
                   100D84135

  14     00010   006/29/98
                   1FFF6FF6FF
                   D006129198

  24     00028   * 8CAROL'S COOKIES COMPANY
                   1451FCCDD7E4CDDDCCE4CDDDCDE
                   10CD831963D20366295203647158
F2-ROTATE F3-END F5-PRV F6-NXT F7-UP F8-DWN F9-FORMAT F10-LEFT F11-RIGHT
    
```

The display is divided into segments determined by each order. For non-3270 terminal test streams, the display is divided into 40-byte segments.

Edit this screen as follows:

- Change the data, including orders, by overtyping it
- Change the length of the data by overtyping the Length field. CA Verify for VTAM will either truncate the data or pad it with blanks to the specified length.
- Change invalid 3270 characters in either of the hex lines, but *not* in the character line

The following rules apply:

- The offset cannot be changed.
- Erased characters in the character line are replaced with blanks; erased characters in hex lines are restored to their original values.
- Changes in either hex line take precedence over changes in the character line, except when a character has been changed in the character line and its corresponding hex representation has been erased in one or both of the hex lines. In this case, the character change takes precedence.

- For a 3270 test stream, if you type an order or modify existing data so that it becomes an order, the existing field will be split at the new order when the screen is refreshed.
- Input screens which contain non-display (dark) fields and which were captured when the installation option DRKPROT=YES was in effect can only be edited in Field format.

Edit Commands

Use the following commands to edit screens:

Find

Scans a test stream for a character string.

Rfind

Repeats the last Find command.

Change

Scans a test stream for a character string and replaces it with a specified string.

Rchange

Repeats the last Change command.

Reset

Removes the Find or Change command parameters specified on the menu.

Delete

Removes a specified range of screens from a test stream or removes all screens associated with a terminal for a multiple terminal test stream.

Save

Saves the edited test stream. CA Verify for VTAM remains in edit mode.

End(PF3)

Saves the edited test stream and redisplay the Test Stream Edit or Test Stream Selection menu.

Return(PF4)

Saves the edited test stream and redisplay the Primary Options Menu.

Cancel

Cancels the edit, discards all changes, and redisplay the Test

Clear

Stream Edit or Test Stream Selection menu.

PA2

Redisplays the current menu. Any data you have keyed in is removed *without* being processed.

Locate Data

Find/Rfind

Scans the test stream for a character string. You can specify these commands in all three formats.

Note: Although the Find and Rfind commands can be typed in Display format, the value specified in the Scan parameter applies to the screen in Field format. Similarly, if the commands are typed in Field or Hex format, the value specified in the Screen ID parameter applies to the screen in Display format.

The Find command searches once for the specified value; the Rfind command repeats the previous Find command. Use the Rfind command to locate additional occurrences of the character string *without* respecifying it.

When you type the Find command, CA Verify for VTAM inserts the Find parameters on the menu as illustrated next.

```

CCC.ORDERAPP.001 ----- EDIT: FIELD FORMAT -----12:43:12
ENTER COMMAND ==>                                         E4

ROW      COLUMN      VALUE
==>     ==>         SCREEN ID ==>
==>     ==>         SCAN      ==>

TYPE:      OUTPUT      RH: 039040      RECORD NUMBER: 9
OPERATION: ERASE/WRITE  APPL: A04IC9NA  DATA LENGTH: 266
RESPONSE:  00:00:00.596  DATE: 11/03/1998  SCREEN SIZE: 24 BY 80
WCC: C2: NL/EM/CR PRINT CNTL, KEYBOARD RESTORE  TIME: 11:53:58.406  TERMINAL: A55TG001

ORDER ROW COL ATTR LENGTH -----|-----|-----|-----|
SBA  7  16      00000
IC   1   1      00000
FLD  1   1 PSH  00004 DATE
SF   1   1 PS  00008 11/03/98
FLD  1  29 PSH  00023 CAROL'S COOKIES COMPANY
FLD  1  63 PSH  00007 RELEASE
SF   1   1 PSM  00003 6.2
FLD  2   1 PSH  00004 TIME
SF   1   1 PS  00008 11:53:58
FLD  2  36 PSH  00009 MAIN MENU
FLD  7   1 PSH  00013 ENTER OPTION:
SF   1   1 UM  00000
    
```

The Find command has two parameters: Screen ID and Scan. You can specify values for one or both parameters. If you specify both values, both must be satisfied.

Screen ID

The value specified for this parameter applies to the screen as it appears in Display format. The Row and Column sub-parameters must be specified. CA Verify for VTAM will search for the value only in that row and column.

Scan

The value specified for this parameter applies to the screen in Field format. The Row and Column sub-parameters are optional. Specify a row without a column to limit the search to a single row; specify a column without a row to limit the search to a single column. Omit both row and column to search the entire screen.

Although the Find and Rfind commands can be typed in Display format, the value specified in the Scan parameter applies to the screen in Field format.

Note: To find orders, specify the Find and Rfind commands in Hex format, omitting the Scan parameter row and column.

If CA Verify for VTAM finds the string, it displays the record in which it was found; otherwise, the current record is redisplayed along with a message.

Specifying the Value

Follow these rules when specifying the Screen ID and Scan values:

- A character value should *not* be specified in single quotes; for example, value
- A hexadecimal value should be preceded by X and enclosed in single quotes; for example, X'value'
- Embedded blanks are permitted within a character value; trailing blanks are ignored.

When to Use Screen ID or Scan

A difference exists between the data you view on your terminal and the data transmitted between your terminal and CICS for the following reasons:

- On *output*, successive transmissions can cumulatively build a terminal display.
- On *input*, only *modified* data is transmitted, not the entire display.

Although CA Verify for VTAM captures only the actual transmission, during the Browse, Run, and Edit functions the terminal display is reconstructed.

Use Screen ID to find a screen based on how it appears at a terminal (Display format); use Scan to find a screen by the actual data transmitted to or from the terminal (Field format).

Locate and Change Data

Change/Rchange

Finds and changes data in a test stream. These commands can be typed in all three formats. The values specified in the Scan and Replace parameters apply to the screen in Field format. Similarly, if these commands are typed in Field or Hex format, the value specified in the Screen ID parameter applies to the screen in Display format.

The Change command searches for each occurrence of the specified value and replaces it. The Rchange command repeats the previous Change command for the next occurrence. Use the Rchange command to locate and change additional occurrences of the value *without* respecifying it.

You can also specify the Rfind command after the Change command to repeat the search *without* replacing the value.

You can optionally specify the range of records which CA Verify for VTAM should search.

If CA Verify for VTAM finds the value, it replaces it with the new value and displays the changed record; otherwise, it redisplay the current record along with a message.

If you expand a field, the location of subsequent 3270 fields will **not** be changed. Avoid destructive field overlap.

When you type the Change command, CA Verify for VTAM inserts the Change parameters on the menu as illustrated next.

```

CCC.ORDERAPP.001 ----- EDIT: FIELD FORMAT -----12:43:41
ENTER COMMAND ==>                                         E4

ROW      COLUMN      VALUE
==>     ==>         SCREEN ID ==>
==>     ==>         SCAN          ==>
==>     ==>         REPLACE       ==>

START WITH RECORD NUMBER ==> 000009 STOP AFTER RECORD NUMBER ==> 000009
                                RH: 039040 RECORD NUMBER: 9
TYPE:      OUTPUT          APPL: A04IC9NA DATA LENGTH: 266
OPERATION: ERASE/WRITE     DATE: 11/03/1998 SCREEN SIZE: 24 BY 80
RESPONSE:  00:00:00.596   TIME: 11:53:58.406  TERMINAL: A55TG001
WCC: C2: NL/EM/CR PRINT CNTL, KEYBOARD RESTORE
ORDER ROW COL ATTR LENGTH -----|-----|-----|-----|
SBA  7  16          00000
IC   1          00000
FLD  1  1  PSH    00004 DATE
SF   1          00008 11/03/98
FLD  1 29  PSH    00023 CAROL'S COOKIES COMPANY
FLD  1 63  PSH    00007 RELEASE
SF   1          00003 6.2
FLD  2  1  PSH    00004 TIME
SF   2          00008 11:53:58
FLD  2 36  PSH    00009 MAIN MENU
    
```

The Change command has five parameters: Screen ID, Scan, Replace, Start With Record Number, and Stop After Record Number. The Scan and Replace parameters must be specified; other parameters are optional.

Screen ID

If specified, CA Verify for VTAM checks the screen as it appears in Display format before processing the Scan and Replace parameters. The Row and Column sub-parameters *must* be specified. The change will apply only to screens which contain the Screen ID value specified in the row and column.

Usually this parameter is specified with a record range (see the Start With Record Number and Stop After Record Number parameters next).

When processing the Screen ID parameter, CA Verify for VTAM treats an attribute or null on the screen as a blank.

Scan

The value specified for this parameter applies to the screen in Field format. You can scan only for data because attributes and nulls will not be changed. (Use Hex format to change attributes and orders.)

The Row and Column sub-parameters are optional. Specify a row without a column to limit the search to a single row; specify a column without a row to limit the search to a single column. Omit both row and column to search the entire screen.

To change orders, the AID, WCC, or cursor position, specify the Change or Rchange command in Hex format, omitting the Scan parameter row and column. Be careful when using these commands in Hex format to avoid changing orders unintentionally.

Replace

Specify the value to replace the Scan value. The number of characters may be the same, greater than, or less than the number of characters in the Scan value. Data in the field following the Scan value will be shifted left or right if the Replace value is shorter or longer than the Scan value.

Start with Record Number

Specify either or both of these parameters to expand the

Stop after Record Number

Is the current record. Use these parameters to make global changes.

See the earlier discussion of the Find/Rfind commands for an explanation of how to specify the value and when to specify Screen ID and Scan.

Remove Parameters

Reset

Removes the Find and Change command parameters from the menu. These parameters are also removed when these commands are successfully processed or when the parameters are blank.

Delete Records and Terminals

Delete

Deletes the displayed record or all the records for a terminal. This command can be typed in all three display formats.

Delete Records

Specify the Delete command to delete the displayed record.

Delete multiple records

Type Delete nn, where nn represents the number of records to be deleted. For example, if you type Delete 3, CA Verify for VTAM will delete the displayed record and the next two records.

For a multiple terminal test stream, the deleted records will be from the same terminal as the displayed record; records from other terminals will be ignored.

Because most applications alternately receive input from the terminal and send output to the terminal, you should usually delete an even number of screens. CA Verify for VTAM will display a warning message on the Confirm Delete menu, illustrated in the following panel, if the deletion will result in:

- Two consecutive input screens
- Two consecutive output screens
- An output screen which is the first record for a single terminal test stream or the first record for a terminal in a multiple terminal test stream

Deleting Terminals and All Records

To delete *all* the records for a terminal in a multiple terminal test stream, type the Delete command on the Initial Terminal Status menu. CA Verify for VTAM will also delete the initial terminal status information.

You cannot delete all the records for:

- A single terminal test stream
- The only remaining terminal in a multiple terminal test stream. Instead, use the Utilities Delete function to delete the test stream.

Confirming the Deletion

When you specify the Delete command, CA Verify for VTAM displays the Confirm Delete menu.

```
----- EDIT: CONFIRM DELETE -----10:15:30
ENTER COMMAND ==> ED

FIRST RECORD TO BE DELETED:      2
LAST RECORD TO BE DELETED:      2
NUMBER OF RECORDS TO BE DELETED: 1

NOTE: THE TEST STREAM WILL CONTAIN TWO CONSECUTIVE INPUT SCREENS FROM THE SAME
TERMINAL. THIS MAY CAUSE SYNCHRONIZATION ERRORS IN THE RUN FUNCTION. THE PRIOR
INPUT SCREEN FROM THIS TERMINAL SHOULD ALSO BE DELETED.

F1-HELP    F3-END    F4-RETURN
```

Note: CA Verify for VTAM warns you if the deletion might create a synchronization error.

Press Enter to confirm the deletion or use the End (PF3) command to cancel it.

Chapter 8: Rules Function

This chapter explains how to access the Rules function, define rulesets, and specify rules *before* running a test stream. See the "Run Function" chapter for detailed instructions on using rulesets *while* running a test stream.

You can also control what is logged by using logging rules. See the chapter "Log Function" for details on using this type of rule.

See the *Rules Primer* for a tutorial that focuses on using the Rules function.

This section contains the following topics:

[Overview](#) (see page 163)

[Use the Rules Function Panels](#) (see page 166)

[Invoke the Rules Function](#) (see page 168)

[Browse Through Rulesets and Rules](#) (see page 169)

[Create a Ruleset](#) (see page 173)

[Add Rules to a Ruleset](#) (see page 177)

[Maintain a Ruleset](#) (see page 209)

Overview

CA Verify for VTAM is used to identify changes in a test stream of pre-recorded 3270 activities. This test stream can be used over and over again against a new software release for both regression and volume testing. However, instead of using the RUN Mismatch panel to pinpoint these changes during runtime, you can use the *Rules* function to identify known changes before running a test stream and specify, in advance, how CA Verify for VTAM is to handle each change.

To identify changes within a test stream, you must first tell CA Verify for VTAM how to recognize the screens that need changes. This is done by creating rules that define what the changes are. This collection of rules is called a *ruleset*.

There are three types of rulesets: test stream, system, and application. How a rule is applied when the test stream is run depends on the type of ruleset that the rule belongs to.

- In a *test stream ruleset*, rules are applied to all screens in the test stream.
- In a *system ruleset*, rules are applied to all screens in all test streams in the system.
- In an *application ruleset*, rules are applied to all test streams in the application.

You can find more detailed information on the different types of rulesets in the section, [Create a Ruleset](#), (see page 173) later in this chapter.

All of the rulesets in the data set are listed on the Ruleset Selection Menu. From this menu, you can use the Ruleset Browse feature to examine the summary information about the rules within a ruleset. This information lists all of a ruleset's rules, and summarizes the actions each rule performs.

How is the Rules Function Used?

There are two situations in which rules are used:

- During Logging

Logging rules are used to control what is logged. Using the Rules function, you can create lists of user IDs, terminals, or transaction IDs that can be included or excluded while logging. For details on this Rules function capability, see the chapter "Log Function".

- During a Run

Run rules are used to manipulate a test stream for known application changes. You can define these rules during a run or before a run begins.

A ruleset is run with a particular test stream to dynamically identify specified changes during runtime—allowing your test stream to run more smoothly and efficiently. For example, a common change within an application is to upgrade its release number. Using a ruleset, you can identify this change once, tell CA Verify for VTAM how to handle the release number discrepancy whenever it is encountered, and then forget about it. CA Verify for VTAM will then interrupt your test stream only for true exceptions.

Procedure for Using the Rules Function

Follow these steps:

1. Review the expected application changes.
2. Determine which of these changes will produce screen changes in your existing test streams (for example, a field was added, a field was moved, a title has been changed, a new screen was added, or an existing screen was removed).
3. Establish a ruleset. This ruleset notifies CA Verify for VTAM that you are expecting certain changes and specifies how to handle them.

To establish a ruleset, you must:

- a. Invoke the Rules function.
- b. Select Add a Ruleset to create a new ruleset.
- c. Add rules to the ruleset.

- d. Add rule actions to the rules. Recognition criteria and modeling are optional.

While defining rules, calculating the exact coordinates of a field within a panel can be very time consuming. You can allow CA Verify for VTAM to automate this calculation for you by using the modeling feature of the Rules function. The modeling feature can be used wherever rule actions are specified. This feature takes the guesswork out of the placement of the fields on a panel by allowing CA Verify for VTAM to fill in the placement values for you.

4. Run the test stream. CA Verify for VTAM will recognize which screens need to be changed, automatically make the substitutions, and add or delete fields as specified in the rules without interrupting the run.

Create Rules for Existing Test Streams

If you have an existing test stream that was created with CA Verify for VTAM Release 1.2 or earlier, you can create a base ruleset for it by either:

- Running the test stream with the current release
- Using an online or batch utility copy.

The current release will automatically convert any variables into their corresponding rules and create a base ruleset containing the converted variables, which you can then modify further at your convenience. Complete migration details are in the section [Convert Variables to Rules](#) (see page 76) in the chapter "Run Function".

Understand the Terminology

As with most things, the Rules function has its own terminology that you must understand before you can use the function to its full capability. Here is a list of terms, with their explanations, that you will encounter while using the Rules function. Each term is also explained at the point where you would use it.

Expected Screen

The model screen with the rule actions applied.

Logical Screen

A collection of test stream records (each reflecting a physical I/O) that together form the screen image seen by the end user.

Model Screen

A copy of the logical screen that is used to specify field changes.

Recognition Criteria

A set of identifiers that tells CA Verify for VTAM how to recognize a logical screen in order to make changes to it. Recognition criteria can be generic (so it applies to many logical screens), or very specific (so it applies to only one logical screen).

There are two types of recognition criteria:

Field:

The rule looks for a specific field or fields on a screen. Whenever the field is found, the rule is applied.

Screen:

The rule applies only to a specific screen.

Rule

A rule is a set of recognition criteria and rule actions.

Rule Action

An instruction for manipulating a field on a screen or which screens to log.

Ruleset

A set of rules detailing how to handle screens during a run or during a logging session. These rules may contain Recognition Criteria that define, to CA Verify for VTAM, which screens these rules should take action on.

Use the Rules Function Panels

There are two types of panels within the Rules function—menus and data entry screens.

- When using a Rules function menu, make your selection as you would when using any other menu. Any rules-specific functions are discussed with the appropriate menu.
- When using Rules function data entry screens, use one of the following methods to complete it:
 1. Tab to the input field and type the value directly into the field.
 2. Use the modeling feature to let CA Verify for VTAM fill in the values for you. How to use the modeling feature is explained in the section, [Use the Modeling Feature](#) (see page 184).

When you are finished entering data, you can take one of these actions:

1. Press Enter to add the rule action you have just defined.
2. Press PF3 (End) to leave the panel without making any changes.

Commands

Use the Caps On/Off command to translate lowercase characters to uppercase characters for screen IDs, value fields, and description fields.

- Caps On, the default, translates characters to uppercase.
- Caps Off ignores translation and uses the capitalization of the characters that appears on the panel.

Common Field Explanations

Fields that appear on many data entry panels are explained next.

RULESET NAME

Identifies the ruleset being defined.

TEST STREAM NAME

Identifies the test stream to which these rules are to be applied. The names of the ruleset and test stream must match.

RULE NAME

The name of this rule.

ROW

Type the number of the row that contains the value to be used. A valid value is any two-digit number beginning with 01 (referring to the first row).

COL

Type the number of the column that contains the value to be used. A valid value is any three-digit number beginning with 001 (referring to the first column).

LEN

Type the length of the value. Valid values are 1 to 999.

Invoke the Rules Function

Follow these steps:

1. Type M on the Primary Options Menu.

CA Verify for VTAM then displays the Maintain Rules menu. A sample menu is shown next.

```

----- MAINTAIN RULES -----12:05:38
ENTER COMMAND ==>

  A  ADD A RULESET           C  COPY A RULESET
  B  BROWSE A RULESET        D  DELETE A RULESET
  E  EDIT A RULESET          R  RENAME A RULESET

RULESET NAME:

DDNAME   ==> TCADS
APPLICATION ==> ccc           (LEAVE APPLICATION, MEMBER,
MEMBER    ==> orderapp        OR VERSION BLANK AND PRESS
VERSION   ==> 001             ENTER FOR A SELECTION LIST)

F1-HELP   F3-END   F4-RETURN
    
```

2. In the RULESET NAME: area, type the name of the ruleset you want to create or display. Detailed instructions on how to name a ruleset are in the section, [Name the Ruleset](#) (see page 174) in the chapter "Rules Function".
3. Indicate which rules activity you want to perform by specifying one of the following letters:

- A**
Add a Ruleset
- B**
Browse a Ruleset
- E**
Edit a Ruleset
- C**
Copy a Ruleset or Rule

D

Delete a Ruleset

R

Rename a Ruleset

4. Press Enter.

CA Verify for VTAM displays the menu for the activity you specified.

Note: If you do not specify a letter, pressing Enter will display a list of existing rulesets.

Browse Through Rulesets and Rules

Follow these steps:

1. Type B on the Maintain Rules menu.

CA Verify for VTAM displays the Browse: Ruleset Selection menu shown next.

```

----- BROWSE: RULESET SELECTION -----13:04:
05
ENTER COMMAND ==>
FILE: TCADS
S-SELECT

          --CREATED-----BY--- --UPDATED-----BY--- RULES  ITEM
S
_ A      A      001  09/02/1997
          A
_ B      B      001  09/02/1997
          A DIFFERENT APPLICATION
          A DIFFERENT SET OF RULES TO TRY
_ CCCORDER REL63 001  09/04/1997
          CAROL'S COOKIES COMPANY
          CONVERSION FROM REL 6.3 TO REL 7.0
_ DADS34 #RULESET 001  09/02/1997
          APPLICATION RULESET FOR DADS CONVERSION 3.4 TO 3.5
_ DADS34 SAMP1  001  09/02/1997
          SAMPLE RECOGNITION/CHANGE TRICK:
          IF A FIELD HAS A VALUE OF 4, CHANGE IT TO A 5.
_ DADS34 SAMP2  001  09/02/1997
          ADD A GLOBAL RULE
          IN A TEST STREAM.
F1-HELP      F3-END      F4-RETURN    F7-UP      F8-DOWN

```

This menu lists all defined rulesets in alphabetical order by ruleset name. The information shown for each ruleset includes: application, member, version, date the ruleset was created and who it was created by, the date it was updated and who it was updated by, the number of rules the ruleset contains, and the number of rule actions. The ruleset's complete description is displayed on the line(s) beneath the ruleset name.

Invoke the Browse Feature

To browse through the rules in a ruleset, type **S** to the left of the ruleset name on the Browse: Ruleset Selection menu. The Rules—Summary (Browse) panel will be displayed. A sample panel is shown next.

```
-----BROWSE RULES - SUMMARY -----12:53:26
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
LINE  1 TO 14 OF 25        TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

S-BROWSE  P-PREVIEW
OBJECT    TYPE ROW  COL LEN OP  VALUE FROM MODEL SCREEN/DESCRIPTION
RULESET   T/S
RULE
FLD-RECOG      1   30  23 EQ  CAROL'S COOKIES COMPANY_____
CHANGED OUT    1   74   1    3_____
VARIABLE OUT    1    7   8    02/11/98_____
VARIABLE OUT    2    7   8    14:06:31_____

F1-HELP  FF3-END  F4-RETURN  F7-UP  F8-DOWN
```

For a description of the RULESET NAME, MODEL NAME, and RULE NAME fields, see the section, [Use the Rules Function Panels](#). (see page 166)

OBJECT

This column lists the rules within this ruleset and the rule actions within each rule. Values that can appear in the OBJECT column are:

RULESET

Ruleset you are viewing

RULE

A rule within this ruleset

FLD-RECOG

Field recognition criteria

SCR-RECOG

Screen recognition criteria

MOVED

Moved field

NEW

New field

CHANGED

Changed field

VARIABLE

Variable field

DELETED

Removed field

AID KEY

Change in use of a PF key

CURSOR

Change in cursor position

WCC

Change in the Write Control Character

DEL-SCRN

Screen removed

INS-SCRN

Test stream inserted

DATAGEN

Field that includes data manipulation

USERID

User IDs being logged

TRANID

Transaction IDs being logged

TERMID

Terminal IDs being logged

CUT

Data to be copied from one screen and pasted into another

PASTE

Cut data pasted into field

TYPE

Indicates what type of ruleset or rule this is. Valid values are:

T/S

A test stream ruleset

APPL

An application ruleset

SYST

A system ruleset

INCL/EXCL

The rule action contains a list of items to be included or excluded while logging

OUT

The rule action applies to an output screen

IN

The rule action applies to an input screen

The column values for ROW, COL, LEN, OP and VALUE are taken from the panel where that particular ruleset, rule, or rule action was defined.

From this panel you can:

- Select an entry to see the details by typing S next to the entry and pressing Enter.
- Preview a rule by typing P next to the rule entry and pressing Enter.

Note: Only rules and rule actions can be previewed.

Select an Entry

When you select either a ruleset, rule, or rule action, details about the item you have selected are displayed.

Ruleset

Displays the Browse: Ruleset Directory panel. This panel contains the name of the ruleset, its description, and statistics about it (such as the date it was created and the protection status it has been assigned).

Rule

Displays the Browse Rules—Rule Name panel. This panel contains the name of the ruleset that this rule belongs to, the name of the rule, and its description.

Rule action (like FLD-RECOG, MOVE, or NEW)

Displays the completed data entry screen for the rule action you have selected.

All screens are display-only. To change any of the information, you must return to the Maintain Rules menu (press PF3 until this menu is displayed) and then type E (Edit) on the command line.

Preview a Rule

Use Preview to display what a screen would look like if all of the rule actions in a rule were applied.

Rules summary status messages may appear when you do a preview. See the section, [Rules Summary Status Messages](#) (see page 103) in the chapter "Run Function" for a list of messages.

Create a Ruleset

There are three types of rulesets: test stream, application, and system. A test stream can be run with more than one type of ruleset. CA Verify for VTAM will try to apply all of the rules from all of the rulesets and will inform you if any conflicts occur.

Note: There is a hierarchy in applying rulesets. During logging, system rulesets are applied first, application next, and test stream rulesets last. During a run, test stream rulesets are applied first, application next, and system rulesets last.

- A *test stream ruleset* is applied only to the test stream whose name matches the ruleset name.

A test stream ruleset is the most specific. Use it to identify very specific changes for a test stream, such as fields that have moved their position on a screen.

- An *application ruleset* is applied only to those test streams whose application name matches the application name of the ruleset.

An application ruleset is the next most specific. It is most often used for screens that are common within an application, such as the application main menu. By creating an application-level ruleset, changes to the main menu can be identified in one ruleset, but applied to more than one test stream (for example, all test streams whose application node name matches the node name of the application ruleset).

- A *system ruleset* is applied to all test streams in the system. Only one system ruleset can be specified.

A system ruleset is the least specific. Use it to apply a change to all screens across all applications.

The type of ruleset you create is determined by how it is named; see the section [Name the Ruleset](#) (see page 174) for details.

The procedure for creating any type of ruleset is explained in the following table.

Task	Description	Panel Used
1	Name the ruleset	Maintain Rules menu
2	Add a ruleset description	Add Rules—Ruleset Description panel
3	Add rules to the ruleset	Begins with the Add Rules—Rule Actions menu

Name the Ruleset

The first step in creating a ruleset is to specify a name for it. The ruleset's name depends on the type of ruleset it is:

- For a test stream ruleset, the ruleset's name must be the same as the name of the test stream it will be run against.
- For a system ruleset, the ruleset's name must be:
ddname.SYSTEM.#RULESET.001

Follow these steps:

1. Specify the appropriate *ddname*; the rest of the name must be specified as shown.
 - For an application ruleset, the ruleset's name must be:
ddname.application.#RULESET.001
2. Specify the appropriate *ddname* and *application*; the rest of the name must be specified as shown.

All ruleset names consist of the following four parts:

DDNAME

Must match the DDname in your startup JCL. A DDname can be one to eight characters long, and can be any combination of letters, numbers, or national characters. The first character cannot be a number.

APPLICATION

Must match the application node in the test stream name. An application can be one to eight characters long, and can be any combination of letters, numbers, or national characters. The first character cannot be a number.

MEMBER

Must match the member node in the test stream name. A member can be one to eight characters long, and can be any combination of letters, numbers, or national characters. The first character cannot be a number.

VERSION

Must match the version used in the test stream name. Specify a number from one to three digits long.

The name of the ruleset is specified on the Maintain Rules menu in the RULESET NAME: section. (A sample menu appears in the section [Invoke the Rules Function](#) (see page 168).).

3. After typing the ruleset name, press Enter to display the Add Rules—Ruleset Description panel where you can add a description of this ruleset.

Note: If you do not supply the application, member, or version pieces of the name, the Ruleset Selection menu will be displayed when you press Enter; see the earlier section, [Browse Through Rulesets and Rules](#) (see page 169), for details.

Add a Ruleset Description

Ruleset descriptions are added from the Add Rules—Ruleset Description panel.

Follow these steps:

1. Type A and press Enter on the Maintain Rules menu.

A sample Add Rules—Ruleset Description panel is shown next.

```
-----ADD RULES - RULESET DESCRIPTION-----07:24:02
ENTER COMMAND ==>
RULESET NAME: TCADS.CCC.ORDERAPP.001
DESCRIPTION ==>
              ==>
              ==>
RULESET PROTECTION ==>          (R-READ W-WRITE P-PRINT)
F1-HELP      F3-END      F4-RETURN
```

2. Type a description of this ruleset in the DESCRIPTION field. The description can be up to three lines long and should be as informative as possible.

Note: If this ruleset name matches the name of an existing test steam, the test stream description will automatically be copied into the ruleset description. You may leave it or overtype the description with a new one.

Protect a Ruleset

You can also add protection for a ruleset from the Add Rules—Ruleset Description panel by specifying protection options in the RULESET PROTECTION field. Valid options are:

R

Read. The ruleset cannot be browsed, edited, run, appended to, inserted into, or merged into another ruleset by anyone *except* its owner or a security administrator. If the ruleset is copied or renamed, read protection is extended to the new ruleset.

W

Write. The ruleset cannot be extended, edited, renamed, deleted, appended to, inserted or merged into another ruleset, nor can its directory be updated, by anyone *except* its owner or a security administrator.

P

Print. The ruleset cannot be printed.

You can use any combination of options (for example, RW, WP, RWP).

Add Rules to a Ruleset

Rules define what the changes are within an application. As explained previously, a collection of rules is called a ruleset. There are two ways you can invoke a rule:

SCREEN RECOGNITION

Identifies a specific screen that this rule applies to. This type of rule applies changes only to a single specific screen (used when only *one* screen changes). You can have only one Screen Recognition criterion in a rule, but multiple rule actions can be defined for that single screen.

FIELD RECOGNITION

Specifies criteria that a screen must meet before the rule will be applied. This type of rule applies changes only to screens that meet the specified recognition criteria. Field recognition rules are useful when one panel occurs multiple times within a test stream. This type of rule allows you to specify a change once, and then CA Verify for VTAM will apply the change to all screens that meet the field recognition criteria.

To add a rule to a ruleset, do the following tasks:

1. Specify a name for the rule.
2. Give the rule a description (optional).
3. Identify when this rule should be applied (to a specific screen or to multiple screens based on field recognition criteria). A model screen can be designated at this time.
4. Specify the rule actions.

All tasks are performed from the Add Rules—Rule Actions panel.

This section explains how to name a rule and specify rule actions. How to locate and select a model screen is covered in the section, [Select and Use Model Screens](#) (see page 179) in the chapter "Rules Function".

Name the Rule

Follow these steps:

1. Type A on the Maintain Rules menu.
2. Type the rule name and description in the RULE NAME and DESCRIPTION fields on the Add Rules—Rule Actions panel.
3. When you are finished entering information, press Enter and you will be prompted to add a rule action.

The Add Rules—Rule Actions panel is displayed as shown next:

```
-----ADD RULES - RULE ACTIONS-----
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

DESCRIPTION ==>
              ==>

      1 FIELD RECOGNITION          11 GENERATE FIELD VALUE
      2 SCREEN RECOGNITION        12 INSERT SCREENS
      3 VARIABLE FIELD            13 DELETE SCREENS
      4 DELETE FIELD              14 CUT SCREEN FIELD
      5 MOVE FIELD                15 PASTE SCREEN FIELD
      6 CHANGE FIELD VALUE        20 USERID LOGGING
      7 NEW FIELD                 21 TERMINAL ID LOGGING
      8 CHANGE AID KEY            22 APPLICATION ID LOGGING
      9 CHANGE CURSOR LOCATION
     10 CHANGE WCC VALUES

F1-HELP      F2-PREVIEW      F3-END      F4-RETURN      F9-SELECT
```

RULE NAME

When you first enter this screen, a default rule name is given: RULnnnnn, where *nnnnn* is a series of numbers starting with 00001. You can either use the default name, or overtype the name with your own descriptive name. Rule names can be up to eight characters long, and can be any combination of letters and numbers.

DESCRIPTION (optional)

Type a description of the rule, up to two lines in length. The description serves as an explanation of what this rule does, so make it as informative as possible.

Now you are ready to select a model screen and specify the kinds of changes this rule will identify. Selecting a model screen is optional; the next section contains instructions on how to select a model screen.

Select and Use Model Screens

One of the most difficult tasks when specifying changes is figuring out the exact coordinates of the field being changed. The modeling feature lets you easily calculate the exact coordinates of a field within a panel by pointing to the field on a model panel and letting CA Verify for VTAM fill in the coordinates on the data entry panel. This feature takes the guesswork out of the placement of the fields on a panel by allowing CA Verify for VTAM to fill in the placement values for you.

A *model screen* is a physical representation of the screen being changed. It is used while specifying rule actions to help identify *what* fields are being changed and *how* they are being changed. Model screens are selected from the test stream that the ruleset is associated with. The model screen and the test stream automatically become associated by their matching names. Only one model screen can be associated with each rule. However, multiple rules can be created within a ruleset, each with their own model screen.

The collection of test stream records, both input and output, that together form the screen image seen by the end user and which is used to create the model screen, is called a *logical screen*.

Specify a Model Test Stream

The model test stream that you will use depends on the type of ruleset it will be used with.

- For a test stream ruleset, the test stream is used as the model (the default). Here, the model test stream will have the same name as the test stream ruleset.
- For a system ruleset, you must create a model test stream with this name:
ddname.SYSTEM.#TSTREAM.001
ddname must match the DDname used in the system ruleset.
- For an application ruleset, you must create a model test stream with this name:
ddname.application.#TSTREAM.001
ddname and *application* must match the DDname and application node used in the application ruleset.

The use of model test streams and model screens is optional. A model screen can be selected at any time during the rule creation process. If a model has not been selected at the time you want to use it, you will be prompted to select a model screen to use.

The next section explains how to locate and select a model screen. Once you have specified a model test stream and selected a model screen, you are ready to use the modeling feature as explained in the section [Use the Modeling Feature](#) (see page 184) in the chapter "Rules Function".

Locate and Select the Model Screen

The first step in selecting a model screen is locating the logical screen that contains the fields being changed. All of the logical screens within a test stream are listed in the Rules—Record Selection panel shown next. To display this panel, press PF9 (Select) from the Add Rules—Rule Actions panel or from any of the individual rule action panels.

```

CCC.ORDERAPP.001 ----- BROWSE: RECORD SELECTION -----12:40:
42
ENTER COMMAND ==>                                     B7

   TERMINAL  APPLID   T/R TIME   OP   AID   VIEW  RECORD  ROW: 1 COL: 30
-   A55TG001  USS         00:01.144  EW                   1  SSOCIATES INTERNAT
-   A55TG001  USS         00:20.455  RM   ENTER           2  SSOCIATES INTERNAT
-   A55TG001  USS         00:20.455  EW                   3  EQUEST ACCEPTED AN
-   A55TG001  A04IC9NA    00:26.796  CON                   4  EQUEST ACCEPTED AN
-   A55TG001  A04IC9NA    00:00.871  EW                   5  NG MY REGION? (CIC
-   A55TG001  A04IC9NA    00:01.680  RM   CLEAR           6
-   A55TG001  A04IC9NA    00:00.000  EW                   7
-   A55TG001  A04IC9NA    00:01.843  RM   ENTER           8
-   A55TG001  A04IC9NA    00:00.596  EW                   9  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:01.235  RM   ENTER          10  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:00.001  EW                   11  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:04.182  RM   ENTER          12  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:00.001  EW                   13  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:01.703  RM   PF3             14  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:00.001  EW                   15  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:00.814  RM   PF3             16  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:00.002  EW                   17  CAROL'S COOKIES CO
-   A55TG001  A04IC9NA    00:00.848  RM   PF3             18  CAROL'S COOKIES CO
TYPE AN "S" TO SELECT A RECORD
F1-HELP  F3-END  F4-RETURN  F7-UP   F8-DOWN  F9-FORMAT  F10-LEFT  F11-RIGHT

```

For each screen, CA Verify for VTAM identifies its:

Terminal:

The terminal name

Tran:

The transaction

T/R Time:

The think time (for an input screen) or response time (for an output screen)

OP:

The operation

W:

Write

EW:

Erase/write

EWA:

Erase/write alternate

RB:

Read buffer

RM:

Read modified

RMA:

Read modified all

EAU:

Erase all unprotected

WSF:

Write structured field

CPY:

Copy

RD:

Read

AID:

Attention ID used to generate input; for example, Enter, PF3

VIEW:

Whether there are mismatches (M), rules applied (R), or both (M,R)

Record:

Record number

ROW COL:

Data from the record which appears in row 1.

Note: You can change the columns using the Profile command. See the section [Browse Screens](#) (see page 135) in the chapter "Browse Function" for details on Profile.

Use the FIND/RFIND Function

Use the Find/RFind function to locate data. First, select a screen from the Rules—Record Selection panel. Then, while viewing the screen, enter the Find or RFind command. The Find command searches once for the specified value; the Rfind command repeats the previous Find command. See the section, [Locate Data](#) (see page 156) in the chapter "Browse Function" for complete details on using Find/RFind.

Note: You can select the first record, so the entire test stream is scanned, or you can position yourself part-way through the list to save scan time.

Confirm Your Choice

The logical screen you have selected or located using the Rules—Record Selection panel is displayed in the Rules—Model Output Screen panel. A sample logical screen is shown next.

```
CCC.ORDERAPP.001 -----RULES: MODEL OUTPUT SCREEN-----
ENTER COMMAND ==>                                     OUT RECORD:    2
TCA4048 - PRESS "SELECT" KEY TO SELECT -THIS- AS THE MODEL SCREEN
-----+-----+-----+-----+-----+-----+-----+-----+
| DATE 02/06/98                CAROL'S COOKIES COMPANY          RELEASE 6.2
| TIME 13:23:43                MAIN MENU
|
| 4
|
| ENTER OPTION:
| 8
|
|          1) PLACE AN ORDER
| 12
|          2) CHECK STATUS OF AN ORDER
|
| 16
|
| 20
```

To verify that this is the correct screen, view all parts of the screen by scrolling up, down, left, and right.

If the Screen is Correct

If this is the correct screen, press PF9 to select this screen as the model. You will then be prompted to use the model screen to complete your rule actions.

If the Screen is Not Correct

If you had entered search criteria to get to this screen and it is not the correct one, type RFind to display the next occurrence of your search criteria. To type different search criteria, press PF3 to return to the Rules—Record Selection panel and type new criteria. After you find the correct screen, press PF9 to select it as the model screen.

Use the Modeling Feature

To use the modeling feature, you must have a model screen selected. Since you can select a model screen at any time while defining rules or rule actions by pressing PF9 (Select), it is not necessary to define a model screen before you begin defining rules. How to select a model screen is covered in the previous section, [Locate and Select a Model Screen](#) (see page 181). If you need to *change* a model screen you have already selected, see the section, [Edit a Rule](#) (see page 212) in the chapter "Rules Function".

After you have selected a model screen for a rule, it will be automatically displayed whenever you select a rule action to define from the Add Rules—Rule Actions menu for that rule. For example, to define the date as a variable field, select 3 from the Add Rules—Rule Actions menu as shown next.

```
-----ADD RULES - RULE ACTIONS-----
ENTER COMMAND ==> 3

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

DESCRIPTION ==>
              ==>

      1 FIELD RECOGNITION          11 GENERATE FIELD VALUE
      2 SCREEN RECOGNITION        12 INSERT SCREENS
      3 VARIABLE FIELD            13 DELETE SCREENS
      4 DELETE FIELD              14 CUT SCREEN FIELD
      5 MOVE FIELD                15 PASTE SCREEN FIELD
      6 CHANGE FIELD VALUE        20 USERID LOGGING
      7 NEW FIELD                 21 TERMINAL ID LOGGING
      8 CHANGE AID KEY            22 APPLICATION ID LOGGING
      9 CHANGE CURSOR LOCATION
     10 CHANGE WCC VALUES

F1-HELP      F2-PREVIEW      F3-END      F4-RETURN      F9-SELECT
```

When you press Enter, the model screen you have selected will appear in the Rules: Modified Screen panel, as shown next.

```

CCC.ORDERAPP.001 -----RULES: EXPECTED SCREEN-----
ENTER COMMAND ==>
TCA4041 - MOVE CURSOR TO VARIABLE FIELD AND PRESS "SELECT" KEY
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| DATE 02/06/98          CAROL'S COOKIES COMPANY          RELEASE 6.2
| TIME 13:23:43          MAIN MENU
|
| 4
|
| ENTER OPTION:
|
| 8
|
| 1) PLACE AN ORDER
|
| 12  2) CHECK STATUS OF AN ORDER
|
| 16
|
| 20

```

Move the cursor to the first character of the DATE field and press PF9 to select it. The Add Rule Actions—Variable Field panel appears with the field values automatically filled in. A sample is shown next.

```

----- ADD RULE ACTIONS - VARIABLE FIELD -----08:00:31
ENTER COMMAND ==>
RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                           TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

VARIABLES:
  ROW COL  LEN  VALUE OR DESCRIPTION
  01  007  008  02/06/98 _____
                           _____
                           _____

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT

```

If the values are correct, press PF3 (End) to return to the Add Rules—Rule Actions menu where you can continue to define additional rule actions.

Display the Changed Panel

At any time during the rule creation process, you can press PF2 to preview the panel you are working on. All of the changes you have made will appear on the panel.

Specify Rule Actions

Rule actions define the changes that are to be made to a panel when this rule is applied. Rule actions include:

- Specifying field or screen recognition criteria
- Identifying a field as a variable (a field that changes from run to run)
- Changes to a field (like changing its length or its place on the panel)
- Adding or removing a field
- Defining a field value as a variable
- Changing the AID or PF keys
- Changing the cursor location or the WCC (Write Control Character) values
- Generating a new value for a date or a field automatically
- Inserting or deleting screens
- Copying data from one screen and pasting it into another screen

Rule action definition begins at the Add Rules—Rule Actions menu; a sample is shown next. To display this menu, press Enter from the Add Rules—Ruleset Description or Add Rules—Confirm Selection panels.

Note: Since rules actions are applied in the order they appear in the ruleset, you should insert the actions in the order you want them applied.

```

-----ADD RULES - RULE ACTIONS-----
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

DESCRIPTION ==>
              ==>

          1  FIELD RECOGNITION          11  GENERATE FIELD VALUE
          2  SCREEN RECOGNITION         12  INSERT SCREENS
          3  VARIABLE FIELD             13  DELETE SCREENS
          4  DELETE FIELD                14  CUT SCREEN FIELD
          5  MOVE FIELD                  15  PASTE SCREEN FIELD
          6  CHANGE FIELD VALUE          20  USERID LOGGING
          7  NEW FIELD                   21  TERMINAL ID LOGGING
          8  CHANGE AID KEY              22  APPLICATION ID LOGGING
          9  CHANGE CURSOR LOCATION
         10  CHANGE WCC VALUES

F1-HELP      F2-PREVIEW      F3-END      F4-RETURN      F9-SELECT
    
```

For a description of the RULESET NAME, TEST STREAM, and RULE NAME fields, see the previous section, [Use the Rules Function Panels](#) (see page 166).

DESCRIPTION (optional)

Type a description for this rule.

FIELD RECOGNITION

Select option 1, Field Recognition, to identify which fields to find on a screen before this rule can be applied.

SCREEN RECOGNITION

Select option 2, Screen Recognition, to apply this rule only to this screen.

VARIABLE FIELD

Select option 3, Variable Field, to create a new variable field or change an existing one. Variable fields identify fields that CA Verify for VTAM should ignore in a logical comparison. An example of a field containing a variable value would be date or time.

DELETE FIELD

Select option 4, Delete Field, to remove an existing field from a panel.

MOVE FIELD

Select option 5, Move Field, to change the placement of an existing field on the panel.

CHANGE FIELD VALUE

Select option 6, Change Field Value, to change the value of a field.

NEW FIELD

Select option 7, New Field, to add a new field to the panel.

CHANGE AID KEY

Select option 8, Change AID Key, to change the value assigned to an AID key.

CHANGE CURSOR LOCATION

Select option 9, Change Cursor Location, to change the placement of the cursor on the panel or to make the cursor location a variable.

CHANGE WCC VALUES

Select option 10, Change WCC Values, to change the Write Control Character or to make it a variable.

GENERATE FIELD VALUE

Select option 11, Generate Field Value, if you need to generate or accumulate values for a numerical field or for date aging.

INSERT SCREENS

Select option 12, Insert Screens, if you need to insert logical screens from a test stream.

DELETE SCREENS

Select option 13, Delete Screens, if you need to delete logical screens from a test stream.

CUT SCREEN FIELD

Select option 14, Cut Screen Field, if you need to use some data from this screen on another screen.

PASTE SCREEN FIELD

Select option 15, Paste Screen Field, to place data that was cut from one screen onto this screen.

USERID LOGGING

TERMINAL ID LOGGING

APPLICATION ID LOGGING

Select one of these options to create a list to include or exclude user IDs (option 20), terminal IDs (option 21), or application IDs (option 22) while logging. These selections are discussed in the chapter "Log Function".

Specify Recognition Criteria

You can specify recognition criteria whenever you define a rule or rule action, but it is not required. There are two types of recognition criteria you can specify:

Field Recognition

Used to identify which fields must be found on a screen for this rule to be applied.

Screen Recognition

Used to set this screen as the only screen to which this rule applies.

Each type of recognition criteria is discussed in the following sections.

Note: Field and screen recognition criteria cannot be defined in the same rule. However, each type of criteria can be defined in a separate rule within the same ruleset.

Use Field Recognition Criteria

To display the Add Rule Actions—Recognition Criteria panel, shown next, type **1** on the Add Rules—Rule Actions menu.

```

-----ADD RULE ACTIONS - RECOGNITION CRITERIA-----07:56:
58
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                           TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

ROW COL  LEN  OPER VALUE
-----
                                     -----
                                     -----
                                     -----

F1-HELP   F2-PREVIEW   F3-END   F4-RETURN   F9-SELECT

```

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#) (see page 166).

OPER

Type an operation. Valid values are:

EQ

Equal

NE

Not Equal

LT

Less Than

GT

Greater Than

LE

Less than or Equal to

GE

Greater than or Equal to

VALUE

Type the information you want to match exactly as it appears on the logical screen.
A value is required.

Use Screen Recognition Criteria

To display the Add Rules—Screen Recognition panel, shown next, type 2 on the Add Rules—Rule Actions menu.

Note: You can have only one Screen Recognition criteria in a rule, but multiple rule actions can be defined for that single screen.

```
----- ADD RULES - SCREEN RECOGNITION -----08:38:04
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

SCREEN RECOGNITION:
DESCRIPTION
-----
-----
-----

THIS RECOGNITION RULE SPECIFIES THAT ALL RULE ACTIONS FOR THIS RULE APPLY
ONLY TO THE SINGLE SPECIFIC SCREEN SELECTED.

F1-HELP   F2-PREVIEW   F3-END    F4-RETURN  F9-SELECT
```

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, and RULE NAME fields, see the section [Use the Rules Function Panels](#). (see page 166)

DESCRIPTION

Type a sample of the screen or a short description. Used for documentation purposes only.

Set a Variable Field

Follow these steps:

1. Type **3** on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Variable Field panel is displayed as shown next.

```

----- ADD RULE ACTIONS - VARIABLE FIELD-----08:00:31
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

VARIABLES:
  ROW  COL  LEN  VALUE OR DESCRIPTION
  ---  ---  ---  -----
                                     _____
                                     _____
                                     _____

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT

```

2. Type the ruleset name, test stream, rule name, row, column, and length fields in the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields.

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

3. Type the information about the field to be set as a variable; optional. You can either put a description for why this field is a variable or a sample of the variable data in this field.

A completed Add Rule Actions—Variable Field panel is shown next. The date has been changed to a variable value.

```
----- ADD RULE ACTIONS - VARIABLE FIELD----- ADD SUCCE
SSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                           TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

VARIABLES:
  ROW  COL  LEN  VALUE OR DESCRIPTION
  03   068  010  07/10/97_____
                           _____
                           _____

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT
```

4. When you are finished specifying variables, press PF3 from the Add Rule Actions—Variable Field panel to return to the Add Rules—Rule Actions Menu.

Delete a Field

Follow these steps:

1. Type 4 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Delete Field panel is displayed.

```
----- ADD RULE ACTIONS - DELETE FIELD -----08:00:31
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                           TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

VARIABLES:
  ROW  COL  LEN  VALUE OR DESCRIPTION
  -    -    -    _____
                           _____
                           _____

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT
```

2. Type the ruleset name, test stream, rule name, row value, column value, and length in the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields.

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

Note: When removing a field that consists of a heading (like birthdate) and an area for data entry, remove both parts of the field by specifying the total length of both parts for LEN.

3. Type the name of the field to be deleted; optional. You can either put an explanation for why this field was deleted or a sample of the value being deleted in this field.

A completed Add Rule Actions—Delete Field panel is shown next. The birthdate field is being removed.

```

----- ADD RULE ACTIONS - DELETE FIELD ----- ADD SUCCE
SSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                           TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

VARIABLES:
  ROW COL  LEN  VALUE OR DESCRIPTION
   15  009  010  BIRTHDATE : _____
                               _____
                               _____

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT

```

Move a Field

Follow these steps:

1. Type 5 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Move Field panel is displayed.

```
----- ADD RULE ACTIONS - MOVE FIELD-----07:50:50
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

MOVE FROM/TO:
ROW COL LEN  VALUE OR DESCRIPTION
--  --  --  _____
--  --  --  _____

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT
```

2. Type the ruleset name, test stream, and rulename in the RULESET NAME, TEST STREAM, and RULE NAME fields.

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

3. Type the row, column, and length values of the *current* location of the field being moved on the first line.
4. Type the row and column values of the *new* location for the field being moved on the second line.
5. Type the name of the field to be moved.

Note: The field name can be up to three lines long. You can either put an explanation for why this field is being moved or a sample of the data being moved in this field.

A completed Add Rule Actions—Move Field panel is shown next. This sample shows a field being moved two spaces to the left.

```

-----ADD RULE ACTIONS - MOVE FIELD----- ADD
SUCCESSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

MOVE FROM/TO:
ROW COL LEN  VALUE OR DESCRIPTION
03  065 011  _____
03  063      _____

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT

```

Change a Field Value

Follow these steps:

1. Type **6** on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Change Field panel is displayed as shown next.

```

-----ADD RULE ACTIONS - CHANGE FIELD VALUE-----08:23:24
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

CHANGED FIELDS:
ROW COL  LEN  ATTR FIELD VALUE
--  --  --  --  _____
                             _____
                             _____

OUTPUT/INPUT FIELD ==> 0      ( I=INPUT, O=OUTPUT)

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT

```

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

ATTR

Type a field attribute, if the attribute is changing. If the attribute is not changing, leave ATTR blank and CA Verify for VTAM will default to the original attribute value. Select one of these values for ATTR: U, UM, UH, UHM, UN, UNM, UNH, UNHM, P, PM, PH, PHM, PS, PSM, PSH, PSHM. The meaning of each letter is explained next.

U

Unprotected field; can be modified

P

Protected field; cannot be modified

N

Numeric field; only numeric data can be entered

S

Cursor will auto-skip over the field

H

High-intensity field

M

Field with modified data tag which will be transmitted from the terminal even if the operator makes no entry

FIELD VALUE

Type the new value to be used in the field. A value is required.

INPUT/OUTPUT FIELD

Indicates whether the value being changed is an input or an output field. The default is Output.

A completed Add Rule Actions—Change Field Value panel is shown next. This sample shows the value of a field being changed to 7.0.

```

-----ADD RULE ACTIONS - CHANGE FIELD VALUE----- ADD SUCCE
SSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

CHANGED FIELDS:
ROW COL  LEN  ATTR FIELD VALUE
02  075  003   ____ 7.0 _____
                             _____
                             _____

OUTPUT/INPUT FIELD ==> 0      ( I=INPUT, O=OUTPUT)

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT

```

Add a New Field

Follow these steps:

1. Type 7 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—New Field panel is displayed as shown next.

```

-----ADD RULE ACTIONS - NEW FIELD-----08:28:40
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

NEW FIELDS:
ROW COL  LEN  ATTR FIELD VALUE
--  --  --  --  _____
                             _____
                             _____

F1-HELP F2-PREVIEW F3-END F4-RETURN F9-SELECT

```

For instructions on completing a data entry panel and for a description of the RULESET NAME, TEST STREAM, RULE NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

2. Type a field attribute, if the ATTR field is new. However, leave ATTR blank if the new field is being inserted into the middle of an existing field.

If the field is not new, leave ATTR blank and CA Verify for VTAM will use the original attribute value for the whole field.

3. Select one of these values for ATTR: U, UM, UH, UHM, UN, UNM, UNH, UNHM, P, PM, PH, PHM, PS, PSM, PSH, PSHM. The meaning of each letter is explained next.

U

Unprotected field; can be modified

P

Protected field; cannot be modified

N

Numeric field; only numeric data can be entered

S

Cursor will auto-skip over the field

H

High-intensity field

M

Field with modified data tag which will be transmitted from the terminal even if the operator makes no entry

4. Type the new value to be used in the field. A value is required.

A completed Add Rule Actions—New Field panel is shown next.

```
-----ADD RULE ACTIONS - NEW FIELD----- ADD SUCC  
SSFUL  
ENTER COMMAND ==>  
  
RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001  
                          TEST STREAM NAME: TCADS.CCC.ORDERAPP.001  
  
NEW FIELDS:  
ROW COL  LEN  ATTR FIELD VALUE  
03  074  002  ____ 19 _____  
_____  
_____
```

Change the AID Key

Follow these steps:

1. Type 8 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Change AID Key panel is displayed as shown next.

Note: A rule can contain only one rule action of this type.

```

-----ADD RULE ACTIONS - CHANGE AID KEY-----13:17:43
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

ORIGINAL  CHANGE  ORIGINAL  CHANGE  ORIGINAL  CHANGE
AID:      TO      AID      TO:     AID      TO:

PF1 ==>  _____ PF11 ==> _____ PF21 ==> _____
PF2 ==>  _____ PF12 ==> _____ PF22 ==> _____
PF3 ==>  _____ PF13 ==> _____ PF23 ==> _____
PF4 ==>  _____ PF14 ==> _____ PF24 ==> _____
PF5 ==>  _____ PF15 ==> _____ ENTER==> _____
PF6 ==>  _____ PF16 ==> _____ PA1  ==> _____
PF7 ==>  _____ PF17 ==> _____ PA2  ==> _____
PF8 ==>  _____ PF18 ==> _____ PA3  ==> _____
PF9 ==>  _____ PF19 ==> _____ CLEAR==> _____
PF10 ==> _____ PF20 ==> _____

F1-HELP    F2-PREVIEW  F3-END      F4-RETURN   F9-SELECT

```

For a description of the RULESET NAME, TEST STREAM, and RULE NAME fields, see the section [Use the Rules Function Panels](#). (see page 166)

ORIGINAL AID

Contains the original AID key name.

CHANGE TO

Type the new value next to the AID keys you wish to change.

Note: The Add Rule Actions—Change AID Key panel only changes the AID key keystroke. To change the words at the bottom of a panel that indicate PF key use, use the change field value option on the Add Rule Actions menu.

Change the Cursor Location

Follow these steps:

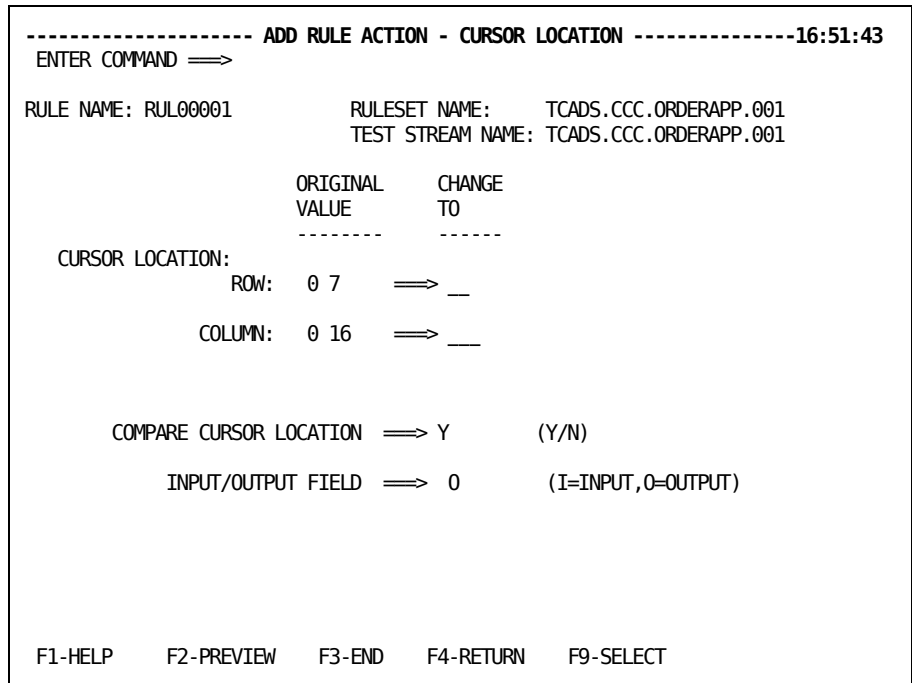
1. Type **9** on the Add Rules—Rule Actions Menu.

The Add Rule Action—Cursor Location panel is displayed. This panel has two purposes:

- To identify a new location for the cursor and then compare the cursor's location to make sure it is the correct one, or
- To set the cursor as a variable so that no comparison is done on the cursor location.

Note: A rule can contain a maximum of one input cursor change and one output cursor change.

A sample panel is shown next.



For a description of the RULE NAME, TEST STREAM NAME, and RULESET NAME fields, see the section [Use the Rules Function Panels](#). (see page 166)

CURSOR LOCATION

The current value for ROW and COLUMN are listed in the ORIGINAL VALUE column. Type the new values for ROW and COLUMN in the CHANGE TO column.

Note: A change in cursor location is only valid if you specify **Y** for the COMPARE CURSOR LOCATION field.

COMPARE CURSOR LOCATION

Indicates whether you want to compare the location of the cursor. Valid values are Y (yes) or N (no). Specifying N means that no comparison will be done, making the cursor location a variable.

OUTPUT/INPUT FIELD

Indicates whether the criteria specified on this panel applies to the output or input version of the screen. Valid values are I (input) or O (output).

Note: If the criteria applies to both output and input versions of the screen, you must create two rule actions—one for output and one for input.

Change the WCC Value**Follow these steps:**

1. Type 10 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—WCC Values panel is displayed. This panel has two purposes:

- To identify changes to the setting of the WCC and then compare the WCCs during the Run function, or
- To set the WCC as a variable so no comparison will be done during the Run.

Note: A rule can contain only one rule action of this type.

A sample panel is shown next.

```

-----ADD RULE ACTIONS - WCC VALUES-----
ENTER COMMAND ==>
                                     13:17:50
RULE NAME: RUL00001                 RULESET NAME:   TCADS.CCC.ORDERAPP.001
                                     TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

                                     ORIGINAL  CHANGE
                                     VALUE      TO
                                     -----
START PRINT:  N      ==> N      (Y/N)
SOUND ALARM:  N      ==> N      (Y/N)
RESTORE KYBD: Y      ==> Y      (Y/N)
RESET MDT:    N      ==> N      (Y/N)

COMPARE WCC VALUES ==> Y      (Y/N)

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SEELCT

```

For a description of the RULESET NAME, TEST STREAM, and RULE NAME fields, see the section [Use the Rules Function Panels](#) (see page 166).

WCC

The current value for START PRINT, SOUND ALARM, RESTORE KYBD, and RESET MDT are listed in the ORIGINAL VALUE column. Type the new values in the CHANGE TO column. Valid values are Y or N.

Note: A change in WCC is only valid if you specify **Y** for the COMPARE WCC VALUES field.

COMPARE WCC VALUE

Indicates whether you want to compare the value of the WCC. Valid values are Y (yes) or N (no). Specifying N means that no comparison will be done, making the WCC a variable.

Generate a Screen Value

Follow these steps:

1. Type 11 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Data Generation panel is displayed. Use this panel to generate a value for an input or an output field. The target field must be a number, numeric currency, or a numeric date. A sample panel is shown next.

```

----- ADD RULE ACTIONS - DATA GENERATION-----16:51:53
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

SCREEN LOCATION:
  ROW COL LEN VALUE
  --- --- ---
  _____
  _____
  _____

INITIAL VALUE    ==> N          (Y/N)
OPERATOR         ==> _          (ADD=+,SUBTRACT=-,MULTIPLY=*,DIVIDE=/)
OPERATOR VALUE   ==> _____ (1 - 9999999)
OVERFLOW        ==> N          (Y/N)
ACCUMULATE       ==> N          (Y/N)
SCOPE           ==> _          (S=SYSTEM,T=TERMINAL,U=USER)
DATE AGING FORMAT ==> _____
AGE DATE BY D|Y ==> _          (D=DAYS,Y=YEARS)

INPUT/OUTPUT FIELD ==> I          (I=INPUT,O=OUTPUT)

F1-HELP   F2-PREVIEW  F3-END   F4-RETURN  F9-SELECT
    
```

For a description of the RULE NAME, TEST STREAM NAME, RULESET NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

SCREEN LOCATION

Indicates the location of the field that contains the value being accumulated or the date being aged. You can fill in the location values by either using a model screen, or by typing the values directly into the appropriate columns.

Note: The field containing the value being accumulated or the date being aged can be either an input field or an output field.

INITIAL VALUE

Indicates whether or not you will supply a starting value for the generated field. Specify N (no) to use the value in the specified field as the initial value. Specify Y (yes) to supply a different starting value; type the new value to be used in the VALUE field.

OPERATOR

Specifies the arithmetic operation to be performed on the initial value; a value is required. Valid values are: + (add the operator value to the initial value), - (subtract the operator value from the initial value), * (multiply the initial value by the operator value), or / (divide the initial value by the operator value).

OPERATOR VALUE

Type a whole number that is to be added to, subtracted from, multiplied by, or used as the divisor of the initial value; a value is required. Valid values are 1 to 9,999,999.

OVERFLOW

Indicates whether processing is to continue if a value overflows the target field length. Specify Y (yes) to ignore any overflows and continue processing. Specify N (no) if overflowing the field boundaries is *not* allowed; processing will stop and the Mismatch panel will be displayed.

ACCUMULATE

Indicates whether or not you want to use the *last* generated value for this field as the basis for the *next* generated value for this field. Type N (no) if you do not, Y (yes) if you do.

If you specify Y, then a value for SCOPE is required. SCOPE controls how the data is accumulated: by user, by terminal, or by system.

Note: If a data generation rule action is changed *during* a run and the accumulator is set to Y, then the accumulator will *not* be adjusted for the remainder of the run. The only exception is if the *length* of the value has changed.

SCOPE

When Y is specified for ACCUMULATE, you must indicate how the data is to be accumulated. Specify S (system) to accumulate the data by system; specify T (terminal) to accumulate the data by terminal; specify U (user) to accumulate the data by user.

DATE AGING FORMAT

Specify the date format you are using in this application. This value is required if the initial value or the value found at the screen location is a date. Valid date formats are:

MMDDYY MM/DD/YYMM / DD / YY YYDDD

YYMMDD YY/MM/DDYY / MM/ /DD

YYDDMM YY/DD/MYY / DD / MM

In any of these formats, the year can be specified as two characters (YY) or four characters (YYYY). You can also replace the / with any national character (such as a -). However, the format, the format's length, and the separator characters specified in the date aging format must match what is found in the screen location during the run. If they do not match, a conflict will occur and the Mismatch panel will appear.

If you specify a value for DATE AGING FORMAT, then you must also specify a value for AGE DATE BY.

AGE DATE BY D|Y

Specify how the date is to be aged: by day (D) or by year (Y).

INPUT/OUTPUT FIELD

Indicates whether this rule applies to an input or an output screen. Specify I for input; O for output.

Insert Screens

Follow these steps:

1. Type 12 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Insert Screens panel is displayed. A sample panel is shown next.

Note: A rule can contain only one rule action of this type.

```

-----ADD RULE ACTIONS - INSERT SCREENS-----13:18:03
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

INSERT SCREENS FROM TEST STREAM:

DDNAME      ==> TCADS          (LEAVE APPLICATION, MEMBER,
APPLICATION ==>              OR VERSION BLANK AND PRESS
MEMBER      ==>              ENTER FOR A SELECTION LIST.)
VERSION     ==>

F1-HELP      F2-PREVIEW    F3-END      F4-RETURN   F9-SELECT

```

For a description of the RULESET NAME, TEST STREAM, and RULE NAME fields, see the section [Use the Rules Function Panels](#). (see page 166)

Insert a New Screen

Before you can insert a new screen, you must build a test stream containing the screens you want to insert.

Follow these steps:

1. Give the test stream a name.
2. Record the new screens using the Log function of CA Verify for VTAM.
3. Edit the test stream so that only the new records are in it.

Once you have performed these steps, you are ready to complete the field under Insert Screens From Test Stream on the Add Rule Actions—Insert Screens panel.

Type the application, member, and version of the test stream containing the new screens in the appropriate fields. The inserted test stream must be from the same TCADS file as the original test stream. The new screens will be inserted in the existing test stream immediately *after* the logical screen you are currently working on.

Delete Screens

Follow these steps:

1. Type 13 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Delete Screens panel is displayed. A sample panel is shown next.

Note: A rule can contain only one rule action of this type.

```
-----ADD RULE ACTIONS - DELETE SCREENS-----13:18:03
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

DELETE __ SCREENS STARTING WITH THE CURRENT OUTPUT

F1-HELP    F2-PREVIEW    F3-END      F4-RETURN   F9-SELECT
```

For a description of the RULESET NAME, TEST STREAM, and RULE NAME fields, see the section [Use the Rules Function Panels](#). (see page 166)

Deleting Screens when Comparison Type = Screen on Run Option Menu

Type the number of screens to be deleted in the DELETE field. The removal takes place beginning with the current output record. When a screen is deleted, all of the output records that make up the output screen, as well as all of the subsequent input records until the next output screen is encountered, are removed.

Deleting Records when Comparison Type = Logical on Run Option Menu

Type the number of records to be deleted in the DELETE field. The removal takes place beginning with the current output record.

Copy Data from a Screen

Follow these steps:

1. Type 14 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Cut Fields panel is displayed. A sample panel is shown next.

Note: You can use the data you select any number of times on any number of panels.

```

-----ADD RULE ACTIONS - CUT  FIELDS-----16:52:
11
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                           TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

CUT FROM:
  ROW  COL  LEN  VALUE OR DESCRIPTION
  ---  ---  ---  -----
  _____
  _____
  _____

OUTPUT/INPUT FIELD ==> 0          (I=INPUT,0=OUTPUT)

CUT ID = C00001

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT

```

For a description of the RULE NAME, TEST STREAM NAME, RULESET NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#). (see page 166)

CUT FROM

Indicates the location of the field that contains the data you want to reuse. You can use a model screen to fill in the location values.

Note: Data that you cut is not removed from the screen. It is copied so you can paste it into another screen.

VALUE OR DESCRIPTION

Type the name of the field to be cut; optional. The field name can be up to three lines long. In this field you can either put an explanation for why this field is being copied or a sample of the data being copied.

INPUT/OUTPUT FIELD

Indicates whether this rule applies to an input or an output screen. Specify I for input; O for output.

2. After you complete the screen and press Enter.

The system-generated CUT ID for the piece of data you have selected will appear on the panel.

Note: The CUT ID always begins with the letter C and is followed by five numbers. A sample CUT ID would be C00001. You will use this CUT ID whenever you want to paste this particular data into another panel.

Paste Data Into a Screen

Follow these steps:

1. Type 15 on the Add Rules—Rule Actions Menu.

The Add Rule Actions—Paste Field panel is displayed. A sample panel is shown next.

```
-----ADD RULE ACTIONS - PASTE FIELD-----UPD SUCCESSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

PASTE TO:
  ROW COL VALUE OR DESCRIPTION
   07 021 _____
                _____
                _____

          CUT ID ==> C00009
OUTPUT/INPUT FIELD ==> I      (I=INPUT,0=OUTPUT)

CUT INFORMATION:
  ROW COL LEN VALUE OR DESCRIPTION
   10 022 005 ORDER

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT
```

For a description of the RULE NAME, TEST STREAM NAME, RULESET NAME, ROW, COL, and LEN fields, see the section [Use the Rules Function Panels](#) (see page 166).

PASTE TO

Indicates the location of the field where you want the data to be put. You can use a model screen to fill in the location values.

VALUE OR DESCRIPTION

Type the name of the field where the data is to be pasted; optional. The field name can be up to three lines long. In this field you can either put an explanation for the paste operation, or a sample of the data being pasted.

CUT ID

Type the CUT ID of the data you want to paste into this panel. This ID is generated on the Add Rule Actions—Cut Field panel.

INPUT/OUTPUT FIELD

Indicates whether this rule applies to an input or an output screen. Specify I for input; O for output.

CUT INFORMATION

Displays the location of the field containing the data associated with the CUT ID. Use this information to make sure you are pasting the correct data.

Maintain a Ruleset

Maintaining a ruleset includes:

- Editing a ruleset
- Copying a ruleset
- Deleting a ruleset
- Renaming a ruleset
- Printing a ruleset, and
- Any changes to the rules and rule actions that make up the ruleset

The following sections contain detailed instructions for performing each of these tasks.

Edit Rulesets, Rules and Rule Actions

Follow these steps:

1. Type the name of the ruleset you want to edit (if you know it), or leave the name blank (if you do not know it) on the Maintain Rules menu.
2. Type E on the Maintain Rules menu and press Enter.

If you did not specify a ruleset name, the Ruleset Selection menu is displayed. (This menu is discussed in a prior section, [Browse Through Rulesets and Rules](#) (see page 169).) Locate and select the ruleset you want to edit.

If you specified a ruleset name, the Rules—Summary (Edit) panel for it is displayed. A sample panel is shown next.

```

----- EDIT RULES - SUMMARY -----12:53:26
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
LINE 1 TO 14 OF 25          TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

S-EDIT  I-INSERT  D-DELETE  R-REPLICATE  P-PREVIEW
OBJECT   TYPE ROW  COL  LEN  OP  VALUE FROM MODEL SCREEN/DESCRIPTION
RULESET  T/S
---
RULE
---
SCR-RECOG      2  29  23  EQ  CAROL'S COOKIES COMPANY
---
DATAGEN  OUT   1  71  10  01/23/1998+4(d)
---
DATAGEN  OUT  22  43   8  04/22/97+279(D)
---
VARIABLE  OUT  22  53   1  1
---
VARIABLE  OUT   2  71   8  08:22:49
---
CURSOR   OUT   1  33  11  NEW CURSOR ROW-6,COL-17
---
DATAGEN  IN   17  33  11  INFORMATION + 37
---
RULE
---
VARIABLE  OUT   1   1   1
---
DELETED   OUT   1   1   1
---
MOVED     OUT   8   8  10  BIRTHDATE:
---
CHANGED   OUT  15  20   8  TEXT

F1-HELP  FF3-END  F4-RETURN  F7-UP  F8-DOWN  F9-MODEL SCREEN
    
```

From this panel, you can perform one of the following actions:

S

Edit a ruleset, rule, or rule action.

I

Inserts a rule when specified on a ruleset or rule line; inserts a rule action when specified from a rule action line. All insertions are placed *after* the line on which I is specified.

D

Deletes a rule or rule action.

R

Replicates a rule or rule action.

P

Previews a rule or rule action.

Edit a Ruleset

Follow these steps:

1. Type an S next to RULESET in the OBJECT column and press Enter.

The Edit Rules—Ruleset Description panel is displayed. A sample panel is shown next.

```
-----EDIT RULES - RULESET DESCRIPTION-----07:24:02
ENTER COMMAND ==>
RULESET NAME: TCADS.CCC.ORDERAPP.001
DESCRIPTION ==>
              ==>
              ==>
RULESET PROTECTION ==>          (R-READ W-WRITE P-PRINT)
F1-HELP    F3-END    F4-RETURN
```

2. On this panel, you can change the ruleset's description and the protection assigned to the ruleset. Press Enter to have your changes accepted, then press PF3 (End) to return to the Summary panel.

Note: To change the name of a ruleset, follow the instructions in the section, [Rename a Ruleset](#) (see page 215) in the chapter "Rules Function".

Edit a Rule

Follow these steps:

1. Type an S next to the rule you want to edit from the Edit Rules—Summary panel and press Enter.

The Edit Rules—Rule Actions panel is displayed. A sample panel is shown next.

```
-----EDIT RULES - RULE ACTIONS-----07:55:37
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.CCC.ORDERAPP.001
                             TEST STREAM NAME: TCADS.CCC.ORDERAPP.001

DESCRIPTION ==> RELEASE 6.2 TO 6.3 CHANGES
              ==>

RESET MODEL SCREEN SELECTION: N          (Y=RESET, N=NO ACTION)

F1-HELP    F2-PREVIEW    F3-END    F4-RETURN    F9-SELECT
```

2. On this panel, you can change the rule name and description. Press Enter to have your changes accepted, then press PF3 (End) to return to the Summary panel.

Edit a Rule Action

Follow these steps:

1. Type an S to the left of the rule action you want to change.
2. Press Enter to display the completed data entry panel used to define that rule action.
3. Make changes by either overtyping the value or by using the modeling feature (explained in a prior section, [Locate and Select the Model Screen](#) (see page 181)).
4. When you are satisfied with your changes, press Enter and then press PF3.

Change Your Model Screen

Follow these steps:

1. Type Y in the RESET MODEL SCREEN SELECTION field. Press Enter.
2. Press PF9 to select a new model screen.

Copy a Ruleset or Rule

Follow these steps:

1. Type the name of the ruleset you want to copy (if you know it), or leave the name blank (if you do not know it). Then, type **b** on the Maintain Rules menu and press Enter.

If you did not specify a ruleset name, the Ruleset Selection menu is displayed. (This menu is discussed in the section [Browse Through Rulesets and Rules](#) (see page 169).) Locate and select the rule you want to copy.

If you specified a ruleset name, the Copy Ruleset panel for it is displayed. A sample panel is shown next.

```

-----COPY RULESET-----13:04:13
ENTER COMMAND ==>

RULESET NAME: TCADS.CCC.ORDERAPP.001

COPY TO:
DDNAME      ==> TCADS
APPLICATION ==> CCC
MEMBER      ==> ORDERAPP
VERSION     ==> 001

DESCRIPTION ==> SAMPLE RULESET
            ==>
            ==>

COPY RULE:
RULE NAME   ==>
NEW NAME    ==>

F1-HELP    F3-END    F4-RETURN

```

RULESET NAME

Contains the name of the ruleset you are copying.

COPY TO

Specify the destination of the copied ruleset.

DESCRIPTION

Contains the description of the source ruleset. At this time, you can change the description for the new ruleset.

COPY RULE

Use to copy a single rule. Specify the name of the rule you want to copy in RULE NAME. Specify the name of the copied rule in NEW NAME.

2. When you are finished, press Enter to return to your previous screen.

Delete a Ruleset

Follow these steps:

1. Type the name of the ruleset you want to delete (if you know it), or leave the name blank (if you do not know it). Then, type D on the Maintain Rules menu and press Enter.

If you did not specify a ruleset name, the Ruleset Selection menu is displayed. (This menu is discussed in the section, [Browse Through Rulesets and Rules](#) (see page 169).) Locate and type D next to the ruleset you want to delete. The Confirm Delete of Ruleset panel is displayed.

If you specified a ruleset name, the Confirm Delete of Ruleset panel for it is displayed. A sample panel is shown next.

```
-----CONFIRM DELETE OF RULESET-----13:04:28
ENTER COMMAND ==>
RULESET NAME: TCADS.A.A.001
DESCRIPTION:  SAMPLE RULE

STATISTICS:
  CREATION DATE:   09/02/1997
  CREATION TIME:  14:57:32
  CREATED BY:
  LAST UPDATE DATE:
  LAST UPDATE TIME:          TOTAL RULES:      000006
  LAST UPDATED BY:          TOTAL RULE ACTIONS: 000016

TEST STREAM NAME: TCADS.A.A.001
PROTECTION STATUS:

F1-HELP      F3-END      F4-RETURN
```

RULESET NAME

Contains the name of the ruleset you are removing.

DESCRIPTION

Contains the description of the ruleset you are removing.

STATISTICS

Displays information relevant to this ruleset.

TEST STREAM NAME

Displays the test stream, if any, that this ruleset is associated with.

PROTECTION STATUS

Displays the protection assigned to this ruleset.

2. When you are finished, press Enter to return to your previous screen.

Rename a Ruleset

Follow these steps:

1. Type the name of the ruleset you want to rename (if you know it), or leave the name blank (if you do not know it). Then, type R on the Maintain Rules menu and press Enter.

If you did not specify a ruleset name, the Ruleset Selection menu is displayed. (This menu is discussed in the section, [Browse Through Rulesets and Rules](#) (see page 169).) Locate and select the rule you want to rename.

If you specified a ruleset name, the Rename Ruleset panel is displayed. A sample panel is shown next.

```

-----RENAME RULESET-----13:04:21
ENTER COMMAND ==>

RULESET NAME: TCADS.CCC.ORDERAPP.001

RENAME TO:
DDNAME      ==> TCADS
APPLICATION ==> CCC
MEMBER      ==> ORDERAPP
VERSION     ==> 002

DESCRIPTION ==> EXAMPLE TWO
            ==>
            ==>

F1-HELP    F3-END    F4-RETURN

```

RULESET NAME

Contains the name of the ruleset that you are renaming.

RENAME TO

Specify the new name of this ruleset.

DESCRIPTION

Contains the description from the source ruleset. You can change the description at this time.

2. When you are finished, press Enter to return to your previous screen.

Chapter 9: Inquiry Function

This chapter explains how to inquire about and terminate active and suspended functions.

This section contains the following topics:

[Overview](#) (see page 217)

[Inquire into Active or Suspended Functions](#) (see page 218)

[Terminate Logging](#) (see page 221)

[Interrupt a Run](#) (see page 222)

[Clean up and Reconnect Sessions](#) (see page 222)

[Terminate the Inquiry](#) (see page 222)

Overview

Use the Inquiry function to:

- Display a list of all active or suspended functions
- Terminate logging
- Interrupt a run
- Clean up or reconnect CA Verify for VTAM sessions

This function is helpful when you want to monitor all CA Verify for VTAM activity. The Inquiry function is also the only way you can terminate logging when multiple terminals are being logged, or when the user of a terminal is unaware that his terminal is being logged.

Inquire into Active or Suspended Functions

Follow these steps:

1. Type I on the Primary Options Menu.

CA Verify for VTAM displays the Inquiry/Termination menu.

```

GENLEVEL=9903 ----- INQUIRY/TERMINATION -----12:44:27
ENTER COMMAND ==> I1

      INVOKED  AT          USING  RECORD
FUNCTION BY    TERMINAL  TIME    TERMINAL  NUMBER  TEST STREAM NAME
- INQUIRY  VERIFY  A60L2048  12:44
- OPTION   BUCBR01  A55TG001  11:56
- LOG      BUCBR01  A55TG001  11:56  2          BRUCE.LMTEST.003
- LOG      BUCBR01  A55TG001  11:55  2          BRUCE.LMTEST.002

DATA CAPTURE BUFFERS 00% FULL, NO SECONDARY BUFFERS ALLOCATED
RPLS USED (HIGH/MAX): VIRTUAL SEND: 0/50    REAL SEND: 0/50
                      REAL RECEIVE: 1/50    SESSION INIT: 0/9999

TYPE AN "S", "P", OR "D" NEXT TO YOUR LOG FUNCTION TO STOP IT
TYPE AN "I" NEXT TO A RUN FUNCTION TO INTERRUPT IT (AT ORIGINATING TERMINAL)
F1-HELP      F3-END      F4-RETURN    F7-UP        F8-DOWN
    
```

FUNCTION

Identifies the function:

Browse

A test stream is being browsed

Edit

A test stream is being edited

Inquiry

The Inquiry function is being used

Log

A terminal or terminals are being logged

Log Init

A user selected the Log function but logging has not yet begun

Log Full

Logging stopped because the data set is full

Log Term

Logging was either user-terminated or terminated due to an error; if due to an error, the error message number is shown in the RECORD NUMBER column. See the [Error Messages](#) (see page 221) section later in this chapter for details.

Option

The Primary Options Menu is being displayed

Rules

The Maintain Rules function is being used

Run

A test stream is being run

Run Init

A user selected the Run function but is not currently running a test stream

Tutorial

The tutorial is being viewed

Utility

One of the utilities is being used

INVOKED BY

The ID of the user who invoked the function.

AT TERMINAL

The terminal at which the function was invoked.

TIME

The time of the last write to the terminal at which the function was invoked. For the Log function, this is the time logging began. If the function was invoked over 24 hours ago, CA Verify for VTAM displays the date instead.

USING TERMINAL

For the Log function, the terminal being logged or, for a multiple terminal test stream, the number of terminals being logged.

For the Run function, the virtual terminal being used or, for a multiple terminal test stream, the number of virtual terminals being used.

RECORD NUMBER

- For the Log function, the number of records written to disk
- For a Log Term function due to an error, the error message number appears in this column
- For the Run function, the number of records processed
- For the Browse and Edit functions, the number of the record currently being displayed
- For suspended functions, *SUSP* appears in this column

TEST STREAM NAME

The test stream's name: Application, Member, and Version.

Buffer Utilization

Beneath the list of functions CA Verify for VTAM displays this message:

```
DATA CAPTURE BUFFERS nn% FULL, NO/NUMBER OF SECONDARY  
BUFFERS ALLOCATED
```

To avoid affecting system performance, CA Verify for VTAM stores screens captured during the Log and Run functions in a buffer before processing them. If the primary buffer becomes full, CA Verify for VTAM allocates secondary buffers. This message indicates what percentages of all allocated buffers are full, and how many — if any — secondary buffers have been allocated.

Note: If you find that secondary buffers are frequently allocated, you should increase the size of the primary buffer in the options module. See the *Installation Guide* for instructions.

RPLs Used

Beneath the buffer utilization message CA Verify for VTAM indicates the number of RPLs used. An installation option determines the maximum number of RPLs CA Verify for VTAM can use.

VIRTUAL SEND

The number of RPLs used to send data to applications.

REAL SEND

The number of RPLs used to send data to terminals.

REAL RECEIVE

The number of RPLs used to receive data from terminals.

SESSION INIT

The number of RPLs used to initiate sessions.

Error Messages

If an error occurs during the Log function, CA Verify for VTAM changes the Log designation in the Function column to Log Term and displays an error message number in the Record Number field. When the log is terminated, CA Verify for VTAM displays the error message in the upper right section of the menu. Then you can use the Help (PF1) command to display a longer version of the message.

It's possible, although unlikely, that a note may also be displayed with the buffer utilization message. The following notes may appear:

Buffer Overflow

One or more screens have been lost because the data capture buffer overflowed. Modify the options module to increase the size of the primary buffer or the number of secondary buffers.

Invalid Address

An invalid address was found in a program, control block, or data capture buffer. See the Problem Reporting section of the *Installation Guide*.

Terminate Logging

Follow these steps:

1. Type S, P, or D to the left of the Log function and press Enter.

S

Stops logging without disconnecting the terminal from the application

P

Stops logging and passes the terminal to the application to which it is currently connected. This option disrupts the session and is primarily useful for non-prime time sessions or when users have been warned to expect the disruption.

D

Stops logging and disconnects the terminal from the application

Note: If another Log function is active, **P** or **D** is treated as **S**; that is, the Log function is terminated but the terminal is not disconnected from the application.

CA Verify for VTAM displays the Log Termination menu. See the chapter "Log Function" for an explanation of this menu.

2. Use this function to terminate:
 - **All** logging, regardless of the Stop Option
 - **Multiple terminal** logging. This is the *only* way logging at multiple terminals can be terminated.
 - **Other terminal** logging when the terminal user is unaware of logging

Interrupt a Run

Follow these steps:

1. Type **I** to the left of the Run function and press Enter.

CA Verify for VTAM displays the Run Status menu with the cancellation message at the terminal where the Run function was invoked.

Use this function to cancel long-running test streams with very long cancel intervals.

Note: To interrupt a run at your terminal, you must invoke the Inquiry function from another terminal.

Clean up and Reconnect Sessions

To clean up a session started at a terminal that is no longer available, type **C** to the left of that function and press Enter.

To reconnect a session left on a terminal, type **R** to the left of that function and press Enter. After you specify Reconnect, pressing Enter at the terminal which owned the session may redisplay the Primary Options Menu.

Reconnect cannot be specified for:

- Run functions, unless the run has not yet begun or has completed
- Applications which have abended

Use Cleanup instead of Reconnect in these situations.

Terminate the Inquiry

To terminate the inquiry, use the End (PF3) command. CA Verify for VTAM redisplay the Primary Options Menu.

Chapter 10: Utilities

This chapter explains how to manipulate test streams.

This section contains the following topics:

[Overview](#) (see page 223)

[Invoke the Utilities](#) (see page 224)

[Copy a Test Stream](#) (see page 226)

[Rename a Test Stream](#) (see page 229)

[Delete a Test Stream](#) (see page 230)

[Update a Test Stream Directory](#) (see page 231)

[Append Records to a Test Stream](#) (see page 232)

[Insert Records into a Test Stream](#) (see page 234)

[Merge Terminals into a Test Stream](#) (see page 252)

[Convert a Test Stream to a REXX Script](#) (see page 256)

[Secure Data in a REXX Script](#) (see page 259)

Overview

The utilities make it easy for you to create new test streams to meet your testing needs. For example, you can:

- Copy a test stream and then edit the copy to create a different test case
- Merge terminals and their screens from the same or different test streams into a single test stream to create a large volume test stream for stress or concurrency testing
- Append one test stream onto the end of another test stream or onto itself for stress testing or repetition testing. This utility also lets you copy just the automated variable fields from one test stream to another.
- Insert screens from one test stream into another to modify the test case

The utilities also help you maintain existing test streams. For example, you can:

- Delete test streams you no longer need
- Update a test stream directory to modify its protection status or change the test stream's owner
- Rename a test stream
- Convert a test stream to REXX script
- Secure data in a REXX script

Invoke the Utilities

Follow these steps:

1. Type **U** on the Primary Options Menu.

CA Verify for VTAM displays the following Utilities menu when using the VTAM interface.

```

----- UTILITIES -----13:50:35
ENTER COMMAND ==>                                     U1

      C COPY A TEST STREAM                               A APPEND RECORDS TO A TEST STREAM
      R RENAME A TEST STREAM                             I INSERT RECORDS INTO A TEST STREAM
      D DELETE A TEST STREAM                             M MERGE TERMINALS INTO A TEST STREAM
      U UPDATE A TEST STREAM DIRECTORY

ENTER TEST STREAM NAME:
DDNAME   ==> TCADS
APPLICATION ==> CCC           (LEAVE APPLICATION, MEMBER,
MEMBER    ==> ORDERAPP        OR VERSION BLANK AND PRESS
VERSION   ==> 002            ENTER FOR A SELECTION LIST)

F1-HELP      F3-END      F4-RETURN
    
```

When using the TSO interface, CA Verify for VTAM displays the following Utilities menu.

```

----- UTILITIES -----13:50:35
ENTER COMMAND ==>                                     U1

      C COPY A TEST STREAM                               A APPEND RECORDS TO A TEST STREAM
      R RENAME A TEST STREAM                             I INSERT RECORDS INTO A TEST STREAM
      D DELETE A TEST STREAM                             M MERGE TERMINALS INTO A TEST STREAM
      U UPDATE A TEST STREAM DIRECTORY                   X CONVERT A TEST STREAM TO REXX
                                                         S SECURE DATA IS A REXX SCRIPT

ENTER TEST STREAM NAME:
DDNAME   ==> TCADS
APPLICATION ==> CCC           (LEAVE APPLICATION, MEMBER,
MEMBER    ==> ORDERAPP        OR VERSION BLANK AND PRESS
VERSION   ==> 002            ENTER FOR A SELECTION LIST)

F1-HELP      F3-END      F4-RETURN
    
```

The default ddname and Version values appear; these can be changed.

If you know the test stream you want to process, follow these steps:

1. Type the Application and Member name and other identifiers, if necessary
2. Type on the command line the letter which identifies the utility you want to use: C, R, D, U, A, I, or M. When using the Utilities menu from the TSO interface, the X and S options are also available.
3. Press Enter.

CA Verify for VTAM displays the menu for the utility you selected.

If you don't know the test stream you want to process, follow these steps:

1. Leave the Application and Member name blank.
2. (Optional) Blank out other identifiers.
3. (Optional) Type on the command line the letter which identifies the utility you want to use: C, R, D, U, A, I, or M. When using the Utilities menu from the TSO interface, the X and S options are also available.
4. Press Enter.

CA Verify for VTAM displays the Test Stream Selection menu.

```

----- UTILITIES: TEST STREAM SELECTION -----14:00:10
ENTER COMMAND ==>
FILE: TCADS
                                LOG-DATE BY   RECORDS  RUN-DATE  RESULT  MULTI-
                                CEMENT INQUIRY OF ALL PROGRAMS AND FILES
_ CLIST  OPERATOR 001 01/02/1998 AJC      28   03/21/1998  LGC EQ
s DEMO    DEMOPROG 001 03/22/1998 NGN        8
                                CUSTOMER MAINTENANCE DEMO PROGRAM
_ PAYROLL DOCUMENT 001 02/01/1998      120
                                ALL PAYROLL SCREENS FOR USER TRAINING
_ PAYROLL INQUIRY  001 01/16/1998 RSM     154   01/16/1998  NOT EQ
                                TEST OF NEW INQUIRY MENU
_ PAYROLL UPDATE   002 01/28/1998      112
                                TEST OF NEW UPDATE SCREEN
_ QA      TEST1    003 01/29/1998 NGN    1022   02/29/1998  NOT EQ
                                TEST1 IN CONVERSION FROM DOS TO MVS
_ QA      TEST2    007 02/21/1998      724
                                TEST2 IN CONVERSION FROM DOS TO MVS
_ SYSTEMS MIGRATE  008 02/21/1998 SAB    2380   03/14/1998  LGC EQ   M
_ SYSTEMS STRESS1  018 03/22/1998 JSN     1502
                                STRESS TEST FOR CICS TEST REGION
_ SYSTEMS STRESS2  019 03/22/1998      1208

```

Complete this menu as follows:

- If you typed on the Utilities menu the letter of the utility you want to use, select test streams by typing S to the left of each test stream you want to process and press Enter.
- If you did not type on the Utilities menu the letter of the utility you want to use, type the letter — **C, R, D, U, A, I, or M** — to the left of each test stream you want to process and press Enter. When using the Utilities menu from the TSO interface, the **X** and **S** options are also available.

In either case, CA Verify for VTAM displays the panel for the utility you selected.

If you select multiple test streams, CA Verify for VTAM will redisplay the Test Stream Selection menu each time you press Enter until all selected test streams are processed.

Copy a Test Stream

Follow these steps:

1. Type **C** on the Utilities or Test Stream Selection menu.

CA Verify for VTAM displays the Test Stream Copy panel.

```
CCC.ORDERAPP.001 ----- TEST STREAM COPY -----10:15:43
ENTER COMMAND ==>                                     U3

TEST STREAM TO COPY TO:
DDNAME      ==> TCADS
APPLICATION ==> CCC
MEMBER      ==> ORDERAPP
VERSION     ==> 001

OPTIONS:
START WITH RECORD NUMBER ==> 000001      (1-999999)
STOP AFTER RECORD NUMBER ==> 999999      (1-999999)
INCLUDE RULESET           ==> Y           (Y/N)
TERMINAL                  ==>            (BLANK - SELECTION LIST)

F1-HELP   F3-END   F4-RETURN
```

TEST STREAM TO COPY TO

The name of the test stream being copied appears in the DDname, Application, Member, and Version fields. Modify the name as you wish.

START WITH RECORD NUMBER

The first record to be copied to the output test stream. The default is record 1. Terminal status information is automatically copied because it is required by the Run function.

STOP AFTER RECORD NUMBER

The last record to be copied to the output test stream. The default is record 999999. Use this option to truncate a test stream that ends in the middle of a transaction or at another inconvenient point.

INCLUDE RULESET

Copies the associated ruleset to the corresponding name. Y, the default, copies the ruleset; type N if you do not want the ruleset to be copied.

TERMINAL

Enter a terminal name to select one terminal from a multiple terminal test stream. If you leave this field blank, CA Verify for VTAM displays the Terminal Selection menu.

```

SAMPLE.MULTTERM.001 ----- COPY: TERMINAL SELECTION -----14:14:40
ENTER COMMAND ==> UW

SELECT: "S" ORIGINAL TERMINAL SCREEN ALTERNATE VIRTUAL
INQUIRY: "I" TERMINAL TYPE SIZE SIZE TERMINAL

- A60L2048 3277 REMOTE 24 BY 80 24 BY 80
- A60L2049 3277 REMOTE 24 BY 80 24 BY 80
- A60L205A 3277 REMOTE 24 BY 80 24 BY 80
- A60L205B 3277 REMOTE 24 BY 80 24 BY 80
*** END OF TERMINALS ***

TYPE AN "S" TO SELECT TERMINALS FOR COPY
TYPE AN "I" TO VIEW TERMINAL STATUS
F1-HELP F3-CONTINUE F4-RETURN F7-UP F8-DOWN

```

This menu lists the following for each terminal in the test stream:

- Original terminal name
 - Terminal type; for example, 3277 remote, 3277 local
 - Screen size
 - Alternate screen size
 - Virtual terminal to be used when the test stream is run
2. Type **S** to the left of one or more terminals and use the Continue (PF3) command. The terminals you select are the ones from which records will be copied.
 3. Type **I** to the left of a terminal for which you want to view Initial Terminal Status information and press Enter. See the "Browse Function" chapter for an explanation of the Initial Terminal Status menu. When you exit from this menu, CA Verify for VTAM redisplay the Terminal Selection menu.
 4. Use CA Verify for VTAM commands as follows:
 - Up (PF7) and Down (PF8) to view additional terminals which do not appear on the initial menu
 - End (PF3) to cancel the copy
 5. Press Enter when you have completed the Copy menu. CA Verify for VTAM copies the test stream and redisplay the Utilities or Test Stream Selection menu, along with a message.
 6. Use the End (PF3) command to cancel the copy.

Rename a Test Stream

Follow these steps:

1. Type R on the Utilities or Test Stream Selection menu.

CA Verify for VTAM displays the Test Stream Rename menu.

Note: If the test stream you are renaming has an associated ruleset, the name of the ruleset will automatically be renamed also.

```
CCC.ORDERAPP.001 ----- TEST STREAM RENAME -----10:21:42
ENTER COMMAND ==>                                     U4

NEW TEST STREAM NAME:

APPLICATION ==> DEMO
MEMBER      ==> DEMOPROG
VERSION     ==> 001

F1-HELP    F3-END    F4-RETURN
```

2. The current test stream name appears in the Application, Member, and Version fields. Modify this name and press Enter. CA Verify for VTAM renames the test stream and ruleset (if any), and redisplay the Online Utilities or Test Stream Selection menu, along with a message.
3. Use the End (PF3) command to cancel the renaming.

Delete a Test Stream

Follow these steps:

1. Type D on the Utilities or Test Stream Selection menu.
CA Verify for VTAM displays the Confirm Delete menu.

Note: If the test stream you are deleting has an associated ruleset, the ruleset will also be deleted. You will receive a confirmation/warning message before the delete takes place.

```
CCC.ORDERAPP.002 ----- CONFIRM DELETE -----
ENTER COMMAND ==>                                     U5
TCA0548 - CORRESPONDING RULESET WILL ALSO BE DELETED
DESCRIPTION: CAROL'S COOKIES COMPANY DEMO PROGRAM

          LOG:      RUN:      EDIT:      TEST STREAM:      IN:  OUT:
INVOKED BY:                                     TOTAL SCREENS:      6    6
INVOKED ON: 06/02/1998 06/03/1998             AVERAGE BYTES:      46   315
START TIME: 13:23:04  08:34:50
DURATION:   00:02:02  00:00:00                LAST RUN:           IN:  OUT:
SYSTEM:     A04IC9NA  A04IC9NA                EQUAL:             6    1
STATUS:     NORMAL   LOGICALLY EQUAL          EQUIVALENT:        5
TERMINAL:   A60L2048
VSAM CI'S:  2                                IGNORED:            0
                                                ACCEPTED:           0
                                                INSERTED:           0
AVERAGE THINK TIME:  00:00:20.256             DELETED:            0
AVERAGE RESPONSE TIME: 00:00:00.013           CHANGED:            0
MAXIMUM SCREEN SIZE:  24 BY 80                 NOT RUN:            0    0
PROTECTION STATUS:                                     OWNER:
ORIGINATING TEST STREAM: CCC.ORDERAPP.001     CREATED BY FUNCTION: RUN

F1-HELP      F3-CANCEL
```

This panel lists directory information for the test stream. See the "Browse Function" chapter for an explanation of the directory fields.

2. Press Enter to confirm the deletion; press PF3 to cancel it. CA Verify for VTAM redisplay the Utilities or Test Stream Selection menu, along with a message.

Update a Test Stream Directory

Follow these steps:

1. Type U on the Utilities or Test Stream Selection menu.
CA Verify for VTAM displays the Directory Update menu.

```

CCC.ORDERAPP.002 ----- DIRECTORY UPDATE -----13:51:57
ENTER COMMAND ==>                                     U6

DESCRIPTION ==> CAROL'S COOKIES COMPANY DEMO PROGRAM
              ==>
              ==>

          LOG:      RUN:      EDIT:      TEST STREAM:      IN:  OUT:
INVOKED BY:
INVOKED ON: 06/29/1998 06/29/1998      TOTAL SCREENS:      5    5
START TIME: 13:18:52 13:39:44      AVERAGE BYTES:      52   289
DURATION:  00:00:12 00:00:00
SYSTEM:    A04IC9NA A04IC9NA      LAST RUN:           IN:  OUT:
STATUS:    NORMAL  NOT EQUAL      EQUAL:              5    1
TERMINAL:  A55TG001                EQUIVALENT:         0
VSAM CI'S: 1                        IGNORED:             0
                                           ACCEPTED:            4
                                           INSERTED:            0  0
                                           DELETED:             0  0
                                           CHANGED:             0
                                           NOT RUN:             0  0
AVERAGE THINK TIME: 00:00:02.388
AVERAGE RESPONSE TIME: 00:00:00.002
MAXIMUM SCREEN SIZE: 24 BY 80
PROTECTION STATUS ==>
ORIGINATING TEST STREAM: CCC.ORDERAPP.001  OWNER ==>
                                           CREATED BY FUNCTION: RUN

F1-HELP      F3-END

```

This menu lists directory information for the test stream. See the "Browse Function" chapter for an explanation of the directory fields.

The test stream owner — the user who initiated logging — or a security administrator can change these fields:

- Description
- Protection Status
- Owner

Note: If the test stream is not write-protected, anyone can change the description.

See the "Log Function" chapter for a discussion of the Description and Protection Status fields.

2. Use the End (PF3) command to save the updated directory; use the Cancel command to cancel the update.

Append Records to a Test Stream

Follow these steps:

1. Type A on the Utilities or Test Stream Selection menu.
CA Verify for VTAM displays the Append menu.

```
CCC.ORDERAPP.002 ----- APPEND -----13:52:59
ENTER COMMAND ==>                                     UA

APPEND FROM TEST STREAM:
DDNAME      ==> TCADS
APPLICATION ==> CCC          (LEAVE APPLICATION, MEMBER,
MEMBER      ==> ORDERAPP     OR VERSION BLANK AND PRESS
VERSION     ==> 002          ENTER FOR A SELECTION LIST)

OPTIONS:
INCLUDE RULESET ==> Y      (Y/N)

F1-HELP      F3-END      F4-RETURN
```

The Append utility copies the test stream you identify on this menu onto the end of the test stream you identified on the Utilities or Test Stream Selection menu.

Lengthening the test stream may be useful for stress testing. You can also append a test stream to itself for repetition testing. Make sure, however, that the appended records make sense in the context of the records which they follow.

The following rules apply to the Append utility:

- Rules will be included in the output ruleset if the Include Ruleset option is Y.
- When a single terminal test stream is appended to a single terminal test stream, the output is a single terminal test stream.
- If either of the test streams is a multiple terminal test stream, the output is a multiple terminal test stream. Terminals will be added to the test stream for the terminals in the second test stream which are not in the first.

APPEND FROM TEST STREAM

The name of the test stream which is the source of the appended records.

If you leave the Application, Member, or Version fields blank, CA Verify for VTAM displays the Test Stream Selection menu. Type S to the left of the test stream you want to select and press Enter.

INCLUDE RULESET

Leave Y as the default to copy rules when the test stream is appended; type N to exclude them.

The appended fields will be referenced in the next Run, Browse, Edit, or Print function.

2. Press Enter when you have completed the specifications. CA Verify for VTAM either performs the append or displays the Append Confirmation menu. If CA Verify for VTAM performs the append, it redisplay the Utilities or Test Stream Selection menu, along with a message.

Confirm the Append

If the output test stream contains two consecutive input or output screens from the same terminal, CA Verify for VTAM displays the Append Confirmation menu. The message on this menu indicates whether CA Verify for VTAM found two consecutive input or output screens.

Here's how either situation could occur. Suppose test stream A is being appended to test stream B. If the first screen for test stream A is an input screen and the last screen for test stream B is an input screen, the output test stream would contain two consecutive input screens. In this case, you may want to edit test stream B to delete the last input screen.

Similarly, if the first screen for test stream A is an output screen and the last screen for test stream B is an output screen, the output test stream would contain two consecutive output screens. In this case, you may want to edit test stream A to delete the first output screen.

Press Enter to confirm the Append or use the End (PF3) command to cancel it. If you confirm the Append, CA Verify for VTAM appends the records and redisplay the Utilities or Test Stream Selection menu, along with a message. If you cancel the Append, CA Verify for VTAM redisplay the Append menu.

Insert Records into a Test Stream

Follow these steps:

1. Type I on the Utilities or Test Stream Selection menu.

CA Verify for VTAM displays the Insert menu.

Note: If the records you are inserting use a different ruleset than the test stream you are inserting them into, then the rules from both test streams will be combined.

```

CCC.ORDERAPP.001 ----- INSERT -----10:24:22
ENTER COMMAND ==> UI

INSERT FROM TEST STREAM:
DDNAME ==> TCADS
APPLICATION ==> CCC (LEAVE APPLICATION, MEMBER
MEMBER ==> ORDERAPP OR VERSION BLANK AND PRESS
VERSION ==> 001 ENTER FOR A SELECTION LIST)

OPTIONS:
START WITH RECORD NUMBER ==> 000001 (1-999999)
STOP AFTER RECORD NUMBER ==> 999999 (1-999999)
INSERT AFTER RECORD NUMBER ==> 999999 (1-999999)
INCLUDE RULESET ==> Y (Y/N)

MULTIPLE TERMINAL TEST STREAM OPTIONS:
TERMINAL TO SELECT FROM ==>
TERMINAL TO INSERT AS ==>

F1-HELP F3-END F4-RETURN
    
```

The Insert utility inserts records from one or more test streams into the test stream you identified on the Utilities or Test Stream Selection menu. You can also insert records from a test stream into that same test stream. Make sure, however, that:

- The records from both test streams are from similar types of terminals
- The inserted transactions will work where they are inserted

Inserting records is one way of expanding a test stream and changing the testing scenario.

INSERT FROM TEST STREAM

The name of the test stream which is the source of the inserted records.

If you leave the Application, Member, or Version fields blank, CA Verify for VTAM displays the Test Stream Selection menu. Type **S** to the left of the test stream you want to select and press Enter. See the screen earlier in this chapter.

START WITH RECORD NUMBER

The first record to be inserted. The default is record 1.

STOP AFTER RECORD NUMBER

The last record to be inserted. The default is record 999999; such as, the last record in the test stream.

INSERT AFTER RECORD NUMBER

The record in the output test stream after which the records should be inserted.

- If you specify 0, the records are inserted at the beginning of the test stream.
- If you leave 999999 as the default or specify a number greater than the number of records in the test stream, the records are inserted at the end of the test stream.

INCLUDE RULESET

Indicates whether the ruleset from the target test stream should be inserted into the source test stream. Y, the default, inserts the ruleset; N does not.

The last two options apply to *multiple test streams only*.

TERMINAL TO SELECT FROM

The name of the terminal in the source test stream from which records are to be selected. If you leave this field blank, CA Verify for VTAM displays the From Terminal Selection menu.

TERMINAL TO INSERT AS

The terminal name that should be used for the inserted records in the output test stream. If you leave this field blank, CA Verify for VTAM displays the To Terminal Selection menu.

2. Press Enter when you have completed the specifications.
 - If necessary, CA Verify for VTAM displays the From Terminal Selection and/or To Terminal Selection menus. See the [Select a Terminal](#) (see page 236) section next.
 - If necessary, CA Verify for VTAM displays the Insert Confirmation menu. See the [Confirm the Insert](#) (see page 236) section.
 - Otherwise, CA Verify for VTAM displays the Insert Status menu. See the [Review the Insert Status](#) (see page 237) section.

Select a Terminal

For multiple terminal test streams, CA Verify for VTAM displays the From Terminal Selection menu if you leave the Terminal to Select from field blank, and the To Terminal Selection menu if you leave the Terminal to Insert As field blank.

These menus are similar to the Terminal Selection menu illustrated in a previous screen.

Follow these steps:

1. Type S to the left of *one* terminal and use the End (PF3) command.
 - The terminal you select on the From Terminal Selection menu is the terminal from which records will be selected for insertion.
 - The terminal you select on the To Terminal Selection menu is the terminal which will be associated with the inserted records.
2. Type I to the left of a terminal for which you want to view Initial Terminal Status information and press Enter. See the "Browse Function" chapter for an explanation of the Initial Terminal Status menu. When you exit from this menu, CA Verify for VTAM redisplay the From or To Terminal Selection menu.
3. Use CA Verify for VTAM commands as follows:
 - **Up (PF7)** and **Down (PF8)** to view additional terminals which don't appear on the initial menu
 - **Cancel** to cancel the insertion.

Confirm the Insert

If the output test stream contains two consecutive input or output screens from the same terminal, CA Verify for VTAM displays the Insert Confirmation menu. The message on this menu indicates whether CA Verify for VTAM found two consecutive input or output screens.

If this situation is acceptable — for example, your application issues consecutive reads or writes — press Enter to confirm the Insert. CA Verify for VTAM displays the Insert Status menu. Otherwise, use the End (PF3) command to cancel it. CA Verify for VTAM then redisplay the Insert menu so you can modify the record numbers.

Review the Insert Status

After you specify all the information required for record insertion, CA Verify for VTAM displays the Insert Status menu.

```
CCC.ORDERAPP.001 ----- INSERT: STATUS -----10:25:11
ENTER COMMAND ==>                                     UM

THE FOLLOWING RECORDS HAVE BEEN SELECTED FOR INSERTION

FROM          FIRST  LAST  FROM  TO  AFTER
TEST STREAM   RECORD RECORD TERMINAL TERMINAL RECORD
CCC.ORDERAPP.001      1      16  NN01  NN01      16

F1-HELP      F3-END      F4-RETURN    F7-UP      F8-DOWN
```

If your specifications are correct, use the Enter key to perform the insertion and save the output test stream. CA Verify for VTAM inserts the records and redisplay the Utilities or Test Stream Selection menu, along with a message.

If your specifications are incorrect, use the End (PF3) key to cancel the insertion.

Reorganize the Data Set

The copy function can be used to migrate an existing CA Verify for VTAM data set to a larger data set or to reclaim unavailable control intervals. Usually reorganization is not required.

A data set cannot be reorganized in place.

Follow these steps:

1. Define a new data set with IDCAMS.
2. Run TCABATCH with TCADSIN allocated to the old data set and TCADSOUT allocated to the new one. Use the following control cards to initialize and format the new data set and copy the test streams:

```
INIT
FORMAT
COPY
SELECT =====, =====, ==
```

3. Delete the old data set and rename the new one.

Delete Test Streams and Their Rulesets

Use the Delete function to delete test streams and rulesets from the data set allocated to TCADSOUT.

Specify the Delete card in the SYSIN DD data set. The format is:

```
DELETE
```

This function has no parameters. One or more Select cards should follow the Delete card. The Select card will select both the test streams and the rule sets that match it. For details, see the section, [Select Test Streams and Rulesets to Copy, Print, and Delete](#) (see page 278) that appeared earlier in this chapter.

Display Parameters

The following parameters apply *only* to Display format.

FRAME/NOFRAME

Specifies whether or not a frame of dashes surrounds the screen.

Frame

A frame is printed.

Noframe

A frame is not printed.

CENTER/NOCENTER

Specifies whether or not the screen is centered on the page.

Center

The screen is centered.

Nocenter

The screen is left justified. Use this option when you intend to photocopy the page.

HIGH/NOHIGH

Specifies whether or not high-intensity fields are overprinted.

High

High-intensity fields are overprinted. Do not specify this parameter if the output is sent to a laser printer or a printer which does not support overprinting.

Nohigh

High-intensity fields are not overprinted.

NOULINE/ULINE

Specifies whether or not unprotected fields are underlined.

Nouline

Unprotected fields are not underlined.

Uline

Unprotected fields are underlined by overprinting.

NOLOW/LOW

Specifies whether or not low-intensity (non-display) fields are printed.

Nolow

Low-intensity fields are not printed.

Low

Low-intensity fields are printed.

Note: For test streams logged with the DRKPROT=YES installation option in effect, input data entered in low-intensity fields will *not* be printed even if LOW is specified.

NOSHRINK/SHRINK

Specifies whether or not blank screen rows should be skipped in order to reduce the size of the listing.

Noshrink

Blank screen rows are printed.

Shrink

Blank screen rows are skipped. The printed rows are numbered.

NOSTATS/STATS

Specifies whether or not statistics for the current screens should be printed.

Nostats

Statistics are not printed.

Stats

Statistical information, including record number, type of operation, data stream length, screen size, and so on, is printed.

CURSOR(_ _)/CURSOR/NOCURSOR

Specifies how the cursor position should be handled.

Cursor (_ _)

One or two characters — for example, underscores, the default — will be overprinted to indicate cursor position. Do not specify this parameter if the output is sent to a laser printer or a printer which does not support overprinting.

Cursor

The cursor row and column will be printed under each screen.

Nocursor

The cursor position will be not be indicated.

Print Parameters

Depending on the options specified when a test stream is run, the output test stream may contain mismatch and applied rules information. The following parameters control the printing of this information.

APRULES(YES)/(NO)/(ONLY)

Controls the printing of the rules applied before the mismatch occurred.

APRules(Yes)

Print the Rules Applied Before Mismatch screens while printing the test stream.

APRules(No)

Do not print the Rules Applied Before Mismatch screens while printing the test stream.

APRules(Only)

Print only those screens that had a Rules Applied Before Mismatch screen created by the Run.

DIFF(NO)/(YES)/(ONLY)

Controls the printing of mismatch information recorded when the Run Record History option is set at Y.

DIFF(No)

Differences are not printed.

DIFF(Yes)

Differences are printed.

DIFF(Only)

Only those screens that had a difference are printed.

SEPARATE(EXPECTED/CURRENT/NONE)/COMBINED

Controls the format of mismatch information.

Separate

Prints information in this order: Expected screen, current screen, Differences, and Applied Rules. Separate is the default.

Separate(Expected)

Prints everything except the Current screen.

Separate(Current)

Prints everything except the Expected screen.

Separate(None)

Only the differences and the Applied Rules are printed.

Combined

One screen is printed. This screen contains one row for each row that is the same and three rows for each row that is different. The rows are labeled:

E/C

Expected and current — for rows that are the same

Expt

Expected — the row from the expected screen when the rows are different

Curr

Current — the row from the current screen when the rows are different

Diff

The differences between the rows:

blank

The characters are equal

X

The characters are not equal

-

The characters are within a variable field

Regardless of your specifications, Combined format uses the following Print function parameters: Nohigh, Low, Nouline, Nocenter, Noshrink, and Cursor.

SIGNOFF(NO)/(YES)/(ONLY)

Controls printing of mismatch signoff information recorded when the Run Require Signoff Data option is set to Y.

Signoff(No)

Mismatch signoff information is not printed.

Signoff(Yes)

Mismatch signoff information is printed.

Signoff(Only)

Only screens with a mismatch are printed.

If signoff information was specified, it is printed to the right of the screen rows which had a mismatch, or on a separate row if more room is needed.

If signoff information was not specified, rows of underscores are printed so the signoff information can be inserted.

Specify Log Options

The Log Options Menu lets you specify whether screens will be logged from your terminal, another terminal, multiple terminals, or all terminals associated with a specific application.

For the demo session, you will capture screens only from your terminal.

```
----- LOG OPTIONS MENU -----11:28:05
ENTER COMMAND ==> t                                     L
  T THIS TERMINAL
  O ANOTHER TERMINAL
  M MULTIPLE TERMINALS
  A AN APPLICATION

F1-HELP      F3-END      F4-RETURN
```

Action:

Type t and press Enter.

Result:

CA Verify for VTAM displays the Single Terminal Log menu.

Note: For future reference, you could have bypassed the Log Options Menu by typing L.T on the Primary Options Menu to direct CA Verify for VTAM to display the Single Terminal Log menu.

Examples

The examples on the next pages illustrate output from the Print function. The same input and output screens are illustrated in the three formats: Display, Field, and Dump.

This input screen was printed in Display format with the default options:

```
08/14/1998                                CA-VERIFY VERSION 1.4                                PAGE 5
10:56:18                                                                CCC.ORDERAPP.001

DATE 07/10/98                                CARL'S COOKIES COMPANY                                RELEASE 6.3
TIME 14:06:05                                ORDER STATUS SELECTION

CUSTOMER NAME                                ORDER NUMBER    STATUS           AMOUNT
- JOHN SMITH                                100-120-15      ON ORDER        17.90
- BILL JONES                                100-205-12      SHIPPED         22.67
- SUE WILLIAM                                100-271-15      ON ORDER        34.30

RECORD: 5                                ENTER
```

This output screen was printed in Display format with the default options:

```
08/14/1998                                CA-VERIFY VERSION 1.4                                PAGE 5
10:56:18                                                                CCC.ORDERAPP.001

DATE 07/10/98                                CARL'S COOKIES COMPANY                                RELEASE 6.3
TIME 14:06:05                                ORDER STATUS

CUSTOMER NAME: JOHN SMITH
STATUS: O N ORDER

ITEM# DESCRIPTION    QUANTITY    PRICE    AMOUNT
137  CHOC CHIP        1 IE        5.00     5.00
474  OATMEAL RSN      2 IE        5.00     10.00

SUBTOTAL:                                15.00
TAX:                                       .90
SHIPPING & HANDLING                        2.00
TOTAL:                                       17.90

RECORD 6
```

This screen was printed in Display format with the Shrink, Nocenter, Stats, Noframe, and Nocursor options:

```

06/14/1998                CA-VERIFY VERSION 1.4                CCC.ORDERAPP.001
10:59:21

RECORD:      1                TRAN:MCCC                DATA LENGTH:  7
TYPE:        INPUT            TIME:06/02/1998 13:18:56  SCREEN SIZE:   24 BY 80
OPERATION:   READ MODIFIED    CURSOR OFFSET:  4 ROW:  1 COL:  5  TERM.NAL:     A60L2048
AID:         ENTER            THINK          00:00:38.057

MCCC
                                1
                                ENTER

RECORD:      2                TRAN:MCCC                DATA LENGTH: 266
TYPE:        OUTPUT           TIME:06/02/1998 13:18:56  SCREEN SIZE:   24 BY 80
OPERATION:   ERASE/WRITE      TERM.NAL:     A60L2048
WCC:         NL/EM-OR PRINT CNL,  KEYBOARD RESTORE  RESPONSE      00:00:00.002

DATE:06/02/1998            CAROL'S COOKIES COMPANY  RELEASE 6.2      1
TIME 13:18:56              MAIN MENU           2
ENTER OPTION:              7
    1) PLACE AN ORDER      10
    2) CHECK STATUS OF AN ORDER 12

RECORD:      3                TRAN:MCCC                DATA LENGTH: 13
TYPE:        INPUT            TIME:06/02/1998 13:19:26  SCREEN SIZE:   24 BY 80
OPERATION:   READ MODIFIED    CURSOR OFFSET: 495 ROW:  7 COL:15  TERM.NAL:     A60L2048
AID:         ENTER            THINK          00:00:35.017

DATE:06/02/1998            CAROL'S COOKIES COMPANY  RELEASE 6.2      1
TIME 13:18:56              MAIN MENU           2
ENTER OPTION: 2            7
    1) PLACE AN ORDER      10
    2) CHECK STATUS OF AN ORDER 12
                                .
                                .
                                .
    
```

This input screen was printed in Field format with the default options:

```

06/14/1998                CA-VERIFY VERSION 1.4                CCC.ORDERAPP.001
11:00:59

RECORD      3                DATA LENGTH 13
TYPE:       INPUT            TRAN: MCCC    SCREEN SIZE: 24 BY 80
OPERATION:  READ MODIFIED    TIME: 06/02/1998 13:18:56  TERM.NAL:   A60L2048
AID:       ENTER            CURSOR OFFSET:  4 ROW:   COL:  5  THINK      00:00:38.057

ORDER  ATTR  ROW  COL.....|.....|.....|.....|.....|.....
SEA   1     72  3  6.2
SEA   7     16  1  2
    
```


This screen was printed with Applied Rules:

08/14/1998 11:16:18	CA-VERIFY VERSION 1.4				PAGE 5 CCC.ORDERAPP.002																
DATE 07/10/98 TIME 14:06:05		CAROL'S COOKIES COMPANY ORDER STATUS SELECTION		RELEASE 6.3																	
<table border="1"> <thead> <tr> <th>CUSTOMER NAME</th> <th>ORDER NUMBER</th> <th>STATUS</th> <th>AMOUNT</th> </tr> </thead> <tbody> <tr> <td>_ JOHN SMITH</td> <td>100-120-15</td> <td>ON ORDER</td> <td>17.90</td> </tr> <tr> <td>_ BILL JONES</td> <td>100-205-12</td> <td>SHIPPED</td> <td>22.67</td> </tr> <tr> <td>_ SUE WILLIAMS</td> <td>100-271-15</td> <td>ON ORDER</td> <td>34.30</td> </tr> </tbody> </table>						CUSTOMER NAME	ORDER NUMBER	STATUS	AMOUNT	_ JOHN SMITH	100-120-15	ON ORDER	17.90	_ BILL JONES	100-205-12	SHIPPED	22.67	_ SUE WILLIAMS	100-271-15	ON ORDER	34.30
CUSTOMER NAME	ORDER NUMBER	STATUS	AMOUNT																		
_ JOHN SMITH	100-120-15	ON ORDER	17.90																		
_ BILL JONES	100-205-12	SHIPPED	22.67																		
_ SUE WILLIAMS	100-271-15	ON ORDER	34.30																		
RECORD: 4			RUN OPTION: 1																		
APPLIED RULES	OBJECT	TYPE	ROW	COL	LEN	OP	VALUE FROM THE MODEL SCREEN/DESCRIPTION														
	RULESET	T/S					CCC.ORDERAPP.001														
	RULE						RUL00001														
	FLD-RECOG		1	30	23	EQ	CAROL'S COOKIES COMPANIES														
	CHANGED OUT		1	74	1	3															
	VARIABLE OUT		1	7	8		06/02/98														
	VARIABLE OUT		2	7	8		13:23:43														

The next screens printed contain Differences:

08/14/1998 11:16:18 EXPECTED	CA-VERIFY VERSION 1.4	PAGE 4 CCC.ORDERAPP.444
	DATE 07/10/98 CAROL'S COOKIES COMPANY RELEASE 6.3 TIME: 14:06:05 MAIN MENU ENTER OPTION: 1) PLACE AN ORDER 2) CHECK STATUS OF AN ORDER	
	RECORD: 2	RUN OPTION: 7
CURRENT	DATE 08/14/98 CAROL'S COOKIES COMPANY RELEASE 6.3 TIME: 11:14:05 MAIN MENU ENTER OPTION: 1) PLACE AN ORDER 2) CHECK STATUS OF AN ORDER	
	RECORD: 2	RUN OPTION: 7

08/14/1998 11:16:18 ROW: 1	CA-VERIFY VERSION 1.4	PAGE 5 CCC.ORDERAPP.444
EXPT: .DATE.07/10/98	.CAROL'S COOKIES COMPANY	.RELEASE.6.3
CURR: .DATE.08/14/98	.CAROL'S COOKIES COMPANY	.RELEASE.6.3
DIFF: X XX		
ROW: 2		
EXPT: .TIME.14:06:05	.MAIN MENU	
CURR: .TIME.11:14:05	.MAIN MENU	
DIFF: X XX		

Print Test Streams and Rulesets

Use the Print function to print test streams and rulesets from the data set allocated to TCADSIN.

Specify the Print card in the SYSIN DD data set. The format is:

PRINT

One or more Select cards should follow the Print card. See the section, [Select Test Streams and Rulesets to Copy, Print, and Delete](#) (see page 278) earlier in this chapter for details. You can also specify one or more Terminals cards to indicate which terminals are to be printed. See [Select Terminals for Copy and Print Functions](#) (see page 279) earlier in this chapter for details.

For each *test stream* selected, the Print function lists directory information, terminal status information, and the screens. See the chapter "Browse Function" for an explanation of directory and terminal status information.

For each *ruleset* selected, a summary like the Rules—Summary panel shown in the chapter "Rules Function" will be printed. See the chapter "Rules Function" for an explanation of the rules information.

Parameters for the Print function follow. All of the following parameters see how the *test stream* will be printed. Mutually exclusive parameters are separated by slashes, with the default listed first. If mutually exclusive parameters are specified, CA Verify for VTAM uses the parameter specified last. Overrides to defaults remain in effect until CA Verify for VTAM encounters the next Print card. However, consecutive Print cards are considered a continuation and overrides remain in effect.

Format Parameters

DISPLAY/DUMP/FIELD

Specifies screen format.

Display

The screen appears as it appeared at the terminal during logging — for 3270 non-graphic test streams.

Dump

The screen appears in dump format — for test streams created at any terminal. Minimal formatting is provided. The header information includes the record number, data length, terminal name, and so on, followed by the data stream sent to or received from the terminal. If specified or left as the default, the hexadecimal translation of the data stream appears. For 3270 test streams, the data stream includes the Write Control Character (WCC) for output screens and the attention identifier (AID) and cursor location for input screens.

Field

Each field in the data stream is listed on a separate line — designed for 3270 graphic or non-graphic test streams, but supports any terminal.

See the chapter "Run Function" for a detailed description of the different formats.

Note: You can specify Display format even if a test stream has mixed terminal types. When necessary, the Print function will print screens in Field or Dump format.

General Parameters

The following parameters apply to all three formats.

RULER/NORULER

Determines whether or not a column number ruler should be printed for the terminal control table user area and data in Field and Dump formats.

Ruler

A ruler is printed

Noruler

A ruler is not printed

NOHEX/HEX

Specifies whether or not the hexadecimal equivalent of each character should be printed on the next two lines for the terminal control table user area and data in Field and Dump formats.

Nohex

The hex equivalent is not printed. This is the default for Display and Field formats.

Hex

The hex equivalent is printed. This is the default for Dump format.

NOINPUT/NOOUTPUT

Controls whether input or output screens are printed.

Noinput

Only output screens are printed.

Nooutput

Only input screens are printed.

If this parameter is omitted, both input and output screens are printed.

Sample JCL

Use JCL similar to the following example to log test streams in batch.

```
//TCABATCH      EXEC    PGM=TCABATCH,REGION=4096K,PARM='CONTROL'  
//STEPLIB      DD      DISP=SHR,DSN=VTAM.TCA.LOADLIB  
//TCADS DD      DISP=SHR,DSN=VTAM.TCADS  
//SYSPRINT     DD      SYSOUT=A  
//TCAPRINT     DD      SYSOUT=A  
//TCASNAP      DD      SYSOUT=A  
//SYSIN DD     *  
APPLLIST TEST01 TEST02 TEST03  
DESC1 STRESS TEST OF THREE APPLICATIONS  
LOG TCADS.TEST.STRESS.001 PROTECTION(R) INTERRUPT(NONE) INCLUDE  
/*
```

In this example:

- The APPLLIST statement identifies the applids that will be included in the log.
- The DESC1 statement describes the test stream.
- The LOG statement specifies:
 - the name of the logged test stream
 - read protection for the test stream
 - that logging begin when the current session ends
 - that the applids listed in the APPLLIST statement be logged

Merge Terminals into a Test Stream

Follow these steps:

1. Type M on the Utilities or Test Stream Selection menu.

CA Verify for VTAM displays the Merge menu.

Note: If the test streams being merged have associated rulesets, then the rulesets are also merged.

```
CCC.ORDERAPP.001 ----- MERGE -----10:17:55
ENTER COMMAND ==>                                     UV

TEST STREAM TO BE MERGED INTO THE OUTPUT TEST STREAM:
DNAME      ==> TCADS
APPLICATION ==> CCC          (LEAVE APPLICATION, MEMBER,
MEMBER      ==> ORDERAPP      OR VERSION BLANK AND PRESS
VERSION     ==> 001          ENTER FOR A SELECTION LIST)

OUTPUT TEST STREAM: TCADS.CCC.ORDERAPP.002

OPTIONS:
BEGIN MERGE AT OUTPUT TEST STREAM RECORD ==> 000001      (1-999999)
INCLUDE RULESET                          ==> Y          (Y/N)
ADJUST THINK TIMES                        ==> NO         (Y/N)

F1-HELP   F3-END   F4-RETURN
```

The Merge utility merges terminals and their records from a test stream into the test stream you identified on the Utilities or Test Stream Selection menu. You can merge records from a test stream into the same test stream or into a different test stream.

The new records are interspersed among the existing records in the test stream. CA Verify for VTAM calculates the position for each record to be merged as follows:

- First, CA Verify for VTAM calculates its offset from the beginning of the test stream (think times plus response times for the terminal).
- Then, CA Verify for VTAM inserts the record at the corresponding offset in the test stream into which it is being merged.

You can modify the record's placement by specifying a record number after which the new records should be interspersed. You can also adjust the think times of the merged records.

Merging records is an excellent way of creating different testing situations. For example, you can merge a test stream with itself for concurrency testing. Or, you can merge several test streams to create a large test stream for stress testing.

TEST STREAM TO BE MERGED INTO THE OUTPUT TEST STREAM

The name of the test stream which is the source of the merged records.

If you leave the Application, Member, or Version fields blank, CA Verify for VTAM displays the Test Stream Selection menu. Type S to the left of the test stream you want to select and press Enter. See the screen earlier in this chapter.

OUTPUT TEST STREAM:

Identifies the name of the output test stream. This is the name you specified on the Utilities or Test Stream Selection menu.

BEGIN MERGE AT OUTPUT TEST STREAM RECORD

The record in the output test stream after which the records should be merged. The default is the first record. Specify a record number to indicate the point in the test stream at which CA Verify for VTAM should begin interspersing the merged records.

INCLUDE RULESET

Indicates whether the ruleset from the source test stream should be merged into the target test stream. Y, the default, merges the ruleset; N does not.

ADJUST THINK TIMES

Enter Yes if the two test streams are of different durations and you want them to be the same. CA Verify for VTAM will adjust the think times of the test stream to be merged so it is approximately as long as the test stream into which it is being merged.

2. Press Enter when you have completed the specifications.
 - If necessary, CA Verify for VTAM displays the Terminal Selection menu. See the [Select Terminals](#) (see page 254) section.
 - Otherwise, CA Verify for VTAM displays the Merge Status menu. See the [Review the Merge Status](#) (see page 254) section.

Select Terminals

If the test stream to be merged is a multiple terminal test stream, CA Verify for VTAM displays the Terminal Selection menu. See the section Copy a Test Stream for a description of this menu.

Follow these steps:

1. Type S to the left of each terminal you want to select and use the End (PF3) command. You must select at least one terminal.
2. Type in I to the left of each terminal for which you want to view Initial Terminal Status information and press Enter. See the the "Browse Function" chapter for an explanation of the Initial Terminal Status menu. When you exit from the Initial Terminal Status menu, CA Verify for VTAM redisplay the Terminal Selection menu.
3. Use CA Verify for VTAM commands as follows:

Assign

Insert S to the left of every terminal

Reset

Insert _ (the initial setting) to the left of every terminal

Up (PF7) and Down (PF8)

View additional terminals which don't appear on the initial menu

Cancel

Cancel the merge

Review the Merge Status

After you specify the Merge information, CA Verify for VTAM displays the Merge Status menu.

```
CCC.ORDERAPP.001 ----- MERGE: STATUS -----10:18:55
ENTER COMMAND ==>                                     UX

FROM CCC.ORDERAPP.001      FROM CCC.ORDERAPP.001      OUTPUT TERMINAL
TERMINAL                   TERMINAL                   ==> NN01
NN01                       NN01                       ==> NN02

F1-HELP   F3-END   F4-RETURN   F7-UP   F8-DOWN
```

- The first From column identifies terminals from the *to* test steam.
- The second From column identifies terminals from the source test stream.
- The Output Terminal column names the output terminals.

If the specifications are correct, use the End (PF3) command to perform the merge and save the output test stream. CA Verify for VTAM merges the test streams and redisplay the Utilities or Test Stream Selection menu, along with a message.

If any of the terminals in the test stream to be merged have the same name as a terminal in the test stream into which they are being merged, CA Verify for VTAM assigns a new name to be used for that terminal in the output test stream. The new name appears in the Output Terminal column.

You can change the name of any terminal listed on the Merge Status menu; however, *each name must be unique*.

Use the commands as follows:

Up (PF7) and Down (PF8)

Scroll through the terminal list

Cancel

Cancel the merge

Merge Considerations

When CA Verify for VTAM runs multiple terminal test streams, it recreates, as much as possible, the same concurrences and order of events that existed when the test stream was originally logged.

During logging, CA Verify for VTAM records input and output screens in the order in which they pass through terminal control. During a run, input screens are transmitted in the same order in which they were logged. The application controls the order of outputs, but each time CA Verify for VTAM finds an output screen in the test stream, it waits for the application to write an output screen before transmitting subsequent input screens.

This method ensures that multiple terminal test streams produce consistent results. When you merge test streams, you must make sure that the new order of events represents a possible one. Failure to do so may cause mismatches, missing output, or a *deadly embrace* situation when you run the new test stream.

Convert a Test Stream to a REXX Script

Follow these steps:

1. While using the CA Verify for VTAM TSO interface, type X on the Utilities or Test Stream Selection menu.

CA Verify for VTAM displays the Convert Test Stream to REXX menu.

```

ASMDemo.OPTION1.001 ----- CONVERT TO REXX -----17:14:50
ENTER COMMAND=>                                         UE

TEST STREAM TO CONVERT: TCADS.ASMDEMO.OPTION1.001

REXX SCRIPT FILE:
  DATA SET NAME  =>'USER02.VERIFY.SCRIPT'
  MEMBER NAME    =>          (BLANK OR PATTERN FOR MEMBER SELECTION LIST)

OPTIONS:
  APPLID         =>          (LOGON APPLID)
  SCREEN LINES   =>03       (# OF SCREEN LINES TO INCLUDE: 0-43)
  PROTECT TARGET =>N        (Y/N)
  SHARE PDS      =>N        (Y/N)
  DELAYS         =>Y        (Y/N)

ACTIVE PASSWORD SECURITY:
  CAPTURE FORMAT . . .TOKEN      USERID . . . . .RYAR002

F1-HELP      F3-END      F4-RETURN
    
```

TEST STREAM TO CONVERT

Identifies the name of the test stream to be converted. This is the name you specified on the Utilities or Test Stream Selection menu.

DATA SET NAME

The data set name of the file in which to store the converted REXX script. The data set may be sequential or partitioned (PDS or PDSE) and must be catalogued, with a fixed record format and an 80-byte record length, The default value is userid.VERIFY.SCRIPT Modify the name as you wish.

MEMBER NAME

The name of the REXX script member if the data set is partitioned (PDS or PDSE). It is blank by default. Specify the name of the REXX script to which the test stream will be converted, or leave the field blank for a member selection list.

APPLID

The logon APPLID for the VTAM region on which the converted REXX script will be executed. It is blank by default. If no APPLID is specified, the LOGON statement is generated as "LOGON '?????'" in the REXX script. The question marks will need to be replaced with a valid APPLID before the script can be executed.

SCREEN LINES

The number of lines from each screen image to be included as comments in the REXX script. The default value is 3. Enter a value from 0 to 43.

PROTECT TARGET

Indicates whether a REXX script should be protected if it already exists in the script file. The default value is 'N'. Enter 'Y' to prevent an existing REXX script from being overlaid.

SHARE PDS

Indicates whether multiple jobs and users can write to the same script file at the same time, if the script file is a PDS. The default value is 'N'. Enter 'Y' to share the script file PDS.

DELAYS

Indicates whether "DELAY" statements, which represent "user think time" should be included in the converted REXX script. The default value is 'Y'. Enter 'N' to omit "DELAY" statements.

CAPTURE FORMAT

The active password capture format used when converting a test stream to a REXX script. The password capture format may be modified from the REXX Password Security panel, or by updating and assembling default options member, VTEOT.

USERID

The active userid. This is a display field only and cannot be modified.

2. If the REXX script file is a PDS and you leave the member name blank, CA Verify for VTAM displays the Member Selection menu.

```
----- UTILITIES: MEMBER SELECTION -----14:51:19
ENTER COMMAND ==>
DATA SET NAME: 'USER02.VERIFY.SCRIPT'
S-SELECT

  NAME          MESSAGE      SIZE  CREATED    CHANGED    ID
- BASIC
- CA31
- DEMA
- ISPF342
- TEST
- TS01
- END OF DIRECTORY

F1-HELP      F3-END      F4-RETURN   F7-UP      F8-DOWN
```

Select a member by typing S to the left of the member name and press Enter

Note: When converting a test stream to REXX the goal is to create a script that can be executed without changes. However the script may not exactly match everything that is in a test stream.

CA Verify for VTAM logging normally starts at a clear screen and when executed, they will be presented with the site's "Welcome to VTAM" screen. To resolve this, conversion will create a TYPE CLEAR statement that is not in the original test stream.

INVITE statements are required when an application unlocks the keyboard, but may subsequently send more output before input keystrokes are expected. Technically this is a between bracket issue. For example, this sometimes occurs during a TSO logon. The conversion creates INVITE statements as required, based on the converted test stream. However, since the number of outputs sent in this condition may vary, the script may have too many or too few INVITE statements.

An INVITE functions as a WAIT, and may slow the execution down if too many are coded.

Secure Data in a REXX Script

If passwords were captured in REXX scripts converted from test streams or if passwords were coded in user written scripts or execs, then the REXX script would contain visible passwords that could be used to gain unauthorized access to protected system resources.

CA Verify for VTAM provides two password security options that allow passwords to be captured and used by CA Verify for VTAM REXX scripts while not being disclosed to or used by anyone other than their owners. There is also a third option, in which actual passwords are captured and are visible in converted REXX scripts. This option should only be used for test systems that do not need to be secure.

Token Security

Token Security captures symbolic password tokens instead of passwords in REXX scripts converted from test streams and allows the scripts to enter tokens instead of passwords to sign on.

Code Security

Code Security captures encoded password codes instead of passwords in REXX scripts converted from test streams and allows the scripts to enter codes instead of passwords to sign on.

Password Security

Password Security captures actual passwords in REXX scripts converted from test streams. This means that the passwords are visible in the scripts. This option should only be used on test systems which do not need to be secure.

The following topics discuss these security measures.

Token Security

Token Security is a password encryption system that allows CA Verify for VTAM test streams that have been converted to REXX scripts to use passwords. A token protects test streams from being disclosed to or used by anyone other than their owner.

Token Security works with RACF, ACF2, CA Top Secret or any other security system that reliably establishes the user ID that owns address spaces in which CA Verify for VTAM is used in the manner prescribed by the z/OS System Authorization Facility (SAF).

- A password is any value entered in a non-display screen field.
- A token is a name that may be used in CA Verify for VTAM REXX scripts to enter a user's password.

Token Security may be used to capture tokens instead of passwords when a CA Verify for VTAM test stream is converted to REXX.

When a CA Verify for VTAM test stream is converted to REXX using Token Security and a password is encountered, the password is replaced by a token in the REXX script. The token and encrypted passwords are stored in the user's profile. The token is either an existing token for the password found in the user's profile or a new token that is automatically created for the password.

When a new token is created for a user:

- A unique name is selected to use as the new token.
- A profile is created for the user, if needed, to store private data.
- The password is combined with the user ID that owns the address space.
- The combined password and user ID is encrypted.
- The new token and the encrypted data are stored in the user's profile.
- A token library is created for the user, if needed, to store token screens.
- An image of the screen that contains the password field is stored as a token screen.
- If the password was entered by a person and system options specify password capture notification, the user is notified that a password was captured.

A TOKEN footnote identifies each token captured in a converted screen image. The footnote in the following example identifies a captured token, UID1A, at screen row 8, column 20.

```
+Session Step(VTERM001 ENTER--> A31ITS0) Cursor(8,20) -----
|----- TSO/E LOGON -----
|
|
| .Enter LOGON parameters below:
|
| . Userid   ==>.BUCBR01.
|
| . Password ==>.USER02A.
|
+- TOKEN AT <8 20> -----
```

The CA Verify for VTAM TYPE command TOKEN keyword identifies a token in a converted or user-written REXX script. For example:

```
" TYPE <8,20> TOKEN 'UID1C' ",
" <8,24> ENTER "
```

When a CA Verify for VTAM REXX script is used to create a session and a token is used to enter a password, the user ID that owns the address space is used to decrypt the token data retrieved from the user's profile. The correct password can be recovered from the token data only in an address space owned by the user id that was used to encrypt the password.

Token Security not only allows CA Verify for VTAM REXX scripts to enter correct passwords that are not seen in the scripts, but also ensures that passwords represented by tokens are used only by their owners.

Token Security provides other safeguards that protect passwords from accidental disclosure, protect passwords sent by online systems to terminals, and protect passwords while they are in memory.

- To prevent accidental disclosure of passwords that could occur if tokens were incorrectly typed in display fields, the CA Verify for VTAM TYPE command does not allow tokens to be typed into display fields.

- Some widely-used security systems and session managers rely on 3270 non-display fields to hide displayed passwords and use them not only as password input fields, but also use both modifiable and protected non-display fields for other purposes.

Examples:

- A session manager that supports concurrent virtual sessions with multiple online systems remembers passwords when users sign on to the session manager. Subsequently, when a user selects a system from a session manager menu, the session manager starts a virtual session with the system. When the selected system sends a sign on display to the virtual terminal, the session manager fills in the non-display password input field for the user before sending the sign on display to the real terminal, allowing the user to simply press the enter key to sign on to selected systems.
- One security system is known to save passwords in protected non-display fields. When a user enters a current password and a new password to change passwords, the system sends a verify-password display that saves the user's password in a protected non-display field. When the new password is re-entered by the user, both the saved password and the re-entered password are sent to the system. Like many security systems, the system views all passwords as uppercase characters, and the password saved in the protected non-display field reflects its uppercase standard, even though it was entered by the user as lowercase characters.
- When a user enters a password to sign on, another security system responds by sending only a protected non-display attribute that replaces the modifiable non-display attribute of the password input field and leaves the password in the display.

When CA Verify for VTAM test streams are converted to REXX, screen images are captured that show each request sent by a user to a system and each response sent by the system to the terminal. To protect all passwords in captured data regardless of who sent them, Token Security replaces all data in modifiable non-display fields with tokens, and replaces data in protected non-display fields with tokens, if the data or a lower case version of the data matches a password referred to by any existing user token.

View and Modify a Token

If a password is changed, and token security is used, then the token value (password) must be changed to the new password using the Token Security Panel. You can view and modify tokens from the Utilities menu of the TSO interface.

Note: The Token Security panel is not accessible through the VTAM interface.

Follow these steps:

1. Type U on the Primary Options Menu of the CA Verify for VTAM TSO interface.
CA Verify for VTAM displays the Utilities menu.

```

----- UTILITIES -----13:50:35
ENTER COMMAND ==>
                                U1

C COPY A TEST STREAM           A APPEND RECORDS TO A TEST STREAM
R RENAME A TEST STREAM         I INSERT RECORDS INTO A TEST STREAM
D DELETE A TEST STREAM         M MERGE TERMINALS INTO A TEST STREAM
U UPDATE A TEST STREAM DIRECTORY X CONVERT A TEST STREAM TO REXX
                                S SECURE DATA IN A REXX SCRIPT

ENTER TEST STREAM NAME:
DDNAME ==> TCADS
APPLICATION ==> CCC           (LEAVE APPLICATION, MEMBER,
MEMBER ==> ORDERAPP          OR VERSION BLANK AND PRESS
VERSION ==> 002              ENTER FOR A SELECTION LIST)

F1-HELP      F3-END      F4-RETURN

```

2. Select option S. The Token Security panel displays if token security is active for the user. If the token security is not active, display the token security panel by typing 'T' on the command line of the displayed security panel and hit Enter. The token security panel follows:

```

----- REXX TOKEN SECURITY -----15:42:02
ENTER COMMAND ==>                                     UT

      C  CODE SECURITY                                P  PASSWORD SECURITY

BLANK  CREATE A NEW TOKEN OR UPDATE AN EXISTING TOKEN
      D  DELETE A TOKEN

TOKEN FILE:
DATA SET NAME ==> 'USER02.VERIFY.TOKEN'
MEMBER NAME   ==>          (BLANK OR PATTERN FOR MEMBER SELECTION LIST)
                                     (SELECT CODES: S – SELECT, D – DELETE)

ACTIVE PASSWORD SECURITY:
CAPTURE FORMAT ==> TOKEN   (OPTIONS: TOKEN, CODE, PASSWORD)
USERID . . . . . USER02

```

DATA SET NAME

Specify the data set name of the token file. The data set must be partitioned (PDS or PDSE), with a fixed record format and a 135-byte record length. The default value is userid.VERIFY.TOKEN.

MEMBER NAME

Specify the name of the REXX token member. It is blank by default. Specify a member name or leave the member name blank for a member selection list.

CAPTURE FORMAT

Displays the active password capture format used when converting a test stream to a REXX script. If options are listed following the Capture Format field, a listed option may be entered to change the active capture format.

The capture format controls password security for all CA Verify REXX scripts for the user, regardless of when the scripts were created.

USERID

The active userid. This is a display field only and cannot be modified.

You can perform the following actions on this screen.

- To update a token specify the name of the member in the token file and hit Enter. Alternately, leave the member name blank, or specify a pattern to display a member list.
- To create a new token from an existing token, specify the dataset name and member name of the existing token and hit Enter. The member name may be left blank, or a pattern may be specified, to display a member list.
- To delete a token enter a 'D' on the command line and specify the name of the token file member, then hit Enter. The member name may be left blank, or a pattern may be specified, to display a member list.

- To change the active capture format for the userid, specify one of the listed capture format options and hit Enter. The new capture format is stored in the user's profile and the panel for the specified capture format is displayed.
- To display the code or password security panel without changing the active capture format, type 'C' or 'P' on the command line and hit Enter.

Note: The code security and password security options are displayed below the command line if they are available. The options are available if the settings in the REXX options table allow them.

- If the member name is left blank, or a pattern is specified, the following Member Selection List is displayed:

```

----- UTILITIES: MEMBER SELECTION -----20:30:32

ENTER COMMAND ==>
DATA SET NAME: 'USER02.VERIFY.TOKEN'
S-SELECT  D-DELETE

   NAME          MESSAGE      SIZE  CREATED      CHANGED      ID
-  USER02A
-  USER02D      00318  2012/08/14  2012/08/15  22:14  USER02
-  USER02H      00079  2012/07/23  2012/07/27  22:07  USER02
-  USER02L      00060  2012/07/23  2012/07/23  22:14  USER02
-  USER02P      00180  2012/07/23  2012/07/24  17:22  USER02
-  USER02R      00095  2012/07/16  2012/07/25  22:06  USER02
-  USER02S      00265  2012/07/14  2012/07/24  17:10  USER02
-  USER02V      00181  2012/07/21  2012/07/25  22:43  USER02

```

- To display the original input screen for which the token was created, select a member and hit Enter.
- To delete a token, type 'D' in the field to the left of the member name and hit Enter.

Example: Screen for a Token for a Script which logs on to a TSO Session

If the token was created for a script which logs on to a TSO session, the original screen looks like the following:

```

----- TSO/E LOGON -----
TCA0579 - PRESS ENTER TO PROCEED OR PF3 TO CANCEL.

Enter LOGON parameters below:                RACF LOGON parameters:

Userid  ==> USER1
Password ==>
Procedure ==> TSOPROC                        Group Ident ==>
Acct Nmbr ==> 123456789
Size    ==> 4096
Perform ==>
Command ==>

Enter an 'S' before each option desired below:
      S -Nomail      S -Nonotice      S -Reconnect      -OIDcard

PF1/PF13 ==> Help  PF3/PF15 ==> Logoff  PA1 ==> Attention  PA2 ==> Reshow
You may request specific help information by entering a '?' in any entry field
    
```

Hit Enter to proceed to the 'Change Token' screen, the 'Create token' screen or the 'Confirm Delete' screen.

Example: Change Token screen

```

----- CHANGE TOKEN -----16:16:13
ENTER COMMAND ==>
US

TOKEN FILE:
DATA SET NAME . . . 'USER02.VERIFY.TOKEN'
MEMBER NAME . . . . USER02B

ENTER A NEW PASSWORD TO CHANGE THE TOKEN.

NEW PASSWORD ==>
CONFIRM PASSWORD ==>
    
```

To update the token, specify a new password in the non-display 'New Password' and 'Confirm Password' fields and hit Enter.

Example: Create Token screen

```

----- CREATE TOKEN -----16:16:13
ENTER COMMAND ==> US

TOKEN FILE:
DATA SET NAME . . . 'USER01.VERIFY.TOKEN'
MEMBER NAME . . . . USER01A

ENTER A NEW PASSWORD TO CHANGE THE TOKEN.

NEW PASSWORD ==>
CONFIRM PASSWORD ==>

```

To create a new token, specify a password in the non-display 'New Password' and 'Confirm Password' fields and hit Enter.

Example: Confirm Delete screen

```

----- CONFIRM DELETE -----16:22:55
ENTER COMMAND ==> US

TOKEN TO BE DELETED:
DATA SET NAME . . . 'USER02.VERIFY.TOKEN'
MEMBER NAME . . . . USER02A

      SET TOKEN DELETE CONFIRMATION OFF? N (Y/N)

PRESS ENTER TO CONFIRM DELETE.
PRESS END OR RETURN TO CANCEL DELETE.

```

Hit Enter to delete the token. You can set delete confirmation off for the session by specifying 'Y' in the 'Set Token Delete Confirmation Off?' field.

Code Security

Code Security is a password encoding system that allows the CA Verify for VTAM REXX component to capture and use passwords while ensuring that they are not disclosed to or used by anyone other than their owner.

Code Security provides effective password protection when:

- A security system is active that reliably establishes the user ID that owns address spaces in which CA Verify for VTAM is used, in the manner prescribed by the z/OS System Authorization Facility (SAF).
- User IDs are 2 through 8 contiguous alphanumeric and national characters (@, #, and \$).
- Passwords are 3 through 8 contiguous alphanumeric and national characters, can be entered as mixed case characters, and are the first non-null data entered into non-display screen fields.

When a CA Verify for VTAM test stream is converted to REXX using Code Security and a password was used in the test stream, the password is replaced by a code in the session data for the REXX script. A code is the encoded value of a password combined with the user ID of the person who owns the password.

The CA Verify for VTAM TYPE command CODE keyword identifies a password code in a captured or user-written REXX exec. For example:

```
" TYPE <8,20> CODE '1SJP' ", "  
<8,24> ENTER "
```

To prevent accidental disclosure of passwords that could occur if codes were incorrectly typed in display fields, the CA Verify for VTAM TYPE command for REXX does not allow codes to be typed into display fields.

When a CA Verify for VTAM REXX script creates a session and uses a password code to sign on, the code is decoded using the user ID that owns the address space. The correct password can only be recovered from a code in an address space owned by the owner of the code. Because password codes can be seen without disclosing the password encoded and because they can be used only by their owner, codes are not confidential information.

If a password is captured as a code, and system options require password capture notification, the user is notified that a password was captured.

Update Codes When Password Changes

The Code Security Panel is used to create codes to be used in REXX scripts to enter passwords. Because a code contains a password, if a REXX script uses a code for a password and the password is changed, the code must be replaced by a code for the new password, wherever the old code is used.

You can create a new code from the Utilities menu of the TSO interface.

Note: The Code Security Panel is not accessible through the CICS interface.

Follow these steps:

1. Type U on the Primary Options Menu of the CA Verify for CICS TSO interface.

```

CA Verify for CICS displays the Utilities menu.
----- UTILITIES -----13:50:35
ENTER COMMAND ==>                                     U1

      C COPY A TEST STREAM                A APPEND RECORDS TO A TEST STREAM
      R RENAME A TEST STREAM              I INSERT RECORDS INTO A TEST STREAM
      D DELETE A TEST STREAM              M MERGE TERMINALS INTO A TEST STREAM
      U UPDATE A TEST STREAM DIRECTORY    X CONVERT A TEST STREAM TO REXX
                                          S SECURE DATA IN A REXX SCRIPT

ENTER TEST STREAM NAME:
DDNAME   ==> TCADS
APPLICATION ==> CCC                (LEAVE APPLICATION, MEMBER,
MEMBER   ==> ORDERAPP              OR VERSION BLANK AND PRESS
VERSION  ==> 002                    ENTER FOR A SELECTION LIST)

F1-HELP      F3-END      F4-RETURN

```

2. Select option S. The Code Security panel displays if code security is active for the user. If code security is not active, display the code security panel by typing 'C' on the command line of the displayed security panel and hit Enter.

The code security panel displays:

```

----- REXX CODE SECURITY -----15:42:02
ENTER COMMAND ==> UC
      T      TOKEN SECURITY          P      PASSWORD SECURITY

PASSWORD/DATA TO ENCODE ==>
CODE FOR USERID          ==> USER02

ACTIVE PASSWORD SECURITY:
  CAPTURE FORMAT ==> CODE  (OPTIONS: TOKEN, CODE, PASSWORD)
  USERID . . . . . USER02
    
```

PASSWORD/DATA TO ENCODE

A non-display field used to enter a password or other confidential data to encode.

CODE FOR USERID

The user ID for which the password is encoded. This field is available only if the CA Verify for VTAM REXX options allow codes to be created for use by other user IDs.

CAPTURE FORMAT

The active password capture format used when converting a test stream to a REXX script. If options are listed following the Capture Format field, a listed option may be entered to change the active capture format.

The capture format controls password security for all CA Verify REXX scripts for the user, regardless of when the scripts were created.

USERID

The active user ID. This is a display field only and cannot be modified.

You can perform the following actions on this screen:

- To create a code for password data, enter a password, or other confidential data, in the non-display 'Password/Data to Encode' field and hit Enter.
- To create a code for password data for another user ID enter a password, or other confidential data, in the non-display 'Password/Data to Encode' field and enter the user ID in the 'Code for userid' field and hit Enter.
- To change the active capture format for the user ID, specify one of the listed capture format options and hit Enter. The new capture format is stored in the user's profile and the panel for the specified capture format is displayed.

- To display the token or password security panel without changing the active capture format, type 'T' or 'P' on the command line and hit Enter.

Note: The token security and password security options are displayed below the command line if they are available. The options are available if the settings in the REXX options table allow them.

Password Security

Password security neither encrypts nor encodes passwords. It is equivalent to having no security. When a CA Verify test stream is converted to REXX using Password Security and a password was used in the test stream, the actual password is used in the session data for the REXX script and is visible to anyone with the authority to browse or edit the script.

Important! Password security should only be used on test systems which do not require security.

If password security is active, the following panel displays:

```

----- REXX PASSWORD SECURITY -----15:16:45
ENTER COMMAND ==>
          T  TOKEN SECURITY          C  CODE SECURITY

WARNING:

REXX PASSWORD SECURITY IS NOT ACTIVE WHILE THE FORMAT IS "PASSWORD".
IF YOU CONVERT A TEST STREAM TO REXX, THE ACTUAL PASSWORD WILL BE
VISIBLE IN THE REXX SCRIPT.

ACTIVE PASSWORD SECURITY:
CAPTURE FORMAT ==> PASSWORD (OPTIONS: TOKEN, CODE, PASSWORD)
USERID . . . . . USER02

```

CAPTURE FORMAT

The active password capture format used when converting a test stream to a REXX script. If options are listed following the Capture Format field, a listed option may be entered to change the active capture format.

The capture format controls password security for all CA Verify REXX scripts for the user, regardless of when the scripts were created.

USERID

The active user ID. This is a display field only and cannot be modified.

You can perform the following actions on this screen.

- To change the active capture format for the user ID, specify one of the listed capture format options and hit Enter.

The new capture format is stored in the user's profile and the panel for the specified capture format is displayed.

- To display the token or code security panel without changing the active capture format, type 'T' or 'C' on the command line and hit Enter.

Note: The token security and code security options are displayed below the command line if they are available. The options are available if the settings in the REXX options table allow them.

Chapter 11: Batch Functions

This chapter discusses how to use CA Verify for VTAM in batch to run, copy, delete, or print test streams and rulesets.

This section contains the following topics:

- [Overview](#) (see page 273)
- [JCL Requirements](#) (see page 273)
- [Define and Initialize Data Sets](#) (see page 275)
- [Format the Data Sets](#) (see page 276)
- [Directory Listing of Test Streams and Rulesets](#) (see page 277)
- [Select Test Streams and Rulesets to Copy, Convert, Print, and Delete](#) (see page 278)
- [Select Terminals for Copy and Print Functions](#) (see page 279)
- [Copy Test Streams and Rulesets](#) (see page 280)
- [Convert a Test Stream to REXX](#) (see page 280)
- [Batch Run](#) (see page 281)
- [Batch Log](#) (see page 284)

Overview

Using the batch functions of CA Verify for VTAM, you can:

- Copy, delete, and print test streams.
- Define, initialize, and format your CA Verify for VTAM data sets easily.
- Perform stress testing at night or on weekends. This lets you avoid periods of peak system activity, and keeps testing from interfering with your staff's everyday tasks.
- Perform other important CA Verify for VTAM tasks in batch. For example, you can execute CA Verify for VTAM in batch to run your test streams and print the differences.

JCL Requirements

Use JCL similar to the following example for CA Verify for VTAM batch functions.

```
//TCABATCH      EXEC      PGM=TCABATCH,REGION=512K[ ,PARM='LINECNT=nn' ]
//STEPLIB       DD        DISP=SHR,DSN=VTAM.TCA.LOADLIB
//TCADSIN       DD        DISP=SHR,DSN=VTAM.TCADS
//TCADSOUT      DD        DISP=SHR,DSN=VTAM.TCADS2
//TCAREXX       DD        DISP=userid.VERIFY.SCRIPT(sssssss),DISP=SHR
//SYSPRINT      DD        SYSOUT=A
//TCAPRINT      DD        SYSOUT=A
//SYSIN         DD        *
```

TCABATCH

The EXEC statement specifies program TCABATCH, the load module which performs batch functions. The size of the required region varies depending on the function, but 512 KB is usually enough. However, CA Verify for VTAM may require additional storage when processing multiple terminal test streams.

You can specify a parameter to override the default number of lines per page:

```
PARM='LINECNT=nn'
```

where *nn* is a 2-digit number between 40 and 99. The default is 58.

Note: The batch functions can usually be run in 512 KB. For batch print using display format, allow 512 KB plus 8 KB per terminal.

STEPLIB

Required unless CA Verify for VTAM is installed in a linklist library.

TCADSIN

Defines the *input* CA Verify for VTAM data set for the Print, Copy, and Directory functions.

TCADSOUT

Defines the *output* CA Verify for VTAM data set for the Initialization, Format, Delete, and Copy functions.

TCAREXX

Defines the *output* CA Verify for VTAM data set for the Convert to REXX function. The data set may be sequential or partitioned (PDS or PDSE), but must be defined with a fixed record format (F|FB|FBA) and an 80-byte record length. If the data set is partitioned, a member name must be specified.

This DD is only required when using the REXX command to convert a test stream to a REXX exec.

SYSPRINT

Control statements and any error messages are written to this data set. If there is no TCAPRINT DD statement, output from the Print and Directory List functions are also written to SYSPRINT.

SYSPRINT can be allocated to disk, tape, or other sequential device. No DCB information is required. The data set attributes are fixed blocked 133-byte records with ASA carriage control. CA Verify for VTAM selects the largest blocksize applicable to the device.

TCAPRINT

If specified, output from the Print and Directory Listing functions is written to this data set. If omitted, this output is written to SYSPRINT.

TCASNAP

If specified, diagnostic dumps are written to this data set during a batch run.

SYSIN

Defines the *control statement input* for batch functions. It can be allocated to disk, tape, or other sequential device. The record length can exceed 80 bytes.

Control Statement Format

Observe the following rules when coding control statements:

Use columns 1-72.

- Blank statements and statements with an asterisk in column 1 are printed but not processed.
- Many control statements and parameters can be abbreviated. In the following sections, the minimum abbreviation is underlined>.
- All batch functions can be specified in the same execution.
- It is not necessary to continue control statements. However, the Print command can effectively be continued by specifying two or more consecutive Print commands.

Define and Initialize Data Sets

Define Data Sets

Use JCL similar to the following example to define a data set.

```
//DEFINEIT      EXEC    PGM=IDCAMS
//SYSPRINT      DD      SYSOUT=A
//SYSIN         DD      *
                DEFINE  CLUSTER ( -
                        NONINDEXED                /* REQUIRED */ -
                        SHAREOPTIONS(2 3)         /* OR (3 3) */ -
                        SPEED -
                        UNIQUE -
                        CYLINDERS(5 5) -
                        VOLUMES(VSAM01) -
                        NAME('VTAM.TCADS') -
                        RECORDSIZE(16377 16377) /* MUST BE CFSIZE-7 */ -
                        CONTROLINTERVALSIZE( 16384) )
```

- The first parameter is required.
- The space allocation must be large enough for at least 11 control intervals.
- The control interval size must be a multiple of 4096 up to a maximum size of 28,672. The recommended size is 16,384.
- The record size must be 7 less than the control interval size.
- The other parameters have no special requirements.

Note: Use SHAREOPTIONS (2 3) if the data set is only being used in one region. Use SHAREOPTIONS (3 3) if the data set will be updated from two regions.

Initialize the Data Sets

You must use the TCABATCH Init function after you have used IDCAMS to define the data set or file. This function initializes the data set allocated to TCADSOUT.

The format is:

```
INIT
```

This function has no parameters.

See the [JCL Requirements](#) (see page 273) section earlier in this chapter for the necessary JCL.

Format the Data Sets

Use the TCABATCH Format function to format control intervals on the data set allocated to TCADSOUT. Although CA Verify for VTAM will automatically format control intervals as needed, it is more efficient to format control intervals in batch when CA Verify for VTAM is not in use.

Specify the Format card in the SYSIN DD data set. The format is:

```
FORMAT
```

Directory Listing of Test Streams and Rulesets

The Directory function lists the test streams and rulesets in the data set allocated to TCADSIN.

Specify the Directory card in the SYSIN DD data set. The format is:

```
DIRECTORY
```

This function has no parameters.

The Directory listing provides the same test stream information as the Directory Information and Initial Terminal Status menus. See the "Browse Function" chapter for a discussion of the fields.

The same ruleset information that appears on the Browse: Ruleset Directory panel is also provided.

Listing Totals and Averages for All Test Streams

After listing information for each test stream, the Directory listing includes the following statistics for the entire data set:

- Total number of test streams
- Total number of input and output screens
- Average input and output screen size
- VSAM control interval size
- Formatted control intervals; i.e., the number formatted by the Format function or formatted as needed by CA Verify for VTAM
- Number of control intervals currently in use
- Unused control intervals
- Unavailable control intervals

Note: The *unavailable* control intervals cannot be used because of system failures during data set updates. Usually this number will be zero; it should always be small. If this number is large, you can recover the space by using the file reorganization procedure. The file reorganization procedure is described in the [Reorganize the CA Verify Data Set](#) (see page 238) section.

Select Test Streams and Rulesets to Copy, Convert, Print, and Delete

Use the Select function to specify the test streams and rulesets to be copied, printed, or deleted. One or more Select cards must follow a Copy, Print, or Delete card. The format is:

```
SELECT name name name ... name
```

- Specify one or more names separated by blanks. When you specify a name, *both* the test stream *and* the ruleset having that name are selected. When using the REXX function to convert a test stream to a REXX exec, only one test stream may be specified.

- Specify each name as follows:

```
application.member.version
```

For example:

```
SELECT GENERAL.TEST.001 GENERAL.TEST.002
```

selects the test streams and rulesets named GENERAL.TEST.001 and GENERAL.TEST.002

Specify Names Generically

To specify names generically, use an equal sign to represent an actual character. For example:

```
SELECT GENERAL.TEST.==
```

Selects all versions of the test stream with an Application of GENERAL and a Member of TEST.

```
SELECT GENERAL.=====001
```

Selects version 001 of all test streams and rulesets with an Application of GENERAL, regardless of the Member name.

```
SELECT GENERAL.=.=
```

Selects all test streams and rulesets with an Application of GENERAL, providing the Member name is only one character. CA Verify for VTAM pads with blanks to the end of each section of a generic name.

```
SELECT =X=====,=====,==
```

Selects all test streams and rulesets that have X as the second character of the Application.

You can also specify that CA Verify for VTAM select the *highest* version of a test stream by substituting >>> for the version number. For example:

```
SELECT GENERAL.TEST.>>>
```

Selects the highest version of the GENERAL.TEST test stream.

Select Terminals for Copy and Print Functions

Use the Terminals function to specify terminals to be copied or printed. The Terminals card applies only to test streams. One or more Terminals cards may precede a Copy or Print card. The format is:

```
TERMINALS name name name ... name
```

Specify one or more terminal names, separated by blanks. For example:

```
TERMINALS TRM1 TRM2
```

selects terminals TRM1 and TRM2.

You can specify consecutive Terminals cards to create a cumulative list of terminals to be copied or printed. Non-consecutive Terminals cards create separate lists. For example:

```
TERMINALS TRM1 TRM2
PRINT
SELECT GENERAL.TEST.001
TERMINALS TRM3 TRM4
COPY
SELECT GENERAL.TEST.002
```

In this case, CA Verify for VTAM will print screens for terminals TRM1 and TRM2 for test stream GENERAL.TEST.001, and copy screens for terminals TRM3 and TRM4 for test stream GENERAL.TEST.002.

Copy Test Streams and Rulesets

Use the Copy function to copy test streams and rulesets from the data set allocated to TCADSIN to the data set allocated to TCADSOUT.

Specify the Copy card in the SYSIN DD data set. The format is:

```
COPY
```

This function has no parameters. One or more Select cards should follow the Copy card. You can also specify one or more Terminals cards to indicate which terminals are to be copied. See the section, [Select Test Streams for Copy, Convert, Print, and Delete](#) (see page 278) earlier in this chapter for details.

Convert a Test Stream to REXX

Use the REXX function to convert a test stream from the data set allocated to TCADSIN to the REXX script file allocated to TCAREXX. The resulting REXX exec can be modified as necessary to meet user needs.

Note: The password security format used in the converted REXX script (that is token, code, or password) is determined by the password security option that is active for the userID that performs the conversion, at the time the test stream is converted to REXX. See the section [Secure Data in a REXX Script](#) (see page 259) for more information on the security options, including viewing or modifying the active security option for your userID.

Specify the REXX card in the SYSIN DD data set. The format is:

```
REXX APPLID(applid) SLINES(nn) [DELAY/NODELAY] [PROTECT/NOPROTECT]
```

APPLID(applid) (Optional)

Specifies the VTAM applid of the application to which the converted REXX exec should establish a session when it is executed. If APPLID is omitted, a "LOGON '?????'" statement will be generated by the conversion routine and the user must modify the exec to provide a valid applid before executing it.

SLINES(nn) (Optional)

Specifies the number of lines of an output screen to be included in the converted REXX exec. The default value is 3. The screen lines are included as comments to aid readability of the exec.

DELAY/NODELAY

Specifies whether DELAY commands should be added to the converted REXX exec, to reflect the think time associated with the original test stream. The default is DELAY.

PROTECT/NOPROTECT

Specifies whether the REXX script (indicated by the TCAREXX DD) should be overwritten if it already exists. If PROTECT is specified and the target script exists, the member will not be overwritten. Instead, a message will be written to SYSPRINT. If NOPROTECT is specified and the target member exists, it will be overwritten. The default is NOPROTECT.

A Select card should follow the REXX card. The Select card specifies the test stream to be converted. See the section, Select Test Streams for Copy, Convert, Print, and Delete in this chapter for details.

Sample JCL

Use JCL similar to the following example to convert a test stream to REXX in batch..

```
//TCABATCH      EXEC    PGM=TCABATCH,REGION=2048K
//STEPLIB       DD      DISP=SHR,DSN=yourHLQ.CATJLOAD
//TCADSIN       DD      DISP=SHR,DSN=hlq.TCADS
//TCADREXX      DD      DISP=SHR,DSN=userid.VERIFY.SCRIPT(sssssss)
//SYSPRINT      DD      SYSOUT=A
//TCAPRINT      DD      SYSOUT=A
//SYSIN DD      *
REXX APPLID(vtamappl) SLINES(24)
SELECT application.member.version
/*
```

Batch Run

The Batch Run function executes CA Verify for VTAM and runs test streams in batch. Differences between the expected and current screens can then be printed using the Print function.

Use the Run command to invoke the Run function

```
RUN d.a.m.v. THINK(NONE) LIMIT(999999) [SCREEN/LOGICAL/PHYSICAL/NONE] SUPOTS
[BATSIGN(xxxxxxxx)]
```

Run (Required)

Invokes the run.

d.a.m.v. (Required)

Identifies the test stream:

d

DDname

a

Application

m

Member

v

Version

Think(NONE) (Optional)

Specifies no simulated operator think time, the default. You can also specify a number of seconds or a percentage. See the "Run Function" chapter for valid parameters.

Limit(nnnnnn) (Optional)

Specifies the maximum number of mismatches CA Verify for VTAM should allow. The default is 999999. If this number is exceeded, CA Verify for VTAM stops the run. Mismatches generated up to that point are recorded and the output test stream is retained.

Screen/Logical/Physical (Optional)

Specifies the type of comparison. The default is screen. See the "Run Function" chapter for an explanation of these options.

Supots (Optional)

The default is for CA Verify for VTAM to create an output test stream with the same name as the input test stream and the version incremented to the next available one. Differences are automatically recorded. Specify this option to suppress the output test stream.

[Batsign(xxxxxxx)] (Optional)

Specifies an override for the XTCAOPTS installation option AUTSIGN = APPLICATION. xxxxxxxx is the name of the #SIGNON and #SIGNOFF test stream. The BATSIGN parameter value will be substituted for the application when the #SIGNON and #SIGNOFF test streams are run.

Processing during a Batch Run

During a batch run, CA Verify for VTAM:

- Accepts missing outputs
- Does not perform mismatch confirmation
- Accepts I/O mismatches; i.e., replaces the original screen with the current screen in the output test stream

Sample JCL

Use JCL similar to the following example to run test streams in batch.

```
//TCABATCH      EXEC    PGM=TCABATCH,REGION=1024K
//STEPLIB       DD      DISP=SHR,DSN=VTAM.TCA.LOADLIB
//TCADSIN       DD      DISP=SHR,DSN=VTAM.TCADS
//TCADSOUT      DD      DISP=SHR,DSN=VTAM.TCADS2
//SYSPRINT      DD      SYSOUT=A
//TCAPRINT      DD      SYSOUT=A
//TCASNAP       DD      SYSOUT=A
//SYSIN DD      *
RUN TCADSOUT.GENERAL.PAYROLL.001 THINK(50%) NONE
RUN TCADSOUT.GENERAL.CLAIMS.003 LIMIT(100) PHYSICAL
PRINT DIFF(ONLY) COMBINED
SELECT GENERAL.PAYROLL.>>>>>>
SELECT GENERAL.CLAIMS.>>>>>>
/*
```

In this example:

- The Run commands specify that two test streams be run.
- The Print command specifies that only screens with differences be printed. The screens are printed in Combined format.
- The Select cards specify versions of >>> which instructs CA Verify for VTAM to select the highest versions of the test streams.

Two return codes are set by the batch Run function:

- 0**
No mismatches
- 4**
Mismatches

Note: The Print function can be executed without the Run function to print the results of runs for which the Run Record History option was Yes. See the [Print Parameters](#) (see page 240) section earlier in this chapter.

Batch Log

The Batch Log function must be executed using the CA Verify for VTAM control task. See the *Installation Guide* for instructions on invoking batch functions using the control task.

The Batch Log function initiates logging as part of control task initialization. Use this function when you want to initiate logging after VTAM startup so you log all data.

You can start the control task before VTAM, in which case the control task will wait for VTAM to start and then begin logging. However, if you want logging to begin when VTAM starts, don't specify other batch function commands after the LOG command because the other commands may interfere with the Log function.

You can specify that an *application or multiple terminals* be logged. See the chapter "Log Function" for detailed information on logging an application or multiple terminals.

To halt the Batch Log function, the security administrator must use the Inquiry/Termination menu.

Use the following control cards to invoke the Log function:

```
TERMINALS real(virt) real2(virt2) ... realn(virtn)
APPLLIST name1 name2 ... namen
DESC1 description
DESC2 description
DESC3 description
LOG d.a.m.v. REALAPPLID(applid)
              VIRTAPPLID(applid)
              PROTECTION(RWP)
              INONLY/NOINONLY
              INTERRUPT(NO/REQUEST/UNCOND/FORCE)
              INCLUDE/EXCLUDE
```

TERMINALS real(virt) real2(virt2) ... realn(virtn) (Optional)

Selects terminals to be logged and optionally assigns virtual terminals for the real terminals being logged. You can use = as a generic character to replace any character in either the real or virtual terminal name. For example, if you specify TRM== as the real terminal name, CA Verify for VTAM will log all terminals beginning with the characters TRM followed by up to two characters; for example, TRM1, TRM66, TRMAB, and so on.

The TERMINALS control card is required when logging multiple terminals and is optional when logging an application.

For logging by terminal:

If you specify:

```
TERMINALS real real2 real3 ...
```

CA Verify for VTAM will log the specified terminals and use virtual terminals specified at installation.

If you specify:

```
TERMINALS real(virt) real2(virt2) real3(virt3)...
```

CA Verify for VTAM will log the real terminals and use the virtual terminals specified.

You can specify virtual terminals for some of the real terminals you are logging and let CA Verify for VTAM use installation-specified virtual terminals for the others.

For logging by application:

- Specify printers and other terminals which the application acquires. Terminals which are not acquired need not be specified.
- For terminals which are acquired, change the real names within the application to virtual names. Use this control card to specify both the real and virtual names.
- You should usually specify a virtual terminal for each real terminal to be acquired, although you can also allow virtual terminals to be selected as per TCAXLATE macro specifications defined at installation. In that case, the TCAXLATE macro should use the PAIR parameter to insure that the correct devices are selected. See the "Customizing Macros" chapter in the *Installation Guide* for details.

APPLIST name1 name2 ... namen (Optional)

Identifies application IDs to be included or excluded from logging. Use multiple cards to extend the list. Specify the INCLUDE or EXCLUDE parameter on the LOG card.

The APPLIST control card is ignored when logging an application.

DESC1 – DESC3 (Required)

Describes the test stream. You can specify up to 59 characters on each of the three lines. You must specify at least one character.

LOG command

Invokes the log and specifies logging parameters.

LOG (Required)

Invokes the log.

d.a.m.v (Required)

Identifies the test stream:

d

DDname

a

Application

m

Member

v

Version

REALAPPLID(applid) (Optional)

Specifies the real applid under which the application will be logged. This parameter must be specified if you are logging an application; otherwise, omit it.

VIRTAPPLID(applid) (Optional)

Specifies the virtual applid with which CA Verify for VTAM will communicate with the application. This parameter must be specified if you are logging an application; otherwise, omit it.

Note: See [Procedures for Logging an Application](#) (see page 287) for an explanation of how to specify the REALAPPLID and VIRTAPPLID parameters.

PROTECTION(RWP) (Optional)

Specifies Read, Write, and/or Print protection for the test stream.

INONLY/NOINONLY (Optional)

Specifies whether or not input screens only should be logged.

INTERRUPT(NO/QUEUE/REQUEST/UNCOND/FORCE) (Optional)

Specifies whether or not the current session(s) should be interrupted.

No

Don't interrupt the current session and do not queue a session for the terminal. Logging will not begin until the user at the terminal to be logged ends the current session and logs on to CA Verify for VTAM.

Queue

Don't interrupt the current session. Logging will begin when the current session ends. This is the default.

Request

Request that the application currently in session with the terminal terminate the session. The application may deny the request.

Uncond

Instruct the application currently in session with the terminal that it must terminate the session. CA Verify for VTAM waits for the application to formally terminate the session before beginning to log the terminal.

Force

Force termination of the session. Generally, this type of deactivation is not recommended; however, it may be advisable for terminals that do not terminate when the Request or Uncond parameters are in effect.

The parameters represent five levels of interruption, with No as the lowest level and Force as the highest. Only the product administrator can specify a level of interruption that is higher than the default specified in the DISC installation option. For example, if DISC=UNCOND is in effect, users other than the security administrator can specify No, Queue, or Request, but not Force.

INCLUDE/EXCLUDE (Optional)

Specifies whether or not the applications in the APPLIST statement should be included or excluded from logging.

The INCLUDE/EXCLUDE parameters are ignored when logging an application.

Procedures for Logging an Application

Logging an application lets you log *all* the terminals for a particular application without specifying most of the terminal names and without incurring the overhead associated with logging all the terminals in a network.

Follow these steps:

1. Recycle the application and change its applid. For example, change CICSTST to XXXXTST. Then specify CICSTST as the REALAPPLID and XXXXTST as the VIRTAPPLID. When logging begins, users of CICSTST will be logged.
2. Change the USS table or routing application to translate the applid. For example, translate CICSTST to PASSTST. Then specify PASSTST as the REALAPPLID and CICSTST as the VIRTAPPLID. When logging begins, users of CICSTST will be logged.
3. Specify another applid as the REALAPPLID. For example, specify PASSTST as the REALAPPLID and CICSTST as the VIRTAPPLID. Instruct users to log onto PASSTST rather than CICSTST. This method is recommended if you want to log some of the application activity but you don't know the names of the terminals you want to log.

Chapter 12: Commands for REXX

This chapter describes the CA Verify for VTAM Host Command Environment which allows REXX execs to ADDRESS VERIFY and use virtual terminals in a multi-session synchronous or asynchronous environment.

The CA Verify for VTAM Host Command Environment allows REXX execs to ADDRESS VERIFY and to issue CA Verify for VTAM host commands.

- CA Verify for VTAM LOGON, TYPE, INVITE, DELAY, and LOGOFF commands allow REXX execs to start sessions using virtual terminals and to use online software that was designed for interactive use by people using 3270 terminals. Using CA Verify for VTAM, REXX execs that repeat captured sessions may be created automatically by converting previously logged test streams to REXX execs.
- CA Verify for VTAM TRACE and ENDTRACE commands allow execs to capture exec-driven sessions in datasets. Using CA Verify for VTAM Interactive System functions, traced virtual terminal screen images may be displayed, printed, or used to perform regression testing.
- The ATTACH command creates new z/OS tasks and REXX Language Processor Environments and uses the environments to execute REXX execs that run at the same time as the attaching exec. Attached exec tasks can start and drive asynchronous sessions to conduct stress tests or to multiply throughput in production applications.
- The ACCESS command allows an exec to use multiple sessions, to attach multiple exec tasks, and to use multiples of any of the application's resource. Automatic resource locks, LOCK and UNLOCK commands allow multiple execs to access and share any of the application's resource.
- QUEUE, PUSH and POST commands allow execs to store data in designated queues to communicate with any number of other asynchronous exec tasks that process queued data using PULL or QUERY QUEUE commands.

- QUERY, HANDLE, WAIT and SIGNAL commands allow execs to inquire about the applications' resources, to modify or interrupt command processing, and to process errors and other conditions using REXX condition traps.
- The MONITOR command activates integrated monitor functions that display the application's commands, command functions, exec-driven sessions, and error messages automatically, and may be used to debug execs or to display multiple virtual terminal screens at a single terminal to monitor concurrent session activity driven by asynchronous attached execs while performing a system stress test.

This section contains the following topics:

[The Session Commands](#) (see page 290)

[Tracing Exec-Driven Sessions](#) (see page 292)

[Ports and Multiple Sessions](#) (see page 292)

[Sharing Sessions with Called Execs](#) (see page 294)

[Attaching Asynchronous Exec Tasks](#) (see page 296)

[Queues and Intertask Communication](#) (see page 297)

[Sharing Resources with Attached Execs](#) (see page 302)

[Smart Exec-Driven Sessions](#) (see page 303)

[ISPF Session Panels](#) (see page 304)

[Monitoring Execs and Sessions](#) (see page 307)

The Session Commands

CA Verify for VTAM session commands may be used by REXX execs to start sessions with online systems using virtual terminals and to use virtual terminals in the same way that people use real terminals to access online system software.

- The LOGON command allocates a virtual terminal and uses the terminal to start a session with any online system that supports terminal sessions.
- The TYPE command uses the virtual terminal keyboard to key in data, position the cursor, and to send data by pressing the Enter key, PF keys or other keys that send data.
- The INVITE command waits for an online system to send anticipated messages, like sign on prompts at the start of a session.

- The DELAY command simulates human think time and controls the speed of an exec driven session.
- The LOGOFF ends a session and frees a virtual terminal.

CA Verify for VTAM session commands return information to execs in REXX variables. At the completion of each session command, a copy of the virtual terminal display buffer is returned in a REXX variable, PTEBUFF, the virtual terminal screen size and cursor position are stored in PTEROWS, PTECOLS and PTECSR, and other information about the virtual terminal and session is returned in other REXX variables. Using the returned display buffer, execs may analyze transaction responses and gather displayed information or use it to enter subsequent transactions.

REXX execs that repeat captured sessions may be created automatically by converting previously logged test streams to execs. When a logged test stream is converted to REXX, session initiation is captured as a LOGON command and user keystrokes are captured as TYPE commands. Converted execs also include INVITE commands that wait for anticipated system messages and may include DELAY commands that capture actual human think-time delays that occur while logging a test stream. A converted exec may be executed to repeat a captured session automatically.

By modifying a captured exec or by writing execs from scratch, intelligent REXX execs may be developed that use the application's sessions and any available online system software to reliably perform or automate almost any imaginable terminal task that could be performed by a person using a terminal.

The REXX exec in the following example uses the application session commands to start a session and to use transactions designed for users.

```

/* Exec: OPEN CA Verify commands for REXX: */
/* LOGON INVITE TYPE LOGOFF */
(1)  address Verify
(2)  " logon cics 24x80 24x80 basicds "
     " invite 1000 "
     " type clear "
(3)  " type 'cent set dataset(somedd) open' enter "
(4)  if substr(PTEBUFF,224,6) = 'NORMAL' then
     say 'open worked ok'
     else
     say 'open failed!!!'
     " type pf3 "
(5)  " logoff "

```

Tracing Exec-Driven Sessions

CA Verify for VTAM TRACE and ENDTRACE commands can be used to capture an exec-driven CA Verify for VTAM session. When a session is traced, a screen image is captured in a trace data set whenever a TYPE command sends data to an online system. Another screen is captured when a response or other message sent by an online system is received at the virtual terminal used for a session.

In the following example, an exec named TRACE uses TRACE and ENDTRACE commands to capture a CICS session.

```
/* Exec: TRACE VERIFY commands for REXX: */
/* TRACE LOGON INVITE TYPE ENDTRACE */
(1) address TSO
   " allocate f(tracedd) sysout(a) "
(2) address Verify
   " TRACE to tracedd image "
(3) " LOGON cics1 model mod2 "
   " INVITE 1000 "
   " TYPE clear "
   " TYPE 'cemt set dataset(somedd) open' ",
   " enter "
   if substr(PTEBUFF,224,6) = 'NORMAL' then
       say 'open worked ok'
   else
       say 'open failed!!!'
   " TYPE pf3 "
   " TYPE home 'logoff' erase enter "
(4) " ENDTRACE "
(5) address TSO
   " free f(tracedd) "
```

Ports and Multiple Sessions

A CA Verify for VTAM port is a place to anchor the application session, session trace, data queue and/or a REXX environment. Each CA Verify for VTAM port is identified by a number. When the first exec in an address space issues a command, the exec's REXX environment is anchored to port 1.

CA Verify for VTAM commands that operate on sessions, traces, execs or queues, create or use the session, trace, REXX environment or queue anchored to the numbered port being accessed by the exec when the command is issued. By default, an exec accesses the port to which its REXX environment is anchored. If an exec issues a CA Verify for VTAM LOGON command, causing the exec's REXX environment to be anchored to port 1, the LOGON command allocates and anchors a virtual terminal to port 1 and uses the terminal to start a session on port 1.

While only one session may be active on a particular port at any point in time, an exec may use the ACCESS command to access another port and may use the LOGON command to start a session on the accessed port.

For example, ACCESS 2 instructs subsequent commands to create or use port 2 resources. While accessing port 2, a LOGON command would allocate a virtual terminal and use it to start a session on port 2, and TYPE commands would use the port 2 virtual terminal keyboard to enter transactions. An exec may use the ACCESS command multiple times to start multiple sessions on different ports, and may access a specific port at any time to enter transactions using the session anchored to the accessed port.

In addition to instructing subsequent commands to create or use resources anchored to a particular port, each ACCESS command also instructs session commands to return session information to an exec using either simple or compound session variable names.

- Simple variable names used by the application to return session information, including PTEBUFF, are defined in the application REXX Variables.
- Compound session variable names like PTEBUFF.1, or PTECOLS.3, have a REXX stem that is a defined simple session variable name and a tail that is the accessed port number.

By default, or if an exec issues an ACCESS EXECPORT command to access the port its REXX environment is anchored to, session commands return session information to the exec using the defined simple session variable names.

If an exec issues an ACCESS NEWPORT command to access a previously unused port, or an ACCESS FREEPORT command to reuse a port that is no longer being used, or if an exec issues an ACCESS command that specifies a port number, including the number of the port that the exec's environment is anchored to, the ACCESS command instructs subsequent session commands to return session information to the exec using compound session variable names.

As a result, when an exec uses the ACCESS command to start and use multiple sessions on multiple ports, the exec may refer to returned session information using either simple variable names or using compound variable names that have an actual or variable port number as a tail, that refers to information about a particular session.

The REXX exec in the following example uses ACCESS commands to start three sessions on three ports, to run three long running end-of-day transactions concurrently. The exec also uses CA Verify for VTAM HANDLE and WAIT commands to control session flow and timing.

```
/* Exec: MULTISES CA Verify commands for REXX: */
/* ACCESS LOGON INVITE HANDLE WAIT */
  address Verify
(1)  sys.1 = 'cicsa'
     sys.2 = 'cicsb'
     sys.3 = 'cicsc'
     do port=1 to 3
       " ACCESS &port "
       " LOGON &sys.port model mod2 "
       " INVITE 1000 "
       " TYPE clear "
       " HANDLE turnaround off "
       " TYPE 'long running end-of-day tran' ",
       " enter "
       " HANDLE turnaround on "
     end
(2)  " WAIT 10000 on response "
     do until done = 3
       done = 0
       do port=1 to 3
         if PTEKB.port = 'INHIBITED' then do
           " ACCESS &port "
           " INVITE "
         end
       else
         done = done + 1
       end
     end
end
```

Sharing Sessions with Called Execs

When an exec calls another exec, the called exec runs in the same REXX environment as the calling exec, and by default accesses the port to which the REXX environment is anchored.

An exec may issue a LOGON command to start a session, then call another exec that issues a TYPE command to sign on. However, REXX variable pools are not shared by called and calling execs. When the called exec issues the TYPE command, PTEBUFF and other session variables are returned to the called exec, and PTEBUFF and other session information in the calling exec's variable pool becomes obsolete.

If an exec starts a session then calls another exec that uses the session, when the called exec returns, the calling exec may refresh session variables in its REXX variable pool using the QUERY SESSION command.

In the following example LOGON issues a LOGON command, then calls SIGNON to sign on. When SIGNON returns, LOGON uses the QUERY SESSION command to determine the status of the session and to refresh PTEBUFF and other session information.

```

/* Exec: LOGON Verify commands for REXX: */
/* LOGON QUERY TYPE */
address Verify
" LOGON cics1 model mod2 "
call 'SIGNON'
" QUERY session "
select
  when PTEINFO = 'NOSESSION' then do
    say 'session failed'
    exit
  end
  when substr(PTEBUFF,2,15),
    \= 'Signon Complete' then do
    say 'sign on failed'
    exit
  end
  otherwise
" TYPE clear "
end
/* etc. */
/* Exec: SIGNON Verify commands for REXX: */
/* INVITE TYPE */
address Verify
" INVITE 1000 "
" TYPE 'uid1' token 'uid1a' enter "
return

```

CA Verify for VTAM resources are cleaned up automatically when the first exec that runs in the port 1 REXX environment ends. If an exec called another exec to start a session before it issued a CA Verify for VTAM command, the REXX environment would be anchored to port 1 when the called exec issued the LOGON command, and would be the first exec in the port 1 REXX environment. The session would be cleaned up automatically by CA Verify for VTAM when the called exec returned to the calling exec.

If no active exec in an address space is using CA Verify for VTAM commands, and an exec is executed that intends to use resources created by a called exec, it must issue some CA Verify for VTAM command, for example, ACCESS EXECPORT, before calling an exec that creates the resources, to ensure that the resources are not cleaned up when the called exec ends.

Attaching Asynchronous Exec Tasks

When an exec creates multiple sessions on multiple ports, then uses the ACCESS command to switch from session to session, the events on the multiple sessions occur serially or synchronously. That is, only one TYPE command can be active at a time. Each TYPE command must complete before the exec can ACCESS another port or execute another TYPE command. The same is true if an exec calls another exec, because the called exec must return before the calling exec can execute additional session commands.

The CA Verify for VTAM ATTACH command may be used to attach an exec that runs at the same time as the attaching exec. Unlike calling and called execs that run synchronously and in the same REXX Language Processor Environment, attaching and attached execs run asynchronously in different REXX Language Processor Environments and as separate z/OS tasks.

An ATTACH command specifies the name of the exec to be attached and may specify up to 20 literal or variable argument values to be passed to the attached exec. An ATTACH command may also specify REXX libraries to be used to load execs, the destination of REXX SAY messages issued by the attached exec and/or the destination of error messages issued by REXX while the exec is executing.

The ATTACH command creates a new z/OS task and a REXX Language Processor Environment that are used to run the attached exec. The REXX environment is anchored to the port being accessed by the attaching exec when the command is issued. Before issuing an ATTACH command, an ACCESS command must be issued to access a CA Verify for VTAM port that is not already associated with a REXX environment.

After loading the attached exec in the new REXX environment, the ATTACH command completes and the attaching exec resumes execution at the same time that the attached exec begins execution.

Attached execs run as peer-to-peer tasks and are not arranged in a hierarchy. No notification is given to an attaching task when an attached task ends. An attaching exec may end before an attached exec ends. Any exec in an address space may use the ATTACH command to attach any other exec and any attached exec may use any CA Verify for VTAM command to create application resources or to use resources created by any other exec running on any port in the address space.

Sessions, traces, data queues and other CA Verify for VTAM resources created by execs are cleaned up automatically by CA Verify for VTAM only when the first exec running in the port 1 REXX environment end. When the port 1 exec ends, cleanup is delayed until any other active execs that have issued CA Verify for VTAM commands have ended.

In the following example an exec named FAST, attaches another exec named CHANGE 10 times to change a user password in 10 remote systems. The result would be the same if FAST called CHANGE 10 times instead of attaching it. However, because called execs run one at a time, and because attached execs run at the same time, the ATTACH solution runs 10 times faster.

```

/* Exec: FAST Verify commands for REXX: */
/* ACCESS ATTACH */
(1)  arg uid oldpt newpt
     address Verify
     do n=1 to 10
(2)  " ACCESS Newport "
     " ATTACH exec change ",
     " &uid &oldpt &newpt 'tso"n" "
     end
/* Exec: CHANGE Verify commands for REXX: */
/* MONITOR LOGON INVITE TYPE */
(3)  arg uid oldpt newpt tson
     address Verify
     " MONITOR signals "
(4)  " LOGON &tson data &uid "
     do until substr(PTEBUFF,34,11),
     = 'TSO/E LOGON'
     " INVITE 1000 "
     end
(5)  " TYPE token &oldpt tab token &newpt enter "
     if substr(PTEBUFF,11,16)
     a= 'REENTER PASSWORD' then do
     " TYPE token token &newpt enter "
     if substr(PTEBUFF,11,16)
     a= 'PASSWORD CHANGED' then do
     say tson 'password changed'
     exit
     end
     end
     say tson 'password change failed'

```

Queues and Intertask Communication

Attached execs that run as asynchronous z/OS tasks may use CA Verify for VTAM data queues to communicate. Like the commands that attach execs and manage sessions, CA Verify for VTAM commands that manage data queues operate on the data queue anchored to the port being accessed by an exec when a command is executed.

QUEUE, PUSH, and POST Commands

QUEUE, PUSH and POST commands may store up to 20 literal or variable argument values as a single entry in an accessed queue. PULL and QUERY QUEUE commands return the argument values fetched from an accessed queue entry in corresponding REXX variables specified by the PULL or QUERY QUEUE command.

- The QUEUE command adds an entry to the bottom of a queue.
- The PUSH command adds an entry to the top of a queue.

- The POST command replaces an entire queue with a specified queue entry.
- The PULL command returns data values fetched from the top entry in a queue and deletes the entry from the queue.
- The QUERY QUEUE command returns data values fetched from the top entry in a queue, but leaves the entry in the queue.
- The DELETEQ command deletes an entire data queue.

Data queues can be used in any desired way:

- A queue may be used by a single exec as private temporary storage.
- A queue may be used as a bulletin board to post information that may be examined by other execs.
- A queue may be used to collect data that is stored by one or more execs and is processed by a single exec.
- A queue may be used to distribute data to multiple execs that access a common queue.
- Multiple queues may be used to distribute data to execs that access designated queues.

By default, if an accessed queue is empty when a PULL command is issued, RC=12 is returned to the exec and the command completes immediately. An exec designed to process data queued by other execs may use the WAIT command to instruct subsequent PULL commands to wait a specified amount of time or to wait FOREVER for an entry to be queued, if the accessed queue is empty when a PULL command is issued.

The SERVER and SESSION execs in the following examples illustrate two uses of CA Verify for VTAM data queues. The SERVER exec attaches SESSION execs to multiple ports and distributes a file of data to the queues anchored to SESSION exec ports. Each SESSION exec starts a session and uses the session to process queue entries pulled from the queue anchored to the SESSION exec's port. After processing each distributed queue entry, the SESSION exec returns a status message to the queue anchored to the SERVER exec's port. After logging a status message pulled from the SERVER exec's queue, the SERVER exec distributes another record to the SESSION exec that returned the logged status message.

Attached execs that drive asynchronous sessions and communicate using data queues may be used to perform system stress testing or may be used in production applications to multiply the throughput possible using conventional serial data processing methods.

```

/* Exec: SERVER Verify commands for REXX: */
/* ACCESS QUEUE ATTACH WAIT PULL */
(1)  address TSO
      " alloc f(quefile) da('appl.queuedata') shr "
      " alloc f(logfile) da('appl.logdata') mod "
      querecs = 0
(2)  do 10
address TSO
      " execio 1 diskr quefile      "
if rc \= 0 then do
querec = 'eof'
leave
end
pull querec
querecs = querecs + 1
address Verify
      " ACCESS Newport      "
      " QUEUE &querec      "
      " ATTACH exec session &pteport  "
end
address Verify
      " WAIT forever on pull      "
(3) do while querec \= 'eof'
      " ACCESS EXECPORT      "
      " PULL &logrec &port      "
address TSO
queue logrec
      " execio 1 diskw logfile      "
querecs = querecs - 1
      " execio 1 diskr quefile      "
if rc = 0 then do
pull querec
querecs = querecs + 1
end
else
querec = 'eof'
address Verify
      " ACCESS &port      "
      " QUEUE &querec      "
end
(4) do while querecs > 0
      " ACCESS EXECPORT      "
      " PULL &logrec &port      "
address TSO
queue logrec
      " execio 1 diskw logfile      "
querecs = querecs - 1
address Verify
      " ACCESS &port      "
      " QUEUE 'eof'      "
end
(5) address TSO
      " execio 0 diskr quefile (FINIS      "
      " free f(quefile)      "
      " execio 0 diskw logfile (FINIS      "
      " free f(logfile)

```

SERVER exec notes:

1. The SERVER exec allocates a quefile that contains data to be processed, allocates a logfile used to collect status messages and initializes a count of in-progress quefile records to zero.
2. The SERVER exec startup loop uses EXECIO and the REXX PULL instruction to read records sequentially from the quefile, and counts each record read as an in-progress quefile record. For each record read, the CA Verify for VTAM ACCESS command is used to access an unused port, the QUEUE command is used to store the quefile record in the data queue anchored to the accessed port, and an ATTACH command is used to attach the SESSION exec to the accessed port to process quefile records distributed to the SESSION exec by the SERVER exec. An ATTACH parameter provides the SERVER exec's port number to each attached SESSION exec.

SESSION execs use the SERVER exec's port number to return status messages to the SERVER exec after processing each distributed quefile record. Before processing status messages, the SERVER exec uses the CA Verify for VTAM WAIT command to instruct subsequent PULL commands to wait for a status message to be queued if the SERVER exec's queue is empty when a PULL command is issued.

3. Each iteration of the SERVER exec mainline loop logs a status message received from any attached SESSION exec and supplies another quefile record to the SESSION exec. The SERVER exec uses the ACCESS command to access the SERVER exec's port and uses the CA Verify for VTAM PULL command to wait for and pull an entry from the SERVER exec's queue. Each queue entry added to the SERVER exec's queue by an attached SESSION exec contains a status message and also the port number of the SESSION exec that added the entry to the SERVER exec's queue. The REXX QUEUE instruction and EXECIO are used to write each pulled status message to the logfile managed by the SERVER exec, and the count of in-progress quefile records is decremented after logging the status message for a processed quefile record.

After logging a status message returned by a SESSION exec, the SERVER uses EXECIO and the REXX PULL instruction to read another quefile record to be processed by the SESSION exec, and counts each record read as an in-progress quefile record. When the end of the quefile is reached, an 'eof' record is created to inform the SESSION exec that all quefile records have been processed and to signal the end of the SERVER mainline loop. The SERVER exec uses the port number that was pulled with the previous status message to ACCESS the SESSION exec's port and uses the QUEUE command to store either the next quefile record or the eof record in the SESSION exec's queue.

4. When the end of the quefile has been reached, the SERVER exec pulls, logs and accounts for the status message for each in-progress quefile record, and queues an eof record to each SESSION exec that returns a final status message, until the count of in-progress quefile records is zero.
5. After all quefile records have been processed and all status messages have been logged, quefile and logfile are closed and freed, and the SERVER exec ends.

```

/* Exec: SESSION Verify commands for REXX: */
/* LOGON INVITE TYPE LOGOFF */
/* WAIT ACCESS PULL QUEUE */
(1) arg logport
address Verify
" LOGON 'cics1' mod2 "
" INVITE 1000 "
" TYPE 'uid' token 'uida' enter "
" TYPE clear "
" TYPE 'tran' enter "
" WAIT forever on pull "
(2) do forever
" ACCESS execport "
" PULL &querec "
if querec = 'eof' then
leave
" TYPE &querec enter "
logrec = substr(PTEBUFF,23*80+1,80)
" ACCESS &logport "
" QUEUE &logrec &pteport "
end
(3) " TYPE clear "
" LOGOFF

```

SESSION exec notes:

1. Each attached copy of the SESSION exec uses the REXX ARG instruction to get the SERVER exec port number passed to the SESSION exec as a parameter by the ATTACH command used by the SERVER exec to attach the SESSION exec.

The SESSION exec starts a session, signs on, and enters a tran that could be any transaction that processes any data contained in any querec.

The CA Verify for VTAM WAIT command is used to instruct subsequent PULL commands to wait for a querec to be queued if the SESSION exec's queue is empty when a PULL command is issued.
2. Each iteration of the SESSION exec mainline uses ACCESS and PULL commands to wait for and to pull a querec from the SESSION exec's queue, uses CA Verify for VTAM session commands to enter the pulled querec, and uses ACCESS and QUEUE commands to store an entry in the SERVER exec's queue. The queue entry includes a status message displayed by 'tran' on screen row 24, and also includes the port number of the SESSION exec that stored the queue entry.
3. An eofquerec instructs the SESSION exec to clean up its session and end.

Sharing Resources with Attached Execs

Attached execs run as z/OS tasks and may be executing at the same time using multiple hardware processors. When attached execs share CA Verify for VTAM resources and multiple execs attempt to use a shared resource at exactly the same time, processor access to the shared resource is serialized automatically. For example, if two execs attempt to pull data from the same queue at the same time, the requests are processed serially and each exec pulls a different entry from the queue.

Locks are used to serialize access to resources. When an exec issues a CA Verify for VTAM command that uses a shared resource, a lock is obtained that permits exclusive use of the resource by the exec task that owns the lock, before the resource is used. If an exec issues a command that uses a shared resource, while the resource lock is owned by another task, the task that wants the lock queues a lock request and waits for the lock.

After a requested operation has been performed on a locked resource, if a lock request was queued by another exec task, ownership of the resource lock is transferred to the task that queued the oldest lock request and execution of the task that then owns the lock is resumed, otherwise the resource is unlocked.

Resource locks are obtained automatically by CA Verify for VTAM commands when shared resources are used, but are held only for the life of the command. In some applications it may be necessary or convenient to hold resource locks while issuing a series of commands. An exec may use the CA Verify for VTAM LOCK command or an ACCESS command that specifies the LOCK keyword to lock an accessed port. When a port is locked, the port and all resources anchored to the port are locked. A port lock is held until an UNLOCK command is issued.

If an exec issues commands that use resources anchored to a port that is locked by another exec task, or attempts to lock a port that is locked by another exec task, lock requests are queued and remain queued until the exec that holds the port lock unlocks the port.

An exec may lock a port to issue a series of commands that use resources anchored to the port, while preventing other execs from using port resources while the commands are executed. For example:

- An ACCESS FREEPORT LOCK command accesses a port that is devoid of resources and locks the port until an UNLOCK command is issued. Two or more execs may issue the command at the same time to attach other execs to the accessed ports without the possibility that the ACCESS command would assign the same FREEPORT to two execs before either had a chance to issue the ATTACH command.
- If an exec task is used to log records that are queued by multiple other exec tasks, and it is desirable to log a series of related records that are queued by a single exec task without interleaving the records with records queued by other exec tasks, LOCK and UNLOCK commands may be used by the execs that queue records, to prevent other exec tasks from queuing records while a series of related records are being queued.

Smart Exec-Driven Sessions

REXX execs created by converting logged test streams contain CA Verify for VTAM LOGON, TYPE, INVITE and DELAY commands that start sessions, re-key user keystrokes, and that handle other detected session events. When they are executed, converted REXX execs create sessions that are similar to the logged user session, provided that online system responses to re-keyed input are similar to online system responses to original input.

While converted REXX execs repeat only what a person did, and do not know why they did it or what they would have done if a system had responded to input in a different way, when a converted exec is executed, the virtual terminal screen images returned by session commands in REXX variables provides the same information to an exec that displayed online system responses provide to a terminal user.

REXX instructions and functions, returned session information and other CA Verify for VTAM commands and command options may be used to develop intelligent REXX execs that make the decisions that people do. For example:

- REXX execs may examine virtual terminal screen images to verify that transactions completed successfully and to decide what to do next.
- Information from previous online system responses may be saved and used as input to subsequent transactions.
- The CA Verify for VTAM QUERY command may be used to check the status of or request information about CA Verify for VTAM resources.

- The CA Verify for VTAM SIGNAL command may be used to trap session failures or other unusual events using REXX condition traps or return codes may be checked to detect the events.
- The CA Verify for VTAM WAIT command may be used to interrupt session commands if an online system response is not received in a reasonable amount of time.

Intelligent REXX applications that use CA Verify for VTAM session commands and any other resources available to REXX execs may be used to perform or automate almost any imaginable terminal task that could be performed by a person using a terminal.

ISPF Session Panels

Options of the CA Verify for VTAM LOGON and TYPE commands make it easy to display CA Verify for VTAM virtual terminal screen images using an ISPF panel and to rekey data entered at the displayed panel into the virtual terminal display.

The LOGON command PANELDATA keyword instructs subsequent CA Verify for VTAM session commands to edit the virtual terminal display buffer returned in variable, PTEBUFF, for display using an ISPF panel similar to the panel shown in the following example.

```
)ATTR
01 TYPE(DATAIN) INTENS(LOW) SKIP(OFF) CAPS(OFF) JUST(ASIS)
05 TYPE(DATAIN) INTENS(HIGH) SKIP(OFF) CAPS(OFF) JUST(ASIS)
07 TYPE(DATAIN) INTENS(NON) SKIP(OFF) CAPS(OFF) JUST(ASIS)
11 TYPE(DATAOUT) INTENS(LOW) SKIP(OFF) CAPS(OFF) JUST(ASIS)
15 TYPE(DATAOUT) INTENS(HIGH) SKIP(OFF) CAPS(OFF) JUST(ASIS)
19 TYPE(DATAOUT) INTENS(LOW) SKIP(ON) CAPS(OFF) JUST(ASIS)
1D TYPE(DATAOUT) INTENS(HIGH) SKIP(ON) CAPS(OFF) JUST(ASIS)
| AREA(DYNAMIC) EXTEND(ON) USERMOD(3F)
)BODY WIDTH(80)
|PTEBUFF |
)INIT
.ALARM = &PTEALARM
)PROC
&CSRPOS = .CSRPOS
&PFKEY = .PFKEY
)END
```

1. When a LOGON command specifies PANELDATA, basic 3270 attributes in the virtual terminal display buffer are returned in PTEBUFF as one of the seven attributes in the session panel definition. 3270 Attribute Values documents the mapping of basic 3270 attributes to panel attributes.
2. PANELDATA also edits PTEBUFF data to remove nulls in protected fields that would otherwise be displayed as periods by ISPF.

3. When the session panel is used to display a virtual terminal screen image, ISPF displays the PTEBUFF variable value returned by CA Verify for VTAM session commands, in the PTEBUFF dynamic area defined in the body of the session panel.
4. The USERMOD(3F) specification in the panel definition instructs ISPF to replace a field attribute in the PTEBUFF variable with the hexadecimal value, 3F, when data is keyed into a field. In a CA Verify for VTAM LOGON command, USERMOD '3F' informs CA Verify for VTAM of the USERMOD value defined in a session panel.
5. CA Verify for VTAM session commands return YES in variable, PTEALARM, when a message received from an online system sounds the terminal alarm. The reference to PTEALARM in the panel definition causes ISPF to echo an alarm at the terminal if an alarm was sounded at the virtual terminal.
6. The PROC section of the panel definition instructs ISPF to return the cursor position and the PF key in variable fields CSRPOS and PFKEY, when data is entered and the ISPF DISPLAY command completes.

The exec named SESSMAN, shown in the following example is a TSO command that starts and manages an interactive session with a named online system. For example, 'TSO SESSMAN CICSA', may be entered while using any ISPF panel to start a session with an online system, CICSA. The SESSMAN exec uses a session panel, the ISPF DISPLAY command, and CA Verify for VTAM session commands to start and display a virtual terminal session at a real terminal, rekey data entered at a terminal into the virtual terminal display, and send the data to an online system. To the user, a session managed by SESSMAN works much like any other terminal session.

```

/* Exec: SESSMAN Verify commands for REXX: * /
/* MONITOR SIGNAL LOGON DELAY TYPE * /
(1) arg system
address Verify
(2) " monitor signals "
" signal error on logoff "
(3) " logon &system paneldata usermod '3F' ",
" 24x80 24x80 basicds "
(4) " delay 500 "
" signal off on logoff "
do forever
address ispxec ,
(4) " display panel(sessspan) ",
" cursor(ptebuff) csrpos( "pteclsrp ") "
(5) if pfkey = ' ' then
aid = 'enter'
else
aid = pfkey
" type usermod <&csrpos> aid &aid "
(6) if rc /= 0 then
leave
end

```

SESSMAN Exec Notes:

1. The name of an online system specified in a SESSMAN command is received by the SESSMAN exec as a REXX argument.
2. CA Verify for VTAM MONITOR and SIGNAL commands are used to display an error message if a requested session cannot be started.
3. A CA Verify for VTAM LOGON command is used to start a session with the named online system. The command specifies PANELDATA to instruct subsequent session commands to edit PTEBUFF for display using a session panel, and specifies USERMOD '3F' to inform CA Verify for VTAM of the USERMOD value defined by the session panel.
4. After the initial sign on screen is received by the DELAY command, the SESSMAN exec enters a DO loop that ends only when the session ends.
5. An image of each display received at the virtual terminal is displayed at the TSO terminal using the ISPF DISPLAY command and a session panel like the panel shown in the following example. The DISPLAY command positions the cursor using the virtual terminal cursor position returned by session commands in variable, PTECSR. P.
6. A TYPE command that specifies the USERMOD keyword is used to rekey data entered by the terminal user into the virtual terminal display. USERMOD finds data in PTEBUFF that was entered by the user using the USERMOD value specified by the LOGON command and in the session panel definition. The TYPE command uses the ENTER key or the PF key pressed by the terminal user to send the input to the online system.
7. The session and the SESSMAN exec end when the user enters a logoff transaction that causes the online system to end the session.

Monitoring Execs and Sessions

CA Verify for VTAM commands are designed to automate terminal tasks and provide options that allow REXX execs to handle all possible errors and other events, and therefore, by default, do not automatically display error messages, exec-driven sessions or other command events. However, an exec or an exec user may use command monitoring functions built into CA Verify for VTAM commands for REXX, to monitor selected events and to document, display or otherwise process errors, exec-driven sessions and other events automatically, while an exec is executing.

The CA Verify for VTAM MONITOR command may be used in any exec to automatically display information about specified events while an exec is executing or to call a monitor exec to process the information:

- MONITOR SIGNALS detects REXX conditions raised by CA Verify for VTAM commands and may be added to any exec to display messages automatically when REXX conditions are raised.
- MONITOR CONDITIONS detects non-zero return codes returned by CA Verify for VTAM commands and may be used to display messages that document the reason.
- MONITOR COMMANDS may be used to display CA Verify for VTAM commands as they are issued by REXX execs.
- MONITOR RESPONSES calls a default or specified monitor exec when responses or other outbound session events are received and may be used to display an exec-driven session at a terminal.
- MONITOR STORE, DROP, FETCH and/or one or more generic variable names, specified in any combination, may be used to display variable values when they are changed, used or dropped by CA Verify for VTAM commands.

MONITOR command VIASAY, VIATPUT and VIAEXEC options specify how monitored events are handled when they are detected. VIASAY and VIATPUT display events other than RESPONSES using the REXX SAY instruction or TSO TPUT, depending on the REXX environment in which the exec is executing. VIAEXEC calls a specified monitor exec when a monitored event is detected. When RESPONSES are monitored, a monitor exec is always called to process online system responses received by CA Verify for VTAM session commands, either an exec specified by the VIAEXEC option or a default monitor exec.

When a monitor exec is called to process detected events, call arguments provide detailed information about the event to the monitor exec. Call arguments are explained in The Monitor Exec Interface. The monitor exec shown in The Distributed Monitor Exec VTEMONX is designed to be used as the default monitor exec that is called when RESPONSES are monitored but a VIAEXEC is not specified. When it is called to process an online system response to a transaction entered by an exec using the CA Verify for VTAM TYPE command, VTEMONX uses either ISPF display services or the REXX SAY instruction to display a virtual terminal screen image, depending on the REXX environment in which the exec is executing.

A MONITOR command applies to all execs that execute in the REXX environment in which the MONITOR command is executed, and may be issued by a general purpose front-end exec that is used to call and monitor other execs with no modification to the called execs.

The distributed front-end exec, VTESMON, is shown in the following example. VTESMON may be used to call and monitor an exec in REXX environments created by ISPF, TSO or IRXJCL, with no modification to the called exec, by entering the following as a TSO command or as an IRXJCL PARM:

```
VTESMON testexec args
```

VTESMON issues a MONITOR command to monitor CA Verify for VTAM commands issued by the called exec, testexec, relying on the default monitor exec, VTEMONX, to display response events. Both VTESMON and VTEMONX use either ISPF display services or the REXX SAY instruction to display events depending on the REXX environment. When a specified testexec returns, VTESMON reports any REXX condition caused by the call to testexec and ends any session not ended by testexec.

The following is an example of the VTESMON exec-driven session monitor:

```

/* VTESMON - A Monitor for REXX-driven Verify Sessions (distributed) */
arg args
parse upper var args execname execargs
if execname = '' then do
    say 'Enter: VTESMON execname (optional args for execname)'
    exit
end
address Verify
" ACCESS EXECPORT " ; " QUERY SESSION "
if ptestate \= 'PTESTATE' then " LOGOFF "
" MONITOR SIGNALS RESPONSES "
    signal on halt name halt ; signal on error name error
    signal on syntax name syntax ; signal on failure name fail
    interpret "call "execname" "execargs""
    problem = '' ; signal finish
    halt: problem = 'HALT' ; signal finish
    error: problem = 'ERROR' ; signal finish
    syntax: problem = 'SYNTAX' ; signal finish
    fail: problem = 'FAILURE' ; signal finish
    finish: signal off halt ; signal off error
    signal off syntax ; signal off failure
" MONITOR OFF " ; " ACCESS LASTPORT " ; " QUERY SESSION "
parse source . . . . . addrspn .
if addrspn = 'ISPF' then do
    green = '01'x ; red = '05'x ; blue = '11'x ; white = '15'x
    PTEDESKT = ''
    address ispexec
    " control nondispl " ; " display panel(VTEPXM2) "
    zwinttl = execname 'execution ended on Port' PTEAPORT
    select
        when problem \= '' then
            PTEMWIN2 = left(red || execname || white,
                || 'terminated; REXX condition(',
                || red || problem || white || ').',72),
                || right(blue || 'Press' || green,
                || 'ENTER' || blue || 'to end test.',72)
        when ptestate.pteaport \= 'PTESTATE.'PTEAPORT then
            PTEMWIN2 = left(red || execname,
                || white || 'did not end Port' PTEAPORT,
                'session. ' red'LOGOFF issued.',72),
                || right(blue || 'Press' || green,
                || 'ENTER' || blue || 'to end test.',72)
        otherwise do
            PTEMWIN2 = left(green || execname,
                || white || 'ended normally.',72),
                || right(blue || 'Test ending . . .',72)
    " control display lock "
    end
    " addpop row(19) column(1) " ; " display panel(VTEPXM2) "
    address Verify " WAIT 800 "
    end
else do
    say copies('_',79) ; say ' '
    select
        when problem \= '' then
            say execname 'terminated; REXX condition(' problem ').'
        when ptestate.pteaport \= 'PTESTATE.'PTEAPORT then
            say execname 'ended but did not end Port',
                PTEAPORT 'session. LOGOFF issued.'
        otherwise say execname 'ended normally.'
    end
end

```

```
end  
if ptestate.pteaopt \= 'PTESTATE.'pteaopt then " LOGOFF "
```


Chapter 13: REXX Reference

This chapter documents the function and syntax of each host command used in the CA Verify for VTAM Host Command Environment. The commands are presented in alphabetical order according to command name.

This section contains the following topics:

[Syntax Notation Format](#) (see page 313)

[ACCESS](#) (see page 314)

[ATTACH](#) (see page 316)

[CANCEL](#) (see page 320)

[DELAY](#) (see page 322)

[DELETEQ](#) (see page 324)

[ENDTRACE](#) (see page 325)

[HANDLE](#) (see page 326)

[INVITE](#) (see page 328)

[LOCK](#) (see page 330)

[LOGOFF](#) (see page 331)

[LOGON](#) (see page 332)

[MONITOR](#) (see page 337)

[POST](#) (see page 343)

[PULL](#) (see page 344)

[PUSH](#) (see page 345)

[QUERY](#) (see page 346)

[QUEUE](#) (see page 348)

[SIGNAL](#) (see page 349)

[TRACE](#) (see page 352)

[TYPE](#) (see page 354)

[UNLOCK](#) (see page 359)

[WAIT](#) (see page 361)

Syntax Notation Format

- CA Verify for VTAM Host Commands and keywords are in UPPERCASE text.
- User data is listed in lowercase bold text and can be literal data or variables.
- Optional parameters are enclosed in parentheses.
- Alternative keywords and/or parameters are separated by the bar symbol.
- In CA Verify for VTAM commands, REXX variable names are coded with a leading ampersand, &, to distinguish them from keywords and other command operands.
- Host command continuation is indicated with a comma.

ACCESS

When CA Verify for VTAM commands start or use sessions, start or end session traces, queue or pull queued data or perform other command functions, by default, they anchor or use resources anchored to the CA Verify for VTAM port on which the issuing exec is executing, and session commands return session information using the simple session variable names defined in CA Verify for VTAM REXX Variables.

The command:

- Instructs subsequent CA Verify for VTAM commands to anchor or use resources anchored to a specified port when performing a command function.
- Instructs subsequent session commands to return session information using either simple or compound session variable names.
- Returns the accessed port number in REXX variable, PTEAPORT.
- Returns the current exec port number in PTEPORT.

Compound session variable names, like PTEBUFF.1, have a REXX stem that is a defined simple session variable name and a tail that is the accessed port number.

Examples:

```
" ACCESS EXECPORT "  
" ACCESS NEWPORT "  
" ACCESS 3 "  
" ACCESS &port "
```

Format:

```
ACCESS ( EXECPORT | * | port | NEWPORT | FREEPORT | LASTPORT ) ( LOCK )
```

ACCESS EXECPORT or ACCESS *

Instructs subsequent commands to anchor or use resources anchored to the port on which the exec is executing, and instructs session commands to return information using simple session variable names.

ACCESS port

Where port is either a port number or a REXX variable name, coded with a leading ampersand, that contains a port number, instructs subsequent commands to anchor or use resources anchored to the specified port, and instructs session commands to return information using compound session variable names.

ACCESS NEWPORT(the default)

Assigns an unused port number, instructs subsequent commands to anchor or use resources anchored to the assigned port, and instructs session commands to return information using compound session variable names.

ACCESS FREEPORT

Locates a port on which no exec, session, session trace, data queue or lock is active, or assigns an unused port number, instructs subsequent commands to anchor or use resources anchored to the located or assigned port, and instructs session commands to return information using compound session variable names.

ACCESS LASTPORT

Identifies the port that was last accessed by any exec running on the current exec port, instructs subsequent commands to anchor or use resources anchored to the identified port, and instructs session commands to return information using compound session variable names.

LOCK

Can be specified to lock the accessed port. When a port is locked, an UNLOCK command must be issued before port resources can be created or used by an exec running on any port other than the port that holds the lock.

Conditions and Return Codes

At the completion of an ACCESS command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes ACCESS command return codes and default REXX conditions that may be raised for some conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
CANCEL	24	HALT	Cancel command processed
FAULT	64	HALT	Invalid command or system error

ATTACH

The ATTACH command creates a new z/OS task and REXX Language Processor environment, anchors the environment to the CA Verify for VTAM port being accessed by the exec when the ATTACH command is issued, and executes a specified exec in the new REXX Language Processor Environment.

The difference between calling an exec and attaching an exec is that the REXX CALL instruction completes and the calling exec resumes execution only when the called exec returns to the calling exec. However, the ATTACH command completes and the attaching exec resumes execution at the same time that the attached exec begins execution. Called and calling execs run one at a time, while attached and attaching execs run at the same time.

Examples:

```
" ATTACH EXEC &execname    "," &arg1 'arg2' "
```

```
" ATTACH EXEC subexec 'logon' "" &sysid &uid &code  "
```

Format:

```
ATTACH EXEC execname ( arg1 . . . arg20 ) ( EXECDD execdd ) ( SAYDD saydd ) ( SAYDEST saydest ) ( MSGDEST msgdest )
```

EXEC

A required keyword which indicates that the value that follows is the name of the exec to be attached.

execname

The name of the REXX exec to be attached. It may be the actual exec name, a literal whose value is the exec name, or a variable name coded with a leading ampersand that contains the exec name (for example, &execname).

arg1 through arg20

Up to 20 arguments to be passed to the attached exec. Each argument may be a literal value enclosed in single or double quotes, or may be a variable name, coded with a leading ampersand that contains an argument value (for example, &arg).

Note: An attached exec may use a REXX ARG instruction to assign argument values to corresponding variables specified by REXX ARG instruction. ARG instruction variable names are separated by commas.

EXECDD

An optional keyword which indicates that the value that follows is the DD name of the REXX library(s) from which the attached exec, and other execs, are to be loaded into the REXX Language Processor Environment created by the ATTACH command.

execdd

The exec library DD name from which execs are loaded. It may be the actual DD name, a literal whose value is the DD name, or a variable name coded with a leading ampersand that contains the exec library DD name (for example, &execdd). If an EXECDD is not specified, execs are loaded from the exec libraries used in the first REXX Language Processor Environment in an address space that uses CA Verify for VTAM commands for REXX, usually from SYSEXEC and/or SYSPROC.

SAYDD

An optional keyword which indicates that the value that follows is the DD name to which REXX SAY messages are to be written in the REXX Language Processor Environment created by the ATTACH command. The SAYDD keyword option is subject to system options, described below, that control REXX message management options.

saydd

The DD name to which REXX SAY messages are to be written. It may be the actual DD name, a literal whose value is the DD name, or a variable name coded with a leading ampersand that contains the DD name (for example, &saydd).

A null-valued variable may be specified as a saydd to request allocation of a new message dataset using a unique system-assigned DD name, and that the assigned name is to be returned to the attaching exec in the specified saydd variable.

If a specified saydd is already allocated when an ATTACH command is executed, the allocated dataset is used in the new REXX Language Processor Environment as a message dataset. If a saydd that was not allocated by CA Verify for VTAM is specified for two or more attached execs that run concurrently, the user must insure that the allocated dataset can be used as a shared message destination by the REXX Language Processor Environments created to run the attached execs.

SAYDEST

An optional keyword which indicates that the value that follows is to be allocated as the destination of REXX SAY messages, if the specified or default SAYDD is not allocated when the ATTACH command is executed. The SAYDEST keyword option is subject to system options, described below, that control REXX message management options.

saydest

The SAYDEST destination value. It may be a JES SYSOUT class, an asterisk, *, to specify the default SYSOUT class for the address space, or may be the keyword, TERMINAL to send REXX SAY messages to a TSO terminal. saydest may be the actual JES SYSOUT class or the TERMINAL keyword, may be a literal whose value is the SAY message destination, or may be variable name coded with a leading ampersand that contains the SYSOUT class or TERMINAL keyword (for example, &saydest).

MSGDEST

An optional keyword which indicates that the value that follows is the destination of REXX error messages issued while processing execs in the REXX Language Processor Environment created by the ATTACH command. The MSGDEST keyword option is subject to system options, described below, that control REXX message management options.

msgdest

A REXX error message destination identified by the MSGDEST keyword. Specify one of the following destination keywords:

- WTO to write REXX messages using WTO only
- SAY to write REXX messages to the REXX SAY message destination only
- ALL to write REXX messages using both WTO and to the REXX SAY message destination
- OFF to discard REXX error messages

Msgdest may be a destination keyword, may be a literal whose value is a destination keyword, or may be a variable name coded with a leading ampersand that contains a REXX message destination keyword (for example, &msgdest).

Note: The number of REXX execs that may be attached is limited by the REXX Language Processor Environment limit contained in the TSO/E REXX environment table, IRXANCHR. IBM publication, TSO/E REXX/z/OS Reference, explains how to change the REXX environment limit.

All REXX Language Processor Environments in which CA Verify for VTAM commands are used are anchored to a CA Verify for VTAM port. When commands are used by an exec running in a REXX environment not created by CA Verify for VTAM, the environment is anchored to a port when the first command is issued. Only one REXX Language Processor Environment may be anchored to a port. The ATTACH command creates a new REXX Language Processor Environment and anchors the environment to the port being accessed by an exec anchored to the port. Before using the ATTACH command, an exec must use the CA Verify for VTAM ACCESS command to access a NEWPORT, a FREEPORT, or to access a specific port that is not already associated with a REXX Language Processor Environment.

An attached exec may ADDRESS VERIFY and issue commands for REXX.

REXX Language Processor Environments created by the ATTACH command are not integrated into TSO. Attached execs may not use TSO and ISPF commands that are supported only in REXX Language Processor Environments that are integrated into TSO. However, execs that operate correctly when attached in a TSO address space may also be attached and operate correctly when IRXJCL is used to execute an exec as a batch job or when they are attached in other non-TSO address spaces.

[Attaching Asynchronous Exec Tasks](#) (see page 296) and [Queues and Intertask Communication](#) (see page 297) describe applications of the ATTACH command and other CA Verify for VTAM commands designed for use by execs that run in a multi-task environment.

REXX Messages Management Options

The operation of and default values of the SAYDD, SAYDEST and MSGDEST keyword options are subject to CA Verify for VTAM system options that allow an installation to specify REXX message management options for each named address space in which CA Verify for VTAM commands for REXX are used. The name of an address space is defined by the REXX parameters module used to initialize REXX Language Processor Environments.

- System options may instruct CA Verify for VTAM to ignore ATTACH command SAYDEST and SAYDD specifications in address spaces that manage REXX message destinations for all REXX Language Processor Environments in the address space.
- System options may instruct CA Verify for VTAM to manage REXX message destinations only when an ATTACH command specifies SAYDEST and/or SAYDD options.

- System options may instruct CA Verify for VTAM to ignore any MSGDEST specified by an ATTACH command, and to use a specified option when running in a named address space.
- If system options permit, CA Verify for VTAM allocates and manages REXX message destinations and options as specified by ATTACH command SAYDEST, SAYDD and/or MSGDEST options or allocates and manages REXX message destinations using default values when ATTACH command options are not specified. Message datasets allocated by CA Verify for VTAM are automatically freed when the last attached exec using a message dataset ends.

Conditions and Return Codes

At the completion of an ATTACH command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes ATTACH command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
LOCKOUT	4		Timed out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

CANCEL

The CANCEL command causes the REXX HALT condition to be raised for the exec that is active on the port being accessed by the issuing exec.

Example:

```
" CANCEL      "
```

Format:

```
CANCEL
```

When the CANCEL command is executed, if an exec is active on the port being accessed, then cancellation of the exec is scheduled. The REXX HALT condition is subsequently raised when the cancelled exec recognizes the request following the execution of any CA Verify for VTAM command.

When the CANCEL command is executed, if a CA Verify for VTAM command is currently executing within the cancelled exec, and if the command is waiting for the completion of an event that is under CA Verify for VTAM control, then the wait for the completion of the event is interrupted immediately. The REXX HALT condition is raised when the interrupted command ends.

If an exec is not active on the port being accessed when a CANCEL command is executed, then no action is performed, but the command is considered to have completed without error.

Conditions and Return Codes

At the completion of a CANCEL command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes CANCEL command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

DELAY

The DELAY command delays execution of an exec for a specified amount of time, but allows outbound session traffic to flow on the session anchored to the port being accessed by the exec, during the delay.

Examples:

```
" DELAY 3200 "" DELAY PERCENT 50 "
```

Format:

```
DELAY hhmmsssth | ( PERCENT percent )
```

Hhmmsssth

A delay time interval, expressed in hours (hh), minutes (mm), seconds (ss) and tenths and hundredths of seconds (th). A delay time interval may be specified using a REXX variable, coded with a leading ampersand, that contains the interval in the format hhmmsssth.

PERCENT

An optional keyword, which specifies that delay times specified by DELAY commands subsequently executed by execs that run on the CA Verify for VTAM port on which a DELAY PERCENT command is executed, are to be factored by the specified percent.

percent

May be an integer value from zero to 999, or may be a variable field that contains an integer from zero to 999. It is the percent of specified delay times to be used when DELAY commands are subsequently executed.

DELAY commands created by recording a session as a REXX exec capture the elapsed time, often called think time, that it took for a user to press enter or another key that sends data, after receiving the preceding message from the online system. When a DELAY command is executed, exec execution is delayed until the recorded or specified delay time elapses, simulating the think time delays that occur when people use terminals, and causing a session produced by a recorded exec to proceed at the same speed as the captured session.

The speed of execs that issue DELAY commands may be controlled using a DELAY command that specifies a delay PERCENT. When a DELAY PERCENT command is executed that specifies a percent less than 100, exec execution is delayed only for a percent of the time specified by each subsequent DELAY command and the exec runs faster. When a percent greater than 100 is specified, delays are longer than the delay times specified by subsequent DELAY commands, causing the exec to run slower.

Because DELAY PERCENT applies to all execs that run on a CA Verify for VTAM port, an exec that calls other execs can control the speed of the called execs by issuing a DELAY PERCENT command.

At the completion of a DELAY command, updated information is returned in session variables that reflects any outbound message(s) received during a delay. Refer to [CA Verify for VTAM REXX Variables](#) (see page 363) for a description of the information returned in session variables.

Conditions and Return Codes

At the completion of a DELAY command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes DELAY command return codes and REXX conditions that are raised by default when some CA Verify for VTAM conditions occur.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Timed out waiting for port lock
TIMEOUT	8		Timed out waiting for response
LOGOFF	16		Session Ended
ENDTRACE	20	HALT	Trace abended (ie., SD37)
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

DELETEQ

The DELETEQ command is used to delete the entire data queue that is anchored to the port being accessed by the issuing exec.

Example:

```
" DELETEQ "
```

Format:

```
DELETEQ
```

Conditions and Return Codes

At the completion of a DELETEQ command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes DELETEQ command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
LOCKOUT	0		Timed out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

ENDTRACE

The ENDTRACE command ends a session trace anchored to the port being accessed by an exec when the command is issued. A session trace is started by the TRACE command.

Example:

```
" ENDTRACE "
```

Format:

```
ENDTRACE
```

Conditions and Return Codes

At the completion of an ENDTRACE command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes ENDTRACE command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
LOCKOUT	0		Timed out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

HANDLE

The HANDLE command activates or inactivates automatic handling of named session events when they occur during the processing of subsequently executed CA Verify for VTAM session commands.

Examples:

```
" HANDLE turnaround off      " HANDLE outbound off      "
```

Format:

HANDLE event option

event

One of the keywords, TURNAROUND or OUTBOUND, that names the session event for which handling is being specified.

Option

One of the keywords, ON or OFF, that specifies whether automatic handling of the named event is to be activated or inactivated.

The HANDLE command TURNAROUND keyword refers to the point in a session that occurs when a TYPE command has sent input to an online system and changes the session direction to outbound. By default or when HANDLE TURNAROUND ON is specified, the TYPE command automatically waits for and receives the online system response to a terminal input. When HANDLE TURNAROUND OFF is specified, subsequent TYPE commands do not wait for the online system response but rather complete immediately after the session direction is changed to outbound. HANDLE TURNAROUND OFF makes the TYPE command a send-only operation. After executing a TYPE command while TURNAROUND handling is off, an exec must eventually use the INVITE command to receive the online system response to the input sent by a TYPE command.

The HANDLE command OUTBOUND keyword refers to the point in a session at which an outbound message has been received from an online system that does not free the terminal keyboard, but rather leaves the session in the outbound state. By default or when HANDLE OUTBOUND ON is specified, when a CA Verify for VTAM session command receives a message from an online system that leaves the session in the outbound state, then CA Verify for VTAM automatically waits for and receives the next message sent by the online system. When HANDLE OUTBOUND OFF is specified, TYPE and INVITE commands that receive messages that leave the session in the outbound state complete following the receipt of each message, whether or not the terminal keyboard is freed. After executing a TYPE or INVITE command that ends a message, is received, and leaves the session in an outbound state while OUTBOUND handling is off, an exec must eventually use the INVITE command to receive the next message sent by the online system.

When HANDLE commands are used to obtain control of outbound messages, and when TYPE and INVITE commands complete while the virtual terminal keyboard is not free, an exec must be aware of the state of a session and act accordingly. Specifically, a TYPE command is valid only while the keyboard is free. An INVITE command must eventually be issued to receive an online system message while the keyboard is locked. Execs that choose to handle outbound message flows may use CA Verify for VTAM-defined variable fields PTEKB or PTESTATE to determine the state of a session and to decide whether TYPE commands are valid or INVITE commands are required. Refer to CA Verify for VTAM REXX Variables for descriptions of PTEKB or PTESTATE and the possible values of the variable fields.

Conditions and Return Codes

At the completion of a HANDLE command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the HANDLE command. The following table describes HANDLE command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

INVITE

The INVITE command receives any message sent by an online system within a specified time interval. It may be used to receive a message that is sent by an online system while the terminal keyboard is free, or to receive messages when the state of a session is outbound after using HANDLE OUTBOUND, HANDLE TURNAROUND, or WAIT time ON RESPONSE commands.

Examples:

```
" INVITE 1000 "" INVITE &invtime "
```

Format:

```
INVITE hhmmsssth
```

hhmmsssth

An optional time interval, expressed in hours (hh), minutes (mm), seconds (ss) and tenths and hundredths of seconds (th).

The INVITE command is used to receive a message at a virtual terminal that is anchored to the port that is being accessed by an exec. The LOGON command allocates and anchors a virtual terminal to an accessed port and uses the terminal to start a session.

A CA Verify for VTAM LOGON command completes immediately after a session is started. The virtual terminal keyboard is always free at the beginning of a session, as is the keyboard on a real terminal. While it is true that a terminal keyboard is free before the first message is sent on a new session, this is seldom noticed by a person. After starting a session, most online systems send a message to the terminal. People are naturally patient and wait until they see the expected message.

REXX execs that use CA Verify for VTAM host commands to start and use terminal sessions with an online system take the place of a terminal operator and must do the things that a person would do if a session is to flow smoothly. The INVITE command allows an exec to wait for an expected message, as a person would. At the start of a session, if an online system sends one or more initial messages, an exec must execute one or more INVITE commands to allow the online system to send the messages.

After receiving a terminal input, some online systems and applications send a message that frees the terminal keyboard immediately after receiving the terminal input. Then, at a later time, the online system sends another message that a terminal user sees as the response to the terminal input. Like a signon prompt sent at the start of a session, the unnoticed free keyboard situation does not cause a problem because the terminal operator is patient and waits for the expected message. A TYPE command ends when an online system message frees the terminal keyboard. If an online system sends a response that frees the terminal keyboard before sending the response message the user is expecting, then an exec must add patience by executing INVITE commands whenever it is necessary to wait for the delayed response.

Because people do not notice some free keyboard situations, it is sometimes difficult to determine when to code INVITE commands. One way to determine if an INVITE is needed is to examine a CA Verify for VTAM test stream for the online system or application in question. A test stream may be created using option L, Log a Test Stream, on the CA Verify for VTAM menu.

Browse the test stream, stopping at the record selection list. Enter the PROFILE command, select the WCC category, press PF3 to return to the record selection list. Paying attention to the OP column (operation), scroll forward through the record selection list. If you see two or more output operations in a row - without input operations between each output, an INVITE may be needed. Any WCC value greater than C1 unlocks the keyboard. If the keyboard is unlocked before the last output in the sequence, an INVITE is recommended after each output after the keyboard was unlocked.

At the completion of an INVITE command, updated information is returned in session variables, as documented in CA Verify for VTAM REXX Variables.

Conditions and Return Codes

At the completion of an INVITE command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes INVITE command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Timed out waiting for port lock
TIMEOUT	8		Timed out waiting for response
LOGOFF	16		Session ended
ENDTRACE	20	HALT	Trace abended (ie., SD37)
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

LOCK

The LOCK command locks the port that is being accessed by an exec and all resources anchored to the port.

The ACCESS command may also be used to lock a port when it is accessed.

While a port is locked, resources anchored to the port may be used only by execs that run on same port as the exec that issued the LOCK command. If an exec running on any other port issues a CA Verify for VTAM command that uses resources anchored to the locked port, the command is delayed until the port is unlocked.

The UNLOCK command is used to unlock a locked port.

Example:

```
" LOCK "
```

Format:

```
LOCK
```

Note: Refer to [Sharing Resources with Attached Execs](#) (see page 302) for more information about locks and uses of locks.

Conditions and Return Codes

At the completion of an LOCK command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes LOCK command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
LOCKOUT	0		Timed out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

LOGOFF

The LOGOFF command ends a session that was started using the LOGON command.

Example:

```
" LOGOFF "
```

Format:

```
LOGOFF
```

The LOGOFF command ends the session anchored to the port being accessed by an exec when the command is executed.

When the LOGOFF command is used to end a session, the online system sees the session termination in exactly the same way that it sees a session termination that occurs when a user presses the SYSREQ key on a real terminal keyboard, then enters the command LOGOFF, to request that VTAM terminate the active application session.

The preferred way to end a session is to issue a TYPE command that enters a particular online system's logoff command or transaction. Entering a logoff transaction may be required for some online systems to give the online system an opportunity to clean up resources that were allocated when the user signed on.

At the completion of a LOGOFF command, all session variables described in CA Verify for VTAM REXX Variables are dropped.

Conditions and Return Codes

At the completion of a LOGOFF command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes LOGOFF command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Timed out waiting for port lock
ENDTRACE	20	HALT	Trace abended (ie., SD37)

Conditions	RC	Default Signal	Reason for Condition
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

LOGON

The LOGON command allocates a CA Verify for VTAM virtual terminal, anchors the terminal to the port being accessed by the exec when the LOGON command is executed, and uses the terminal to start a session with a named online system.

Examples:

```
" LOGON cics1 model mod2 "" LOGON &system data &uid "
```

Format:

```
LOGON system-name (MODEL terminal-model | MOD2 | MOD3 | MOD4 | MOD5 ) (
default-screen-size24X80 | 32X80 | 43X80 | 27X132 ) ( alternate-screen-size24X80 |
32X80 | 43X80 | 27X132 )| ( terminal-type
```

```
  BASICDS | EXTDS )
```

```
(FROM terminal-name )
```

```
(DATA logon-data )
```

```
( buffer-format
```

```
BASICDATA | EXTDSDATA | PANELDATA | IMAGEDATA | ATTRIBUTES attr-values )( USERMOD
ispf-usermod )
```

system-name

The 1 through 8 character name of an online system with which a session is to be started. The system name specified may be an actual name, a literal value or a REXX variable, coded with a leading ampersand, that contains the name of an online system.

MODEL

An optional keyword and indicates that the value that follows is a symbolic terminal model name or the name of a mode table entry.

terminal-model

The logon mode table entry to be used to start a session. It may be one of the keywords MOD2, MOD3, MOD4 or MOD5, to refer to a mode table entry name, or it may be the actual name of a logon mode table entry. terminal-model may be expressed as an actual value, or may be a variable field that contains a valid terminal model value or null value.

default-screen-size

(Optional) Indicates the default virtual terminal screen size to be used for a session. default-screen-size may be one of the keywords 24X80, 32X80, 43X80, or 27X132, expressed as an actual value, or as a variable field that contains a screen size keyword or a null value.

alternate-screen-size

(Optional) Indicates the alternate virtual terminal screen size to be used for a session. alternate-screen-size may be one of the keywords 24X80, 32X80, 43X80, or 27X132, expressed as an actual value, or as a variable field that contains a screen size keyword or a null value.

terminal-type

(Optional) Specifies the type of terminal to be used for a session. terminal-type may be one of the keywords BASICDS or EXTDS, expressed as an actual value, or as a variable field that contains a terminal type keyword or null value.

FROM

An optional keyword that indicates that the data item that follows is a virtual terminal name.

terminal-name

The name of the virtual terminal to be used for the session. terminal-name may be the actual name of a VTAM APPL that has been defined at an installation for use as a CA Verify for VTAM virtual terminal or may be a variable field that contains a virtual terminal name or a null value. If the FROM keyword is not specified or if terminal-name is a variable field that contains a null value, then a virtual terminal will be assigned automatically.

DATA

An optional keyword that indicates that the data item that follows is logon data.

logon-data

A data item identified by the DATA keyword that is to be sent to an online system with a session request. logon-data may be a variable field that contains logon data and may be up to 255 characters in length, or may be one or more consecutive literal values whose accumulated length(s) do not exceed 255 characters. When the DATA keyword is not specified or if logon-data is a variable field that contains no data, then data is not included in the session request sent to an online system.

buffer-format

An optional keyword that specifies the format of the virtual terminal display buffer data returned in REXX variables PTEBUFF and PTEEAB at the completion of the LOGON command and subsequent session commands. Refer to 3270 Attribute Values for the values and meanings of basic, panel and extds attributes and extended attribute data.

- By default, basic field attribute values are returned in PTEBUFF and extended attribute data is returned in PTEEAB only if an EXTDS session is active.
- BASICDATA returns basic attributes in PTEBUFF and does not return PTEEAB, even if an EXTDS session is active.
- EXTDSDATA returns extds attributes in PTEBUFF and returns extended attribute data in PTEEAB, even if a BASICDS session is active.
- PANELDATA returns panel attributes in PTEBUFF, blanks out protected non-display data and translates nulls in protected display fields to blanks. PTEEAB is not returned.
- IMAGEDATA translates all non-display data, attributes and nulls to blanks in the returned PTEBUFF, and does not return PTEEAB. IMAGEDATA produces a legible PTEBUFF that may be printed or used in application documentation.
- ATTRIBUTES may be used to specify the 32 1-byte hexadecimal values to be returned as the 32 possible basic 3270 field attributes in PTEBUFF. The value following ATTRIBUTES, attribute-values, is a 64-character literal value enclosed in single or double quotes. Each character is a hexadecimal character, 0-F, and each successive pair of characters is a hexadecimal value to be used to represent the next successive basic field attribute. When ATTRIBUTES is specified, PTEEAB is returned if an EXTDS session is active.

USERMOD

An optional keyword that indicates that the value that follows is an ISPF usermod value.

ISPF-usermod

Immediately follows the USERMOD keyword and specifies a one-byte value, expressed as a single character or as a two-character hexadecimal value enclosed in single or double quotes. The ISPF-usermod value tells CA Verify for VTAM the USERMOD value specified by an ISPF panel that is used to display an image of a virtual terminal screen. ISPF-usermod defaults to hexadecimal 3F.

The system name specified may be the actual VTAM APPL name by which an online system is known to VTAM or may be a familiar system id defined in CA Verify for VTAM system options, that refers to an actual VTAM APPL.

If a null terminal model is specified in a CA Verify for VTAM LOGON command, or if the MODEL keyword is not specified, then a default mode table entry name specified during CA Verify for VTAM installation is used. The following table lists terminal model keywords and their associated default and alternate virtual terminal screen sizes.

Model Keyword	Default Size	Alternate size
MOD2	24 X 80	24 X 80
MOD3	24 X 80	32 X 80
MOD4	24 X 80	43 x 80
MOD5	24 X 80	27 x 132

The first screen size keyword encountered in a LOGON command specifies the default screen size. If a default screen size is specified, it is used only when a session is started using a mode table entry that does not contain screen sizes, and sizes are not forced by an online system.

The second screen size keyword encountered in a LOGON command specifies the alternate screen size. If an alternate screen size is specified, it is used only when a session is started using a mode table entry that does not contain screen sizes, and sizes are not forced by an online system.

If screen sizes are not specified and are not defined in the mode table used to start a session and are not forced by an online system, then default sizes specified at an installation are used.

A terminal may be either a basic or extended 3270 data stream terminal. A basic data stream terminal has a single screen buffer that is used to store screen data and coded basic field attributes. An extended data stream terminal has a screen buffer that is used to store screen data and actual basic field attributes and has an extended attribute buffer that is used to store extended data stream color and highlighting attributes and other information.

If a terminal type is not specified, a default type specified at an installation is used. If an online system sends a 3270 Read Partition Query structured field to a terminal to determine device capabilities, the terminal type or screen sizes specified influence the contents of the reply.

After using the LOGON command to start a session, the CA Verify for VTAM TYPE, INVITE, and DELAY commands are used to key data into the virtual terminal used for a session, to send input to the online system, to receive online system responses to input, and to receive messages initiated by an online system.

ISPF Session Panels explains how to use the LOGON command PANELDATA and USERMOD options to display an image of a virtual terminal screen using an ISPF panel, and how to key data entered by the user into a virtual terminal using the TYPE command USERMOD option.

At the completion of each CA Verify for VTAM session command, session information is returned to the issuing exec in REXX variables. Refer to CA Verify for VTAM REXX Variables for a description of each session variable.

A session is ended by an online system when a logoff transaction is entered using a TYPE command, or may be ended using a LOGOFF command. Sessions are terminated automatically if all execs in an address space end and leave sessions active.

Conditions and Return Codes

At the completion of a LOGON command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes LOGON command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Timed out waiting for port lock
LOGOFF	16		Session ended
ENDTRACE	20	HALT	Trace abended (ie., SD37)
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

MONITOR

The MONITOR command instructs CA Verify for VTAM to monitor or to stop monitoring specified events and specifies what to do when monitored events are detected. Detected events may be displayed at a terminal, written as REXX SAY messages, or may be passed to a user-written exec that may process the event as desired. MONITOR command instructions apply to subsequent CA Verify for VTAM commands issued by any exec that runs in the REXX Language Processor Environment in which the MONITOR command is issued, including execs that call or that are called by an exec that issues a MONITOR command. A MONITOR command may instruct CA Verify for VTAM to monitor or to stop monitoring:

- CA Verify for VTAM commands issued by REXX execs
- online system responses or other messages received by CA Verify for VTAM session commands
- REXX variable values assigned or used by CA Verify for VTAM commands
- REXX conditions raised by CA Verify for VTAM commands to indicate CA Verify for VTAM conditions to an exec
- CA Verify for VTAM conditions returned to an exec as a return code

Examples:

```
" MONITOR SIGNALS "  
" MONITOR SIGNALS CONDITIONS COMMANDS RESPONSES STORE DROP FETCH "  
" MONITOR &REXXSYM &PTEMESS "  
" MONITOR SIGNALS CONDITIONS COMMANDS RESPONSES VIAEXEC MONEXEC "  
" MONITOR OFF "
```

Format:

```
MONITOR ( events )( &generic_symbols )( OFF )( VIASAY | VIATPUT | VIAEXEC monitor_exec  
( NOTE &note | RECALL &note )
```

events

An optional list of keywords that name events to be monitored. When OFF is also specified monitoring is stopped for the specified events. Event keywords are:

- SIGNALS monitors REXX HALT, ERROR or FAILURE conditions raised by CA Verify for VTAM commands to indicate CA Verify for VTAM conditions to an exec.
- CONDITIONS monitors return codes returned to execs by CA Verify for VTAM commands to indicate CA Verify for VTAM LOCKOUT, TIMEOUT, ENDQUEUE, LOGOFF, ENDTRACE, CANCEL or FAULT conditions.
- COMMANDS monitors the start of subsequent commands.
- RESPONSES monitors online system responses and other messages sent by an online system to a virtual terminal, as well as session initiation and termination events, when they are received by CA Verify for VTAM session commands. When RESPONSES are received, information is not displayed; instead a specified or default monitor_exec is called to process the information. The distributed default monitor_exec, VTEMONX, shown in [The Distributed Monitor Exec](#) (see page 342) displays commands and virtual terminal screen images using ISPF display services or the REXX SAY instruction, depending on the REXX environment.
- STORE monitors changes to variables by CA Verify for VTAM commands or monitors changes to variable values whose names begin with specified &generic_symbols.
- FETCH monitors uses of variables by CA Verify for VTAM commands or monitors uses of variables whose names begin with specified &generic_symbols.
- DROP monitors variables dropped by CA Verify for VTAM commands or monitors dropped variables whose names begin with specified &generic_symbols.

&generic_symbols

Monitors operations performed by CA Verify for VTAM commands on REXX variables whose names begin with any specified `generic_symbol`, or stops monitoring when OFF is also specified. For example, `MONITOR &PTE &Q_VALUE`, monitors CA Verify for VTAM operations on variables whose names begin with `PTE` or `Q_VALUE`. When `STORE`, `FETCH` and/or `DROP` are also specified, only the specified operations are detected, otherwise all operations on variables whose names begin with specified `&generic_symbols` are detected.

OFF

Stops monitoring for specified events and/or `&generic_symbols`. If OFF is the only MONITOR command option specified, then all monitoring is stopped.

VIASAY

Causes messages to be sent to the REXX SAY destination when monitored events other than RESPONSES are detected.

VIATPUT

Causes messages to be sent to the TSO terminal using TSO TPUT, when monitored events other than RESPONSES are detected. In a non-TSO address space, VIATPUT sends messages to the REXX SAY destination.

VIAEXEC monitor_exec

Specifies that a named exec, `monitor_exec`, is to be called when a monitored event is detected. [The Monitor Exec Interface](#) (see page 341) documents arguments passed to a `monitor_exec` when it is called to process events and provides other information about monitor execs.

NOTE ¬e

Saves the value of REXX variable `note` for subsequent recall by any exec that runs on the same port as the exec that saved the `¬e`.

RECALL ¬e

Returns a monitor note in REXX variable `note` that was saved by a MONITOR NOTE command issued by any exec running on the same port as the exec that recalls the `¬e`.

By default, CA Verify for VTAM commands are not monitored. While return codes, REXX conditions and information returned in REXX variables informs an exec about errors or other CA Verify for VTAM conditions encountered by CA Verify for VTAM commands, no information about CA Verify for VTAM conditions is automatically displayed or otherwise made available to the user of an exec.

- A MONITOR command that specifies only SIGNALS may be used to display or SAY CA Verify for VTAM error messages automatically.

- A MONITOR command that specifies RESPONSES may be added to a converted or user written exec that uses CA Verify for VTAM session commands to automatically display the session while the exec is executing.
- MONITOR commands that specify other events and/or variables may be used to perform more extensive exec debugging.

Because MONITOR commands apply to all execs that run in a REXX environment, general purpose execs that activate monitoring and call other execs may be used to debug execs without modification to the exec being debugged. In addition to debugging applications, the MONITOR command, monitor execs, other CA Verify for VTAM commands, and ISPF commands may be used to monitor multi-session stress tests. More information about and examples of MONITOR command applications may be found in [Monitoring Execs and Sessions](#) (see page 307).

Conditions and Return Codes

At the completion of a MONITOR command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes MONITOR command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

The Monitor Exec Interface

A monitor exec specified using the MONITOR command VIAEXEC option is called to process all monitored events when they are detected. A default monitor exec is called to process online system responses when RESPONSES are monitored, but a monitor exec has not been specified using the MONITOR command VIAEXEC option. When a monitor exec is called to process an event, information about the event is passed to the monitor exec as CALL arguments. A monitor exec may assign the argument values to REXX variables using a REXX ARG instruction that has commas coded between specified variable names. The CALL arguments passed to a monitor exec are:

- The name of the REXX Environment in which the monitored event was detected, as specified by REXX parameters when the environment was initialized, possibly z/OS, TSO/E or ISPF.
- The name of the REXX exec that issued the CA Verify for VTAM command that was being processed when the monitored event was detected.
- The text of the CA Verify for VTAM command being executed when the monitored event was detected.
- One of the keywords, COMMAND, RESPONSE, STORE, FETCH, DROP or CC, that identifies the event to be processed by the monitor exec.
- When argument 4 is STORE, FETCH or DROP, then argument 5 is the name of the REXX variable whose value was stored, fetched or dropped.
- When argument 4 is CC, then argument 5 is one of REXX conditions HALT, ERROR or FAILURE, if a REXX condition is being raised by a CA Verify for VTAM command, or is RC if a return code is being returned to an exec to indicate a CA Verify for VTAM condition.
- When argument 4 is STORE or FETCH, then argument 6 is the value of the REXX variable that was stored or fetched.
- When argument 4 is CC, then argument 6 is one of the CA Verify for VTAM condition keywords, LOCKOUT, TIMEOUT, ENDQUEUE, LOGOFF, ENDTRACE, CANCEL or FAULT, and indicates why a REXX condition is being raised or a return code is being returned to an exec.
- When argument 4 is CC, argument 7 is a CA Verify for VTAM message that further documents why a REXX condition is being raised or a return code is being returned to an exec.

Prior to calling a monitor exec, active monitoring is turned off, and monitoring is restored when a monitor exec returns. A monitor exec may issue an ACCESS LASTPORT command to determine the port being accessed by the exec when the monitored event was detected, may issue a QUERY SESSION command to fetch a copy of all CA Verify for VTAM defined session variables, or may issue any other CA Verify for VTAM command including the MONITOR command. Monitor execs may also ADDRESS other command processors and use other commands that are valid in the REXX Language Processor Environment.

MONITOR NOTE and MONITOR RECALL functions are intended for use by monitor execs and other execs that control monitor functions and monitor execs. An exec that issues a MONITOR command that specifies a user-written monitor exec may pass information to the monitor exec using a monitor note. A monitor exec may recall information noted by another exec or may recall, update and note session statistics or other information needed when the monitor exec is called to process subsequent events. While there are no restrictions regarding the use of the MONITOR NOTE or RECALL functions, it is recommended that the functions be used only by monitor execs or execs that communicate or cooperate with monitor execs, to avoid conflicting use of notes if monitor execs are used to monitor other execs.

The Distributed Monitor Exec

If a MONITOR command specifies RESPONSES, but does not specify VIAEXEC, a default monitor exec specified in CA Verify for VTAM system options is called when subsequent online system responses or other outbound session events are processed by CA Verify for VTAM session commands.

A distributed monitor exec, VTEMONX, is designed to be used as a default monitor exec. When called to process detected RESPONSE events, VTEMONX displays CA Verify for VTAM session commands and virtual terminal screen images using ISPF display and pop-up services, when called in an ISPF REXX Language Processor Environment, or using the REXX SAY instruction, when called in a TSO or other REXX Language Processor Environment.

VTEMONX is distributed in the CA Verify for VTAM CATJEXEC library. ISPF panels used by VTEMONX, VTEPXMDT and VTEPXMW2, are distributed in the CA Verify for VTAM CATJPENU library.

VTEMONX should not be specified as a MONITOR command VIAEXEC. If called to process an event other than a RESPONSE event, VTEMONX ignores the event and returns. Monitored events other than RESPONSE events are displayed automatically if a VIAEXEC is not specified. However, a user-written monitor exec that processes other events may call VTEMONX to process RESPONSE events provided that it passes all arguments passed to it by CA Verify for VTAM.

POST

The POST command replaces the entire queue anchored to the port being accessed by an exec, with a single queue entry that contains specified argument values. If a PULL command issued by an exec running on another port is waiting for data to be stored in the queue, then the oldest waiting PULL command is resumed when the queue entry is posted.

Examples:

```
" POST 'saymsg' &PTEMESS "  
" POST &item1 &item2 &item3 "
```

Format:

```
POST (arg1 . . . arg20)
```

arg1 through arg20

(Optional) Argument which specifies up to 20 values, either literal values contained in single or double quotes, or REXX variables, coded with a leading ampersand, that contain argument values to be stored in the posted queue entry. A null queue entry is posted if no arguments are specified.

If the POST command is used to post updated information and QUERY QUEUE commands are used to examine the information, a queue becomes a bulletin board that may be used to provide current information to any number of other execs. QUEUE and PULL commands may be used to process queue entries in the order that they were queued. PUSH and PULL commands may be used to process the most recently queued entry first.

Conditions and Return Codes

At the completion of a POST command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Times out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

PULL

The PULL command assigns argument values fetched from the top entry of the queue anchored to the port being accessed by an exec when the command is issued, to variables specified by the PULL command.

Example:

```
" PULL &var1 &var2 &var3 "
```

Format:

```
PULL (&variable1 . . . &variable20)
```

&variable1 through &variable20

The names of up to 20 variables, coded with a leading ampersand, to which pulled argument values may be assigned.

Argument values stored in the pulled queue entry by a QUEUE, PUSH, or POST command are returned in the corresponding variables specified by a PULL command.

If the number of variables specified exceeds the number of argument values in the pulled queue entry, then a zero-length value is assigned to excess variables. If the number of argument values in a pulled queue entry exceeds the number of variables specified by the PULL command, then excess argument values are discarded.

A CA Verify for VTAM WAIT command that specifies ON PULL may be issued to specify a time interval that subsequent PULL commands are to wait for data to be queued in the event that an accessed queue is empty when a PULL command is issued. A PULL completes normally if queued data is immediately available or if data is queued within a specified time interval. If an accessed queue is empty and a WAIT interval was not specified or a specified interval expires before data is queued, the PULL command completes with return code 12 to indicate the CA Verify for VTAM ENDQUEUE condition.

Conditions and Return Codes

At the completion of a PULL command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes PULL command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully

Conditions	RC	Default Signal	Reason for Condition
LOCKOUT	4		Times out waiting for port lock
ENDQUEUE	12		Data queue was empty
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

PUSH

The PUSH command adds an entry to the top of the queue anchored to the port being accessed by an exec when the command is issued, that contains specified argument values. If a PULL command issued by an exec running on another port, is waiting for data to be stored in the queue, then the oldest waiting PULL command is resumed when an entry is queued by a PUSH command.

Examples:

```
" PUSH 'INQUIRE' &ACCOUNT "
```

```
" PUSH &item1 &item2 &item3 "
```

Format:

```
PUSH (arg1 . . . arg20)
```

arg1 through arg20

(Optional) Argument which specifies up to 20 values, either literal values contained in single or double quotes, or REXX variables, coded with a leading ampersand, that contain argument values to be stored in the queue entry. A null entry is queued if no arguments are specified.

When the PUSH command is used to queue data and the PULL command is used to process it, the most recently queued entries are processed first. QUEUE and PULL commands may be used to process queue entries in the order that they were queued. A queue may also be used as a bulletin board to post current information that may be examined to any number of other execs using the POST and QUERY QUEUE commands.

Conditions and Return Codes

At the completion of a PUSH command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes PUSH command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Times out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

QUERY

The QUERY command returns requested information about CA Verify for VTAM resources in REXX variables. The QUERY command may be used to:

- Obtain information about the CA Verify for VTAM session, session trace, data queue or exec task on the port being accessed by the interrogating exec.
- Obtain a list of ports that have active CA Verify for VTAM sessions, active session traces, queued data, or active REXX exec tasks.

Examples:

```
" QUERY session          "
" QUERY sessions        "
" QUERY queue &var1 &var2 &var3 "
```

Format:

```
QUERY
  ( QUEUE (&variable1 . . . &variable20) | QUEUES | SESSION ( LOGONDATA |
  BASICDATA | EXTDSDATA |
  PANELDATA | IMAGEDATA ) | SESSIONS | TASK | TASKS |
  TRACE | TRACES )
```

QUEUE, QUEUES, SESSION, SESSIONS, TASK, TASKS, TRACE and TRACES

Keywords that identify the CA Verify for VTAM resource or resources about which information is to be returned.

&variable1 . . . &variable20

Can be specified when a QUEUE is queried, they are the names of up to 20 REXX variables, coded with a leading ampersand, to which the queried argument values are to be assigned.

LOGONDATA, BASICDATA, EXTDSDATA, PANELDATA and IMAGEDATA

Keywords that may be specified when a SESSION is queried to specify the format of the virtual terminal display buffers returned in variables PTEBUFF and PTEEAB.

When QUEUES, SESSIONS, TASKS or TRACES is specified, NOQUEUES, NOSESSIONS, NOTASKS or NOTRACES is returned in variable, PTEINFO, if the queried resource does not exist on any CA Verify for VTAM port. Otherwise QUEUES, SESSIONS, TASKS, or TRACES is returned in PTEINFO and a list of the ports on which the queried resource exists is returned in PTEPORTS. For example:

- If only the queues on ports 1, 2, and 6 contain data, the command, query queues, returns QUEUES in PTEINFO and returns 1 2 6 in PTEPORTS.
- If all queues are empty, NOQUEUES is returned in PTEINFO.
- Query tasks, never returns NOTASKS in PTEINFO, because at least the exec that issued the QUERY command is active on a port.

When QUEUE, SESSION, TASK or TRACE is specified, NOQUEUE, NOSESSION, NOTASK or NOTRACE is returned in PTEINFO, if the queried resource is not active on the port being accessed by the exec when the QUERY command is issued. Otherwise QUEUE, SESSION, TASK or TRACE is returned in PTEINFO.

When a QUERY QUEUE command specifies one or more variables, &variable1 through &variable20, and the accessed queue contains data, then values obtained from the top entry in the queue are returned in corresponding variables specified by the QUERY command. If the number of variables specified exceeds the number of values in the top queue entry, a zero-length value is returned in excess variables. The QUERY QUEUE command works like the PULL command, except that the QUERY command does not remove data from a queue.

A QUERY SESSION command returns the same information in session variables that is returned by all CA Verify for VTAM session commands, and drops session variables if a session is not active on the accessed port. However, a QUERY SESSION command may specify one of the keywords, LOGONDATA, BASICDATA, EXTDSDATA, PANELDATA or IMAGEDATA, to override the format of the virtual terminal display buffers returned by the QUERY command in PTEBUFF and PTEEAB. By default or when LOGONDATA is specified, buffer data is returned using the format specified by the LOGON command that started the queried session. Refer to LOGON for a description of the format of the buffer data returned when other optional format keywords are specified. Refer to CA Verify for VTAM REXX Variables for a description of all session variables.

Conditions and Return Codes

At the completion of a QUERY command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes QUERY command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Times out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

QUEUE

The QUEUE command adds an entry to the bottom of the queue anchored to the port being accessed by an exec when the command is issued, that contains specified argument values. If a PULL command issued by an exec running on another port is waiting for data to be stored in the queue, then the oldest waiting PULL command is resumed when the queue entry is added.

Examples:

```
" QUEUE 'INQUIRE' &ACCOUNT "
```

```
" QUEUE &item1 &item2 &item3 "
```

Format:

```
QUEUE (arg1 . . . arg20)
```

arg1 through arg20

(Optional) Arguments which specify up to 20 values, either literal values contained in single or double quotes or REXX variables, coded with a leading ampersand, that contain argument values to be stored in the queue entry. A null entry is queued if no arguments are specified.

When the QUEUE command is used to queue data and the PULL command is used to process it, queue entries are processed in the order they were queued. PUSH and PULL commands may be used to process the most recently queued entry first. A queue may also be used as a bulletin board to post current information that may be examined to any number of other execs using the POST and QUERY QUEUE commands.

Conditions and Return Codes

At the completion of a QUEUE command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes QUEUE command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Times out waiting for port lock
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

SIGNAL

The SIGNAL command instructs subsequent CA Verify for VTAM commands to signal the occurrence of a specified CA Verify for VTAM condition by raising a REXX ERROR, FAILURE or HALT condition, or to raise no REXX condition if a specified CA Verify for VTAM condition is encountered.

Examples:

```
"          SIGNAL OFF ON ENDTRACE  "
```

```
"          SIGNAL ERROR ON LOGOFF  "
```

Format:

```
SIGNAL REXX-cond ON Verify-cond
```

REXX-cond is one of the keywords, ERROR, FAILURE, HALT or OFF.

- ERROR, FAILURE or HALT specify the REXX condition to be raised if the specified Verify-cond occurs, and are also the REXX condition keywords used in a REXX SIGNAL or CALL instruction to trap the CA Verify for VTAM-cond.
- OFF specifies that no REXX condition is to be raised if the specified Verify-cond occurs.

ON is required and identifies the Verify-cond that follows.

Verify-cond is one of the CA Verify for VTAM condition keywords, LOCKOUT, TIMEOUT, ENDQUEUE, LOGOFF, ENDTRACE, CANCEL or FAULT.

All unusual events and errors that can be detected by CA Verify for VTAM commands are categorized into named groups called Verify conditions. Each Verify condition is associated with a unique return code that is returned in the REXX RC variable when a Verify condition is detected. The following table is a summary of all possible Verify condition and return codes and default REXX conditions raised for some CA Verify for VTAM conditions.

The CA Verify for VTAM SIGNAL command is designed for use with REXX SIGNAL and CALL instructions to trap CA Verify for VTAM conditions using REXX condition traps, or may be used to avoid REXX conditions that are raised by default for some CA Verify for VTAM conditions.

For example, instead of checking the return code following each CA Verify for VTAM session command to detect and process an unexpected session failure, a CA Verify for VTAM SIGNAL command and a REXX SIGNAL instruction may be used to detect and process an unexpected session failure.

If a session is traced, but a trace failure is not a big enough problem to interrupt an exec, the SIGNAL command may be used to override the REXX HALT condition that is raised by default when a CA Verify for VTAM ENDTRACE condition occurs.

```
" SIGNAL OFF ON ENDTRACE
"
"
  trace
  to tracedd
"
"
  SIGNAL ERROR ON LOGOFF
"
  signal ON ERROR name ended
"
  logon
  cics
"
  say 'session ended:' PTEMESS
```

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Timed out waiting for port lock
TIMEOUT	8		Timed out waiting for response

Conditions	RC	Default Signal	Reason for Condition
ENDQUEUE	12		Data queue was empty
LOGOFF	16		Session ended
ENDTRACE	20	HALT	Trace abended
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

Conditions and Return Codes

At the completion of a SIGNAL command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table defines the CA Verify for VTAM conditions, return codes and default REXX conditions that may be raised by the SIGNAL command.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

TRACE

The TRACE command starts a CA Verify for VTAM session trace on the port being accessed by an exec when the command is issued. While a session trace is active, CA Verify for VTAM writes the current image of a virtual terminal screen image to a trace data set whenever a TYPE command sends data to an online system and when an online system sends a response or other message to the virtual terminal being used for a session.

Examples:

```
" TRACE to tracedd image freekb "
```

```
" TRACE 'change caption to this' "
```

```
" TRACE to &ddname format pack "
```

Format:

```
TRACE TO ddname  
( FORMAT | IMAGE | UPPERCASE )  
( DELAYS | DELAYSOFF )  
( LOGONS | LOGONSOFF )  
( CHAINS | FREEKB )  
( PACK | NOPACK )|  
( caption )
```

TO ddname

Specifies the DD name to be opened to capture screen images when CA Verify for VTAM session commands are used to send and receive data using the session anchored to the same port as the session trace.

FORMAT

(Optional) Keyword which specifies that traced screen images are to contain all screen data.

IMAGE

(Optional) Keyword which specifies that traced screen images are to be edited, to convert attributes and other non-display data to blanks and graphic escape characters to dashes, producing screen images similar to screen images visible to users of the system.

UPPERCASE

(Optional) Keyword which specifies that traced screen images are to be edited and converted to all upper case characters.

DELAYS

Specifies that user think time is to be captured as DELAY statements in the trace data set. DELAYSOFF specifies that no DELAY statements are to be created.

LOGONS

Specifies that LOGON statements are to be captured when a session is started. LOGONSOFF specifies that no LOGON statements are to be created.

CHAINS

Specifies that all outbound screen images are to be traced. FREEKB specifies that outbound screens images are to be captured only when an outbound message frees the terminal keyboard.

PACK

Specifies that traced session data is to be written using the ISPF packed data format. NOPACK specifies that traced screen images are to be written as unpacked, fixed-length records.

caption

a literal value that is to be used as the caption of subsequently traced screen images, and may be specified when a trace is started or at any time while a trace is active. A caption must be enclosed in either single or double quotes.

Default values for all optional parameters are controlled by CA Verify for VTAM system options.

The TRACE command starts or modifies the trace on the port that is being accessed TRACE command is issued.

A trace may be started or ended before, during and after a session is started or ended to capture any portion of a session.

A trace is ended using the ENDTRACE command or is ended automatically when all execs in an address space have ended.

Conditions and Return Codes

At the completion of a TRACE command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes TRACE command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Times out waiting for port lock
ENDTRACE	20	HALT	Trace abended (ie., SD37)
CANCEL	24	HALT	CANCEL command processed

Conditions	RC	Default Signal	Reason for Condition
FAULT	34	HALT	Invalid command or system error

TYPE

The TYPE command operates a virtual terminal by pressing keys on a virtual terminal keyboard that perform the same functions as the keys on a real terminal keyboard. For example, a tab key moves the cursor to the next modifiable field. When a data key is pressed, each character of the data is keyed in at the current cursor position, the modified data tag is turned on in the attribute that controls the field, and the cursor advances one position or skips to the next field if the position is a skip attribute.

A TYPE command uses the keyboard of the virtual terminal that is anchored to the CA Verify for VTAM port being accessed by an exec when a TYPE command is issued, to position the cursor, to type literal, variable and other data values, to erase fields, to send data to an online system, and to perform other keyboard operations specified by the command. The keyboard operations specified by a TYPE command are performed in the order in which they are coded.

Examples:

```
" TYPE home erase 'cemt set' ", " ' da(&dd) open ena' enter "
```

```
" TYPE clear "
```

```
" TYPE <2 15> 'inq' "
```

```
" TYPE <4 15> 'smith' enter "
```

```
" TYPE <&row &col> &data1 "" TYPE <4 15> &data2 enter "
```

```
" TYPE home tab &account ", " tab &order pf2 "
```

```
" TYPE usermod <&cursor> "pfkey
```

Format:

```
TYPE ( <row column> )
      ( <position> )
      ( HOME TAB BACKTAB NEWLINE )
      ( 'literal-data' )
      ( "literal-data" )
      ( &variable-data )
      ( ERASE )
      ( SELECT | DESELECT )
      ( TOKEN token )
      ( CODE code )
      ( USERMOD )
      ( ENTER | PF1-24 | PA1-3 |
      PEN | CLEAR | ATTN |AID &aid-variable )
      TYPE
```

<row column>

Moves the cursor to the specified virtual terminal screen row and column. A row or column may be a row or column number or the name of a REXX variable, coded with a leading ampersand, whose value is a row or column number.

<position>

Moves the cursor to the specified virtual terminal screen position, where position = (row - 1) * PTECOLS + column. position may be a number or the name of a REXX variable, coded with a leading ampersand, whose value is a screen position.

HOME, TAB, BACKTAB and NEWLINE

Move the cursor to the first modifiable screen field, to the field that follows or precedes the current cursor location, or to the first modifiable screen position that follows the current cursor row.

literal-data,

Types the indicated data, which must be enclosed in single or double quotes.

&variable-data

Types the data contained in a named REXX variable, coded with a leading ampersand.

ERASE

Erases the remainder of the modifiable screen field, beginning at the current cursor position.

SELECT and DESELECT

Keywords select or deselect the pen detectable selection or attention field at the current cursor location. The operations simulate operations performed by a 3270 light pen or cursor select key, with the following exceptions:

- SELECT selects a pen selectable field even if the field is already selected,
- DESELECT deselects a pen selectable field even if the field is already deselected,
- If a pen attention field with a null designator is selected, a PEN keyword must be coded as the last TYPE command keystroke to send the pen aid and data.
- If a pen attention field with an ampersand designator (a simulated ENTER key) is selected, an ENTER keyword must be coded as the last TYPE command keystroke to send the data.

TOKEN

Identifies a CA Verify for VTAM password token, which follows the TOKEN keyword. token may be a literal value or a REXX variable coded with a leading ampersand, that contains a token (for example, &token). A token represents a password that is encrypted as described in Token Security. A token:

- is used to secure password data while Token Security is active;
- is converted to another form if Token Security is not active;
- may not be typed into a display field;
- is hidden in memory when it is typed;
- is not returned in PTEBUFF;
- can be decrypted only when used by its owner;
- is decrypted only when it is sent to an online system; and
- replaces password data when a session is traced.

CODE

Identifies a CA Verify for VTAM password code, which follows the CODE keyword. code may be a literal value or a REXX variable, coded with a leading ampersand, that contains a code (for example, &code). A code is a password or other data that is encoded as described in Code Security. A code:

- is used to secure encodable passwords while Code Security is active;
- is converted to another form if Code Security is not active;
- may not be typed into a display field;
- can be decoded correctly only when used by its owner;
- is decoded when it is typed into a non-display field; and
- replaces encodable passwords when a session is traced;

USERMOD

Fetches data from fields of the virtual terminal display buffer in REXX variable, PTEBUFF, whose attribute values match a USERMOD value specified by the LOGON command that started a session, and rekeys the data into corresponding fields of the session's virtual terminal display buffer.

- A fully functional image of a virtual terminal screen may be displayed at a real terminal following any successful CA Verify for VTAM session command, by simply displaying an ISPF panel that defines a dynamic area named PTEBUFF and attributes defined by the CA Verify for VTAM LOGON command PANELDATA option.
- When a LOGON command used to start a CA Verify for VTAM session and an ISPF panel used to display the session specify the same USERMOD value, all data entered by a terminal user while a virtual terminal screen image is displayed may be rekeyed into the session's virtual terminal display buffer by issuing a single TYPE command that specifies USERMOD.
- A REXX exec illustrated in [ISPF Session Panels](#) (see page 304) uses CA Verify for VTAM session commands and an ISPF panel to start and manage interactive sessions with other online systems while using any ISPF application.

ENTER, PF1-24, PA1-3, PEN, CLEAR and ATTN

Keywords send data to an online system that is formatted like the data sent when a like-named key is pressed on a real terminal keyboard. The AID keyword identifies a variable that follows, &aid, which contains the name of the key to be pressed to send data. Virtual terminal keys that send data may be coded as the last TYPE command keystroke only.

A TYPE command that does not specify a key that sends data to an online system completes when the last specified keyboard operation has been performed.

When a key that sends data is pressed, the virtual terminal keyboard is locked and data identical to the data sent by a real terminal is sent to the online system. After sending data, the TYPE command normally waits for and receives response messages from the online system, until a message is received that frees the terminal keyboard, before returning to the exec that issued the command.

The HANDLE command may be issued to instruct the TYPE command to return immediately after sending data or to return after receiving any message even if the message does not free the keyboard. A TYPE command completes with a TIMEOUT condition if a response is not received within a time limit specified by a previous WAIT command.

The TYPE command returns updated information in session variables, as documented in CA Verify for VTAM REXX Variables.

Conditions and Return Codes

At the completion of a TYPE command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes TYPE command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Times out waiting for port lock
TIMEOUT	8		Timed out waiting for response
LOGOFF	16		Session ended
ENDTRACE	20	HALT	Trace abended (ie., SD37)
CANCEL	24	HALT	CANCEL command processed
FAULT	34	HALT	Invalid command or system error

UNLOCK

The UNLOCK command unlocks the port being accessed by an exec when the command is issued. A port may be unlocked only by an exec that is running on the same port as the exec that issued the LOCK or ACCESS command that locked the port.

If another exec task was delayed because it attempted to use resources anchored to the port being unlocked, the exec task is resumed when the port is unlocked.

Example:

```
" UNLOCK "
```

Format:

```
UNLOCK
```

Conditions and Return Codes

At the completion of an UNLOCK command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes UNLOCK command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
LOCKOUT	4		Timed out waiting for port lock
TIMEOUT	8		Time out waiting for response
LOGOFF	16		Session ended
ENDTRACE	20	HALT	Trace abended
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

WAIT

The WAIT command waits for a specified period of time to elapse, or limits the amount of time that subsequent CA Verify for VTAM commands wait for online system responses, data to be queued, or locks.

Examples:

```
" WAIT &mssth "
```

```
" WAIT 50000 on response "
```

```
" WAIT forever on pull "
```

Format:

```
WAIT hhmssth | FOREVER
```

```
( ON event )
```

Descriptions

hhmssth is a time interval, expressed in hours (hh), minutes (mm), seconds (ss) and tenths and hundredths of seconds (th), or the keyword, FOREVER. FOREVER is valid only when ON event is specified.

ON event is optional. If not specified, the WAIT command simply waits for the specified interval to elapse. ON indicates that the time limit applies only when waiting for a named event to complete.

- ON LOCK limits the amount of time that CA Verify for VTAM commands will wait for a resource lock, or the time that the LOCK command will wait for a port lock.
- ON PULL limits the amount of time that the CA Verify for VTAM PULL command will wait for data when a PULL command is issued while the accessed data queue is empty.
- ON RESPONSE limits the amount of time that a CA Verify for VTAM session command will wait for a required online system response to a virtual terminal input.

Conditions and Return Codes

At the completion of a WAIT command, the REXX variable RC indicates any CA Verify for VTAM condition encountered while executing the command. The following table describes WAIT command return codes and default REXX conditions that may be raised for some CA Verify for VTAM conditions.

Conditions	RC	Default Signal	Reason for Condition
	0		Command completed successfully
CANCEL	24	HALT	CANCEL command processed
FAULT	64	HALT	Invalid command or system error

Chapter 14: REXX Variables

This chapter documents special variables defined by CA Verify for VTAM to provide information to a REXX exec.

CA Verify for VTAM REXX Variables

CA Verify for VTAM commands return specific information to execs in CA Verify for VTAM defined REXX variables.

- All CA Verify for VTAM defined REXX variable names begin with the characters PTE. Execs that use CA Verify for VTAM commands for REXX should not create REXX variables that begin with PTE. Observing this convention ensures that there will be no conflict between user defined variables and current or future CA Verify for VTAM defined variables.
- PTEPORT, PTEAPORT, PTEPORTS, PTEINFO and PTEMESS are used to return unique information and are always returned using the defined simple variable names.
- All other CA Verify for VTAM defined variables are session variables, used by session commands to return information about a session on a CA Verify for VTAM port accessed by an exec. If an exec accesses sessions on more than one port, session information is not unique. Session information is returned to an exec using either simple or compound session variable names that are unique for each session accessed by an exec.
- All variable names defined below are simple variable names. Session commands return information using simple session variable names by default or when an exec accesses the session on the exec's port by issuing an ACCESS command that instructs session commands to return information using simple session variable names.
- Compound session variable names have a REXX stem that is a defined simple session variable name and a tail that is a session's port number. For example, PTEBUFF.2 is a compound session variable name that may be used by session commands to return the session information defined for PTEBUFF when an exec accesses the session on port 2. Session commands return information using compound session variable names when an exec accesses a session on any port, including the session on the exec's port, by issuing an ACCESS command that instructs session commands to return information using compound session variable names.
- Session commands return session variables if a session is active on the accessed port at the completion of the session command. Session commands drop all session variables except PTERSENS if a session is not active on the accessed port at the completion of the command. The value of a dropped variable symbol is the value of the symbol itself.

PTEALARM

When a message is received from an online system, PTEALARM is set to YES if the message sounded the terminal alarm, or is set to NO if the message did not sound the terminal alarm.

PTEAPORT

Every ACCESS command sets PTEAPORT to the number of the port being accessed by the exec. ACCESS EXECPORT or ACCESS * accesses the port on which an exec is executing. ACCESS NEWPORT or an ACCESS command that specifies no operands assigns and accesses a previously unused port. ACCESS FREEPORT accesses a port that may have been previously used, but is not currently being used, or accesses a previously unused port. An ACCESS command may specify the number of the port to be accessed.

PTEASIZ

When a session is started, PTEASIZ is set to one of the values 24X80, 32X80, 43X80 or 27X132, and indicates the alternate screen size established for the session.

PTEBUFF

PTEBUFF is a copy of the virtual terminal display buffer used for a CA Verify for VTAM session. The size of the buffer, in rows and columns, is indicated by the session variables PTEROWS and PTECOLS. Screen rows are arranged serially in PTEBUFF, so that when PTECOLS is 80, screen row 2 begins at position 81 in PTEBUFF.

The format of the data and attributes stored in PTEBUFF may be specified by a QUERY SESSION command. In any other case, the format of PTEBUFF is determined by the BASICDATA, EXTDSDATA, PANELDATA, IMAGEDATA or ATTRIBUTES options specified by the LOGON command that started the session.

PTECC

A chain is a complete message sent from or to a terminal. PTECC is a count of the outbound chains received at a virtual terminal during the execution of the previous CA Verify for VTAM session command. PTECC is set to 0 (zero) if no message is received during the execution of an INVITE or DELAY command.

PTECOL

A virtual terminal cursor works like a real terminal cursor. An online system may send orders that move the cursor to any display position. The TYPE command moves the cursor while keying data into a virtual terminal display, when tab or other keys are used, and moves the cursor to any specified display position. At the completion of any CA Verify for VTAM session command, PTEROW and PTECOL identify the current cursor row and column in the virtual terminal display buffer.

PTECOLS

PTECOLS contains the current number of virtual terminal screen columns. The possible values of PTECOLS are fixed when default and alternate screen sizes are established during session initiation. The current value of PTECOLS at any point in time is controlled by the online system using 3270 ERASE-WRITE or ERASE-WRITE-ALTERNATE commands.

PTECSR

During the execution of a TYPE command, the cursor is advanced as data is keyed into a virtual terminal screen. When an online system sends a terminal message, the message may reposition the cursor. Whenever the cursor is repositioned, PTECSR is set to the position of the cursor within PTEBUFF. When the cursor is at row 1, column 1, PTECSR is 1. When the cursor is at row 2, column 1 of an 80-column screen, PTECSR is 81.

PTESIZ

When a session is started, PTESIZ is set to one of the values 24X80, 32X80, 43X80 or 27X132, and indicates the default screen size established for the session.

PTEEAB

PTEEAB is an image of a virtual terminal Extended Attribute Buffer used to store 3270 extended attribute data that correspond to the field attributes and data stored in PTEBUFF. Refer to 3270 Attribute Values for a description of the data contained in an extended attribute buffer.

When session variables are returned by a QUERY SESSION command, PTEEAB is returned if EXTSDATA is specified, and is not returned if BASICDATA, PANELDATA or IMAGEDATA are specified. In any other case, when session variables are returned by a session command, PTEEAB is returned if the LOGON command that started the session specified EXTSDATA or if the LOGON command started an EXTDS session and did not specify BASICDATA, PANELDATA or IMAGEDATA.

PTEINFO

If the QUERY command determines that a named CA Verify for VTAM resource is active, the resource name is returned in PTEINFO. If the QUERY command determines that a named CA Verify for VTAM resource is not active, the concatenation of NO and the resource name is returned in PTEINFO. For example, if the command QUERY SESSIONS finds a session active on any CA Verify for VTAM port, SESSIONS is returned in PTEINFO, otherwise, NOSESSIONS is returned in PTEINFO.

PTEKB

PTEKB is the state of a virtual terminal keyboard and is one of the following values:

- BUSY means that data has been typed but not entered and that additional data may be typed.
- FREE means that data may be typed, but no data has been typed since the keyboard was freed.
- INHIBITED means that a session is timed out, outbound or in another state that does not permit data to be typed, but a TYPE ATTN command is permitted.
- LOCKED means that a session has timed out in a state that does not permit the use of the TYPE statement.

Note: Keyboard state names that have lower alphabetic values are "more free" and names with higher values are locked tighter. Data may be typed when PTEKB is LE "FREE", but may not be typed when PTEKB is GE "INHIBITED".

PTELUDS

When a session is started, PTELUDS is set to one of the values BASICDS or EXTDS, and indicates the 3270 data stream level supported by the virtual terminal used for the session.

PTEMESS

An error or information message may be stored in PTEMESS during the execution of any CA Verify for VTAM command. Selected messages are sent to the terminal or to another message destination automatically, if a MONITOR command has been issued that specified SIGNALS, CONDITIONS or the PTEMESS variable name.

PTEPLU

When a session is started with any Primary Logical Unit (PLU), the network name of the online system is stored in PTEPLU. While most sessions are started by the LOGON command, sessions may also be started while executing any session command, if an online system passes the PLU end of a session to another PLU. All session commands store the name of the current PLU in PTEPLU if a session is passed to another PLU.

PTEPORT

All ACCESS commands store the number of the port on which an exec is executing in PTEPORT.

PTEPORTS

A QUERY command may specify one of the keywords, SESSIONS, TRACES, TASKS or QUEUES, to obtain a list of the ports on which the named CA Verify for VTAM resource exists. For example, an exec may issue a QUERY SESSIONS command to set PTEPORTS to a list of port numbers on which CA Verify for VTAM sessions are active. If sessions are active on ports 3, 4, and 7, the value 3 4 7 is stored in PTEPORTS.

PTEROW

A virtual terminal cursor works like a real terminal cursor. An online system may send orders that move the cursor to any display position. The TYPE command moves the cursor while keying data into a virtual terminal display, when tab or other keys are used, and moves the cursor to any specified display position. At the completion of any CA Verify for VTAM session command, PTEROW and PTECOL identify the current cursor row and column in the virtual terminal display buffer.

PTEROWS

PTEROWS is the current number of virtual terminal screen rows. The possible values of PTEROWS are fixed when default and alternate screen sizes are established during session initiation. The current value of PTEROWS at any point in time is controlled by the online system using 3270 ERASE-WRITE and ERASE-WRITE-ALTERNATE commands.

PTERSENS

If VTAM is unable to start a session requested by a LOGON command, or if an active session fails, or if data sent to an online system is rejected during the execution of a CA Verify for VTAM session command, the eight character sense code received from VTAM or the online system is stored in PTERSENS. Sense codes are defined by SNA and indicate the cause of a session failure or other negative response. If a LOGON fails, or a session fails unexpectedly, an exec may analyze the contents of PTERSENS to determine the cause. For example, 08570002 means the PLU is not active and 087D0001 indicates a session services path error, possibly resulting from an attempt to start a session with an undefined PLU. Unlike other session variables, PTERSENS is not dropped at the end of a session. General information on sense codes can be found in SNA Sense Codes.

PTERTIME

When a message is received from an online system, response time is calculated by subtracting the time of the previous terminal input from the time the message is received, and the calculated response time, expressed in hundredths of a second, is stored in PTERTIME.

PTESENSE

When CA Verify for VTAM sends a negative response to a message received from an online system, the four-character SNA sense code sent with the negative response is stored in PTESENSE. The sense code indicates the reason that the online system request was rejected. If a negative response is not sent during the execution of a CA Verify for VTAM session command, the value '0000' is stored in PTESENSE. General information on sense codes can be found in SNA Sense Codes.

PTESIZE

When a CA Verify for VTAM session is started or when a 3270 ERASE-WRITE command is received from an online system, the default screen size, calculated as the default screen size rows times the default screen size columns, is stored in PTESIZE. When a 3270 ERASE-WRITE-ALTERNATE command is received, the alternate screen size is calculated as the alternate screen size rows times the alternate screen size columns, is stored in PTESIZE.

PTESLU

When a session is started by a LOGON command, the name of the VTAM APPL used as a CA Verify for VTAM virtual terminal is stored in PTESLU. SLU is an acronym for Secondary Logical Unit. The name is either a name supplied by the exec, or is an assigned name, if a name was not supplied by the exec.

PTESTATE

PTESTATE is a name that describes the state of a CA Verify for VTAM session. PTESTATE may be any state name described in CA Verify for VTAM Logical Unit States, except OFFLINE. When a session ends, instead of storing the value OFFLINE, PTESTATE is dropped.

PTETTIME

When a TYPE command is used to send terminal input to an online system, think time is calculated by subtracting the time at which the previous message was received from the online system from the time of the terminal input, and the calculated think time, expressed in hundredths of a second, is stored in PTETTIME.

Chapter 15: Installation Verification Procedure and Demo Session

When you complete this session, you will understand how to use CA Verify for VTAM to test application program changes.

The session uses a demonstration program that is distributed and automatically installed with CA Verify for VTAM.

Here's what you will do:

1. First, you will log the input and output screens associated with the demo program to create a test stream.
2. Next, you will change the demo program, deliberately creating an error.
3. Then you will run the logged test stream. CA Verify for VTAM will detect the error in the demo program when it compares the logged output screens with the output screens produced during the run.
4. Next, you will correct the demo program.
5. Finally, you will retest the corrected program with CA Verify for VTAM.

To simplify the demo session, you do not actually have to change the demo program. Instead, three versions of the demo program exist:

Version of Demo	Description
DEMO OLD	The original version <i>before</i> any changes
DEMO BUG	The changed version with the error
DEMO NEW	The corrected version

The demo program is a Customer Maintenance Program. You will perform a simple inquiry to list information for a customer.

Note: The defaults at your installation may differ from the delivered defaults, so some of your menus may differ slightly from the menus presented here. These differences won't affect your use of the demo session.

This section contains the following topics:

- [Invoke CA Verify for VTAM](#) (see page 371)
- [Select the Log Function](#) (see page 372)
- [Specify Single Terminal Log Options](#) (see page 373)
- [Select an Option on the Demo Program's Menu](#) (see page 377)
- [Select a Customer Number](#) (see page 378)
- [Exit the Demo Program](#) (see page 379)
- [Stop Logging](#) (see page 380)
- [View Log Termination Information](#) (see page 381)
- [Select the Edit Function](#) (see page 382)
- [Specify the Test Stream to be Edited](#) (see page 383)
- [Select a Test Stream](#) (see page 384)
- [View the Directory Information](#) (see page 385)
- [View the Initial Terminal Status Information](#) (see page 386)
- [View Record Information](#) (see page 387)
- [Select a Record](#) (see page 388)
- [Edit the Screen](#) (see page 389)
- [Select the Run Function](#) (see page 390)
- [Specify Run Options](#) (see page 391)
- [Execute the Run](#) (see page 393)
- [CA Verify for VTAM Detects a Mismatch](#) (see page 394)
- [View the Expected Screen](#) (see page 395)
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- [Insert a New Rule Into a Ruleset](#) (see page 400)
- [Create a Rule Name](#) (see page 401)
- [Establish Recognition Criteria](#) (see page 402)
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- [Select the Time Variable](#) (see page 405)
- [Display Applied Rules](#) (see page 407)
- [CA Verify for VTAM Detects Another Mismatch](#) (see page 408)
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- [Ignore the Screen Changes](#) (see page 413)
- [View Run Statistics](#) (see page 413)
- [Select a Test Stream](#) (see page 415)
- [View Directory Information](#) (see page 416)
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- [Select a Record](#) (see page 418)
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[Select the Run Function](#) (see page 420)
[Specify the Run Options](#) (see page 421)
[Initiate the Run](#) (see page 422)
[CA Verify for VTAM Detects a Mismatch](#) (see page 422)
[View the Expected Screen](#) (see page 424)
[View the Current Screen](#) (see page 425)
[View the Original Screen](#) (see page 426)
[Accept the Program Change](#) (see page 427)
[View Run Statistics](#) (see page 428)

Invoke CA Verify for VTAM

Action:

Type verify on the USS menu or on the menu from your routing application and press Enter.

Result:

CA Verify for VTAM displays the Signon menu or the Primary Options Menu, depending on your installation's options.

```

          CCCCCCCCCCCCCC
          CCCCCCCCCCCCCC
          CCCC
          CCCC  AAAAAAAAAA
          CCCC  AAAAAAAAAA
          CCCC  AAAA  AAAA
          CCCC  AAAA  AAAA
          CCC  AAAA  AAAA
          C  AAAACCCCCCCCCC
          AAAACCCCCCCCCC
          AAAA  AAAA
          AAAA  AAAA
          AAAA  AAAA

          C A - V E R I F Y / E E O
          Version

9.0.00

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          USERID  ==>
          PASSWORD ==>
          NEW PASSWORD ==>

          ENTER THE ABOVE INFORMATION AND PRESS ENTER TO CONTINUE OR F3 TO END
  
```

Action:

At the Signon menu, type your user id and password and press Enter.

Result:

CA Verify for VTAM displays the Primary Options Menu.

Select the Log Function

The Primary Options Menu lists all of CA Verify for VTAM's primary functions. Like all of the menus, it is ISPF-like. From this menu you can:

- Select a function by typing the first character of the function on the command line and pressing Enter.
- View the online Tutorial by typing T and pressing Enter. The tutorial describes each of CA Verify for VTAM's functions and related topics.
- Exit from CA Verify for VTAM by typing X and pressing Enter, or by pressing PF3 or PF4.

Your first task is to log the screens associated with the demo program.

```
Version 9.0.00 ----- CA VERIFY PRIMARY OPTIONS MENU -----11:27:44
ENTER COMMAND ==> 1                                     TERM: A60L2049
                                                         OPER: SAMPLE

  L LOG A TEST STREAM
  B BROWSE A TEST STREAM
  R RUN A TEST STREAM
  E EDIT A TEST STREAM
  M MAINTAIN RULES
  I INQUIRY/TERMINATION OF FUNCTIONS
  U UTILITIES
  T TUTORIAL
  X EXIT
*** ENTER "KEYS" COMMAND TO SEE PF KEY ASSIGNMENTS ***

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```

Action:

Type 1 and press Enter.

Result:

CA Verify for VTAM displays the Log Options Menu.

Specify Single Terminal Log Options

The Single Terminal Log Options menu lets you specify the name for the series of screens – test stream – you are going to log. You can also specify options that affect the logging.

```

----- SINGLE TERMINAL LOG -----11:28:13
ENTER COMMAND ==>                               L1

LOG TEST STREAM AS:
  DDNAME      ==> TCADS
  APPLICATION ==> demo
  MEMBER      ==> demoprogram
  VERSION     ==> 001

DESCRIPTION ==> customer maintenance demo program
            ==>
            ==>

STOP OPTION      ==> DISC      (DISC, MAN, PF__, PA_,OR CLEAR)
PROCESS WITH RULES ==> N      (Y/N)
TEST STREAM PROTECTION ==>      (R-READ W-WRITE P-PRINT)
LOG INPUT SCREENS ONLY ==> N      (Y/N)
EXTEND TEST STREAM ==> N      (Y/N)
VIRTUAL TERMINAL ==>      (TO USE A SPECIFIC VIRTUAL TERMINAL)

RULESET NAME:

F1-HELP      F3-END      F4-RETURN

```

Action:

Fill in the four fields whose contents are shown in lower case in the LOG TEST STREAM AS; field, and press Enter.

Result:

CA Verify for VTAM redisplay the USS menu or the menu from your routing application.

Field Definitions

LOG TEST STREAM AS:

DDNAME, APPLICATION, MEMBER, VERSION

Identifies the test stream.

- The ddname is the data set into which the screens will be logged. Your installation may have many valid ddnames. TCADS is the default and should be available. However, you can tab to this field and overwrite it if necessary.
- The Application and Member are the names you specify for the test stream.
 - Tab to the Application field and type demo.
 - Then tab to the Member field and type demoprogram.
- The Version identifies the test stream when multiple test streams have the same DDname, Application, and Member names. Leave **001** as the default.

DESCRIPTION

Describes the test stream.

Tab to this field and type any meaningful text, using up to three lines.

STOP OPTION

Specifies how you will terminate logging.

Leave **DISC** as the default. Logging will end when you disconnect from the VTAM session. You can also specify a PF or PA key, CLEAR, or MAN to manually stop logging.

PROCESS WITH RULES

Specifies whether Rules should be applied to this logging session.

Leave **N** as the default.

TEST STREAM PROTECTION

Limits access to this test stream by other users.

Leave this field blank.

LOG INPUT SCREENS ONLY

Logs only input screens from the terminal to the application.

Leave **N** as the default.

EXTEND TEST STREAM

Specifies whether or not this test stream is to be appended to an existing test stream.

Leave **N** as the default.

VIRTUAL TERMINAL

Assigns a specific virtual terminal to the real terminal.

Leave this field blank.

Specify the Program

Your USS menu or the menu from your routing application should be displayed. This screen will be logged, along with whatever you type next. CA Verify for VTAM will continue to log each input and output screen until you stop logging by ending the session.

Now you can invoke the demo program.

Action:

If you are using a routing application:

Type verdemo and press Enter.

If you are using USS:

Type logon applid(verdemo) and press Enter.

Result:

CA Verify for VTAM clears your screen.

Now, access the demo program's Main Menu.



```
xtca demo old
```

Action:

Type xtca demo old and press Enter.

Result:

The demo program's Main Menu is displayed.

Select an Option on the Demo Program's Menu

The demo program's Main Menu has the literal XTCADemo in the upper left corner. This identifier appears on all demo program screens.

```
XTCADemo    CA VERIFY DEMONSTRATION PROGRAM    02/19/1999
              CUSTOMER MASTER MAINTENANCE
              MAIN MENU

              SELECT OPTION ==> 2

              1 - INQUIRE / CHANGE CUSTOMER
              2 - LISTING BY SALES PERSON

              CUSTOMER NUMBER OR SALES PERSON ==>

PF3=QUIT
```

Action:

Type 2 in the Select Option field, as illustrated. The cursor moves to the next field. Press Enter.

Result:

The demo program's Sales Person Inquiry screen is displayed.

Select a Customer Number

Select a customer to see general information about his account.

XTCADMO	CA VERIFY DEMONSTRATION PROGRAM	02/19/1999			
CUSTOMER MASTER MAINTENANCE	11:41:29	SALES			
PERSON INQUIRY					
SALES PERSON: Ellen Jenkins					
NUMBER	CUSTOMER NAME	CITY	STATE	MAIN CONTACT	TOTAL AR
s 9045	Allied Gene Splicing	San Antonio	TX	Geronimo Davis	112,000
_ 2353	U. S. Tire Nozzles	Greenwich	CT	Alex Schnitzwattle	1,065,000
_ 6028	3D Computer Graphics	N Hollywood	CA	Horatio Ivanowitz	2,331,756
TYPE "S" NEXT TO DESIRED CUSTOMER AND ENTER PF3=QUIT					

Action:

Type s next to Customer Number 9045, as illustrated previously, and press Enter.

Result:

The demo program's Customer Inquiry screen is displayed.

Exit the Demo Program

The demo program displays information for the customer you specified on the previous screen. Now you are going to exit from the demo program.

XTCADMO	CA VERIFY DEMONSTRATION PROGRAM	02/19/1999
	CUSTOMER MASTER MAINTENANCE	11:41:59
	CUSTOMER INQUIRY	
SALES PERSON: Ellen Jenkins		
CUSTOMER NAME:	Allied Gene Splicing	CONTACT1: Geronimo Davis
ADDRESS1:	Technologies Plaza	CONTACT2: Ellen Jenkins
ADDRESS2:	114 McCauley Avenue	CONTACT3: Henry Meehan
CITY:	San Antonio	CONTACT4: Bradley Thomas
STATE:	TX ZIP: 78221	
***** ACCOUNTING INFORMATION *****		
CREDIT LINE:	83,500.00	AR 30 DAYS: 35,000.00
		AR 60 DAYS: 37,000.00
		AR 90 DAYS: 40,000.00

		TOTAL AR: 112,000.00
PLEASE CHANGE DESIRED INFORMATION AND PRESS ENTER		PF3=QUIT

Action:

Press PF3.

Result:

The demo program terminates and your screen is cleared.

Stop Logging

You are now ready to stop logging.



Logoff

Action:

Type logoff and press Enter.

Result:

You are disconnected from the VTAM session. Because you specified DISC as the log stop option, CA Verify for VTAM stops logging and displays the Log Termination screen.

View Log Termination Information

The Log Termination screen displays statistics for the test stream you just logged.

```

DEMO.DEMOPROG.001 ----- LOG TERMINATION -----11:42:17
ENTER COMMAND ==>                                     L5

DESCRIPTION: CUSTOMER MAINTENANCE DEMO PROGRAM

LOG:          RUN:          EDIT:          TEST STREAM:      IN:    OUT:
INVOKED BY:  SAMPLE                                     TOTAL SCREENS:    6     7
INVOKED ON:  02/19/1999                                AVERAGE BYTES:   11    400
START TIME:  11:40:49
DURATION:    00:01:24   00:00:01
SYSTEM:      MULTIPLE
STATUS:      NORMAL
TERMINAL:    A60L2049
VSAM CI'S:   2

AVERAGE THINK TIME:   00:00:13.858
AVERAGE RESPONSE TIME: 00:00:00.143
MAXIMUM SCREEN SIZE:  24 BY 80
PROTECTION STATUS:
ORIGINATING TEST STREAM:                                OWNER: SAMPLE
                                                         CREATED BY FUNCTION: LOG

F1-HELP      F3-END      F4-RETURN

```

Once a test stream has been logged, it can be used for all kinds of testing.

In this demo session, you are going to test a change in the application – unit testing. This is a typical use of CA Verify for VTAM. After an application has been changed, you run the test stream to make sure the output generated by the changed application is still correct.

First, however, you exit this screen and then change the demo program.

Action:

Press PF3 to exit from the Log Termination screen.

Result:

CA Verify for VTAM displays the Primary Options Menu.

Select the Edit Function

For the purposes of the demo session, you are not going to actually change the demo program. Instead, three versions of the program exist:

Version of Demo	Description
DEMO OLD	the original version <i>before</i> any changes
DEMO BUG	the changed version with the error
DEMO NEW	the corrected version

The first screen in the logged test stream invoked the demo program with this command:

```
XTCA DEMO OLD
```

Now you are going to use the demo program DEMO BUG when you retest the application. To do this, you must change the first logged screen to invoke DEMO BUG instead of DEMO OLD.

Changing this screen will demonstrate the Edit function.

```
Version 9.0.00 ----- CA VERIFY PRIMARY OPTIONS MENU -- -----11:42:31
ENTER COMMAND ==> e                                     TERM: A60L2049
                                                         OPER: SAMPLE

  L LOG A TEST STREAM
  B BROWSE A TEST STREAM
  R RUN A TEST STREAM
  E EDIT A TEST STREAM
  M MAINTAIN RULES
  I INQUIRY/TERMINATION OF FUNCTIONS
  U UTILITIES
  T TUTORIAL
  X EXIT
    *** ENTER "KEYS" COMMAND TO SEE PF KEY ASSIGNMENTS ***

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```

Action:

Type e and press Enter.

Result:

CA Verify for VTAM displays the Test Stream Edit menu.

Specify the Test Stream to be Edited

On this menu you specify the test stream you want to edit.

The DDname, Application, and Version fields contain the default values.

If you filled in the test stream Member name, CA Verify for VTAM would display that test stream. However, if you don't know the name, you can leave the Application and/or Member fields blank and CA Verify for VTAM will list all the test streams so you can select the one you want, which is what you are going to do now.

```

----- TEST STREAM EDIT -----11:42:44
ENTER COMMAND ==>
                                     E1

ENTER TEST STREAM NAME:
  DDNAME      ==> TCADS
  APPLICATION ==> DEMO
  MEMBER      ==>
  VERSION     ==> 001
                                     (LEAVE APPLICATION, MEMBER,
                                     OR VERSION BLANK AND PRESS
                                     ENTER FOR A SELECTION LIST)

F1-HELP      F3-END      F4-RETURN

```

Action:

Leave the Member field blank and press Enter.

Result:

CA Verify for VTAM displays the Test Stream Selection menu.

Select a Test Stream

The Test Stream Selection menu lists all the test streams for the specified DDname. The first column identifies the Application name; the second column identifies the Member name.

You are positioned in the list just before the test streams for DEMO, the Application name you specified.

Now select the test stream you just logged.

```

----- EDIT: TEST STREAM SELECTION -----11:45:52
ENTER COMMAND ==>
FILE: TCADS
          LOG-DATE  BY      RECORDS  RUN-DATE  RESULT  MULTI-
          |         |         |         |         |         | TERM
BRUCE    DEMO      202 01/20/1999 BUCBR01    16
          X
s DEMO    DEMOPROG 001 02/19/1999 SAMPLE    16
          CUSTOMER MAINTENANCE DEMO PROGRAM
_ JAN27   TEST1     001 01/27/1999 BBBRUCE    0
          SAMPLE TEST
_ JAN27   TEST2     001 01/27/1999 NOTBRUCE    5
          ANOTHER TEST
_ SAMPLE  TEST      001 02/09/1999 DORI      21
          |
_ SAMPLE  TEST      002 02/09/1999 DORI      21 02/09/1999 LGC EQ
          SAMPLE TEST OF A04IC9NA, CAROL'S COOKIES COMPANY
_ TEST    LOGRULES 001 01/11/1999 V        37
          TEST LOG RULES: INCLUDE APPLID A04IC9NA
_ TEST    LOGRULES 002 01/11/1999 V        36 01/11/1999 NOT EQ
          TEST LOG RULES: INCLUDE APPLID A04IC9NA
END OF DIRECTORY * "M" WHEN MULTIPLE TERMINALS, "I" WHEN INCOMPLETE
    
```

Action:

Type s to the left of the test stream DEMO DEMOPROG and press Enter.

Result:

CA Verify for VTAM displays the Directory Information screen for your test stream.

View the Directory Information

The Directory Information screen displays the statistics for the test stream that were displayed on the Log Termination menu.

```
DEMO.DEMOPROG.001 ----- EDIT: DIRECTORY INFORMATION -----11:46:30
ENTER COMMAND ==>                                     E3

DESCRIPTION ==> CUSTOMER MAINTENANCE DEMO PROGRAM
              ==>
              ==>

          LOG:      RUN:      EDIT:      TEST STREAM:      IN:      OUT:
INVOKED BY: SAMPLE                                TOTAL SCREENS:      6      7
INVOKED ON: 02/19/1999                            AVERAGE BYTES:     11     400
START TIME: 11:40:49
DURATION:   00:01:24   00:00:01
SYSTEM:    MULTIPLE
STATUS:    NORMAL
TERMINAL:  A60L2049
VSAM CI'S: 2

AVERAGE THINK TIME:   00:00:13.858
AVERAGE RESPONSE TIME: 00:00:00.143
MAXIMUM SCREEN SIZE:  24 BY 80
PROTECTION STATUS:
ORIGINATING TEST STREAM:                                OWNER: SAMPLE
                                                         CREATED BY FUNCTION: LOG

F1-HELP      F3-END      F4-RETURN
```

Action:

Press Enter.

Result:

CA Verify for VTAM displays the Initial Terminal Status screen.

View the Initial Terminal Status Information

The Initial Terminal Status screen displays information about the terminal from which the test stream was logged.

```
DEMO.DEMOPROG.001 ----- EDIT: INITIAL TERMINAL STATUS -----11:46:41
ENTER COMMAND ==>                                             E6

TERMINAL ==> A60L2049

VIRTUAL TERMINAL
ASSIGNMENT ==>

SCREEN SIZE: 24 BY 80                                         DEVICE TYPE: LOGICAL UNIT
ALTERNATE: IN USE                                           DEVICE CHARS: C06D001033800000

FEATURES:

BIND: LOGMODE:      D4C32782                                LU TYPE:      02
  FM PROFILE:      03                                       EXT STREAM:   00
  TS PROFILE:      03                                       RESERVED:    00000000
  PLU PROTOCOL:    B1                                       SIZES:       18500000
  SLU PROTOCOL:    90                                       FLAGS:       7E00
  COM PROTOCOL:    3080                                    CRYPTOGRAPHY: 09
  TS FIELDS:      000187F80000
  LOGON DATA:

F1-HELP      F3-END      F4-RETURN    F10-LEFT    F11-RIGHT
```

Action:

Press Enter.

Result:

CA Verify for VTAM displays the Record Selection menu.

View Record Information

The Record Selection menu lists information for each screen in the test stream, such as the terminal at which the screen was logged and its application.

```

DEMO.DEMOPROG.001 ----- EDIT: RECORD SELECTION -----11:46:49
ENTER COMMAND ==>                                         E7

  TERMINAL  APPLID   T/R TIME  OP  AID  VIEW RECORD  ROW: 1 COL: 30
- A60L2049  USS       00:00.094  EW
- A60L2049  USS       00:09.118  RM  ENTER      2  SSOCIATES INTERNAT
- A60L2049  USS       00:00.031  EW          3  EQUEST ACCEPTED AN
- A60L2049  VERDEMO   00:00.442  CON        4  EQUEST ACCEPTED AN
- A60L2049  VERDEMO   00:00.051  DSC        5  EQUEST ACCEPTED AN
- A60L2049  A04IVRFY  00:00.008  CON        6  EQUEST ACCEPTED AN
- A60L2049  A04IVRFY  00:00.100  EWA        7
- A60L2049  A04IVRFY  00:20.330  RM  ENTER      8
- A60L2049  A04IVRFY  00:00.265  EWA        9  ERIFY DEMONSTRATIO
- A60L2049  A04IVRFY  00:06.174  RM  ENTER     10  ERIFY DEMONSTRATIO
- A60L2049  A04IVRFY  00:00.004  EWA       11  ERIFY DEMONSTRATIO
- A60L2049  A04IVRFY  00:29.923  RM  ENTER     12  ERIFY DEMONSTRATIO
- A60L2049  A04IVRFY  00:00.002  EWA       13  ERIFY DEMONSTRATIO
- A60L2049  A04IVRFY  00:09.621  RM  PF3       14  ERIFY DEMONSTRATIO
- A60L2049  A04IVRFY  00:00.002  EWA       15
- A60L2049  A04IVRFY  00:07.980  RM  ENTER     16
***  END OF RECORDS  ***

TYPE AN "S" TO SELECT A RECORD
F1-HELP  F3-END  F4-RETURN  F7-UP  F8-DOWN  F9-FORMAT  F10-LEFT  F11-RIGHT

```

Note: The terminal name and Think/Response (T/R) Times may differ on your menu.

Underneath the Row: 1 and Col: 30 fields, the actual data on the screen in Row 1, Column 30 is displayed. For each application screen this is VERIFY DEMONSTRATION, part of the literal CA VERIFY DEMONSTRATION PROGRAM.

You can scroll left or right to display other data in Row 1.

Action:

Press PF10.

Result:

CA Verify for VTAM scrolls the display to the left.

Action:

Press PF10 again.

Result:

CA Verify for VTAM positions the display at Row 1: Col: 1.

Select a Record

The data on the right of the menu is that which appears in Row 1, Column 1 on the logged screens.

Now you can see the eighth record contains the data xtca demo old beginning in Row 1, Column 1. This is the screen you want to change.

```

S.S.001 ----- EDIT: RECORD SELECTION -----13:44:11
ENTER COMMAND ==>                                     E7

  TERMINAL  APPLID  T/R TIME  OP  AID  VIEW  RECORD  ROW: 1 COL: 1
- A60L2049  USS      00:00.661  EW
- A60L2049  USS      00:20.111  RM  ENTER
- A60L2049  USS      00:00.004  EW
- A60L2049  VERDEMO  00:00.107  CON
- A60L2049  VERDEMO  00:00.014  DSC
- A60L2049  A04IVRFY 00:00.005  CON
- A60L2049  A04IVRFY 00:00.048  EWA
- A60L2049  A04IVRFY 00:05.553  RM  ENTER
- A60L2049  A04IVRFY 00:00.001  EWA
- A60L2049  A04IVRFY 00:02.004  RM  ENTER
- A60L2049  A04IVRFY 00:00.002  EWA
- A60L2049  A04IVRFY 00:01.588  RM  ENTER
- A60L2049  A04IVRFY 00:00.005  EWA
- A60L2049  A04IVRFY 00:01.467  RM  PF3
- A60L2049  A04IVRFY 00:00.001  EWA
- A60L2049  A04IVRFY 00:02.040  RM  ENTER
***  END OF RECORDS  ***

TYPE AN "S" TO SELECT A RECORD
F1-HELP  F3-END  F4-RETURN  F7-UP  F8-DOWN  F9-FORMAT  F10-LEFT  F11-RIGHT
    
```

Action:

Tab to the eighth record, type s, and press Enter.

Result

CA Verify for VTAM displays the screen.

Edit the Screen

The eighth screen in the test stream appears. This is the screen on which you typed xtca demo old to invoke the demo program.

Now you want CA Verify for VTAM to invoke DEMO BUG instead of DEMO OLD so you can test the change in the program.

```

DEMO.DEMOPROG.001 ----- EDIT: FIELD FORMAT -----11:47:47
ENTER COMMAND ==>                                     E4

TYPE:          INPUT          RH: 0392A0          RECORD NUMBER:      8
OPERATION:     READ MODIFIED  APPL: A04IVRFY    DATA LENGTH:       16
THINK:        00:00:20.330    DATE: 02/19/1999  SCREEN SIZE: 24 BY 80
AID:          ENTER          TIME: 11:41:23.174  TERMINAL: A60L2049
ORDER  ROW  COL  ATTR  LENGTH  -----+-----+-----+-----+-----+
                00013  xtca demo bug
                ***  END OF FIELDS  ***

```

Action:

Move the cursor to old and overkey it with bug, and press Enter. Press PF3, then PF3 AGAIN.

Result:

CA Verify for VTAM saves the changed screen.

Now the test stream will use a different version of the demo program, simulating a change to the original program.

Let's return to the Primary Options Menu and retest the program.

Action:

Press PF4.

Result:

CA Verify for VTAM displays the Primary Options Menu.

Select the Run Function

Select the Run Function from the Primary Options Menu.

```
VERSION 1.4.0 ----- CA VERIFY PRIMARY OPTIONS MENU -----14:18:36
ENTER COMMAND ==> r                                     TERM: A60L2049
                                                         OPER: SAMPLE

  L LOG A TEST STREAM
  B BROWSE A TEST STREAM
  R RUN A TEST STREAM
  E EDIT A TEST STREAM
  M MAINTAIN RULES
  I INQUIRY/TERMINATION OF FUNCTIONS
  U UTILITIES
  T TUTORIAL
  X EXIT
    *** ENTER "KEYS" COMMAND TO SEE PF KEY ASSIGNMENTS ***

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```

Action:

Type r and press Enter.

Result:

CA Verify for VTAM displays the Run Options screen.

Specify Run Options

Some of the fields on this screen contain default values. See the field definitions that follow.

```

----- RUN OPTIONS -----14:18:51
ENTER COMMAND ==>

ENTER INPUT TEST STREAM NAME:
DDNAME      ==> TCADS
APPLICATION ==> demo      (LEAVE APPLICATION, MEMBER,
MEMBER      ==> demoprogram OR VERSION BLANK AND PRESS
VERSION     ==> 001      ENTER FOR A SELECTION LIST)

CREATE NEW OUTPUT TEST STREAM:
DDNAME      ==> *        ("*" USES NEXT AVAILABLE VERSION)
APPLICATION ==>
MEMBER      ==>
VERSION     ==>

PROCESS WITH RULES      ==> Y  (Y/N OR S-SELECT)
COMPARISON TYPE        ==> S  (S-SCREEN, L-LOGICAL, P-PHYSICAL)
RECORD HISTORY         ==> Y  (Y/N)
REQUIRE SIGNOFF DATA ==> N  (Y/N)
SIMULATED USER THINK TIME ==> NONE (NONE, NNN% OF ORIGINAL, NN SECONDS)
STATUS INTERVAL        ==> 005 (SECONDS)
CANCEL INTERVAL        ==> 001 (MINUTES)
STOP AT MISMATCHES    ==> Y  (Y/N)
F1-HELP  F3-END  F4-RETURN

```

Action:

Type the information in the ENTER INPUT TEST STREAM NAME:fields. Press Enter.

Result:

CA Verify for VTAM redisplay the Run Options screen.

Field Definitions

INPUT TEST STREAM NAME:

DDNAME, APPLICATION, MEMBER, VERSION

Fill in the name of the test stream you logged.

CREATE NEW OUTPUT TEST STREAM

Specifies the name of the new test stream. Typing an asterisk in the DDNAME field instructs CA Verify for VTAM to generate a name automatically. This name will be the same as the original name with the Version incremented to the next version available.

Type * in the DDNAME field.

PROCESS WITH RULES

Specifies whether rules should be applied during the run.

Leave Y as the default.

COMPARISON TYPE

Specifies the type of comparison: screen, logical, or physical.

Leave S as the default.

RECORD HISTORY

Specifies whether or not CA Verify for VTAM should store any history information it detects. If stored, this information can later be viewed or printed.

Leave Y as the default.

REQUIRE SIGNOFF DATA

Specifies whether or not the operator must explain each mismatch.

Leave N as the default.

SIMULATED USER THINK TIME

Specifies the rate at which input screens are sent to the application, simulating user think time.

Leave NONE as the default.

STATUS INTERVAL

Specifies, in seconds, how often CA Verify for VTAM should report the status of the run.

Leave 005 as the default.

CANCEL INTERVAL

Specifies, in minutes, how often CA Verify for VTAM should give you the opportunity to cancel the run.

Leave 001 as the default.

STOP AT MISMATCHES

Specifies whether the run should be interrupted if a mismatch is encountered.

Leave Y as the default.

Execute the Run

The NAME GENERATED message appears in the top right corner of the Run Options screen. Also, the name of the output test stream appears in the CREATE NEW OUTPUT TEST STREAM fields. This name is the same as the INPUT TEST STREAM NAME except the Version number has changed.

```

----- RUN OPTIONS -----NAME GENERATED
ENTER COMMAND ==>

ENTER INPUT TEST STREAM NAME:
DDNAME      ==> TCADS
APPLICATION ==> DEMO      (LEAVE APPLICATION, MEMBER,
MEMBER      ==> DEMOPROG   OR VERSION BLANK AND PRESS
VERSION     ==> 001       ENTER FOR A SELECTION LIST)

CREATE NEW OUTPUT TEST STREAM:
DDNAME      ==> TCADS      ("*" USES NEXT AVAILABLE VERSION)
APPLICATION ==> DEMO
MEMBER      ==> DEMOPROG
VERSION     ==> 002

PROCESS WITH RULES      ==> Y  (Y/N OR S-SELECT)
COMPARISON TYPE        ==> S  (S-SCREEN, L-LOGICAL, P-PHYSICAL)
RECORD HISTORY         ==> Y  (Y/N)
  REQUIRE SIGNOFF DATA ==> N  (Y/N)
SIMULATED USER THINK TIME ==> NONE (NONE, NNN% OF ORIGINAL, NN SECONDS)
STATUS INTERVAL        ==> 005 (SECONDS)
CANCEL INTERVAL        ==> 001 (MINUTES)
STOP AT MISMATCHES    ==> Y  (Y/N)
F1-HELP  F3-END  F4-RETURN

```

Now CA Verify for VTAM is going to test the changed demo program by re-executing the logged test stream. Remember, CA Verify for VTAM is testing a *new version* of the demo program which simulates a change in the original program.

When CA Verify for VTAM runs the test stream, it compares the original output screens from the application with the current output screens and displays any differences it finds.

Action:

Press Enter.

Result:

CA Verify for VTAM begins running the test stream and displays the Run Status menu and then the Run Mismatch Options menu.

CA Verify for VTAM Detects a Mismatch

When CA Verify for VTAM displays the Run Mismatch Options menu, it means it has detected a mismatch. In other words, one of the original logged screens differs from the current screen generated by the application.

```

----- RUN MISMATCH OPTIONS -----14:19:39
ENTER COMMAND ==>                                     R6

  1 DISPLAY RULESET SUMMARY           6 ACCEPT ORIGINAL OUTPUT
  2 DISPLAY PREVIOUS INPUT            7 ACCEPT CURRENT OUTPUT
  3 DISPLAY NEXT INPUT                8 CHANGE NEXT INPUT
  4 SKIP ORIGINAL OUTPUT              9 INSERT CURRENT OUTPUT AND INPUT
  5 SKIP ORIGINAL OUTPUT AND INPUT    10 INSERT CURRENT OUTPUT

INPUT:   TCADS.DEMO.DEMOPROG.001      CURRENT RECORD: 11
OUTPUT:  TCADS.DEMO.DEMOPROG.002

RULESET: TESTSTREAM: TCADS.DEMO.DEMOPROG.001
         APPLICATION: NOT USED
         SYSTEM:      NOT USED

      TYPE  OPERATION      WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE ALT.  C3   9  2  24*80   607  A60L2049
CURRENT:  OUTPUT  ERASE/WRITE ALT.  C3   9  2  24*80   607  A04IU001
ONLY UNEQUAL ROW: 02

                        .CUSTOMER MASTER MAINTENANCE      .11:41:29
                        .CUSTOMER MASTER MAINTENANCE      .14:19:39
                        X XX X

F1-HELP  F2-ROTATE  F3-END   F7-UP    F8-DOWN
    
```

The information on the bottom half of the Run Mismatch Options menu indicates that when CA Verify for VTAM compared the eleventh record, Row 2 was the only unequal row. The data on Row 2 appears at the bottom of the menu, and CA Verify for VTAM inserts X's underneath the field which differed. In this case the field is the time stamp.

Let's look at the Expected, Current, and Original screens.

Action:

Press PF2. PF2 rotates the display between the Expected, Current, and Original screens, and the Run Mismatch Options menu.

Result:

CA Verify for VTAM displays the Expected screen.

View the Expected Screen

The Expected Screen is the originally logged screen, with any rules applied to it. In our case, we have not yet defined any rules. So, the Expected screen will look the same as the Original screen.

```

DEMO.DEMOPROG.001 ----- RUN: EXPECTED SCREEN -----14:19:39
ENTER COMMAND ==>                                     OUT RECORD: 11
                10      20      30      40      50      60      70 R5
-----+-----|-----+-----|-----+-----|-----+-----|-----
| XTCADemo                CA VERIFY DEMONSTRATION PROGRAM      02/19/
|                          CUSTOMER MASTER MAINTENANCE        11:4
|                          SALES PERSON INQUIRY
|
| 4
|
|                          SALES PERSON: Ellen Jenkins
|
| NUMBER   CUSTOMER NAME      CITY     STATE   MAIN CONTACT   TOTAL
| 8
| _9045   Allied Gene Splicing  San Antonio TX   Geronimo Davis   112,
| _2353   U. S. Tire Nozzles    Greenwich  CT   Alex Schnitzwattle 1,065,
| 12
| _6028   3D Computer Graphics  N Hollywood CA   Horatio Ivanowitz 2,331,
|
| 16
|
| 20

```

Action:

Press PF11 to scroll the display to the right.

Result:

CA Verify for VTAM scrolls the display. The row number ruler no longer appears on the left side of the screen. Now you can see the time stamp. Notice that the date appears right above the time.

Action:

Press PF2.

Result:

CA Verify for VTAM rotates the display and displays the Current screen.

View the Current Screen

This is the screen generated during the Run function when CA Verify for VTAM retested the changed program.

```
DEMO.DEMOPROG.001 ----- RUN: CURRENT SCREEN -----14:19:57
ENTER COMMAND ==>                                OUT RECORD: 11
          10      20      30      40      50      60      70      R5
-----+-----+-----+-----+-----+-----+-----+-----+-----+
XTCADEMO                                CA VERIFY DEMONSTRATION PROGRAM 02/19/1999
                                         CUSTOMER MASTER MAINTENANCE 14:19:39
                                         SALES PERSON INQUIRY

                                         SALES PERSON: Ellen Jenkins

NUMBER    CUSTOMER NAME          CITY    STATE    MAIN CONTACT    TOTAL AR
_ 9045    Allied Gene Splicing    San Antonio    TX    Geronimo Davis    112,000
_ 2353    U. S. Tire Nozzles    Greenwich    CT    Alex Schnitzwattle    1,065,000
_ 6028    3D Computer Graphics    N Hollywood    CA    Horatio Ivanowitz    2,331,756
```

Notice that you do not have to use PF11 to scroll the display to the right. Once you scroll the display, CA Verify for VTAM uses the new screen position to display all future screens *unless* you use PF10 to change it again.

Of course, the time stamp differs from the time stamp on the Original screen. Fields like date and time are always changing. CA Verify for VTAM doesn't know that this difference is acceptable, so it flags it as a mismatch.

However, you can instruct CA Verify for VTAM to *ignore* fields like date and time which change with every execution by defining them as *variable fields*.

Action:

Press PF2.

Result:

CA Verify for VTAM rotates and displays the Original screen.

View the Original Screen

This is the way the Original screen looked when you logged it.

```
DEMO.DEMOPROG.001 ----- RUN: ORIGINAL SCREEN -----14:20:00
ENTER COMMAND ==>                                OUT RECORD: 11
          10          20          30          40          50          60          70          R5
-----+-----|-----+-----|-----+-----|-----+-----|-----+-----|-----+
XTCADemo                CA VERIFY DEMONSTRATION PROGRAM          02/19/1999
                        CUSTOMER MASTER MAINTENANCE              11:41:29
                        SALES PERSON INQUIRY

                        SALES PERSON: Ellen Jenkins

NUMBER  CUSTOMER NAME          CITY  STATE  MAIN CONTACT  TOTAL AR
_ 9045  Allied Gene Splicing    San Antonio  TX  Geronimo Davis  112,000
_ 2353  U. S. Tire Nozzles          Greenwich   CT  Alex Schnitzwattle 1,065,000
_ 6028  3D Computer Graphics        N Hollywood CA  Horatio Ivanowitz 2,331,756
```

Action:

Press PF2.

Result:

CA Verify for VTAM redisplay the Run Mismatch Options menu.

Select the Ruleset Option

CA Verify for VTAM allows you to change or add a rule to a ruleset without terminating the run. For instance, if you forgot to account for an expected screen change, you can select Option 1 to display the Applied Rules panel. From here, rulesets and individual rules can be browsed, edited, or deleted. After you modify a ruleset and reactivate the run, CA Verify for VTAM will repeat the comparison, taking into account your rule specification. CA Verify for VTAM also provides other options for dealing with mismatches during a run, including ignoring the mismatch to continue the run, and updating or replacing a screen in the test stream. See the chapter "Run Function", for more information.

Shortly, you will define the time as a variable field. When CA Verify for VTAM compares the Original and Current screens, it will exclude variable fields from the comparison. First, however, you must establish a ruleset.

```
----- RUN MISMATCH OPTIONS -----14:20:05
ENTER COMMAND ==> 1                                     R6

  1 DISPLAY RULESET SUMMARY          6 ACCEPT ORIGINAL OUTPUT
  2 DISPLAY PREVIOUS INPUT          7 ACCEPT CURRENT OUTPUT
  3 DISPLAY NEXT INPUT              8 CHANGE NEXT INPUT
  4 SKIP ORIGINAL OUTPUT            9 INSERT CURRENT OUTPUT AND INPUT
  5 SKIP ORIGINAL OUTPUT AND INPUT 10 INSERT CURRENT OUTPUT

INPUT:  TCADS.DEMO.DEMOPROG.001      CURRENT RECORD:  11
OUTPUT: TCADS.DEMO.DEMOPROG.002

RULESET: TESTSTREAM: TCADS.DEMO.DEMOPROG.001
         APPLICATION: NOT USED
         SYSTEM:      NOT USED

      TYPE  OPERATION      WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE ALT.  C3   9  2  24*80   607  A60L2049
CURRENT:  OUTPUT  ERASE/WRITE ALT.  C3   9  2  24*80   607  A04IU001
ONLY UNEQUAL ROW: 02

                .CUSTOMER MASTER MAINTENANCE      .11:41:29
                .CUSTOMER MASTER MAINTENANCE      .14:19:39
                X XX X

F1-HELP  F2-ROTATE  F3-END  F7-UP  F8-DOWN
```

Action:

Type 1 and press Enter.

Result:

You will be presented with the Applied Rules panel.

View the Applied Rules Screen

The Applied Rules panel lists all of the rulesets that you requested to be included in the run: test stream, application, and system. It will also display all rules where the rule actions were applied.

```
----- APPLIED RULES -----14:20:17
ENTER COMMAND ==>

INPUT TEST STREAM: TCADS.DEMO.DEMOPROG.001          CURRENT RECORD: 11
                                                    LINE 1 TO 1 OF 1

B-BROWSE  E-EDIT
OBJECT    TYPE ROW  COL LEN OP  VALUE FROM THE MODEL SCREEN/DESCRIPTION
e RULESET  T/S                TCADS.DEMO.DEMOPROG.001

F1-HELP   F2-ROTATE  F3-END    F4-RETURN  F7-UP     F8-DOWN
```

Our ruleset has no rules in it yet, so no rules have been applied.

Action:

Type e next to the ruleset and press Enter.

Result:

CA Verify for VTAM displays the Edit Rules Summary panel.

Insert a New Rule Into a Ruleset

The Edit Rules Summary panel lists all the rules in the ruleset and provides information as to whether each rule was applied.

Now, you can insert a rule into your ruleset.

```
----- EDIT RULES - SUMMARY -----14:20:24
ENTER COMMAND ==>

RULE NAME:                RULESET NAME:  TCADS.DEMO.DEMOPROG.001
LINE  1 TO  1 OF  1      TEST STREAM NAME: TCADS.DEMO.DEMOPROG.001

S-EDIT I-INSERT D-DELETE R-REPLICATE
OBJECT   TYPE ROW  COL LEN OP  VALUE FROM THE MODEL SCREEN/DESCRIPTION
i RULESET   T/S                TCADS.DEMO.DEMOPROG.001

F1-HELP   F3-END     F4-RETURN  F7-UP     F8-DOWN
```

Action:

Type i next to the ruleset name to insert a new rule into the ruleset.

Result:

CA Verify for VTAM displays the Add Rules – Rule Actions panel.

Create a Rule Name

CA Verify for VTAM automatically creates a rule name. You can change it if you wish, but the generated name is used for the purposes of this demonstration.

You may, optionally, type in a description for the rule.

```

----- ADD RULES - RULE ACTIONS -----14:20:29
ENTER COMMAND ==> 1

RULE NAME    ==> RUL00001    RULESET NAME:    TCADS.DEMO.DEMOPROG.001
                                TEST STREAM NAME: TCADS.DEMO.DEMOPROG.001

DESCRIPTION  ==>
                                ==>

      1 FIELD RECOGNITION          11 GENERATE FIELD VALUE
      2 SCREEN RECOGNITION         12 INSERT SCREENS
      3 VARIABLE FIELD             13 DELETE SCREENS
      4 DELETE FIELD               14 CUT SCREEN FIELD
      5 MOVE FIELD                 15 PASTE SCREEN FIELD
      6 CHANGE FIELD VALUE         20 USERID LOGGING
      7 NEW FIELD                  21 TERMINAL ID LOGGING
      8 CHANGE AID KEY             22 APPLID LOGGING
      9 CHANGE CURSOR LOCATION
     10 CHANGE WCC VALUES

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT

```

Action:

Type a 1 in the Enter Command field and press Enter.

Result:

The Run: Expected Screen will be displayed so you can cursor select the identification field information.

Establish Recognition Criteria

Now, you need to specify the recognition criteria CA Verify for VTAM will use to identify screens in this application. Use this criterion:

DEMONSTRATION PROGRAM

Place your cursor on the first character of the field to select it, and then press PF9 to drag that field information into the Recognition Criteria panel. CA Verify for VTAM will do the work of figuring out the Row, Column, Length, Operator, and Value coordinates.

```
DEMO.DEMOPROG.001 ----- RUN: EXPECTED SCREEN ----- ENT
ER COMMAND ==>                                     OUT RECORD: 11 TCA404
9 - MOVE CURSOR TO IDENTIFICATION CRITERIA FIELD; PRESS "SELECT" KEY
-----+-----+-----+-----+-----+-----+-----+-----+
| XTCADemo                CA VERIFY DEMONSTRATION PROGRAM      02/19/
|                          CUSTOMER MASTER MAINTENANCE        11:4
|                          SALES PERSON INQUIRY
|
|                          SALES PERSON: Ellen Jenkins
|
| NUMBER   CUSTOMER NAME      CITY   STATE   MAIN CONTACT   TOTAL
| 8
| _ 9045  Allied Gene Splicing  San Antonio TX  Geronimo Davis   112,
|
| _ 2353  U. S. Tire Nozzles    Greenwich  CT  Alex Schnitzwattle 1,065,
| 12
| _ 6028  3D Computer Graphics  N Hollywood CA  Horatio Ivanowitz 2,331,
|
|
| 16
|
| 20
```

Action:

Position the cursor on the C in CA Verify Demonstration Program on the top line, and press PF9.

Result:

The Add Rule Actions Recognition Criteria screen will be displayed, with the recognition criteria information automatically entered, as shown next.

The ADD SUCCESSFUL message appears in the top right corner of the panel.

```
----- ADD RULE ACTIONS - RECOGNITION CRITERIA-----ADD SUCCESSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME:   TCADS.DEMO.DEMOPROG.001
                             TEST STREAM NAME: TCADS.DEMO.DEMOPROG.001

RECOGNITION CRITERIA:
ROW COL  LEN  OPER VALUE
01  026  044  EQ   CA VERIFY DEMONSTRATION PROGRAM

F1-HELP    F2-PREVIEW    F3-END     F4-RETURN   F9-SELECT
```

Action:

Press PF3 to return to the Add Rules%Rule Actions panel.

Result:

CA Verify for VTAM displays the Add Rules%Rule Actions panel.

Set Up the Date and Time Fields as Variables

Now you can make the time field (and date field, if necessary) into a variable.

```
----- ADD RULES - RULE ACTIONS ----- ENT
ER COMMAND ==> 3
TCAS155 - RULE IS NOT YET COMPLETE -- MUST ADD RULE ACTION
RULE NAME ==> RUL00001 RULESET NAME: TCADS.DEMO.DEMOPROG.001
TEST STREAM NAME: TCADS.DEMO.DEMOPROG.001

DESCRIPTION ==>
==>

      1 FIELD RECOGNITION          11 GENERATE FIELD VALUE
      2 SCREEN RECOGNITION        12 INSERT SCREENS
      3 VARIABLE FIELD            13 DELETE SCREENS
      4 DELETE FIELD              14 CUT SCREEN FIELD
      5 MOVE FIELD                15 PASTE SCREEN FIELD
      6 CHANGE FIELD VALUE        20 USERID LOGGING
      7 NEW FIELD                 21 TERMINAL ID LOGGING
      8 CHANGE AID KEY            22 APPLID LOGGING
      9 CHANGE CURSOR LOCATION
     10 CHANGE WCC VALUES

F1-HELP  F2-PREVIEW  F3-END    F4-RETURN  F9-SELECT
```

Action:

Type 3 in the command field and press Enter.

Result:

CA Verify for VTAM will display the Run: Expected Screen panel.

Select the Time Variable

Next, select the time variable.

```

DEMO.DEMOPROG.001 ----- RUN: EXPECTED SCREEN -----EN
TER COMMAND ==>                                     OUT RECORD: 11TCA40
41 - MOVE CURSOR TO VARIABLE FIELD AND PRESS "SELECT" KEY
-----+-----|-----+-----|-----+-----|-----+-----|-----+-----
XTCADemo                CA VERIFY DEMONSTRATION PROGRAM          02/19/1999
                        CUSTOMER MASTER MAINTENANCE             11:41:29
                        SALES PERSON INQUIRY

                        SALES PERSON: Ellen Jenkins

NUMBER  CUSTOMER NAME      CITY      STATE  MAIN CONTACT  TOTAL AR
_ 9045  Allied Gene Splicing  San Antonio  TX  Geronimo Davis  112,000
_ 2353  U. S. Tire Nozzles      Greenwich   CT  Alex Schnitzwattle 1,065,000
_ 6028  3D Computer Graphics    N Hollywood CA  Horatio Ivanowitz 2,331,756

```

Action:

Position the cursor on the first digit of the time, then press PF9.

Result:

The Add Rule Actions Variable Field screen will be displayed, with the time variable automatically entered, as shown next.

The ADD SUCCESSFUL message appears in the top right corner of the panel.

```
----- ADD RULE ACTIONS - VARIABLE FIELD-----ADD SUCCESSFUL
ENTER COMMAND ==>

RULE NAME: RUL00001          RULESET NAME: TCADS.DEMO.DEMOPROG.001
                             TEST STREAM NAME: TCADS.DEMO.DEMOPROG.001

VARIABLES:
  ROW COL  LEN  VALUE OR DESCRIPTION
   02  073  008  11:41:29

F1-HELP  F2-PREVIEW  F3-END  F4-RETURN  F9-SELECT
```

Action:

Press PF3.

Result:

You are returned to the Add Rules Rule Actions screen.

Action:

Press PF3.

Result:

You are returned to the Edit Rules Summary panel, where you can view the rule you just created.

Action:

Press PF3.

Result:

You are returned to the Applied Rules panel.

Display Applied Rules

This panel shows how the rule we just created has been applied to the originally logged screen.

```

----- APPLIED RULES -----14:21:35
ENTER COMMAND ==>

INPUT TEST STREAM: TCADS.DEMO.DEMOPROG.001          CURRENT RECORD: 11
                                                    LINE 1 TO 4 OF 4

B-BROWSE  E-EDIT
OBJECT    TYPE ROW  COL LEN OP  VALUE FROM THE MODEL SCREEN/DESCRIPTION
RULESET   T/S
RULE
- FLD-RECOG      1  26  44 EQ  CA VERIFY DEMONSTRATION PROGR <RECOGNIZED>
- VARIABLE OUT   2  73   8   11:41:29 <APPLIED>

F1-HELP    F2-ROTATE    F3-END     F4-RETURN  F7-UP     F8-DOWN

```

Action:

Press PF2 to rotate the display to Expected, which consists of the originally logged test steam record with the rules applied; to the current view of the test stream record, and to the original test stream record from the originally logged test stream. When you are finished, press PF3.

Result:

If there are no additional mismatches, the run will continue until either the next mismatch, or the end of the test stream

CA Verify for VTAM Detects Another Mismatch

CA Verify for VTAM redisplay the Mismatch Options menu.

```

----- RUN MISMATCH OPTIONS -----14:21:57
ENTER COMMAND ==>                                     R6

  1 DISPLAY RULESET SUMMARY           6 ACCEPT ORIGINAL OUTPUT
  2 DISPLAY PREVIOUS INPUT           7 ACCEPT CURRENT OUTPUT
  3 DISPLAY NEXT INPUT                8 CHANGE NEXT INPUT
  4 SKIP ORIGINAL OUTPUT              9 INSERT CURRENT OUTPUT AND INPUT
  5 SKIP ORIGINAL OUTPUT AND INPUT    10 INSERT CURRENT OUTPUT

INPUT:   TCADS.DEMO.DEMOPROG.001      CURRENT RECORD: 13
OUTPUT:  TCADS.DEMO.DEMOPROG.002

RULESET: TESTSTREAM: TCADS.DEMO.DEMOPROG.001
         APPLICATION: NOT USED
         SYSTEM:      NOT USED

          TYPE      OPERATION          WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE ALT.  C3   7 19   24*80   870  A60L2049
CURRENT:  OUTPUT  ERASE/WRITE ALT.  C3   7 19   24*80   855  A04IU001
FIRST UNEQUAL ROW: 11  UNEQUAL ROWS: 03
          STATE: .TX. ZIP: .78221.
          STATE: .TX. ZIP: .78221-2718.
                          XXXXXXXX
F1-HELP  F2-ROTATE  F3-END   F7-UP    F8-DOWN
    
```

As the UNEQUAL ROWS field indicates, CA Verify for VTAM has detected three more mismatches.

The first mismatch is the zip code field in Row 11. This mismatch occurred because the program increased the length of the zip code field from 5 to 10.

Let's page down to see the other two mismatches.

Action:

Press PF8.

Result:

CA Verify for VTAM displays the All Unequal Rows screen.

View Additional Mismatches

The All Unequal Rows screen displays the other mismatches

```

DEMO.DEMOPROG.001 ----- RUN: ALL UNEQUAL ROWS -----14:23:11 ENTER
COMMAND ==>
                                RL
                                RECORD: 13
                                10      20      30      40      50      60      70      80
ROW:11-+-----+-----+-----+-----+-----+-----+-----+
        STATE: .TX. ZIP: .78221.
        STATE: .TX. ZIP: .78221-2718.
                                XXXXXXXX

ROW: 17-+-----+-----+-----+-----+-----+-----+-----+
                                AR 60 DAYS: . 37,000.00.
                                AR 60 DAYS: . 35,000.00.
                                X

ROW: 18-+-----+-----+-----+-----+-----+-----+-----+
                                AR 90 DAYS: . 40,000.00.
                                AR 90 DAYS: . 35,000.00.
                                XX

*** END OF UNEQUAL ROWS ***

F1-HELP      F2-ROTATE    F3-END      F7-UP      F8-DOWN    F10-LEFT   F11-RIGHT

```

In addition to the zip code field mismatch, mismatches occur in rows 17 and 18 in the AR fields.

Let's examine the Expected, Current, and Original screens.

Action:

Press PF2.

Result:

CA Verify for VTAM displays the Expected screen.

View the Expected Screen

The Expected screen is the originally logged screen with any rules applied to it.

```
DEMO.DEMOPROG.001 ----- RUN: EXPECTED SCREEN -----14:23:11
ENTER COMMAND ==>                                     OUT RECORD: 13
      10      20      30      40      50      60      70      R5
-----+-----+-----+-----+-----+-----+-----+-----+
XTCADemo                CA VERIFY DEMONSTRATION PROGRAM      02/19/1999
                        CUSTOMER MASTER MAINTENANCE          11:41:59
                        CUSTOMER INQUIRY

                        SALES PERSON: Ellen Jenkins

CUSTOMER NAME: Allied Gene Splicing   CONTACT1: Geronimo Davis
ADDRESS1:    Technologies Plaza      CONTACT2: Ellen Jenkins
ADDRESS2:    114 McCauley Avenue     CONTACT3: Henry Meehan
CITY:        San Antonio             CONTACT4: Bradley Thomas
STATE: TX   ZIP: 78221

***** ACCOUNTING INFORMATION *****

CREDIT LINE: 83,500.00   AR 30 DAYS: 35,000.00
                        AR 60 DAYS: 37,000.00
                        AR 90 DAYS: 40,000.00
                        -----
                        TOTAL AR: 112,000.00
```

Action:

Press PF2.

Result:

CA Verify for VTAM rotates the display and displays the Current Screen.

View the Current Screen

This is the screen generated during the Run function when CA Verify for VTAM retested the changed program.

```

DEMO.DEMOPROG.001 ----- RUN: CURRENT SCREEN -----14:23:22
ENTER COMMAND ==>                                     OUT RECORD: 13
      10      20      30      40      50      60      70      R5
-----+-----+-----+-----+-----+-----+-----+-----+-----+
XTCADemo                CA VERIFY DEMONSTRATION PROGRAM      2/19/1999
                        CUSTOMER MASTER MAINTENANCE          14:21:43
                        CUSTOMER INQUIRY

                        SALES PERSON: Ellen Jenkins

CUSTOMER NAME: Allied Gene Splicing   CONTACT1: Geronimo Davis
ADDRESS1:    Technologies Plaza       CONTACT2: Ellen Jenkins
ADDRESS2:    114 McCauley Avenue      CONTACT3: Henry Meehan
CITY:        San Antonio              CONTACT4: Bradley Thomas
STATE: TX   ZIP: 78221-2718

***** ACCOUNTING INFORMATION *****

CREDIT LINE: 83,500.00   AR 30 DAYS: 35,000.00
                        AR 60 DAYS: 35,000.00
                        AR 90 DAYS: 35,000.00
                        -----
                        TOTAL AR: 112,000.00

```

Notice that the zip code does not match the zip code on the original screen. That's because one of the changes made in the demo program increased the length of the zip code field from 5 to 10. The 10-character zip code on the current screen confirms that the changed program is performing as expected in this instance.

But the differences in the values of the AR 60 DAYS and AR 90 DAYS fields represent errors in the program you are testing. These errors must be corrected.

Action:

Press PF2.

Result:

CA Verify for VTAM displays the Original Screen

View the Original Screen

This is the way the original screen looked when you logged it. Notice the values in the ZIP, AR 30 DAYS, AR 60 DAYS, and AR 90 DAYS fields.

```
DEMO.DEMOPROG.001 ----- RUN: ORIGINAL SCREEN -----14:23:25
ENTER COMMAND ==>                                     OUT RECORD: 13
      10      20      30      40      50      60      70      R5
-----+-----+-----+-----+-----+-----+-----+-----+-----+
XTCADemo                CA VERIFY DEMONSTRATION PROGRAM      02/19/1999
                        CUSTOMER MASTER MAINTENANCE          11:41:59
                        CUSTOMER INQUIRY

                        SALES PERSON: Ellen Jenkins

CUSTOMER NAME: Allied Gene Splicing   CONTACT1: Geronimo Davis
ADDRESS1:    Technologies Plaza       CONTACT2: Ellen Jenkins
ADDRESS2:    114 McCauley Avenue      CONTACT3: Henry Meehan
CITY:        San Antonio              CONTACT4: Bradley Thomas
STATE: TX   ZIP: 78221

***** ACCOUNTING INFORMATION *****

CREDIT LINE:  83,500.00   AR 30 DAYS:  35,000.00
                                AR 60 DAYS:  37,000.00
                                AR 90 DAYS:  40,000.00
                                -----
                                TOTAL AR:  112,000.00
```

Action:

Press PF2.

Result:

CA Verify for VTAM redisplay the All Unequal Rows menu.

Action:

Press PF7.

Result:

CA Verify for VTAM redisplay the Run Mismatch Options menu.

Ignore the Screen Changes

Because CA Verify for VTAM detected errors as well as a valid program change, you want to ignore the changes in the current screen. You can instruct CA Verify for VTAM to use the original screen rather than the incorrect current screen in the new test stream. This lets you use the new test stream to retest the program after you've corrected the error.

```

----- RUN MISMATCH OPTIONS -----14:24:28
ENTER COMMAND ==> 6                                     R6

  1 DISPLAY RULESET SUMMARY           6 ACCEPT ORIGINAL OUTPUT
  2 DISPLAY PREVIOUS INPUT            7 ACCEPT CURRENT OUTPUT
  3 DISPLAY NEXT INPUT                8 CHANGE NEXT INPUT
  4 SKIP ORIGINAL OUTPUT              9 INSERT CURRENT OUTPUT AND INPUT
  5 SKIP ORIGINAL OUTPUT AND INPUT    10 INSERT CURRENT OUTPUT

INPUT:   TCADS.DEMO.DEMOPROG.001      CURRENT RECORD: 13
OUTPUT:  TCADS.DEMO.DEMOPROG.003

RULESET: TESTSTREAM: TCADS.DEMO.DEMOPROG.001
         APPLICATION: NOT USED
         SYSTEM:      NOT USED

          TYPE      OPERATION          WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE ALT.  C3   7 19   24*80  870  A60L2049
CURRENT:  OUTPUT  ERASE/WRITE ALT.  C3   7 19   24*80  855  A04IU001
FIRST UNEQUAL ROW: 11  UNEQUAL ROWS: 03
STATE: .TX. ZIP: .78221.
STATE: .TX. ZIP: .78221-2718.
                    XXXXXXXX
F1-HELP  F2-ROTATE  F3-END   F7-UP    F8-DOWN

```

Action:

Type 6 (Accept Original Output) and press Enter.

Result:

CA Verify for VTAM continues the run, and then displays the Run Completion screen.

View Run Statistics

The Run Completion screen provides statistics about the run which has just completed. As a result of the run, you know that the revised program has an error that must be fixed.

As before, you will not actually change the program. Instead, you will use a different version of the program to simulate that the program has been fixed.

Again, use the Edit function to change the name of the program invoked by the demo application.

You can access the Edit function by selecting it from the Primary Options Menu, or you can enter Edit directly, which is what you're going to do now.

```
TCADS.DEMO.DEMOPROG.001      RUN COMPLETION -----14:25:52
ENTER COMMAND ==> =e                                               R8

OUTPUT SCREENS COMPARED:      6
PHYSICALLY EQUAL SCREENS:    3
LOGICALLY EQUAL SCREENS:     5

OUTPUT TEST STREAM: TCADS.DEMO.DEMOPROG.003

RULESET(S) USED:
TESTSTREAM: TCADS.DEMO.DEMOPROG.001
APPLICATION: NOT USED
SYSTEM:     NOT USED
           IN:  OUT:
EQUAL:      6   3
EQUIVALENT:    2
IGNORED:      1
ACCEPTED:     0
INSERTED:     0
DELETED:      0
CHANGED:      0
NOT RUN:      0

F1-HELP  F3-END  F4-RETURN
```

Action:

Type =e and press Enter.

Result:

CA Verify for VTAM displays the Test Stream Edit menu.

Select a Test Stream

Now you are going to change the test stream version created during the previous run.

```
----- TEST STREAM EDIT -----14:26:21
ENTER COMMAND ==>                                     E1

ENTER TEST STREAM NAME:
DDNAME      ==> TCADS
APPLICATION ==> DEMO      (LEAVE APPLICATION, MEMBER,
MEMBER      ==> DEMOPROG  OR VERSION BLANK AND PRESS
VERSION     ==> 002      ENTER FOR A SELECTION LIST)

F1-HELP      F3-END      F4-RETURN
```

Action:

Complete the menu as illustrated next and press Enter. Note that the Version is now 002.

Result:

CA Verify for VTAM displays the Directory Information screen.

View Directory Information

This screen provides *Last Run* information; that is, statistics related to the run.

```

DEMO.DEMOPROG.002 ----- EDIT: DIRECTORY INFORMATION -----14:26:31
ENTER COMMAND ==>                                         E3

DESCRIPTION ==> CUSTOMER MAINTENANCE DEMO PROGRAM
==>
==>

LOG:      RUN:      EDIT:      TEST STREAM:      IN:  OUT:
INVOKED BY: SAMPLE  SAMPLE  SAMPLE  TOTAL SCREENS:    6   7
INVOKED ON: 02/19/1999 02/19/1999 02/19/1999  AVERAGE BYTES:   11  400
START TIME: 11:40:49  14:25:52  11:47:50
DURATION:   00:01:24  00:00:00
SYSTEM:     MULTIPLE MULTIPLE      LAST RUN:         IN:  OUT:
STATUS:     NORMAL   LOGICALLY EQUAL  EQUAL:           6   4
TERMINAL:   A60L2049      EQUIVALENT:      1
VSAM CI 'S: 2              IGNORED:         1
                                ACCEPTED:         0
                                INSERTED:         0  0
                                DELETED:         0  0
                                CHANGED:         0
                                NOT RUN:         0  0
AVERAGE THINK TIME: 00:00:13.858
AVERAGE RESPONSE TIME: 00:00:00.053
MAXIMUM SCREEN SIZE: 24 BY 80
PROTECTION STATUS:
ORIGINATING TEST STREAM: DEMO.DEMOPROG.001  OWNER: SAMPLE
CREATED BY FUNCTION: RUN

F1-HELP      F3-END      F4-RETURN

```

- Four output screens were *equal* to the logged screens.
- One output screen was *equivalent* to the logged screen. This was the output screen that you made logically equal to the logged output screen by defining time as a variable field.
- One output screen was *ignored*. This was the screen with the zip code and AR changes that you asked CA Verify for VTAM to ignore.

Action:

Press Enter.

Result:

CA Verify for VTAM displays the Initial Terminal Status screen.

View Initial Terminal Status Information

The Initial Terminal Status screen displays information about the terminal from which the test stream was logged.

```
DEMO.DEMOPROG.002 ----- EDIT: INITIAL TERMINAL STATUS -----14:26:53
ENTER COMMAND ==>                                         E6

TERMINAL ==> A60L2049

VIRTUAL TERMINAL
ASSIGNMENT ==>

SCREEN SIZE: 24 BY 80                                     DEVICE TYPE: LOGICAL UNIT
ALTERNATE: IN USE                                       DEVICE CHARS: C06D001033800000

FEATURES:

BIND: LOGMODE:      D4C32782                            LU TYPE:      02
FM PROFILE: 03                                           EXT STREAM:   00
TS PROFILE: 03                                           RESERVED:    00000000
PLU PROTOCOL: B1                                        SIZES:      18500000
SLU PROTOCOL: 90                                        FLAGS:       7E00
COM PROTOCOL: 3080                                     CRYPTOGRAPHY: 09
TS FIELDS: 000187F80000
LOGON DATA:

F1-HELP      F3-END      F4-RETURN   F10-LEFT   F11-RIGHT
```

Action:

Press Enter.

Result:

CA Verify for VTAM displays the Record Selection menu.

Select a Record

The Record Selection menu lists each record in the test stream.

You are going to change the eighth screen again – the screen which invokes the demo program.

```

DEMO.DEMOPROG.002 ----- EDIT: RECORD SELECTION -----14:27:05
ENTER COMMAND ==>                                         E7

  TERMINAL  APPLID  T/R TIME  OP  AID  VIEW  RECORD  ROW: 1 COL: 30
-  A60L2049  USS      00:00.060  EW
-  A60L2049  USS      00:09.118  RM  ENTER      2  SSOCIATES INTERNAT
-  A60L2049  USS      00:00.003  EW      3  EQUEST ACCEPTED AN
-  A60L2049  VERDEMO  00:00.034  CON      4  EQUEST ACCEPTED AN
-  A60L2049  VERDEMO  00:00.008  DSC      5  EQUEST ACCEPTED AN
-  A60L2049  A04IVRFY 00:00.004  CON      6  EQUEST ACCEPTED AN
-  A60L2049  A04IVRFY 00:00.003  EWA      7
s  A60L2049  A04IVRFY 00:20.330  RM  ENTER      8
-  A60L2049  A04IVRFY 00:00.002  EWA      R      9  ERIFY DEMONSTRATIO
-  A60L2049  A04IVRFY 00:06.174  RM  ENTER     10  ERIFY DEMONSTRATIO
-  A60L2049  A04IVRFY 00:00.009  EWA      R     11  ERIFY DEMONSTRATIO
-  A60L2049  A04IVRFY 00:29.923  RM  ENTER     12  ERIFY DEMONSTRATIO
-  A60L2049  A04IVRFY 00:00.003  EWA      R     13  ERIFY DEMONSTRATIO
-  A60L2049  A04IVRFY 00:09.621  RM  PF3      14  ERIFY DEMONSTRATIO
-  A60L2049  A04IVRFY 00:00.242  EWA     15
-  A60L2049  A04IVRFY 00:07.980  RM  ENTER     16
***  END OF RECORDS  ***

TYPE AN "S" TO SELECT A RECORD
F1-HELP  F3-END  F4-RETURN  F7-UP  F8-DOWN  F9-FORMAT  F10-LEFT  F11-RIGHT
    
```

Action:

Tab to the eighth record, type s, and press Enter.

Result:

CA Verify for VTAM displays the screen.

Edit the Screen

Now you want to change the demo program from DEMO BUG to DEMO NEW to simulate that the program error has been corrected.

```
DEMO.DEMOPROG.002 ----- EDIT: FIELD FORMAT -----14:27:57
ENTER COMMAND ==>                                         E4

TYPE:      INPUT          RH:  0392A0          RECORD NUMBER:      8
OPERATION: READ MODIFIED  APPL: A04IVRFY       DATA LENGTH:       16
THINK:     00:00:20.330   DATE: 02/19/1999     SCREEN SIZE:  24 BY 80
AID:      ENTER          TIME: 14:25:30.424   TERMINAL:        A60L2049
ORDER  ROW  COL  ATTR  LENGTH  -----+-----|-----+-----|-----+-----|-----+
          00013  xtca demo new
          ***  END OF FIELDS  ***
```

Action:

Move the cursor and overkey BUG with new. Press Enter. Then press PF3 three times.

Result:

CA Verify for VTAM saves the edited test stream and displays the Primary Options Menu.

Select the Run Function

Now you can select the Run function to retest the corrected program.

```
VERSION 1.4.0 ----- CA VERIFY PRIMARY OPTIONS MENU -- -----14:28:20 ENTER
COMMAND ==> r                                     TERM: A60L2049
                                                    OPER: SAMPLE

  L LOG A TEST STREAM
  B BROWSE A TEST STREAM
  R RUN A TEST STREAM
  E EDIT A TEST STREAM
  M MAINTAIN RULES
  I INQUIRY/TERMINATION OF FUNCTIONS
  U UTILITIES
  T TUTORIAL
  X EXIT
    *** ENTER "KEYS" COMMAND TO SEE PF KEY ASSIGNMENTS ***

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```

Action:

Type r and press Enter.

Result:

CA Verify for VTAM displays the Run Options menu.

Specify the Run Options

Complete the Run Options menu as shown next.

```

----- RUN OPTIONS -----14:28:27
ENTER COMMAND ==>

ENTER INPUT TEST STREAM NAME:
DDNAME      ==> TCADS
APPLICATION ==> DEMO      (LEAVE APPLICATION, MEMBER,
MEMBER      ==> DEMOPROG  OR VERSION BLANK AND PRESS
VERSION     ==> 002      ENTER FOR A SELECTION LIST)

CREATE NEW OUTPUT TEST STREAM:
DDNAME      ==> *        ("*" USES NEXT AVAILABLE VERSION)
APPLICATION ==>
MEMBER      ==>
VERSION     ==>

PROCESS WITH RULES      ==> Y  (Y/N OR S-SELECT)
COMPARISON TYPE        ==> S  (S-SCREEN, L-LOGICAL, P-PHYSICAL)
RECORD HISTORY         ==> Y  (Y/N)
  REQUIRE SIGNOFF DATA ==> N  (Y/N)
SIMULATED USER THINK TIME ==> NONE (NONE, NNN% OF ORIGINAL, NN SECONDS)
STATUS INTERVAL        ==> 005 (SECONDS)
CANCEL INTERVAL        ==> 001 (MINUTES)
STOP AT MISMATCHES    ==> Y  (Y/N)
F1-HELP  F3-END  F4-RETURN

```

Action:

Type the name of the input test stream, specifying Version 002, the version created during the last run.

Type * in the DDNAME field under CREATE NEW OUTPUT TEST STREAM.

Press Enter.

Result:

CA Verify for VTAM redisplay the Run Options menu.

Initiate the Run

The Run Options menu now contains the generated name of the output test stream; that is, same name, version 003.

```

----- RUN OPTIONS -----NAME GENERATED
ENTER COMMAND ==>

ENTER INPUT TEST STREAM NAME:
DDNAME      ==> TCADS
APPLICATION ==> DEMO      (LEAVE APPLICATION, MEMBER,
MEMBER      ==> DEMOPROG   OR VERSION BLANK AND PRESS
VERSION     ==> 002       ENTER FOR A SELECTION LIST)

CREATE NEW OUTPUT TEST STREAM:
DDNAME      ==> TCADS      ("*" USES NEXT AVAILABLE VERSION)
APPLICATION ==> DEMO
MEMBER      ==> DEMOPROG
VERSION     ==> 003

PROCESS WITH RULES      ==> Y  (Y/N OR S-SELECT)
COMPARISON TYPE        ==> S  (S-SCREEN, L-LOGICAL, P-PHYSICAL)
RECORD HISTORY         ==> Y  (Y/N)
  REQUIRE SIGNOFF DATA ==> N  (Y/N)
SIMULATED USER THINK TIME ==> NONE (NONE, NNN% OF ORIGINAL, NN SECONDS)
STATUS INTERVAL        ==> 005 (SECONDS)
CANCEL INTERVAL        ==> 001 (MINUTES)
STOP AT MISMATCHES    ==> Y  (Y/N)
F1-HELP  F3-END  F4-RETURN

```

Action:

Press Enter to begin the run.

Result:

CA Verify for VTAM initiates the run, displays the Run Status menu, and then displays the Run Mismatch Options menu.

CA Verify for VTAM Detects a Mismatch

Remember that the last time you ran the test stream CA Verify for VTAM detected several mismatches:

- Time
- Zip code
- AR60 and AR90 fields

You resolved the time mismatch by creating rule actions and marking the time as a variable field. CA Verify for VTAM will now ignore a mismatch in that field.

The zip code mismatch still exists. That is a valid difference because the updated program increased the zip code field from 5 to 10. Notice that this is now the *only* unequal row.

```

----- RUN MISMATCH OPTIONS -----14:30:01
ENTER COMMAND ==>                                     R6

  1 DISPLAY RULESET SUMMARY          6 ACCEPT ORIGINAL OUTPUT
  2 DISPLAY PREVIOUS INPUT          7 ACCEPT CURRENT OUTPUT
  3 DISPLAY NEXT INPUT              8 CHANGE NEXT INPUT
  4 SKIP ORIGINAL OUTPUT            9 INSERT CURRENT OUTPUT AND INPUT
  5 SKIP ORIGINAL OUTPUT AND INPUT 10 INSERT CURRENT OUTPUT

INPUT:  TCADS.DEMO.DEMOPROG.002      CURRENT RECORD: 13
OUTPUT: TCADS.DEMO.DEMOPROG.003

RULESET: TESTSTREAM: TCADS.DEMO.DEMOPROG.002
         APPLICATION: NOT USED
         SYSTEM:      NOT USED

      TYPE  OPERATION      WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE ALT.  C3   7 19  24*80   870  A60L2049
CURRENT:  OUTPUT  ERASE/WRITE ALT.  C3   7 19  24*80   855  A04IU001
ONLY UNEQUAL ROW: 11
                STATE: .TX. ZIP: .78221.
                STATE: .TX. ZIP: .78221-2718.
                XXXXXXXX
F1-HELP  F2-ROTATE  F3-END   F7-UP    F8-DOWN

```

Let's look at the Expected, Current, and Original screens.

Action:

Press PF2.

Result:

CA Verify for VTAM displays the Expected screen.

View the Expected Screen

Look at the values in the AR fields.

```
DEMO.DEMOPROG.002 ----- RUN: EXPECTED SCREEN -----14:30:01
ENTER COMMAND ==>                                     OUT RECORD: 13
      10      20      30      40      50      60      70  5
-----+-----|-----+-----|-----+-----|-----+-----|
| XTCADMO                CA VERIFY DEMONSTRATION PROGRAM      03/04/
|                        CUSTOMER MASTER MAINTENANCE          12:5
|                        CUSTOMER INQUIRY
|
| 4
|
|                        SALES PERSON: Ellen Jenkins
|
| 8  CUSTOMER NAME: Allied Gene Splicing   CONTACT1: Geronimo Davis
|    ADDRESS1:   Technologies Plaza       CONTACT2: Ellen Jenkins
|    ADDRESS2:  114 McCauley Avenue       CONTACT3: Henry Meehan
|    CITY:      San Antonio               CONTACT4: Bradley Thomas
|    STATE:    TX  ZIP: 78221
|
| 12
|
|                        ***** ACCOUNTING INFORMATION *****
|
| 16  CREDIT LINE:  83,500.00             AR 30 DAYS:  35,000.00
|                                           AR 60 DAYS:  37,000.00
|                                           AR 90 DAYS:  40,000.00
|
| 20                                           -----
|                                           TOTAL AR:   112,000.00
```

Action:

Press PF2 to look at the Current screen.

Result:

CA Verify for VTAM displays the Current screen.

View the Original Screen

Notice the values in the AR fields.

```
DEMO.DEMOPROG.002 ----- RUN: ORIGINAL SCREEN -----14:30:40
ENTER COMMAND ==>                                     OUT RECORD: 13
                10      20      30      40      50      60      70 R5
-----+-----|-----+-----|-----+-----|-----+-----|
| XTCADemo                CA VERIFY DEMONSTRATION PROGRAM      03/04/
|                          CUSTOMER MASTER MAINTENANCE        12:5
|                          CUSTOMER INQUIRY
|
|                          SALES PERSON: Ellen Jenkins
|
|      CUSTOMER NAME: Allied Gene Splicing   CONTACT1: Geronimo Davis
|      ADDRESS1:    Technologies Plaza      CONTACT2: Ellen Jenkins
|      ADDRESS2:    114 McCauley Avenue     CONTACT3: Henry Meehan
|      CITY:        San Antonio            CONTACT4: Bradley Thomas
|      STATE: TX   ZIP: 78221
|
|
|                          ***** ACCOUNTING INFORMATION *****
|
|      CREDIT LINE:  83,500.00             AR 30 DAYS:  35,000.00
|                                          AR 60 DAYS:  37,000.00
|                                          AR 90 DAYS:  40,000.00
|
|
|                                          -----
|                                          TOTAL AR:  112,000.00
```

Action:

Press PF2.

Result:

CA Verify for VTAM displays the Run Mismatch Options menu.

Accept the Program Change

Now you can instruct CA Verify for VTAM to accept the program change – the extended zip code field – as permanent. This means CA Verify for VTAM will not flag this field as a mismatch in future testing.

```

----- RUN MISMATCH OPTIONS -----14:30:47
ENTER COMMAND ==> 7                                     R6

  1 DISPLAY RULESET SUMMARY           6 ACCEPT ORIGINAL OUTPUT
  2 DISPLAY PREVIOUS INPUT           7 ACCEPT CURRENT OUTPUT
  3 DISPLAY NEXT INPUT                8 CHANGE NEXT INPUT
  4 SKIP ORIGINAL OUTPUT              9 INSERT CURRENT OUTPUT AND INPUT
  5 SKIP ORIGINAL OUTPUT AND INPUT    10 INSERT CURRENT OUTPUT

INPUT:   TCADS.DEMO.DEMOPROG.002      CURRENT RECORD: 13
OUTPUT:  TCADS.DEMO.DEMOPROG.003

RULESET: TESTSTREAM: TCADS.DEMO.DEMOPROG.002
         APPLICATION: NOT USED
         SYSTEM:      NOT USED

          TYPE      OPERATION          WCC  CURSOR  SIZE  LENGTH  TERMINAL
EXPECTED: OUTPUT  ERASE/WRITE ALT.  C3   7 19  24*80  870  A60L2049
CURRENT:  OUTPUT  ERASE/WRITE ALT.  C3   7 19  24*80  855  A04IU001
ONLY UNEQUAL ROW: 11
                STATE: .TX. ZIP: .78221.
                STATE: .TX. ZIP: .78221-2718.
                        XXXXXXXX
F1-HELP  F2-ROTATE  F3-END   F7-UP    F8-DOWN

```

Action:

Type 7 (Accept Current Output) and press Enter.

Result:

CA Verify for VTAM continues the run, displays the Run Status menu, and then displays the Run Completion menu.

View Run Statistics

The Run Completion menu provides information on the run that has just completed.

```
TCADS.DEMO.DEMOPROG.002      RUN COMPLETION -----14:30:54
ENTER COMMAND ==>                                           R8

OUTPUT SCREENS COMPARED:      6
PHYSICALLY EQUAL SCREENS:    4
LOGICALLY EQUAL SCREENS:     5

OUTPUT TEST STREAM: TCADS.DEMO.DEMOPROG.003

RULESET(S) USED:
  TESTSTREAM: TCADS.DEMO.DEMOPROG.002
  APPLICATION: NOT USED
  SYSTEM:     NOT USED

                IN:  OUT:
EQUAL:           6   4
EQUIVALENT:           1
IGNORED:           0
ACCEPTED:          1
INSERTED:          0   0
DELETED:           0   0
CHANGED:           0
NOT RUN:           0   0

F1-HELP F3-END F4-RETURN
```

You have now finished testing the demo program.

With CA Verify for VTAM, you were able to:

- Detect program errors
- Ignore valid differences
- Fix a program bug and retest to make sure the error was corrected

If you wish, you can print the test stream you just created for documentation purposes. See the chapter "Batch Functions" for directions.

This demo has illustrated some of the features of CA Verify for VTAM. To learn more about CA Verify for VTAM, see the other chapters in this guide.

Action:

Press PF4.

Result:

CA Verify for VTAM displays the Primary Options Menu.

Now you can exit from CA Verify for VTAM or use the test streams you created to learn more about CA Verify for VTAM 's other features.

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