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- Find the most current information about BMC products
- Search a database for problems similar to yours and possible solutions
- Order or download product documentation
- Download products and maintenance
- Report a problem or ask a question
- Subscribe to receive proactive e-mail alerts
- Find worldwide BMC support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

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Before contacting BMC
Have the following information available so that Customer Support can begin working on your issue immediately:

- Product information
  - Product name
  - Product version (release number)
  - License number and password (trial or permanent)
- Operating system and environment information
  - Machine type
  - Operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - System hardware configuration
  - Serial numbers
  - Related software (database, application, and communication) including type, version, and service pack or maintenance level
- Sequence of events leading to the problem
- Commands and options that you used
- Messages received (and the time and date that you received them)
  - Product error messages
  - Messages from the operating system
  - Messages from related software
License key and password information

If you have questions about your license key or password, contact Customer Support through one of the following methods:

- Send an e-mail message to customer_support@bmc.com. (In the Subject line, enter SupID:yourSupportContractID, such as SupID:12345.)
- In the United States and Canada, call 1 800 537 1813. Outside the United States and Canada, contact your local support center for assistance.
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About this book

This book contains detailed information about DELTA IMS VIRTUAL TERMINAL and is intended for IMS systems programmers, IMS database administrators, and any other individuals involved in the installation, operation, and maintenance of an IMS system.

DELTA IMS VIRTUAL TERMINAL is a four-tiered product from BMC Software that enables you to better manage your IMS system components. DELTA IMS includes the following product tiers:

- DELTA IMS DC
- DELTA IMS DB/DC
- DELTA PLUS for DBCTL
- DELTA IMS VIRTUAL TERMINAL

Together, these products let you define IMS system components and expand user access to IMS without performing IMSGENS.

This book discusses the use of the fourth DELTA IMS product tier: DELTA IMS VIRTUAL TERMINAL.

This edition of this user guide replaces all previous editions of the book. This edition applies to version 6.8.00 of the BMC Software DELTA IMS VIRTUAL TERMINAL product and to all subsequent versions until otherwise indicated in later books. For complete information about the book editions for this product, see the applicable release notes.

In many instances in this book, a DELTA IMS VIRTUAL TERMINAL load module or PDS member which is referenced will actually be one of different versions because DELTA IMS VIRTUAL TERMINAL is designed to work with all supported versions of IMS. In all such occurrences, the last character of the member name will be replaced with an n. This character indicates that the actual member referenced depends upon theIMS version. For example, the n is replaced by 5 under IMS Version 13.1, or 6 under IMS Version 14.1.
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- View Quick Course videos (short overviews of selected product concepts, tasks, or features), which are available from the following locations:
  - Documentation Center (primary center and secured center)
  - Support Central (at http://www.bmc.com/support/mainframe-demonstrations)
  - BMC Mainframe YouTube channel (https://www.youtube.com/user/BMCSoftwareMainframe)


Products with online interfaces also offer online Help via the **F1** key or, for graphical user interfaces (GUIs), via a **Help** button.

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Conventions

This document uses the following special conventions:

- All syntax, operating system terms, and literal examples are presented in this typeface.
- Variable text in path names, system messages, or syntax is displayed in italic text: `testsys/instance/fileName`
- Menu sequences use a symbol to convey the sequence. For example, `Actions => Create Test` instructs you to choose the `Create Test` command from the `Actions` menu.

Syntax statements

This topic explains conventions for showing syntax statements.

A sample statement follows:

```
COMMAND KEYWORD1 [KEYWORD2 | KEYWORD3] KEYWORD4={YES | NO} fileName...
```

The following table explains conventions for syntax statements and provides examples:

<table>
<thead>
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<th>Convention</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items in italic type represent variables that you must replace with a name or value. If a variable is represented by two or more words, initial capitals distinguish the second and subsequent words.</td>
<td><code>alias</code> <code>databaseDirectory</code> <code>serverHostName</code></td>
</tr>
<tr>
<td>Brackets indicate optional items. Do not type the brackets when you enter the option. A comma means that you can choose one or more of the listed options. You must use a comma to separate the options if you choose more than one option.</td>
<td><code>[tableName, columnName, field]</code> <code>[-full, -incremental, -level]</code></td>
</tr>
<tr>
<td>Braces indicate that at least one of the enclosed items is required. Do not type the braces when you enter the item.</td>
<td>`{DBDName</td>
</tr>
</tbody>
</table>
Convention | Example
---|---
A vertical bar means that you can choose only one of the listed items. In the example, you would choose either commit or cancel. | \{commit | cancel\}
An ellipsis indicates that you can repeat the previous item or items as many times as necessary. | columnName...

Syntax diagrams

The following figure shows the standard format for syntax diagrams:

The following example illustrates the syntax for a hypothetical DELETE statement. Because the FROM keyword, alias variable, and WHERE clause are optional, they appear below the main command line. In contrast, the tableName variable appears on the command line because the table name is required. If the statement includes a WHERE clause, the clause must contain a search condition or a CURRENT OF clause. (The searchCondition variable appears on the main line for the WHERE clause, indicating that this choice is required.)
The following guidelines provide additional information about syntax diagrams:

- Read diagrams from left to right and from top to bottom.

- A recursive (left-pointing) arrow above a stack indicates that you may choose more than one item in the stack.

- An underlined item is a default option.

- If a diagram shows punctuation marks, parentheses, or similar symbols, you must enter them as part of the syntax.

- In general, IBM commands, keywords, clauses, and data types are displayed in uppercase letters. However, if an item can be shortened, the minimum required portion might be shown in uppercase letters, with the remainder in lowercase (for example, CANcel).

- The following conventions apply to variables in syntax diagrams:
  
  — Variables are typically displayed in lowercase letters and are always italicized.

  — If a variable is represented by two or more words, initial capitals distinguish the second and subsequent words (for example, databaseName).
Introduction

This chapter provides a high-level overview of DELTA IMS VIRTUAL TERMINAL and its features. DELTA IMS VIRTUAL TERMINAL diagnostic tools and operational considerations are also described in this chapter.

An Overview of DELTA IMS VIRTUAL TERMINAL

A virtual terminal is any 3270, SLU1, SLU2, SLUP, or 3600/FINANCE terminal that is not defined in an IMSGEN but is created at logon time. A 3270, SLU2 or 3600/FINANCE virtual terminal is deleted after the user logs off IMS. SLUP virtual terminals are not deleted when the user logs off IMS. Sites can specify that the IMS terminal control block for a virtual terminal reside in the IMS control region only while that virtual terminal is logged on to IMS and that it be deleted after logoff, thereby freeing virtual storage for another virtual terminal user.

Virtual Printers

Virtual printers are LTERMs and corresponding nodes that do not have to be IMSGEN-defined to be used by BMP and MPP programs for output. A virtual printer is created when IMS attempts to locate a destination unknown to the system. You do not have to make changes to IMS application programs to send output to virtual printers.

Virtual Terminals

Virtual terminals are nodes and corresponding LTERMs that do not have to be IMSGEN-defined to be used by IMS users. A virtual terminal is created at logon time and is deleted after the user logs off IMS.
Virtual Terminal Control Blocks

DELTA IMS VIRTUAL TERMINAL uses six control blocks for defining and accessing virtual terminals and virtual printers.

For more information, see “Virtual Terminal Control Blocks” on page 117.

Diagnostics

The following tools are used to assist in DELTA IMS VIRTUAL TERMINAL problem determination and resolution:

- Virtual terminal trace facility
- IMS system log tapes
- File select print utility (DFSERA10)
- IMS dispatcher trace facility

The virtual terminal Trace facility consists of three elements. The first is the trace table which consists of entries located in extended private virtual storage. The second is a macro interface that generates standard trace table entries and/or specific event entries. The third element is a callable routine that allocates trace table entries with integrity in a multiprocessor environment, initializes entries with an ID and time stamp, and if a CLB address is provided, produces the standard trace entry.

The IMS system log tapes, file select print utility, and dispatcher trace facility are used by BMC Software Customer Support to diagnose problems when IMS abends or is suspected to be in a loop or wait state.

Virtual Terminal Trace Facility

DELTA IMS VIRTUAL TERMINAL provides a virtual terminal trace facility which is used for BMC Software diagnostic purposes. The facility maintains a trace within the IMS control region by documenting events that are considered significant by DELTA IMS VIRTUAL TERMINAL. The virtual terminal trace facility has three elements:

- Trace table
- Macro interface
- Callable trace routine

Trace Table

The trace table consists of 3200 64-byte entries located in extended private virtual storage. The size of the table never exceeds 3200 entries; when the table is full,
writing continues by overlaying the oldest entry with the newest entry. The address of the trace table is at offset X'30' in load module VTFXVCDn, while the address of the most recent entry is at offset X'38'.

**Macro Interface**

Two forms of the virtual terminal Trace facility macro interface are available. The first generates a DSECT of a standard trace table entry. Note that while the format of trace table entries is variable and event-specific, you can use a common format by typing the $VTFTRCE macro instruction in the following format:

```plaintext
$VTFTRCE DSECT
```

The second form of the macro interface traces an event. The expansion of the macro provides the expected linkage to the callable routine VTFXTRCn, and is shown in the example below. Upon return from $VTFTRCE, general register R15 contains the 31-bit address of the trace entry created:

```plaintext
$VTFTRCE ID='value',VCD=address,CLB=address
```

ID= ‘value’ is a four character string that serves as an eye-catcher in the trace table and identifies the type of event.

VCD=address is the address of VTFXVCDn, or general register R2-R12.

CLB=address is an optional parameter that indicates the standard trace entry is desired and provides the address, or general register R2-R12, of the CLB whose data is to be traced. If this parameter is omitted, a trace entry is created, but it includes only the ID and time stamp.

**Callable Routine**

The callable routine, VTFXTRCn, is link-edited to VTFXVCDn. It allocates trace table entries with integrity in a multiprocessor environment, initializes the entry with the ID and time stamp, and if a CLB address is provided, produces the standard trace entry as described by the DSECT form of $VTFTRCE.

**/DISPLAY VT TRACE Command**

The /DISPLAY VT TRACE command provides an online report of the current contents of the virtual terminal trace table.

For more information on the /DISPLAY command and the Trace report contents and format, see “Using IMS Operator Commands” on page 147.
IMS System Log Tapes

When the IMS control region abends or is operating incorrectly, the IMS system log tapes are used by BMC Software Customer Support to diagnose the problem. Once obtained, keep this documentation until the problem has been resolved to your satisfaction. BMC Software may not need any or all of this material; however, it is important that it is readily available, if it is needed. The following describes creating documentation to send to BMC Software, when required.

IMS and DELTA IMS VIRTUAL TERMINAL log records are used for analysis, sometimes requiring records from a log tape created since the last cold start.

Usually, a limited subset of log record types are required, but occasionally other types are needed. The most frequently used log records are X’02’, X’11’, X’12’, X’40’, and X’DE’.

If confidentiality requires that complete log contents not be disclosed, you can copy (not print) these record types to tape using DFSERA10 prior to submitting them to BMC Software.

If your site has customized the log code used for DELTA IMS VIRTUAL TERMINAL, replace the log code X’DE’ with the code you selected in the DELTA IMSID Basic Options panel.

File Select Print Utility

DLACNTL member DLA#ERA7 contains JCL to use the IBM file select print utility (DFSERA10).

DFSERA10 can select and print log records that contain a specific character or hexadecimal string irrespective of offset.

For example, to select all records that contain the string ABC, include one of the following SYSIN control cards:

```
OPTION PRINT E=DFSERA70,C=E,PARM=(DATA=ABC)
```

-Or-

```
OPTION PRINT E=DFSERA70,C=E,PARM=(DATA=X'C1C2C3')
```

DFSERA10 is particularly useful when researching terminal related problems from the IMS log.
IMS Dispatcher Trace Facility

The IMS dispatch trace facility can provide valuable information for diagnostic purposes. This facility traces the calls of the IMS dispatcher and places the results in a trace table. You can turn the facility on and off using the online /TRACE command, but you must first use the DISP=ON parameter in the OPTIONS statement when you initialize your IMS system. If you do not have this facility activated on your IMS system, you should consider activating it to help with the diagnosis of any future problems with IMS or other products that run under IMS.

See the IBM publication *IMS System Definition Reference* for more information on the IMS dispatcher trace facility.

Identifying ZAPS Supplied by BMC Software

Each zap supplied by BMC Software includes an IDRDATA control card. When keying in a BMC Software supplied zap to the IBM AMASPZAP utility, always include the IDRDATA card.

The VTFCNTL library contains member VTF#LIDR. If you have applied the IDRDATA control card along with each zap supplied by BMC Software, you can generate a list of the zaps that have been applied to DELTA IMS VIRTUAL TERMINAL at your site by running job VTF#LIDR.

Figure 1 on page 21 shows a standard AMASPZAP job with typical control cards, including IDRDATA.

Figure 1: Standard AMASPZAP Job with IDRDATA Control Card

```
//DELTAFIX JOB (ACCT#),NORMAL JOBCARD INFO
//
//STEP1 EXEC PGM=AMASPZAP,REGION=512K
//SYSPRINT DD  SYSOUT=*  
//SYSLIB DD DISP=SHR,DSN=BMCNODE.ppp LIB
//SYSIN DD  * 
NAME DLAXNVB0 DLAXNVB0                   
VER 148C 4100073D <----- IDENTIFY MODULE, CSECT
CHECKSUM 1BC94100 <----- VERIFY DATA  
REPLACE DATA
CHECKSUM 1B654100 <----- REPLACE CHECKSUM
IDRDATA  P186055 <----- IDRDATA, ALWAYS INCLUDE!
/*
```

Restrictions and Compatibility

When using DELTA IMS VIRTUAL TERMINAL, keep the following operational restrictions and considerations in mind.
Restrictions

The restrictions are as follows:

- The IMS Master Terminal cannot be a virtual terminal or be used as a virtual terminal logon model.

- IMS commands that allow a range of LTERM or node names to be selected cannot include a virtual terminal.

- Application programs responding to virtual terminal conversational input must respond via the I/O PCB.

- Local copy output from virtual terminals or to BSC 3270 candidate printers is not supported.

- When Resource Manager (RM) is active, virtual terminal status is no longer kept in VTE control blocks.

- A /STO NODE command issued against a virtual terminal is lost after the control blocks have been deleted unless Resource Manager (RM) and Sysplex Terminal Management (STM) are in use.

- When Resource Manager (RM) is active, VTE entries are no longer created for the /EXCL, /STOP, /TEST, and /TRACE commands.

- After installing DELTA IMS VIRTUAL TERMINAL, the following become reserved words for all command processing (including non-display and non-virtual command formats), LTERM names, and MFS format names: VT, ALLOWED, OVERRIDE, PRINTER, SIGNON, TRACE, VIRTUAL, VP, VPO, VTF, VCN, VLB, VTE.

- Do not use operator initiated checkpoints (such as /CHE, and /DBR) that inadvertently occur during online change (/MODIFY, /PREPARE, and /COMMIT), to restart your IMS system.

- Do not use the special characters # or @ in the node name.

- Virtual printers that use models defined to IMS with OPTIONS=DISCON are automatically logged off whenever the queue count is zero. The OPTIONS=DISCON parameter takes precedence over any virtual printer logoff interval you specify on the Virtual Terminal Limits panel. This option also takes precedence over the No Automatic Timeout option in a Virtual Printer Timer Override table.

- The terminal communication option, Automatic Session Restart (ASR), is not supported when specified on a virtual terminal model definition.
VTAM MODETAB PSERVIC field presentation space values must be coded correctly for DELTA IMS VIRTUAL TERMINAL to determine screen size.

Using a multiple LTERM per node Translate Subsystem Services (TSS) table for signon or signon bypass requires a special TSS translation, which precludes the use of pattern masking in these tables.

The user VTFBMCUS is created and used by DELTA IMS VIRTUAL TERMINAL. User VTFBMCUS should not be defined by IMSGEN or added through DELTA IMS DB/DC.

When a /STO NODE ALL command is issued, virtual terminal logons are not allowed until the virtual terminal logon models are restarted.

Models used for virtual terminals and virtual printers should never be connected or used.

If an LTERM destination is created as a remote CNT via the Virtual Remote LTERMs TSS table, it cannot be used as a local LTERM until the next cold start of IMS. Conversely, if an LTERM is created as a local LTERM, it cannot be used as a remote LTERM until the next cold start of IMS.

**IMS Master Terminal Restrictions**

The IMS Master Terminal is the control center for all IMS system operations. Operator commands affecting the entire IMS application and communications network can be entered at this terminal. System status messages are displayed on the Master Terminal.

Because of the importance of the IMS Master Terminal, IMS takes extraordinary measures during restart to accommodate it. These measures provide for the integrity of messages and conversations enqueued to the Master Terminal from the prior IMS restart. Also during this period, IMS accepts input from, and displays messages relevant to, the current restart. For these reasons, the following restrictions apply to virtual terminals and the Master Terminal:

- A virtual terminal cannot be either the IMS Master Terminal or secondary Master Terminal.
- An LTERM that is IMSGEN-defined to the Master Terminal or secondary Master Terminal cannot be used as a virtual terminal user’s LTERM.

**Locating DELTA IMS VIRTUAL TERMINAL Tasks**

DELTA IMS tasks are described in the four books provided with the product.
Table 1 on page 24 shows the most common tasks and shows the book name and chapter number of the task description.

**Table 1: Task Locator Table**

<table>
<thead>
<tr>
<th>Task</th>
<th>Manual and Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview of All Product Tiers</td>
<td><em>DELTA IMS General Information</em></td>
</tr>
<tr>
<td>Initial and Maintenance Installation</td>
<td>Installation guide</td>
</tr>
<tr>
<td>Software Environment and Resource Requirements</td>
<td>Installation guide</td>
</tr>
<tr>
<td>CPU ID Passwords</td>
<td>Installation guide</td>
</tr>
<tr>
<td>DELTA IMS Customization for All Tiers Except DELTA IMS VIRTUAL TERMINAL</td>
<td>Installation guide</td>
</tr>
<tr>
<td>DELTA IMS VIRTUAL TERMINAL Customization</td>
<td><em>DELTA IMS VIRTUAL TERMINAL User Guide</em></td>
</tr>
<tr>
<td>TSO/ISPF Interface</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>DELTA Lists—Creating and Editing</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>DELTA Lists—Checking and Executing</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>DELTA Lists—Generating and Converting</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>Translate Subsystem Services Tables</td>
<td><em>DELTA IMS VIRTUAL TERMINAL User Guide</em></td>
</tr>
<tr>
<td>Defining Spare Elements</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>DELTA Logs—Creating and Maintaining</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>DELTA Log Reports</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>IMS Storage—Display and Zap</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>XRF</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>Online Change</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
<tr>
<td>IMS Operator Commands</td>
<td><em>DELTA IMS VIRTUAL TERMINAL User Guide</em></td>
</tr>
<tr>
<td>Problem Diagnosis</td>
<td><em>DELTA IMS User Guide</em></td>
</tr>
</tbody>
</table>
Customizing DELTA IMS VIRTUAL TERMINAL

This chapter describes the options and associated panels that enable you to customize Customizing DELTA IMS VIRTUAL TERMINAL to your specific environment.

Overview

This section starts the customization for DELTA PLUS VIRTUAL TERMINAL. To completely customize the IMSID options module for DELTA PLUS VIRTUAL TERMINAL, you must understand fully the ramifications of each option. Please see the chapters in this book to assist you in selecting the correct options for your IMS system.

Resource Requirements

The estimated virtual, CPU, and DASD resources required for DELTA PLUS VIRTUAL TERMINAL are described below. These are estimates; they may vary depending on the requirements of your system.

Table 2 on page 25 shows private storage under IMS, except where noted. Use this table to estimate virtual storage needed.

Table 2: DELTA PLUS VIRTUAL TERMINAL Virtual Storage Requirements

<table>
<thead>
<tr>
<th>Description</th>
<th>Storage Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual terminal and printer control blocks (VLBs)</td>
<td>612 bytes</td>
</tr>
<tr>
<td>Virtual LTERM control blocks (VCNs)</td>
<td>156 bytes</td>
</tr>
<tr>
<td>Each /SECURE allowed userid</td>
<td>16 bytes</td>
</tr>
<tr>
<td>Each virtual printer override (VPO)</td>
<td>28 bytes</td>
</tr>
<tr>
<td>Description</td>
<td>Storage Requirements</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Each virtual terminal pending element (VTEs)</td>
<td>16 bytes</td>
</tr>
</tbody>
</table>

**VLB and VCN Composition**

To create a VLB, DELTA PLUS VIRTUAL TERMINAL adds a prefix and suffix to the standard control blocks that IMS uses to create terminals and printers. The combined prefix and suffix storage is approximately 28 bytes. All storage used for VLBs is allocated above the 16-MB line. See the IBM IMS documentation for information on the standard control blocks IMS uses to create terminals and printers.

To create a VCN, DELTA PLUS VIRTUAL TERMINAL adds a prefix and suffix to the standard control blocks IMS uses to create LTERMs. The combined storage used by the prefix and suffix is approximately 12 bytes. VCN storage is allocated above the 16-MB line. See the IBM IMS documentation for information on the standard control blocks IMS uses to create LTERMs.

You can review the contents of VLBs and VCNs by issuing one of the following IMS commands:

- `/DISPLAY VT VLB nodename`
- `/DISPLAY VT VCN ltermname`

For information on these IMS commands, see “Using IMS Operator Commands” on page 147.

**GETMAIN and CWAP Storage**

GETMAIN-requested storage will be more than the control block size times the number of control blocks. This is due to increased pool size calculations that IMS performs; these calculations are based on the number of terminals.

DELTA PLUS VIRTUAL TERMINAL uses approximately 20 KB from the IMS Communications Work Pool Area (CWAP) during virtual terminal logon/signon processing. Since this process is serialized, 20 KB is the maximum amount DELTA PLUS VIRTUAL TERMINAL ever uses at one time. If you are using virtual printers, your CWAP calculations should also include approximately 2 KB for each concurrent virtual printer request. Once implemented, you should periodically monitor your CWAP allocation for future adjustments.
Before You Begin Customization

Before you start customizing DELTA PLUS VIRTUAL TERMINAL, you must install a password (or bypass password), and you must enable DELTA PLUS VIRTUAL TERMINAL.

Install a DELTA IMS Password or Bypass Password

If you are installing DELTA PLUS VIRTUAL TERMINAL for the first time on an IMS system, you must have already installed a DELTA IMS permanent or bypass password which will authorize virtual terminal execution. See the installation guide for more information on setting passwords.

Enable Customizing DELTA IMS VIRTUAL TERMINAL

In the following pages, you will be presented options which will enable or disable DELTA IMS VIRTUAL TERMINAL.

You must select the Enable DELTA IMS VIRTUAL TERMINAL option, which is displayed on the Virtual Terminal Options panel (IMSID Basic Options panel number 4). See “Selecting Virtual Terminal Options” on page 31.

To use DELTA IMS VIRTUAL TERMINAL, ETO must be disabled. You can disable ETO in the following two ways:

- Do not include ETO in the IMMSGEN.
  -Or-

- If ETO is included in the IMMSGEN, use the statement ETO=N or ETO=M in member DFSPByyy of your PROCLIB.

See IBM APAR PN65988 for more information.

ETO can be enabled if you use only the DELTA IMS DC or DELTA IMS DB/DC product tiers.
Setting IMSID Options for Customizing DELTA IMS VIRTUAL TERMINAL

As you proceed through the customization options, you may find it necessary to see later chapters in this manual to completely understand the option you are setting.

You will find it particularly useful to review “Virtual Terminals” on page 91, “Virtual Printers” on page 107, and “Using Virtual Terminal Exits” on page 125 before starting the customization. You may also use these chapters as a reference for modifying your options after DELTA PLUS VIRTUAL TERMINAL is installed as your needs or requirements change.

Setting Virtual Terminal Limits

To access the Virtual Terminal Limits panel, shown in the following figure, type 3 in the selection field on the IMSID Options panel or page down from the previous panel.

**Figure 2: Virtual Terminal Limits Panel**

```
I3                      DELTA IMS VT - IMSID Basic Options
Virtual Terminal Limits   IMSID . . . . GPF6   Page 3 of 8   More: - +
Maximum /SECURE ALLOWed users . . . . . . . . 20____ *
Maximum Virtual Printer overrides . . . . . . 25____ *
Maximum Virtual Terminal pending entries . . . . . 25____ *
Idle terminal logoff intervals . . . . . . . . Standard 10_ min./Alternate 60_ min.
Idle conversation logoff intervals . . . . . . . Standard 30_ min./Alternate 60_ min.
Idle Virtual Printer logoff intervals . . . . . . Standard 0__ min./Alternate 0__ min.
Held conversation exit interval . . . . . . . . 50____ minutes
```

* Changes will not take effect until IMS is restarted.
Use the SAVE command to save options.

The following fields are available on this panel:

**IMSID**

If you overtype the IMSID with the name of an existing IMSID, any changes made to the original options are saved and the new IMSID options are loaded for update. If the new IMSID does not exist, the new set of options are copied from the previous IMSID options.
Maximum /SECURE ALLOWed users

The maximum number of userids which can be specified by a /SECURE ALLOW command between IMS cold starts or /SECURE CLEAR commands. DELTA PLUS VIRTUAL TERMINAL uses this value to calculate the size and capacity of the userid pool VTFUSBPL which is allocated in the IMS private area during initialization. This value is optional; a 0 or blank indicates that no userid pool is allocated.

If this value is too low, it can cause /SECURE ALLOW commands to fail. If this value is too high, it can waste private area virtual storage, but it will not create more overhead.

The initial value is site-dependent. Although you may increase the value without impacting IMS operation, it will not take effect until the next IMS restart. A cold start is recommended if you decrease the value.

Maximum Virtual Printer overrides

The maximum number of virtual printer overrides which can be specified by an /ASSIGN command that are in effect at the same time. DELTA PLUS VIRTUAL TERMINAL uses this value to calculate the size and capacity of the VPO pool VTFVPOPL, which is allocated in the IMS private area during initialization. This value is optional; a 0 or blank indicates that no VPO pool is allocated.

If this value is too low, it can cause /ASSIGN commands for virtual printers to fail. If this value is too high, it can waste private area virtual storage, but it will not create more overhead.

The initial value is site-dependent. Although you can increase the value without impacting IMS operation, it will not take effect until the next IMS restart. A cold start is recommended if you decrease the value.

Maximum Virtual Terminal pending entries

The maximum number of virtual terminal pending entries that can be in effect at the same time. This value is ignored when Resource Manager (RM) and Sysplex Terminal Management (STM) are in use. DELTA PLUS VIRTUAL TERMINAL uses this value to calculate the size and capacity of the VTE pool VTFVTEPL which is allocated in the IMS private area during initialization.

If this value is too low, it can cause virtual terminal /TRA or /TEST MFS commands to fail. If this value is too high, it can waste private area virtual storage, but it will not create more overhead.
You can change the value without impacting IMS operation, but it will not take effect until the next IMS restart. A cold start is recommended if you decrease the value. A 0 indicates that no VTE pool is allocated.

Tip
You should specify a non-zero number for both VPOs and VTEs. If a non-zero value is specified, you will be able to specify a virtual printer override and to set nodes in test MFS in emergency situations. BMC Software recommends that you specify a value of at least 10 for both VPOs and VTEs.

**Idle terminal logoff intervals**

The number of minutes a virtual terminal can remain inactive before an automatic logoff is invoked. You can specify the use of an alternate interval during the logon/signon process. See “Using IMS Operator Commands” on page 147 for information on using IMS commands. The alternate value, entered in minutes, specifies how long a virtual terminal can remain inactive before an automatic logoff is invoked.

A valid terminal logoff interval is 0 or a value between 10 and 999 minutes.

**Idle conversation logoff/exit intervals**

The number of minutes a virtual terminal in conversational mode can remain inactive before an automatic logoff is invoked. This value overrides the idle terminal logoff interval specified in the previous field if the terminal is in conversational mode.

When a virtual terminal is logged off, conversations are assigned to the user /SPQB that was created when the terminal was logged on. The conversations remain in the state they were in when the terminal was logged off. This option only logs off the terminal; it does not exit the conversations.

You can specify the use of the alternate interval during the logon/signon process. See “Using IMS Operator Commands” on page 147 for information on using IMS commands. The alternate value, entered in minutes, specifies how long a virtual terminal in conversational mode can remain inactive before an automatic logoff and exit is invoked.

A valid logoff interval for a terminal in conversation is 0 or a value between 10 and 999 minutes.

**Idle Virtual Printer logoff intervals**

The number of minutes a virtual printer can remain inactive before an automatic logoff is invoked. You can specify the use of the alternate interval via the virtual printer timer override. See “Creating Virtual Terminal TSS Tables” on page 34. The alternate value, entered in minutes, specifies how
long a virtual printer may remain inactive before an automatic logoff will be
invoked.

Virtual printers that use models defined to IMS with OPTIONS=DISCON are
automatically logged off whenever the queue count is zero. The
OPTIONS=DISCON parameter takes precedence over any value you specify
in this field. This option also takes precedence over the **No Automatic
Timeout** option in a Virtual Printer Timer Override table.

**Held conversation exit interval**

This field is optional. The number of minutes a virtual terminal waits before
exiting a held conversation, whether the conversation was initiated and/or
held on either a virtual terminal or an IMMSGEN-defined terminal. A 0 or
blank indicates that no held conversations are to be exited.

Held conversations can be exited only if the terminal is stopped.

Also, this interval is independent of the idle conversation logoff/exit
intervals; it does not begin after the expiration of the idle conversation
logoff/exit intervals. For example, if a held conversation exceeds the held
conversation exit interval while still assigned to an active terminal, the
conversation will be immediately exited when the terminal logs off or is
automatically logged off due to inactivity.

**Selecting Virtual Terminal Options**

To access the Virtual Terminal Options panel, shown in the following figure, type 4
in the selection field on the IMSID Options panel or page down from the previous
panel.

**Figure 3: Virtual Terminal Options Panel**

```
I4 DELTA IMS VT - IMSID Basic Options  Page 4 of 8
Virtual Terminal Options  IMSID . . . . GPF6  More: - +
Select one or more of the following.

/ Enable DELTA IMS Virtual Terminal *
/ Notify MTO of auto logoffs and exits
/ Require signon for ALL Virtual Terminals
/ Support multiple concurrent LTERMs for Virtual Terminals
DFS3649A /SIGN COMMAND REQUIRED format name . . . SIGNON_
DFS3650 SESSION STATUS format name . . . . . . . SIGNON2_
```

* Changes will not take effect until IMS is restarted.
Use the SAVE command to save options.
The following fields are available on this panel:

IMSID

If you overtype the IMSID with the name of an existing IMSID, any changes made to the original options are saved and the new IMSID options are loaded for update. If the new IMSID does not exist, the new set of options are copied from the original IMSID options.

Enable DELTA IMS VIRTUAL TERMINAL

Type / in this field to activate DELTA PLUS VIRTUAL TERMINAL.

Notify MTO of auto logoffs and exits

Type / in this field to send a message to the IMS Master Terminal each time DELTA PLUS VIRTUAL TERMINAL automatically logs off an idle virtual terminal or automatically exits a conversation.

Require signon for ALL Virtual Terminals

Type / in this field to specify that a signon is required after a virtual terminal logon. A signon is required for DELTA PLUS VIRTUAL TERMINAL enhanced conversation and message-handling features to associate conversations and messages with a userid.

Note

If any of your users are not required to sign on, do not specify signon required. All users will attempt signon bypass if you have not specified signon required. If signon bypass is not successful, the user will still be required to sign on.

Support multiple concurrent LTERMs for Virtual Terminals

Type / in this field to enable multiple concurrent LTERM support for virtual terminals. If you select this option, each virtual terminal can support up to 8 LTERM names. The node and LTERMS must be virtual.

When you do not want multiple LTERMs, the argument length in the Translate Subsystem Services (TSS) table for Signon Bypass options 2 and 3 and Signon options 2 and 4 must equal eight; otherwise, it must be greater than eight to permit suffixed node or userid values.

WARNING

Using a multiple LTERM per node TSS table for signon or signon bypass requires a special TSS translation, which precludes the use of pattern masking in these tables.
Tip

Use this option only if your NLTERM table has at least one node with more than one LTERM. This does not pertain to using a userid as the LTERM and signing on multiple times.

DFS3649A /SIGN COMMAND REQUIRED format name

This field contains the name of a Message Output Descriptor (MOD) that displays each time logon occurs at a VTAM terminal where signon is required. The following MODs may be used in this field:

- **user-customized MOD** - The user’s own MOD may be used; however, it should contain a SYSMSG field.

- **IBM default MOD** - The IBM default MOD DFS3649A /SIGN COMMAND REQUIRED is displayed if the field is left blank.

If a signon failure occurs, a message describing the failure will be displayed in the SYSMSG field of the MOD used. To change the message text, use sample JCL in VTFCNTL member DLA#SMSG to assemble and link a replacement module called VTFMSG0.

Figure 4 on page 33 shows the source code for replacement module VTFMSG0.

### Figure 4: Replacement Module VTFMSG0

```plaintext
MSG  TITLE 'VTFMSG0 - VTF SIGNON ERROR MESSAGES'
*  @BMCCHG P122804,MOD IMS 3.2 POSITIONING @122804
*  @BMCCHG P194530,SAMP CORRECT MIS-SPELLINGS @194530
*  @DLACHG P195459,SAMP ADD SAMPLE SIGNON MSG TO SAMP LIB @195459
VTFMSG0 $VTFINIT SUB=YES, IDENTIFY CSECT
USER=YES, USER ROUTINE
EXTLK=NO NO EXTENDED LINKAGE
SMESSAGE $VTFMSG 0, 'DFS3650 SESSION READY FOR INPUT'
$VTFMSG 4, 'USER PROFILE NOT DEFINED TO RACF'
$VTFMSG 8, 'PASSWORD IS NOT AUTHORIZED'
$VTFMSG 12, 'PASSWORD HAS EXPIRED'
$VTFMSG 16, 'NEW PASSWORD IS INVALID'
$VTFMSG 20, 'USER NOT DEFINED TO GROUP'
$VTFMSG 24, 'RACINIT FAILED BY INSTALLATION EXIT ROUTINE'
$VTFMSG 28, 'USER ACCESS HAS BEEN REVOKED'
$VTFMSG 32, 'RACE IS NOT ACTIVE'
$VTFMSG 36, 'USER ACCESS TO SPECIFIED GROUP REVOKED'
$VTFMSG 40, 'OIDCARD PARM REQUIRED BUT NOT SPECIFIED'
$VTFMSG 44, 'OIDCARD PARM IS INVALID FOR SPECIFIED USER'
$VTFMSG 48, 'USER NOT AUTHORIZED TO USE TERMINAL'
$VTFMSG 52, 'USER NOT AUTHORIZED TO USE APPLICATION'
$VTFMSG 60, 'REJECTED BY DFSCSGN0 EXIT ROUTINE'
$VTFMSG 104, 'UNABLE TO OBTAIN STORAGE FOR SIGNON, RETRY SIGNON'
$VTFMSG 128, 'SYNTAX ERROR'
$VTFMSG 132, 'SYSTERM ERROR'
$VTFMSG 144, 'USER ID MORE THAN 8 CHARACTERS'
$VTFMSG 180, 'USERID CANNOT BE SPECIFIED BY STATIC TERMINAL'
$VTFMSG 200, 'GUIDES RETURNED BY DFSMSG0 CONTAIN RESERVED PREFIXES'
$VTFMSG 212, 'USER STRUCTURE BLOCKS COULD NOT BE OBTAINED, DFSBCB'
$VTFMSG 224, 'USER SIGNING ON ALREADY EXISTS AND HAS BEEN /STOPPED'
$VTFMSG 276, 'USER ALREADY EXISTS AND IS CURRENTLY BEING USED - /ASS, /STD, /OPN'
$VTFMSG 9996, 'END OF TABLE MESSAGE - DO NOT DELETE'
END
```

DFS3650 SESSION STATUS format name

This field contains the name of a Message Output Descriptor (MOD) that displays each time a VTAM terminal which is not required to sign on, logs on to IMS. If a MOD name has not been supplied and the terminal logs on, the IBM default message DFS3650 SESSION STATUS is displayed.
If a MOD name has been supplied and the terminal logs on, the MOD will be displayed.

Creating Virtual Terminal TSS Tables

To access the Virtual Terminal TSS Tables panel, shown in the following figure, type 5 in the selection field on the IMSID Options panel or page down from the previous panel.

For more information on virtual printers and output destinations, see “Virtual Printers” on page 107.

Figure 5: Virtual Terminal TSS Tables Panel

The following fields are available on this panel:

IMSID

If you overtype the IMSID with the name of an existing IMSID, any changes made to the original options are saved and the new IMSID options are loaded for update. If the new IMSID does not exist, the new set of options are copied from the previous IMSID options.

TSS table data set name

The name of the TSS library. The TSS library holds the tables used by the Translate Subsystem which is used by DELTA PLUS VIRTUAL TERMINAL. You can allocate the TSS data set using the Library Format option, the JCL in DLACNTL member DLA#TSSA, or ISPF utilities. See “Translate Subsystem Services Tables” on page 47 for more information on formatting TSS libraries.
If you use ISPF for the allocation, the data set should be physical sequential with a RECFM of FS and an LRECL and BLKSIZE of 4096. The space used depends on the number of tables to be contained in the TSS data set; an initial allocation of 1 cylinder is a recommended minimum. If you omit this parameter and any of the virtual terminal exits require TSS, then abend U4060 subcode 010 occurs.

**Number of TSS cache (look aside) buffers**

The look-aside-buffer is a cache in the extended private area. The Translate Subsystem Services table uses the look-aside-buffer to keep the most recently referenced blocks from the TSS library which speeds up TSS response. Valid values are any number between 5 and 1024. For best performance, specify the total number of index and table blocks plus one for the control record taken from the Table Select panel for all TSS tables. To ensure that the most recent data is accessed, you must refresh the TSS table. See “Translate Subsystem Services Tables” on page 47 for more information on refreshing TSS libraries.

**Note**

If a value of 0 is specified, the buffers will be eliminated and I/O to the data set will be required each time table data is needed.

**Virtual Printers**

Type the name of the TSS table used to define the valid virtual printer LTERM name.

**Virtual Printer Timer Override**

Type the name of the TSS table used to derive the Timer facility override value.

Virtual printers that use models defined to IMS with OPTIONS=DISCON are automatically logged off whenever the queue count is zero. The OPTIONS=DISCON parameter takes precedence over the No Automatic Timeout option available through the Virtual Printer Timer Override table.

**Unsolicited Output**

Type the name of the TSS table that contains the LTERM names that are to be created when a message is sent to the TSS table.

**WARNING**

This table is the final search to determine if a destination is valid. Liberal use of wild cards (*) may allow LTERMs to be created that you really do not wish to have created.
Virtual Remote LTERMs

Type the name of the TSS table used for the output. The table must consist of an 8-byte argument and function fields. The argument field contains the virtual remote LTERM name and the function field contains the MSNAME of the link to the destination IMS system.

Require "ALLROWS" keyword on /DIS TSSTABLE tablename command

Type / in this field to require a user to enter the ALLROWS keyword on the /DIS TSSTABLE tablename command to display all entries in the table. Requiring the ALLROWS keyword on this command will prevent the inadvertent display of an entire table.

Selecting a Virtual Terminal Logon Technique

To access the Virtual Terminal Logon panel, shown in the following figure, type 6 in the selection field on the IMSID Options panel or page down from the previous panel.

For more information, see “Logon Exit Sample Routine” on page 127.

Figure 6: Virtual Terminal Logon Panel

I6                      DELTA IMS VT - IMSID Basic Options
Command ===> ________________________________________________ Scroll ===> PAGE
Virtual Terminal Logon                IMSID . . . . IMSA

Select a technique for obtaining a Logon Model node name.

1. Use the following defaults.
   Default SLU2 logon model node name . . . MODLSLU2
   Default 3270 logon model node name . . . MODL3270
   Default SLU1 logon model node name . . .
   Default SLUP logon model node name . . .

2. Translate the VTAM terminal type and screen size to a model name.
   Bind to logon model TSS table name . . . LMODEL__

3. Call customer-modified logon exit

Use the SAVE command to save options.

The following fields are available on this panel:

IMSID

If you overtype the IMSID with the name of an existing IMSID, any changes made to the original options are saved and the new IMSID options are loaded for update. If the new IMSID does not exist, the new set of options are copied from the original IMSID options.
Select a technique for obtaining a Logon Model node name.

Specify the technique that DELTA PLUS VIRTUAL TERMINAL should use to create node names from logon models.

*Note*

These node names should never exist in the VTAM network.

The model names specified in the IMSID options for 3270 terminals must not be inadvertently or specifically changed by executing a DELTA List. The mask name used for adding terminals must not resolve to a terminal used as a model.

1. **Use the following defaults:**
   - **Default SLU2 logon model node name**
     
     The name of a terminal present in the IMS Stage-1 system definition which DELTA PLUS VIRTUAL TERMINAL can use as a model control block for SLUTYPE2 devices. If there are no SLUTYPE2 devices in your network that will be used as virtual terminals, type **NONE**.

   - **Default 3270 logon model node name**
     
     The name of a terminal present in the IMS Stage-1 system definition which DELTA PLUS VIRTUAL TERMINAL can use as a model control block for VTAM 3270 devices. If there are no VTAM 3270 devices in your network that will be used as virtual terminals, type **NONE**.

   - **Default SLU1 logon model node name**
     
     The name of a terminal present in the IMS Stage-1 system definition which DELTA PLUS VIRTUAL TERMINAL can use as a model control block for SLUTYPE1 devices. If there are no SLUTYPE1 devices in your network that will be used as virtual terminals, leave this field blank.

   - **Default SLUP logon model node name**
     
     The name of a terminal present in the IMS Stage-1 system definition which DELTA PLUS VIRTUAL TERMINAL can use as a model control block for SLUTYPEP devices. If there are no SLUTYPEP devices in your network that will be used as virtual terminals, leave this field blank.

2. **Translate the VTAM Terminal type/screen size to a model name.**

   Uses the TSS table specified in the **Bind to logon model TSS table name** field to translate the VTAM terminal type and screen size into a logon model node name. The VTAM terminal type and screen size information is combined into a six-character symbolic table name in the form **ttttpp** where **tttt** is **SLU1**, **SLU2**, **SLUP** or **3270**, **p** is the primary screen size (0-5),
and \( a \) is the alternate screen size (0-5). The suggested name for this table is LMODEL.

3 **Call the customer-modified logon exit.**

Calls the customer modified Logon Exit routine in module VTFEXIT\( n \). This routine provides the name of the logon model. Unless you have hard-coded the table name in the exit, this exit will use the TSS table name specified in Virtual Terminal Logon Option 2.

### Selecting a Virtual Terminal Signon Bypass Technique

To access the Virtual Terminal Signon Bypass panel, shown in the following figure, type 7 in the selection field on the IMSID Options panel or page down from the previous panel.

For more information, see “Signon Bypass Exit Sample Routine” on page 134.

**Figure 7: Virtual Terminal Signon Bypass Panel**

<table>
<thead>
<tr>
<th>Command</th>
<th>DELTA IMS VT - IMSID Basic Options</th>
<th>Scroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a technique for obtaining an LTERM when user signon is NOT required.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Signon-Bypass Option**

1. Use the node name as the LTERM name
2. Translate the node name into an LTERM name.
   - Node to LTERM TSS table name . . . . . . NLTERM__
   - LTERM timer override TSS table name . . . . LTERMOR_
3. Call customer-modified signon-bypass exit

Use the SAVE command to save options.

The following fields are available on this panel:

**IMSID**

If you overtype the IMSID with the name of an existing IMSID, any changes made to the original options are saved and the new IMSID options are loaded for update. If the new IMSID does not exist, the new set of options are copied from the original IMSID options.

**Signon-Bypass option**

This option provides three LTERM name selection methods for virtual terminals that are not required to perform an IMS signon.
If some users are required to sign on and others are not, enter the following information into the signon bypass TSS table for each user not required to sign on:

- The node name
- The associated LTERM

The remainder of the nodes will fail the table search and will be required to sign on.

Select one of the following options by typing its number in the selection field:

1. **Use the node name as the LTERM name**

2. **Translate the node name into an LTERM name**
   Use Translate Subsystem Services to translate the node name to an LTERM name. You can use the Translate Subsystem Services to translate the derived LTERM name into a virtual terminal Timer facility override value. This option uses the same logic as the Signon Bypass Exit sample routine distributed in exit VTFEXBX.
   - **Node to LTERM TSS table name** – Enter the name of the TSS table used to derive the LTERM name using the Signon Exit sample routine. A suggested table name is NLTERM.
   - **LTERM timer override TSS table name** – Enter the name of the TSS table used to derive a virtual terminal Timer facility override value. A suggested table name is LTERMOR.

3. **Call customer-modified signon-bypass exit**
   Calls the customer-modified signon-bypass exit sample routine in module VTFEXITn. This exit routine is responsible for providing LTERM name(s), and a virtual terminal Timer facility override value. For more information about the requirements for this exit, see “Signon Bypass Exit Sample Routine” on page 134.
   If you select this option and use the Signon Bypass Exit sample routine provided with DELTA PLUS VIRTUAL TERMINAL, you must also specify **Node to LTERM translation table name** and **LTERM timer override TSS table name** on the Virtual Terminal Signon panel for these features to work.
Note

This exit uses the TSS table names specified in Signon-Bypass Option 2 (Page 7 of 8) on the IMSID Basic Options panel unless you have hard-coded the table names in the exit.

If you select this option and have installed the Signon Bypass Exit sample routine provided with DELTA PLUS VIRTUAL TERMINAL, the Signon Bypass Exit routine will determine the LTERM name based on the userid or node name depending on the value you specified in the previous field.

Selecting a Virtual Terminal Signon Technique

To access the Virtual Terminal Signon panel, shown in the following figure, type 8 in the selection field on the IMSID Options panel or page down from the previous panel.

Figure 8: Virtual Terminal Signon Panel

<table>
<thead>
<tr>
<th>I8</th>
<th>DELTA IMS VT - IMSID Basic Options</th>
<th>Page 8 of 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Terminal Signon</td>
<td>IMSID . . . GPF6</td>
<td>More: -</td>
</tr>
</tbody>
</table>

Select the techniques for obtaining an LTERM when signon is required.

Select a "key" to be used below...

1. Node name
2. Userid

Permanent LTERM Option (to be used after signon occurs)

0. Use the LTERM selected by the Signon-Bypass Option. (see previous page)
1. Use the Node name (or userid) as the LTERM name
2. Use the Node name (or userid) allow RACF "data" override *
3. Translate the Node name (or userid) into an LTERM name
   Node name (or userid) to LTERM TSS table: ULTERM_
   LTERM timer override TSS table name: .. LTERMOR_
4. Call customer-modified signon exit

* RACF "data" not available for this release of IMS (Ver. 910)

Command ===> ________________________________________________ Scroll ===> PAGE
F1=Help      F2=Split     F3=Exit      F7=Up        F8=Down      F9=Swap

The following fields are available on this panel:

IMSID

If you overtype the IMSID with the name of an existing IMSID, any changes made to the original options are saved and the new IMSID options are loaded for update. If the new IMSID does not exist, the new set of options are copied from the original IMSID options.

Select a "key" to be used below

Select one of the following options by typing its number in the selection field.
1 - **Node name** – Node name is used in the selection technique for permanent LTERMs.

2 - **Userid** – Userid is used instead of node name in the selection technique for permanent LTERMs.

**Permanent LTERM Option (to be used after signon occurs)**

Select one of the following options to be used in assigning the permanent LTERM name:

0 - **Use the LTERM selected prior to signon (see above).** The LTERM created using the Signon Bypass option or the Transient LTERM option, specified on the Update Virtual Terminal Signon Bypass panel, remains the permanent LTERM name. This option is for users that want to establish the LTERM name using the Signon Bypass option but that also have certain user groups that do sign on. For more information, see “Signon Bypass Exit Sample Routine” on page 134.

With this option, the AOI exit sees the response to the signon command. As far as DELTA IMS is concerned, this is essentially a NOP of virtual terminal signon processing logic in the sense that no action of any kind is taken. No LTERMs are assigned and no conversations are released.

**Note**

The following options each assign a permanent LTERM name on the basis of either the node name or the userid, depending on the selection made above.

1 - **Use the Node name (or userid) as the LTERM name.** – Sets up an LTERM equivalent to the node name or userid. No model override, timer override.

2 - **Use the Node name (or userid) allow RACF "data" override.** – No longer available for use.

3 - **Translate the Node name (or userid) into an LTERM name.** – Uses the TSS tables to translate the node name or userid into an LTERM name. The TSS tables are then used to translate the derived LTERM name into a virtual terminal Timer facility override value.

**Node name (or userid) to LTERM TSS table name** – Provides the name of the Translate Subsystem Services table used for determining the LTERM name. If the node name is used, a suggested table name is NLTERM. For more information, see “Signon Bypass Exit Sample Routine” on page 134.

If the userid is used, a suggested table name is ULTERM. For more information, see “Signon Exit Sample Routine 5 and TSS” on page 142.

**LTERM timer override TSS table name.** Provides the name of the TSS table used to derive a virtual terminal Timer facility override value. A
suggested table name is LTERMOR. Requirements for the table are discussed in “Signon Bypass Exit Sample Routine” on page 134.

- **4 - Call customer-modified signon exit** – Calls the customer modified Signon Exit sample routine in module VTFEXITn. This exit routine is responsible for providing LTERM name(s), as well as a virtual terminal Timer facility override value. For more information about the requirements for this exit, see “Signon Bypass Exit Sample Routine” on page 134.

If you select this option and use the Signon Exit sample routine provided with DELTA PLUS VIRTUAL TERMINAL, you must also specify **Node to LTERM translation table name** and **LTERM timer override TSS table name** on the Virtual Terminal Signon panel for these features to work.

---

**Note**

This exit uses the TSS table names specified in **Signon Option 2** on the IMSID Basic Options panel (Page 8 of 8) unless you have hard-coded the table names in the exit.

---

If you select this option and have installed any of the Signon Exit sample routines provided with DELTA PLUS VIRTUAL TERMINAL, the Signon Exit routines determine the LTERM name based on the userid or node name depending on the value you specified in the previous field.

### Saving IMSID Options

If you select the confirm option on the Customization panel, the Confirm IMSID Basic Options panel, shown in the following figure, is displayed after you make changes using the IMSID options. This panel lets you save the changes you just made, return to the previous panel without saving, or cancel the changes.
This panel will also appear after you view or update an options module created by any version of DELTA IMS prior to Version 5.x. Message BMC2107 will appear in the upper right corner of the panel. This message indicates that the options module has been upgraded for use under DELTA IMS Version 5.x. This will happen only once for each options module created under a prior version of DELTA IMS.

**Figure 9: Confirm IMSID Save**

IM                DELTA IMS VT - Confirm IMSID Basic Options Save

IMSID . . : IMSA

Select one of the following. Then press Enter.

_  1. Save changes and return to previous screen
_  2. Return to previous screen without saving changes
_  3. Exit without saving changes (CANCEL)

If 1 is selected, IMSID Basic Options will be saved to these libraries:
DELTA IMS options library  DLA.V5.LOAD________________________
Additional libraries . . . __________________________________________

Options will NOT be saved to APF-auth. lib: (none specified)
Options will NOT be saved to alt. APF lib: (none specified)

The END command has no effect on this panel.

The following field is available on this panel:

**Select one of the following. Then press Enter.**

- 1 – Save changes and return to previous panel
- 2 – Return to previous panel without saving changes
- 3 – Exit without saving changes (CANCEL)

**Updating IMSID Basic Options in the Control Region**

If you select option U on the IMSID Options panel to update the IMSID basic options in the IMS control region and select the confirm option on the Customization panel,
the Confirm IMSID Basic Options Update panel, shown in the following figure, is displayed. This panel lets you continue or cancel the IMSID basic options update.

**Figure 10: Confirm IMSID Basic Options Update**

![](image)

Select one of the following. Then press Enter.

- 1. Continue the IMSID Basic Options update.
- 2. Do not update the IMSID Basic Options.

If 1 is selected, IMSID Basic Options will first be saved (if changed). A request will then be sent to the online IMS control region to reload the IMSID Basic Options. Some changes will take effect immediately. Other changes (noted with ‘*’ on the update panels) will not take effect until the IMS control region is restarted.

The END command has no effect on this panel.

The following field is available on this panel:

Select one of the following. Then press Enter.

- **1** – Continue the IMSID Basic Options update.
- **2** – Do not update the IMSID Basic Options.

**Confirming a CPU ID Refresh**

If you select option **R** to refresh CPU IDs on the IMSID Options panel and select the confirm option on the Customization panel, the Confirm CPU ID Refresh panel, shown in the following figure, is displayed.

This panel lets you continue or cancel the CPU ID refresh.
This only pertains to changing your options while IMS is up. If IMS is not up, the refresh process is not needed since changes will be picked up after the next restart.

**Figure 11: Confirm CPU ID Refresh**

<table>
<thead>
<tr>
<th>Command</th>
<th>DELTA IMS VT - Confirm CPU ID Refresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSID</td>
<td>IMSA</td>
</tr>
</tbody>
</table>

Select one of the following. Then press Enter.

1. Continue the CPU ID refresh.
2. Do not refresh the CPU ID.

Note: This option refreshes the CPU ID within the IMS control region.
The END command has no effect on this panel.

The following field is available on this panel:

Select one of the following. Then press Enter.

- 1 – Continue the CPU ID refresh.
- 2 – Do not refresh the CPU ID.

## Extended Options

DELTA PLUS VIRTUAL TERMINAL was designed and written to function consistently in every IMS system. Occasionally, a new feature is added that does not completely fit into the basic design of the product, but it is deemed worthwhile for customers who may have a specific need for that feature. These types of features are known as Extended Options.

These options are implemented by assembling a macro called $DLAXOPT in the DLASAMP library using DLACNTL member DLA#XOPT. In the assembly JCL, the feature you desire can be activated by specifying either YES or NO, whichever is appropriate. The macro $DLAXOPT is self-documenting.

---

**WARNING**

Extended Options are features that have been added to resolve a specific customer need. These options should not be used unless the results are fully understood. An IMS restart is required to implement or remove these options; they cannot be refreshed. In addition, the Extended Options macro ($DLAXOPT) contains some options that are intended for BMC use only. Using any of these restricted options at your site could have catastrophic results.
Call BMC Software Customer Support if you are unsure if these options will solve the problem you are trying to address.

Table 3 on page 46 shows the Extended Options that may be used. If you wish to use any of the other options, call BMC Software Customer Support before doing so.

**Table 3: Extended Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEQ</td>
<td>YES</td>
<td>Dequeues any undelivered message to a virtual terminal during signon bypass or signon processing, whichever can assign the LTERM that has the messages to the node being logged on.</td>
</tr>
<tr>
<td>EXIT</td>
<td>YES</td>
<td>EXITSs any active conversational transaction during signon bypass or signon processing, whichever can assign the LTERM that has the conversation transaction to the node being logged on.</td>
</tr>
<tr>
<td>CONVRCPF</td>
<td>YES</td>
<td>Use this option to bypass the RACF authorization check for conversations during the IMS signon process.</td>
</tr>
</tbody>
</table>
| OEM1      | YES       | Use this option if you are using a session manager and you wish to use the REAL VTAM node name for these terminals rather than the session manager pool node name. Prerequisites for using this option are

- The session manager product must place the real VTAM node name in the VTAM user data field when a terminal user logs on. Check with your local session manager support group or the session manager vendor to see if your product complies.
- The VTAM APPL for this IMS must have PARSESS = YES. |
| OEM1PRE   | xxxx      | Use this option if you use the OEM1 extended option and wish to limit it to a specific group of nodes. Use this option to specify the common prefix of the session manager pool node names. |
| S3649     | YES       | Use this option to use the DFS3649 replacement option for static nodes in addition to virtual terminals. |
| S3650     | YES       | Use this option to use the DFS3650 replacement option for static nodes in addition to virtual terminals. |
This chapter describes the Translate Subsystem Services (TSS) tables and how DELTA PLUS VIRTUAL TERMINAL can use TSS during the logon and/or signon of a virtual terminal.

Overview of TSS

TSS provides a flexible means for DELTA PLUS VIRTUAL TERMINAL sites to specify LTERM names, logon models, and other functions for virtual terminals. During the logon and/or signon of a virtual terminal or printer, DELTA PLUS VIRTUAL TERMINAL can use TSS to perform the following tasks:

- Determine the name of a virtual terminal logon model
- Specify an LTERM name, based either on the virtual terminal node or the userid
- Specify use of the alternate virtual terminal Timer facility value
- Specify custom virtual terminal, printer, or LTERM features that you define

Using TSS, DELTA PLUS VIRTUAL TERMINAL can dynamically define and configure IMS elements required for specific applications and user needs, eliminating the need for more IMSGENs.

TSS is a generalized table-lookup facility which is external to the application that invokes it. TSS searches TSS tables for user-specified information that DELTA PLUS VIRTUAL TERMINAL uses to create and configure IMS nodes and LTERMs. When a user or application requires a virtual LTERM, terminal, or printer, the product reads the appropriate TSS table. If TSS finds the requested value in a TSS table, DELTA PLUS VIRTUAL TERMINAL creates and configures the element according to the definition in the table. If TSS does not find a definition of the requested element, the product issues a return code of 4 to indicate that the IMS element is not among those your site has defined.
Structure of TSS Tables

TSS tables are contained in a TSS data set, and have a two-column format: the first column contains an argument value, and the second column contains a function or result value. When DELTA PLUS VIRTUAL TERMINAL queries the TSS tables, it searches for the argument; if the argument is found, DELTA PLUS VIRTUAL TERMINAL returns the corresponding result.

You can set the length of the argument and function/result columns between 1 and 256 bytes. While the number and length of the columns is fixed, you can have as many rows as necessary.

Although each TSS table row contains only one argument and one function, you can create multiple logical functions by including subfields in the function/result. The design of a TSS table depends on the requirements of the application.

Updating TSS Tables

Using TSS commands, you define and maintain TSS tables through the ISPF interface provided with DELTA IMS, through batch routines, or through TSS commands that are issued at the TSO READY prompt and interpreted by the DLATSS TSO command processor.

For batch operation, the TSO command processor runs in a batch region. All of these methods are described in this chapter. See “TSS ISPF Interface” on page 52 for more information on updating TSS tables.

TSS Search Methods

DELTA PLUS VIRTUAL TERMINAL can search TSS tables in two ways: through a binary search, or through a sequential search. When you create a TSS table, you can specify which of these methods will be used during TSS processing.

The default method performs a binary search of the TSS data set to find the appropriate TSS table and the requested argument. This search method does not allow pattern masking. Optionally, DELTA IMS can perform a sequential search that allows pattern masking.

**WARNING**

If you have selected multiple LTERM support, a sequential search will be performed on an NLTERM (node to lterm) table only. It will have no effect on any other table. Wildcard masking *cannot* be performed when doing a sequential search.
This search method is less efficient than a binary search and should not be used unless absolutely needed.

Structure of the TSS Data Set

The TSS data set is a fixed-length BDAM data set, with an LRECL and BLKSIZE which are equal. There is no required LRECL or BLKSIZE; however, a minimum of 4096 is suggested. TSS uses the relative block number to chain its blocks together.

Note

The LRECL and BLKSIZE of the TSS data set are forced to a value of 4096 by the TSS ISPF interface. If this is not acceptable at your site, you may allocate the TSS data set with a different LRECL and BLKSIZE.

The TSS data set is accessed by TSS subroutines which are resident in the IMS address space. Because the subroutine is present in the IMS address space, no inter-region communication is required. Only one TSS data set can be used within any IMS control region at a time.

DELTA PLUS VIRTUAL TERMINAL provides no security or automatic backup for the TSS data set, although the Translate Tables panel in the DELTA PLUS VIRTUAL TERMINAL ISPF interface provides a utility you can use to back up the TSS data set. You should ensure that the TSS data set is protected from unauthorized updating and is regularly backed up.

TSS Data Set Records

There are three types of records in a TSS data set:

- **Control records** describe the TSS tables present in the data set. All table definitions must fit in a single control record. Each table definition is 96 bytes.

- **Index records** are used to locate table records with as little I/O as possible. Each index record is itself a mini-table with an argument value representing the highest argument in each individual table block. The corresponding function is the relative block number of the table record. There can be more than one index record per table.

- **Table records** contain the argument-function pairs. Entries are added to a table record until the record becomes full. When a record is full, the next time an entry is added to the table, the table is split in half before the ADD is performed. When a table record is split, a new entry is added to the index record representing the highest entry in the new table record.
Note
Do not perform data compression on any of the TSS data set records.

Updating TSS Data Sets

Consider the following when creating and updating TSS data sets.

Using Wildcard Characters for Searches and Updates

If you specify the wildcard masking option when you create a TSS table, you can use asterisks (*) as wildcard characters when searching for TSS table names, arguments, and functions. When one of these values contains a wildcard, it is considered to be a pattern. The wildcard character can be in the leading, middle, or trailing positions. When in the trailing position, the character will pad to the maximum length of the value, but leading and middle positions must have an * for each character considered to be wild.

When a wildcard character is specified in a pattern type operand of a TSS command, all character values found in the TSS data set are considered to match the wildcard character’s position in the pattern. You can use pattern type operands only in certain situations. See the individual descriptions of the TSS commands for more details.

Note
Using a multiple lterm per node TSS table for signon or signon bypass requires a special TSS translation which precludes the use of pattern masking in these tables.

Establishing Shared Access to TSS Data Sets

You can establish shared access to a TSS data set as follows:

■ Using the Disposition field on panels in the ISPF interface
■ Using the MVS macros ENQ and DEQ
■ Using the OLD or SHR parameters of the DLATSS TSO command
■ Using the OLD or SHR parameters of the DLATSS JCL command statement
Keep in mind the following considerations when updating TSS data sets using the ISPF interface, the DLATSS command from a TSO READY prompt, and the DLATSS command statement in JCL.

When attempting to access an existing data set, the disposition of a TSS data set depends entirely on the disposition that was assigned to the data set when it was allocated. When you allocate a TSS data set, the default disposition is SHR.

**Note**

If you attempt to update an existing TSS data set, the OLD and SHR keywords on the DLATSS command or command statement and the Disposition field on the ISPF panels are ignored, since the data set has already been allocated and a disposition has already been specified.

If you allocate a TSS data set with a disposition of OLD, MVS assigns the data set exclusively to one user. In this case, updates from this one user are always allowed and TSS does not perform special enqueues. The update mode keywords EXCL, SHR, and NONE are ignored.

If you use a disposition of SHR, TSS responds to the update mode keywords EXCL, SHR, and NONE. To protect the data set from simultaneous updates from other users, TSS issues a systems-level enqueue on the data set.

**TSS Enqueues**

TSS uses a *long-term* and a *short-term* enqueue, as necessary.

- The *long-term* enqueue allows several users to update the TSS data set in shared mode, or one user to update the data set exclusively.

- The *short-term* enqueue is issued by TSS to prevent possible concurrent updating during logical operations such as TSS ADD, DEFINE, LOAD, or UNLOAD. The short-term enqueue is released when the logical operation is completed, and should only be held for a fraction of a second each time.

The update mode keywords EXCL, SHR, and NONE on the DLATSS command or command statement determine how the enqueues are used. SHR is the default.

- EXCL permits one user to update the data set exclusively. Other users may use update mode NONE, but they may not use SHR or EXCL. TSS obtains an exclusive long-term enqueue when EXCL is used. No short-term enqueues are obtained.

- SHR allows multiple users to update the data set concurrently. TSS obtains a shared long-term enqueue when SHR is used, and exclusive short-term enqueues are obtained as needed.
- NONE does not permit updates. TSS tables can be examined but not changed. No enqueues are obtained.

### Preventing TSS Table Damage

TSS uses the qname SPFEDIT, which is the same qname used by ISPF. Normally, this name will already be defined to Global Resource Serialization (GRS) or its equivalent for propagation to multiple CPUs. If updates from multiple CPUs are expected, ensure that SPFEDIT is defined.

### Repairing TSS Table Damage

In the absence of GRS or its equivalent, concurrent updates from multiple CPUs can occur and will cause unpredictable results. When a TSS table is damaged by concurrent updates or another malfunction, you can attempt to repair the damage in two ways: using the LOAD function, or using GRS or its equivalent.

For instructions on using the LOAD function, see “Load a TSS Table” on page 69.

To repair the damage, unload the table, allocate a data set named TSSERROR with LRECL=80, RECFM=FB, then load the table. Any duplicate or out-of-sequence table entries are written to the TSSERROR file for examination. You can then use this data set with the batch READ command to reload the table with any valid entries.

### TSS ISPF Interface

The TSS ISPF interface allows you to use TSS commands online to create and maintain TSS tables. This section describes the TSS translate tables option.

For convenience, you can access this option in either of the following ways:
Type 8 on the DELTA IMS Primary Menu:

Figure 12: DELTA IMS Primary Menu

<table>
<thead>
<tr>
<th>PM</th>
<th>DELTA IMS VT - Primary Menu</th>
<th>Product Level: V6.0.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome to DELTA IMS. Select one of the following. Then press Enter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Edit a DELTA List</td>
<td>(ES/ED)</td>
<td></td>
</tr>
<tr>
<td>2. Check a DELTA List</td>
<td>(CS/CH)</td>
<td></td>
</tr>
<tr>
<td>3. Execute a DELTA List</td>
<td>(XS/EX)</td>
<td></td>
</tr>
<tr>
<td>4. IMS commands operator interface</td>
<td>(CM)</td>
<td></td>
</tr>
<tr>
<td>5. Customize globals, options, profiles, etc.</td>
<td>(CU)</td>
<td></td>
</tr>
<tr>
<td>6. Utility functions</td>
<td>(UT)</td>
<td></td>
</tr>
<tr>
<td>7. Statistics for Virtual Terminal</td>
<td>(VT)</td>
<td></td>
</tr>
<tr>
<td>8. TSS translation tables</td>
<td>(TR)</td>
<td></td>
</tr>
<tr>
<td>I. Interface preferences</td>
<td>(VI)</td>
<td></td>
</tr>
</tbody>
</table>

For options 1, 2, or 3:

DELTA IMS PDS . . . . DLA.V5.DELTAPDS_____________________________
DELTA List name . . . ________ Member name (blank for list of members)

(*) DELTA IMS is a registered trademark of BMC Software, Inc.
Copyright (c) 1984-1995 BMC Software, Inc. as an unpublished licensed work.
All rights reserved.
Copyright (c) 1987-1995 AT&T. All rights reserved.

Type 5 on the DELTA IMSS Primary Menu and then 6 on the Customization panel:

Figure 13: DELTA IMS Customization Panel

<table>
<thead>
<tr>
<th>CU</th>
<th>DELTA IMS VT - Customization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ===&gt; _________________________________________________________________</td>
<td></td>
</tr>
<tr>
<td>Select one of the following. Then press Enter.</td>
<td></td>
</tr>
<tr>
<td>1. Global options</td>
<td>(GL)</td>
</tr>
<tr>
<td>2. IMSID options for IMSID . . KJS1</td>
<td>(IM)</td>
</tr>
<tr>
<td>3. Add user access profiles</td>
<td>(UA)</td>
</tr>
<tr>
<td>4. Update user access profiles</td>
<td>(UR)</td>
</tr>
<tr>
<td>5. Keywords for DELTA List edit</td>
<td>(KY)</td>
</tr>
<tr>
<td>6. TSS translation tables</td>
<td>(TR)</td>
</tr>
<tr>
<td>DELTA IMS options library BMC.DLA.LOAD________________________________</td>
<td></td>
</tr>
<tr>
<td>Save confirmation . . . 2 1. Save/update changes without prompting.</td>
<td></td>
</tr>
<tr>
<td>2. Prompt for confirmation before saving/updating.</td>
<td></td>
</tr>
</tbody>
</table>

TSS Tables Online

The DELTA IMS ISPF interface enables you to allocate and maintain TSS data sets, including backup data sets.

It enables you to define, edit, test, and reorganize TSS tables online. The Translate Tables panel, shown in the following figure, is displayed after selecting option 8 on
the DELTA IMS Primary Menu or after selecting option 6 on the Customization panel.

**Figure 14: Translate Tables Panel**

<table>
<thead>
<tr>
<th>TR</th>
<th>DELTA IMS VT - Translate Tables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select one of the following. Then press Enter.</td>
</tr>
<tr>
<td>_</td>
<td>1. Edit a table</td>
</tr>
<tr>
<td>2.</td>
<td>Browse a table</td>
</tr>
<tr>
<td>3.</td>
<td>Test a table</td>
</tr>
<tr>
<td>4.</td>
<td>Search and modify</td>
</tr>
<tr>
<td>5.</td>
<td>Define a table</td>
</tr>
<tr>
<td>6.</td>
<td>Remove a table</td>
</tr>
<tr>
<td>7.</td>
<td>Unload a table</td>
</tr>
</tbody>
</table>

TSS table library . . RIHMJD.DELTA.TSS____________________________
Disposition . . . . . SHR       (SHR or OLD)
Table name . . . . . ________  (blank for table selection list)

The following fields are available on this panel:

Select one of the following. Then press Enter.

- **1. Edit a table** – Enables you to edit an existing TSS table. This includes adding new entries and deleting or changing entries.
- **2. Browse a table** – Enables you to browse an existing TSS table.
- **3. Test a table** – Enables you to test a TSS table by specifying an argument and checking the function returned.
- **4. Search and modify** – Enables you to exclude or include records in a TSS table, making editing easier. This option also allows you to add new table entries and change or delete table entries.
- **5. Define a table** – Enables you to define a new TSS table.
- **6. Remove a table** – Enables you to remove a table from a TSS library.
- **7. Unload a table** – Enables you to unload existing TSS tables.
- **8. Load a table** – Enables you to load existing TSS tables.
- **9. Refresh tables** – Enables you to refresh existing TSS tables.
- **10. Format TSS library** – Enables you to define TSS tables in a library.
- **11. Backup TSS library** – Enables you to backup a TSS library by unloading all the tables in the TSS library.
- **12. Reorganize TSS library** – Enables you to reclaim unused space in a TSS library.
13. Status of TSS library – Enables you to determine the status on the amount of space remaining in a TSS library.

TSS table library

Specifies the data set name of the TSS data set you want to modify or test.

Disposition

Tells the DELTA IMS ISPF interface how the table library is allocated to your DELTA IMS session. The default is SHR, which allows other users to access the table library. To exclude all other access while performing updates, specify OLD.

Table name

Enables you to specify a table to be edited, tested, modified, or acted on by one of the table utilities. If this field is left blank, the Table Select panel is presented for options 1 (Table Edit), 2 (Table Test), and 3 (Table Modify). Option 4 (Table Utilities) does not allow selection from the Table Select panel, and option 5 (Library Utilities) does not require a table specification.

Select a TSS Table

The Table Select panel, shown in the following figure, is displayed whenever Translate Tables panel options Edit, Test, or Search/Modify are specified without naming a TSS table.

Figure 15: Table Select Panel

The following fields are available on this panel:
Command

To add a new table with this panel, type `ADD newname`, where `newname` is the name of the new table.

Act

Type one of the following action codes next to the appropriate table name(s), then press `Enter`. You can make multiple table selections at one time from this panel.

- S – Edit the table
- E – Edit the table
- B – Browse the table
- T – Test the table
- M – Modify the table

Table

The one- to eight-character TSS table name.

Arg lth

The length of the argument in the TSS table.

Fcn lth

The length of the function in the TSS table.

Free pct

The percentage of space (0-99) that should be left in each table block for future expansion during LOAD operations. The default is 0. You can change this value by overtyping it with another value.

Mask-match

A table defined with this option causes DELTA PLUS VIRTUAL TERMINAL to treat asterisks (*) in the TSS table as wildcard characters when the `NOSPEED` option is in effect. A table defined with no masking causes a speed search, but an * is not treated as a wildcard in the table. You can change this value by overtyping it with another value.

No. of Index blocks

The number of index records currently used by the corresponding table. Index records are discussed in “Structure of the TSS Data Set” on page 49.
No. of Table blocks

The number of table records currently used by the corresponding table. Table records are discussed in “Structure of the TSS Data Set” on page 49.

Title/Description

An optional description of the TSS table. You can change this value by over-typing it with another value.

With ISPF Version 2.3 or higher, double-byte character set (DBCS) capable terminals (such as the IBM 5550) may edit the Title/description field in mixed DBCS/SBCS mode. DBCS-capable terminals can display titles that contain both IBM Kanji double-byte characters and standard characters.

Edit a TSS Table

The Table Edit panel, shown in the following figure, is displayed after a TSS table name is typed in the Table name field and option 1 is selected on the Translate Tables panel.

With ISPF Version 2.3 or higher, double-byte character set (DBCS) capable terminals (such as the IBM 5550) may edit the Title field in mixed DBCS/SBCS mode. DBCS-capable terminals can display titles that contain both IBM Kanji double-byte characters and standard characters.

The TSS table LMODEL, a logon model table used by the Logon Exit sample routine, is used in all the example panels which reference tables so you can see the different ways you can display a table with the DELTA IMS ISPF interface. The complete LMODEL table is shown in Figure 16 on page 58. See this figure to compare the
result of the INCLUDE, EXCLUDE, REVISE, REVISEX, and RESET commands, which are discussed in the following sections.

**Figure 16: Table Edit Panel**

<table>
<thead>
<tr>
<th>TE</th>
<th>DELTA IMS VT - Table Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ===</td>
<td>__________________________</td>
</tr>
<tr>
<td>Scroll ===</td>
<td>PAGE</td>
</tr>
</tbody>
</table>

Table name: LMODEL  Title LOGON MODEL TABLE

Use the ADD, INCLUDE, EXCLUDE, REVISE, or RESET commands; or Type over the functional result field to modify/update a result; or Type one or more action codes. Then press Enter.

D=Delete

Row 000001 of 000010

<table>
<thead>
<tr>
<th>Act</th>
<th>Argument</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>_</td>
<td>SLU221</td>
<td>$SLU2001</td>
</tr>
<tr>
<td>_</td>
<td>SLU222</td>
<td>$SLU2002</td>
</tr>
<tr>
<td>_</td>
<td>SLU223</td>
<td>$SLU2003</td>
</tr>
<tr>
<td>_</td>
<td>SLU224</td>
<td>$SLU2004</td>
</tr>
<tr>
<td>_</td>
<td>SLU225</td>
<td>$SLU2005</td>
</tr>
<tr>
<td>_</td>
<td>327021</td>
<td>$3270001</td>
</tr>
<tr>
<td>_</td>
<td>327022</td>
<td>$3270002</td>
</tr>
<tr>
<td>_</td>
<td>327023</td>
<td>$3270003</td>
</tr>
<tr>
<td>_</td>
<td>327024</td>
<td>$3270004</td>
</tr>
<tr>
<td>_</td>
<td>327025</td>
<td>$3270005</td>
</tr>
</tbody>
</table>

******************************* BOTTOM OF DATA ********************************

**New TSS Table Entry**

To add a new entry to an existing table, type ADD on the Command line of the Table Edit panel and press Enter. The New Table Entry panel, shown in the following figure, is displayed. Type the desired argument and result values; press Enter after each entry. Each time you change the argument and press Enter, a new entry is added to the table.

**Figure 17: New Table Entry Panel**

<table>
<thead>
<tr>
<th>TN</th>
<th>DELTA IMS VT - New Table Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ===</td>
<td>______________________________</td>
</tr>
</tbody>
</table>

Table name: LMODEL

Use the "COPY argument" command to copy an existing entry as a model; or Type the desired argument and result values. Press Enter to add each new table entry. Use the END command return to the Table Edit display.

<table>
<thead>
<tr>
<th>Argument</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>--------</td>
<td>--------</td>
</tr>
</tbody>
</table>

**Confirm Deletions**

The Confirm Delete panel, shown in the following figure, is displayed when you type D in the Act field on the Table Edit panel. The Confirm Delete panel lets you select an option to delete or not delete the row from the selected table. The name and title of the selected table are shown at the top of the panel.
Explain Table Values

The Table Edit panel initially displays all the entries in a TSS table; however, you can use the EXCLUDE command to specify that certain table entries be excluded from the display. The Exclude Scan Values panel, shown in the following figure, is displayed by typing EXCLUDE on the Command line of the Table Edit panel and pressing Enter. From this panel, you can specify an argument pattern, a function pattern, and/or an argument range to exclude from the table display. You can use the wildcard character (*) when specifying argument and function patterns to exclude.

Figure 19: Exclude Scan Values Panel

In the LMODEL example, typing the argument pattern SLU2* and pressing Enter will produce the panel shown in Figure 20 on page 60.
Notice that all arguments beginning with SLU2 have been excluded from the initial table display that was shown in “Edit a TSS Table” on page 57.

**Figure 20: Table Edit Panel after Excluding Arguments**

<table>
<thead>
<tr>
<th>Command ===&gt;</th>
<th>DELTA IMS VT - Table Edit</th>
<th>Scroll ===&gt; PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table name:</td>
<td>LMODEL</td>
<td>Title LOGON MODEL TABLE __________________</td>
</tr>
</tbody>
</table>

Use the ADD, INCLUDE, EXCLUDE, REVISE, or RESET commands; or
Type over the functional result field to modify/update a result; or
Type one or more action codes. Then press Enter.
D=Delete

---

Row 000001 of 000010

<table>
<thead>
<tr>
<th>Act</th>
<th>Argument</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>327021</td>
<td>$3270001</td>
</tr>
<tr>
<td>-</td>
<td>327022</td>
<td>$3270002</td>
</tr>
<tr>
<td>-</td>
<td>327023</td>
<td>$3270003</td>
</tr>
<tr>
<td>-</td>
<td>327024</td>
<td>$3270004</td>
</tr>
<tr>
<td>-</td>
<td>327025</td>
<td>$3270005</td>
</tr>
</tbody>
</table>

*** Bottom of Data ***

To redisplay the entire table, type RESET on the Command line and press Enter.

**Include Previously Excluded Table Values**

The Table Edit panel initially displays all the entries in a TSS table; however, after an exclude you can use the INCLUDE command to specify that certain excluded table entries be displayed again. The INCLUDE command causes the Include Scan Values panel to display, from which you can specify an argument pattern, function pattern, and/or argument range to limit the table display. You can use the wildcard character (*) when specifying argument and function patterns to include.

Assuming that all rows of the example TSS table were previously excluded, typing an argument range of SLU222 - SLU224 (Figure 22 on page 61), and pressing Enter will display arguments beginning with SLU2, as shown in Figure 21 on page 60.

**Figure 21: Include Scan Values Panel**

<table>
<thead>
<tr>
<th>Command ===&gt;</th>
<th>DELTA IMS VT - Include Scan Values</th>
<th>Scroll ===&gt; PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table name:</td>
<td>LMODEL</td>
<td>Title LOGON MODEL TABLE __________________</td>
</tr>
</tbody>
</table>

Type the search criteria as needed to include previously excluded rows in the next display of the current translation table.
Use an asterisk (*) in either of the patterns as a DON'T-CARE character.

Patterns

<table>
<thead>
<tr>
<th>Argument</th>
<th>Functional result</th>
</tr>
</thead>
</table>

Argument range

<table>
<thead>
<tr>
<th>Begin value</th>
<th>End value</th>
</tr>
</thead>
<tbody>
<tr>
<td>slu222</td>
<td>slu224</td>
</tr>
</tbody>
</table>
The INCLUDE command includes only previously excluded argument/function pairs. If you attempt an include from a TSS table which has no excluded entries, nothing happens.

Figure 22 on page 61 shows that the previously excluded argument/result pairs beginning with SLU2.

Figure 22: Table Edit Panel Showing Included Table Values

<table>
<thead>
<tr>
<th>TE</th>
<th>DELTA IMS VT - Table Edit</th>
<th>Scroll</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ===&gt; ____________________________</td>
<td>Scroll ===&gt; PAGE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table name: LMODEL Title LOGON MODEL TABLE

Use the ADD, INCLUDE, EXCLUDE, REVISE, or RESET commands; or Type over the functional result field to modify/update a result; or Type one or more action codes. Then press Enter.

D=Delete

Row 000002 of 000010

More: -

<table>
<thead>
<tr>
<th>Act Argument Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLU222 $SLU2002</td>
</tr>
<tr>
<td>SLU223 $SLU2003</td>
</tr>
<tr>
<td>SLU224 $SLU2004</td>
</tr>
<tr>
<td>327021 $3270001</td>
</tr>
<tr>
<td>327022 $3270002</td>
</tr>
<tr>
<td>327023 $3270003</td>
</tr>
<tr>
<td>327024 $3270004</td>
</tr>
<tr>
<td>327025 $3270005</td>
</tr>
</tbody>
</table>

******************************* BOTTOM OF DATA ********************************

To redisplay the entire table, type RESET on the **Command** line and press **Enter**.

**EXCLUDE and INCLUDE Together**

You can use the Exclude Scan Values panel and the Include Scan Values panel together for maximum flexibility in displaying the entries in a TSS table. You may exclude part of a table, and then include some of the previously-excluded table entries. The following additional example shows how to use the EXCLUDE and INCLUDE commands together:

Beginning with a complete display of the example table LMODEL, you can exclude all entries beginning with 3270 using an argument pattern **3270*** typed on the Exclude Scan Values panel.

The following output is the result:

<table>
<thead>
<tr>
<th>s Argument Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLU221 $SLU2000</td>
</tr>
<tr>
<td>SLU221 $SLU2001</td>
</tr>
<tr>
<td>SLU222 $SLU2002</td>
</tr>
<tr>
<td>SLU223 $SLU2003</td>
</tr>
<tr>
<td>SLU224 $SLU2004</td>
</tr>
<tr>
<td>SLU225 $SLU2005</td>
</tr>
</tbody>
</table>
To include some of the previously-excluded values, request that all arguments ending in 3 be displayed using an argument pattern of *****3 on the Include Scan Values panel.

The following output is the result:

<table>
<thead>
<tr>
<th>s</th>
<th>Argument</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLU221</td>
<td>$SLU2000</td>
<td></td>
</tr>
<tr>
<td>SLU221</td>
<td>$SLU2001</td>
<td></td>
</tr>
<tr>
<td>SLU222</td>
<td>$SLU2002</td>
<td></td>
</tr>
<tr>
<td>SLU223</td>
<td>$SLU2003</td>
<td></td>
</tr>
<tr>
<td>SLU224</td>
<td>$SLU2004</td>
<td></td>
</tr>
<tr>
<td>SLU225</td>
<td>$SLU2005</td>
<td></td>
</tr>
<tr>
<td>327023</td>
<td>$3270003</td>
<td></td>
</tr>
</tbody>
</table>

You can perform EXCLUDE and INCLUDE operations as many times as necessary to arrive at the table you want. Once you have successfully limited your table according to your requirements, you can then modify all included or excluded functions, using the REVISE and REVISEX commands, as described in the following pages.

**Revise Included Rows**

If you need to revise several functional result values in a TSS table, type REVISE on the **Command** line of the Table Edit panel. This displays the Revise Included Rows panel, shown in the following figure. From this panel you can specify a new function pattern to overlay the displayed (included) functions in your table. You can use wildcard characters (*) to specify which parts of the functions pass through REVISE unchanged.

**Figure 23: Revise Included Rows Panel**

If the display of the example table LMODEL has been limited to include those arguments beginning with SLU2, and then REVISE is performed with the function pattern incl****, all included functions in table LMODEL are prefaced with INCL.
If you use the RESET command after returning to the Table Edit panel, the example table appears as shown in Figure 24 on page 63. All previously excluded rows are again displayed, as are the rows that you have changed.

**Figure 24: Table Edit Panel Showing Updated Table Values**

```
Command ===> _______________________________________________ Scroll ===> PAGE
Table name: LMODEL                     Title LOGON MODEL TABLE
Use the ADD, INCLUDE, EXCLUDE, REVISE, or RESET commands; or
Type over the functional result field to modify/update a result; or
Type one or more action codes. Then press Enter.
D=Delete

Row 000002 of 000010  More: -
Act Argument  Result
-  --------  --------
_  SLU222    INCL2002
_  SLU223    INCL2003
_  SLU224    INCL2004
_  SLU225    INCL2005
_  327021    $3270001
_  327022    $3270002
_  327023    $3270003
_  327024    $3270004
_  327025    $3270005
```

```
******************************* BOTTOM OF DATA ********************************
```

**Revise Excluded Rows**

If you need to revise several functional result values in a TSS table, type REVISEX on the command line of Table Edit panel and press Enter. This displays the Revise Excluded Rows panel, shown in the following figure. From this panel you can specify a new function pattern to overlay the non-displayed (excluded) functions in your table. You can use wildcard characters (*) to specify which parts of the functions pass through REVISEX unchanged.

**Figure 25: Revise Excluded Rows Panel**

```
Command ===> __________________________________________________________________
Table name: LMODEL                    Title LOGON MODEL TABLE
Type (and verify) the functional result pattern to be used to
GLOBALLY replace ALL currently excluded rows of the table:
Functional result __________
Use an asterisk (*) in the pattern to indicate the column positions in the
new result value which are to be filled-in from the same column positions
in the old result value. As an example:

old-value     pattern     new-value
----------     --------     ----------
NODE0123  ---> LTRM****  ---> LTRM0123

Press Enter to GLOBALLY REVISE the table.
Use the END command to cancel the revise.
```

If the display of the example table LMODEL has been limited to exclude those arguments beginning with 3270 and then a REVISEX is performed with the function
pattern excl***, all excluded functions in table LMODEL are prefaced with EXCL as shown in Figure 26 on page 64. If a RESET is performed after returning to the Table Edit panel, the example table appears as shown below.

**Figure 26: Table Edit Panel Showing Reset Values**

```
Table name: LMODEL                             Title LOGON MODEL TABLE
Use the ADD, INCLUDE, EXCLUDE, REVISE, or RESET commands; or
Type over the functional result field to modify/update a result; or
Type one or more action codes. Then press Enter.
D=Delete

Row 000002 of 000010
More: -
```

You can perform further table ADD, INCLUDE, EXCLUDE, REVISE, REVISEX, or RESET commands by typing the desired command on the **Command** line.

**Browse a TSS Table**

The Table Browse panel is displayed after a TSS table name is typed in the **Table name** field and option 2 is selected on the Translate Tables panel.

With ISPF Version 2.3 or higher, double-byte character set (DBCS) capable terminals (such as the IBM 5550) may edit the **Title** field in mixed DBCS/SBCS mode. DBCS-capable terminals can display titles that contain both IBM Kanji double-byte characters and standard characters.

The TSS table LMODEL, a logon model table used by the Logon Exit sample routine, is used in all the example panels which reference tables so you can see the different
ways you can display a table with the DELTA IMS ISPF interface. The complete LMODEL table is shown in the following figure:

**Figure 27: Table Browse Panel**

<table>
<thead>
<tr>
<th>TB Command  </th>
<th>DELTA IMS VT - Table Browse  </th>
<th>Scroll  </th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table name:</td>
<td>LMODEL</td>
<td>Title: LOGON MODEL TABLE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Act</th>
<th>Argument</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLU221</td>
<td>$SLU2001</td>
<td></td>
</tr>
<tr>
<td>SLU222</td>
<td>$SLU2002</td>
<td></td>
</tr>
<tr>
<td>SLU223</td>
<td>$SLU2003</td>
<td></td>
</tr>
<tr>
<td>SLU224</td>
<td>$SLU2004</td>
<td></td>
</tr>
<tr>
<td>SLU225</td>
<td>$SLU2005</td>
<td></td>
</tr>
<tr>
<td>327021</td>
<td>$3270001</td>
<td></td>
</tr>
<tr>
<td>327022</td>
<td>$3270002</td>
<td></td>
</tr>
<tr>
<td>327023</td>
<td>$3270003</td>
<td></td>
</tr>
<tr>
<td>327024</td>
<td>$3270004</td>
<td></td>
</tr>
<tr>
<td>327025</td>
<td>$3270005</td>
<td></td>
</tr>
</tbody>
</table>

*-------------------- BOTTOM OF DATA ***********************

**TSS Table Test**

You can test your TSS tables by specifying a table and typing 3 on the Translate Tables panel. This displays the Table Test panel, shown in the following figure. A test translate has been performed with the example LMODEL table, for argument 327024, and has returned the result shown.

**Figure 28: Table Test Panel**

<table>
<thead>
<tr>
<th>TT Command  </th>
<th>DELTA IMS VT - Table Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table name:</td>
<td>LMODEL</td>
</tr>
<tr>
<td>Title: LOGON MODEL TABLE</td>
<td></td>
</tr>
<tr>
<td>Type an input argument value and press Enter to display the translated functional result value (using the above table).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Argument</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>327024</td>
<td>EXCL0004</td>
</tr>
</tbody>
</table>

**TSS Table Search and Modify**

DELTA PLUS VIRTUAL TERMINAL offers an alternate table editing method, Table Modify, which initially limits a TSS table display to a specified argument/function pattern and/or argument range. Type 4 on the Translate Tables panel. The Table Search panel, shown in the following figure, is displayed. In this example, the display of the LMODEL table is limited to only those functions ending in 2.
The wildcard character (*) does not automatically pad the leading positions.

**Figure 29: Table Search Panel**

![Table Search Panel]

Type the search criteria as needed to find rows which match. All values must match for the row to be considered a match. Use an asterisk (*) in either of the patterns as a DON’T-CARE character.

**Modify a TSS Table**

The Table Modify panel is displayed after specifications have been made on the Table Search panel. The example Table Modify panel shown below resulted from a Table Search panel specification for the example LMODEL table limited to those functions ending in 2, with the function pattern ******2.

With ISPF Version 2.3 or higher, double-byte character set (DBCS) capable terminals (such as the IBM 5550) can edit the Title field in mixed DBCS/SBCS mode. DBCS-capable terminals can display titles that contain both IBM Kanji double-byte characters and standard characters.

**Figure 30: Table Modify Panel**

![Table Modify Panel]

After the Table Modify panel is displayed, you can perform further table ADD, INCLUDE, EXCLUDE, REVISE, REVISEX, or RESET commands by typing the desired command on the **Command** line. These commands function the same as they would if they were issued from the Table Edit panel.
Define a TSS Table

The Define Table panel, shown in the following figure, is displayed by typing 5 on the Translate Tables panel and pressing Enter. This panel enables you to define a new TSS table. The Define Table panel can also be accessed by typing ADD on the Command line of the Table Select panel.

With ISPF Version 2.3 or higher, double-byte character set (DBCS) capable terminals (such as the IBM 5550) can edit the Table title field in mixed DBCS/SBCS mode. DBCS-capable terminals can display titles that contain both IBM Kanji double-byte characters and standard characters.

Figure 31: Define Table Panel

DT                         DELTA IMS VT - Define Table
Command ===> _________________________________________________________________

Type table definition parameters. Then press Enter to define the table.

Table name . . . . . . . . LMODEL__
Table title . . . . . . . . ________________________________
Input argument length . . 8__ (1 to 256)
Functional result length . 8__ (1 to 256)
Default free-space . . . . 0_ % (1 to 99 percent)
Table translation exit . . ________ (load module name)

Search/masking option . . 1 1. Hi-speed binary search (no masking allowed)
                        2. Sequential search with pattern masking

Use the "COPY table" command to use an existing table definition as a model.

Specify the argument and function lengths of a new TSS table, a free-space percent value (that amount of the table which will be added to the initial table allocation for future table expansion), and whether patterned searches are allowed in the table. After you complete specifications for a new table, press Enter to create the table.

Patterned table searches require a longer time to execute because the high-speed TSS binary search algorithm cannot be used.

A table defined with the Sequential search with pattern masking option causes DELTA PLUS VIRTUAL TERMINAL to treat asterisks (*) in the TSS table as wildcard characters during searches. A table defined with the Hi-speed binary search option causes a DELTA PLUS VIRTUAL TERMINAL to perform a speed search using the high-speed search algorithm. When a speed search is performed, asterisks are not treated as a wildcard character in the table.

Note
Using a multiple LTERM per node TSS table for signon or signon bypass requires a special TSS translation which precludes the use of pattern masking in these tables.
Remove a TSS Table

The Remove Table panel, shown in the following figure, is displayed by typing 6 on the Translate Tables panel and pressing Enter. The Remove Table panel displays a list of all the tables in your TSS library. Select a table for removal by typing D in the Act field to the left of the table name. The example Remove Table panel below shows the table LMODEL selected for deletion.

Figure 32: Remove Table Panel

![Remove Table Panel]

<table>
<thead>
<tr>
<th>RT</th>
<th>DELTA IMS VT - Remove Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ===&gt; ____________________ Scroll ===&gt; PAGE</td>
<td></td>
</tr>
<tr>
<td>Type one or more action codes. Then press Enter.</td>
<td></td>
</tr>
<tr>
<td>D=Delete</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Act. Table</th>
<th>lth</th>
<th>lth</th>
<th>pct match</th>
<th>Index / Table</th>
<th>Title / description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>DGW</em></td>
<td>8</td>
<td>8</td>
<td>0%</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td><em>FREE</em></td>
<td>8</td>
<td>8</td>
<td>14%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>LMODEL</em></td>
<td>8</td>
<td>8</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>LONG</em></td>
<td>250</td>
<td>250</td>
<td>0%</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td><em>LONGNEW</em></td>
<td>250</td>
<td>250</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>LTERMOR</em></td>
<td>8</td>
<td>1</td>
<td>0%</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td><em>NLTERM</em></td>
<td>8</td>
<td>8</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>TYPE0404</em></td>
<td>4</td>
<td>4</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>TYPE0440</em></td>
<td>4</td>
<td>40</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>TYPE0480</em></td>
<td>4</td>
<td>80</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>TYPE1010</em></td>
<td>10</td>
<td>10</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>TYPE4050</em></td>
<td>40</td>
<td>50</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
<tr>
<td><em>TYPE4080</em></td>
<td>40</td>
<td>80</td>
<td>0%</td>
<td>N</td>
<td>1</td>
</tr>
</tbody>
</table>

Confirm a Removed TSS Table

The Confirm Remove panel, shown in the following figure, is displayed when you specify a table to delete on the Remove Table panel. This panel lets you select an option to delete or not delete the table.

Figure 33: Confirm Remove Panel

![Confirm Remove Panel]

<table>
<thead>
<tr>
<th>RC</th>
<th>DELTA IMS VT - Confirm Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ===&gt; ____________________</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following. Then press Enter.

1. Remove (delete) the table
2. Do not remove the table

<table>
<thead>
<tr>
<th>Table</th>
<th>Arg Fcn Free Mask- No. of blocks</th>
<th>Title / description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>LMODEL</em></td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
Unload a TSS Table

The Unload Tables panel, shown in the following figure, is displayed by typing 7 on the Translate Tables panel and pressing Enter. This panel is useful for copying and moving TSS tables, and for reallocating TSS libraries.

To copy a TSS table or tables from one TSS library to another, unload the table or tables from the old library, load the table or tables to the new library, then reload the table or tables to the original library.

To reallocate a TSS library, unload all TSS tables from the library, reallocate the library with more storage space, and then load all TSS tables back into the TSS library. You can unload up to 9999 blocks at one time.

![Figure 34: Unload Tables Panel](image)

In either case, the Unload Tables panel performs the unload. In addition to performing the unload, you can allocate an unload data set from the Unload Table panel. Follow the prompts provided by the panel.

To unload all tables, enter a wildcard character (*) in the Table name or mask field. You can unload a specific table or a table pattern. For example, if the Unload Tables panel has a specification of *LTERM, then all tables with six-character names whose last five characters are LTERM are unloaded.

Load a TSS Table

The Load Tables panel, shown in the following figure, is displayed by typing 8 on the Translate Tables panel and pressing Enter. To load a TSS table into a TSS library, type the name and volume serial of the unload data set that contains the TSS table in the appropriate fields, and type the TSS table name or pattern in the Tables to be loaded field.
You can request a specific table to be loaded, or you can use a table pattern with wildcard characters (*). For example, if the Load Tables panel has a specification of *, then all tables in the unload data set are loaded.

**Figure 35: Load Tables Panel**

![Load Tables Panel](image)

If you select a specific table (no wildcard characters), you can rename the table by entering a new name.

**WARNING**

If you do not use GRS or its equivalent for TSS enqueues and concurrent updates occur from multiple CPUs, unpredictable results will occur, including damage to the TSS table. If this happens, see “Repairing TSS Table Damage” on page 52 for instructions on using the LOAD command to attempt to repair the TSS table.

### Refresh a TSS Table

To refresh all Translate Subsystem Services tables in the IMS control region, type 9 on the Translate Tables panel. The Refresh Tables panel, shown in the following figure, is displayed. Confirm the refresh by pressing Enter.

**Figure 36: Refresh Tables Panel**

![Refresh Tables Panel](image)

This option allows you to flush all TSS look-aside buffers in a specified IMS control region. Press Enter to initiate the refresh. Upon completion, the panel will display a list of those tables which were refreshed, errors, or a blank panel if no look-aside buffers existed.

Refreshing the TSS look-aside buffers requires either IMS Update Parms or Execute IMS commands authority. See the installation guide for information on updating user access authorization.
Format a TSS Library

The Format Library panel, shown in the following figure, is displayed by typing 10 on the Translate Tables panel and pressing Enter. The prompts provided by this panel will help you format and/or allocate a new TSS library. The space allocation for a TSS library must be at least 2 tracks and can be as large as 9999 tracks or cylinders.

WARNING

Use the format with care, as it will destroy any existing tables in a TSS library.

Figure 37: Format Library Panel

<table>
<thead>
<tr>
<th>FL</th>
<th>DELTA IMS VT - Format Library</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ==&gt; _________________________________________________________________</td>
<td></td>
</tr>
</tbody>
</table>

Data set information

Data set name : DGW.DLA.TSS
Disposition status : OLD (DISP=OLD or NEW)
Volume serial : DEVO85 (optional if DISP=NEW)
Unit name : __________ (required if DISP=NEW)

DCB information

Record format : FS
Logical record length : 4096
Block size : 4096
Data set organization : PS

Space information (required if DISP=NEW)
Units : (TRKS or CYLS)
Quantity : ___

Note

The LRECL and BLKSIZE of the TSS data set are forced to a value of 4096 by the Translate Subsystem Services ISPF interface. If this is not acceptable at your site, use JCL to allocate the TSS data set with a different LRECL and BLKSIZE.

Back Up a TSS Library

The Unload Library panel, shown in the following figure, is displayed by typing 11 on the Translate Tables panel and pressing Enter. Use this option to back up a TSS library by unloading all the tables in the TSS library. This unload does not allow a specific table or table pattern to be indicated for unloading. You can specify up to 9999 blocks.
Reorganize a TSS Library

The Reorganize Library panel, shown in the following figure, is displayed by typing 12 on the Translate Tables panel and pressing Enter. This panel allows you to reclaim lost space in a TSS library whenever a large number of TSS tables or their entries have been deleted from the TSS library.

The Reorganize utility requires the use of a temporary output data set, indicated by the initial &UNLOAD entry. You can type a permanent data set name on that line to retain a backup copy of the TSS library before reorganizing. Follow the prompts on the panel to allocate the data set and begin the reorganization. You can specify up to 9999 blocks.

The LRECL and BLKSIZE of the TSS data set are forced to a value of 4096 by the Translate Subsystem Services ISPF interface. If this is not acceptable at your site, use JCL to allocate the TSS data set with a different LRECL and BLKSIZE.
Create a Library Status Report

The TSS Library Status panel, shown in the following figure, is displayed by typing 13 on the Translate Tables panel and pressing Enter. This panel allows you to create a summary or detailed report on the TSS Library either online or in batch mode.

To generate a report, the library you specify is examined for any logical errors, including out-of-sequence or duplicate records, broken pointers, and invalid index records. You can specify up to 9999 tracks.

The Library Status utility requires the use of an output data set. The default data set name is &REPORT. You can specify a permanent data set name if you want to create a permanent copy of the report.

**Figure 40: TSS Library Status Panel**

<table>
<thead>
<tr>
<th>SL</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DELTA IMS VT - TSS Library Status</td>
</tr>
</tbody>
</table>

Type the output dataset information. Then press Enter to get statistics.

- **Sequential output file (may be a temporary data set)**
  - Data set name . . . . . . &REPORT
  - Disposition status . . . . NEW (DISP=OLD or NEW)
  - Volume serial . . . . . . ______ (optional if DISP=NEW)
  - Unit name . . . . . . . . SYSDA___ (required if DISP=NEW)
  - New Space quantity . . . . ____ tracks (required if DISP=NEW)

- **Type of report . . . . . 1  1. Summary report.**
  - 2. Detail report (for error analysis).

**Note**

See “TSS Table Batch Reports” on page 89 for information on creating a batch version of this report.

Generating Library Status Reports

If you select a summary report on the TSS Library Status panel, the TSS Status Browse panel, shown in the following figure, is displayed. The summary report begins with messages for any errors that are detected. In the report example below, no errors were found and no error messages are displayed.
Figure 41: TSS Status Browse Panel

TSS TABLE LIBRARY SUMMARY

DATA SET NAME . . . . : DGW.DLA.TSS
LAST FORMATTED ON . . : 09/27/90 17:51:33   BY . . : DGW2TSS

LIBRARY BLOCKSIZE . . . . . . . . . . . . . . : 4096
MAXIMUM NUMBER OF TABLES THAT CAN BE DEFINED. : 42 100%
NUMBER OF TSS TABLES NOW DEFINED . . . . . . : 19 45%
NUMBER OF BLOCKS ALLOCATED . . . . . . . . : 150 100%
NUMBER OF BLOCKS FORMATTED FOR USE . . . . : 150 100%
NUMBER OF BLOCKS IN USE . . . . . . . . . . : 51 34%
NUMBER OF BLOCKS UNAVAILABLE (DEAD SPACE) . . : 58 39%
NUMBER OF BLOCKS FREE . . . . . . . . . . . : 41 27%

RECOMMENDATIONS:
REORGANIZING THE TABLE LIBRARY WOULD PROVIDE SOME BENEFIT AND IS SUGGESTED.

For most purposes, the summary report is sufficient. To generate this report, the library is examined for logical errors, including out-of-sequence or duplicate entries, broken pointers, and invalid index records. The summary report begins with messages for any errors that are detected. These conditions are unusual, and it is unlikely you will ever see any such messages.

The detail report contains information about the contents of each block in the data set and may be useful if error conditions are detected.

Following the detail and error reports (if any), a one-page library summary is produced, listing the date and time that the library was last formatted, along with the userid or job name that did the formatting.

The library summary also lists the amounts of allocated, formatted, used, free, and dead space in the library. The allocated space should match the formatted space unless the library was moved to a different type of device or a larger data set since it was last formatted. If so, you must reorganize the library to make use of the extra space. TSS will only use space that is formatted (secondary extents will never be obtained during TSS processing). Dead space is space that was occupied by tables that have since been deleted. You can recover dead space by reorganizing the library.

Recommendations

One of the following five recommendations will be made concerning table reorganization:

- **ERRORS DETECTED. REORGANIZE THE TABLE LIBRARY AS SOON AS POSSIBLE.**

  If any errors are detected in the library, such as out-of-sequence records or broken pointers, this recommendation will be made, regardless of free-space or other criteria.
THE TABLE LIBRARY SHOULD BE REORGANIZED AS SOON AS POSSIBLE.
This recommendation is made if:

— More than two-thirds of the library is unusable dead space

— Any one table contains more than two-thirds free space

— The library contains more than five empty table blocks
  The last two criteria identify tables that have had a large number of rows deleted.

REORGANIZING THE TABLE LIBRARY WOULD PROVIDE SOME BENEFIT AND IS SUGGESTED.
This recommendation is made if:

— More than one-third of the table library is dead space

— Any one large table is more than half free space

— Any empty table blocks exist

REORGANIZING THE TABLE LIBRARY WOULD PROVIDE ONLY MINOR BENEFITS
AND IS THEREFORE NOT REQUIRED.
This recommendation is made if the table library is between 10% and 33% dead space, or if any one table has significantly more free space than was requested (but less than 50%).

THERE IS NO NEED TO REORGANIZE THE TABLE LIBRARY.
This recommendation is made if none of the criteria listed above is met.

The last page of the report lists all tables in the library with summary information for each table. The detail report also lists all tables which previously existed in the library but which have been deleted.

Batch TSS Commands

There are three types of TSS commands:

■ **TSS data set commands** apply to the TSS data set and affect all tables in the data set.

■ **TSS table commands** apply to a specific TSS table or, in some instances, to a group of tables.
- **TSS table entry commands** affect only a specific argument/function pair or, in some instances, a group of argument/function pairs.

The following table lists the TSS commands and provides a brief description of their actions. You can issue all TSS commands from the DELTA IMS ISPF interface panels, the TSO READY prompt, or in a batch job stream. These TSS commands execute as subcommands of the single TSO command processor load module named DLATSS.

**Table 4: TSS Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADD</td>
<td>Create new TSS table entries</td>
</tr>
<tr>
<td>CALL</td>
<td>Call a user written TSS program</td>
</tr>
<tr>
<td>DEFINE</td>
<td>Define a TSS table and its characteristics</td>
</tr>
<tr>
<td>DELETE</td>
<td>Delete TSS table argument/function pairs</td>
</tr>
<tr>
<td>END</td>
<td>Terminate a TSS session</td>
</tr>
<tr>
<td>FORMAT</td>
<td>Format a TSS data set</td>
</tr>
<tr>
<td>LIST</td>
<td>Display a TSS table and its contents</td>
</tr>
<tr>
<td>LOAD</td>
<td>Load a TSS table from a physical sequential data set</td>
</tr>
<tr>
<td>READ</td>
<td>Read a data set containing TSS commands</td>
</tr>
<tr>
<td>REMOVE</td>
<td>Delete a TSS table</td>
</tr>
<tr>
<td>RENAME</td>
<td>Change table argument values without changing (or rekeying) the function values</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Update a TSS table, changing Title, Free Space Percent and/or SPEED/NOSPEED option</td>
</tr>
<tr>
<td>REVISE</td>
<td>Change existing TSS table entries</td>
</tr>
<tr>
<td>SET</td>
<td>Establish a QUOTES or NOQUOTES mode</td>
</tr>
<tr>
<td>TR</td>
<td>Translate an argument</td>
</tr>
<tr>
<td>UNLOAD</td>
<td>Unload a TSS table to a physical sequential data set</td>
</tr>
</tbody>
</table>

The following sections describe the TSS commands in greater detail and explain the syntax notation conventions used in the command descriptions.

**DLATSS TSO Command Processor**

Use the DLATSS TSO command processor to begin a TSS session and process TSS commands.
Once the DLATSS TSO command processor has been activated, the TSS command processor responds with the TSS prompt. All commands issued at this prompt are treated as TSS commands until an END command is issued. You can activate the DLATSS TSO command processor from the TSO READY prompt or in a batch job stream.

**Figure 42: DLATSS TSO Command Processor Syntax**

You can use the following keywords with the DLATSS TSO command processor:

- **dsname**
  The name of the TSS data set.

- **VOLUME**
  Required if data set is not cataloged.

- **DD**
  Data definition name.

- **OLD**
  Exclusive data set.

- **SHR**
  Shared data set (default). When access to a TSS data set is shared, the following parameters can be used to limit access. See “TSS Enqueues” on page 51 for information on the use of these parameters.
  - SHR – Shared update (default)
  - EXCL – Exclusive update
  - NONE – No shared data set
TSS Data Set Commands

There are three TSS data set level commands:
- FORMAT
- READ
- END

FORMAT

The FORMAT command initializes a TSS data set so that table definitions and table entries can be made. The command requires a TSS data set disposition of OLD. Formatting a TSS data set erases all TSS tables present in the data set.

Figure 43: TSS Data Set FORMAT Command Syntax

READ

The READ command specifies the ddname of a data set, either physical sequential or a PDS library member, that contains TSS commands. When READ and the ddname are specified to TSS, all the commands in the READ data set are presented to TSS, just as if they were entered from a TSO READY prompt. The format for the READ command is shown below.

Use the ALLOCATE command from the TSO READY prompt to assign the ddname, or include a DD card for the DSN to be read for a batch job.

Figure 44: TSS Data Set READ Command Syntax

END

The END command terminates a TSS session.

Figure 45: TSS Data Set END Command Syntax

TSS Table Commands

There are six TSS table level commands:
- DEFINE
- REPLACE
- REMOVE
- LIST
- UNLOAD
- LOAD

**DEFINE**

The DEFINE command defines a table and its characteristics to TSS.

DEFINE writes a table definition record to the TSS table control record and initializes the first index and table records for the table. You must specify an argument and function length.

**Figure 46: TSS Table DEFINE Command Syntax**

You can use the following keywords with the DEFINE command:

- `tablename`

  Name of the table being defined.

- `LENGTH`

  Specifies the length of the argument and function pairs.

- `TITLE`

  A title or description of the table being defined; the title/description is displayed on the Select TSS Table panel and similar panels (see “Select a TSS Table” on page 55 for an example). The format for this parameter is a character string enclosed in quotes with a maximum length of 32 characters.

- `FRSPC`

  Specifies the percentage of free space (0-99) to be left in each table block for future additions to the table during a LOAD operation.
EXIT

Specifies the load module name of the translation assist exit used by this table.

SPEED

Instructs TSS that pattern masking will not be allowed during searches of the TSS table. This parameter causes TSS to use the high-speed search algorithm, which results in faster searches of the TSS table. SPEED is the default parameter for the DEFINE command.

NOSPEED

Instructs TSS that pattern masking will be allowed during searches of the TSS table. This parameter causes TSS to treat asterisks (*) as wildcard characters, which result in more flexible but slower table searches.

REPLACE

The REPLACE command changes the table definition parameters.

Use this command to update table title, free space percentage, translation assist exit load module name, or SPEED/NOSPEED options. You cannot reset the argument length and function length.

Figure 47: TSS Table REPLACE Command Syntax

You can use the following keywords with the REPLACE command:

tablename

Name of the table you want to change.

TITLE

A title or description of the table being defined; the title/description is displayed on the Select TSS Table panel and similar panels (see “Select a TSS Table” on page 55). The format for this parameter is a character string enclosed in quotation marks with a maximum length of 32 characters.
FRSPC

Specifies the percentage of free space (0-99) to be left in each table block for future additions to the table during a LOAD operation.

EXIT

Specifies the load module name of the translation assist exit used by this table.

SPEED

Instructs TSS that pattern masking will not be allowed during searches of the TSS table. This parameter causes TSS to use the high-speed search algorithm, which results in faster searches of the TSS table. SPEED is the default parameter for the DEFINE command.

NOSPEED

Instructs TSS that pattern masking will be allowed during searches of the TSS table. This parameter causes TSS to treat asterisks (*) as wildcard characters, which result is more flexible but slower table searches.

REMOVE

The REMOVE command deletes a TSS table and all of its entries. Once a TSS table is removed, its space is not freed, but remains as dead space until the TSS data set is reorganized. See the LOAD and UNLOAD commands later in this section for information on TSS data set reorganization.

Figure 48: TSS Table REMOVE Command Syntax

```plaintext
REMOVE  tablename
```

LIST

The LIST command displays information about the tables in a TSS data set and their contents.

Each table matching the table-name pattern is listed. The argument length, function length, title, and SPEED/NOSPEED options are displayed along with the table name.

To list basic table information, specify:

```plaintext
LIST  tablenamepattern
```
For more information, specify:

```
LIST tablenamepattern ALL
```

or any other combination of table-name-pattern and ARGUMENT, RANGE, and/or FUNCTION.

**Figure 49: TSS Table LIST Command Syntax**

---

**UNLOAD**

The UNLOAD command creates a transportable copy of a TSS table or group of TSS tables. You can specify a group of TSS tables using a wildcard character to create a table name pattern, which unloads all tables matching the pattern. Specify an argument pattern, using the wildcard character, or an argument range to limit UNLOAD.

If you omit the table name, then all tables are unloaded.

When specifying UNLOAD, the output data set must be pre-allocated; if it is not, the following message is issued.

```
BMC1864 ALLOCATION FAILED
```

**Figure 50: TSS Table UNLOAD Command Syntax**

---

**LOAD**

The LOAD command loads a copy, created with the UNLOAD command, of a TSS table or a group of TSS tables.

You specify a group of TSS tables using a wildcard character to create a table name pattern, which loads all tables matching the pattern. Specify an argument pattern, using the wildcard character, or an argument range to limit LOAD.
If you specify RENAME, the table loaded is renamed. RENAME requires that the TABLE parameter refer to a specific input table.

**Figure 51: TSS Table LOAD Command Syntax**

```
LOAD
   inputdsname
      IDD(ddname)
     / TABLE(name)
        RENAME(name)
       / ARGUMENT(pattern)
          RANGE(arg1,arg2)
```

**TSS Table Entry Commands**

There are six TSS table entry level commands:
- ADD
- DELETE
- RENAME
- REVISE
- SET
- TRANSLATE

**ADD**

The ADD command creates a new argument/function entry for a specific TSS table. You can specify wildcard characters only if the table was defined with the NOSPEED option.

See “DEFINE” on page 79 for more information about the SPEED/NOSPEED option.

New entries are added to a table in alphabetic sequence, according to the argument. If a record split occurs because of an ADD, a new entry will be added to the table index record.

**Figure 52: TSS Table Entry ADD Command Syntax**

```
ADD
   tablename
      argumentpattern
         functionpattern
```

**DELETE**

The DELETE command removes an existing row from a TSS table. It can be specified for an individual row by a specific argument or for several rows matching an argument or function pattern. If more than one entry is to be deleted, the ALL
parameter is required. The table name and argument pattern are required parameters for this command.

**Figure 53: TSS Table Entry DELETE Command Syntax**

```
DELETE  tablename  argumentpattern  Function(functionpattern)  ALL
```

**RENAME**

The RENAME command allows a specific old argument pattern in one or more TSS table entries to be changed to a new argument pattern without changing the function value. If you want to retain parts of the old argument, use asterisks (*) to indicate which positions in the old argument are to be retained in the new argument. The old argument pattern and new argument pattern are required parameters. ALL is an optional parameter that indicates that all arguments matching the old argument pattern are to be changed. The default is to only change the first match.

**Figure 54: TSS Table Entry RENAME Command Syntax**

```
RENAME  tablename
```

```
oldargumentpattern  newargumentpattern  ALL
```

**REVISE**

The REVISE command assigns a new function value to a specific argument or to a group of arguments. ALL is an optional parameter that indicates that all functions that match the argument pattern are to be changed. When ALL is specified, asterisks (*) are interpreted as wildcard characters.

If ALL is not specified, however, asterisks will not be interpreted as wildcard characters. It is assumed that the desired argument actually contains asterisks. Only the first match found in the table is revised.

**Figure 55: TSS Table Entry REVISE Command Syntax**

```
REVISE  tablename
```

```
argumentpattern  newfunction  ALL
```

**SET**

The SET command establishes QUOTES or NOQUOTES mode for TSS. When in QUOTES mode, you must enter all TSS argument and function specifications,
regardless of the command, within quotation marks to allow embedded blanks to be included within argument and function values. When in NOQUOTES mode, quotes are never used, and embedded blanks are not recognized for argument or function values in TSS commands.

**Figure 56: TSS Table Entry SET Command Syntax**

```
SET [NOQUOTES | QUOTES]
```

**TRANSLATE**

The TRANSLATE (TR) command queries a TSS table. When an argument or argument pattern is presented with the TR command, the TSS displays either the corresponding function or an error message.

If the table has the SPEED option, asterisks (*) in the argument-pattern are not wild and must be found in the table. If the table has the NOSPEED option, asterisks in the argument-pattern are wild. In this case only the first match in the table is returned.

Since the matching algorithm is not defined, a variation in algorithm or additions or deletions to the table can cause different functions for the same argument on subsequent translate calls when wildcard characters are used.

**Figure 57: TSS Table Entry TRANSLATE Command Syntax**

```
TR tablename argumentpattern
```

**CALL**

The CALL command allows you to call a user written program which can then make calls to the Translation Subsystem in a batch environment. Parameters may also be passed to the program on the CALL command. The format of these parameters is defined by the user program.

A sample user program which performs a simple TSS table lookup is provided in VTFSAMP member DLATSAM2. JCL to assemble and link-edit the program is provided in VTFCTL member DLA#SAM2.

**Figure 58: TSS Table Entry CALL Command Syntax**

```
CALL userprogram parameters
```
Stage-1 Conversion Aid

Use job stream DLA#BILD to create input for loading the TSS tables NLTERM and VPRINTER. This job stream reads the current IMS Stage-1 input and creates TSS ADD commands for potential virtual devices. Review and edit the file of ADD commands produced prior to loading the TSS tables.

Implementation

First, edit job stream DLA#BILD in the DLACNTL data set. Make sure that the job card, data set names, and table names are correct. The last line in the job stream is a FIRST command that sets the table names you will use; the first name is for the NLTERM table, the second is for the VPRINTER table name.

When the JCL is correct, submit the job. LIST, which produces many error messages, has been turned off as these messages do not impact production of the desired result.

After the job has executed, the SYSPUNCH data set will contain the TSS ADD commands that can be used to load the tables. Before you actually run the load, remove any names you do not want to be virtual devices.

Virtual Printers

Supply the model names for virtual printer devices. This task may become somewhat tedious depending on how many different printer configurations you use. DELTA PLUS VIRTUAL TERMINAL supplies a default model name:

- PTRMODLA for all 3270 printers
- PTRMODLB for all SLUTYPE1 printers

A CHANGE ALL command will suffice in setting the correct model name. Remember the model name must be defined in the IMSGEN, but must never actually be logged on. The model’s characteristics and attributes must correctly match the respective virtual printer; otherwise, the results are unpredictable.

NLTERMs

The NLTERM table adds a numerical suffix that is appended to the node name for the second and subsequent LTERMs found for any given terminal. This is compatible with TSS tables used with the multiple LTERM support. It requires a
table definition where the argument (node name) length is greater than eight bytes to allow for the suffix. An argument length of ten bytes, for example, allows a two-digit suffix. If you do not want to use multiple LTERM support, define the NLTERM table argument length as eight bytes. Then the multiples are all rejected because the argument is too long.

**Execution**

When the SYSPUNCH data set content has been refined, it can be used as input to the DLATSS command processor, either in batch or online.

Figure 59 on page 87 shows sample JCL for the batch job. In the batch job stream, supply the dsname of the SYSPUNCH data set via a DD card and issue the TSS READ subcommand.

**Figure 59: Sample JCL for Stage-1 Conversion Aid**

```plaintext
//TSSBATCH JOB (account)  
/*UPDATE JOB CARD  
/*/  
//TSOBATCH EXEC PGM=IKJEFT01,DYNAMNBR=99  
//STEPLIB DD DSN=BMC.pppLIB,DISP=SHR  
/*VERIFY STEPLIB  
/*/  
//SYSTSPRT DD SYSOUT=*  
//SYSPRINT DD SYSOUT=*  
//SYSUDUMP DD SYSOUT=*  
//SYSPUNCH DD DSN=syspunch.dsname,DISP=SHR  
/*VERIFY DATA SET NAME  
/*/  
//SYSTSTN DD *  
DLATSS table-data-set-name  
READ SYSPUNCH
```

In an online TSO environment, supply the following information:

```
ALLOC DA(syspunch.dsname) SHR FI(SYSPUNCH)  
DLATSS table-data-set-name EXCL  
READ SYSPUNCH  
END
```

**Execute TSS Batch Commands**

If the DLATSS TSO command processor is run in a batch region, you can execute the TSS commands from a batch job stream. The following figure shows a sample job stream that defines the table LMODEL, adds 10 entries to the table, and then lists all tables and entries in the data set.

**Figure 60: Sample JCL for DLATSS Batch Job**

```plaintext
//TSSBATCH JOB (account)  
/* UPDATE JOB CARD
```
Execute TSS Batch Commands

```/*
//TSOBATCH EXEC PGM=IKJEFT01,DYNAMNBR=99
//STEPLIB DD DSN=BMC.ppp LIB,DISP=SHR
//* VERIFY STEPLIB
//*
//SYSTSPRT DD SYSOUT=* 
//SYSPRINT DD SYSOUT=* 
//SYSSUOMP DD SYSOUT=* 
//SYSTSIN DD *
PROF MSGID
/* INITIATE TSS
DLATSS 'ABC.V4.TABLES' OLD
/* TABLE DEFINITION
DEFINE LMODEL
TITLE('LOGON MODEL TABLE') -
LENGTH(6,8)
/* ADD TABLE ENTRIES
ADD LMODEL 327021 $3270001
ADD LMODEL 327022 $3270002
ADD LMODEL 327023 $3270003
ADD LMODEL 327024 $3270004
ADD LMODEL 327025 $3270005
ADD LMODEL SLU221 $SLU2001
ADD LMODEL SLU222 $SLU2002
ADD LMODEL SLU223 $SLU2003
ADD LMODEL SLU224 $SLU2004
ADD LMODEL SLU225 $SLU2005
LIST * ALL
/* LIST ALL TABLES/ENTRIES
END
/*

If you need to refresh TSS in batch, use job DLA#TSSR in the DLACNTL data set. The following figure shows the messages written to SYSOUT by this job stream.

Figure 61: Translate Subsystem Services Batch Messages

READY
PROF MSGID
READY
DLATSS 'ABC.V4.TABLES' OLD
TSS
DEFINE LMODEL TITLE('LOGON MODEL TABLE') -
LENGTH(6,8)
TSS
ADD LMODEL 327021 $3270001
TSS
ADD LMODEL 327022 $3270002
TSS
ADD LMODEL 327023 $3270003
TSS
ADD LMODEL 327024 $3270004
TSS
ADD LMODEL 327025 $3270005
TSS
ADD LMODEL SLU221 $SLU2001
TSS
ADD LMODEL SLU222 $SLU2002
TSS
ADD LMODEL SLU223 $SLU2003
TSS
ADD LMODEL SLU224 $SLU2004
TSS
ADD LMODEL SLU225 $SLU2005
TSS
LIST * ALL
TABLE----LMODEL LOGON MODEL TABLE
LENGTH(006,008) FRSPC(00) SPEED
ARGUMENT---(SLU221) FUNCTION---($SLU2001)
## TSS Table Batch Reports

Invoke the DLATSTAT utility to generate a status report for a TSS table library. Error messages are generated for any logical errors found in the table. The free space, last date formatted, number of tables, and recommendations for reorganizing the library are included on the first page. Subsequent pages include one line for each table in the library, giving the number of rows, free space, and other information about the table. This information is also provided for tables which have been deleted since the library was last reorganized.

Use the following JCL step to invoke the utility in batch:

```jcl
//TSTAT EXEC PGM=DLATSTAT,PARM='TSS.LIBRARY.NAME'
//STEPLIB DD DISP=SHR,DSN=BMC.pppLIB
```

If desired, you can provide the TSS library name by DD statement instead of parameter. Eliminate the parameter and add a TSSTABLE DD statement. You can direct the output to a data set or to other than the default (SYSOUT=*) by adding a TSSPRINT DD statement.

You can also invoke the utility as a TSO command:

```tsocl
DLATSTAT 'TSS.LIBRARY.NAME'
```
Virtual Terminals

This chapter describes how DELTA IMS VIRTUAL TERMINAL creates, deletes, and uses virtual terminals. The following related topics are also covered: Statistics and log records related to virtual terminals, processing after an IMS restart, dequeuing and requeuing virtual LTERMs, and the virtual terminal Timer facility.

Introduction

DELTA IMS VIRTUAL TERMINAL allows you to eliminate IMSGENs for VTAM terminals and LTERMs for VTAM terminals.

Virtual Terminal

A virtual terminal is any IMS terminal that is not defined in the IMS gen. These nodes are created when a logon attempt is made on a terminal after it is determined that it is not in the GEN and has not already been created. These nodes exist only while they are actively being used. After a site-defined period of inactivity, the nodes (except SLUPs) are logged off and subsequently deleted.

Virtual LTERM

A virtual LTERM is created during the signon bypass process, if signon is not required, or during the IMS signon process. A virtual LTERM can also be created by sending a message to it.

DELTA IMS VIRTUAL TERMINAL code will go through a destination search sequence before an LTERM is created. This destination search sequence is very important. Once a message is sent to a destination, DELTA IMS VIRTUAL TERMINAL code will attempt to find it in the following search sequence:

1. IMS GENed LTERMs, transactions, and remote LTERMs
2 LTERMｓ and transactions added by DELTA IMS DB/DC
3 Previously defined virtual LTERMｓ that are still in existence
4 Virtual remote LTERM TSS table (if system is MSC capable)
5 Virtual printer TSS table
6 Unsolicited output TSS table

If the above searches fail to find the name, the message will be rejected and an appropriate IMS error message will be displayed.

WARNING
Use of wildcard masking in a virtual printer or unsolicited output TSS table could have unexpected consequences. Masking could allow destinations to be deemed valid and created when the opposite result is intended. Use masking with discretion.

Virtual Terminals and IMSGEN-Defined Terminals

Under all versions of IMS, DELTA IMS VIRTUAL TERMINAL does not affect the operation of IMSGEN-defined terminals, with the following exceptions:

- The automatic exit of held conversations applies to conversations initiated at virtual terminals, IMSGEN-defined VTAM terminals, and IMSGEN-defined BTAM lines and PTERMS.

- The /SECURE command applies to both IMSGEN-defined terminals and virtual terminals.

Virtual Terminal Models

When DELTA IMS VIRTUAL TERMINAL defines a virtual terminal to IMS, it copies and modifies model control blocks. Models are standard IMS terminal definitions which are included in the IMSGEN. Models define the characteristics and such features as screen size that the product uses to define a virtual terminal to IMS. These models are used during virtual terminal logon and signon processing.
You should review the Virtual Terminal Logon panel number 6 to determine what the current settings are and revise these settings if needed. See “Selecting a Virtual Terminal Signon Technique” on page 40, for more information.

Logon Models

Logon model terminal definitions provide DELTA IMS VIRTUAL TERMINAL with example IMS definitions for the 3270-type, SLUTYPE1, SLUTYPE2, and SLUTYPEP devices in use in your IMS network. DELTA IMS VIRTUAL TERMINAL uses the logon models two ways:

- You can specify four default logon models. These models are used to provide default characteristics for all SLUTYPE1, SLUTYPE2, SLUTYPEP, and 3270-type devices. While you can specify these default models for any of the device types, they specifically apply only if you select the defaults.

- You can provide a complete set of models for each SLUTYPE1, SLUTYPE2, SLUTYPEP, and 3270-type physical terminal/screen size combination in use at your site. These models can be selected for use by the Logon Translate option or the Logon exit routine. These additional logon models take the place of the default logon models described above. The Logon Translate option and the Logon Exit sample routine provided use the DELTA IMS Translate Subsystem to build the name of a logon model from the physical terminal type and the screen size. For more information, see “Logon Exit Sample Routine” on page 127.

When a virtual terminal is logged on to IMS, DELTA IMS VIRTUAL TERMINAL uses specifications from the model to format the virtual terminal control block. Names and address pointers in the new control blocks are adjusted accordingly.

Defining Logon Models

Before using Virtual terminals, you must define terminals in the IMSEG that can be used as 'MODELS' for virtual terminals. The following steps describe how to define virtual terminal logon models in the IMSEG:

1. Review your current static terminal definitions and determine a terminal definition that has the unique combination of options that you will need in your virtual terminal environment.

   Any option that differs from previous models will require a different model be defined. For example, if virtual terminals require different options, such as OUTBUF, then separate models must be IMSEG-defined.

   You should have one or more terminal definitions that adequately represent all of the static terminal definitions in your network.
2 Rename these terminals in the GEN source so that they do not match any other terminal in your network.

When defining virtual terminal logon models, the following restrictions apply:

- These nodes should never be logged on or used in the DELTA IMS DB/DC tier as spare elements.
- The node name of a logon model should never match the node name of a terminal in your network. Doing so may cause unpredictable results.

**Note**

If you use a session manager to access IMS terminals and wish to use the real VTAM node name instead of the session manager pool name, refer to “Extended Options” on page 45.

### Signon Models

You can use signon model terminal definitions to override the terminal characteristics provided by the logon models. Signon models can provide a greater variety of screen sizes and options than available with the default logon models.

For example, if the default screen size specified in the logon model was 24 by 80, but some applications require 27 by 132 screens, then you can specify an alternate screen size through a signon model.

Like logon models, signon models are defined in the Stage-1 IMSGEN macros used for your IMS system. There is no limit set to the number of 3270-type or SLUTYPE2 signon models which can be used by DELTA IMS VIRTUAL TERMINAL. Signon models can be used as logon models.

You can customize the Signon Exit sample routines to return the name of a signon model. It is your responsibility to ensure that signon models exist for each model that the Virtual Terminal Signon Exit sample routine can specify.

The actual logon model name is not changed; only its characteristics are modified to match the new model.

### Supporting SLUTYPEP Devices

DELTA IMS VIRTUAL TERMINAL supports SLUTYPEP devices when you complete the following procedures:
1 You must have the correct VTAM definitions for SLUTYPEP devices. The VTAM TSPROFILE must be X'04', or you must use a customized logon exit to identify SLUTYPEP devices by name.

2 Place the SLUPxx entries in your LMODEL TSS table or SLUTYPEP default model. SLUP VTAM definitions often use SLUP00 for the model types.

If you have SLUTYPEP devices that require different macro parameters, set up a different logon model for each set of needed options. This may require a TSS table lookup by node name to determine which model is required.

You can use the same method you are using now to determine the virtual terminal logon model for SLUTEPE2 or 3270-type devices as long as the correct logon model is passed to DELTA IMS VIRTUAL TERMINAL prior to creation.

3 SLUTYPEP devices are generally not signed on to IMS. If you currently require signon for all virtual terminals, but do not want SLUTYPEP devices to be signed on, change to signon not required and build an NLTERM TSS table for all SLUTYPEP devices.

Place the table name NLTERM in the IMSID basic options module on the Virtual Terminal Signon Bypass panel. Use the VTAM node name as the table argument in the NLTERM table and use the associated LTERM as the function. Devices other than SLUTYPEP will fail this translation and force the user to signon, thus reinstating your requirement that signon is required for all other virtual terminals.

If you do not require signon for any of your virtual terminals SLUTYPEP LTERMS can be derived the same as SLUTEPE2SLUTEYPE or 3270 devices. If you require signon for all terminals including SLUTYPEP devices, then SLUTYPEP LTERMS can be derived the same as SLUTEPE2 or 3270-type devices. However, you must determine whether SLUTYPEP devices support MFS and you must take appropriate action as to whether you want DELTA IMS VIRTUAL TERMINAL to display the signon format.

Signon Bypass

The Signon Bypass option provides the LTERM name and override values for virtual terminals when signon is not required. The Signon Bypass option may, after examination of the node name, determine that signon is required by the terminal. The Signon Bypass option applies only when all of the following conditions are met:

- The IMSID basic option **Require signon for ALL Virtual Terminals** is not selected. See “Selecting Virtual Terminal Options” on page 31.
- IMS is run without signon.
The translate process is successful or the Signon Bypass Exit routine, if present, issues a return code of 0. If the translate fails or the Signon Bypass Exit routine issues a return code of 4, then the Signon Bypass option is negated. See “Selecting a Virtual Terminal Signon Bypass Technique” on page 38, and “Signon Bypass Exit Sample Routine” on page 134.

**Tip**
If some of your users need to perform an IMS signon and others do not, you can identify the nodes that should bypass signon in the following manner:

- Specify that signon is not required on the IMSID Basic Options panel (Page 4 of 8).
- Enter the nodes for which signon is not required on the Signon Bypass TSS table.

The nodes that require signon will fail the signon bypass search and will be forced to sign on via a virtual terminal.

---

### Supporting Multiple LTERMs for Virtual Terminals

Up to eight concurrent LTERM names can be supported at a virtual terminal. The LTERMs can be only virtual LTERMs.

An interface defined for the Signon and Signon Bypass exits permits a list of up to eight LTERM names to be returned for a virtual terminal. The exit can use any means to generate the names for the list.

To supply the LTERM names for the list, use:

- Virtual Terminal Signon Bypass panel option **Translate the Node name into an LTERM name**

- Virtual Terminal Signon panel option **Translate the Node name (or userid) into an LTERM name**

- sample exit routines using the Translate Subsystem (TSS)

Activate multiple LTERM support by selecting the Virtual Terminal Options panel option **Support multiple concurrent LTERMs for Virtual Terminals**. When activated, the node name/userid to LTERM translation is a one-to-many relationship rather than a one-to-one relationship. This relationship is internally implemented using the TSS LIST command, which permits an argument range, instead of a TSS TRANSLATE command, which requires a specific argument. For multiple LTERMs
to be associated with a single node, you must add one entry to the table for each LTERM.

---

**Note**
Using a multiple LTERM per node TSS table for signon or signon bypass requires a special TSS translation which precludes the use of pattern masking in these tables.

---

Since TSS requires a unique node name table argument, you must append a suffix to each argument to ensure uniqueness. The suffix can be any length, but three characters or less is suggested. An example TSS table definition containing three LTERMs for node name TERMINAL is shown in the following example.

```
DEF MLTERM LEN(9,16) TITLE('MULTIPLE LTERM TABLE')
SET QUOTES
ADD MLTERM 'TERMINAL1' 'LTERM1  PROFILE1'
ADD MLTERM 'TERMINAL2' 'LTERM2'
ADD MLTERM 'TERMINAL3' 'LTERM3  PROFILE2'
```

Since you implement multiple LTERM support using the TSS LIST command, the Translate Assist Exit routine is not invoked. During the setup of a virtual terminal requiring multiple LTERMs, all LTERMs must be valid and available for use. If they are not, the setup fails which prevents successful completion of the logon or signon. Also, you must define all LTERMs using a valid name.

See the following sections for more information on multiple LTERM support:

- “Selecting Virtual Terminal Options” on page 31
- “Selecting a Virtual Terminal Signon Bypass Technique” on page 38
- “Selecting a Virtual Terminal Signon Technique” on page 40
- “Translate Subsystem Services Tables” on page 47
- “Using Virtual Terminal Exits” on page 125

---

**Virtual Terminal and LTERM Statistics**

DELTA IMS VIRTUAL TERMINAL presents virtual terminal statistics in two ways: through the Virtual Terminal Statistics panel, and through messages issued at shutdown.
Virtual Terminal Statistics Panel

When you use the Virtual Terminal Statistics panel, DELTA IMS takes a "snapshot" of virtual terminal control block usage and provides this information as two panels of online statistics.

The Virtual Terminal Statistics panel displays statistics on USB, VPO, and VTE control block usage.

--- Note ---
When Resource Manager (RM) is active, virtual terminal status is no longer kept in VTE control blocks.

To view the first Virtual Terminal Statistics panel, type 7 on the Primary Menu panel and press Enter.

**Figure 62: Virtual Terminal Statistics Panel (Page 1)**

<table>
<thead>
<tr>
<th>VT</th>
<th>DELTA IMS VT - Virtual Terminal St</th>
<th>Press Enter to refresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command ====&gt;</td>
<td>Press Enter to refresh VIRTUAL TERMINAL statistics from the control region.</td>
<td></td>
</tr>
<tr>
<td>IMSID. . . ABC4</td>
<td>Page 1 of 2</td>
<td></td>
</tr>
</tbody>
</table>

| LOGONS-to-date . . : | 3 | SIGNONS-to-date . : | 2 |
| AUTO-LOGOFFS-to-date: | 2 | AUTO-EXITS-to-date: | 0 |

USB Pool

- Current -> 0%
- Highest => 0%
- 100% is Adds Del's
- 20
- 0
- 0

VPO Pool

- Current -> 0%
- Highest => 0%
- 25
- 0
- 0

VTE Pool

- Current -> 0%
- Highest => 0%
- 25
- 0
- 0
To refresh the display, press **Enter**. To view the second Virtual Terminal Statistics panel, use the DOWN command.

**Figure 63: Virtual Terminal Statistics Panel (Page 2)**

| VT Command | DELTA IMS VT - Virtual Terminal Statistics | Press Enter to refresh VIRTUAL TERMINAL statistics from the control region.
|-------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| IMSID . . . ABC4 | Page 2 of 2 | More: -

<table>
<thead>
<tr>
<th>Summary</th>
<th>USBs</th>
<th>VPOS</th>
<th>WTEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of blocks in pool . . . . . . . :</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Current number of blocks in use . . . . :</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maximum number of blocks ever in use . . :</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of times blocks were added . . . :</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of times blocks were deleted . . :</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

To refresh the display, press **Enter**. To view the first Virtual Terminal Statistics panel, use the UP command.

---

### Shutdown Statistics

When DELTA IMS VIRTUAL TERMINAL is shut down, checkpoint records are automatically written to the IMS system log, and virtual terminal statistics, virtual LTERM statistics, and event records are written to the MVS system log. Sample messages are shown in the following figure.

**Figure 64: Virtual Terminal Shutdown Statistics Sample**

```
BMC6695 VIRTUAL TERMINAL STATUS
BMC6696 LOGONS(100) SIGNONS(110) AUTO-LOGOFFS(25)
    AUTO-EXITS(15)
BMC6697 USERIDS ALLOWED(10) MAX USAGE(0)
    PERCENT(0) CHKPT(0)
BMC6697 OVERRIDES ALLOWED(50) MAX USAGE(30)
    PERCENT(60) CHKPT(30)
BMC6697 DC TRACES ALLOWED(10) MAX USAGE(2)
    PERCENT(20) CHKPT(20)
BMC6672 PRINTER LTERMS-IDENTIFIED(100)
    OPNDST-ISSUED(200) CONNECTS(175)
BMC6698 CONVERSATIONS DEFINED(200) BUSY(5)
    HELD(5)
BMC6699 END VIRTUAL TERMINAL STATUS
```

The statistics written include virtual terminal activity, control block usage, and conversation usage. The following table shows the statistics that are written to the IMS system log and the MVS system log when DELTA IMS VIRTUAL TERMINAL shuts down.
Table 5: DELTA IMS VIRTUAL TERMINAL Shutdown Statistics

<table>
<thead>
<tr>
<th>Statistic Category</th>
<th>Statistics Written</th>
<th>Message Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Number of logons</td>
<td>BMC6696</td>
</tr>
<tr>
<td></td>
<td>Number of signons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of logoffs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of internal /EXITS</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td>Number in use at shutdown check point time</td>
<td>BMC6697</td>
</tr>
<tr>
<td>Conversation Usage</td>
<td>Number in use</td>
<td>BMC6698</td>
</tr>
<tr>
<td></td>
<td>Number held</td>
<td></td>
</tr>
</tbody>
</table>

Log Records

DELTA IMS VIRTUAL TERMINAL uses log code X'DE' for all event and checkpoint records that are written to the IMS system log.

An IMSID customization option permits you to modify this code within the range of X'A0' to X'FF'. Whenever the DELTA IMS VIRTUAL TERMINAL log code is changed, the first subsequent IMS restart must be a cold start. Log records are used for checkpoints and significant events. The product adds one log code and several subcodes to the X'DE', or user specified, log code. During an IMS restart, these records are used to reconstruct the virtual terminal environment.

Note

After warm and emergency restarts, virtual LTERMs are restored only if they have some status, such as MFSTEST or TRACE, or if they have queued messages.

You can change the DELTA IMS VIRTUAL TERMINAL log code X'DE'. For clarity, all examples in this document use X'DE' for the DELTA IMS log code.

Table 6 on page 100 shows DELTA IMS VIRTUAL TERMINAL event records.

Table 6: Virtual Terminal Event Records

<table>
<thead>
<tr>
<th>Log Code</th>
<th>Event</th>
<th>DSECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'DE00'</td>
<td>Logon</td>
<td>$VTFMAP LGR</td>
</tr>
<tr>
<td>X'DE04'</td>
<td>Signon</td>
<td>$VTFMAP URM</td>
</tr>
<tr>
<td>X'DE08'</td>
<td>Forced Signoff</td>
<td>$VTFMAP LGR</td>
</tr>
<tr>
<td>X'DE10'</td>
<td>Delete</td>
<td>$VTFMAP LGR</td>
</tr>
<tr>
<td>X'DE14'</td>
<td>Conversation Hold</td>
<td>$VTFMAP HCV</td>
</tr>
</tbody>
</table>
Table 7 on page 101 shows DELTA IMS VIRTUAL TERMINAL checkpoint records.

### Table 7: Virtual Terminal Checkpoint Records

<table>
<thead>
<tr>
<th>Log Code</th>
<th>Checkpoint Type</th>
<th>DSECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'DE40'</td>
<td>Begin Checkpoint</td>
<td>$VTFMAP CKP</td>
</tr>
<tr>
<td>X'DE44'</td>
<td>End Checkpoint</td>
<td>$VTFMAP CKP</td>
</tr>
<tr>
<td>X'DE48'</td>
<td>VLB Checkpoint</td>
<td>$VTFMAP CVC</td>
</tr>
<tr>
<td>X'DE4C'</td>
<td>VCN Checkpoint</td>
<td>$VTFMAP CKP</td>
</tr>
<tr>
<td>X'DE50'</td>
<td>USB Checkpoint</td>
<td>$VTFMAP CKP</td>
</tr>
<tr>
<td>X'DE54'</td>
<td>VPO Checkpoint</td>
<td>$VTFMAP CKP</td>
</tr>
<tr>
<td>X'DE58'</td>
<td>Deleted VCN Checkpoint</td>
<td>$VTFMAP CKP</td>
</tr>
<tr>
<td>X'DE5C'</td>
<td>VTE Checkpoint</td>
<td>$VTFMAP VTE</td>
</tr>
</tbody>
</table>

### Virtual LTERM Dequeue

Use one of the following procedures to dequeue IMS responses from a virtual LTERM:

- For those sites using signon userid-to-LTERM name translation, have the affected user sign on to IMS and dequeue the LTERM using PA1 and PA2.
- Or-

- Have the MTO stop the virtual terminal which the messages are queued to and then dequeue that node or user/SPQB.

**Note**

The DEQ extended option can be used to dequeue all messages that are not delivered to a virtual terminal during signon bypass or signon.

This action may help in a session manager environment where there is a danger of secured messages being displayed to the wrong terminal user.
Timer Facility for Virtual Terminals

DELTA IMS VIRTUAL TERMINAL provides a time monitoring facility to track activity on virtual terminals and printers. The Timer facility enables you to establish standard, alternate, or zero values only for automatically logging off idle virtual printers and terminals. Under all supported versions of IMS, a zero value disables the Timer facility.

Unattended Virtual Terminal

A signed on and unattended terminal can compromise data security or confidentiality. To minimize such occurrences, DELTA IMS VIRTUAL TERMINAL uses the Timer facility to keep track of all idle terminals. The Time facility can log off the idle terminals after a period of time that you define.

Optionally, DELTA IMS VIRTUAL TERMINAL can notify the IMS Master Terminal Operator each time a virtual terminal has been automatically logged off or a conversation has been exited.

Idle Terminal Logoff

The Idle Terminal Logoff Interval determines when DELTA IMS VIRTUAL TERMINAL will log off idle terminals. This interval applies only to virtual terminals that are not in conversational mode unless the value of the Idle Conversation Logoff/Exit Interval is zero.

If a virtual terminal is not in conversational mode and options for the standard interval and the alternate interval are specified on the Virtual Terminal Limits panel, an internal /CLSDST (close destination) command is issued when a virtual terminal is inactive for the amount of time specified in the standard or alternate interval. If the standard interval is specified as zero, the Idle Terminal Logoff option is disabled. See “Setting Virtual Terminal Limits” on page 28 for more information on setting virtual terminal limits.

When DELTA IMS VIRTUAL TERMINAL logs off an idle virtual terminal, all LTERMs remain assigned to the user/SPQB that was created when the terminal logged on only when there is a status or message queued. If no status or message exists, the LTERMS are deleted. Conversations are assigned to the user/SPQB and maintain the status they held when the virtual terminal was logged off.
Standard Idle Terminal Logoff Interval

Under all versions of IMS, the standard idle terminal logoff interval is used only under one of the following sets of conditions:

- The terminal is not in conversational mode.
- The alternate interval option is not specified for the user that is currently signed on to the terminal.
- The idle terminal logoff standard interval option is specified, but not as zero.

-Or-

- The terminal is in conversational mode.
- The alternate interval option is not specified for the user that is currently signed on to the terminal.
- The idle conversation interval option is not specified.
- The idle terminal logoff standard interval option is specified, but not as zero.

Alternate Idle Terminal Logoff Interval

Under all versions of IMS, the alternate interval is used only under one of the following sets of conditions:

- The terminal is in non-conversational mode.
- The alternate interval option is specified for the user that is currently signed on to the terminal.
- The idle terminal logoff alternate interval option is specified, but not as zero.

-Or-

- The terminal is in conversational mode.
- The alternate interval option is specified for the terminal.
- The idle conversation interval option is not specified for the user that is currently signed on to the terminal.
- The idle terminal logoff alternate interval option is specified, but not as zero.

See “Translate Subsystem Services Tables” on page 47 for information on setting alternate intervals and the TSS table LTERMOR.
Idle Conversation Logoff and Exit

When a virtual terminal is in conversational mode, the Idle Conversation Logoff/Exit Interval overrides the Idle Terminal Logoff interval, even if the value of the Idle Terminal Logoff interval is zero.

Idle conversation logoff occurs after a virtual terminal in conversational mode has remained inactive for the period of time specified for the Idle Conversation Logoff/Exit Interval. When idle terminal logoff occurs, all LTERMs for that terminal remain assigned to the user/SPQB that was created when the terminal logged on. Conversations are assigned from the terminal to the user/SPQB and maintain the status they held at the time the virtual terminal was logged off; the conversations are not exited.

If the Idle Conversation Logoff/Exit Interval is specified as zero, the feature is disabled, in which case the Idle Terminal Logoff Interval applies. In this situation, when the idle terminal logoff interval has expired, the terminal is logged off and conversations directed to the terminal are assigned from the terminal to the user/SPQB and maintain the status they held at the time the virtual terminal was logged off; the conversations are not exited.

See “Extended Options” on page 45 for additional information on exiting conversational transactions.

Standard Idle Conversation Logoff/Exit Interval

Under all versions of IMS, this interval is used when all of the following conditions exist:

- The terminal is in conversational mode.
- No alternate interval options are specified for the user currently signed on to the terminal.
- The idle conversation logoff and exit standard interval option is specified, but not as zero.

Alternate Idle Conversation Logoff/Exit Interval

Under all versions of IMS, this interval and is used when all of the following conditions exist:

- The terminal is in conversational mode.
- The alternate interval option is specified for the user currently signed on to the terminal.
The idle conversation logoff and exit alternate interval option is specified, but not as zero.

**Held Conversation Exit Interval**

Under all versions of IMS, this interval specifies how long held conversations are kept before being exited after one of the following has occurred:

- A disconnect
- An operator /HOLD
- A terminal in conversational mode with an Idle Conversation Logoff/Exit Interval of zero is logged off after the expiration of the Idle Terminal Logoff Interval, as explained in “Idle Conversation Logoff and Exit” on page 104.

Held conversations are exited with an internal /EXIT command when the amount of time since the last conversational input exceeds the held conversation exit interval. If the held conversational exit interval is specified as zero, conversations will always be held and will never be exited. This feature only applies to conversations associated with disconnected virtual and non-virtual terminals (those not logged on). See “Setting Virtual Terminal Limits” on page 28 for more information on setting virtual terminal limits.

---

**Note**

A disconnect in this case can mean a virtual terminal automatic logoff, a lost terminal, an IMS shutdown, system crash, etc. In the event of a system shutdown or abend, the hold takes place after IMS has been restarted.
Virtual Printers

This chapter describes the use of virtual printers and output destinations and how IMS BMP and MPP programs send output to them.

Introduction

Virtual printer sessions are LTERMs and corresponding nodes that do not have to be present in the IMSGEN for IMS BMP and MPP programs to send output to them. DELTA IMS VIRTUAL TERMINAL uses models defined in the IMSGEN to create the control blocks required for virtual printers to function. You do not have to change IMS application programs to send output to virtual printers.

A virtual printer is any SLUTYPE1 or 328x-type printer that is not defined in an IMSGEN, and whose node name and LTERM name are contained in a table in the DELTA IMS Translate Subsystem Services (TSS). A possible virtual printer LTERM name can be validated and, when needed, translated into the virtual printer node name. Virtual printer LTERMs are created when needed, and additional elements are created shortly after output is ready to be sent to the printer.

This chapter explains how to set up virtual printers and virtual remote LTERMs, how to handle unsolicited output to undefined virtual LTERMs, and how to use the Timer facility.

Virtual Printer Setup

To activate virtual printers, create a Translate Subsystem Services (TSS) virtual printer table and specify its name in the IMSID basic options.

See “Translate Subsystem Services Tables” on page 47 for more information.
TSS Virtual Printer Table

To create a virtual printer, you must first define a TSS table.

A suggested name for this table is VPRINTER. The table consists of an 8-byte argument column and a 16- to 32-byte function column. The argument specifies an LTERM which can be used as a virtual printer while the function comprises a split node/model/modetable entry.

Specify each portion of the function column on the VPRINTER table as follows:

- For the node portion of the VPRINTER table, specify the appropriate VTAM node name to be used to create the virtual printer session.
- For the model portion of the VPRINTER table, specify any appropriate IMSGEN-defined printer definition to serve as the model to build a virtual printer session.
- For the optional modetable portion of the VPRINTER table, you may specify a modetable definition to be used for the virtual printer session. This modetable will override the one already defined for this node.

The Stage-1 Conversion Aid DLA#BILD can be useful when you initially load the TSS table. See “Stage-1 Conversion Aid” on page 86 for more information.

You can specify a table name other than VPRINTER on the Virtual Terminal Options panel, but you must have created a TSS table with that name. “Translate Subsystem Services Tables” on page 47 for more information.

Several virtual printer LTERMs may designate the same node name, functioning in a manner similar to multiple LTERM names for a printer created with an IMSGEN. When the same printer node name is specified in several function fields, it is important that each specify the same model name; otherwise, results may not be consistent. Virtual printer LTERMs cannot designate a IMSGEN-defined node.

The LTERM name must conform to IMS naming conventions. It may not duplicate an LTERM, transaction code, or remote LTERM defined in the IMSGEN or by DELTA IMS, which includes LTERMs added by the DELTA List Execute function or DELTA IMS VIRTUAL TERMINAL. The node name must be the name of a VTAM terminal of the type defined for the given model in the IMSGEN.

Table 8 on page 108 shows a sample VPRINTER table.

**Table 8: Sample Virtual Printer TSS Table**

<table>
<thead>
<tr>
<th>Argument &lt;LTERM-►</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;node-►</td>
</tr>
<tr>
<td></td>
<td>&lt;model-►</td>
</tr>
<tr>
<td></td>
<td>&lt;keyword=value-►</td>
</tr>
<tr>
<td>LTERM001</td>
<td>VPNODE01</td>
</tr>
<tr>
<td></td>
<td>VPMOD#01</td>
</tr>
</tbody>
</table>
As printers are removed from the IMSGEN, corresponding entries must be added to the VPRINTER table.

If the LTERM is specified in the TSS table VPRINTER, DELTA IMS VIRTUAL TERMINAL supports insertion of messages to a virtual printer LTERM via an alternate IO PCB.

**Virtual Printer Models**

DELTA IMS VIRTUAL TERMINAL uses models to create the control blocks for virtual printers. All virtual printer models must be defined as SLUTYPE1 devices, even those for 3284, 3286, and 3287 devices. If different IMSGEN-defined terminal features and options are required at different virtual printers, more than one model printer will be required. Use the VPRINTER table to define candidate virtual printers.

Virtual printers that use models defined to IMS with OPTIONS=DISCON are automatically logged off whenever the queue count is zero. The OPTIONS=DISCON parameter takes precedence over any virtual printer logoff interval you specify on the Virtual Terminal Limits panel. The parameter also takes precedence over the No Automatic Timeout option in a Virtual Printer Timer Override table.

Include a virtual printer model in the IMSGEN by specifying a TYPE macro with UNITYPE=SLUTYPE1. Do not specify the COMPT2, COMPT3, or COMPT4 keywords on the TYPE or TERMINAL macros. The first operand for the COMPT1 keyword must specify PRINTER1; the second and third operands are up to you to specify. DELTA IMS ignores the logical terminal name specified for the model definitions.
A sample virtual printer model is shown in Figure 65 on page 110. A question mark (?) indicates that you can specify a site-dependent value. When specifying virtual printer models, use only the keywords shown in the figure.

**Figure 65: Sample Virtual Printer Model Definition**

```
TYPE UNTYPE=SLUTYPE1
TERMINAL NAME=VPMOD#01, EDIT=?, MSGDEL=?, MODETBL=?,
COMPT1=(PRINTER1, ?, ?), SEGSIZE=!, OUTBUF=!,
OPTIONS=!
NAME VPMOD#01
```

## Virtual Printers

A virtual printer is created when IMS attempts to locate a destination unknown to the system. This occurs when an MPP or BMP does an insert to an alternate TP PCB for an unknown LTERM. Using TSS, DELTA IMS VIRTUAL TERMINAL attempts to translate the LTERM into the VPRINTER node name and model.

If translation fails, an appropriate status code for an unknown LTERM is returned to the application program. If the translation is successful, DELTA IMS VIRTUAL TERMINAL creates a virtual printer LTERM and performs the following actions.

DELTA IMS VIRTUAL TERMINAL uses IMS facilities to create the virtual printer LTERM and assign it to a virtual printer. DELTA IMS then writes an X'DE18' log record to the IMS system log. DELTA IMS VIRTUAL TERMINAL then searches the TSS Virtual Printer Timer Override table for an override value. This value is passed to the virtual terminal Timer facility.

See “Translate Subsystem Services Tables” on page 47 for more information on using TSS tables. For information on the related topic of virtual terminal exits, see “Using Virtual Terminal Exits” on page 125.

## Virtual Printer Autologon

DELTA IMS VIRTUAL TERMINAL supports the autologon of virtual printers.

**To enable the autologon capability**

1. The VTAM CINIT LUTYPE field in the VTAM PSERVIC parameter of the VTAM MODEENT macro must be X'01'. Example:

```
MODEENT LOGMODE=SCS,
  FMPROF=X'03',
  TSPROF=X'03',
  PRIPROT=X'01',
  SECPROT=X'90',
  COMPROT=X'3080',
  SRCVPAC=X'01',
```
Inoperative or Nonexistent Virtual Printer Devices

DELTA IMS VIRTUAL TERMINAL uses IMS facilities to create the virtual printer and assign the virtual LTERM to a user/SPQB of the same name. If the LTERM cannot be assigned, IMS will issue the appropriate error messages. You can then use standard IMS diagnostics to find and resolve the problem.

Virtual Remote LTERMs Setup

When an application program in an IMS system using the Multiple Systems Coupling (MSC) feature has to direct output to an LTERM on another IMS system, IMS requires that the target LTERM be IMSGEN-defined to each system; one as remote, the other as local. DELTA IMS VIRTUAL TERMINAL removes this requirement by creating virtual remote LTERMs.
TSS Virtual Remote LTERM Table

Specify a TSS table name to enable virtual remote LTERMs. The TSS table contains an eight-byte argument and an eight-byte function representing the virtual remote LTERMs and their corresponding MSNAMEs.

See “Translate Subsystem Services Tables” on page 47 for more information.

Virtual Remote LTERMs

A virtual remote LTERM is created when an MPP or BMP inserts output to an unknown LTERM destination. The virtual remote LTERM TSS table is searched for the required LTERM name; if it is found and if the associated MSNAME is valid, a temporary remote LTERM (RCNT) control block is created. The control block is created in the lowest level save area of the ITASKs save set, so it is only available to that ITASK.

There is no verification made that the LTERM actually exists in the target system; if it does not, the output is discarded when received by the target system. However, if the LTERM is also listed in the unsolicited output LTERM table on the target system, DELTA IMS VIRTUAL TERMINAL creates the required LTERM.

Since the remote LTERM definition is temporary, it never shows on a display of LTERMs and cannot be the target of any IMS operator commands. To display, change, or delete it, update and refresh the TSS table.

Virtual Printer Override

Using the /ASSIGN command to redirect the output from one virtual printer to another is called virtual printer override (VPO). VPO is useful when a production printer is inoperative and the printer’s output must be routed to a working printer.

You can redirect the virtual printer output to another virtual printer using the VPO parameter. See “Using IMS Operator Commands” on page 147 for an explanation of /ASSIGN command syntax.

While it is not necessary for the LTERM or the node to exist for a virtual printer override to take place, both must exist in the TSS VPRINTER table. The assignment is effective until another assignment is made or IMS is cold started.

When a VPO is performed, the /ASSIGN command creates an entry in an area called VTFVPOPL. This area is named during initialization through IMODULE GETMAIN, according to the amount of user-specified VPOs. The entry in VTFVPOPL links the
LTERM name from the TSS VPRINTER table with the node name and model name from the VPRINTER table. If the node name does not exist in the VPRINTER table but was created through the VTAM automatic logon feature and exists when the /ASSIGN command is issued, the LTERM will be assigned to this virtual node.

Virtual printer overrides are retained across warm and emergency restarts. VPOs are searched before the virtual printer table, thus making the table entry for the LTERM irrelevant when that LTERM is overridden. You do not need to update the table to correspond with the override.

VPOs are cancelled only by reissuing the /ASSIGN command that created the virtual printer override or cold starting the IMS system.

If a virtual printer LTERM is assigned to a IMSGEN-defined node or BTAM line and PTERM, a VPO control block is not created. If a virtual printer override control block already exists for the LTERM, it is deleted.

**Tip**
To use VPOs, you must have allowed a sufficient number of VPO entries in the IMSID options.

---

**Timer Facility for Virtual Printers**

The DELTA IMS VIRTUAL TERMINAL Timer facility provides a time monitoring facility to track activity on virtual terminals and printers. The Timer facility enables you to establish standard, alternate, or zero values for automatically logging off idle virtual printers and terminals. Under all versions of IMS, a zero value disables the Timer facility.

### Unattended Virtual Printer

The DELTA IMS VIRTUAL TERMINAL Timer facility tracks all idle printers and logs them off IMS after a period of time that you specify.

Optionally, DELTA IMS VIRTUAL TERMINAL can notify the IMS Master Terminal Operator each time a virtual printer has been automatically logged off or a conversation has been exited. See “Setting Virtual Terminal Limits” on page 28 for more information on setting virtual terminal limits.
Idle Printer Logoff

The idle printer logoff occurs if the virtual printer options for idle virtual printer logoff intervals are specified. The standard and alternate intervals specify the amount of time a virtual printer is inactive before an internal /CLDST command is issued. You can set the intervals at virtual printer creation time.

See “Setting Virtual Terminal Limits” on page 28 for more information on setting virtual terminal limits.

When DELTA IMS VIRTUAL TERMINAL logs off an idle virtual printer, LTERMs that have no status and no queued messages are deleted; LTERMs that have queued messages or some status remain assigned to the user/SPQB that was created when the virtual printer was logged on.

Note

LTERMs with no status and no messages queued may be retained when DELTA IMS VIRTUAL TERMINAL logs off a virtual printer by assembling the $DLAXOPT macro in the DLASAMP library using the DLA#XOPT member in the DLACNTL library. Specify DCNT=NO to implement this option.

Unsolicited Output to Undefined Virtual LTERMs

Application programs can send non-conversational messages to virtual LTERMs before the LTERM is initially defined.

In this way, an MPP or BMP program can create output for a terminal user before the user ever logs on or signs on to a virtual terminal. After completion of the logon/signon, the output messages are made available to the user.

The Unsolicited Output feature is invoked when IMS attempts to locate a destination (LTERM) that is unknown to the system. Before this feature is invoked, DELTA IMS VIRTUAL TERMINAL will first attempt to find the destination by searching the following types of LTERMs in the order presented below:

1. IMS GENed LTERMs, transactions, and remote LTERMs
2. LTERMs and transactions added by DELTA IMS DB/DC
3. Previously defined virtual LTERMs that are still in existence
4. Virtual remote LTERM TSS table (if system is MSC capable)
5 Virtual printer TSS table

6 Unsolicited output TSS table

At this point, DELTA IMS VIRTUAL TERMINAL attempts translation using the Unsolicited Output Support TSS table.

The LTERM is temporarily assigned to user/SPQB VTFBMCUS only for static ISC subpool destinations used as dynamic LTERMS. For all other destinations, the LTERM is assigned to a user/SPQB with the same name as the LTERM. Subsequently, application program insert, change, and purge calls for this LTERM proceed normally. No application program changes are required.

---

**Note**

Virtual printer LTERMs cannot be created using the Unsolicited Output TSS table; they must be entered in the VPRINTER TSS table.

---

To take advantage of the ability to send non-conversational messages to a terminal before the user signs on, specify a TSS table name on the Unsolicited Output field on the IMSID Options panel for virtual terminal TSS tables. Using TSS online panels or batch commands, define and load the table. The table argument is 8-bytes long and equals the LTERM name. The function is irrelevant, but TSS requires it to be specified; use a 1-byte function set equal to Y.

See “Translate Subsystem Services Tables” on page 47 for more information on TSS tables.

---

**WARNING**

Use of wildcard characters in the Unsolicited Output table LTERM name can result in invalid LTERM names.

---

If invalid LTERMs have been created via the Unsolicited Output table, delete them in the following manner:

1 Dequeue/purge any queued messages.

2 Log on to your node and sign on if necessary.

3 Issue a /STOP command for your user.

4 Issue an /ASSign command for the invalid LTERM to your user.

5 Issue a /START command for your user.

6 Log off from your node or issue a /CLOSE command for your node.
7 Issue the /CHE command.
Virtual Terminal Control Blocks

This chapter describes the use of control blocks provided with DELTA IMS VIRTUAL TERMINAL.

Introduction

DELTA IMS VIRTUAL TERMINAL uses seven control block types to define and access virtual terminals and printers. This chapter describes these control blocks. It also describes a special node, a special user/SPQB, and a macro interface which provides easy access to IMS and the virtual terminal control blocks. Finally, it discusses the use of the Timer facility with respect to virtual terminal control blocks.

Control Blocks

The following table shows the seven control block types used by DELTA IMS VIRTUAL TERMINAL.

<table>
<thead>
<tr>
<th>Control Block</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCD</td>
<td>Virtual terminal global area</td>
</tr>
<tr>
<td>VLB</td>
<td>Prefix for a virtual terminal control block concatenation</td>
</tr>
<tr>
<td>VCN</td>
<td>Prefix for a virtual LTERM or virtual user/SPQB</td>
</tr>
<tr>
<td>VPO</td>
<td>Virtual printer override</td>
</tr>
<tr>
<td>USB</td>
<td>Userid created by /SECURE ALLOW command</td>
</tr>
<tr>
<td>VTE</td>
<td>Virtual terminal pending element</td>
</tr>
</tbody>
</table>
Virtual Terminal Global Area

The virtual terminal global area (VCD) is normally the first CSECT in module VTFXVCDn. It stores constants, variables, and addresses used by all virtual terminal routines resident in the IMS control region. The load module containing the VCD is loaded by VTFXINTn during control region initialization and remains there until IMS shutdown.

Virtual Terminal Control Block

The virtual terminal control block (VLB) is created at logon exit time, and consists of a prefix and copies of the appropriate model CLB, CTB, CIB, CRB, and CTT control blocks. A suffix of one word is added to each virtual CLB. This suffix contains a code that identifies the control block as virtual.

**Figure 66: DELTA IMS VIRTUAL TERMINAL VLB Element**
While the VLB contains the IMS control blocks, the VLB DSECT only lists the virtual terminal prefix; the IMS control blocks are assumed to follow immediately and must be mapped by the appropriate IMS DSECTs. DELTA IMS VIRTUAL TERMINAL uses IMS facilities to create virtual terminal control blocks.

**Virtual Communications Name**

The virtual communications name (VCN) control block (also known as the LTERM) serves the same function as the IMS CNT. It consists of a virtual LTERM prefix, followed by the IMS CNT. DELTA IMS VIRTUAL TERMINAL uses IMS facilities to create virtual LTERM control blocks.

A suffix of one word is added to each virtual CNT. This suffix contains a code that identifies the control block as virtual.

**Virtual Printer Override**

The virtual printer override (VPO) consists of the virtual printer LTERM name and its override node and model name.

**User Signon Block**

The user signon block (USB) consists of a userid that has been specified by the /SECURE ALLOW command. It is created by the command processor from storage in the USB pool (VTFUSBPL). USBs are chained in LIFO order and are deleted by the /SECURE CLEAR command.

**Virtual Terminal Pending Element**

The virtual terminal pending element (VTE) consists of the virtual terminal node name and its specified trace level, module specification, and MFS TEST status.

*Note*

When Resource Manager (RM) is active, virtual terminal status is no longer kept in VTE control blocks, and VTE entries are no longer created for the /EXCL, /STOP, /TEST, and /TRACE commands.

When an IMSID specifies a non-zero value for the maximum virtual terminal pending entries, a VTE is created when any of the following situations occurs:
- A /STO NODE *nodename* command is issued against a nonexistent node.
- A /STO USER *username* command is issued against a nonexistent user/SPQB.
- A /EXC USER *username* command is issued against a nonexistent user/SPQB.
- A /TEST MFS NODE *nodename* command is issued against a nonexistent node.
- A /TEST MFS USER *username* command is issued against a nonexistent user/SPQB.
- A /TRACE SET ON VT *nodename* command is issued against a nonexistent node.
- A user logs on to IMS, issues /TEST MFS command, then logs off without issuing /END command.

VTE entries are used to ensure that the status set with any of the above commands is set when the node or user becomes active. Once the node becomes active, the specific status is transferred to the associated user/SPQB. If the user logs off without resetting the status, the user/SPQB is not deleted. In this case, the VTE entry continues to exist, but it is not used as long as the user/SPQB exists.

### Special Element Created by DELTA IMS VIRTUAL TERMINAL

DELTA IMS VIRTUAL TERMINAL creates a special IMS element.

The user/SPQB, VTFBMCUS, is always present when DELTA IMS VIRTUAL TERMINAL is active in the IMS system. VTFBMCUS is a general-purpose control block. Virtual LTERMs are assigned to VTFBMCUS *only for* static ISC subpool destinations used as dynamic LTERMS when DELTA IMS VIRTUAL TERMINAL creates an LTERM specified in the unsolicited output Translate Subsystem Services (TSS) table.

When DELTA IMS VIRTUAL TERMINAL logs off an idle virtual terminal that has messages queued or conversations assigned to it, all LTERMS that have messages queued to them remain assigned to the user/SPQB that was created for the virtual terminal at logon. Conversations are assigned from the virtual terminal to the user/SPQB and maintain the conversational status they held at the time the terminal was deleted.

DELTA IMS VIRTUAL TERMINAL observes IMS rules for connecting conversation control blocks (CCBs) and LTERM control blocks (CNTs) to user/SPQB control blocks (SPQBs).
Macro $VTFCBS

A macro interface is provided with DELTA IMS VIRTUAL TERMINAL to simplify accessing IMS and virtual terminal control blocks. The macro interface, $VTFCBS, can be used in user-written exits and in modifications made to IMS code that execute in the IMS control region. While the interface is supplied with DELTA IMS VIRTUAL TERMINAL, the interface is not dependent upon the product being installed in the IMS system. It will support virtual terminal control blocks if installed. Macro $VTFCBS options are shown in the following table.

Table 10: Macro $VTFCBS Format

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIND</td>
<td>For CLB: Locate by node name or line number. The CLB address is returned in R1. For CTB: Locate by line number, PTERM number, or node name. The CTB address is returned in R1. For CNT: Locate by LTERM name. The CNT address is returned in R1.</td>
</tr>
<tr>
<td>TEST</td>
<td>For CLB, CTB, or CNT: Determines if the address given is valid.</td>
</tr>
<tr>
<td>SCAN</td>
<td>For CLB, CTB, or CNT: To obtain the address of the first control block, the address specified should be 0. To obtain the address of the next control block in sequence, specify the address of the prior control block. IMSGEN-defined control blocks are returned first, followed by virtual control blocks. No attempt is made to ensure that these lists are obtained in or merged into alphanumeric sequence.</td>
</tr>
<tr>
<td>CLB=, CTB=, CNT=</td>
<td>The address may be specified as a register, for example, Cxx=(R4); as storage, for example, Cxx=LABEL; or as 0. In these examples, Cxx is CLB, CTB or CNT. One of these keywords can be specified to the exclusion of the other two.</td>
</tr>
<tr>
<td>AM=</td>
<td>Used to limit CLB and CTB scanning to either BTAM or VTAM control blocks (with BOTH as default). AM= is ignored for non-SCAN functions and for scanning CNT blocks.</td>
</tr>
<tr>
<td>SCD=</td>
<td>The address of the IMS SCD. The default is R11.</td>
</tr>
<tr>
<td>ROUTINE=</td>
<td>The address of the VTXCBSn routine. The default is =V(VTXCBSn).</td>
</tr>
</tbody>
</table>

Note

If you specify a storage address rather than a register, the storage address is assumed to contain the address of the control block, not the control block itself.

Macro $VTFCBS is used in conjunction with CSECT VTXCBSD and is supplied in source and load form with DELTA IMS VIRTUAL TERMINAL. The macro can be used as required in your routines. Make sure the CSECT is link-edited with your routines.
You can use the macro instruction $VTFMAP to produce DSECTs that map each virtual terminal control block. $VTFMAP is coded as follows:

```
$VTFMAP  xxx=0
```

where `xxx` is the three-letter name of the control block desired.

Standard linkage conventions are observed by VTFXCBSn. Ensure that the calling program’s registers are saved before invoking the $VTFCBS macro to call VTFXCBSn. General register R13 should reference a standard IMS save area in which there are at least six remaining save areas in the save set, which is usually the case without any special action.

$VTFCBS outputs a return code in general register R15, with general register R1 containing the address of the block returned, as described in the following table.

The following table shows the output of the $VTFCBS macro:

*Table 11: Macro $VTFCBS Output*

<table>
<thead>
<tr>
<th>Register</th>
<th>Return Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>---</td>
<td>Contains the address of the control block in question for the FIND and SCAN functions.</td>
</tr>
<tr>
<td>R15</td>
<td>0</td>
<td>The address of the control block in question has been returned to R1 or is valid.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>No more blocks remain (for the SCAN function).</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Invalid name, line, PTERM, or address.</td>
</tr>
</tbody>
</table>

**BTAM Line and PTERM Number Formats**

To retrieve a BTAM CLB, the line number must be presented as a full word line number.

To retrieve a BTAM CTB, the line and PTERM numbers must be presented as a full word line number followed by a full word PTERM number. DELTA IMS VIRTUAL TERMINAL tests the first two bits of the line number to determine whether a line number or node name has been supplied. If the bits are zero, the product assumes line number.

For example, if you wish to retrieve LINE 5 PTERM 14 (/DIS LINE 5 PTERM 14), your program must include the following:

```
$VTFCBS FIND,CTB=LINEPTRM,AM=BTAM
- -
```
LINEPTRM DS OD
LINE   DC A(5)
PTRM   DC A(14)
Using Virtual Terminal Exits

DELTA IMS VIRTUAL TERMINAL provides eight virtual terminal sample exit routines. This chapter describes the sample exit routines and the macro, $VTFTEST, which can be used to test whether a terminal or LTERM is virtual.

Macro $VTFTEST

DELTA IMS VIRTUAL TERMINAL provides a standard macro instruction that allows site-written programs to test whether a terminal or LTERM is virtual or not. The macro, $VTFTEST, performs a simple test to determine whether the control block is virtual and then branches accordingly to one of two addresses you supply.

Table 12 on page 125 shows the macro format and options that is the responsibility of your application program to establish addressability to the terminal (CLB) or LTERM (CNT) control block.

Table 12: Macro $VTFTEST Format

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST=</td>
<td>Specifies whether a CLB or CNT is to be tested.</td>
</tr>
<tr>
<td>V=</td>
<td>The branch address if the block is virtual.</td>
</tr>
<tr>
<td>NV=</td>
<td>The branch address if the block is non-virtual.</td>
</tr>
</tbody>
</table>

Virtual Terminal Sample Exit Routines

The following table lists and describes the sample exit routines.
Table 13: Virtual Terminal Sample Exit Routines

<table>
<thead>
<tr>
<th>Sample Exit Routine Name</th>
<th>Exit Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logon Exit Sample Routine</td>
<td>Specifies the name of a virtual terminal logon model. The Translate Subsystem is invoked to translate the device type and screen size into a model name using the standard logon model table.</td>
</tr>
<tr>
<td>Logon Exit Sample Routine 1</td>
<td>Specifies the name of a virtual terminal logon model. The Translate Subsystem is invoked to find the VTAM node name associated with the terminal logging on in the table and to return the model name. If this translate fails, the default logon models are used.</td>
</tr>
<tr>
<td>Logon Exit Sample Routine 2</td>
<td>Performs translates on two TSS tables. The first translate looks for the node logging on in a node-to-logon model table to determine the logon model to use for the node. If this translate fails, then the next translate looks for the bind parameters in the standard logon model table.</td>
</tr>
<tr>
<td>Signon Bypass Exit Sample Routine</td>
<td>Provides an alternative LTERM assignment method for sites which do not require IMS signon. The Translate Subsystem translates the node name into an LTERM name. The LTERM name is checked to see if the virtual terminal Timer facility applies.</td>
</tr>
<tr>
<td>Signon Exit Sample Routine 1</td>
<td>Sets the LTERM name as the VTAM node name. This is the default Signon Exit routine, and it is provided with DELTA IMS VIRTUAL TERMINAL in load module form.</td>
</tr>
<tr>
<td>Signon Exit Sample Routine 5</td>
<td>Converts userid into LTERM. The LTERM name is checked to see if the virtual terminal Timer facility applies.</td>
</tr>
<tr>
<td>Signon Exit Sample Routine 7</td>
<td>Allows you to limit the number of times a specific userid can sign on if the LTERM name assigned is not derived from the userid.</td>
</tr>
<tr>
<td>Signon Exit Sample Routine 9</td>
<td>Allows up to eight virtual LTERMs to be created for sites that use the userid as the virtual LTERM name.</td>
</tr>
</tbody>
</table>

Using the Virtual Terminal Exit Assembly Guide

You must assemble and link-edit a virtual terminal exit into the APF-authorized library as member name VTFEXITn. After the assembly, recycle IMS.

When modifying any of the sample exit routines, note that the assembler code for the exit is not present in the member which is assembled by the assembly JCL. The exit is embedded by a member whose last character is D, signifying the IMS version.

A zero completion code for the link-edit of VTFEXITn is required. Any unresolved external reference messages, IEW0461 (linkage editor) or IEW2454W (binder), issued during the link-edit should be researched.
Table 14 on page 127 lists the names of members in VTFSAMP and VTCNCTL that contain the various virtual terminal sample exit routines; the members which embed them during assembly and link-edit; and the JCL job streams used for the assembly.

Table 14: Virtual Terminal Sample Exit Routines Assembly Guide

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DLA#SIGN</td>
<td>VTFEXS14</td>
<td>VTFEXS15</td>
<td>VTFEXS16</td>
<td>VTFEXS1X</td>
<td>Signon Exit Sample Routine 1</td>
</tr>
<tr>
<td>DLA#SIGN</td>
<td>VTFEXS34</td>
<td>VTFEXS35</td>
<td>VTFEXS36</td>
<td>VTFEXS3X</td>
<td>Signon Exit Sample Routine 3</td>
</tr>
<tr>
<td>DLA#SIGN</td>
<td>VTFEXS54</td>
<td>VTFEXS55</td>
<td>VTFEXS56</td>
<td>VTFEXS5X</td>
<td>Signon Exit Sample Routine 5</td>
</tr>
<tr>
<td>DLA#SIGN</td>
<td>VTFEXS74</td>
<td>VTFEXS75</td>
<td>VTFEXS76</td>
<td>VTFEXS7X</td>
<td>Signon Exit Sample Routine 7</td>
</tr>
<tr>
<td>DLA#SIGN</td>
<td>VTFEXS94</td>
<td>VTFEXS95</td>
<td>VTFEXS96</td>
<td>VTFEXS9X</td>
<td>Signon Exit Sample Routine 9</td>
</tr>
<tr>
<td>DLA#SGNB</td>
<td>VTFEXBX4</td>
<td>VTFEXBX5</td>
<td>VTFEXBX6</td>
<td>VTFEXBXX</td>
<td>Signon Bypass Exit Sample Routine</td>
</tr>
<tr>
<td>DLA#LGNX</td>
<td>VTFEXLX4</td>
<td>VTFEXLX5</td>
<td>VTFEXLX6</td>
<td>VTFEXLXX</td>
<td>Logon Exit Sample Routine</td>
</tr>
<tr>
<td>DLA#LGN1</td>
<td>VTFEXL14</td>
<td>VTFEXL15</td>
<td>VTFEXL16</td>
<td>VTFEXLXX</td>
<td>Logon Exit Sample Routine 1</td>
</tr>
<tr>
<td>DLA#LGN2</td>
<td>VTFEXL24</td>
<td>VTFEXL25</td>
<td>VTFEXL26</td>
<td>VTFEXLXX</td>
<td>Logon Exit Sample Routine 2</td>
</tr>
</tbody>
</table>

Logon Exit Sample Routine

Use the Logon Exit sample routine to provide a logon model name for a virtual terminal logging on to IMS. The logon model is used to provide default terminal characteristics for the new virtual terminal.

The Logon Exit routine is entered after the VTAM Logon exit is driven for the terminal logging on and before entry to the Logon routine in DFSCNXA0. The routine runs under an interrupt request block (IRB) that preempts other IMS control region processing. Processing does not resume until after the routine completes.
Before You Begin

Review the IMSID Basic Options panel number 6 in this book to determine the current settings.

To INVOKE a Logon Exit routine you must select option 3, Call customer-modified logon exit, from the IMSID Basic Options panel number 6 and then save the options. For more information, see “Selecting a Virtual Terminal Logon Technique” on page 36.

Setting Logon Exit Routine Conditions

You must set the following conditions for any Logon Exit routine used by DELTA IMS VIRTUAL TERMINAL:

- Set one of the following return codes in Register R15: 0=OK or 4=Refuse logon.
- If the return code is 0, then register R0 must contain the address of a virtual terminal model name.
- Observe standard IMS linkage and register saving/restoring conventions.
- Adhere to the entry register requirements described in the following table.

Table 15: Register Contents at Logon Exit Entry

<table>
<thead>
<tr>
<th>Register</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Address of logon parameters</td>
</tr>
<tr>
<td>R3</td>
<td>Address of session parameters</td>
</tr>
<tr>
<td>R4</td>
<td>Address of device characteristics</td>
</tr>
<tr>
<td>R8</td>
<td>Address of 2048 byte work area</td>
</tr>
<tr>
<td>R5</td>
<td>Address of VTAM logmode entry</td>
</tr>
<tr>
<td>R10</td>
<td>Address of VCDDSECT</td>
</tr>
<tr>
<td>R11</td>
<td>Address of SCD</td>
</tr>
<tr>
<td>R13</td>
<td>Address of save area</td>
</tr>
<tr>
<td>R14</td>
<td>Return address</td>
</tr>
<tr>
<td>R15</td>
<td>Entry point address</td>
</tr>
</tbody>
</table>
Using the Logon Exit Sample Routine

The Logon Exit sample routine provided with DELTA IMS VIRTUAL TERMINAL derives a logon model name through the use of the Translate Subsystem. The TSS table LMODEL is presented with an argument consisting of the physical terminal and the screen size. TSS responds by providing the name of a logon model included in your IMSGEN.

Before calling the Logon Exit sample routine, DELTA IMS VIRTUAL TERMINAL performs a VTAM INQUIRE to determine device type and screen size from the PSERVIC entry in VTAM. The translate call is done to a TSS table named "LMODEL." The result field should be the name of a sysgened logon model. If you wish to use a TSS Table name other than LMODEL, you must change all occurrences of LMODEL in this exit.

The argument field is structured: TYPEXY

where:

TYPE is 3270, SLU1, SLU2 or SLUP

The type is derived from the first byte of the PSERVIC parameter of the MODETABLE. Check with your VTAM systems programmer for the appropriate MODETABLE definitions.

<table>
<thead>
<tr>
<th>00</th>
<th>=</th>
<th>3270</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>=</td>
<td>SLU1</td>
</tr>
<tr>
<td>02</td>
<td>=</td>
<td>SLU2</td>
</tr>
<tr>
<td>00</td>
<td>=</td>
<td>SLUP if TSPROF = 04</td>
</tr>
</tbody>
</table>

Note

SLUTYPE3 can be supported as SLUTYPE1.

where X is the primary screen size:

<table>
<thead>
<tr>
<th>00</th>
<th>=</th>
<th>3270</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>=</td>
<td>SLU1</td>
</tr>
<tr>
<td>02</td>
<td>=</td>
<td>SLU2</td>
</tr>
<tr>
<td>00</td>
<td>=</td>
<td>SLUP if TSPROF = 04</td>
</tr>
</tbody>
</table>

where Y is the alternate screen size, the values are the same as above.

Example: PSERVIC information found in bind is as follows:
Therefore, the following argument would be used for the TSS TRANSLATE:

SLU222

The corresponding entry in the TSS LMODEL table would be the following argument and functional result:

<table>
<thead>
<tr>
<th>Argument</th>
<th>Functional Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLU222</td>
<td>SLU2MDL&lt;br&gt;Where: SLU2MDL is the SLUTYPE2 MOD 2 logon model</td>
</tr>
</tbody>
</table>

**Setting IMSID Basic Options**

The Logon Exit sample routine obtains the name of the logon model TSS table from the IMSID basic options for the active IMS control region. You must specify this TSS table name as part of the virtual terminal logon model node name selection options.

**Logon Exit Sample Routine 1**

Use the Logon Exit sample routine 1 to provide a logon model name for a virtual terminal logging on to IMS. The logon model is used to provide default terminal characteristics for the new virtual terminal.

Enter the Logon Exit sample routine 1 after the VTAM Logon exit is driven for the terminal logging on and before entry to the Logon routine in DFSCNXA0. The routine runs under an interrupt request block (IRB) that preempts other IMS control region processing. Processing does not resume until after the routine completes.
Before You Begin

Review the IMSID Basic Options panel number 6 in this book to determine the current settings.

To INVOKE a Logon Exit routine you must select option 3, Call customer-modified logon exit, from the IMSID Basic Options panel number 6 and then save the options. See “Selecting a Virtual Terminal Logon Technique” on page 36, for more information.

Setting Logon Exit Routine 1 Conditions

You must set the following conditions for any Logon Exit routine used by DELTA IMS VIRTUAL TERMINAL:

- Set one of the following return codes in Register R15: 0=OK or 4=Refuse logon.
- If the return code is 0, then register R0 must contain the address of a virtual terminal model name.
- Observe standard IMS linkage and register saving/restoring conventions.
- Adhere to the entry register requirements described in “Setting Logon Exit Routine Conditions” on page 128.

Using the Logon Exit Sample Routine 1

The Logon Exit sample routine 1 provided with DELTA IMS VIRTUAL TERMINAL derives a logon model name through the use of the Translate Subsystem. The TSS table LMODEL is presented with an argument consisting of the physical terminal VTAM node name associated with the terminal logging on. TSS responds by providing the name of a logon model included in your IMSGEN. If the node name is not located in the LMODEL table, the logon exit will attempt to determine the device type based on the bind parameters and use one of the four default logon models supplied in the IMSID Basic Options panel number 6.

The TSS table LMODEL for this exit has an 8-character argument length and an 8-character functional result. The argument is the VTAM node name and the functional result is the logon model as defined in your IMSGEN which should be used for this terminal.
Setting IMSID Basic Options

The Logon Exit sample routine obtains the name of the logon model TSS table from the IMSID basic options for the active IMS control region. You must specify this TSS table name as part of the virtual terminal logon model node name selection options.

Logon Exit Sample Routine 2

Use the Logon Exit sample routine 2 to perform translates on two TSS tables. The first translate looks for the node logging on in a node-to-logon model table to determine the logon model to use for the node. If this translate fails, then the next translate looks for the bind parameters in the standard logon model table.

The Logon Exit sample routine 2 is entered after the VTAM Logon exit is driven for the terminal logging on and before entry to the Logon routine in DFSCNXA0. The routine runs under an interrupt request block (IRB) that preempts other IMS control region processing. Processing does not resume until after the routine completes.

Before You Begin

Review the IMSID Basic Options panel number 6 in this book to determine the current settings.

To INVOKE a Logon Exit routine you must select option 3, Call customer-modified logon exit, from the IMSID Basic Options panel number 6 and then save the options. See “Selecting a Virtual Terminal Logon Technique” on page 36, for more information.

Setting Logon Exit Routine 2 Conditions

You must set the following conditions for any Logon Exit routine used by DELTA IMS VIRTUAL TERMINAL:

- Set one of the following return codes in Register R15: 0=OK or 4=Refuse logon.
- If the return code is 0, then register R0 must contain the address of a virtual terminal model name.
- Observe standard IMS linkage and register saving/restoring conventions.
Adhere to the entry register requirements described in “Setting Logon Exit Routine Conditions” on page 128.

Using the Logon Exit Sample Routine 2

This module is called for each virtual terminal VTAM logon. The purpose of the routine is to return the name of a sysgenned VTAM terminal that can be used as a model for creating the control blocks for the terminal attempting to logon.

This implementation of the VTF Logon Exit uses the Translation Subsystem (TSS) to translate the node name into a model name. If the node is not found in the TSS table, the exit attempts to determine the device type and screen size, and performs a second TSS translate to the LMODEL table to determine a logon model.

The first translate is to a node-to-logon model table. The argument is the node name, and the functional result will be the logon model. This is a hard-coded table named "NMODEL." You must create a TSS table by that name unless you change all occurrences of NMODEL in this exit to the table name you wish to use.

The node-based TSS table used by this exit is structured as follows:

**ARGUMENT:** 8-byte VTAM node name padded with blanks

**RESULT:** 8-byte sysgenned terminal logon model name

The Second translate call is only done if the first translate call to the NMODEL table did not find the node name. The Exit does a VTAM Inquire to determine device type and screen size from the PSERVIC entry in VTAM. The translate call is done to a hard-coded TSS table named "LMODEL." You must create a table by this name with the argument as specified below. The result field should be the name of a sysgenned logon model. If you wish to use a TSS Table name other than LMODEL, you must change all occurrences of LMODEL in this exit.

See “Using the Logon Exit Sample Routine” on page 129 for an explanation of how the argument field is built.

Setting IMSID Basic Options

The TSS table names NMODEL and LMODEL are hard-coded in this exit routine and are not specifiable via the IMSID basic options.
Signon Bypass Exit Sample Routine

The Signon Bypass Exit sample routine can be used when you have a combination of terminal users who must sign on and others who are not required to sign on. Those users who will bypass signon will have their LTERM assigned as determined by the Signon Bypass exit. The terminal users who are not assigned an LTERM during this process will be required to sign on. They will be assigned an LTERM according to the signon options specified on the IMSID Basic Options panel.

When IMS signon is not required, use the Signon Bypass Exit sample routine to specify the LTERM name, and to call the virtual terminal Timer facility. The Signon Bypass Exit sample routine receives control prior to initial entry to the IMS Communication Analyzer (DFSICIO0) during the logon process. This exit is called before the DFS3649A message is displayed at the terminal.

The URMDSECT addressed by R1 contains the node name that is in the process of logging on. This routine is required to provide an LTERM name in URMLTERM or issue return code 4. If return code 4 is issued, a transient LTERM name is assigned according to your customization options, and signon is required. You can set byte URMFLAG2 to URM2ATTL (alternate time out) or URM2NOTO (do not time out).

The Signon Bypass Exit Sample Routine can also provide overrides for the virtual terminal Timer facility. The TSS table LTERMOR (LTERM-Override) controls these overrides. The LTERMOR table also contains arguments and functions. The LTERM name acts as the argument. The function is designated as A (alternate time-out value) or N (never time-out this terminal).

Before You Begin

Review the IMSID Basic Options panel number 7 in this book to determine the current settings.

To invoke a Logon Exit routine you must select option 3, Call customer-modified logon exit, from the IMSID Basic Options panel number 6 and then save the options. See “Selecting a Virtual Terminal Signon Bypass Technique” on page 38, for more information.

Using Multiple LTERMs

When multiple LTERMs are used for a virtual terminal, each LTERM name is returned in the URMXLIST extension area.
At entry, R2 contains the address of this area. It consists of 255 24-byte entries. In each entry, the first 8 bytes are reserved for the LTERM name and the second 8 bytes for the profile name. The final 8 bytes are reserved and should be left at 0. Entries are used from beginning to end. The count of entries used is returned in URMCOUNT. In the extension, the LTERM name is stored in URMLTNAM, and the profile name is stored in URMSECNM.

**Note**

To use this feature, you must have selected the option "Support multiple concurrent LTERMs for Virtual Terminals," on the IMSID Basic Options panel (Page 4 of 8).

**Using URMCOUNT**

URMCOUNT is a one-byte binary number with the following conventions:

- URMCOUNT=0 - LTERM name returned in URMLTERM
- URMCOUNT=1 to 255 - LTERM names are returned in the extension list

**Using the Work Area**

At entry, R4 contains the address of a 3072 byte work area that is used as needed. However, set aside the last 2048 bytes of this area for translation services.

**Setting Signon Bypass Exit Routine Conditions**

You must set the following conditions for any Signon Bypass Exit sample routine used by DELTA IMS VIRTUAL TERMINAL:

- Set one of the following return codes in Register R15: 0=OK or 4=Signon is required.
- Return one or more LTERM names. This is the exit’s only required function.
- Designate whether this virtual terminal should have any virtual terminal Timer facility time-out values. If no time-out values apply, set URMFLAG2 with the URM2NOTO bit.
- Designate whether this virtual terminal should have alternate virtual terminal Timer facility time-out values. If these alternate values apply, set URMFLAG2 with the URM2ATTL bit.
- If you want the node name to be used as the user/SPQB name, set URMFLAG2 with the URM2USND bit.
- Observe standard IMS linkage and register saving/restoring conventions.
- Adhere to the entry register requirements described in Table 16 on page 136.

### Table 16: Register Contents at Signon Bypass Exit Entry

<table>
<thead>
<tr>
<th>Registers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Address URMDSECT</td>
</tr>
<tr>
<td>R2</td>
<td>Address of LTERM name/profile name list area</td>
</tr>
<tr>
<td>R4</td>
<td>Address of work area</td>
</tr>
<tr>
<td>R7</td>
<td>Address of CTB</td>
</tr>
<tr>
<td>R9</td>
<td>Address of CLB</td>
</tr>
<tr>
<td>R10</td>
<td>Address of VCDDSECT</td>
</tr>
<tr>
<td>R11</td>
<td>Address of SCD</td>
</tr>
<tr>
<td>R13</td>
<td>Address of save area</td>
</tr>
<tr>
<td>R14</td>
<td>Return address</td>
</tr>
<tr>
<td>R15</td>
<td>Entry point address</td>
</tr>
</tbody>
</table>

### Using Signon Bypass Exit Sample Routine

The Signon Bypass Exit sample routine uses TSS table NLTERM (Node-to-LTERM) to assign the LTERM name. This table is used under all versions of IMS, even though LTERMs are not assigned directly to nodes.

The TSS table NLTERM consists of 8-byte arguments and the corresponding result field. Bytes 1 through 8 of the result field provide the LTERM name.

Virtual terminal Timer facility values are controlled by TSS table LTERMOR (LTERM-Override). The table consists of arguments that are the LTERM names and functions specified as A (alternate values) or N (never time-out this terminal).

### Setting IMSID Basic Options

The Signon Bypass Exit sample routine refers to various fields in the IMSID basic options for the active IMS control region.
You must specify whether you want multiple concurrent LTERM support and the name of the Node-to-LTERM TSS table. Additionally, you can specify the optional LTERM Timer Override TSS table name to control virtual terminal time-out processing. The IMSID basic options must not require virtual terminals to sign on.

**Signon Exit Sample Routines**

Five Signon Exit sample routines are provided with DELTA IMS VIRTUAL TERMINAL.

You can use these exits in unaltered form, or you can modify them as required to suit the unique needs of your site, provided that the new Signon Exit routine adheres to the conditions discussed on “Setting Signon Exit Routine Conditions” on page 138.

Use a Signon Exit sample routine to specify LTERM names, the signon model name, and alternate values for the virtual terminal Timer facility. A Signon Exit routine is called before a successful IMS signon and before the DFS3650 "SESSION STATUS" message is issued.

DELTA IMS VIRTUAL TERMINAL does not use the standard IMS Signon Exit routine, DFSCSGN0, which has already been driven.

The URMDSECT addressed by R1 contains the node name and userid for the user signing on. This routine is required to provide an LTERM name in URMLTERM or issue return code 4. If return code 4 is issued, then a transient LTERM is assigned according to your customization options.

You can set byte URMFLAG2 to URM2ATTL (use an alternate time-out) or URM2NOTO (do not time out this terminal).

**Before You Begin**

Review the IMSID Basic Options panel number 8 in this book to determine the current settings.

To create a Signon Exit routine you must select option 4 - Call customer-modified signon exit, from the IMSID Basic Options panel number 6 and then save the options. See “Selecting a Virtual Terminal Signon Technique” on page 40, for more information.
Using Multiple LTERMs

When multiple LTERMs are used for a virtual terminal, each LTERM name is returned in the URMXLIST extension area.

At entry, R2 contains the address of this area. It consists of 255 24-byte entries. In each entry, the first 8 bytes are reserved for the LTERM name and the second 8 bytes are for the profile name. The last 8 bytes are reserved and should be left 0. Entries are used from beginning to end. The count of entries used is returned in URMCOUNT. In the extension, the LTERM name is stored in URMLTNAM, and the profile name is stored in URMSECNM.

---

**Note**
To use this feature, you must have selected the option "Support multiple concurrent LTERMs for Virtual Terminals," on the IMSID Basic Options panel (Page 4 of 8).

---

Using URMCOUNT

URMCOUNT is a 1-byte binary number with the following conventions:

- URMCOUNT= 0 - LTERM name is returned in URMLTERM
- URMCOUNT=1 to 255 - LTERM names are returned in the extension list

Using the Work Area

At entry, R4 contains the address of a 3072-byte work area that is used as needed. However, set aside the last 2048 bytes of this area for translation services.

Setting Signon Exit Routine Conditions

You must set the following conditions for any Signon Exit routine used by DELTA IMS VIRTUAL TERMINAL:

- Set one of the following return codes in Register R15: 0=OK or 4=signon refused.
- Set the URMLTERM field to the LTERM name for the user signing on. This is the exit’s only required function.
- Indicate the name of a model node from which device characteristics, such as screen size and other IMS-related terminal options, can be copied. Use the field URMMODEL to specify the name of the model device.

- Designate whether this user should have any virtual terminal Timer facility time-out values. If no time-out values apply, set URMFLAG2 to URM2NOTO (do not time out this terminal).

- Designate whether this user should have alternate virtual terminal Timer facility time-out values. If these alternate values apply, set URMFLAG2 with the URM2ATTL bit.

- If you want the node name to be used as the user/SPQB name, set URMFLAG2 with the URM2USND bit.

- Observe standard IMS linkage and register saving/restoring conventions.

- Adhere to the entry register interface described in Table 17 on page 139.

### Table 17: Register Contents at Signon Exit Entry

<table>
<thead>
<tr>
<th>Registers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0</td>
<td>0 entry code = signon</td>
</tr>
<tr>
<td>R1</td>
<td>Address URMDSECT</td>
</tr>
<tr>
<td>R2</td>
<td>Address of LTERM/profile name list area</td>
</tr>
<tr>
<td>R4</td>
<td>Address of work area</td>
</tr>
<tr>
<td>R7</td>
<td>Address of CTB</td>
</tr>
<tr>
<td>R9</td>
<td>Address of CLB</td>
</tr>
<tr>
<td>R10</td>
<td>Address of VCDDSECT</td>
</tr>
<tr>
<td>R11</td>
<td>Address of SCD</td>
</tr>
<tr>
<td>R13</td>
<td>Address of save area</td>
</tr>
<tr>
<td>R14</td>
<td>Return address</td>
</tr>
<tr>
<td>R15</td>
<td>=Entry point address</td>
</tr>
</tbody>
</table>

### Signon Exit Sample Routine 1

Signon Exit Sample Routine 1 is the simplest Signon Exit routine provided with DELTA IMS VIRTUAL TERMINAL. This routine sets the virtual terminal LTERM name using the VTAM node name or the signed-on userid based upon an IMSID
basic option. You must correctly specify the userid instead of the node name in the signon selection technique IMSID basic option.

**Signon Exit Sample Routine 3 and RACF**

Like Signon Exit Sample Routine 1, Signon Exit Sample Routine 3 sets the virtual terminal LTERM name using the VTAM node name or the signed-on userid based upon the same IMSID basic option. This routine also retrieves additional variable override data from RACF. This information is entered in the **RACF DATA** field, and is stored by userid. The information can specify that virtual terminal Timer facility alternate time-out values are to be used. This information can also override the LTERM specified by the Signon Exit routine.

The version of IMS you are running determines when this exit is invoked in relation to RACF signon.

This exit is invoked before RACF completes signon. You can use this exit to set the virtual terminal LTERM name, but you cannot use it to retrieve the override data from RACF.

---

**Note**

Virtual LTERM names must conform to the resource naming rules outlined in the IBM publication IMS System Definition Reference Manual.

---

You can include the override data more than once, allowing one specification for one IMS system, for example, and another for all IMS systems. If your site already uses the **DATA** field for other purposes, the override data can be appended to or included within it, as long as it conforms to the formatting conventions explained in “Setting Signon Exit Routine Conditions” on page 138.

At signon time, DELTA IMS VIRTUAL TERMINAL reads the RACF **DATA** field and analyzes and applies the override data, if it is specified. When locating the override data within the RACF **DATA** field, it first scans for a unique IMSID and if not found, then for **IMS** for all IMS systems.

Use the ALTER USER (ALU) command to specify the override data to RACF for existing userids, or the ADD USER (AU) command for new userids. The following example statements use these commands:

- Specify RACF DATA field for new userid **JCB**. Alternate automatic logoff intervals are indicated for any IMS system to which **JCB** signs on.

  
  ```
  AU JCB DATA('IMS(,,,A)')
  ```

- Specify RACF DATA field for existing userid **RLS**. Override the LTERM name to **SDT01201** when **RLS** signs on to IMSID **TIMS**. **RLS** already had accounting data...
for another application specified in the DATA field; You must specify this
information again in the update.

```
ALU RLS DATA('acctgdata TIMS(,,SDT01201)')
```

■ Specify RACF DATA field for existing userid *MTJ*, Override the LTERM to
LTERMP01 for IMSID *PIMS*, and to LTERMT99 for all other IMS systems.

```
ALU MTJ DATA('PIMS(,,LTERMP01) IMS(,,LTERMT99)')
```

An example override data statement is shown below:

```
IMS | imsid(amodel,bmodel,lterm,o)
```

**IMS | imsid**

Indicates whether the override data applies to one specific IMSID or all IMS
systems. DELTA IMS VIRTUAL TERMINAL searches for the specific IMSID
first; if not found, it then searches for IMS. If neither are found, no override
information is used for this userid.

**amodel**

Name of an IMSGEN-defined 3270-type signon model terminal which
specifies terminal options and screen size to override the logon model for this
user. The *amodel* field is ignored if the user logs on to a bmodel-type device,
and vice versa. This is an optional operand which generally should not be
used.

**bmodel**

Name of an IMSGEN-defined SLUTYPE2 signon model terminal, which
specifies terminal options and screen size to override the logon model for this
user. The *bmodel* field is ignored if the user logs on to an amodel-type
device, and vice versa. This is an optional operand which generally should
not be used.

**LTERM**

LTERM name to be substituted for this user. If omitted, the Signon Exit
sample routine specifies the userid as the LTERM name.

**A**

Timer facility alternate time-out intervals for this user.
Signon Exit Sample Routine 5 and TSS

Signon Exit Sample Routine 5 uses TSS to determine the names assigned to virtual terminal LTERMs. The routine queries the TSS table ULTERM (userid-to-LTERM) to see if the table contains the userid that initiated the logon.

The routine returns the LTERM name from the ULTERM table if the userid is found. If no match is found, the IMS signon is denied. The LTERM name is then set to the lowercase node name assigned to the physical terminal from which the IMS logon was initiated.

The ULTERM table contains arguments and functions. The arguments provide IMS system access for the userids, and the corresponding LTERM names act as the functions.

Signon Exit Sample Routine 5 can also provide overrides for the virtual terminal Timer facility. The TSS table LTERMOR (LTERM-Override) controls these overrides. The LTERMOR table also contains arguments and functions. The LTERM name acts as the argument. The function is designated as **A** (alternate time-out value) or **N** (never time-out this terminal).

Setting Signon Exit Sample Routine 5 Conditions

This topic contains information about setting signon exit sample Routine 5 conditions.

General register contents at entry to Signon Exit Sample Routine 5 are the same as those shown in “Setting Signon Exit Routine Conditions” on page 138.

Setting IMSID Basic Options

The following IMSID basic options affect the operation of Signon Exit Sample Routine 5:

- From the Virtual Terminal Options panel (refer to “Selecting Virtual Terminal Options” on page 31), select the **Support multiple concurrent LTERMs for Virtual Terminals** option if you want to use multiple LTERMs. If you do not want to use multiple LTERMs, leave this field blank.

- From the Virtual Terminal Signon panel (refer to “Selecting a Virtual Terminal Signon Technique” on page 40), use the **Select a "key" to be used below** field to specify whether you will use the node name or userid as the translate criteria for the permanent LTERM.
The key you select determines which key will be highlighted in option 3 (the Permanent LTERM Option selection field). BMC Software recommends that you make the table names reflect the key you select. For example, if you use the node name for the key, then you should use an NLTERM table name. If you use userid for the key, BMC Software recommends that you use an ULTERM table name.

If you choose selection 4 for the permanent LTERM option but do not modify the exit, the table name specified in selection 3 is used as the default table name.

**Signon Exit Sample Routine 7**

This module is called before completion of IMS signon. It is used to determine the LTERM(s) that should be associated with the terminal signing on.

This exit can be used to limit the number of times a given userid can signon when the LTERM name is not derived from the userid. This exit performs the following TSS translates:

- A TSS translate is performed on the "MSIGNON" TSS table using the userid as the argument. (The MSIGNON table name is hard-coded in the exit.)

  If the userid is found, the RESULT field should contain the maximum number of times this userid can sign on. If the userid is not found or the result is invalid, the default MAXUSER value is used.

  **Note**
  
  The MSIGNON table allows a maximum of 4 digits in the FUNCTIONAL RESULT field. If more than 4 digits are specified, the default value MAXUSER will be used. The recommended size of the MSIGNON table is 8x4.

The exit then calls the VCDXUSRX routine to determine whether or not the userid is at the maximum number of signons.

If the maximum number of signons has already been reached, the signon attempt is rejected.

- If multiple LTERM support is enabled in the IMSID options, a TSS translate list is performed on the IMSNLT2 table. IMSNLT2 is a variable which contains the TSS table name specified in the IMSID Basic Options panel (Page 8 of 8). This translate will return the LTERM(s) to be associated with this terminal. If multiple LTERM support is not enabled, a TSS translate is performed on the IMSNLT2 table. This translate can return a single LTERM. The argument used for these translates will either be the node name or the userid, depending on the key specified in the IMSID Basic Options panel (Page 8 of 8). If the argument is not found by the TSS translate, the signon attempt is rejected.
A third and final TSS translate is performed on the IMSLTR2 table to determine whether this terminal should use the alternate time-out value, as specified in the IMSID Basic Options panel (Page 3 of 8), or not time-out at all. IMSLTR2 is a variable which contains the TSS table name specified in the IMSID Basic Options panel (Page 8 of 8). The userid is used as the argument for this translate.

**Multiple LTERM Support**

When multiple LTERMS are used for a virtual terminal, each LTERM name is returned in the URMXLIST extension area. Entry R2 contains the address of this area. It consists of 255 24-byte entries. In each entry the first 8 bytes are reserved for the LTERM name. The second 8 bytes are not used. The last 8 bytes are reserved and you should leave them as zero. You use entries from beginning to end. The count of entries you use is returned in URMCOUNT. In the extension, the LTERM name is stored in URMLTNAM.

**Using URMCOUNT**

URMCOUNT is a 1-byte binary number with the following convention:

- URMCOUNT = 0, LTERM name returned in URMLTERM.
- URMCOUNT = 1 through 255, LTERM names are returned in the extension (URM XLIST field URMLTNAM).

**Work Area**

At entry R4 contains the address of a 3072 byte work area. The first 2048 bytes of this area should be reserved for translation services, otherwise the area may be used as needed.

**Signon Exit Sample Routine 9**

Signon Exit 9 allows sites that use the userid as the virtual LTERM name to allow IMS users to sign on multiple times with the same userid. To use Signon Exit 9, you must specify a value of G or Z for the SGN parameter in the IMS Control Region.
The first time an IMS user signs on, Signon Exit 9 uses the base userid as the name of the first LTERM for that userid. In subsequent signons, a numeric suffix is attached to the userid to create additional LTERM names based on that userid.

The suffix of the LTERM name can be up to three characters long. For example, if ABC is your userid, the first LTERM name is ABC, the second is ABC001, the third is ABC002, etc. If your userid is seven characters long, then the suffix will be only one character. Therefore, the length of the LTERM name depends on the length of the base userid.

Signon Exit 9 allows up to 255 signons with the same userid, but you can use the MAXUSER parameter to specify a maximum number of signons per userid. The maximum number of signons available per userid is also limited by the size of the userid. For example, if a userid is seven bytes in length, then the suffix can be only one byte in length, which allows a maximum of 10 signons (the base userid, then the base userid appended with 1 through 9). If you require more than nine additional LTERMs per userid, Signon Exit 9 allows you to specify that the suffix be created in hexadecimal format, which allows X'1' through X'F'.

Coding conventions for Exit 9 are the same as for other signon exits.

**Translation Assist Exit**

Program manipulation of an argument value that produces a function value reduces table storage requirements and I/O. In this way, a Translation Assist exit routine provides the TSS user with additional flexibility in table design. When a TSS table is defined with an exit load module name specified, the exit routine can perform the translation before the table is searched. The exit routine can perform the following tasks:

- Perform the translation
- Alter the argument
- Request a table search
- Reject the argument

The prologue to the Translation Assist Exit sample contains additional information on the exit and its interface conventions.
Assemble and Link-Edit

Once you have coded your exit, assemble and link-edit it into the APF-authorized library using any load module name you choose. Sample JCL for the assemble and link job is in member DLA#SAMP in the VTFCNTL library.

Implement the Exit

The exit is not dependent on the IMS environment for operation. You can test it in the TSO environment before implementing it into your IMS control region. An IMS restart is not required to initially implement an exit. When you define a table using the EXIT keyword, IMS loads the exit from the STEPLIB you specified. If the exit routine is subsequently modified, the changes will not be implemented until the next IMS restart.

Prevent Errors

When Translate Subsystem Services (TSS) uses a table that was defined with the EXIT keyword, the exit is given control prior to the table search. If the exit is not found, translation fails with a return code of 8.
Using IMS Operator Commands

This chapter describes the use of IMS operator commands with DELTA IMS VIRTUAL TERMINAL.

Introduction

DELTA IMS allows you to enter IMS operator commands from a DELTA list or an online panel.

All operator commands (AOI commands) described in the IBM publication *IMS/ESA Customization Guide: DC* can be entered from a virtual terminal, within the limits of IMS terminal security for the LTERM involved. However, not all commands can designate a virtual terminal or a virtual LTERM name.

The following table lists those operator commands for which you can designate virtual terminals and virtual LTERMs.

**Table 18: IMS Commands for Virtual Terminals and LTERMs**

<table>
<thead>
<tr>
<th>Command</th>
<th>Comment</th>
</tr>
</thead>
</table>
| /ASSIGN     | A virtual LTERM cannot be assigned to the primary or secondary master terminal.  
This command functions as documented by IBM; virtual LTERMs cannot be assigned to IMSGEN-defined nodes. |
<p>| /CLSDST     |         |
| /DEQUEUE    |         |
| /DISPLAY    | Not all keywords are allowed. See “Using the /DISPLAY Command” on page 150. |
| /END        |         |
| /EXCLUSIVE  |         |
| /EXIT       |         |
| /FORMAT     |         |</p>
<table>
<thead>
<tr>
<th>Command</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>/IDLE</td>
<td></td>
</tr>
<tr>
<td>/LOCK</td>
<td>It works if NODE (name) and PTERM are specified.</td>
</tr>
<tr>
<td>/MODIFY</td>
<td></td>
</tr>
<tr>
<td>/OPNDST</td>
<td></td>
</tr>
<tr>
<td>/PSTOP</td>
<td></td>
</tr>
<tr>
<td>/PURGE</td>
<td></td>
</tr>
<tr>
<td>/QUIESCE</td>
<td></td>
</tr>
<tr>
<td>/RSTART</td>
<td></td>
</tr>
<tr>
<td>/SET</td>
<td></td>
</tr>
<tr>
<td>/START</td>
<td>A /START LTERM xxxxx creates an LTERM if the LTERM name xxxxx is found in the VPRINTER table or the Unsolicited Output table.</td>
</tr>
<tr>
<td>/STOP</td>
<td>A /STOP LTERM xxxxx creates an LTERM if the LTERM name xxxxx is found in the VPRINTER table or the Unsolicited Output table; the LTERM status will be STOP.</td>
</tr>
<tr>
<td>/TEST</td>
<td>The command syntax for virtual terminals depends on the version of IMS run on your system. See “Using the /TEST MFS Command” on page 165 for information.</td>
</tr>
<tr>
<td>/TRACE</td>
<td>If the node does not exist, VTE entries are required.</td>
</tr>
<tr>
<td>/UNLOCK</td>
<td>It works if NODE (name) and PTERM are specified.</td>
</tr>
</tbody>
</table>

### Specifying DELTA IMS VT Operator Commands

This section describes those IMS commands that DELTA IMS has altered for the purpose of supporting virtual terminals and virtual LTERMs. Additional keywords have been added to these commands. Syntax diagrams are included to illustrate the format of these commands.

### Using the /ASSIGN Command

The following restrictions apply to the /ASSIGN command:

- You cannot mix NODE and LINE/PTERM assignments in the same command. You can only have one LTERM assignment per command.

- When using the /ASSIGN command with virtual terminals, the following restrictions apply:
— The control blocks for the virtual node must already exist. If the virtual node has been timed out and its control blocks deleted, it cannot be used in the command.

— The virtual LTERM must already exist or be defined in the VPRINTER table or the Unsolicited Output table.

— The ASSIGN is only in effect until the next signon at the target node. During signon, DELTA IMS VIRTUAL TERMINAL assigns LTERMs to that node using the designated TSS signon table.

— The /ASSIGN LTERM TO USER SAVE command does not work for virtual terminals.

DELTA IMS facilities are used only if an LTERM is assigned from one virtual printer to another virtual printer through a virtual printer override (VPO). Figure 67 on page 149 shows the format of the /ASSIGN command for performing a VPO.

In all other cases, DELTA IMS VIRTUAL TERMINAL uses IMS facilities to execute the /ASSIGN command. The /ASSIGN command, therefore, functions as documented in the IBM publication IMS/ESA Version 4 Operator’s Reference. See this IBM publication for full information on the /ASSIGN command.

**Figure 67: /ASSIGN Command Format for a VPO**

```
ASSign  LTERM  lname  VPO  lname  [MODEL  modelName]  [ACTIVATE]
```

You can use the following keywords with the /ASSIGN command:

**LTERM**

In DELTA IMS VIRTUAL TERMINAL, this parameter indicates that you want to assign an LTERM to a new destination.

*lname*

The name of the LTERM being assigned.

**VPO**

This parameter indicates that you want to perform or cancel a virtual printer override (VPO). VPO allows you to redirect the output from one virtual printer to another. VPO is useful when a production printer is inoperative and the printer’s output must be routed to a working printer. The way DELTA IMS VIRTUAL TERMINAL handles VPOs depends on the version of IMS.
nname

The name of the node to which you want to assign the LTERM. If you previously used this command to redirect output, you can assign the output to its original node name or use the /ASSIGN LTERM *name* VPO ORIGINAL command to cancel the redirection.

ORIGINAL

If you previously used the /ASSIGN LTERM *name* VPO *name* command to redirect output, use the ORIGINAL parameter to cancel the redirection. This parameter is useful if you do not know the original node name.

MODEL *modelname*

Use the MODEL keyword with the *modelname* parameter to specify the model node to be used when creating the virtual printer node. The model node must be an IMS sysgenned node name.

If the MODEL keyword is specified, it overrides any model specified in the VPRINTER TSS table.

If the MODEL keyword is not specified, then the model name associated with the node in the VPRINTER TSS table will be used.

ACTIVATE

If you specify the ACTIVATE keyword with the /ASSIGN LTERM VPO command, DELTA IMS VIRTUAL TERMINAL attempts to immediately deliver output that is currently queued to the specified LTERM. Otherwise, output will be delivered to the device the next time output is queued to the specified LTERM.

Using the /DISPLAY Command

Virtual terminals possess certain unique qualities not covered by standard IMS commands. Therefore, DELTA IMS VIRTUAL TERMINAL has expanded the IMS /DISPLAY command to include several new keywords that augment those listed in the IMS Operator’s Reference Manual.

The /DISPLAY command has the following additional DELTA IMS VIRTUAL TERMINAL keywords:

- ALLOWED
- PRINTER
- VP
- VT
- VTE
- VPO
- VIRTUAL

Note

These keywords become reserved words for all command processing purposes, including non-display and non-virtual terminal command formats. If these keywords conflict with previously named resources at your site, consider renaming your resources since the alternative is to SUPERZAP the keyword in CSECT VTFXKWT0 of load module VTFXVCDn.
You can generate DSECTS for AOI programs that can enter these commands. Code the $VTFMAP macro instruction as follows to generate DSECTS for all DELTA IMS VIRTUAL TERMINAL /DISPLAY output formats.

```
$VTFMAP FID=0
```

Figure 68: /DISPLAY Command Syntax

You can use the following keywords with the /DISPLAY command:

**SIGNON**

Provides a report on signons and is used with either the STATUS or ALLOWED parameter.
STATUS

Provides a one-line report that identifies whether user signons are enabled or disabled.

ALLOWED

Provides a multi-line report listing all /SECURE ALLOWED userids. The report lists seven userids per line.

userid

Specify one or more userids after the ALLOWED keyword to generate a multi-line report listing each specified userid signon. If a userid is not /SECURE ALLOWED, the message **IS NOT ALLOWED** appears after the userid.

ALL

Provides a listing of all /SECURE ALLOWED userids.

VPO

The Virtual Printer Override parameter provides a report on overridden virtual printer LTERMs.

ltermname

Specify one or more LTERM names after the VPO parameter to generate a multi-line report listing each specified LTERM, the override printer node name and the override model name. If the LTERM is not overridden, then N/O follows the LTERM name.

ALL

Provides a listing of all overridden virtual printer LTERM names.

VT

The Virtual Terminal parameter provides a report on current virtual terminals.

nodename

Specify one or more node names after the VT parameter to generate a multi-line report listing each specified virtual terminal name on a separate line. Each line contains the following information:

- Terminal’s VTAM node name
- Virtual device type: **T** (terminal) or **P** (printer)
- Model’s node name
- IMS device type and model (if available)
- Status with respect to automatic logoff or block delete
- Period of inactivity for purposes of time-out and block delete listed in hours, minutes, and seconds.

Note
If the terminal has not been active since IMS restart, an ] will appear.

ALL

Provides a listing of all current virtual terminals. This command does not affect the virtual terminal Timer facility time stamp used for purposes of idle terminal logoff and/or control block deletion.

STATUS

Use the STATUS keyword with the VT parameter to generate a multi-line summary of the virtual terminal network. The summary consists of four sections: Current, Activity, Terminal Timeout Status Summary, and Pool Usage.

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Shows how many virtual devices are currently connected and disconnected</td>
</tr>
<tr>
<td></td>
<td>Virtual devices include virtual terminals and printers. Connected means currently logged on. Disconnected means not currently logged on.</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Activity</td>
<td>Shows statistics from the last IMS restart and within approximately the last 10 minutes on the following:</td>
</tr>
<tr>
<td></td>
<td>■ LOGONS—connections made between IMS and VTAM that require a VTAM LOGON exit to be scheduled and the successful establishment of a virtual terminal session as a result</td>
</tr>
<tr>
<td></td>
<td>■ SIGNONS—/SIGNON commands successfully processed at a virtual terminal. This requires that an option other than option 0 be specified as the Virtual Terminal Signon option</td>
</tr>
<tr>
<td></td>
<td>■ VIRTUAL PRINTER /OPNDSTS ISSUED—the number of /OPN NODE commands issued to logon a virtual printer because output was available to be sent</td>
</tr>
<tr>
<td></td>
<td>■ VPRINTER CONNECTIONS MADE—the number of connections made between IMS and VTAM for a virtual printer device that require the VTAM logon exit to be scheduled and the successful establishment of a virtual printer session</td>
</tr>
<tr>
<td></td>
<td>■ TERMINALS AUTOMATICALLY LOGGED OFF—the number of virtual terminals and printers automatically logged off by DELTA IMS VIRTUAL TERMINAL because they had exceeded the installation specified period of inactivity</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Terminal Timeout Status Summary</td>
<td>Provides the number of virtual terminals and printers in each timeout status. The timeout status categories and descriptions are as follows:</td>
</tr>
<tr>
<td></td>
<td>■ <strong>NO TIMEOUT</strong>—virtual terminal is connected, but it is not eligible for any type of automatic logoff due to inactivity</td>
</tr>
<tr>
<td></td>
<td>■ <strong>STANDARD</strong>—standard idle terminal logoff interval</td>
</tr>
<tr>
<td></td>
<td>■ <strong>ALTERNATE</strong>—alternate idle terminal logoff interval</td>
</tr>
<tr>
<td></td>
<td>■ <strong>CONVERSATIONAL</strong>—the idle conversation logoff and exit interval</td>
</tr>
<tr>
<td></td>
<td>■ <strong>CONV-ALT</strong>—the alternate idle conversation logoff and exit interval</td>
</tr>
<tr>
<td></td>
<td>■ <strong>VPRINTER</strong>—the virtual printer idle printer logoff interval</td>
</tr>
<tr>
<td></td>
<td>■ <strong>TEMPORARY</strong>—the terminal has been logged off or the control block is a temporary block used to save significant status information locally. The control block may be deleted by IMS at a checkpoint.</td>
</tr>
<tr>
<td></td>
<td>■ <strong>ITASK</strong>—the virtual terminal control blocks are in use by the IMS ITASK, preventing consideration for deletion</td>
</tr>
<tr>
<td></td>
<td>■ <strong>QMGR</strong>—an IMS queue buffer is allocated to the virtual terminal, preventing consideration for deletion</td>
</tr>
<tr>
<td></td>
<td>■ <strong>CONV-PEND</strong>—the virtual terminal is associated with a conversation in pending (CCB1PEND) status preventing consideration for deletion</td>
</tr>
<tr>
<td></td>
<td>■ <strong>CONV-SCHD</strong>—the virtual terminal is associated with a conversation in scheduled status, preventing consideration for deletion</td>
</tr>
<tr>
<td></td>
<td>■ <strong>CONV-ACT</strong>—the virtual terminal is associated with an active conversation, preventing consideration for deletion. This is usually transient and can be cleared by an imminent /HOLD or /EXIT command issued internally by DELTA IMS</td>
</tr>
<tr>
<td></td>
<td>■ <strong>CINIT PEND</strong>—a pending request to VTAM exists for the device</td>
</tr>
</tbody>
</table>
**Pool Usage**

Provides current percent of capacity and usage; maximum percent of capacity and usage; and capacity for the USB, VPO, and VTE pools.

To minimize the performance impact of information gathering for this report, the statistics presented are not gathered by the command itself, but are gathered during normal control block scan by the virtual terminal Timer facility approximately every 20 seconds. Since the Timer facility runs under an asynchronous TCB, it may execute while the command is processing. Therefore, it is possible that the end of the report may be more current than the beginning. Do not attempt to balance the report.

IMS checkpoints interrupt or delay the virtual terminal Timer facility operation. To obtain the most up-to-date information, do not use the /DISPLAY command during system checkpoints or for approximately 30 seconds after checkpoint completion.

**TRACE**

Provides a multi-line report of the current contents of the Virtual Terminal Trace table. Entries are listed from the most recent to the oldest.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>count</td>
<td>Permits user specification of the number of entries to be listed. The default is 10.</td>
</tr>
<tr>
<td>LTERM</td>
<td>Specify one or more LTERM names after the LTERM keyword to selectively list only those trace entries appropriate to the specified LTERMS. Use spaces to separate multiple LTERM names.</td>
</tr>
<tr>
<td>NODE</td>
<td>Specify one or more node names after the NODE keyword to selectively list only those trace entries appropriate to the specified nodes.</td>
</tr>
<tr>
<td>USER</td>
<td>Specify one or more user names after the USER keyword to selectively list only those trace entries appropriate to the specified users. Use spaces to separate multiple user names.</td>
</tr>
</tbody>
</table>

Trace entries are listed in dump format with no interpretation or significance made as to the content of any entry. It is up to you to assign any significance or lack thereof to the contents of trace entries.

Because each entry requires five segments to display and the COUNT field may be meaningfully specified as high as 3200, displaying a large number of entries may have a significant negative impact on the IMS message queue.

A count as great as 99999 is permitted; however, the internal trace table only contains 3200 entries and the command will not list the same entry twice.
VLB

Displays in hexadecimal and character format the VLB, ECB, CLB, CTB, CRB, and CIB control blocks for the node name you specified.

VCN

Displays in hexadecimal and character format the VCN, CNT, and USR control blocks for the LTERM name you specified.

OPTIONS

Provides a multi-line report of the current DELTA IMS VIRTUAL TERMINAL IMSID options specified for the specified IMS system.

VTE

The Virtual Terminal Pending Elements parameter provides a report on virtual terminal pending elements.

NODE

This keyword is optional. Specify one or more node names to generate a multi-line display that lists the node status and user/SPQB status on a separate line for each specified node name.

ALL

Provides a listing of all current virtual terminal pending Trace elements.

VT EXITS

Provides an online display of which virtual terminal exits are link-edited into VTFEXITn. It also provides the assembly date of the exit, and based on current IMSID options, indicates whether the exit is active.

TSSTABLE LIST

Provides an online display of all TSS tables that reside in the currently allocated TSS table data set. It also provides information about each table. The returned information includes argument length, function length, masking yes/no, and the name of the Table Translation Assist Exit, if present.

TSSTABLE tablename INFO

Provides an online display of the information detailed in the previous three field names for a specified table name.
**TSSTABLE tablename**

Provides an online display of a TSS table. All entries in the table are displayed. If you want to prevent an entire table from being inadvertently displayed, you may require users to enter the ALLROWS keyword with this command. Activate the requirement to use the ALLROWS keyword by selecting the **Require "ALLROWS" keyword on /DIS TSSTABLE tablename command** field on screen number 5 of the IMSID Basic Options panel.

**TSSTABLE tablename argument**

Provides an online display of one or more TSS table entries that match the provided argument.

**TSSTABLE tablename ALLROWS**

Provides an online display of all entries in a TSS table.

**/DISPLAY Command Examples**

The following examples show the output that is generated by /DISPLAY commands that contain DELTA IMS VIRTUAL TERMINAL keywords:

If you enter

```
/DISPLAY SIGNON STATUS
```

the following data is displayed:

```
SIGNONS ARE ENABLED
*89163/171549*
```

If you enter

```
/DISPLAY SIGNON ALLOWED ALL
```

the following data is displayed:

```
RLS  BSM2  TCM  MTJ1  JRM  KJQ  WKK
TRR2  LDS  IIM
*89163/171549*
```

If you enter

```
/DISPLAY SIGNON ALLOWED U001
```

the following data is displayed:

```
U001 IS NOT ALLOWED
*89163/171549*
```
If you enter

/DISPLAY VIRTUAL PRINTER OVERRIDE ALL

the following data is displayed:

LTERM NODE MODEL
LC311G1 LC311G1 MD002
*89163/171549*

If you enter

/DISPLAY VPO LC311E2

the following data is displayed:

LTERM NODE MODEL
LC311E2 N/O
*89163/171549*

If you enter

/DISPLAY VIRTUAL TERMINAL LC312P1

the following data is displayed:

NODE T/P MODEL TYPE INACTIVITY T/O STATUS
LC312P1 T $SLU2002 SLU2-2 :00 STANDARD
*89163/171549*

If you enter

/DISPLAY VT ALL

the following data is displayed:

NODE T/P MODEL TYPE INACTIVITY T/O STATUS
VTBMCMP T $3270011 3277-2 * NO DELETE
LC311E2 P LC311F2 SLU1 :22 VPRINTER
*89163/171549*

If you enter

/DISPLAY VIRTUAL TERMINAL STATUS

the following is displayed:

CURRENT CONNECTED DISCONNECTED
VIRTUAL DEVICES 2 1
ACTIVITY LAST 10 MINUTES SINCE RESTART
LOGONS 1 8
SIGNONS 1 8
VPRINTER OPNSTDTS 0 2
VPRINTER CONNECTS 0 3
AUTO-LOGOFFS 8 8
AUTO-EXITS 0 0
If you enter

```
/DISPLAY VT TRACE
```

the following data is displayed:

```
17:14:01 0000 E2C9C7D5 02BA6200 D3F3F1F2 D7F14040 *SIGN.LC312P1.*
0010 02BA6284 0012C478 C2E2D440 40404040 *...DD.BSM....*
0020 00000000 10010000 00000000 00000000 ........................
0030 00000000 809A5C0A A0732979 15032C00 ........................

17:13:46 0000 D3D6C7D5 02BA6200 D3F3F1F2 D7F14040 *LOGN..L312P1.*
0010 02BA6284 0012C430 C2C1D9C2 40404040 *...DD.BARB...*
0020 00000000 00010000 00000000 00000000 ........................
0030 00000000 809A5B80 A073296B ABC65C10 ........................

17:13:45 0000 D3D6C7E7 02BA6200 D3F3F1F2 D7F14040 *LOGX..L312P1.*
0010 02BA6284 0012C478 C2E2D440 40404040 *...DD.BSM....*
0020 00000000 00010000 00000000 00000000 ........................
0030 00000000 809A5B80 A0732951 CFE93890 ........................
```

If you enter

```
/DISPLAY VT VLB L3AEF1
```

the following data is displayed:

```
VT - VIRTUAL CLB DISPLAY FOR NODE NAME L3AEF1:

VLB PREFIX
0F5B9510 +00 00000000 00000000 00000000 00000000 ...........................
0F5B9520 +10 00000000 00000000 00000000 00000000 ...........................

ECB DATA
0F5B9538 +00 FC4E2D7 00968400 801A8508 8D9E9B80 *.DSP............*

CLB DATA
0F5B9548 +00 00000000 00000000 00000000 00000000 ...........................
0F5B9558 +10 00000000 0800000E 00000000 00000000 ...........................
0F5B9568 +20 050000A1 00000000 D3F3C1C5 C6F14040 ...........................

CTB DATA
0F5B9578 +30 00040900 0F5B95E8 8F5B9684 009610B2 *.Y.$.......*

CRB DATA
0F5B9588 +40 000000CA 0F5B9548 00010000 00000000 ...........................
0F5B9598 +50 0F5B95E8 00000000 00000000 00000000 ...........................
0F5B95A8 +60 00000000 00000001 00000000 00000000 ...........................

*89163/171549*
If you enter

/ DISPLAY VT OPTIONS

the following is displayed.

DELTA IMS VIRTUAL TERMINAL IMSID OPTIONS FOR REJ4/PRODUCT V6.0.12
LAST UPDATE: 99146-09:42:30:02 / RELOADED 0 TIMES / XOPTS=Y
LOG CODE=DE / RESLIB=IMSVS.R51.RESLIB
COPY OPTIONS=N / ALLOW DUMPS=Y / ALLOW ZAPS=Y / LOG COMMANDS=Y
DELTA PSB=DELTAIMS / TRAN=DELTAIMS / / LU-NAME=REJLINKP
PRIMARY LOG=RIHREJ.R51.LOG1REJ5
SECONDARY LOG=RIHREJ.R51.LOG2REJ5
VIRT TERMS=NA / VIRT LTERM=NA / USB= 22 / VPO= 25 / VTE= 1
IDLE TERM LOGOFF=2-60/IDLE CONV LOGOFF=2-60/IDLE PRT LOGOFF=2-0
HELD CONV EXIT=60 / UNUSED TERMINAL DEL=NA / UNUSED PRINTER DEL=NA
SIGNON REQUIRED=N / MULTIPLE LTERM SUPPORT=Y / NOTIFY MTO=Y
DFS3649A /SIGN FORMAT=SIGNON / DFS3650I SESSION STATUS FORMAT=DFSMO5
TSS DSN=RIHREJ.R41.TSS1REJ4
TSS BUFFERS= 10 / DISPLAY TSTABLE COMMAND RESTRICTED
TSS TABLES: VPRT=VPR / VPOR=VPOVER / USOL=UNSOL / RCNT=VRMT
LOGON OPTION=1 - USE DEFAULT LOGON MODELS
DEFAULT MODELS
3270=MODL3270/SLU2=PIE10001/SLU1=$SLU1002/SLUP=$SLUP001
SIGNON BYPASS OPTION=1 - USE NODE NAME AS LTERM
SIGNON OPTION=1 - USE NODE NAME
*99150/090328*

If you enter

/ DISPLAY VTE ALL

the following data is displayed.

NAME <----- NODE STATUS ----->    <- USER STATUS ->
L3A8L2    MFST STOPPED TRACE(4,ALL)    MFST EXCL STOPPED
L3A8U2

If you enter

/ DIS VT EXITS

the following data is displayed:

<table>
<thead>
<tr>
<th>EXIT TYPE</th>
<th>EXIT NAME</th>
<th>ASM/LINK INFORMATION</th>
<th>ACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNON BYPASS</td>
<td>NO EXIT PROVIDED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOGON</td>
<td>VTFEXLX4</td>
<td>03/01/90-14.10</td>
<td>NO</td>
</tr>
<tr>
<td>SIGNON</td>
<td>VTFEXS94</td>
<td>08/12/91-16.42</td>
<td>YES</td>
</tr>
</tbody>
</table>
*91256/101527*
If you enter

/DIS TSSTABLE LIST

the following data is displayed:

CM                      DELTA IMS VT - Execute IMS Cmd
Command ===> ___________________________________________ Scroll ===> CSR_
BMC1537 The IMS operator command was successfully processed by IMS.
IMSID ... EAW5
IMS Command /DIS TSSTABLE LIST___________________________ Row 0001 of 0032 Cols 001 080
>                                                  More:     +

TSS TABLE NAME LIST
AUTOSIGN ARG LEN=  8 FUNC LEN=172 MASKING=NO TRANS ASSIST EXIT=NO EXIT
DFS3649A ARG LEN=  8 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
DFS3650I ARG LEN=  8 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
LMODEL  ARG LEN=  6 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
LOGONMOD ARG LEN=  8 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
LOGONTYP ARG LEN=  8 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
LTERMOR  ARG LEN=  8 FUNC LEN=  1 MASKING=NO TRANS ASSIST EXIT=NO EXIT
NLTERM   ARG LEN=  9 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
NLTERMX  ARG LEN=  8 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
PRINT   ARG LEN=  8 FUNC LEN=152 MASKING=NO TRANS ASSIST EXIT=NO EXIT
PRINTERS ARG LEN=  8 FUNC LEN=152 MASKING=NO TRANS ASSIST EXIT=NO EXIT
RCNT     ARG LEN=  8 FUNC LEN=  8 MASKING=NO TRANS ASSIST EXIT=NO EXIT
SIGNON   ARG LEN=  8 FUNC LEN=172 MASKING=YES TRANS ASSIST EXIT=NO EXIT
TABLE1   ARG LEN=  2 FUNC LEN=  2 MASKING=NO TRANS ASSIST EXIT=NO EXIT
TABLE2   ARG LEN=  2 FUNC LEN=  4 MASKING=NO TRANS ASSIST EXIT=NO EXIT
TABLE3   ARG LEN= 15 FUNC LEN= 15 MASKING=NO TRANS ASSIST EXIT=NO EXIT

If you enter

/DIS TSSTABLE ATABLE INFO

the following data is displayed:

TSS TABLE DISPLAY FOR ATABLE
ATABLE  ARG LEN= 10 FUNC LEN= 50 MASKING=NO TRANS ASSIST EXIT=NOEXIT
*91256/101620*

If you enter

/DIS TSSTABLE CTSUNSOL

the following data is displayed:

TSS TABLE DISPLAY FOR CTSUNSOL
CTSUNSOL  ARG LEN=  8 FUNC LEN=  1 MASKING=NO TRANS ASSIST EXIT=NOEXIT
TSS TABLE DISPLAY RETURNED        3 DATA ENTRIES
ARGUMENT FUNCTIONAL RESULT
----------
CTS***** Y
UFRED  Y
If you enter

```
/DIS TSSTABLE CTSVPRNT VPRNT001
```

the following data is displayed:

```
TSS TABLE DISPLAY FOR CTSVPRNT
CTSVPRNT ARG LEN=8 FUNC LEN=16 MASKING=NO TRANS ASSIST EXIT=NOEXIT
ARGUMENT FUNCTIONAL RESULT
-------------- --------------
VPRNT001 L3A1F2 L3A1F2
```

### Using the /SECURE Command

After the /START DC command has been entered, any virtual terminal in the network can perform a logon. Once logged on, the user can signon (if required) and enter IMS transactions. At certain times, such as during system checkouts and during special processing periods, this could be less than desirable. DELTA IMS VIRTUAL TERMINAL has provided a new IMS-type command, /SECURE, which can be used to restrict signons to a designated group during these periods.

/SECURE can be used to disable signons, to designate a specific list of users allowed to signon during disabled periods, to enable signons, and to clear the list of designated userids. The ENABLE/DISABLE state after IMS cold and warm starts is ENABLE; after emergency restart it is the same as before the failure. The /SECURE command applies equally to virtual terminals and IMSGEN-defined terminals.

**WARNING**

The /SECURE ALLOW command requires the *nodename* parameter rather than the *userid* parameter for dynamic SLUP devices only.

**Note**

The /SECURE command options are valid for a single system only—they do not apply across the sysplex, even if Resource Manager (RM) is active.

### Figure 69: /SECURE Command Syntax

You can use the following keywords with the /SECURE command:
ALLOW

ALLOW is followed by one or more userids which are to be allowed access to IMS after the /SECURE DISABLE command. Each issuing of the /SECURE ALLOW command will append the list of previously allowed userids.

userid

Follow the ALLOW parameter with one or more of the userids that you want to process with the /SECURE command.

nodename

Follow the ALLOW parameter with one or more of the nodenames that you want to process with the /SECURE command for dynamic SLUP devices only.

DISABLE

Specifies that all new userid signons are to be disabled, excepting those specified by the /SECURE ALLOW command.

ENABLE

Specifies that all users authorized by the security subsystem to access IMS should be permitted to signon.

CLEAR

Specifies that the entire list of users created with one or more /SECURE ALLOW commands is to be cleared.

Using the /TEST MFS Command

The virtual terminal /TEST MFS commands allows you to activate and deactivate MFS TEST mode for a virtual terminal or virtual printer, before the terminal control blocks have been created. The format of the /TEST MFS command depends on the version of IMS run on your system.

Figure 70: /TEST MFS NODE Command Syntax

```
/TEST MFS NODE nodename
```

Figure 71: /TEST MFS USER Command Syntax

```
/TEST MFS USER username
```

You can use the following keywords with the /TEST MFS commands:
NODE

This parameter indicates that the MFS TEST mode should follow the node control block and should not be tied to the user.

*nodename*

The node name. The node must exist at the time the /TEST MFS command is issued, or you must have specified a non-zero value for the **Maximum Virtual Terminal pending entries** field on the Virtual Terminal Limits panel in the IMSID basic options.

**Note**

When Resource Manager (RM) is active, the node name restrictions do not apply. TEST status applies across the sysplex.

USER

This parameter indicates that the MFS TEST mode should follow the user control block and should not be tied to the node. If a user logs off one node and logs back on to another node, the TEST MFS status of that user should still be in effect.

*username*

The name of the user/SPQB. The user/SPQB must exist at the time the /TEST MFS command is issued, or you must have specified a non-zero value for the **Maximum Virtual Terminal pending entries** field on the Virtual Terminal Limits panel in the IMSID basic options.

**Note**

When Resource Manager (RM) is active, the user name restrictions do not apply. TEST status applies across the sysplex.

**Using the /END Command**

The /END command allows you to end the MFS TEST mode.

**Figure 72: /END Command Syntax**

```
/ END
  NODE nodename
  USER username
```

You can use the following keywords with the /END command:
NODE

`nodename`

After the NODE parameter, specify the name of the node on which you want to deactivate the TEST MFS command. This parameter ends MFS TEST mode for both virtual and IMSEGENDefined devices.

USER

`username`

After the USER parameter, specify the user/SPQB from which you want to deactivate the TEST MFS command. This parameter ends MFS TEST mode for the specified userid.

Using the /TRACE Command

The virtual terminal /TRACE command allows the IMS DC trace facility to be activated for nodes before the terminal control blocks have been created and the user has signed on.

**Figure 73: /TRACE Command Syntax**

You can use the following keywords with the /TRACE command:

NODE

Indicates that you want to run the /TRACE command on a node. DELTA PLUS VIRTUAL TERMINAL will process the NODE parameter of the /TRACE command only if the specified `nodename` is a virtual terminal and only if the virtual terminal already exists.

VT

Indicates that you want to run the /TRACE command on a virtual terminal.
nodename

Specify one or more virtual terminal node names after the VT parameter to run a trace for those nodes. The virtual terminal control blocks do not have to exist at the time the /TRACE command is issued as long as you have specified a non-zero value for the Maximum virtual terminal pending entries field on Virtual Terminal Limits panel in the IMSID basic options. The node name you specify must not be IMSGEN-defined.

**Note**

The VT parameter is not supported when you use Resource Manager (RM) for Sysplex Terminal Management (STM). Use the NODE parameter instead. TRACE status applies across the sysplex.

**Note**

DELTA IMS VIRTUAL TERMINAL does not support ranges of node names. You must specify each node name individually.

---

**LEVEL**

Specify the control block trace information level. See the IMS /TRACE command for more information.

**MODULE**

Specify the module control blocks to trace. See the IMS /TRACE command for more information.
Glossary

A

ACB

See "application control blocks."

AOI

See “automated operator interface.”

API

Application program interface. A functional interface supplied by the operating system that allows a transaction program written in a high-level language to use specific data or functions of the operating system. See also implicit API and explicit API.

APPC

Advanced program-to-program communications. An implementation of the LU 6.2 protocol that allows interconnected systems to communicate and share processing of programs.

application control blocks

The control blocks created from the output of PSBGEN and placed in the ACB library for use during online and DBD region type execution of IMS.

area

See “Database Area.”
automated operator interface

An IMS interface that automates the interaction with various system processes.

B

batch message processing

A batch processing program that has access to online databases and message queues.

BDAM data set

Basic direct access method data set.

BMCLINK

An interregion control facility provided with DELTA IMS that allows the DELTA IMS user to communicate with an IMS control region.

BMCRESLB

A DD name for the IMS RESLIB data set used in the IMS control region if IMS RESLIB is a LINKLIST data set.

BMP

See “batch message processing.”

C

CNT

See “communications name table.”

communications name table

An IMS table containing a list of LTERM names.
control section

The part of a program specified by the programmer to be a relocatable unit, all elements of which are to be loaded into adjoining main storage locations.

CSECT

See “control section.”

D

Data Base Recovery Control

An IMS feature that maintains information needed for database recovery.

data entry database

A database consisting of one or more areas. It is a direct-access database in which each area contains both root and dependent segments.

Data Language/I

A language that provides an interface between user applications and IMS.

data management block

An IMS control block in main storage that describes and controls a physical database. It is constructed from information obtained from the ACB library or the DBD library.

database

A collection of data that is often stored hierarchically to eliminate data redundancy.

database area

The subset of a DEDB.

database recovery
The process of restoring a corrupted physical database data set to a point in time before the corruption occurred.

**DBCS**

See “double-byte character set.”

**DBRC**

See “Data Base Recovery Control.”

**DEDB**

See “data entry database.”

**destination name table**

An internal table containing the name of all destination SMBs, CNTs, and VCNs.

**DL/I**

See “Data Language/I.”

**DL/I database**

A database that is created and accessed using DL/I.

**DMB**

See “data management block.”

**DNT**

See “destination name table.”

**double-byte character set**
A set of characters in which each character is represented by two bytes. Languages, such as Japanese, which contain more symbols than can be represented by 265 code points require double-byte characters. See “Kanji.”

DSECT

See “dummy control section.”

dummy control section

A control section that an assembler can use to format an area of storage without producing any object code.

E

explicit API

In APPC, the SAA communications API.

G

general register storage

General registers R1-R15 store or compute values or addresses.

GRS

General Resource Serialization. A MVS facility that maintains integrity across multiple MVS users of the same resource.

I

implicit API

In APPC, an extension of the IMS standard DL/I API.

IMS
See “Information Management System.”

**Information Management System**

IBM’s system for managing large volumes of data and transactions.

**ITASK**

A unit of IMS work.

**J**

**job**

One or more programs, executed synchronously, under control of the operating system (OS/VS) and Job Entry Subsystem (JES).

**K**

**Kanji**

A graphic character set consisting of symbols used in Japanese ideographic alphabets. Each character is represented by 2 bytes.

**L**

**logical terminal**

A destination with a name related to a physical terminal.

**LTERM**

See “logical terminal.”
**main storage database**

A root-segment database residing in main storage that can be accessed to a field level.

**Master terminal operator**

The person using the logical terminal that controls all IMS resources and online operations.

**MODBLKS**

Two data sets, an active and an inactive set, in which the IMS Online Change modifications are placed for a MODBLKS update. Changes are made to the inactive data set and are applied by making that data set active.

**MSC**

See “Multiple Systems Coupling.”

**MSDB**

See “main storage database.”

**MSNAME**

Indicates that an LTERM entry is to be defined as a remote LTERM specifying the link name block name of the desired logical system.

**MTO**

See “master terminal operator.”

**Multiple Systems Coupling**

An IMS feature that permits geographically dispersed IMS systems to communicate with each other.
physical terminal

A hardware device attached to the computer and supported by IMS/DC as a terminal. A physical terminal usually has one or more logical terminals (LTERMs) associated with it.

PTERM

See “physical terminal.”

quiesce

Ends a process by allowing operations to complete normally.

Remote Communications Name Table

A table containing the name of a terminal in another MSC-connected system where a transaction originated.

S

SBCS

See “single-byte character set.”

double-byte character set

A character set in which each character is represented by a 1-byte code.
SMB

An IMS transaction control block.

spare element pool

A group of unused terminal, LTERM, and subpool control blocks used by DELTA IMS DC and DB/DC to add terminals, LTERMs, and subpools between IMSGENs.

SPQB

Subpool Control Block. A control block that links virtual LTERMs to virtual nodes.

T

TP

Transaction program. In APPC terminology, an application.

TP_PROFILE

A VSAM data set owned by APPC/MVS that provides attribute information for transaction profile names used by APPC applications.

U

UPDS

See “user profile data set.”

USB

See “user signon block.”

user profile data set

A partitioned data set used to store the DELTA IMS user access profiles. The user access profiles are used to control access to DELTA IMS functions.
user signon block

Contains a user ID that has been specified by the /SECURITY ALLOW command.

user/SPQB

In DELTA IMS documentation, this term is used to denote the IMS user element. See also SPQB.
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