CICS Online Transmission Time Optimizer

IBM

User's Guide

Version 1 Release 2

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> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under Appendix G,
> "Notices," on page 133.

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PREFACE

CICS® Online Transmission Time Optimizer (CICS OTTO) is a tool for the IBM® Customer Information Control System (CICS). CICS OTTO improves user productivity and 3270 network utilization.

Who Should Use This Book

CICS Online Transmission Time Optimizer User's Guide is intended for use by the system programmer responsible for the operation of CICS. It explains how to control CICS OTTO's operation using CICS panels.

How to Use This Book

This *CICS Online Transmission Time Optimizer User's Guide* contains the following chapters.

- "Chapter 1: Optimization Features" on page 1 describes the features of CICS OTTO and explains how to control them.

- "Chapter 2: Installing CICS OTTO" on page 9 details the steps are required to complete installation after the product has been SMPE received, applied, and accepted. This information is for the attention of the installing system programmer.

- "Chapter 3: Operating CICS OTTO" on page 11 describes how the optimization operates under CICS.

- "Chapter 4: Considerations for Tuning and Runtime" on page 13 describes how to achieve maximum optimization effects and minimum CPU overhead. Additionally, it contains runtime considerations for the VSAM KSDS files that are required for CICS OTTO operation and the sequential files used for the trace and enhanced statistics facilities.

- "Chapter 5: Using the Dialog" on page 21 provides general information on how to access and use CICS OTTO's CICS menus and panels.

- "Chapter 6: System Options" on page 31 explains how to define CICS OTTO's system options.

- "Chapter 7: Starting and Stopping Optimization" on page 35 explains how to start and stop the optimization.

- "Chapter 8: Display and Control Image Pool Size" on page 37 explains how to control the image pool using CICS panels and provides frequently asked questions.

- "Chapter 9: Component Based Optimization Control" on page 41 explains how to set the optimization features for components.

- "Chapter 10: LU Based Optimization Control" on page 47 describes how to set the optimization features for LUs.

- "Chapter 11: Module Based Optimization Control" on page 55 describes how to set the optimization features for modules.

- "Chapter 12: Optimization Exclusion and Selection" on page 61 shows how to exclude terminals/modules from optimization when CICS OTTO is fully started and how to select LUs for inclusion when optimization is selectively started.

- "Chapter 13: Trace Control" on page 67 describes how to use CICS OTTO's trace feature to perform message tracing and instorage tracing of inbound and outbound data streams.

- "Chapter 14: Optimization Statistics" on page 85 describes how to control and display CICS OTTO's statistics.

- "Chapter 15: Compatibility Mode" on page 103 shows how to access the Compatibility Mode. The Compatibility Mode allows you to control CICS OTTO's optimization features using the tool's native command language.

- "Chapter 16: Batch Utilities" on page 105 explains the batch utilities that can be used to apply maintenance, print all optimization options, set options in batch, and copy existing options to the control file of a new release.

- "Appendix A: Troubleshooting" on page 111 provides hints to resolving problems and describes what information should be provided for technical support in case of difficulties.

- "Appendix B: User Exit Support" on page 113 explains how to implement a user-written exit routine.

- "Appendix C: Mass Processing of Commands (ABLPCMD)" on page 117 describes a program that allows you to perform processing of a large number of CICS OTTO commands. This might be useful to facilitate mass updates to the CICS OTTO command file, e.g., to temporarily or permanently exclude a large number of terminals that have suddenly caused a problem.

- "Appendix D: Interpreting Message Trace DD Output" on page 121 describes the trace output that results when a SYSOUT message trace is used. Also described are the return codes associated with such traces.

- "Appendix E: SABLLOAD – Alias List" on page 129 provides the alias names used within the CICS OTTO modules and documentation.

- "Appendix G: Technical Support Checklist" on page 131 should be considered in the event you require technical support.

- "Appendix F: Notices" on page 117 contains IBM legal notices and trademarks.

- The comprehensive "Index" on page 137 allows you to access specific information quickly.

Contacting IBM support

Information on IBM support policy can be found on the Web site. Follow the Support link in the left-hand column at ibm.com/software/ts/cics/.

Where to Get More Information

For more general information and technical information, the following books complete the library of CICS OTTO:

- *Program Directory* explains how to install CICS OTTO.

- *CICS Online Transmission Time Optimizer Compatibility Mode Guide* explains how to control optimization using native commands as an alternative to using the CICS panels.

- *CICS Online Transmission Time Optimizer Message Guide* provides an explanation for the messages that may be issued and explains any action that may be necessary.

What's New in Release 1.2

The following enhancements are included in CICS OTTO release 1.2:

- Statistics are collected for inbound and outbound data stream errors. These statistics show the number of data streams in which an error was detected, as well as information on the terminal for which the error most recently occurred. Such information includes date, time, LU/module name, partition ID and size, along with the displacement of the error in data stream, and failing 3270 order or data. A short description of the error code is also shown.

- Inbound and outbound data streams can be traced using an CICS OTTO storage area in which the trace records are stored. This so-called instorage trace enables you to track and evaluate specific inbound and outbound data stream errors. The online Trace Control option provides the controls to start, stop, and display this instorage trace. The instorage trace is provided as an alternative to the tracing that is written to SYSOUT.

- Online help and field level help is presented when PF1 is pressed on any product panel.

- **Changes for Version 1 Release 2, PTF PK53254**
  EMULATED 3270 MODEL 2 STARTS WITH INVALID AID X'27' WHICH IS AN ASCII SINGLE QUOTE INSTEAD OF SINGLE QUOTE EBCDIC X'7D'

  ERROR DESCRIPTION: A bank cash terminal is defined as a 3270 model 2 VTAM® terminal but the input data stream starts with X'27' which is an invalid AID for "normal" 3270 terminals, but when converted to EBCDIC it is x'7D' which is the 3270 AID for an ENTER key. The input data stream is mixed ASCII and EBCDIC with the 3270 control commands being in ASCII and the user data in EBCDIC.
  LOCAL FIX:
  The fix allows for ASCII control data being present in input messages. Output messages for the cash-terminal are optimized in the normal way. The fix does not affect terminals sending/receiving only EBCDIC data, and so it can be safely installed at other customer sites.

- **Changes for Version 1 Release 2, PTF PK59540**
  TO ALLOW COMPRESSION TO BE STOPPED FOR PRINTERS OR TERMINALS INDEPENDENTLY
  This PTF gives the ability to START/STOP optimization for 3270 screens and printers independently. Default optimization options will still be common for both.

- **Changes for Version 1 Release 2, PTF PM41414**
  CHANGE ABLBAT COMMANDS DEFAULT TO PERMANENT
  The default option for commands executed in batch mode is changed from T to P. A default option of P will now be assumed.

- **Changes for Version 1 Release 2, PTF PK89259**
  TO ENABLE CICS/OTTO TO RUN WITH CICS/TS V410
  This PTF ships minor compatibility changes to CICS/OTTO to allow it to function with release 4.1 of CICS Transaction Server.

- **Changes for Version 1 Release 2, PTF PM41468**
  TO ENABLE CICS/OTTO TO RUN WITH CICS/TS V420

  This PTF ships minor compatibility changes to CICS/OTTO to allow it to function with release 4.2 of CICS Transaction Server.

CHAPTER 1: OPTIMIZATION FEATURES

This chapter provides an overview of the features offered by the CICS Online Transmission Time Optimizer (CICS OTTO):

- Techniques used for optimization.

- Controls that you may consider using for optimization.

All these features are applicable to the following three component types:

1. 3270 terminals and printers.

2. SCS printers.

3. 3600/4700 banking terminals.

General control of the CICS OTTO features is handled using the CICS OTTO online dialog, which detailed in subsequent chapters. The *CICS Online Transmission Time Optimizer Compatibility Mode Guide* explains how to use the product's native command language as an alternative to using the online dialog.

1.1 Controlling Optimization

The optimization features of CICS OTTO are controlled based on two different types of start modes:

- Fully started indicates that **all** logical units (LUs) and modules are included in optimization **except** for those which are specifically excluded either because of active LU or module exclusions.

- Selectively started indicates that only those messages that are destined for terminals and/or printers specifically defined in the CICS OTTO selection list are optimized.

The minimum definitions required are those that define which optimization features should apply to the components. This is called Component Based Optimization. You can go further by defining optimization features that are LU specific and module specific.

LU Based definitions take priority over the Component Based definitions. Module[1] Based definitions take priority over both LU and Component Based definitions. This structure provides that most of your optimization needs can be handled at the component level.
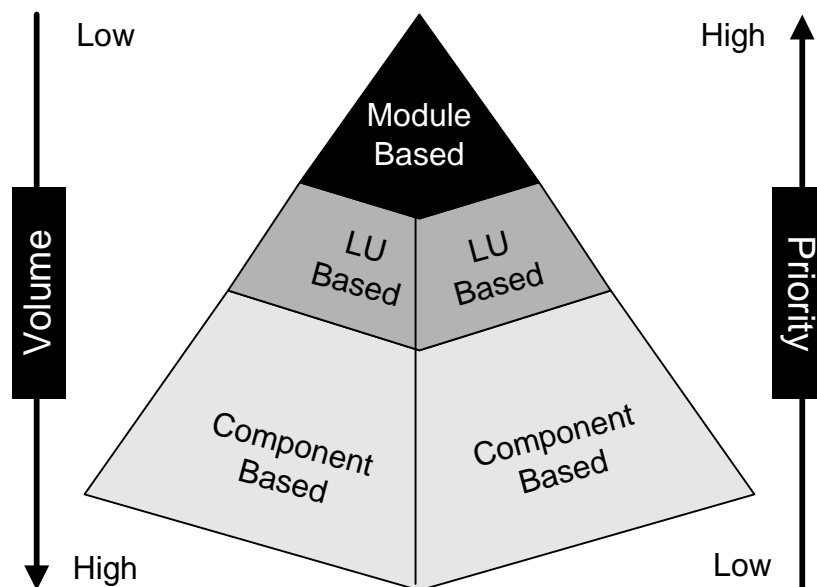
Figure 1: Optimization Structure

---

[1] Refer to the "Transaction ID" option on the SYSTEM OPTIONS panel.

1.1.1 Component Based Optimization Control

The optimization level as well as other processing-relevant information for a given message are defaulted to the component values. The following options may be set for the 3270 component:

```
Imaging
Optimization
Image Compression
Clear TIOA
Lightpen
WCC-Ignore
Base Color Switch
Printer Linesize
3192
Zero MF order allowed
Blank elimination
Field merge
```

1.1.2 LU Based Optimization Control

One or more component defaults may be overwritten by specific terminal settings, called LU settings. All options as described for the component may be set for one or more LUs. LU settings have a higher priority than the component values.

1.1.3 Module Based Optimization Control

The following options may be set for specific modules:

```
Imaging                             Optimization
Clear TIOA                          Lightpen
WCC-Ignore                          Opt. as SCS/3270
Prime compr. char.                  Printer linesize
Blank elimination                   Field merge
```

If one of the above options is set for a specific module and differs from the component value, any current LU-specific settings for these options are ignored for messages sent by the specific module destined for the specific LU. All other options that can be set for the component or LU—but **not** for a module—are taken from any current LU settings, or lastly from the component settings.

For example, assume the following controls are issued:

```
SET OPTIMIZATION OUT IMAGE ALL PERM
SET FMERGE ON MOD=pgm PERM
SET WCC-IGNORE ON MOD=pgm PERM
```

As a result, the following highlighted settings are active for the component, the LU, and module:

	Component Value	LU Value	Module Value	Resulting Value
Imaging	**ON**	ON	ON	ON
Clear Tioa	OFF	OFF	OFF	OFF
Lightpen	OFF	OFF	OFF	OFF
WCC-Ignore	OFF	OFF	**ON**	ON

If a message is sent by the module[1] *pgm* to the LU *name* the module settings for the above options are assumed. All options that are not explicitly set for a module are defaulted from the LU value (if it exists) or from the component.

---

[1] Refer to the "Transaction ID" option on the SYSTEM OPTIONS panel.

1.2 3270 Optimization Techniques

The 3270 component is divided into terminals and printers, referred to as logical units (LUs). Generally, optimization is done according to the 3270 data stream conventions using the intelligence of connected cluster controllers and/or terminals. This is done by the following basic optimization techniques:

- Replacing repeating characters by an RA-order (**R**epeat to **A**ddress).

- Sorting the data stream by buffer addresses.

These techniques are used for terminals as well as for printers with a defined line length in the WCC (**W**rite **C**ontrol **C**haracter). For printers without defined line length, blanks followed by a NL (**N**ew **L**ine) order are eliminated. Additionally, spaces at the end of the line (without NL) are optimized. You can also handle such data streams as if the line length were defined using the WCC-IGNORE option.

In addition to these basic optimization techniques, CICS OTTO provides Imaging, Field Merge, and Blank Elimination features for 3270 terminals. The following sections describe these features in more detail.

1.2.1 Imaging

Imaging is provided for 3270 terminals. Imaging is an optimization technique that keeps a copy of a screen in main storage and transmits only changed data. CICS OTTO uses an image pool to do this. Imaging starts with the first outbound message that is written by the application with an ERASE/WRITE command. All of the subsequent messages destined for the terminal are compared with the existing data in the screen image and only changed data and attributes are transmitted after the optimization process. Simultaneously, the screen image is updated with the new data and attributes.

The Imaging technique leads to a high optimization ratio if terminal operators are using applications that always send the same screen, or at least the same headings and constants. If you use Imaging, the following additional optimization techniques may be used.

1.2.2 Field Merge Optimization

Field Merge means that the transmission of specific attributes of protected fields is omitted after the optimization process, if:

- The protected field is invisible. In this case, also the data is not transmitted.

- The protected field is preceded by another protected field with exactly the same attribute.

CICS OTTO has full control over the merged fields. They may be changed in a subsequent outbound message. Also, a READ BUFFER is serviced as if these attributes were really on the screen.

Field Merge optimization may be used only if Imaging is used.

1.2.3 Blank Elimination

Blank Elimination means that all blanks in protected fields are changed to hexadecimal nulls. The advantage of this technique is mainly in conjunction with an ERASE/WRITE command. With an ERASE/WRITE command, not all referenced screen positions are filled with hex nulls. Therefore, replacing blanks with zeros represents a significant savings potential. Additionally, this technique leads to good optimization results when there are frequent screen exchanges.

CICS OTTO has full control over the eliminated blanks. The field contents may be changed in a subsequent outbound message and a READ BUFFER is serviced as if the blanks were really on the screen.

Blank Elimination may be used only if Imaging is used.

1.3 SCS Optimization Techniques

The only way to optimize SCS printer data streams is to replace blanks by tabulator positions. Instead of multiple blanks, only a PT-order (**P**rogram **T**ab) is transmitted after the optimization process. Additionally, one or more SHF-orders (**S**et **H**orizontal **F**ormat) are generated to determine the tabulator positions.

CICS OTTO provides the ability to use the 3270 printer optimization techniques for printers that are defined as SCS printers to the TP system and connected to a 3174-type cluster controller.

1.4 3600/4700 Optimization Techniques

CICS OTTO provides pure SCB data compression (**S**tring **C**ontrol **B**ytes) for both outbound and inbound directions. This technique distinguishes three categories of characters:

- Prime character.

- Repeating characters.

- Normal text.

The prime character is the most frequently used character in the data streams sent to the banking terminals (usually blank or hexadecimal null). After the optimization process, only one byte is transmitted instead of a series of prime characters. For repeating characters, two bytes are transmitted and for normal text the number of bytes of the text plus one count byte are transmitted. Good optimization results are achieved if the data streams contain a lot of prime characters and/or repeating characters.

Module ABLSNA performs SCB compression/decompression. ABLSNA is responsible for the pure SCB data compression as described in the IBM manual, *SNA Sessions Between Logical Units* (GC20-1868), Part 2 Chapter 5. However, the FMH handling is dependent on the TP system. This special handling (such as setting the compression bit in the appropriate FMH) is performed by an interface module, ABLSNAI. A sample source member is distributed as ABLSNAI. Within this source member, all actions to be performed are described in detail.

The decompression/compression mechanism on the 3600/4700 side is not part of the package, it is a user responsibility.

The 3600/4700 Optimization may be started only for TP-System outbound messages (SET OPT OUT 3600) or for both directions (SET OPT FULL 3600).

1.5 Optimization Tracing Options

Traces can be produced before and after each optimization for LUs and modules. There are two tracing techniques that can be used:

1. Message traces for inbound and outbound data streams can be written to an output file identified by DDNAME OTTOTRCS.

2. Instorage traces use a CICS OTTO storage area in which the trace records are saved for viewing via the Display Instorage Trace option of the TRACE CONTROL panel.

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CHAPTER 2: INSTALLING CICS OTTO

This chapter indicates what steps are required to complete installation after the product has been SMPE received, applied, and accepted. This information is for the attention of the installing system programmer.

2.1 Job Descriptions

All sample jobs are contained in members that you will find in the AABLINST data set. This section describes the purpose of each of the sample jobs.

 If you are installing this product into it's own SMP/E environment, the first job will define it:

- ABLSMPSU - is to ALLOCATE and INITIALIZE the SMP/E environment.

The remaining jobs are required for all installations:

- ABLALLOC - allocates the TARGET and DISTRIBUTION libraries.

- ABLDDDEF - performs the SMP/E ADD DDDEFs.

- ABLRECV - performs the SMP/E RECEIVE stage.

- ABLAPPLY - performs the SMP/E APPLY stage.

- ABLACCPT - performs the SMP/E ACCEPT stage, and completes the SMP/E part of the installation.

The following sample jobs are also required to be run:

- ABLVSAMJ - to create the required application VSAM data sets.

- ABLASML - to assemble and linkedit the exits.

- ABLBATC - to setup the application command file. The defaults can be changed and are listed in this User's Guide.

- ABLCASM - to assemble and linkedit the application programs.

An optional sample job:

- ABLOCSD - is provided to enable the definitions of the maps, etc. to be installed via DFHCSDUP.

2.2 System Changes

The following changes will also need to be made to your system:

DFHPLPTI requires the following entry:

- ```
  DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
  ```

- ```
  DFHPLT TYPE=ENTRY,PROGRAM=ABLSTRT
  ```

   Note: ABLSTART must be coded after DFHDELIM, and DFHDELIM must be explicitly defined.

DFHPLTSD requires the following entry:

- ```
  DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
  ```

- ```
  DFHPLT TYPE=ENTRY,PROGRAM=ABLSTOP
  ```

They should then be added to the SIT.

The following DD statements should be specified in the CICS startup JCL. The first three are mandatory, however if the statistics file (OTTOSTAT) is not defined, the module statistics will not be gathered at CICS shutdown.

```
//OTTOCMD  DD DSN=<hlq>.SABLCCMD,DISP=SHR    (command file)
//OTTOMOD  DD DSN=<hlq>.SABLCMOD,DISP=SHR    (module file)
//OTTOTRCS DD SYSOUT=*                       (trace file)
//OTTOSTAT DD SYSOUT=*                       (statistics file)
```

In addition the CICS OTTO load library <HLQ>.SABLLOAD must be concatenated to the DFHRPL DD statement.

Your installation should now be complete.

CHAPTER 3: OPERATING CICS OTTO

The optimization features described in the first chapter can be controlled in either of the following two ways:

1. Using the CICS dialog panels. The majority of all functions can be performed using these interactive and self-explanatory panels without the need to know or understand CICS OTTO's native command language. In subsequent chapters of this book, explanations needed for using these panels are provided.

2. Using the Compatibility Mode. Compatibility Mode under CICS allows you to use CICS OTTO's native command language. The main functions of the native commands are compatible to those that can be made using the CICS dialog panels. Accessing the Compatibility Mode from the CICS panels is detailed on page 103. The actual use of the native commands required in this mode are detailed in the *CICS Online Transmission Time Optimizer Compatibility Mode Guide*.

3.1 CICS Startup

CICS OTTO is automatically initiated using the PLT-phase ABLSTRT at CICS startup time. ABLSTRT enables the CICS input and output exits and initializes CICS OTTO by calling the interface module OTTOEXIT. All other routines are loaded from the VSAM control file OTTOMOD into the private area of the CICS region above the 16 MB line. All other required storage such as work areas, control blocks and the image pool is also acquired from above the 16 MB line.

3.2 CICS Normal Operation

CICS OTTO gets control of all input and output messages using standard CICS exits:

>   XTCOUT and XTCIN in case of BTAM

>   XZCOUT, XZCOUT1 and XZCIN in case of VTAM

If your installation is already using one or more of these exits, the order in which they should be enabled depends on the logic they perform. Generally, CICS OTTO should be the first one to get control of all messages, i.e. it should be the first one to be enabled. However, contact IBM Support if you want to use more than one program for the above exits.

3270, SCS and 3600/4700 type messages are optimized depending on the various start and control options. Additionally the user exit may influence the optimization.

3.3 CICS Shutdown

Optimization statistics are automatically written to the console or, if DD statement OTTOSTAT is present, to the statistics file at CICS shutdown time. This is initiated using the PLT program ABLSTOP.

☞   **Note:** Statistics are only written if a SHUT,NO is issued.

3.4 Temporarily Stopping and Restarting CICS OTTO

Two programs are delivered that you can use to temporarily stop and restart CICS OTTO processing without the need to recycle the CICS system; ABLTSTP and ABLTSTA, respectively.

To do so, add the following PPT/PCT definitions to your CICS system or enter corresponding definitions via CEDA :

```
DFHPPT TYPE=ENTRY,PROGRAM=OTTOTSTA,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=OTTOTSTP,PGMLANG=ASSEMBLER
DFHPCT TYPE=ENTRY,PROGRAM=OTTOTSTA,TRANSID=OSTA
DFHPCT TYPE=ENTRY,PROGRAM=OTTOTSTP,TRANSID=OSTO
```

The following transactions support this operation:

• Transaction OSTO stops CICS OTTO processing and disables the exit program OTTOEXIT.

• Transaction OSTA restarts CICS OTTO processing. Restarting CICS OTTO works like CICS OTTO initialization at CICS startup, i.e., the permanent CICS OTTO settings are read from the CMD file and the CICS OTTO optimization routines are read from the MOD file.

CHAPTER 4: CONSIDERATIONS FOR TUNING AND RUNTIME

This chapter contains tuning considerations that will assist you in making efficient use of your resources and achieving the best possible optimization results.

4.1 CPU Time

CICS OTTO needs some CPU time for the optimization of the messages. If Imaging is active and you want to decrease the CPU overhead, switch off the image compression. Without image compression, a higher value must be set for the total image pool size to make sure that all images can be saved in main storage. Therefore, you have to decide whether to use CPU time or main storage.

Generally, the CPU time depends on the optimization features in use. Less CPU time is used if Imaging is switched off -- but at the cost of the optimization effect.

Module based statistics also cause CPU overhead. Therefore, these statistics should be switched off whenever possible.

4.2 Optimization Ratio

The optimization ratio depends on:

- The optimization level used.

- The image pool size.

- How optimization is started (FULL or SELECTIVE).

- Which exclusions are active.

- User exits and various settings as described below.

4.2.1 Optimization Level

The highest optimization level should be selected to get maximum optimization results; meaning that Imaging should be switched on.

4.2.2 Image Pool Size

The image pool statistics provide information about the usage of the image pool. They are only relevant if the Imaging feature is used (this is the case when the optimization level **OUT IMAGE** is used). The image pool should be large enough to save the screen image of all terminals connected to the TP system. The SHORTAGE DELETIONS value in the image pool statistics will show if the total pool size should be increased. This value should be zero, or very low, to ensure best optimization effect. These statistics are important for the tuning of CICS OTTO and should be reviewed thoroughly

1. during the first weeks following the implementation of CICS OTTO and

2. after adding terminals to the TP system.

More details regarding the image pool can be found in section "8.1 FAQs About the Image Pool" on page 39.

4.2.3 Start Option

CICS OTTO has two start options; FULLY started or SELECTIVELY started. Fully started means that **all** LUs and modules are optimized **except** those which are excluded either because of active LU or module exclusions. Selectively started means that messages are optimized only if they are destined for terminals or printers in the selection list.

If CICS OTTO is selectively started, the optimization result is lower than if it is fully started. However, if only some remote terminals are to be optimized, the selective start option should be used.

4.2.4 Exclusions

The number of excluded terminals and modules influences the optimization ratio. However, the required module and terminal exclusions as described in the installation must be defined to ensure CICS OTTO functionality.

4.2.5 User Exit

When using a CICS OTTO user exit program, carefully check the return code passed to CICS OTTO because this return code has the highest priority regarding the optimization level used.

4.2.6 Various Settings

Optimization results depend on various settings. This section includes some tuning considerations regarding the types of settings that can be used.

4.2.6.1 *Set BCS*

If there are no terminals in your installation with the BASE COLOR SWITCH set, switch this feature off to get better optimization results. If there are only some terminals with the base color switch on, it is recommended to set this feature on explicitly for these terminals rather than to set the component value.

4.2.6.2 *Set LIGHTPEN*

If there are no terminals in your installation that can work with a light pen, switch this feature off to get better optimization results. If there are only some terminals with light pens, it is recommended to set this feature on explicitly for these terminals rather than to set the component value on.

4.2.6.3 *Set ZERO-MF-ALLOWED*

If all terminals in your installation support an MF-order with zero number of pairs, switch this feature on to get better optimization results. If there are only some terminals that do not support this kind of order, it is recommended to set this feature off explicitly for these terminals rather than to set the component value off.

4.2.6.4 *Set 3192*

If there are no 3179 or 3192 terminals in your installation, switch this feature off to get better optimization results. If there are only some terminals of these types, it is recommended to set this feature on explicitly for these terminals rather than to set the component value on.

4.2.6.5 *SET SCS*

If there are LU-type 1 printers in your environment that are connected to a 3174 type cluster controller, these printers can be optimized like an LU-type 3 printer. This will increase the printer optimization ratio.

4.2.6.6 *Set TERMNO*

TERMNO is the initialization value for the number of terminals. At startup time, CICS OTTO acquires all (internal) lists for exactly this number of terminals. Each time a list is filled up, the list is increased by the TP system's GETMAIN/FREEMAIN. Because the main storage is fragmented, this number should be set in a production environment.

```
>>──── SET TERMNO=nnn ──┬─ 3270 ─┬──────────────────────────────><
                        ├─ 3600 ─┤
                        └─ SCS ──┘
```

 The DISPLAY OPTIONS command will show you the number of control blocks in use. Take this value to set your start up number.

```
>>── DISPLAY OPTIONS ──┬─ SYSTEM ──┬──────────────────────────><
                       ├─ 3270 ────┤
                       ├─ SCS ─────┤
                       ├─ 3600 ────┤
                       ├─ LU=tid* ─┤
                       └─ MOD=pgm* ┘
```

4.3 Runtime Considerations

Two VSAM KSDS files are required for CICS OTTO operation and optionally two sequential files for the trace and enhanced statistics facilities. This section contains some runtime considerations in regard to these files.

4.3.1 VSAM Files

There are two VSAM files:

* The VSAM control file OTTOMOD is used to load CICS OTTO code at startup time and to keep track of any maintenance. This file might overflow while maintenance is applied.

* The VSAM command file OTTOCMD is used to maintain all permanent settings defined by the user. This file might overflow if a permanent command tries to add a new record.

In the event one of these files overflows, before the next startup you should:

1. Run a REPRO against the file.

2. DELETE and DEFINE the file again with a higher RECORDS specification.

3. Run the REPRO back into the new file.

To increase these VSAM files, you can use the sample JCL member ABLVSAMJ.

4.3.2 Trace File

A trace file is provided to track down message problems and output them to a SYSOUT DD statement called OTTOTRCS. Alternatively, an instorage trace is also offered that presents the trace records online.

This section refers only to the message trace that uses the output trace file. For details on how to start and stop all traces, see "Chapter 13: Trace Control" on page 67.

If the internal or non-internal trace option is chosen, the trace file will be opened when a trace is started and it will be closed when the trace is stopped.   Such traces can only be started if the OTTOTRCS DD statement exists. It is highly recommended to add this DD statement into the TP system startup deck. If the trace is on, CICS OTTO will trace all inbound and outbound data streams before optimization, as well as all outbound and inbound messages after optimization. Trace data is in a printable format according to the trace specification. Dynamic allocation is not performed for the trace file. You may therefore allocate it to disk which allows you to print the trace information using IEBGENER while the TP system is still up.

The trace information is written with the following DCB information:

```
LRECL=133,BLKSIZE=1330,RECFM=FBA,BUFNO=15
```

BLKSIZE and BUFNO may be overwritten in the JCL DCB parameter.

You may choose between the following two DD statements for the trace file:

```
1)     //OTTOTRCS DD    SYSOUT=*

2)     //OTTOTRCS DD    DSN=prefix.OTTOvvmm.TRACE,
       //               DISP=disp,DCB=(BLKSIZE=nnn,BUFNO=mmm)
```

where:
  prefix = Site specific high level qualifier
  vvmm = CICS OTTO version and release number
  disp   = OLD, SHR, MOD
  nnn   = Number of blocks
  mmm = Number of buffers

☞ **Note:** If the trace file is allocated to a disk, it must be printed after the trace is stopped and before a new trace is started in case of DISP=SHR or DISP=OLD. Otherwise, the trace previously written will be lost.

In the event of a B37 abend on the trace file, it can be handled automatically. During the installation process, parameter WRAP on the ABLGEN macro decides whether the trace output should be halted in a B37 condition or if it should be wrapped around. Wrapping simply means that the trace file will be overwritten starting from the top.

☞ **Note:** Do not use DISP=MOD with the WRAP AROUND installation option. This avoids D37 abends which cannot be handled.

4.3.3 Statistics File

The purpose of the statistics file is to save statistical information. This file is opened and closed during the TP system shutdown or whenever a request for statistics is made. The file may be allocated to disk which allows you to print the statistics information written using IEBGENER while the TP system is still up.

For details on creating, viewing, and printing statistics, see "Chapter 14: Optimization Statistics" on page 85. Module statistics are only available if the DD statement for the statistics file is present. Otherwise, only the component and pool statistics are written to the console.

The statistical information is written with the following DCB information:

```
LRECL=133,BLKSIZE=1330,RECFM=FBA,BUFNO=15
```

BLKSIZE and BUFNO may be overwitten in the JCL DCB parameter.

The number of records written to the statistics file depends on the number of entries in the module statistics list. This number may be restricted to a pre-defined value using the dialog option for excluding modules from statistics.

The required space (in number of records) for the statistics file can be calculated using the following formula:

```
r = 70 + 2*n + 5*((n+14)/15)
```

where: n is the number of modules for which statistics are saved.

To avoid B37 conditions, the statistics file should be pre-allocated with the following space specification in case of disk allocation:

```
SPACE = (1330,(r/10))
```

For example, if the number of modules for which statistical information should be saved is 200, the space is calculated as follows:

```
r = 70 + 2*200 +5*214/15
r = 544

SPACE = (1330,(55))
```

In the event of a B37 abend on the trace file, it can be handled automatically. During the installation process, parameter WRAP on the ABLGEN macro decides whether the trace output should be halted in a B37 condition or if it should be wrapped around. Wrapping simply means that CICS OTTO will overwrite the trace file starting from the top.

You may choose between the following two DD statements for the statistics file:

```
1)  //OTTOSTAT DD     SYSOUT=*

2)  //OTTOSTAT DD     DSN=prefix.OTTOvvmm.STAT,
    //                DISP=disp,BLKSIZE=nnn,BUFNO=mmm
```

where:

prefix = Site specific high level qualifier
vvmm = CICS OTTO version and release number
disp = OLD, SHR, MOD
nnn = Number of blocks
mmm = Number of buffers

Note: If DISP=SHR or DISP=OLD is used, the statistics file should be printed before a new TP system startup. If it is not, the previous statistics information will be lost. DISP=MOD should not be used together with the WRAP AROUND installation option. This avoids D37 abends which cannot be handled.

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CHAPTER 5: USING THE DIALOG

This chapter is intended to provide the minimally required information that is needed to get you started using the online dialog panels of CICS OTTO. This information includes:

- Operations.

- Access to and general use of the panels.

- Primary options of the PRIMARY OPTION MENU.

5.1 Accessing the Online Dialog

To access the online dialog of CICS OTTO, call the transaction ID. Normally, this ID is **OTTO**. However, this ID is assigned as part of a required PCT entry during installation.

5.2 The System Command File

Using the CICS panels of CICS OTTO, you will notice that most optimization controls can be defined as CURRENT or PERMANENT. All of your permanent optimization settings are maintained on a command file defined by the DD statement OTTOCMD, see section 4.3.1 VSAM Files on page 16. At each TP system startup, the command file optimization settings are activated. However, optimization settings can be changed temporarily.

- Use the PERMANENT field to define optimization settings that should be updated to the command file and activated at each system startup.

- Use the CURRENT field to define temporary changes to settings that effect only the current processing and that are not updated to the command file. Therefore, the permanent command file definitions are again activated at the next start up.

5.3 Using the Menus and Panels

Each menu and panel is described in detail. Each section begins with a picture of the menu or panel that is being described. If you are reading a section that describes a menu, you will see an explanation of what happens when you select each choice on the menu. If you are reading a section about a panel, you will see a list of the fields on the panel along with an explanation of each field.

5.3.1 Selecting an Option

On each menu, there is a list of options that can be selected and an input field called OPTION. Select an option by typing the corresponding option number into the OPTION field and pressing <ENTER>. If the selected option displays another menu, make a selection directly from the first menu, by entering both option numbers separated by a dot into the OPTION field:

> OPTION ===> *number of option.number of sub-option*   (e.g., 13.4)

From <u>any</u> panel you can go directly to an option or sub-option of the PRIMARY OPTION MENU by using the OPTION field as follows:

> OPTION ===> = *number of option.number of sub-option*   (e.g., =12.15 or =6)

For more illustration on using the OPTION field, see the explanation and examples detailed in section 5.5 "Using the Primary Option Menu".

Note: You cannot select all sub-options by typing an option number preceded by an equal sign.

5.3.2 Using Commands

Each menu and panel allows you to use commands that are defined by function keys. The panel specific function keys are defined at the bottom of each panel. The most common function key commands are:

F1 Displays online help for all panels that support the F1 key. To get field level help, position the cursor to an input field and press F1 to get online information for this field. To get general help for the panel, position the cursor elsewhere and press F1.

F3 Saves your input and returns to the calling menu. This function key is also used to terminate the OTTO transaction if used on the PRIMARY OPTION MENU.

F4 Returns to the PRIMARY OPTION MENU.

F7 Scrolls the panel backward.

F8 Scrolls the panel forward.

F9 Routes statistics to print or deletes special LU/module settings.

5.3.3 Using Generic Notation

On many panels you will be asked to enter LU or module names. When entering the name of an LU or module, generic notation is often allowed. Generic notation is a way of grouping LUs or modules with similar names using wildcards.

There are two types of generic notation: simple and extended.

5.3.3.1 *Simple Generic Notation*

Simple generic notation allows you to use the asterisk (*) as a wildcard to generically name LUs and modules by appending the asterisk to the end of a name, thus masking all names that begin with like characters. For example, generic LU name TE* will mask to all LU names that begin with TE.

5.3.3.2 *Extended Generic Notation*

Extended generic notation allows you to use the asterisk (*) and percent sign (%) as wildcards anywhere in a string. This applies to every parameter (or input field) for which CICS OTTO supports generic notation.

When using the extended generic notation, follow IBM's conventions for RACF® and OPC/ESA when using these two special characters. A percent sign matches any valid (non-blank) character in a name, whereas an asterisk matches any string of zero or more valid characters in a name.

There is one syntax restriction. Two or more consecutive asterisks are not allowed.

Wildcard notation is honored for every online input field and for every keyword (i.e., commands in compatibility mode) for which CICS OTTO supports generic notation.

Special attention must be paid to menu items 5.1 "Specify Optimization Values for Specific LU", and 6.1 "Specify Optimization Values for Specific Module". In compatibility mode, these items correspond to a SET command with keyword LU or MOD.

When a CICS OTTO command of this type is issued, two actions are performed:

1. All active terminals and modules are checked to see if they are matched by the LU/MOD specification. If so, the command is executed for these terminals and modules.

2. An entry is added to an internal CICS OTTO control block called "pending queue". This entry reflects the options set by the SET command.

    Actually, there are two pending queues, one for terminals and one for modules. Pending queue entries may be TEMPORARY (in-storage, only), or PERMANENT (written to the CMD file and read into storage during CICS /OTTO initialization).

Every time a terminal or module is optimized by CICS OTTO for the first time, the appropriate pending queue is scanned for an entry whose name matches the terminal, or module name. The logic follows one of the following courses:

- If no entry is found, the terminal/module is optimized using the default settings of the component (3270, SCS, or 3600) to which the terminal/module belongs.

- If there are one or more pending queue entries matching the terminal/module, a set of rules is applied in order to select a pending queue entry whose settings are used for the terminal/module. Exactly one entry is selected and there is no merge of settings of different matching pending queue entries.

The rules are governed by the goal to find the best-matching pending queue entry. In some respects, RACF methods are adopted to find the best-matching profile for a given resource.

Table 1: Wildcard Matching Rules and Examples for Generic Notation

Rule	Description
1	If there is a pending queue entry that exactly matches the name of the terminal/module, this entry is always selected. This would be the case if a SET command had been issued previously with the exact (i e., non-generic) LU/MOD name.
	If there is no exact match and there is only one matching generic pending queue entry, this entry will be selected.
	If there is no exact match and at least two matching generic pending queue entries exist, Rules 2-4 are used to find the best-matching entry.
	CICS OTTO uses the name "pattern" for a string that contains one or more generic characters (i.e., asterisks and/or percent signs). Thus, the name of a generic pending queue entry is a pattern. Rules 2-4 explain how CICS OTTO compares patterns in order to find the best matching one.
2	Both patterns are compared from left to right. CICS OTTO assumes that no asterisk precedes the first position where they differ. Since both patterns match the terminal/module name, one of the characters at this position must be generic. In this case, a non-generic character wins against a generic character and a percent sign wins against an asterisk.
	Example:
	For the name ABC, pattern ABC* matches better than AB%, AB% matches better than AB*, and AB* matches better than A%C.

3	If Rule 2 does not apply, both patterns must be equal up to, and including, a position where both contain an asterisk. In this case, the pattern with the higher number of "hits" (no. of characters $\diamond$ *) wins. If both patterns have the same number of hits, the pattern with the smaller number of asterisks wins. *Example*: For the name ABC, Rule 1 does not decide between the matching patterns A*, A*C, A*B*, and A*C*. Rule 3 lets A*C win against each other of these patterns.
Rule 4	If Rules 2 and 3 do not apply, the pattern that is higher in alphabetical order wins. This rule will apply in any case because both patterns are different. *Example :* For the name ABC, Rules 2 and 3 do not decide between the matching patterns A*B*, and A*C*. Rule 4 lets A*C* win.

5.4 START Panel

The START panel is the first panel to be displayed after calling the CICS OTTO transaction,
usually this transaction name is OTTO.

```
                                                                       OTTOM00




                      Online   Transmission   Time   Optimizer

                        OTTO for CICS V1R2   0602 / 06110


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                               All rights reserved


                               OTTOEXIT STARTED




 --------------------------------------------------------------------------------
 F3=Exit    ENTER=Primary Option Menu
```
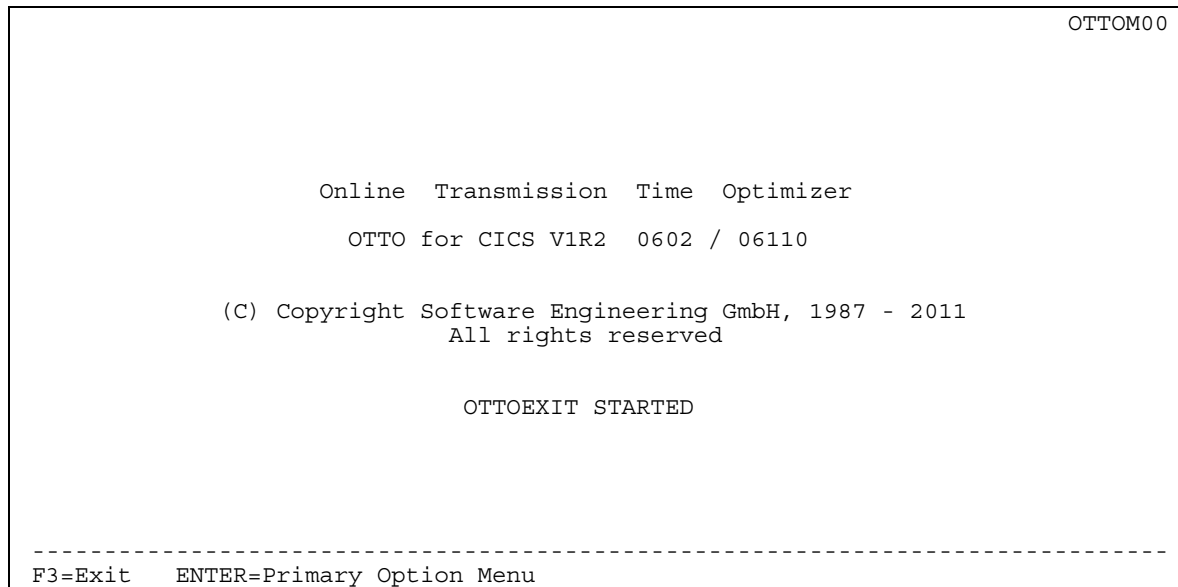
Figure 2: START Panel (OTTOM00)

To continue, press the ENTER key to access the PRIMARY OPTION MENU.

5.5 Using the Primary Option Menu

After pressing <ENTER> on the START panel, the PRIMARY OPTION MENU is displayed.

```
 PRIMARY OPTION MENU         OTTO for CICS V1R2                        OTTOM01


 OPTION ===> _____


              1.   START / STOP  OTTO for CICS Optimization
              2.   Display and Control OTTO Image Pool Size
              3.   3270 Component Based Optimization Control
              4.   3600/SCS Component Based Optimization Control
              5.   LU Based Optimization Control
              6.   Module Based Optimization Control
              7.   EXCLUDE LUs from Optimization
              8.   EXCLUDE Modules from Optimization
              9.   SELECT LUs for Optimization
             10.   Trace
             11.   System Options
             12.   Statistics Control
             13.   Display Statistics
             14.   OTTO Commands (Compatibility Mode)
              X.   Exit

 ------------------------------------------------------------------------------
 F1=Help     F3=Exit
```

Figure 3: PRIMARY OPTION MENU (OTTOM01)

Use the PRIMARY OPTION MENU to access other menus and panels that allow you to control
all optimization features, run traces, and manage system statistics.

Using the Panel

1. To go directly to the panel of a primary option from the PRIMARY OPTION MENU, place
    the cursor in the OPTION field and type one of the following option numbers:

    Enter: **To do this:**

    1   Start and stop the optimization for each component type, see "Chapter 7: Starting
                 and Stopping Optimization".

    2   Display image pool statistics and change the image pool size in main storage, see
                 "Chapter 8: Display and Control Image Pool Size" on page 37.

    3   Set optimization features for all 3270 terminals and printers, see "Chapter 9:
                 Component Based Optimization Control".

    4   Set optimization features for all 3600 terminals / SCS printers, see "Chapter 9:
                 Component Based Optimization Control".

    5   Set optimization features for LUs, see "Chapter 10: LU Based Optimization
                 Control".

6	Set optimization features for modules, see "Chapter 11: Module Based Optimization Control".
7	Exclude LUs from optimization when the start mode is FULL, see "Chapter 12: Optimization Exclusion and Selection".
8	Exclude modules from optimization when the start mode is FULL, see "Chapter 12: Optimization Exclusion and Selection".
9	Select terminals for optimization when the start mode is SELECTIVE, see "Chapter 12: Optimization Exclusion and Selection".
10	Start and stop the trace function, see "Chapter 13: Trace Control".
11	Define general system parameters, see "Chapter 6: System Options".
12	Manage statistics for modules, see "Chapter 14: Optimization Statistics".
13	Display and print statistics, see "Chapter 14: Optimization Statistics".
14	Access the Compatibility Mode for the purpose of using native commands to control the optimization features of CICS OTTO. Refer to the *CICS Online Transmission Time Optimizer Compatibility Mode Guide* for details on how to use native commands.
x	Terminate the CICS OTTO transaction (alternatively press <F3>). **Note:** To exit the CICS OTTO transaction from any other panel, type =X in the OPTION field.

2. To go directly to a sub-option of another menu from the PRIMARY OPTION MENU, place the cursor in the OPTION field and type: the primary option number, a dot, the sub-option number:

   Example: This example selects the sub-option EXCLUDE MODULES FROM STATISTICS, which is option 15 of the STATISTICS CONTROL menu, which is option 12 from PRIMARY OPTION MENU.

   - Enter 12.15 into the OPTION field of the PRIMARY OPTION MENU.
   - The EXCL. MODS FROM STATISTICS panel is displayed.

3. To bypass the PRIMARY OPTION MENU and make a panel selection from any other panel, place the cursor in the OPTION field and type: an equal sign, the primary option number, a dot, the sub-option number:

   Example: This example selects the sub-option EXCLUDE MODULES FROM STATISTICS, which is option 15 of the STATISTICS CONTROL menu, which is option 12 from PRIMARY OPTION MENU.

   - Enter =12.15 into the OPTION field on any panel.

   - The EXCL. MODS FROM STATISTICS panel is displayed.

5.6 General Panel Layout

All panels have the same general layout, except for the panel that is used for entering native commands called the Compatibility Mode.

```
L01 Panel Title                 OTTO for CICS V1R2                    Panel ID
L02
L03  Message Area
L04  Input Field for Selection of an Option
L05  ............................................................................
L06
L07  .
L08  .
L09  .
L10  .
L11  .
L12  .
L13  .                          Work Area
L14  .
L15  .
L16  .
L17  .
L18  .
L19  .
L20  .
L21  .
L22  ...........................................................................
L23  ----------------------------------------------------------------------
L24  Function Key Area
```

Figure 4: Panel Layout

L01   -   Line 1 contains CICS OTTO name, the version/release number V1R2, the panel title, and the panel identification number.

L02   -   Line 2 is always a blank separator line.

L03   -   Line 3 is the message area for online messages. There are two kinds of messages:

    1. General messages (syntax checking, etc.).
    2. Command execution messages.

    All messages are listed in the *CICS Online Transmission Time Optimizer Message Guide*.

L04   -   Line 4 contains an input field for the selection option.

L05 to L22- Lines 5 through 22 are used as work area lines for input and output fields.

L23   -   Line 23 is a dashed separator line.

L24   -   Line 24 is the function key area.

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CHAPTER 6: SYSTEM OPTIONS

General processing parameters are called system options. Such parameters include date format, exit support, etc.

The SYSTEM OPTIONS panel is displayed when option **11** is entered on the PRIMARY OPTION MENU.

```
 SYSTEM OPTIONS                 OTTO for CICS V1R2                         OTTOM16


 OPTION ===> _____


 SYSTEM OPTION        CURRENT        PERM.      CHANGE CURRENT     CHANGE PERM.
 -------------------------------------------------------------------------------
 DBCS support          NO            NO            ___                 ___
 User exit active      NO            NO            ___                 ___
 Name of user exit    -NA-          -NA-          ___ (SUFFIX)        ___ (SUFFIX)
 Application ID       CICS1                       _____            _____
 OTTO mods loaded      YES           NO
 Date formatting     EUROPEAN      EUROPEAN        _    A,E,J          _    A,E,J
                                                A(merican), E(uropean), J(ulian)
 Transaction ID        NO            NO            ___                 ___
 Terminal ID          CICS          CICS

 STATUS OF OTTO   CONTROL FILE:
 -----------------------------
 OPEN                                        CLOSE CONTROL FILE . . . ___    YES


 -------------------------------------------------------------------------------
 F1=Help    F3=End F1=Help     F3=End
```

Figure 5: SYSTEM OPTIONS Panel (OTTOM16)

Use the SYSTEM OPTIONS panel to define general parameters applicable to your site. Like all optimization definitions, these general parameter values may be active on a CURRENT basis (meaning active at this moment) or PERMANENT (meaning they are also updated in the control file for activation at the next startup of the TP system).

Using the Panel

1. To temporarily change a parameter, enter the new value in the CHANGE CURRENT column and press <ENTER>. Parameter definitions are provided below in the Fields section for this panel.

2. To permanently change a parameter, enter the new value in the CHANGE PERM column and press <ENTER>. When a new value is entered permanently, the new value also becomes currently active.

Fields

DBCS support   Is DBCS supported? **YES** or **NO**
The default is NO.

User exit active   To dynamically activate a suffixed user exit program, enter **YES**.
To dynamically deactivate a suffixed user exit program, enter **NO**.

Note: When activating the user exit, a suffix name must be entered in the next field.

For more details on user exits, see "Appendix B: User Exit Support".

Name of user exit   If a user exit is active, enter the suffix name for the user exit. For more details on user exits, see "Appendix B: User Exit Support".

Application ID   Defines an application ID to be used instead of the original TP system application ID. This ID is displayed on CICS OTTO's command screen (OTTO Compatibility Mode). Normally this ID is taken from the CICS SIT. This is for informational purposes only. To reset an application ID, enter a blank in this field. The distributed default ID is blank.

OTTO mods loaded   Indicates whether CICS OTTO's command execution modules (needed for manipulating optimization features) are permanently loaded in the main storage. Normally, when the OTTO Compatibility Mode is accessed, all native command modules are loaded and will remain loaded even after exiting the Compatibility mode.

Date formatting   Enter the date format to be displayed on panels and used on printed reports. Valid input:

J = JULIAN (YYYY-DDD)

E = EUROPEAN (DD-MM-YYYY)

A = AMERICAN (MM-DD-YYYY).

Transaction ID   Indicates whether module names should be considered to specify CICS program names or CICS transaction IDs. Valid input:

ON   Exclusion/selection is based on the transaction ID.

OFF   Exclusion/selection is based on the program name.

Terminal ID	Indicates whether the LU name is taken from the TP-system terminal definition (CICS) or as VTAM node name. Valid input:
	CICS
	IMS
	VTAM
STATUS OF OTTO CONTROL FILE	Indicates whether CICS OTTO's control file, OTTOCMD, is opened or closed.
CLOSE CONTROL FILE	Enter YES to close the control file, OTTOCMD. This is necessary before any command processing can run parallel in batch using the ABLBAT utility. See the "Batch Utilities" chapter of this book.

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CHAPTER 7: STARTING AND STOPPING OPTIMIZATION

The START/STOP panel is displayed when option **1** is entered on the PRIMARY OPTION MENU.

```
 START / STOP                  OTTO for CICS V1R2                        OTTOM02


 OPTION ===> _____

                              Valid Input for Status:   1 - START FULL
                                                        2 - START SELECTED
                                                        3 - STOP

 COMPONENT        CURRENT              PERMANENT        CHANGE CURRENT   CHANGE PERM.
                  Status               Status             Status           Status
 ---------      --------------       --------------     --------------   -----------

   3270T        FULLY STARTED        FULLY STARTED
                                                            _                _

   3270P        STOPPED              STOPPED
                                                            _                           _

   SCS          FULLY STARTED        FULLY STARTED
                                                            _                _

   3600         SELECTED STARTED     SELECTED STARTED
                                                            _                _




 -------------------------------------------------------------------------------
 F1=Help     F3=End
```

Figure 6: START/STOP Panel (OTTOM02)

This panel displays the current optimization status for each component and the status of the components on CICS OTTO's control file. For each individual component type, optimization can be started fully or selectively, or it can be stopped for each component. When optimization is fully started, all messages will be optimized except for those which are excluded either because of active LU exclusions or module exclusions. When optimization is started selectively, only messages which are designated to terminals or printers which are in CICS OTTO's selection list will be optimized.

On the panel the component 3270 has been split into 3270T and 3270P so that terminals or printers can be started or stopped independently.

The START/STOP status is displayed in the CURRENT and PERMANENT status columns. CURRENT refers to the status that is active at this moment. PERMANENT refers to the status that is reflected in the control file. At startup, the PERMANENT status is always reflected as the CURRENT status. The CURRENT status can be temporarily changed without changing the PERMANENT status. However, changing the PERMANENT status also changes the CURRENT status.

Using the Panel

To control optimization for each component type, enter one of the following status codes in either the CHANGE CURRENT Status field or the CHANGE PERM. Status field:

Enter: **To do this:**

1   Start full optimization of the component. When fully started, all messages are optimized except for those which are excluded either because of active LU exclusions or module exclusions. For details on exclusions, see "Excluding LUs" and "Excluding Modules" beginning on page 61.

2   Start selective optimization of the component. When selectively started, only messages which are designated to terminals or printers which are in the selection list are optimized. To explicitly select logical units for optimization, see "Selective LU Inclusion" on page 64.

3   Stop optimization for the specific component.

Fields

COMPONENT   Displays the type of component for which optimization can be started or stopped.

CURRENT Status   Displays the optimization status that is active at this time.

PERMANENT Status   Displays the permanent optimization status that is based on the control file.

CHANGE CURRENT Status   Allows you to change the current optimization status for the component. This change is effective for the current process only. Valid input: **1, 2,** or **3.**

CHANGE PERM. Status   Allows you to change the permanent optimization status for the component. This change will be updated to the control file. Changing the PERMANENT status also changes CURRENT status.   Valid input: **1, 2,** or **3.**

CHAPTER 8: DISPLAY AND CONTROL IMAGE POOL SIZE

This chapter explains how to display and control the image pool using CICS panels. Additionally, frequently asked questions are listed.

The IMAGE POOL panel is displayed when option **2** is entered on the PRIMARY OPTION MENU.

```
 IMAGE POOL                     OTTO for CICS V1R2                        OTTOM04


 OPTION ===> _____

                          Image Pool Statistics

 Number of slots generated . : 00004          Shortage deletions . : 00002
 Number of slots in use  . . : 00003          Delete requests  . . : 00004
 Average image length  . . . : 02757 Bytes    Image not saved  . . : 00005
 Length of longest image . . : 06696 Bytes    Image not found  . . : 00013
 Length of shortest image  . : 01992 Bytes


 POOL SIZE SETTINGS              CURRENT      PERMANENT            CHANGE PERM.
 --------------------          ---------    ---------          --------------
 Total pool size in KB          00016         00016                _____
 Slot size in bytes              4000          1024                ____



 -------------------------------------------------------------------------------
 F1=Help     F3=End
```

Figure 7: IMAGE POOL Panel (OTTOM04)

Use this panel to change the size of CICS OTTO's image pool. The image pool is allocated in the private area above 16MB. Imaging means a copy of each screen is kept in main storage. CICS OTTO's image pool is used for this. Imaging starts with the first outbound message written by the application with an ERASE/WRITE. All of the following messages that are destined to the same terminal will be compared with the existing data in the screen image and only changed data and attributes will be transmitted after the optimization process. Consequently, the screen image is updated with the new data and attributes.

The minimum pool size is 16 KB and the maximum size is 99999 KB. The minimum slot size is 256 bytes and the maximum is 9996 bytes. The optimum size is the one using the smallest number of slots to save one image. Check your pool settings against the displayed values after the system has been used for a while. Any new slot size defined here becomes active at the next startup of the TP system. The total amount of the image pool can be increased dynamically while CICS is running. CICS OTTO will try to obtain additional storage according to the SIZE specification and concatenate it to the existing pool with the old slot size specification. However, the changing of the slot size cannot be serviced while the TP system is still up (that also means no current changing is possible). Slot size changes become active at the next TP system startup.

The default value for the distributed image pool is 16 KB with a slot size of 1024 bytes. For more information regarding the image pool size, see "Considerations" on page 13.

Using the Panel

To use the IMAGE POOL panel, follow these instructions:

1. Review the actual Image Pool Statistics that are displayed. An explanation of these fields is provided below in the Output Fields section for this panel.

2. If desired, change the Pool Size Settings by entering a new size in the CHANGE PERM. field as detailed below in the Input Fields section for this panel.   When a new permanent setting is entered, the CURRENT setting is changed also.

Output Fields

Number of slots generated	Number of slots generated by CICS OTTO. This is the maximum number of slots in the existing pool.
Number of slots in use	Number of slots which are currently used to save screen images.
Average image length	Average length of all saved images since startup.
Length of shortest/longest image	Self explanatory.
Shortage deletions	Number of image deletions because the pool is full.
Delete requests	Number of explicit image deletions.
Image not saved	Number of images not saved.
Image not found	Number of 'image not found' conditions.

Input Fields

Total pool size in KB	To change the permanent total pool size setting, in the CHANGE PERM field, you may enter a value from **16** to **99999**. If the new size is a lower value, the decrease will be reflected at the next startup. If the new pool size is higher, a dynamic increase will be done immediately.
Slot size in bytes	To change the permanent slot size in bytes, enter a value from **256** to **9996** in the CHANGE PERM field. The length can be set to the average image length to make sure that a minimum of main storage is used by CICS OTTO. The entered value will be rounded to a fullword.

8.1 FAQs About the Image Pool

This section includes some commonly asked questions about the image pool.

How is the image pool allocated?

The image pool is allocated with a pre-defined size at the startup of CICS OTTO. This pool is a GETMAIN area and cannot be decreased while the TP system is up. The whole pool is used to keep screen images.

How do I calculate the pool size?

The pool should be big enough to capture all images of all terminals. It can be calculated by the following formula:

number of terminals * average image length

How do I know the pool is full?

The value in the "Shortage deletions" field of the pool statistics will indicate whether the pool is full. This value shows how many times CICS OTTO must delete an old image to be able to keep a new one -- this value should be zero or small.

The image pool should be enlarged only if the Image Shortage Deletion Count in the pool statistics is high, measured for at least one day. Keep in mind that the first message for a terminal always results in an image not found condition and thus increments this count.

What does the average image length have to do with slot size?

The average image length may be used to set the value for the SLOT size so that optimum usage of the image pool can be achieved. It is also recommended to use a part of the average image length -- because if there is a message of only 100 bytes also a full slot is used to keep it.

The number of generated slots represents the total pool size divided by the slot size.

What happens if the pool is full?

If the image pool is full, CICS OTTO will try to get space to save a new image. This is done by deleting images without transparent screen modifications (this means that CICS OTTO does not modify the bits on the screen). If possible, images that were not modified are deleted.

There are no messages issued in this case (100% full). CICS OTTO tries to free slots of other terminals (referred to as 'shortage deletions' in the image pool statistics). If enough slots cannot be freed, the new image cannot be saved and optimization for that message is performed as if the optimization level is 'OUT-NOIMAGE'.

When are images released?

Existing images are released when:

1. CICS OTTO tries to save a new image and there is no space in the image pool. CICS OTTO deletes the oldest image and increments the shortage deletions.

2. The CLEAR key is pressed.

3. An OPT OUT NOIMAGE is temporarily set for some reason.

4. A module is excluded.

For whatever reason, a message for a given terminal should not be optimized.

CHAPTER 9: COMPONENT BASED OPTIMIZATION CONTROL

This chapter explains how to control the optimization features for 3270 and 3600/SCS components.

9.1 3270 Component Based Optimization Control

The 3270 OPT. CONTROL panel is displayed when option **3** is entered on the PRIMARY OPTION MENU.

```
3270 OPT. CONTROL            OTTO for CICS V1R2                    OTTOM05


OPTION ===> _____

3270 COMPONENT           CURRENT         PERM.          CHANGE         CHANGE
  SETTINGS                                              CURRENT         PERM.
-------------------- -------         -------        -------        -------
Imaging                  ON              ON
Compress images          OFF             OFF          ____           ____
Lightpen                 OFF             OFF          ____           ____
3179/3192 C              OFF             OFF          ____           ____
WCC-Ignore               OFF             OFF          ____           ____
Base Color Switch        OFF             OFF          ____           ____
Zero MF order allowed    OFF             OFF          ____           ____
Clear TIOA               OFF             OFF          ____           ____
Printer linesize         132             132          ____           ____
Blank elimination        OFF             OFF          ____           ____
Field Merge              OFF             OFF          ____           ____


--------------------------------------------------------------------------------
F1=Help     F3=End
```

Figure 8: 3270 OPT. CONTROL Panel (OTTOM05)

Use the 3270 OPT. CONTROL panel to change CICS OTTO's optimization features for all connected 3270 terminals and printers, except for those which have special settings for LU or modules different from the 3270 component values.

The settings for each optimization feature are displayed in the CURRENT and PERM. columns. CURRENT refers to the setting that is active at this moment. PERM. refers to the status that is reflected in the control file. At startup, the PERMANENT status is always reflected as the CURRENT status. The CURRENT status can be temporarily changed without changing the PERMANENT status. However, changing the PERMANENT status also changes the CURRENT status.

Using the Panel

To use the 3270 OPT. CONTROL panel, follow these instructions:

1. To change a 3270 component setting, enter a new setting in the CHANGE CURRENT or CHANGE PERM. fields. The CHANGE CURRENT field allows you to change the current active value of the optimization feature. The CHANGE PERM. field allows you to change the permanent value on the control file. The optimization features and component settings for this panel are defined below.

2. To update the change, press <ENTER>. The changed setting is reflected in the corresponding CURRENT or PERM. fields.

Optimization Features

The following field explanations of CICS OTTO's optimization features have the same meaning for LUs and modules.

Imaging	Switches CICS OTTO's imaging feature *ON* or *OFF*.
Compress images	Keeps images in a compressed format in main storage to save memory. This keeps the image pool requirements low by compressing the saved screen images up to 50%. However, if the compression is switched on, this requires some CPU overhead. Therefore, if enough main storage is available the compression should be switched off. This should always be the case in a z/OS® environment.
	The default value of this feature is 'OFF'.
Lightpen	Determines if there are terminals in your installation which have a light pen. The distributed default value is 'OFF'.
3179/3192 C	Determines if there are 3179 or 3192 type terminals in your installation. This may decrease the optimization ratio and should be set 'OFF' whenever possible. The distributed default value is 'OFF'.
WCC-Ignore	Determines if the line length in the WCC of data streams destined for a 3270 printer should be considered by CICS OTTO 'OFF' or if it should be ignored and default to a line length of 80 'ON'. The distributed default value is 'OFF'.

Base Color Switch   Determines if there are terminals in your installation which have the BASE COLOR SWITCH 'ON'. This may decrease the optimization ratio and should be set 'OFF' whenever possible. The distributed default value is 'OFF'.

Zero MF order allowed   Determines if the MF-order (modify field) may be generated with a zero number of pairs. This is allowed according to the 3270 data stream conventions but may lead to problems with some kind of emulation or with terminals that are not 100% IBM compatible. It should be set to ´ON´ whenever applicable to increase the optimization effect. The default value is 'OFF'.

Clear TIOA   Determines if the CICS terminal input/output area (TIOA) should be cleared before moving the optimized message to it. This causes CPU overhead and should only be activated (ON) if there are transactions in your CICS system which do not use the length field of the TIOA (TIOADL) to determine the length of the incoming data but rather scan the whole I/O area for incoming data. Enter 'ON' to use this feature. The distributed default value is 'OFF'.

Printer linesize   Sets the standard line size for LU type 3 printers. Valid entries are 40, 64, 80, or 132. There is no distributed default value for this field.

                               This value is used if the printer message does not contain a line size indicator in WCC and the feature WCC-IGNORE is set 'OFF'.

Blank Elimination   Changes all blanks in protected fields to hexadecimal nulls. Enter 'ON' to use this feature. The distributed default value is 'OFF'.

                               Note: Blank elimination optimization may only be used when Imaging is used.

Field Merge   Omits the transmission of specific attributes of protected fields after the optimization process. Enter 'ON' to use this feature. The distributed default value is 'OFF'.

                               Note: Field Merge optimization may only be used when Imaging is used.

9.2 3600/SCS Component Based Optimization Control

The 3600/SCS OPT. CONTROL panel is displayed when option **4** is entered on the PRIMARY OPTION MENU.

```
3600/SCS OPT. CONTROL        OTTO for CICS V1R2                        OTTOM06


 OPTION ===> _____


 3600 COMPONENT            CURRENT        PERM.        CHANGE        CHANGE
   SETTINGS                                            CURRENT       PERM.
 -----------------        -------       -------       -------       -------
 Prime compr. character   X'40'          X'40'        X' __ '       X' __ '
 Input optimization         ON            ON           ___           ___
 Clear TIOA                OFF            OFF           ___           ___


 SCS COMPONENT            CURRENT        PERM.        CHANGE        CHANGE
   SETTINGS                                            CURRENT       PERM.
 -----------------        -------       -------       -------       -------
 SCS linesize              121            132          ___           ___
 Opt. as SCS / 3270        SCS            SCS          ____          ____



 --------------------------------------------------------------------------------
 F1=Help     F3=End
```

Figure 9: 3600/SCS OPT. CONTROL Panel (OTTOM06)

Use the 3600/SCS OPT. CONTROL panel to change CICS OTTO's optimization features for all of the connected 3600/4700 terminals or SCS printers, except for those which have special settings for LUs or modules different from the 3600/4700 or SCS component values.

The settings for each optimization feature are displayed in the CURRENT and PERM. columns. CURRENT refers to the setting that is active at this moment. PERM. refers to the status that is reflected in the control file. At startup, the PERMANENT status is always reflected as the CURRENT status. The CURRENT status can be temporarily changed without changing the PERMANENT status. However, changing the PERMANENT status also changes the CURRENT status.

 Using the Panel

To use the 3600/SCS OPT. CONTROL panel, follow these instructions:

1. To change a component setting, enter a new setting in the CHANGE CURRENT or CHANGE PERM. fields. The CHANGE CURRENT field allows you to change the current active value of the optimization feature. The CHANGE PERM. field allows you to change the permanent value on the control file. The optimization features and component settings are defined below for this panel.

2. To update the change, press <ENTER>. The changed setting is reflected in the corresponding CURRENT or PERM. fields.

Optimization Features

The following field explanations of CICS OTTO's optimization features have the same meaning for LUs and modules.

Prime compr. char.   Defines the hexadecimal specification of the prime compression character for 3600/4700 type devices. The distributed component default value is BLANK (X'40').

Input Optimization   Activates (*ON*) or deactivates (*OFF*) CICS OTTO's input optimization for 3600/4700 type terminals.

Clear TIOA   Determines if the CICS terminal input/output area (TIOA) should be cleared before moving the optimized inbound message to it. This causes CPU overhead and should only be activated if there are transactions in your CICS system which do not use the length field of the TIOA (TIOADL) to determine the length of the incoming data but rather scan the whole I/O area for incoming data. Enter '*ON*' to use this feature. The distributed default value is '*OFF*'.

SCS linesize   Sets the standard line size for SCS printers. Valid input is **1** through **999**. The distributed component default value is 132.

Opt. as SCS / 3270   Sets the optimization technique for SCS printers like SCS or 3270. The distributed component default value is SCS.

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CHAPTER 10: LU BASED OPTIMIZATION CONTROL

One or more component defaults may be overwritten by specific terminal settings (referred to as Logical Unit = LU in this chapter). All options as described for the components may be set for one or more LUs. These LU settings have a higher priority than the component values.

10.1 LU Based Optimization Control Menu

The LU BASED OPT. CONTROL menu is displayed when option **5** is entered on the PRIMARY OPTION MENU.

```
 LU BASED OPT. CONTROL          OTTO for CICS V1R2                   OTTOM07


 OPTION ===> _____



           1.  Specify Optimization Values for Specific LU
           2.  Display a List of all LUs with Specific Settings
           3.  Display Active 3270 Terminals
           4.  Display Active 3270 Printers
           5.  Display Active 3600 Terminals
           6.  Display Active SCS Printers


 LU NAME . . _____   For option 1  : input required
                                         full or generic name
                                         ("* " not allowed)

                         For option 2-6: input optional, default = *
                                         full or generic name
                                         ("* " allowed)

 ------------------------------------------------------------------------------
 F1=Help     F3=End
```

Figure 10: LU BASED OPT. CONTROL Panel (OTTOM07)

Use the LU BASED OPT. CONTROL menu to select several panels that allow you to view or change CICS OTTO's optimization features for a single LU or a group of specific terminals/printers (LUs) connected to the TP system.

Using the Panel

To use the LU BASED OPT. CONTROL menu, place the cursor in the OPTION field and type one of the following option numbers:

Enter: To do this:

1   Define optimization features for a specific LU or a group of terminals by using a generic name different from the component values. An LU name must be entered in the LU NAME field. If the LU name already exists in CICS OTTO's optimization process, the active values for this LU are displayed. Otherwise, a new entry is generated if you change one of the displayed active component values.

2   Display a list of all LUs which have a different setting from their component sorted by name. To limit the list, select a group of LUs by entering a generic name in the LU NAME field.

3   Display a list of all active 3270 terminals sorted by name. To limit the list, select a group of LUs by entering a generic name in the LU NAME field.

4   Display a list of all active 3270 printers sorted by name. To limit the list, select a group of LUs by entering a generic name in the LU NAME field.

5   Display a list of all active 3600 terminals sorted by name. To limit the list, select a group of LUs by entering a generic name in the LU NAME field.

6   Display a list of all active SCS printers sorted by name. To limit the list, select a group of LUs by entering a generic name in the LU NAME field.

10.2 Displaying LU Selection Lists

The LU LIST panel is displayed when options **2** through **6** are entered on the LU BASED OPT. CONTROL menu.

```
 LU LIST   (lu type)          OTTO for CICS V1R2                     OTTOM08


 OPTION ===> _____  DISPLAY CRITERIA *_____     Entries   1 to   44 of    48
                                                                   MORE:   +
                   Selection for LU based optimization control

   LU                  LU                  LU                  LU
 -------------------------------------------------------------------------------
 _ LU00*            _ LU01*            _ LU02*            _ LU03*
 _ LU11*            _ LU12*            _ LU13*            _ LU14*
 _ LU15*            _ LU16*            _ LU17*            _ LU18*
 _ LU19*            _ LU21*            _ LU22*            _ LU23*
 _ LU24*            _ LU25*            _ LU26*            _ LU27*
 _ LU28*            _ LU29*            _ LU31*            _ LU32*
 _ LU33*            _ LU34*            _ LU35*            _ LU36*
 _ LU37*            _ LU38*            _ LU39*            _ LU41*
 _ LU42*            _ LU43*            _ LU44*            _ LU45*
 _ LU46*            _ LU47*            _ LU48*            _ LU49*
 _ AAAA             _ BLA              _ PR00             _ PR01


                                                                  MORE...
 -------------------------------------------------------------------------------
 F1=Help   F3=End   F4=Return   F7=Backward   F8=Forward
```

Figure 11: LU LIST Panel (OTTOM08)

The LU LIST panel contains a list of all LUs selected in the LU BASED OPT. CONTROL menu. Use this panel to select one or more LUs to view or change their optimization settings. The specific type of LUs listed depends on the option (2 through 6) entered on the LU BASED OPT. CONTROL menu:

- All LUs with specific settings.

- Active 3270 terminals and printers.

- Active 3600 terminals.

- Active SCS printers.

The specific type of LUs listed is shown in (lu type) on the top line of the panel.

Using the Panel

1. To select an LU, place the cursor on the underscore field to the left of the displayed LU name and type an **S.** You can select one or more of the LU names.

2. Press <ENTER> after selecting an LU(s).

3. Depending on the type of LU LIST displayed, the appropriate LU OPT. CONTROL panel is displayed as illustrated in the remaining sections of this chapter.

4. If more than one LU was selected by entering **S**, a panel for the next selected LU is displayed after returning from the called panel by pressing <F3>. After exiting the panel for the last selected LU, the LU list is displayed again with the names of selected LUs highlighted. You can select new LUs, go to another option, or return.

Fields

DISPLAY CRITERIA   Contains the full or generic LU name as entered on the LU BASED OPT. CONTROL menu or the default value *. You can define another selection for this list by changing the LU value in this field.

Entries   Contains the number of LUs displayed on this screen (from/to) and the total LUs found for the specified display criteria.

10.3 LU Based Optimization - 3270 Terminals/Printers

The 3270 LU OPT. CONTROL panel for terminals and printers is displayed as a result of one of
the following actions:

- Entering a 3270 terminal/printer name on the LU BASED OPT. CONTROL menu and se-
  lected option **1** (SPECIFY OPTIMIZATION VALUES FOR SPECIFIC LU), or

- Selecting a 3270 device by entering an **S** on an LU based selection list, or

- Typing a name into the NEXT LU field on this same panel and the terminal/printer is already
  active (in CICS OTTO's optimization process) and is a 3270 device type.

```
3270 LU OPT. CONTROL          OTTO for CICS V1R2                      OTTOM10


OPTION ===> _____                              NEXT LU . . . . . _____

SETTINGS FOR LU          CURRENT         PERM.        CHANGE         CHANGE
    SET2          (Component values in parenth.)      CURRENT        PERM.
-------------------------------------------------------------------------------
Imaging                ON  (ON)       ON  (ON)        ___            ___
Compress images        OFF (OFF)      OFF (OFF)       ___            ___
Lightpen               OFF (OFF)      OFF (OFF)       ___            ___
3179/3192 C            OFF (OFF)      OFF (OFF)       ___            ___
WCC-Ignore             N/A (N/A)      N/A (N/A)       ___            ___
Base Color Switch      OFF (OFF)      OFF (OFF)       ___            ___
Zero MF order allowed  OFF (OFF)      OFF (OFF)       ___            ___
Clear TIOA             OFF (OFF)      OFF (OFF)       ___            ___
Blank elimination      OFF (OFF)      OFF (OFF)       ___            ___
Field Merge            OFF (OFF)      OFF (OFF)       ___            ___
Printer line size      N/A (N/A)      N/A (N/A)



-------------------------------------------------------------------------------
 F1=Help     F3=End      F4=Return
```

Figure 12: 3270 LU OPT. CONTROL Panel (OTTOM10)

For details on using this panel and for a description of the specific optimization features that can
be controlled here, see "3270 Component Based Optimization Control" on page 41.

To go to another LU, type the name into the NEXT LU field.

10.4 LU Based Optimization - 3600 Terminals

The 3600 LU OPT. CONTROL panel is displayed as a result of one of the following actions:

- Entering a 3600 terminal name on the LU BASED OPTIMIZATION CONTROL menu and selecting option **1** (SPECIFY OPTIMIZATION VALUES FOR SPECIFIC LU), or

- Selecting a 3600 terminal by entering an **S** on an LU based selection list, or

- Typing a name into the NEXT LU field on this same panel and the terminal is already active (in CICS OTTO's optimization process) and is a 3600 device type.

```
 3600 LU OPT. CONTROL            OTTO for CICS V1R2                      OTTOM11


 OPTION ===> _____                              NEXT LU . . . . . _____




 SETTINGS FOR LU            CURRENT        PERM.         CHANGE        CHANGE
     T012            (Component values in parenth.)     CURRENT        PERM.
 ------------------------------------------------------------------------------
 Prime compr. char.   X'40' (X'00')    X'40' (X'00')   X' __ '       X' __ '
 Input optimization    ON  (OFF)        ON  (OFF)
 Clear TIOA            ON  (OFF)        ON  (OFF)         ___           ___




 ------------------------------------------------------------------------------
 F1=Help     F3=End      F4=Return
```

Figure 13: 3600 LU OPT. CONTROL Panel (OTTOM11)

For details on using this panel and for a description of the specific optimization features that can be controlled here, see "3600/SCS Component Based Optimization Control" on page 44.

To go to another LU, type the name into the NEXT LU field.

10.5 LU Based Optimization - SCS Printers

The SCS LU OPT. CONTROL panel is displayed as a result of one of the following actions:

- Entering an SCS printer name on the LU BASED OPTIMIZATION CONTROL menu and selecting option **1** (SPECIFY OPTIMIZATION VALUES FOR SPECIFIC LU), or

- Selecting an SCS printer by entering an **S** on an LU based selection list, or

- Typing a name into the NEXT LU field on this same panel and the LU is already active (in CICS OTTO's optimization process) and is an SCS printer.

```
SCS LU OPT. CONTROL              OTTO for CICS V1R2                      OTTOM12


OPTION ===> _____                                  NEXT LU . . . . . _____



SETTINGS FOR LU            CURRENT        PERM.        CHANGE         CHANGE
    SCS1              (Component values in parenth.)   CURRENT         PERM.
------------------------------------------------------------------------------

Printer linesize      121 (121)     121  (132)         ___            ___
Opt. as SCS / 3270    3270 (SCS )   3270 (SCS )        ____           ____





------------------------------------------------------------------------------
F1=Help    F3=End      F4=Return
```

Figure 14: SCS LU OPT. CONTROL Panel (OTTOM12)

For details on how to use this panel and for a description of the specific optimization features that can be controlled here, see "3600/SCS Component Based Optimization Control" on page 44.

To go to another LU, type the name into the NEXT LU field.

10.6 LU Based Optimization - LU Not Active

The LU OPT. CONTROL panel is displayed as a result of one of the following actions:

- Entering an LU name for an LU which is not active on the LU BASED OPT. CONTROL menu and selecting option **1** (SPECIFY OPTIMIZATION VALUES FOR SPECIFIC LU), or

- Selecting an LU name which is not active by entering an **S** on an LU based selection list, or

- Typing a name into the NEXT LU field on this same panel and the LU is **not** active yet (in CICS OTTO's optimization process).

In this case all possible optimization values of all components are displayed and must be changed according to your special device type. The specified values are activated at the first connection of this LU to the TP system.

```
 LU OPT. CONTROL               OTTO for CICS V1R2                      OTTOM13


 OPTION ===> _____                              NEXT LU . . . . . _____

 LU . . .  SE17           CURRENT         PERM.      CHG. CURRENT   CHG. PERM.
 ------------------------------------------------------------------------------
 Imaging                ON  (ON)        ON  (ON)        ___            ___
 Lightpen               OFF (OFF)       OFF (OFF)       ___            ___
 WCC-Ignore             OFF (OFF)       OFF (OFF)       ___            ___
 Base Color Switch      OFF (OFF)       OFF (OFF)       ___            ___
 Printer linesize       121 -NA-        132 -NA-        ___            ___
 Prime compr. char.     X'40' (X'40')   X'40' (X'40')   X'___ '        X'___ '
 Compress images        OFF (OFF)       OFF (OFF)       ___            ___
 3179/3192 C            OFF (OFF)       OFF (OFF)       ___            ___
 Zero MF order allowed  OFF (OFF)       OFF (OFF)       ___            ___
 Opt. as SCS / 3270     SCS  (SCS)      SCS  (SCS)      ____           ____
 Clear TIOA             OFF (OFF)       OFF (OFF)       ___            ___
 Blank elimination      OFF (OFF)       OFF (OFF)       ___            ___
 Field Merge            OFF (OFF)       OFF (OFF)       ___            ___



 ------------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return     F9=Delete Entry
```

Figure 15: MODULE OPT. CONTROL Panel (OTTOM13)

For details on how to use this panel and for a description of the specific optimization features that can be controlled here, see "Chapter 9: Component Based Optimization Control" on page 41.

To go to another LU, type the name into the NEXT LU field.

CHAPTER 11: MODULE BASED OPTIMIZATION CONTROL

This chapter explains how to control optimization by defining the optimization features for modules. For modules, the following optimization features may be set:

```
Imaging
Clear TIOA
WCC-Ignore
Prime compr. char.
Lightpen
SCS Optimization
Printer linesize
Blank elimination
Field Merge
```

The highest priority for settings is 1) the module, 2) the LU, and 3) the component. For complete information, see "Chapter 1: Optimization Features" on page 1.

This means if one or more of the above options is set for a specific module and the setting is different from the component settings or the LU specific settings, the module settings are used for the messages sent by the specific module destined to the specific LU. All other options which can be set for the component or LU—but **not** for a module—are taken from the component settings or eventually present LU settings.

For example, assume the following commands are issued using the online dialog or the native command language for components and LUs:

```
SET OPTIMIZATION OUT IMAGE ALL PERM
SET BLANKELIM ON LU=name PERM
SET FMERGE ON MOD=pgm PERM
SET WCC-IGNORE ON MOD=pgm PERM
```

As a result, the following highlighted settings are active for the component, LU and module:

	Component Value	LU Value	Module Value	Resulting Value
Imaging	**ON**	ON	ON	ON
Clear Tioa	OFF	OFF	OFF	OFF
Lightpen	OFF	OFF	OFF	OFF
WCC-Ignore	OFF	OFF	**ON**	ON

Now, if a message is sent by the module *pgm* to the LU *name* the module settings for the above options are taken. All options which are not explicitly set for a module are defaulted from the component or the LU (if the LU definitions exist).

One or more component defaults may be overwritten by specific module settings. These module settings have a higher priority than the component values and - if any exist - the LU values.

11.1 Module Based Optimization Control Menu

This MOD. BASED OPT. CONTROL menu is displayed when option **6** is entered on the
PRIMARY OPTION MENU.

```
 MOD. BASED OPT. CONTROL       OTTO for CICS V1R2                    OTTOM09


 OPTION ===> _____



          1.   Specify Optimization Values for Specific Module
          2.   Display a List of all Modules with Specific Settings


 MODULE . .  _____  For option 1 : input required
                                       Full or generic name
                                       ("* " not allowed)

                        For option 2 : input optional, default = *
                                       Full or generic name
                                       ("* " allowed)




 --------------------------------------------------------------------------------
 F1=Help      F3=End
```

Figure 16: MOD. BASED OPT. CONTROL Panel (OTTOM09)

Use the MOD. BASED OPT. CONTROL panel to select several panels that allow you to view or
change CICS OTTO's optimization features for one or a group of specific modules.

Using the Panel

To use the MOD. BASED OPT. CONTROL menu, place the cursor in the OPTION field and type
one of the following option numbers and define a MODULE name if required:

Enter: To do this:

1   Set optimization features different from the component values for one or a group of
          modules by using a generic name. A module name must be entered in the MODULE
          field. If the module name entered already exists in CICS OTTO's optimization process,
          the active values for this module are displayed. Otherwise, a new entry is generated
          when you change one of the displayed values.

2   Display a list of all modules which have a different setting from the components sorted
          by name. All modules are displayed if no module name is entered in the MODULE
          field. Optionally, select a group of modules by using generic name.

11.2 Display Module Selection List

The MOD. LIST is displayed when option **2** is entered on the MOD. BASED. OPT. CONTROL menu.

```
 MOD. LIST (SPEC. SETT.)      OTTO for CICS V1R2                      OTTOM08


 OPTION ===> _____  DISPLAY CRITERIA *_____     Entries   1 to    3 of    3

                Selection for module based optimization control

   MODULE            MODULE              MODULE            MODULE
 ------------------------------------------------------------------------------
 _ MOD00000         _ MOD00001         _ OTTO*






 ------------------------------------------------------------------------------
 F1=Help   F3=End   F4=Return   F7=Backward   F8=Forward   F9=Delete ALL
```

Figure 17: MOD. LIST Panel (OTTOM08)

The MOD. LIST panel contains a list of all active modules which have specific settings. Use this panel to select one or more modules and view or change the optimization settings for the selected module(s).

Using the Panel

1. To select a module, place the cursor on the underscore field to the left of the displayed module name and type an **S**. You can select one or more of the modules to work with.

2. Press <ENTER> after selecting a module(s). The MOD. OPT. CONTROL panel is displayed on which you can view or edit the optimization features for the specific module.

3. If more than one module was selected by entering **S**, a panel for the next selected module is displayed after returning from the called panel by pressing <F3>. After exiting the panel for the last selected module, the module list is displayed again with the names of the selected terminals highlighted. You can select new modules, go to another option, or return.

Fields

DISPLAY CRITERIA Contains the full or generic module name as entered on the MOD. BASED OPT. CONTROL menu or the default value *. You can define a different selection for this list by changing the module value in this field.

Entries Contains the number of modules displayed on this screen (from/to) and the total modules found for the specified display criteria.

11.3 Module Based Optimization

The MODULE OPT. CONTROL panel is displayed as a result of one of the following actions:

- Entering a module name in the MOD. BASED OPT. CONTROL menu and selecting option **1.**

- Selecting a module in the module based selection list (MOD. LIST panel).

- Typing a name into the NEXT MODULE field on this panel.

```
MODULE OPT. CONTROL            OTTO for CICS V1R2                    OTTOM13


OPTION ===> _____                              NEXT MODULE . . . _____

Module .  OTTO*          CURRENT          PERM.      CHG. CURRENT   CHG. PERM.
------------------------------------------------------------------------------
Imaging                ON  (ON)       ON  (ON)        ___            ___
Lightpen               OFF (OFF)      OFF (OFF)       ___            ___
WCC-Ignore             OFF (OFF)      OFF (OFF)       ___            ___
Base Color Switch         (N/A)          (N/A)
Printer linesize       132 -NA-       080 -NA-        ____           ____
Prime compr. char.     X'00' (X'00')  X'00' (X'00')  X'___ '      X'___ '
Compress images           (N/A)          (N/A)
3179/3192 C               (N/A)          (N/A)
Zero MF order allowed     (N/A)          (N/A)
Opt. as SCS / 3270     SCS  (SCS)     SCS  (SCS)      ____           ____
Clear TIOA             OFF (OFF)      OFF (OFF)       ___            ___
Blank elimination      OFF (OFF)      OFF (OFF)       ___            ___
Field Merge            OFF (OFF)      OFF (OFF)       ___            ___



------------------------------------------------------------------------------
F1=Help    F3=End     F4=Return     F9=Delete Entry
```

Figure 18: MODULE OPT. CONTROL Panel (OTTOM13)

If the module is **not yet active** (in CICS OTTO's optimization process), all possible optimization values are displayed and must be changed according to your special needs. The specified values become effect at the moment the first message is sent by the specified module.

For details on how to use this panel and for a description of the specific optimization features that can be controlled here, see "Chapter 9: Component Based Optimization Control" on page 41.

To go to another module, type the name into the NEXT MODULE field.

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CHAPTER 12: OPTIMIZATION EXCLUSION AND SELECTION

CICS OTTO has two start modes:

1. FULLY STARTED - When CICS OTTO is FULLY STARTED all messages are included in optimization, except for specific LUs or modules that are excluded from the optimization process.

2. SELECTIVELY STARTED - When CICS OTTO is SELECTIVELY STARTED, the only messages that are optimized are those destined for specifically selected LUs that are included in the optimization process.

This chapter explains how to exclude LUs and modules from the FULLY STARTED mode and how to selectively include LUs when the SELECTIVELY STARTED mode is used. For more details on starting and stopping the optimization, see "Chapter 7: Starting and Stopping Optimization" on page 35.

12.1 Excluding LUs

The EXCL. LUs FROM OPT panel is displayed when option **7** is entered on the PRIMARY OPTION MENU.

```
 EXCL. LUS FROM OPT.            OTTO for CICS V1R2                      OTTOM14


 OPTION ===> _____        EXCLUDE LU . . . . . .  _____     PERMANENT . NO
                                                 ENTRIES    1 TO    24 OF    41
                                                                MORE:    +
 LU        EXCLUDE          INCLUDE     LU          EXCLUDE          INCLUDE
        temp.   perm.    temp.  perm.            temp.   perm.    temp.  perm.
 --------------------------------------------------------------------------------
 LU00*    YES     YES     ___    ___    LU01*     YES     YES     ___    ___
 LU02*    YES     YES     ___    ___    LU03*     YES     YES     ___    ___
 LU11*    YES     YES     ___    ___    LU12*     YES     YES     ___    ___
 LU13*    YES     YES     ___    ___    LU14*     YES     YES     ___    ___
 LU15*    YES     YES     ___    ___    LU16*     YES     YES     ___    ___
 LU17*    YES     YES     ___    ___    LU18*     YES     YES     ___    ___
 LU19*    YES     YES     ___    ___    LU21*     YES     YES     ___    ___
 LU22*    YES     YES     ___    ___    LU23*     YES     YES     ___    ___
 LU24*    YES     YES     ___    ___    LU25*     YES     YES     ___    ___
 LU26*    YES     YES     ___    ___    LU27*     YES     YES     ___    ___
 LU28*    YES     YES     ___    ___    LU29*     YES     YES     ___    ___
 LU31*    YES     YES     ___    ___    LU32*     YES     YES     ___    ___
                                                                        MORE...
 --------------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return     F7=Backward     F8=Forward
```

Figure 19: EXCL. LUS FROM OPT. Panel (OTTOM14)

Use the EXCL. LUS FROM OPT. panel to; 1) exclude one or more LUs from optimization when CICS OTTO is FULLY STARTED (all LUs that are already excluded temporarily or permanently are displayed on this panel) and 2) remove LUs from exclusion.

Using the Panel

1. To exclude an LU, enter the LU name in the EXCLUDE LU field (generic notation is allowed). If you want to exclude this LU permanently, enter YES in the PERMANENT field (the default value is NO).

2. Press <ENTER>. The LU name should appear on the list of excluded LUs. The LUs displayed are sorted by name.

3. To remove an LU from exclusion temporarily, enter YES in the INCLUDE temp. column for the specific LU and press <ENTER>. Because this is a temporary include, the LU will again be excluded effective with the next system start up.

4. To remove an LU from permanent exclusion, enter YES in the INCLUDE perm. column for the specific LU. Press <ENTER> and the LU is removed from the list of excluded LUs.

Fields

EXCLUDE LU	Enter the name of the LU to be excluded from optimization when CICS OTTO is FULLY STARTED.
PERMANENT	To exclude an LU temporarily, enter **NO**. A temporarily excluded LU becomes included effective with the next system startup.
	To exclude an LU permanently, enter **YES**. A permanently excluded LU remains excluded effective with each system startup.
ENTRIES	Displays the number of excluded LUs that may be viewed on the panel.
LU Columns	Displays the name of LUs that are excluded from optimization.
EXCLUDE Columns	Indicates with a YES or a NO whether the LU is excluded temporarily or permanently from optimization.
INCLUDE Columns	To temporarily include an LU in optimization, enter **YES** in the temp. column. The LU will again be excluded effective with the next system startup.
	To permanently include an LU in optimization, enter YES in the perm. column. The LU is removed from the list of excluded LUs.

12.2 Excluding Modules

The MOD. EXCLUSIONS panel is displayed when option **8** is entered on the PRIMARY OPTION
MENU.

```
 MOD. EXCLUSIONS                 OTTO for CICS V1R2                       OTTOM14


 OPTION ===> _____         EXCLUDE MODULE . . . .  _____      PERMANENT . NO
                                                     ENTRIES    1 TO     3 OF    3

 MODULE     EXCLUDE           INCLUDE    MODULE       EXCLUDE          INCLUDE
        temp.   perm.   temp.   perm.             temp.   perm.   temp.   perm.
 -------------------------------------------------------------------------------
 DFH3270P  YES     YES     ___     ___








 -------------------------------------------------------------------------------
 F1=Help    F3=End    F4=Return    F7=Backward    F8=Forward
```

Figure 20: MOD. EXCLUSIONS Panel (OTTOM14)

Use the MOD. EXCLUSIONS panel to exclude one or more modules from optimization when
CICS OTTO is FULLY STARTED. All modules that are already excluded temporarily or
permanently are displayed on this panel. Therefore, this panel is also used to remove modules
from exclusion.

The use of this panel and the field descriptions are the same as detailed for LU exclusions in the
previous section.

12.3 Selective LU Inclusion

When CICS OTTO is SELECTIVELY started, only explicitly defined LUs are included in optimization.

Note: Modules cannot be selectively included in the optimization process because all module messages are optimized except excluded modules.

The SELECT LUS FOR OPT. panel is displayed when option **9** is entered on the PRIMARY OPTION MENU.

```
 SELECT LUS FOR OPT.             OTTO for CICS V1R2                     OTTOM14


 OPTION ===> _____        SELECT LU  . . . . . . _____       PERMANENT . NO
                                                  ENTRIES    1 TO     2 OF    2

 LU          SELECT            UNSELECT     LU          SELECT            UNSELECT
         temp.   perm.     temp.   perm.            temp.   perm.     temp.   perm.
 ------------------------------------------------------------------------------
 SET9     YES     YES       ___     ___     BLUB     YES     YES       ___     ___













 ------------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return     F7=Backward     F8=Forward
```

Figure 21: SELECT LUs FOR OPT. Panel (OTTOM14)

Use the SELECT LUs FOR OPT. panel to select one or more LUs for inclusion in optimization when CICS OTTO is started SELECTIVELY. LUs that are already currently or permanently selected will also be displayed on this panel.

Using the Panel

1. To select an LU, enter the LU name in the SELECT LU field (generic notation is allowed). To select this LU permanently, enter YES in the PERMANENT field (the default value is NO).

2. Press <ENTER>. The LU name should appear on the list of selected LUs. The displayed LUs are sorted by name.

3. To remove a selected LU from optimization temporarily, enter YES in the UNSELECT TEMP. column for the specific LU and press <ENTER>. Because this is a temporary removal, the LU is selected again effective with the next system start up.

4. To remove a selected LU from optimization permanently, enter YES in the UNSELECT PERM. column for the specific LU. Press <ENTER> and the LU is removed from the list of selected LUs.

Fields

SELECT LU

Enter the name of the LU to be included in optimization when CICS OTTO is SELECTIVELY STARTED.

PERMANENT

To select an LU for inclusion temporarily, enter NO. A temporarily selected LU becomes excluded effective with the next system startup. The default is NO.

To select an LU for permanent inclusion, enter YES. A permanently selected LU remains selected effective with each system startup.

ENTRIES

Displays the number of selected LUs that may be viewed on the panel.

LU Columns

Displays the name of LUs that are included in optimization when CICS OTTO is SELECTIVELY STARTED.

SELECT Columns

Indicates with a YES or a NO whether the LU is selected temporarily or permanently for inclusion in selective optimization.

UNSELECT Columns

To temporarily remove an LU from inclusion in optimization, enter YES in the TEMP. column. The LU will again be optimized with the next system startup.

To permanently remove an LU from inclusion in optimization, enter YES in the PERM. column. The LU is removed from the list of selected LUs.

This page intentionally left blank.

CHAPTER 13: TRACE CONTROL

Traces can be produced before and after each optimization for LUs and modules. Traces may be useful for error determination. For example, if you see general statistics or error statistics that require extended evaluation, you should use a trace.

There are two types of tracing techniques:

1. *Message traces* (option 1 on the panel) for inbound and outbound data streams are written to an output file identified by DDNAME OTTOTRCS. Internal traces (option 2) collect the same information as a message trace and write it to the same SYSOUT. An internal trace also collects internal information about CICS OTTO control blocks and CICS control blocks that might be useful for trouble shooting. For a complete description of the SYSOUT and the message return codes, see "Appendix D: Interpreting Message Trace DD Output" on page 121.

2. *Instorage traces* use a CICS OTTO storage area in which the trace records are saved for viewing online via the Display Instorage Trace option of the TRACE CONTROL panel. The storage area is automatically allocated based on parameters that you define on the TRACE CONTROL panel.

13.1 Using the TRACE CONTROL Panel

The TRACE CONTROL panel is displayed when option **10** is entered on the PRIMARY OPTION MENU.

```
 TRACE CONTROL                   OTTO for CICS V1R2                     OTTOM15


 OPTION ===> _____            SELECT . .  _

       1. Start Trace  . . . .  for . .   1. All 3270 LUs
       2. Start Internal Trace  for . .   2. All 3600 LUs
       3. Start Instorage Trace for . .   3. All SCS Printers
       4. Stop Trace                      4. Specific or Generic LU name
       5. Display Instorage Trace         5. Specific or Generic Module name
       6. Clear Trace Storage             6. All LUs
       7. Release Trace Storage
       8. Set Instorage Trace Parms
 LU(S)/MODULE(S)  _____ _____ _____ _____ _____ _____ _____
 ID 01          PAGESIZE 60        TITLE _____
     CHANGE CURRENT/PERM.         CURRENT/ PERM.                    CURRENT/PERM.
 WRAP AROUND   ___   ___      MAXNO  _____   _____    STOP ON ERROR  ___    ___
 ERROR CODE(S) ___ ___ ___

 TRACE IS STARTED  INSTORAGE          SINCE 06-03-2006 09-44-34  Lines       5
 FOR 3270 COMP.
 WRAP NO /NO  MAXNO   100/  100 STOP NO /NO  CODE N/A             Entries    128
 ------------------------------------------------------------------------------
 F1=Help     F3=End
```

Figure 22: TRACE CONTROL Panel (OTTOM15)

Use the TRACE CONTROL panel to define the characteristics of a trace and to control the trace. The following control options are provided.

1. Start Trace allows you to start a normal message trace for which the output is written to the data set defined by DDNAME OTTOTRCS. For a complete description of the SYSOUT and the message return codes, see "Appendix D: Interpreting Message Trace DD Output" on page 121.

2. Start Internal Trace starts an internal trace, which should only be performed if requested by your technical support representative. For more information, refer to "Appendix A: Troubleshooting".

3. Start Instorage Trace allocates an CICS OTTO storage area in which the traced records are saved. After stopping this trace, you can use option 5 to view the records. For a complete description of the online options and error codes, see "Viewing Data Stream Errors" beginning on page 74.

4. Stop Trace stops the trace that has been started using one of the above options. The trace is available for printing or viewing online depending on the type of trace. The trace file should be printed/reviewed before a new trace is started. Otherwise, the trace information previously written may be lost.

5. Display the inbound and outbound data stream messages produced by the instorage trace. See "Viewing Instorage Traces Online" on page 73.

6. Clear Trace Storage clears the storage area provided for capturing trace data.

7. Release Trace Storage frees up the trace storage area. Otherwise, the storage area is freed up at CICS OTTO shut down.

8. Set Instorage Trace Parms allows you to change the WRAP AROUND, MAXNO, and STOP ON ERROR parameters for an instorage trace without starting the trace itself.

Using the Panel

1. In the OPTION field, type the corresponding Trace Control option number (see the description provided above.).

2. For trace OPTION numbers 1, 2, or 3, you must also use the SELECT field to enter the LU or module selection number (**1** through **6**) for which the message should be traced. Note that if you choose numbers 4 or 5, the specific or generic LU or module name must be entered in the fields provided.

3. Enter the report characteristics in the ID, PAGESIZE, and TITLE fields as defined below in the Fields section for this panel.

4. If you want to change the defaults for the instorage allocation, enter PERMANENT or CURRENT settings for WRAP AROUND, MAXNO, STOP ON ERROR, and ERROR CODES. Changes to these parameters take effect when an instorage trace is started (option 3) or when option 8 is entered. The defaults are displayed on line 22. See the description of these fields below.

5. Press <ENTER> to start the trace. The TRACE IS STARTED FOR . . . message is displayed along with a timestamp for started SINCE.

6. To stop a normal trace or an instorage trace, type **4** in the OPTION field and press <ENTER>. The TRACE IS STOPPED message is displayed and the trace should be routed to the printer. Instorage traces can be viewed online.

Fields

LU(S)/MODULES(S)   Enter a name that is either specific, generic, or extended-generic. A specific name consists of 1 to 8 letters (A - Z), numeric (0 - 9), or national characters (below referred to as "valid" characters).

- A generic name consists of 1 to 7 valid characters with an asterisk appended. For example, a generic name ABC* represents all specific names that start with ABC.

- An extended-generic name consists of 1 to 8 valid characters, percent signs, and asterisks. At least one character must be different from an asterisk. In an extended-generic name, a percent sign (%) represents one valid character, and an asterisk represents a string of 0 to 8 valid characters.

The name that you enter is not translated to uppercase except your terminal is defined to CICS with Upper Case Translation.

See system options Terminal ID and Transaction ID on the SYSTEM OPTIONS panel on how CICS OTTO LU and module names are interpreted.

ID   A 2 byte numeric identifier. The default is 01.

PAGESIZE   The number of lines printed per page on the normal trace or internal trace reports, options 1 or 2 respectively. Valid input is a number from 1 to 99. The default is 60.

TITLE	A descriptive title that documents the purpose of the trace. It is printed on top of each page of the normal or internal trace reports, options 1 or 2 respectively. The values specified on the TRACE CONTROL panel are used to create a CICS OTTO command, which is processed internally. Since a command string may not exceed 80 characters, the specified TITLE string is ignored if it does not fit into the internal command area.
Lines	After a trace is started, the actual number of lines written to DDNAME OTTOTRCS. Valid only for trace options 1 or 2.
WRAP AROUND	When using the Instorage Trace option, use this field to indicate whether the trace storage area should wrap around. Wrapping simply means that CICS OTTO will overwrite the trace area starting from the top.

YES Allow the trace information to wrap around the reserved storage area.

NO Completely fill the allocated trace storage area. Message TRACE STARTED INS (xxx) is displayed in line 20 of the TRACE CONTROL panel. If xxx is MXN, the maximum number of trace entries has been saved. If xxx is SOS then there are no free slots. Refer to the description of the MAXNO field for further explanation. The default value is NO . The current and permanent values of this option are shown in line 22 of the TRACE CONTROL panel.

➤ To temporarily change the WRAP AROUND parameter, enter the new value in the CHANGE CURRENT column and press <ENTER>.

➤ To permanently change the WRAP AROUND parameter, enter the new value in the CHANGE PERM. column and press <ENTER>. The new value becomes currently active and is saved in the control file for activation at the next CICS system startup.

MAXNO   Enter a number from 1 to 999 to define the size of the storage area reserved for an instorage trace. The current and permanent MAXNO values are shown in line 22. MAXNO multiplied by 2172 will give you the size of the area. At most, MAXNO trace entries can be saved. One entry uses 60 bytes plus a variable number of slots that are 256 bytes in size. At most 8*MAXNO slots can be used. The area is allocated the first time an instorage trace is started and resides in private storage above 16MB. The area is reused unless it is released by the user or the MAXNO value is increased. The starter value is 100 .

➤ To temporarily change the MAXNO parameter, enter the new value in the CHANGE CURRENT column and press <ENTER>.

➤ To permanently change the MAXNO parameter, enter the new value in the CHANGE PERM. column and press <ENTER>. The new value becomes currently active and is saved in the control file for activation at the next CICS system startup.

STOP ON ERROR   Controls whether the instorage trace should stop upon detection of a specific error code.

YES Stop the instorage trace when a predefined error code is found in a traced message.

NO The instorage trace must be explicitly stopped using option 4 on the trace panel. If the WRAP AROUND option is not used, the trace is stopped when the storage area is full.

For more information on error codes, refer to the description of the ERROR CODE(S) field below or refer to the ERROR STATISTICS panel. If the stop condition occurs, message TRACE STARTED INS (ERR) is displayed in line 20 of the TRACE CONTROL panel. The starter value is NO.

➤ To temporarily change the parameter, enter the new value in the CHANGE CURRENT column and press <ENTER>.

➤ To permanently change the parameter, enter the new value in the CHANGE PERM. column and press <ENTER>. The new value becomes currently active and is saved in the control file for activation at the next CICS system startup.

ERROR CODE(S)   Enter 1 to 3 error codes, which causes an instorage trace to stop if one of these error codes is detected in a traced message and option STOP ON ERROR has been set to YES. All previously defined error codes are removed and replaced by the new values. Error codes are not saved permanently. At CICS OTTO startup, there are no predefined error codes.

Error codes are specified as I*nn* or O*nn*, where *nn* represents two numeric digits. Furthermore, generic notation is allowed, i. e., you may enter *xn** or *x** , where *x* represents I or O, and *n* is a numeric digit.

For a complete list of error codes, see "Data Stream Error Codes" on page 80.

Entries   After a trace is started, the number of trace entries (before and after optimization) are displayed.

13.2 Viewing Instorage Traces Online

After starting and stopping an instorage trace, you can display the results online by selecting
option **5** on the TRACE CONTROL panel. The DIAGNOSTICS OVERVIEW panel is displayed.

```
DIAGNOSTICS OVERVIEW           OTTO for CICS V1R2                         OTTOM23


Option ===>  _____



                                         Last          Last         Last
Type (S)elect for details                LU            Module       ErrorCode
                                         ----------------------------------

_ Outbound Data Stream Errors:     7     CP11          TESTECOD     O22

  Inbound  Data Stream Errors:     0

_ All Data Streams traced    :    25






--------------------------------------------------------------------------------
 F1=Help    F3=End     F4=Return
```

Figure 23: DIAGNOSTICS OVERVIEW Panel (OTTOM23)

The DIAGNOSTICS OVERVIEW panel displays an overview of the outbound and inbound data
stream errors. Also displayed is the last terminal ID, last transaction ID, and last error code for
each type of data stream for inbound or outbound errors, as well as an overview of all data
streams that were traced.

Using the Panel

Place the cursor into the input field to the left of an overview type and enter **S** to view a detailed
list of the specific inbound or outbound data stream errors, or all of data streams that were
traced.

13.2.1 Viewing Data Stream Errors

After selecting a specific type of data stream errors, the following panel is displayed with the type of data stream that you selected.   This figure uses outbound data stream errors for illustration.

```
 OUTBOUND DATA STREAM ERRORS    OTTO for CICS V1R2                          OTTOM24


 OPTION ===> _____                                    Total entries:        7

     Seq Code Description                  LU        Module  Dspl OR  Time
    ------------------------------------------------------------------------------
 _      8 O11  INVALID MF                   CP11      TESTECOD 0005 MF  10-03-00
 _      9 O09  INVALID CHARACTER IN RA-ORDER CP11     TESTECOD 006F RA  10-03-00
 _     10 O22  UNEXPECTED DBCS DATA         CP11      TESTECOD 0071 SFE 10-03-00
 _     11 O22  UNEXPECTED DBCS DATA         CP11      TESTECOD 0072 SFE 10-03-00
 _     12 O02  INVALID STRUCTURED FIELD     CP11      TESTECOD 0003 N/A 10-03-00
 _     13 O12  UNPAIRED SO/SI               CP11      TESTECOD 0000 N/A 10-03-00
 _     14 O22  UNEXPECTED DBCS DATA         CP11      TESTECOD 000A N/A 10-03-00







    ------------------------------------------------------------------------------
 F1=Help     F3=End      F4=Return      F7=Backward     F8=Forward
```

Figure 24: DATA STREAM ERRORS Panel (OTTOM24)

An overview of each inbound or outbound data stream is displayed along with details pertaining to the LU and module name, displacement, OR, and time.

Using the Panel

- Place the cursor into the input field to the left of an error code and enter **S** to see a detailed overview of a specific data stream error. The data stream buffer is displayed, see "Viewing Data Stream Buffer" on page 78.

- Use the option field to scroll to the top or bottom of the panel. To scroll to the top, enter an **M** and press PF7. To scroll to the bottom, enter an **M** and press PF8.

Columns

Seq	Unique sequence number that CICS OTTO assigns to the data stream to be used as an easy reference number.
Code	Indicates the error code assigned by CICS OTTO. See "Data Stream Error Codes" beginning on page 80 for a detailed description of each possible outbound and inbound data stream error.

Description	A short description of the error. See "Data Stream Error Codes" beginning on page 80 for a long description of each possible outbound and inbound data stream error.
LU / Module	Displays the LU name and module name.
Dspl	Shows the actual error displacement. If the actual displacement could not be determined or if a displacement is meaningless for this type of error, the value shown is FFFF.
OR	Displays the data stream order or N/A if not applicable.
Time	Displays the time in the format hh-mm-ss

13.2.2 Viewing All Traced Data Streams

After selecting the option to view "All data streams traced", the following panel is displayed with a complete listing of all data streams that were traced.

```
 TRACE ENTRIES                  OTTO for CICS V1R2                    OTTOM24


 OPTION ===>  _____                               Total entries:     32

     Seq Dir LU        Module   Bef  Aft Time     Err  Data
   -------------------------------------------------------------------------
 _     1 Out 0113      OTTOMC00 1454  276 08-38-54      F5C311C37D131140401DE8E3
 _     2 In  0113      OTTO      590    0 08-38-55      F3C37D11C1D196A3A3964086
 _     3 Out 0113      OTTOMC00 1487  766 08-38-55      F5C311C37D131140401DE8D7
 _     4 In  0113      OTTO      183    0 08-38-56      F3C37D11C1D196A3A3964086
 _     5 Out 0113      OTTOMC00   81   54 08-38-56      F5C35C405C405C4040404040
 _     6 In  0113      UNKNOWN    82    0 08-39-00      7D40C5858396844040404040
 _     7 Out 0113      TESTECOD  112   98 08-39-01      F5C31DF100F1F2F31DF00000
 _     8 Out 0113      TESTECOD   10    0 08-39-01 O11  F1C31140C32C01C0F000
 _     9 Out 0113      TESTECOD  116    0 08-39-01 O09  F5C31DF100F1F2F31DF00000
 _    10 Out 0113      TESTECOD  124    0 08-39-01 O22  F5C3C1C21DF100F1F2F31DF0
 _    11 Out 0113      TESTECOD  126    0 08-39-01 O03  F5C332C11DF100F1F2F31DF0
 _    12 Out 0113      TESTECOD   11   11 08-39-01 O02  F3000A0240404040404040
 _    13 Out 0113      TESTECOD   14    0 08-39-01 O12  F5C31DF0000000001DF04040
 _    14 Out 0113      TESTECOD   16    0 08-39-01 O22  F5C31DF0000000001DF00E40
 _    15 In  0113      UNKNOWN   129  129 08-39-17      8800178181010000500003001
   -------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return     F7=Backward     F8=Forward
```

Figure 25: TRACE ENTRIES Panel (OTTOM24)

Along with an overview of all data streams that were traced, the decimal lengths before and after optimization are shown as well as any errors that might have been determined.

Using the Panel

- Place the cursor into the input field to the left of an error code and enter **S** to see a detailed overview of a specific data stream error as illustrated below on the DATA STREAM DISPLAY panel.

- Use the option field to scroll to the top or bottom of the panel. To scroll to the top, enter an **M** and press PF7. To scroll to the bottom, enter an **M** and press PF8.

Columns

Seq	Unique sequence number that CICS OTTO assigns to the data stream to be used as an easy reference number.
Dir	Indicates whether the data stream's direction was inbound or outbound.
LU / Module	Displays the LU name and module name.

Bef / Aft	Shows the decimal length of the data stream before and after optimization.
Time	Displays the time in the format hh-mm-ss.
Err	Displays the error, if one exists. All possible error inbound and outbound error codes are listed in the section entitled "Data Stream Error Codes" beginning on page 80.
Data	Displays the first characters of the data stream. Drill down using line command **S** to see the entire data stream.

13.2.3 Viewing Data Stream Buffer

After selecting a specific type of error code or a specific trace entry, the inbound or outbound data stream is displayed on the DATA STREAM DISPLAY panel.

```
DATA STREAM DISPLAY              OTTO for CICS V1R2                      OTTOM25


 OPTION ===>  _____    LU   : 0113    PID: 00  PSize: 1920 Length: 0074
 Entry  ===>  BEFORE    Module: TESTECOD DIR: Out Displ: 006F Date  : 23-03-2006
                        Seq             9         Error: O09  Time  : 08-13-32
 Offset Data
 ------------------------------------------------------------------------------
 ____     00  . . 04  . . 08  . . 0C  . . 10  . . 14  . .
 0000   F5C31DF100F1F2F31DF0000000000000000001DF0000000 5C.1.123.0..........0...
 0018   1D4040404040404040C2C5D5C5C6C9C3C9D9E840D4C1E2E3 .       BENEFICIRY MAST
 0030   C5D940D7C1D9E340C1404040404040404000001DF0D7C1C7 ER PART A       ...0PAG
 0048   C51D50404040F11DF0D6C61DF0404040F21DF0C8C9C3001D E.&   1.0OF.0   2.0HIC..
 0060   C0F0F0F1F0F1F4F0F3F0C140401DF03C40403F00         ä001014030A  .0.  ..




 ------------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return     F7=Backward     F8=Forward
```

Figure 26: DATA STREAM DISPLAY Panel (OTTOM25)

The DATA STREAM DISPLAY panel displays the data stream buffer in HEX and CHARACTER format. You can analyze the 3270 buffer by scrolling through the buffer or by defining an offset value.

Using the Panel

* You can toggle between the *before and after* data stream buffer. To view the data stream buffer before the optimization, enter command **B** in the ENTRY field. To view the data stream buffer after the optimization, enter command **A** in the ENTRY field.

* Use the OPTION field to scroll to the top or bottom of the panel. To scroll to the top, enter an **M** and press PF7. To scroll to the bottom, enter an **M** and press PF8.

* In the OFFSET column, you can enter a hexadecimal offset value in order to position yourself to a specific offset within the buffer area.

Display Fields

LU / Module   Displays the LU name and module name for which the error was
                              determined.

Error	Indicates the error code that was incurred along with a short description. See "Data Stream Error Codes" beginning on page 80 for a detailed description of each possible outbound and inbound data stream error.
Date / Time	Displays the last date and time for which the error was encountered. The date format depends on your site-specific date setting. The time format is HH-MM-SS.
PID / PSize	Displays the partition ID and the partition size
DIR	Indicates the direction of the data stream, either inbound or outbound.
Displ	Shows the actual error displacement. **Note:** if the actual displacement could not be determined or if a displacement is meaningless for this type of error, the value shown is FFFF.
Seq	Unique sequence number that CICS OTTO assigns to the data stream to be used as an easy reference number.

13.2.4 Data Stream Error Codes

This section documents the data stream error codes. The format of an error code is:

xnn   where: *x* = I for inbound
                        O for outbound

           nn= 2 digit error number

Table 2: Outbound Data Stream Errors (Instorage Trace)

Error Code	Outbound Instorage Message Description
O01	Truncated parameter list. An outbound data stream ended with an incomplete 3270 order.
O02	Invalid structured field. An unknown or invalid structured field was detected.
O03	Invalid data stream order. An invalid 3270 data stream order was detected. If this was an SCS Printer data stream, then an invalid set function, MPP, left and right margins, or horizontal tab were specified.
O04	Invalid address. An invalid buffer address was detected in an EUA, RA, or SBA order. One of the following conditions was found: • Address unknown • Address larger than the current device buffer size
O05	Invalid attribute type. An invalid attribute type was detected in an MF, SA, or SFE order. Valid attribute types are • 3270 Field Attributes • Extended Highlighting • Extended Color • Character Set • Field Outlining • Background Transparency • Field Validation
O06	Invalid attribute value. An invalid attribute value was found for an attribute type other than Character Set in an MF, SA, or SFE order.
O07	Invalid graphic escape character. An invalid GE (Graphic Escape) order was detected. Valid values are: X'40' to X'FE'.
O08	Invalid command code.
O09	Invalid repeat character. An invalid repeat character was specified for an RA (Repeat-to-Address) order. The valid repeat characters are: X'00' and, X'40' to X'FE'.

Error Code	Outbound Instorage Message Description
O10	Invalid reply mode in a Set Reply Mode structured field. An invalid Reply Mode was detected in the SRM (Set Reply Mode) structured field. Valid Reply Modes are • Field • Extended Field • Character
O11	Target of a modify field is not an attribute. The target of a MF order must be an attribute byte. In this case, the target was not an attribute byte.
O12	Invalid Shift Out/Shift In pairing. A Shift Out/Shift In (SO/SI) pair was detected that is invalid or incomplete. The SO and SI orders must appear as pairs in the terminal buffer.
O13	Invalid structured field length. A structured field was present in the outbound data stream which was longer than the remaining length of the data stream.
O14	Invalid LCID in a Load Programmed Symbols structured field. An invalid LCID was detected in a LPS (load programmed symbol) structured field. Valid values for the LCID are: X'40' to X'EF'.
O15	Invalid RWS in a Load Programmed Symbols structured field. An invalid RWS (Read/Write Store) was detected in a LPS (Load Programmed Symbol) structured field. Valid values for the RWS are: X'02' to X'0B'.
O16	Load Programmed Symbols beginning code point invalid. The beginning code point of a LPS (Load Programmed Symbol) must be in the range from X'41' to X'FE'.
O17	Load Programmed Symbols data exceeds RWS limit. The programmed symbol (PS) data which started at the specified beginning code point in the PS set RWS (Read/Write Store) has overflowed. It has exceeded the maximum code point allowed for that RWS.
O18	Invalid character set. An invalid LCID was found in the attribute value field of an attribute type Character Set (programmed symbols) in an MF, SA, or SFE order. This value must be: X'00' orX'40' to X'FE'.
O19	Invalid DBCS sub-field. A DBCS sub-field was detected that has an odd number of bytes . This is usually found in conjunction with SO/SI orders.
O20	Invalid DBCS field. A DBCS field was detected that has an odd number of bytes .
O21	Invalid DBCS character. An invalid DBCS character was detected. Valid DBCS characters are: X'4040' toX'FEFE'.
O22	Unexpected DBCS data. This is usually found if the CICS OTTO DBCS Option is not set and DBCS data is to be written to the screen. Switch the CICS OTTO DBCS Option "on" to avoid this error code.

Table 3: Inbound Data Stream Errors (Instorage Trace)

Error Code	Inbound Instorage Message Description
I01	Truncated parameter list. An inbound data stream ended with an incomplete 3270 order.
I02	Invalid structured field. An unknown or invalid structured field was detected.
I03	Invalid data stream order. An invalid 3270 data stream order was detected when • an order other than SF SFE SBA GE or SA is detected • any other invalid data (lower than X'40') is detected
I04	Invalid address. An invalid buffer address was detected in a SBA order or computed from the position of a SF(E) order. One of the following conditions was found: • address unknown • address larger than the current device buffer size • a SBA or SF(E) order does not correspond to a field on the screen.
I05	Invalid attribute type. An invalid attribute type was detected in an MF, SA, or SFE order. Valid attribute types are • 3270 Field Attributes • Extended Highlighting • Extended Color • Character Set • Field Outlining • Background Transparency • Field Validation
I06	Invalid attribute value. An invalid attribute value was found for an attribute type other than Character Set in a SA or SFE order.
I07	Invalid graphic escape character. An invalid Graphic Escape (GE) order was detected. Valid values are: X'40' to X'FE'.
I08	Unknown AID in inbound data stream
I09	Data stream field longer than image field. A field was present in the inbound data stream that was longer than the field that was last sent to the screen at that location.
I10	Data stream contains both SF and SBA. An inbound data stream contains both Start Field and Set Buffer Address orders. This is not valid for inbound data streams.

I11	SBA found but not at start of data. An SBA at the beginning of the inbound data stream indicates a formatted ReadModified (RM) data stream. If no SBA is present at the beginning of the data stream, the data stream is unformatted and cannot contain other SBA orders.
I12	Unmodifiable field in Read Modified. A field that is protected and not pre-modified or Select Pen Detectable has been found in the inbound data stream. This cannot occur with a valid 3270 device.
I13	Structured field longer than data stream. A structured field length is larger than the remaining length of the data stream.
I14	Incomplete Read Buffer. A Read Buffer (RB) data stream was found to be too short (not all data was read from the buffer) or too long (more data was read than the buffer should contain).
I15	Data stream protected field differs from image field. An inbound field which is protected has been changed since the data was last sent to the screen. This is not possible with a valid 3270 device.
I16	Data stream protected field shorter than image field. A field was found in the inbound data stream which was shorter than the field last sent to the device. This is not valid if the field is protected.
I17	Query reply descriptor length invalid. The Descriptor Length in the Character Sets or Graphic Symbol Set query reply was invalid or zero.
I18	Invalid character set. An invalid LCID was found in the attribute value field of an attribute type CharacterSet (programmed symbols) in an MF, SA, or SFE order. This value must be X'00' orX'40' to X'FE'.
I19	Data stream SBA out of sequence. An SBA was encountered in the inbound data stream whose address was less than the address of the preceding SBA. This is not valid for inbound data streams unless the address is zero (X'4040')
I20	SFE without basic attribute in an inbound data stream which is the result of a Read Buffer. This cannot occur with a valid 3270 device.
I21	Unprotected field too long in an inbound data stream which is the result of a Read Buffer. The incoming field is longer than the outgoing field which cannot occur with a valid 3270 device.
I22	Unexpected DBCS data. This is usually found if the CICS OTTO DBCS Option is not set and DBCS data is to be written to the screen. Switch the CICS OTTO DBCS Option "on" to avoid this error code.

I23	Protected field MDT on with hex nulls between data. A so called pre-modified protected field is usually used by a programmer to save data on the screen, which is returned with the next inbound message. If this field contains hex nulls between data, the incoming field is shorter than the outgoing field because hex nulls are not transmitted from a 3270 device in a Read Modified. Therefore, the incoming data cannot be mapped in the same way as the outgoing data and processing may fail.
I24	Expected inbound data is missing.

CHAPTER 14: OPTIMIZATION STATISTICS

Optimization results can be viewed and analyzed using CICS OTTO's statistics. These statistics show how many messages have been optimized and how many bytes have been saved during the optimization process. If CICS OTTO is fully started, all messages are counted except those for which an LU or module exclusion was active. If CICS OTTO is selectively started, only the messages destined to the specific LUs which are in CICS OTTO's selection list are counted.

CICS OTTO statistics may be found using the following sources:

• Viewed using the CICS panels as described in this chapter.

• Written to the OTTOSTAT file for printing on demand.

• At shutdown time of the TP system, statistics are automatically written to the OTTOSTAT file for printing.

Note: If DDNAME OTTOSTAT is missing, the statistics are written to the system log.

For space allocation information regarding the OTTOSTAT file under z/OS, see the "Runtime Considerations" on page 16.

14.1 Types of Optimization Statistics

The following different kinds of optimization statistics are provided.

14.1.1 Overall Statistics

Overall statistics provide a graphical summary of all optimization results for all LUs; 3270, SCS and 3600. This information is provided only online.

14.1.2 Component Based Statistics

Component based statistics show counters for message optimization and saved bytes, as well as total reduction expressed as a percentage. For the 3270 component, these statistics are separated by terminal statistics (T3270) and printer statistics (P3270).

14.1.3 LU Based Statistics

LU based statistics are always active. However, these are available only online. Statistical information can be obtained for a single LU, for a group of LUs qualified by a generic name, or different LU types.

14.1.4 Module Based Statistics

An option allows accumulation of module statistics the same as it does for LUs. The module name is either the CICS program name or the CICS transaction ID (see option "Transaction ID" on the SYSTEM OPTIONS panel). Module based statistics are available only if they have been explicitly activated.

Module statistics should only be used to figure out modules/transactions that have a low optimization ratio. Module statistics cause CPU overhead. Therefore, you may wish to exclude modules with a low optimization ratio. Statistical data may be collected for a list of pre-defined modules by starting the module statistics **selectively** or for all modules by starting them **fully**.

To reduce the amount of main storage used by module statistics, the number of entries for the module statistics list may be restricted using the MODULE STATISTICS SIZE panel.

The module statistics may be displayed online for single modules or for a group of modules qualified by a generic name. At shutdown time of the TP system, a list is written that contains all modules for which statistical information has been saved. The statistics output is self explanatory.

Warning: Information about which transactions are working with a WRITE/SAVE (marked with '* W/S *' in the statistical output) is provided when the module statistics are written at shutdown time. These applications **must be excluded** from optimization because they are normally using the same TIOA for every WRITE. Because CICS OTTO changes the length field after the optimization process, these applications in conjunction with optimization may cause scrambled terminal output.

14.2 Error Statistics

Inbound and outbound data stream errors are recorded. The number of data streams in which an error was detected is displayed, as well as information on the terminal for which the error most recently occurred. Such information includes date, time, LU/module name, partition ID (hex) and size, as well as displacement of the error in the data stream, and failing 3270 order or data.

14.3 Statistics Control

The STATISTICS CONTROL menu is displayed when option **12** is entered on the PRIMARY
OPTION MENU.

```
 STATISTICS CONTROL              OTTO for CICS V1R2                        OTTOM17


 OPTION ===> _____
            1. Clear OTTO for CICS Image Pool Statistics
            2. Clear all LU and Module Statistic Values
            3. Clear all LU Statistic Values
            4. Clear all Module Statistic Values
            5. Clear all 3270 Statistic Values
            6. Clear 3270 Terminal Statistic Values
            7. Clear 3270 Printer Statistic Values
            8. Clear 3600 Statistic Values
            9. Clear SCS Statistic Values
           10. Clear Statistics of Specific LU           LU . . . .  _____
           11. Clear Statistics of Specific Module       MODULE . .  _____
           12. Start Module Statistics for all Modules
           13. Start Module Statistics for Selected Modules
           14. Stop Module Statistics
           15. Exclude Modules from Statistics
           16. Select Modules for Statistics
           17. Control Size of Control Blocks for Module Statistics
           18. Clear Error Statistics
 -------------------------------------------------------------------------------
 F1=Help     F3=End
```

Figure 27: STATISTICS CONTROL Panel (OTTOM17)

Use the STATISTICS CONTROL panel to issue commands and define variables that control the
statistical information that is gathered. Such controls include:

• Clearing statistics. This means set all counters to zero.

• Starting statistics for all or specific modules.

• Stopping module statistics.

• Selecting modules for the statistics.

- Excluding modules from the statistics.

- Changing the restricted size of the module statistics in main storage.

Using the Panel

In the OPTION field, enter one of the following statistical options:

Enter:	To do this:
1	Clear the image pool statistics.
2	Clear all terminal statistics (3270, SCS, and 3600) <u>and</u> all module statistics.
3	Clear all LU statistics.
4	Clear all module statistics.
5	Clear statistics for all 3270 terminals and printers - component 3270.
6	Clear statistics for all 3270 terminals.
7	Clear statistics for all 3270 printers.
8	Clear statistics for all 3600 terminals - component 3600.
9	Issue a command that clears statistics for all SCS printers - component SCS.
10	Issue a command that clears statistics for a specific terminal or a group of terminals by entering a fully qualified or generic LU name in the LU-NAME field. If the LU-NAME field is left blank, the CLEAR LU STATISTICS panel displays a list of all active LUs where one or more LUs can be selected for resetting statistics.
11	Issue a command that clears statistics for a specific module or group of modules by entering of a fully qualified or generic group name in the MODULE field. If the MODULE field is left blank, the CLEAR MODULE STATISTICS panel displays a modules list from which a module can be selected for resetting statistics.
12	Issue a command that starts CICS OTTO's statistics for all modules (*fully*). This means the statistics of all modules should be saved, except for those modules which are excluded from statistics . To exclude modules from statistics, use option 15 below.

13 Issue a command that starts CICS OTTO's statistics for selected modules (*selectively*). That means the statistics should be saved only for those modules which are selected for statistics.

To select modules for statistics, use option 16 below.

14 Issue a command that stops CICS OTTO's statistics for modules.

15 Exclude modules from statistics. The EXCL. MOD'S FROM STATISTICS panel is displayed on which you can define the modules to be excluded from accumulating statistics, see "Excluding Modules from Statistics" on page 90.

16 Define modules for selective gathering of statistics using command 13. The SEL. MOD'S for STATISTICS panel is displayed, see "Selecting Modules for Statistics" on page 91.

17 Change size of control blocks for module statistics. The MODULE STATISTICS SIZE panel is displayed, see "Controlling Module Statistics Size" on page 92.

18 Clear the error statistics.

14.3.1 Excluding Modules from Statistics

The EXCL. MODS FROM STATISTICS panel is displayed when option **15** is entered on the STATISTICS CONTROL menu.

```
 EXCL. MODS FROM STATISTICS    OTTO for CICS V1R2                      OTTOM14

 OPTION ===> _____          EXCLUDE MODULE . . . . _____      PERMANENT . NO
                                                   ENTRIES     1 TO    2 OF    2

 MODULE     EXCLUDE          INCLUDE    MODULE     EXCLUDE          INCLUDE
        temp.   perm.    temp.   perm.           temp.   perm.    temp.  perm.
 -----------------------------------------------------------------------------
 MOD00000  YES     YES      ___     ___   MOD00001  YES     YES      ___    ___









 -----------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return     F7=Backward     F8=Forward
```

Figure 28: EXCL. MODS FROM STATISTICS Panel (OTTOM14)

Use the EXCL. MODS FROM STATISTICS panel to:

1.   Display a list of all modules which are excluded from CICS OTTO's statistics.

2.   Exclude additional modules.

3.   Remove modules from this exclusion list.

When the statistics are started for all modules using command 12 of the STATISTICS CONTROL menu, there are no statistics gathered for the modules on this exclusion list.

Modules can be excluded temporarily (PERMANENT field = *NO*) or permanently (if PERMANENT field = *YES*). Likewise, modules can be temporarily or permanently included into statistical processing.

Using the Panel

For details on how to use this panel, see "Excluding LUs" on page 61.

14.3.2 Selecting Modules for Statistics

The SEL. MODS FOR STATISTICS panel is displayed when option **16** is entered on the
STATISTICS CONTROL panel.

```
 SEL. MODS FOR STATISTICS        OTTO for CICS V1R2                        OTTOM14


 OPTION ===> _____        SELECT MODULE  . . . . _____        PERMANENT . NO
                                               ENTRIES    1 TO     2 OF     2

 MODULE      SELECT          UNSELECT     MODULE      SELECT          UNSELECT
         temp.   perm.   temp.   perm.            temp.   perm.   temp.   perm.
 -------------------------------------------------------------------------------
 C*        YES     YES     ___     ___    OTTO*     YES     YES     ___     ___








 -------------------------------------------------------------------------------
 F1=Help      F3=End      F7=Backward     F8=Forward      F4=Return
```

Figure 29: SEL. MODS FOR STATISTICS Panel (OTTOM14)

Use the SEL. MOD'S FOR STATISTICS panel to display all modules defined for selective collec-
tion of module statistics, to define new modules for selection, and to remove modules from se-
lection. When module statistics are selectively started using command 13 of the STATISTICS
CONTROL menu, statistics are gathered only for the modules on this list.

Modules can be selected temporarily (PERMANENT field = *NO*) or permanently (if
PERMANENT field = *YES*). Likewise, modules can be temporarily or permanently be removed
from selection.

Using the Panel

For details on how to use this panel, see "Selective LU Inclusion" on page 64.

14.3.3 Controlling Module Statistics Size

The MODULE STATISTICS SIZE panel is displayed when option **17** is entered on the
STATISTICS CONTROL menu.

```
MODULE STATISTICS SIZE         OTTO for CICS V1R2                         OTTOM18


 OPTION ===> _____

                    CURRENT CONTROL BLOCK VALUES
                    ----------------------------

Total control block size in KB . . :      10
Number of entries generated  . . . :     232
Number of entries used . . . . . . :       4



                        CURRENT      PERM.     CHANGE CURRENT      CHANGE PERM.
                        --------    --------   --------------     --------------
Restricted size           YES         YES         ___                ___
Size in KB                 10          10         ____               ____
Max number entries        232         232         _____              _____
Status of statistics    STOPPED     STOPPED        _                  _


---------------------------------------------------------------------------------
 F1=Help     F3=End      F4=Return
```

Figure 30: MODULE STATISTICS SIZE Panel (OTTOM18)

Use the MODULE STATISTICS SIZE panel to restrict the size of main storage that is used for
saving module statistics. CICS OTTO starts module statistics for 100 modules (5 KB). This
number is increased dynamically whenever necessary, without any restrictions. If no storage is
available for the module statistics list, an informational message is displayed at startup time.

The section of this panel called CURRENT CONTROL BLOCK VALUES reflects the actual cur-
rent usage of main storage that is allocated for module statistics. If you enter storage restrictions
that are intended to reduce the allocated amount, this reduction is reflected following the next
system startup.

Restriction to the main storage used for module statistics can be made in one of the following
two ways:

1.   Restrict the storage size for the module statistics directly in KB.

2.   Restrict the number of entries to be kept.

Note: The length of one entry needed for one module is 44 bytes.

Using the Panel

To restrict the main storage size for the module statistics, follow these steps:

1. Enter **YES** in the Restricted size field for either the CHANGE CURRENT or CHANGE PERM. columns.

2. Enter the size in KB <u>or</u> the maximum number of entries you want to keep (KB size has priority over maximum number of entries). These size restrictions can be entered in either the CHANGE CURRENT or CHANGE PERM. columns.

3. If you want to remove restrictions, enter **NO** in the Restricted size field of the CHANGE CURRENT or CHANGE PERM. columns.

Fields

Total control block size in KB	The current allocation in KB.
Number of entries generated	Maximum number of modules for the size above.
Number of entries used	Current number of modules saving statistics.
Restricted size	**NO** indicates that there is no restriction of the amount of main storage used for module statistics. Enter **YES** along with either the size in KB or number of entries to restrict storage.
Size in KB	The main storage restriction size in KB.
Max number of entries	The maximum number of modules for which statistics are to be saved.
CHANGE CURRENT Column	If the restriction is applicable only for this system startup, enter the current restriction values in this column. For *Status of statistics*, you must enter 1, 2, or 3 to start module statistics fully or selectively, or to stop module statistics. At the next system startup, the values reflected in the CURRENT column are the same as the values in the PERM. column.
CHANGE PERM. Column	If the restriction is applicable on a permanent basis, enter the restriction values in this column. For *Status of statistics*, you must enter 1, 2, or 3 to start module statistics fully or selectively, or to stop module statistics. Both CURRENT and PERM. restrictions are updated.
Status of statistics	Shows the current and permanent status of the module statistics, which can be either FULL, SELECTED, or STOPPED.

14.4 Displaying Statistics

Statistics can be accessed using the DISPLAY STATISTICS MENU. This menu is displayed when option **13** is entered on the PRIMARY OPTION MENU.

```
 DISPLAY STATISTICS MENU       OTTO for CICS V1R2                      OTTOM19


 OPTION ===> _____



          1. Display LU Statistics Summary
          2. Display 3270 Statistics
          3. Display 3270 Terminal Statistics
          4. Display 3270 Printer statistics
          5. Display 3600 Statistics
          6. Display SCS Statistics
          7. Display Statistics of Specific 3270 Terminal(s)  . . _____
          8. Display Statistics of Specific 3270 Printer(s) . . . _____
          9. Display Statistics of Specific 3600 Terminal(s)  . . _____
         10. Display Statistics of Specific SCS Printer(s)  . . . _____
         11. Display Statistics of Specific Module(s) . . . . . . _____
         12. Display Error Statistics  I(n) O(ut) A(ll) . . . . .



 --------------------------------------------------------------------------------
 F1=Help      F3=End
```

Figure 31: DISPLAY STATISTICS MENU (OTTOM19)

Use the DISPLAY STATISTICS MENU to select options that are available for displaying the statistics for components, LUs, and modules.

On each of the statistics panels, use function key <F9> to write all statistics to the OTTOSTAT file for printing. One of two things will happen:

1. Statistics are written to the statistics file, or

2. Statistics are written to the console. This happens in the event no statistics file exists (i.e., no DD statement).

Using the Panel

In the OPTION field, enter one of the following display options:

Enter: To do this:

1   Display a summary of LU statistics presented in graphical representations of reduction percentages, see section 14.4.1 for details.

2   Display 3270 statistics, see section 14.4.2 for details.

3   Display 3270 terminal statistics, see section 14.4.2 for details.

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4	Display 3270 printer statistics, see section 14.4.2 for details.
5	Display 3600 statistics, see section 14.4.2 for more details.
6	Display SCS statistics, see section 14.4.2 for details.
7	Display statistics for specific 3270 terminals. The specific or generic terminal ID must be typed in the field provided, see section 14.4.3 for details.
8	Display statistics for specific 3270 printers. The specific or generic printer ID must be typed in the field provided, see section 14.4.3 for details.
9	Display statistics for specific 3600 terminals. The specific or generic terminal ID must be typed in the field provided, see section 14.4.3 for details.
10	Display statistics for specific SCS printers. The specific or generic SCS printer ID must be typed in the field provided, see section 14.4.3 for details.
11	Display statistics of specific modules. The specific or generic module name must be typed in the field provided, see section 14.4.4 for details.
12	Display error statistics for inbound and outbound data streams. Use the input field to specify whether inbound (I), outbound (O), or all (A) error statistics are displayed, see section 14.4.5 for details.

14.4.1 LU Statistics Summary

The LU STATISTICS SUMMARY panel is displayed when option **1** is entered on the DISPLAY STATISTICS MENU.

```
LU STATISTICS SUMMARY          OTTO for CICS V1R2                      OTTOM20


OPTION ===> _____



Reduction in %               0   10   20   30   40   50   60   70   80   90  100
                             +----+----+----+----+----+----+----+----+----+----+
3270 terminal - total: 48%   *************************

3270 printer  - total:  0%   *

SCS  printer  - total: 46%   ***********************

3600 terminal - out  : 46%   ***********************
3600 terminal - in   : 57%   ****************************
3600 terminal - total: 48%   *************************



--------------------------------------------------------------------------------
F1=Help     F3=End     F4=Return
```
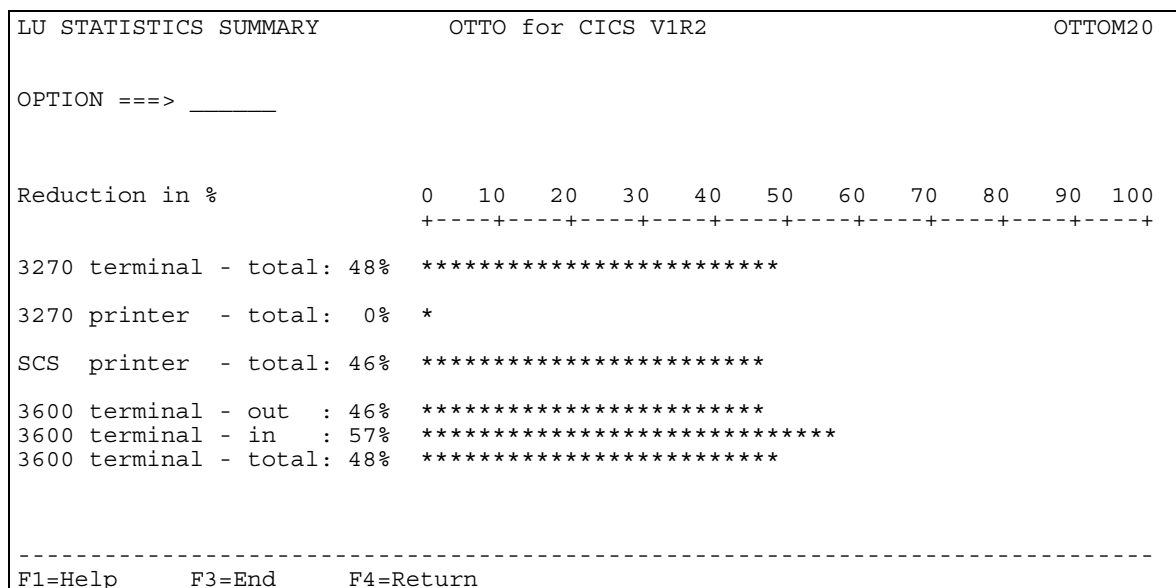
Figure 32: LU STATISTICS SUMMARY Panel (OTTOM20)

The LU STATISTICS SUMMARY panel graphically presents the optimization effect for the three component types; 3270, SCS, and 3600. The reduction per component is displayed in percent and graphically as a line with asterisks.

The 3270 component is split into the 2 parts: terminal (total) and 3270 printer (total). The 3600 component is split into 3 parts; terminal out, terminal in, and terminal total.

This summary information can only be viewed online and cannot be routed to a printer.

14.4.2 Component Statistics

The COMPONENT STATISTICS panel is displayed when one of the options **2** through **6** is entered on the DISPLAY STATISTICS MENU.

```
 COMPONENT STATISTICS            OTTO for CICS V1R2                       OTTOM21


 OPTION ===> _____

                   component statistics type here


 From      19-01-2006 08-45-32   to ******** ********

                                     COUNT           OPTIMIZED     PERCENTAGE
                                  ---------------- ---------------- ----------
 Number of output messages  . :              121              112    92%
 Number of input messages . . :              113               92    81%

                                  COUNT BEFORE      COUNT AFTER    REDUCTION
                                  ---------------- ---------------- ----------
 Number of output bytes . . . :           163.902           88.271    47%
 Number of input bytes  . . . :            27.939           11.893    58%
 Total number of bytes  . . . :           191.841          100.164    48%


 ------------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return    F9=Write Statistics to OTTOSTAT or Console
```

Figure 33: COMPONENT STATISTICS Panel (OTTOM21)

The COMPONENT STATISTICS panel displays statistics for each component type as determined by the option number entered on the DISPLAY STATISTICS MENU. The component type is identified in the heading of this panel.

The measurement dates are identified in the From/to field. If the "**to**" field contains all asterisks, the component is still active.

Using the Panel

Press <F9> to write these statistics to an output file (or console if no output file is available) for printing.

Fields

NUMBER OF OUTPUT MESSAGES COUNT - Total message counter sent from CICS.

OPTIMIZED - Total number of optimized messages.

PERCENTAGE - Percentage of savings. This number is calculated as: 'OPTIMIZED' divided by 'COUNT' and the quotient multiplied by 100.

NUMBER OF INPUT MESSAGES (**only** *when sub-option* **5** *or sub-option* **9** *is used on the DISPLAY STATISTICS MENU*

COUNT - Total message counter received by CICS.

OPTIMIZED - Total number of optimized messages.

PERCENTAGE - Percentage of savings. This number is calculated as: 'OPTIMIZED' divided by 'COUNT' and the quotient multiplied by 100.

NUMBER OF OUTPUT BYTES

COUNT BEFORE - Total number of bytes of data that have been sent from CICS. This is the number of bytes that would have been transmitted if CICS OTTO was not active. The difference in this number and COUNT AFTER is the savings obtained from optimization.

COUNT AFTER - Total number of bytes of data actually transmitted to the LU(s) after the optimization. This number should be smaller than the previous number 'COUNT BEFORE'.

REDUCTION - Percentage of savings. This number is calculated as: 'COUNT BEFORE' minus 'COUNT AFTER', the result divided by 'COUNT BEFORE' and the quotient multiplied by 100.

NUMBER OF INPUT BYTES (**only** *when sub-option* **5** *or sub-option* **9** *is used on the DISPLAY STATISTICS MENU)*

COUNT BEFORE - Total number of bytes of data that have been passed to CICS, after inserting any fields set to ON when the screen was displayed. If Input Optimization (3600/4700 type terminals **only**) is ON, this is the number of bytes that would have been re-transmitted back from the LU(s) if CICS OTTO was not active.

COUNT AFTER - Total number of bytes of data transmitted from the LU(s) to CICS, prior to inserting any fields which had set on when the screen was displayed. If Input Optimization (3600/4700 type terminals **only**) is ON, this number should be smaller than 'COUNT BEFORE', else these two numbers will be equal. The difference in the two numbers is the number of bytes that did not have to be re-transmitted back from the LU(s).

REDUCTION - Percentage of savings. This number is calculated as: 'COUNT BEFORE' minus 'COUNT AFTER', the result divided by 'COUNT BEFORE' and the quotient multiplied by 100.

TOTAL NUMBER OF BYTES(**only** *when sub-option* **5** *or sub-option* **9** *is used on the DISPLAY STATISTICS MENU)*

COUNT BEFORE - Total number of bytes sent from CICS and received by CICS with CICS OTTO active.

COUNT AFTER - Total number of bytes that have actually been sent to the LU(s) and received from the LU(s), that is the total number of bytes really transmitted in both directions.

REDUCTION - Percentage of savings; it is calculated as: 'COUNT BEFORE' minus 'COUNT AFTER', the result divided by 'COUNT BEFORE' and the quotient multiplied by 100.

14.4.3 Statistics of a Specific LU

The LU STATISTICS panel is displayed when one of the options **7** through **10** is entered on the DISPLAY STATISTICS MENU and a specific or generic LU name was entered.

```
 LU STATISTICS                 OTTO for CICS V1R2                      OTTOM21


 OPTION ===> _____                       DISPLAY CRITERIA . . . SET9

                 Statistics for specific terminal(s)


 From      19-01-2006 08-45-32   to ********** ********

                                     COUNT          OPTIMIZED    PERCENTAGE
                                ----------------- ----------------- ----------
 Number of output messages  . :              96                92     95%
 Number of input messages . . :              92                85     92%

                                  COUNT BEFORE     COUNT AFTER    REDUCTION
                                ----------------- ----------------- ----------
 Number of output bytes . . . :         134.447            66.732     51%
 Number of input bytes  . . . :          28.764            10.729     63%
 Total number of bytes  . . . :         163.211            77.461     53%



 ------------------------------------------------------------------------------
 F1=Help     F3=End     F4=Return    F9=Write Statistics to OTTOSTAT or Console
```

Figure 34: LU STATISTICS Panel (OTTOM21)

The LU STATISTICS panel displays statistics for the specified LU(s). The LU(s) are identified in the DISPLAY CRITERIA field.

The measurement dates are identified in the From/to field. If the **"to"** field contains all asterisks, the LU(s) are still active.

Using the Panel

1. To display statistics for another specific LU, type the LU name in the DISPLAY CRITERIA field. This field may contain a specific name or (if it is a summary over chosen LUs) a generic LU name.

2. Press <F9> to write these statistics to an output file (or console if no output file is available) for printing.

Fields

See "Component Statistics" on page 97 for a description of the fields on this panel.

14.4.4 Module Statistics

The MODULE STATISTICS panel is displayed when option **11** is entered on the DISPLAY
STATISTICS MENU and a specific or generic module name is entered.

```
 MODULE STATISTICS              OTTO for CICS V1R2                      OTTOM21


 OPTION ===> _____                          DISPLAY CRITERIA . . . OTTO*

                  Statistics for specific module(s)


 From     19-01-2006 10-11-27   to ********** ********

                                      COUNT          OPTIMIZED    PERCENTAGE
                                 ----------------- ----------------- ----------
 Number of output messages  . :             44               44     100%
 Number of input messages . . :             41               41     100%

                                 COUNT BEFORE      COUNT AFTER    REDUCTION
                                 ----------------- ----------------- ----------
 Number of output bytes . . . :          55.687           26.008     54%
 Number of input bytes  . . . :           9.119              473     95%
 Total number of bytes  . . . :          64.806           26.481     60%



 --------------------------------------------------------------------------------
 F1=Help    F3=End     F4=Return    F9=Write Statistics to OTTOSTAT or Console
```

Figure 35: MODULE STATISTICS Panel (OTTOM21)

The MODULE STATISTICS panel displays statistics for the specified module(s). The module
name is identified in the DISPLAY CRITERIA field.

The measurement dates are identified in the From/to field. If the **"to"** field contains all asterisks,
the module(s) are still active.

Using the Panel

1. To display statistics for another specific module or group, type the module name in the
    DISPLAY CRITERIA field. This field may contain a specific name or (if it is a summary over
    chosen modules) a generic module name.

2. Press <F9> to write these statistics to an output file (or console if no output file is available)
    for printing.

Fields

See "Component Statistics" on page 97 for a description of the fields on this panel.

14.4.5 Error Statistics

The ERROR STATISTICS panel is displayed when option **12** is entered on the DISPLAY STATISTICS menu. The panel shows a summary of inbound and outbound data stream errors that occurred since error statistics were cleared the last time (see option 18 on the STATISTICS CONTROL panel for details about clearing statistics).

```
 ERROR STATISTICS               OTTO for CICS V1R2                    OTTOM26

 OPTION ===> _____           I(n) O(ut) A(ll) _      Entries  41 to  45 of  45
                                                                       MORE: -
                             All Data Stream Errors

 Code Last Date    Time      Count  LU         Module    PI  PSize  Dspl  OR/Fld
 ---  ----------  --------   -----  --------   --------  --  -----  ----  ------
 I19                             0
      SBA OUT OF SEQUENCE
 I20                             0
      SFE WITHOUT BASIC ATTRIBUTE
 I21  08-03-2006  16-14-54      13  0113       TE10004   00   1920  0515  000000
      UNPROT. FIELD TOO LONG (RB)
 I22                             0
      N/A
 I23                             0
      N/A

                                                                        BOTTOM
                                  Total Errors :        13
 ------------------------------------------------------------------------------
 F1=Help   F3=End   F4=Return   F7=Backward   F8=Forward   F9=Print
```

Figure 36: ERROR STATISTICS Panel (OTTOM26)

The ERROR STATISTICS panel displays an overview of all possible errors. This figure uses inbound errors for illustration. The number of data streams (count) in which an error was detected is displayed, as well as information on the terminal for which the error most recently occurred. Such information includes date, time, LU/module name, partition ID (hexadecimal) and size (decimal), along with the displacement of the error in data stream (hexadecimal), and failing 3270 order or data. A short description of the error code is also shown.

To more closely evaluate a specific type of error, use the Instorage Trace option. For more about tracing and to see a complete listing of all error codes and their description, see "Viewing Data Stream Errors" on page 80.

Using the Panel

- To change the filtering of the error statistics displayed on the panel, enter **I**, **O**, or **A**.

- Press F9 on the ERROR STATISTICS panel to write statistics to CICS OTTO file called OTTOSTAT or to the system log.

- Press F3 on the ERROR STATISTICS panel to return to the previous panel.

- Press F4 to return to the PRIMARY OPTION MENU.

- Press F7 and F8 to scroll backwards and forwards through the error list.

Columns

Code	Indicates the error code that was incurred along with a short description. See "Data Stream Error Codes" beginning on page 80 for a detailed description of each possible outbound and inbound data stream error.
Last Date / Time	Displays the last date and time for which the error was encountered. The date format depends on your site-specific date setting. The time format is HH-MM-SS.
Count	The number of times this error was encountered.
LU / Module	Displays the LU name and module name for which the error was most recently encountered.
PI / PSize	Displays the partition ID and the partition size.
Dspl	Shows the actual error displacement. **Note:** if the actual displacement could not be determined or if a displacement is meaningless for this type of error, the value shown is FFFF.
OR/Fld	Displays the data stream order or data field for which the error was detected. The column may contain an order or just a data field.

CHAPTER 15: COMPATIBILITY MODE

Generally, CICS OTTO's interactive menus and panels allow you to control all optimization features as documented in this *CICS OTTO User's Guide*. There is an exception: you will be asked to use native commands if you need to reload a module after applying a PTF, or for some type of error determination. If such instances occur, your technical support representative will provide instructions.

Alternatively, the CICS OTTO native commands are also supported via the so-called Compatibility Mode. This Compatibility Mode allows you to use these native commands instead of the online interactive panels. In the event you want to use CICS OTTO's native commands, enter the Compatibility Mode by selecting option **14** on the PRIMARY OPTION MENU.

Note: For details on how to use CICS OTTO native language via the Compatibility Mode, refer to the *CICS Online Transmission Time Optimizer Compatibility Mode Guide*.

When entering the Compatibility Mode for the first time, all command execution routines are loaded into the main storage. These routines stay permanently in main storage while the TP system is active.

To return from the Compatibility Mode to the PRIMARY OPTION MENU, press the <F3> function key or CLEAR key.

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CHAPTER 16: BATCH UTILITIES

This chapter explains the following batch utilities:

- ABLMAIN to print options and settings.

- ABLBAT to set optimization options in batch.

- ABLCONV to copy existing optimization options to the control file of a new release.

16.1 ABLMAIN Print Utility

ABLMAIN, the CICS OTTO print utility, can be used to print the permanent optimization settings maintained on the VSAM command file, which is defined by the OTTOCMD DD statement .

The JCL required to run the print utility is delivered within the sample JCL member also called ABLMAIN.

16.1.1 Control Statement Overview

The following rules must be followed when entering ABLMAIN control statements:

- Each input card must contain a valid command unless it is a continuation card or a comment card.

- Comment cards are identified by an asterisk in column 1.

- The command and possible keywords may appear in any column.

- Continuation cards are assumed unless all required keywords are entered.

- The card may be filled including column 72.

- The command and the keyword(s) must be separated from each other by one or more blanks.

- The keywords can be entered in any sequence.

The general card format is:

```
 COMMAND KEYWORD1 KEYWORD2 .. KEYWORDn-1 KEYWORDn
```

Command and keyword defaults are printed in bold type in the following command overview and the minimum abbreviations are underlined.

Table 4: ABLMAIN Print Utility Command

Command	Keyword 1	Keyword 2	Keyword 3	Keyword 4	Keyword 5
PRINT	**SET**TINGS				
	OPTIONS	**ALL** SYSTEM 3270 SCS 3600 MOD LU			
	EXCLUSION	**ALL** LU MOD MODSTAT			
	SELECTION	**ALL** LU MODSTAT			

The PRINT command lists all permanent settings made to the command file OTTOCMD.

PRINT keywords	Description
SETTINGS	Prints all options as well as the exclusion and selection lists.
OPTIONS	Prints various options depending on the 2nd keyword: ALL system, component and LU based options SYSTEM system-wide valid options like APPLID, date formatting, user exit, pool size, etc. 3270 component based options like optimization level, start option, request unit size, etc. SCS component based options like start option, line size, etc. 3600 component based options like start option, prime character, etc. LU LU based options like optimization level, start option, line size, prime character, etc. for all LU's with settings different from the component value. MOD module based options like optimization level, line size, prime character, etc. for all modules with settings different from the component value.

PRINT keywords	Description
<u>E</u>XCLUSION	ALL prints module and LU exclusions as well as exclusions from module statistics LU prints LU exclusions MOD prints module exclusions MODSTAT prints exclusions from module statistics
<u>S</u>ELECTION	ALL prints LU selections as well as selections for module statistics LU prints LU selections MODSTAT prints selections for module statistics

16.1.2 Utility Output

The utility output is self-explanatory. Error messages should be checked carefully. The utility ends with return code 0 if everything ran correctly. It will otherwise end with a return code 4.

16.2 Batch Command Utility

The batch command utility ABLBAT is used to process commands (except for DISPLAY) in a batch environment. Usually, this is done during installation or to correct an optimization option before the next startup.

Any of the commands START, STOP, SET, EXCLUDE, INCLUDE, SELECT, or UNSELECT that are executed in batch mode by program ABLBAT, which specify neither the option P<ERMANENT> nor T<EMPORARY>, will default to P<ERMANENT>.

16.2.1 Required JCL

The required JCL is distributed within the sample JCL member ABLBATC.

16.2.2 Control Statements

The following rules must be adhered to when entering ABLBAT control statements:

- Each record must contain a valid command, unless it is a continuation or comment record.

- Comments are identified by an asterisk in column 1.

- The command and possible keywords may appear in any column.

- Continuation records are assumed, unless all required keywords are entered.

- The record may be filled including column 72.

- The command and the keyword(s) must be separated by one or more blanks.

- The keywords can be entered in any sequence.

The general record format is:

```
 COMMAND KEYWORD1 KEYWORD2 .. KEYWORDn-1 KEYWORDn
```

16.3 Conversion Utility

The conversion utility ABLCONV is used to copy all permanent settings from CICS OTTO VSAM file(s) of a prior release to the actual command file. This includes all exclusion and selection lists, all LU-based and component-based settings, as well as all system-wide parameters such as date formatting, user exit, etc.

The required JCL is distributed within the sample JCL member ABLCONV.

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APPENDIX A: TROUBLESHOOTING

A.1 Invalid Optimization

If a problem occurs, make sure that it is an optimization problem by switching off the optimization for the LU where the error occurred. If the problem persists, the following information is needed for technical support to solve the problem:

1. What kind of terminal or printer is used?

2. Does the error also occur on other terminal types?

3. Trace of the error situation on tape (see the following section).

4. Output of the Print Utility at the time of the error, to see all permanent settings.

5. A list of all PTFs that have been applied.

6. Hard copy of the screen or printout where the error occurred and a hard copy for the same correct screen or printout.

A.2 Trace Control Using DD OTTOTRCS

CICS OTTO will trace all input and output messages before and after optimization for those components for which the trace facility was activated using the TRACE ON command. The trace file written to DDNAME OTTOTRCS is opened when a TRACE ON command is issued and closed when a TRACE OFF command is issued.

➔ **Note**: The trace file should be printed before another TRACE ON command is issued. If this is not done, the trace information previously written may be lost.

In the case of an output message, the TRACE BEFORE OPTIMIZATION entry is the original message layout as sent by the application and the TRACE AFTER OPTIMIZATION entry shows the message after the optimization process. In the case of an input message, the TRACE BEFORE OPTIMIZATION shows the message as received from the terminal and the TRACE AFTER OPTIMIZATION shows the message as passed to the application. See "Appendix D: Interpreting Message Trace DD Output" for an example and explanation of an optimization trace.

In some cases, it is necessary to take an internal trace that will additionally print some control blocks as well as relevant control blocks of the TP system. This kind of trace is invoked by adding the keyword INT to the TRACE command. Contact IBM Support before activating the trace to decide whether an internal trace is necessary to solve the problem.

A.3 SYSTEM ABENDS

In the event of a system abend, make sure that the problem is an optimization problem by examining the PSW and registers at the time of abend.

If a CICS OTTO module is involved, register 12 will point to the entry point of the module; on displacement 4 you will find an eye catcher identifying the abending module. The following information is needed for technical support to solve the problem:

1. What changes have been made to the TP system?

2. What changes have been made to CICS OTTO?

3. A tape with the original copied dump data set created by IEBGENER.

4. The Job Control of the dump tape creation.

5. Number of terminals connected to the TP system.

6. If the error can be reproduced, a CICS OTTO trace of the error situation on tape.

X37 ABENDS

B37 abends on the trace file and the statistics file can be handled automatically. During the installation process, parameter WRAP on the ABLGEN macro decides whether the output of these files should be halted in a B37 condition or if it should be wrapped around. Wrapping simply means that CICS OTTO will overwrite the file starting from the top, thus avoiding any B37 abend.

If the WRAP AROUND option was chosen, the installation guide warned against using a DISP=MOD in the DD statements for these files to avoid D37 abends. Therefore, in the event of a D37 abend, verify that the DD statement does not contain a DISP=MOD.

APPENDIX B: USER EXIT SUPPORT

The user can control the optimization using a user exit routine. This routine must be linked as ABLEX*nn* where *nn* is a numeric suffix between 00 and 90 (the numbers 91 ... 99 are reserved). Any newly linked exit routine can be dynamically activated by the SET EXIT command. Whenever a given exit is activated, it gets control for all input and output messages before and after the optimization process. A sample user exit source module is distributed as ABLEX00.

B.1 Exit Linkage Conventions

Registers upon entry to the exit module:

- R1   Parameter list address
- R13   Save area address
- R14   Return address
- R15   Entry point address
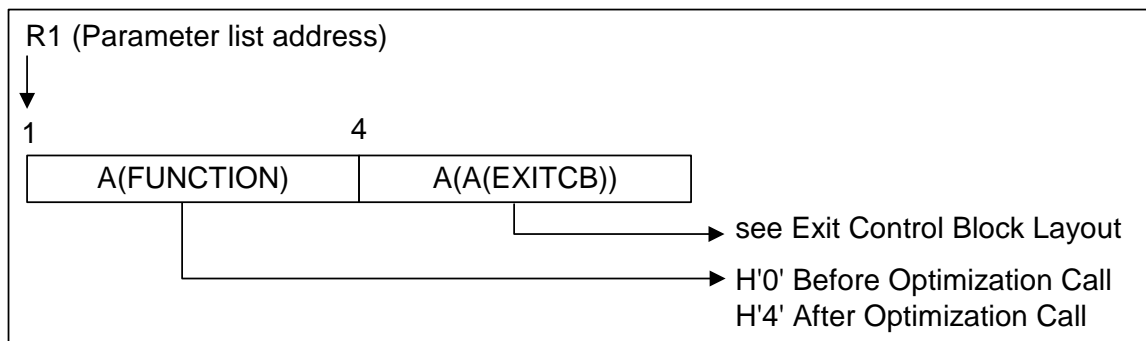
Before optimization: Register 15 return code upon return from the user exit call:

R15	3270 type LU	3600/4700 type LU	SCS type LU
0	Optimize normally	Optimize normally	Optimize normally
4	No imaging	No optimization	No optimization
8	No optimization	No optimization	No optimization
12	Optimize OUTIMAGE	No optimization	No optimization
16	Message changed	Message changed	Message changed
20	Optimize normally	No optimization	No optimization

The return code that is passed back in R15 has effect only for the current message. Changing the optimization using a return code only makes sense if a different optimization should be performed than the one used on entry to the user exit.

After optimization: If R15 is **not** zero, the original message is passed to the terminal or application. This means no optimization was done.

B.2 EXIT CONTROL BLOCK LAYOUT

```
0  ----------------------------------------
       EXITTID
8  ----------------------------------------
       EXITMOD
16 ----------------------------------------
       EXITMSGA
20 ----------------------------------------
       EXITMSGL
24 ----------------------------------------
       EXITMSGT | EXITDIR | EXITCHR | EXITOLEV
28 ----------------------------------------
       EXITCSAA
32 ----------------------------------------
       EXITTCAA
36 ----------------------------------------
       EXITTCTA
40 ----------------------------------------
       EXITTIOA
44 ----------------------------------------
       EXITSCDA
48 ----------------------------------------
       EXITCLBA
52 ----------------------------------------
       EXITCTBA
56 ----------------------------------------
       EXITCNTA
60 ----------------------------------------
       EXITCIBA
64 ----------------------------------------
       EXITCTTA
```
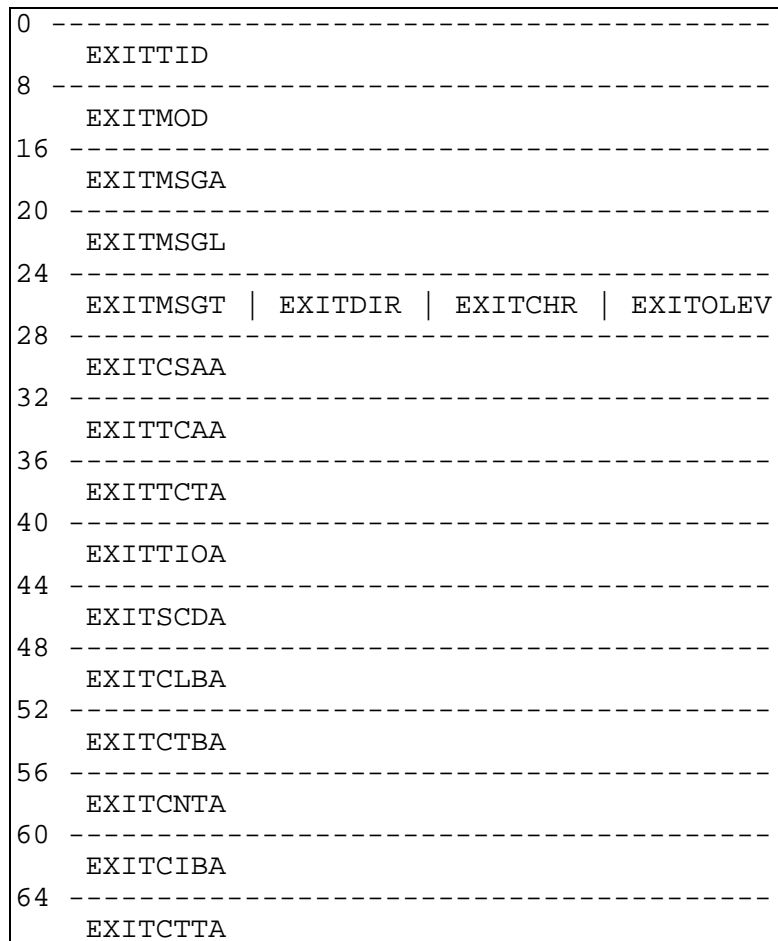
Figure 37: Exit Control Block Layout

```
Decimal
Displacement    Field Name          Field Description

    0           EXITTID  DS CL8      Terminal identifier
                                     FIRST 4 BYTES WITH TCTTETI
                                     NEXT 4 BYTES ARE BLANK
    8           EXITMOD  DS CL8      Program name
                                     COPIED FROM PPT
   16           EXITMSGA DS A        Pointer to message
   20           EXITMSGL DS F        Message length
   24           EXITMSGT DS XL1      Message/LU type

Bits defined in EXITMSGT

                EXIT3270 EQU X'80'   3270-type message
                EXITSNA  EQU X'40'   3600/4700 message
                EXITSCS  EQU X'20'   SCS message
                EXITSCRN EQU X'08'   Screen
                EXITPRT  EQU X'04'   Printer

   25           EXITDIR  DS XL1      Message direction

Bits defined in EXITDIR

                EXITDIRO EQU X'80'   Output message
                EXITDIRI EQU X'08'   Input message

   26           EXITCHR  DS CL1      For exit usage
   27           EXITOLEV DS XL1      OPTIMIZATION LEVEL
                EXITOIOC EQU X'40'   OUTBOUND OPT WITH IMAGING CURRENTLY
                EXITONOC EQU X'20'   OUTBOUND OPT NO IMAGING CURRENTLY
   28           EXITCSAA DS F        CSA-address
   32           EXITTCAA DS F        TCA-address
   36           EXITTCTA DS F        TCT-address
   40           EXITTIOA DS F        TIO-address
```

B.3 EXIT CODING CONSIDERATIONS

The exit must be reusable. The exit runs in 31-bit addressing mode and is loaded according to its RMODE attribute. Since the exit is copied to a CICS OTTO storage area after having been loaded, you may not use relocatable symbols that are adjusted by the loader.

The only fields in the exit control block that may be changed are EXITMSGL and EXITCHR. EXITCHR may be used to keep track of control information between the BEFORE and AFTER optimization calls. The message may be changed and made longer if EXITMSGL is set correctly. The return code 16 must be used if the message is changed. It must never be made longer than the original message length before optimization.

APPENDIX C: MASS PROCESSING OF COMMANDS (ABLPCMD)

Program ABLPCMD is designed to process a given number of CICS OTTO commands. This might be useful to facilitate mass updates to the CICS OTTO command file. For example, if a large number of terminals have suddenly caused a problem, you might use ABLPCMD to temporarily or permanently exclude a large number of terminals.

All valid OTTO commands as described in this User's Guide may be passed to ABLPCMD. These commands are processed as if they had been entered using the OTTO transaction. All manipulating commands (e.g., EXCLUDE, SELECT) are immediately made available to the CICS OTTO optimization process that is running. If the command contains the keyword PERMANENT, the information is immediately written to the CICS OTTO control file. Non-manipulating commands (e.g., DISPLAY) are ignored.

The number of commands to be processed must be passed to ABLPCMD. This number may be restricted by the ICVR value defined in the SIT of CICS. If too many commands are processed by ABLPCMD (processing is performed without CICS interrupt), the program may abend with AICA. CICS OTTO has been tested with up to 32000 commands and an ICVR value of 5000 without any problems. Rather than an AICA, a Short-On-Storage condition with 64000 commands that resided below the 16 MB line was caused.

C.1 Calling ABLPCMD

ABLPCMD may be called by any program running under CICS using the following instruction:

```
 EXEC CICS LINK PROGRAM('ABLPCMD') COMMAREA(PARMAREA) LENGTH(16)
```

PARMAREA must contain the addresses of the following four areas, which are needed by ABLPCMD:

1. Address of a fullword containing the number of passed commands.

2. Address of a fullword containing the address of the first command. The commands are expected to be padded with blanks and every command line must be 80 characters long. The next command line must follow immediately.

3. Address of a fullword that is used by ABLPCMD to pass the return code to the caller.

4. Address of a fullword that will contain the number of commands which were not successfully processed by CICS OTTO.

Details pertaining to the assembler definition of PARMAREA begin on the next page.

In assembler language, the PARMAREA must be defined as follows:

```
PARMAREADS   0A
PARMNOA DS   A        Address of fullword: number of commands
PARMCMDADS   A        Address of first command line
PARMRCA DS   A        Address of fullword: return code from ABLPCMD
PARMCTA DS   A        Address of fullword: error count from ABLPCMD
```

The areas referred to in PARMAREA must be defined as follows:

```
NUMCMDS  DS F         Number of commands to be processed
RETCODE  DS F         Return code from ABLPCMD
ERRCOUNT DS F         Number of commands which have not been processed
COMMANDS DS xCL80         where x = NUMCMDS
```

Every command line contains a valid CICS OTTO command and must be padded with blanks. ABLPCMD uses the first 72 characters to extract the command. The last 8 characters are used by ABLPCMD in case of a failing command to pass the error-message-ID to the caller. This ID is the same as described in Chapter 2 of the *CICS OTTO Message Guide*. For example, ABL6305I means entry already exists in list (for any EXCLUDE or SELECT command).

All passed areas may reside below or above the 16 MB line.

The following table lists the return codes of ABLPCMD:

Table 5: ABLPCMD Return Codes

RC	Description
00	All commands have been processed successfully
04	At least one command failed: use the error count and the last 8 characters of the command lines to determine the kind of error
08	CICS OTTO is actually servicing another command. Issue a WAIT and try again.
12	The passed number of commands is not positive. Fill in the correct value.
16	Program ABLEXIT is not available. Check whether CICS OTTO is installed and initialized properly.
20	Control block OTCB is not available. Check whether CICS OTTO is installed and initialized properly.
24	Internal error. Command processor CM00 is not available.
28	Internal error. Bad return from loading command modules.

Note: Return codes 16 – 28 should not occur. If CICS OTTO is correctly installed and initialized and you get a return code higher than 12, a dump is needed for further problem determination. For this purpose, ABLPCMD contains statements to force a transaction abend. The resulting transaction dump with an abend code of ABL0, ABL4, ABL6, or ABL8 should be passed to your support center.

C.2 Defining ABLPCMD to CICS

Define ABLPCMD with the following options:

- Language   Assembler

- Data   Below

- EXECKEY   CICS

- Resident   No

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APPENDIX D: INTERPRETING MESSAGE TRACE DD OUTPUT

This appendix documents the inbound and outbound messages that might result from a CICS OTTO trace that has been written to SYSOUT, versus the instorage trace that is presented online.

The table in this section documents the return codes and their associated description. The following is an output example of the normal CICS OTTO message trace written to DDNAME OTTOTRCS:

```
MESSAGE  TRACE INIT. AT 1996-169   13-56-32 ID=0  TITLE=THIS IS THE TITLE              VM 0600/00014 SEMUNICH PAGE    1


327T TRACE BEFORE OPT.    OUT MOD=ABLMC00 LU=SET9     DATE=1996-169   TIME=13-56-32 LEN=   771 BYTES        L=3 I=NA T=N

lines 1  *F1C31140401DF8D6E3D5E2C5F0F0F100001DFD61C6D6D940D6E3E3D61DF8D6959389958540E3998195A29489A2A289969540E389948540D697A38994*
      2  *1C.    .80TNSE001..../FOR OTTO.80online Transmission Time Optim*
      3  *   SBA  SF                SF               SF                                                              *
      4  *    1,1                                                                                                     *

         *89A98599404040404040000000001DF8E5D440F0F5F5F061F9F6F0F3F10000000000000000000000000000001DF8C39697A899898788A340E29686A3A6*
         *izer          .....8VM 0550/96031................8Copyright Softw*
         *                          SF                                         SF                                      *
         *                                                                                                            *

     120 *81998540C595878995858599989958740C79482C86B40F1F9F8F7406040F1F9F9F60000000000000000000000000000000000011C2601DFD0000*
         *are Engineering GmbH, 1987 - 1996.......................B-.....*
         *                                                                                            SBA   SF     *
         *                                                                                            3,1          *
```

Figure 38: Message Trace Output Sample

Where:

L= the optimization level for current message:

  1 = opt-level OUT/NOIMAGE

  2 = opt-level OUT/IMAGE

I= indicates whether the image available (Y) or not available (NA).

T= indicates whether modifications were made by OTTO (Y) or not (N).

line 1   Hexadecimal representation of message
line 2   Character representation of message
line 3   Identifies orders within message (appears only if at least one order is available)
line 4   Identifies *line,row* if preceded by an appropriate command

Table 6: Message Trace Return Codes and Descriptions

Return Code	Description
00004000	Module excluded from optimization
32000000	Normal completion
320004C0	Data stream not modified
320004C6	Image not found and imaging set off for this message
320004D0	Data stream not modified

Return Code	Description
320004D2	Data stream not modified
320004D3	Optimized message longer than original + increment value
320008A1	Insufficient space for image buffer (IBB)
320008A2	Insufficient space for image buffer (IBA)
320008B1	Data stream is neither inbound nor outbound
320008C1	Terminal is neither printer nor screen
320008C2	Inbound data stream from printer arrived
320008C3	Unexpected return code from buffer management module (no pool generated or internal error (message area = compression area))
320008C4	Return code 0 from OTTO3205 not supported
320008C5	Return code 8 from OTTO3205 not supported
320008C8	Image deletion requested by interface
320008D1	Terminal is neither printer nor screen
320008D3	Unexpected return code from buffer management
32030800	Image after eliminating gaps longer than before
320518B1	Image of zero length produced: old one deleted
321104A0	Data stream with zero length arrived
321104A1	Not optimized because order found (05,11,12,13,1D,28,29,2C or 3C)
321104A2	Old DBCS field
321104A3	WCC C8 indicates no line size given. In this case linesize should have been set with SET LINESIZE.
321104A4	Data for command F1 could not be optimized because start of line could not be located
321104A5	Found two consecutive SI without SO
321104A6	Found two consecutive SO without SI
321104B1	Data stream not modified
321104C1	Optimized message longer than original
322000A1	Optimization switched off for this message
322004D3	Structured field longer than data stream. A structured field length is larger than the remaining length of the data stream.
322008A2	Insufficient space for image buffer (IBA)

Return Code	Description
322008D1	Insufficient space for structured field
322100A1	Imaging switched off for this message
322100B1	Nothing to optimize (inbound data stream)
322100C1	Normal completion
322200B2	Normal completion
322200C1	Normal completion
322200D3	Normal completion
322200F2	Normal completion
322200F4	Normal completion
322204A2	Inbound data stream has incorrect partition identifier
322204A4	Partition identifier not found
322204A6	Unknown AID in inbound data stream
322204B1	No screen image defined
322204D1	No screen image defined
322204F1	No screen image defined
322204F3	No screen image defined
322208A1	Implicit partition 0 not found
322208A3	Explicit partition 0 not found
322208D4	SFE without basic attribute in an inbound data stream which is the result of a Read Buffer. This cannot occur with a valid 3270 device.
322208D5	Incomplete Read Buffer. A Read Buffer (RB) data stream was found to be too short (not all data was read from the buffer) or too long (more data was read than the buffer should contain).
322208D7	Data stream contains both SF and SBA. An inbound data stream contains both Start Field and Set Buffer Address orders. This is not valid for inbound data streams.
322208D8	Data stream SBA out of sequence. An SBA was encountered in the inbound data stream whose address was less than the address of the preceding SBA. This is not valid for inbound data streams unless the address is zero (X'4040')
322208D9	SBA found but not at start of data. An SBA at the beginning of the inbound data stream indicates a formatted ReadModified (RM) data stream. If no SBA is present at the beginning of the data stream, the data stream is unformatted

Return Code	Description
	and cannot contain other SBA orders.
322308C6	UDB's after read buffer input
323000A1	Optimization switched off
323004C1	Unknown command code
323004D3	Invalid structured field length. A structured field was present in the outbound data stream which was longer than the remaining length of the data stream.
323004D4	Invalid structured field. An unknown or invalid structured field was detected.
323008A2	Insufficient space for image buffer (IBA)
323008D1	Insufficient space for structured field
323104A1	Invalid command code
323104D6	Optimized data greater IOAL
323104F2	EW(A) if reset_incomplete, leads to image deletion and take old msg
323104F7	Reset_incomplete but data stream not modified
323200B2	Normal completion
323200C1	Normal completion
323200D2	Normal completion
323204A2	Data stream has incorrect partition identifier
323204A4	Explicit partition not found
323204A5	Image critical and EW(A)
323204A6	Unknown command code
323204B1	No screen image defined
323204C2	Reset_incomplete and EW(A)
323204D1	No screen image defined
323208A1	Implicit partition 0 not found
323208A3	Explicit partition 0 not found
323304C1	Data gone beyond partition
323304DC	Data stream field longer than image field. A field was present in the inbound data stream that was longer than the field that was last sent to the screen at that location.

Return Code	Description
323304DD	Data stream protected field shorter than image field. A field was found in the inbound data stream which was shorter than the field last sent to the device. This is not valid if the field is protected.
323304DE	Unexpected double-byte-character-set (DBCS) data. This is usually found if the CICS OTTO DBCS Option is not set and DBCS Data is to be written to the screen. Switch the CICS OTTO DBCS Option on to avoid this error code.
323304DF	Data stream protected field differs from image field. An inbound field which is protected has been changed since the data was last sent to the screen. This is not possible with a valid 3270 device.
323304E6	SBA-order incomplete
323304E6–EA 323304ED-EE 323308EB	Truncated parameter list. An inbound data stream ended with an incomplete 3270 order.
323304E7	SF-order incomplete
323304E8	SFE-order incomplete
323304E9	MF-order incomplete
323304EA	RA-order incomplete
323304EB	Character attributes not supported
323304EC	Invalid repeat character follows RA-order
323304ED	EUA-order incomplete
323304EE	SA-order incomplete
323304EF	Character attributes not supported
323308D1 323504F3	Invalid DBCS field. A DBCS field was detected that has an odd number of bytes .
323308D2 323504F4	Invalid DBCS character. An invalid DBCS character was detected. Valid DBCS characters are: X'4040' toX'FEFE'.
323308D3	Invalid data stream order. An invalid 3270 data stream order was detected. If this was an SCS Printer data stream, then an invalid set function, MPP, left and right margins, or horizontal tab were specified.
323308DB	Unprotected field too long in an inbound data stream which is the result of a Read Buffer. The incoming field is longer than the outgoing field which cannot occur with a valid 3270 device.

Return Code	Description
323308E0	Invalid attribute value. An invalid attribute value was found for an attribute type other than Character Set in an MF, SA, or SFE order.
323308E1	Invalid graphic escape character. An invalid Graphic Escape (GE) order was detected. Valid values are: X'40' to X'FE'.
323308E2	Invalid character set. An invalid LCID was found in the attribute value field of an attribute type Character Set (programmed symbols) in an MF, SA, or SFE order. This value must be: X'00' orX'40' to X'FE'.
323308E3	Invalid attribute type. An invalid attribute type was detected in an MF, SA, or SFE order. Valid attribute types are • 3270 Field Attributes • Extended Highlighting • Extended Color • Character Set • Field Outlining • Background Transparency • Field Validation
323308E4	Target of a modify field is not an attribute. The target of a MF order must be an attribute byte. In this case, the target was not an attribute byte.
323308E5	Invalid address. An invalid buffer address was detected in an EUA, RA, or SBA order. One of the following conditions was found: • Address unknown • Address larger than the current device buffer size
323308E7	SICF pool full
323308E8	SICF pool full
323308EA	Invalid repeat character. An invalid repeat character was specified for an RA (Repeat-to-Address) order. The valid repeat characters are: X'00' and, X'40' to X'FE'.
323308EB	GE-order incomplete
323308EC	Unexpected incoming field. The incoming field may be an unmodifiable field or it may reference a position on the screen for which no field has been created by the preceding outbound data stream.
323308F2	SICF pool full
323504D4	Uneven double-byte-character-set (DBCS) field
323504D5	Wrap-around DBCS field not supported

Return Code	Description
323504D6	Uneven DBCS field
323504F1	Invalid Shift Out/Shift In pairing. A Shift Out/Shift In (SO/SI) pair was detected that is invalid or incomplete. The SO and SI orders must appear as pairs in the terminal buffer.
323504F2	Invalid DBCS sub-field. A DBCS sub-field was detected that has an odd number of bytes . This is usually found in conjunction with SO/SI orders.
323604D4	Uneven DBCS field
323904A1	DBCS data stream cannot be optimized because there is no image available and the command code is a WRITE without ERASE
323904A2	Invalid command code
323904DE	DBCS switched off, no image available, 43F/FE01/SO found
324004A1	Incorrect INOP in READ PARTITION
324004B2	Incorrect partition identifier (screen is in base state)
324004B4	Incorrect partition identifier (screen is in partitioned state)
324008B1	Implicit partition 0 not found
324008B3	Explicit partition 0 not found

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APPENDIX E: SABLLOAD – ALIAS LIST

An alias exists for many of the product modules and members. This means that each module may be referred to in the manuals or within the modules themselves by a prefix that begins with ABL and one that begins with an alias (OTTO).   All alias's are listed in a data set called SABLLOAD.

The following is a list of all alias names found in SABLLOAD.

Alias	Module/Member Name
OTTOBAT	ABLBAT
OTTOCONV	ABLCONV
OTTOEX00	ABLEX00
OTTOEXIT	ABLEXIT
OTTOH01	ABLH01
OTTOH02	ABLH02
OTTOH04	ABLH04
OTTOH05	ABLH05
OTTOH06	ABLH06
OTTOH07	ABLH07
OTTOH08	ABLH08
OTTOH09	ABLH09
OTTOH10	ABLH10
OTTOH11	ABLH11
OTTOH12	ABLH12
OTTOH13	ABLH13
OTTOH14	ABLH14
OTTOH15	ABLH15
OTTOH16	ABLH16
OTTOH17	ABLH17
OTTOH18	ABLH18
OTTOH19	ABLH19
OTTOH20	ABLH20
OTTOH21	ABLH21
OTTOH23	ABLH23
OTTOH26	ABLH26
OTTOM00	ABLM00
OTTOM01	ABLM01
OTTOM02	ABLM02
OTTOM03	ABLM03
OTTOM04	ABLM04
OTTOM05	ABLM05
OTTOM06	ABLM06
OTTOM07	ABLM07

OTTOM08	ABLM08
OTTOM09	ABLM09
OTTOM10	ABLM10
OTTOM11	ABLM11
OTTOM12	ABLM12
OTTOM13	ABLM13
OTTOM14	ABLM14
OTTOM15	ABLM15
OTTOM16	ABLM16
OTTOM17	ABLM17
OTTOM18	ABLM18
OTTOM19	ABLM19
OTTOM20	ABLM20
OTTOM21	ABLM21
OTTOM23	ABLM23
OTTOM24	ABLM24
OTTOM25	ABLM25
OTTOM26	ABLM26
OTTOMA23	ABLMA23
OTTOMAIN	ABLMAIN
OTTOMC00	ABLMC00
OTTOPCMD	ABLPCMD
OTTOSNAI	ABLSNAI
OTTOSTOP	ABLSTOP
OTTOSTRT	ABLSTRT
OTTOTSTA	ABLTSTA
OTTOTSTP	ABLTSTP

APPENDIX G: TECHNICAL SUPPORT CHECKLIST

If you encounter a problem that you cannot solve, please contact IBM Support.   To help us to provide the best possible service to you, please consider the following checklist before you contact our office. Our contact information was provided on page xi.

Contact name: _____

Contact telephone: _____

Product version and release number: _____

                                                                                         _____

CICS version and release number: _____

Model of computer on which the product is being used: _____

Operating system release number: _____

Other non-IBM proprietary software on your system: _____

                                                                                         _____

In addition to the general information shown on the checklist, we also need specific information about the problem you are having. The "Trouble Shooting" appendix provides a list of information that is needed in order to resolve your problem. Before you contact us, please try to have this information available.

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APPENDIX F: NOTICES

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