

LINCS

Problem Determination

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Where to go for the information you seek.

Several books make up the 1174, 9300 and LINCS library, and include information to install, customize, operate, and maintain the 1174 and 9300 products. Following is a list and description of these manuals.

1174 Hardware Reference

The 1174 Hardware Description manual provides a description of the hardware found in several of the 1174 hardware platforms. These include the 1174-10R, 1174-10L, 1174-15X, 1174-20R, 1174-25X, 1174-60R, 1174-60C, 1174-65R, 1174-90R, and 1174-90T models. This manual includes installation planning considerations and front panel operations.

1174 Hardware Reference - 1174-65S/90S Communications Servers

The 1174 Hardware Description manual provides a description of the hardware found in the 1174-65S and 1174-90S hardware platforms. This manual includes installation planning considerations and front panel operations.

9300 Hardware Description

The 1174 Hardware Description manual provides a description of the hardware found in the 1174 hardware platforms. This manual includes installation planning consideration and front panel operations.

LINCS Product Description

The LINCS Product Description manual gives a brief description of the LINCS communications software capabilities. A reasonably complete list of the functions supported by LINCS is included.

LINCS Features

The LINCS Feature manual provides a much more detailed description of many of the LINCS features. Among those features described in detail are APPN Network Node, SNA PU Gateway support, IPX Routing, Host Connectivity, 3270 Server capabilities (IPX and TN3270), CUT Device features including Windowing, Keystroke Record/Playback, Entry Assist and Calculator, IP routing, IP Channel Bridge, ASCII Device and ASCII Host support, and NetView features.

LINCS Configuration

A Description of the LINCS Configuration process, as well as details of the configuration panels used to customize the LINCS software can be found in this manual.

LINCS Central Control

This manual contains information about the online Central Control panels. The Central Control mode provides a means to manage the LINCS software and the 1174 and 9300 hardware. A detailed description of their use is included in the manual.

LINCS Problem Determination

The LINCS Problem Determination manual aids the LINCS administrator by providing useful information about error codes and how to interpret them. Information is also included for running offline utilities.

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1. Problem Determination

LINCS is the name of the operating system that runs on the Visara 1174 and SCON product lines. This operating system also ran on some products manufactured by Memorex Telex, including the 1174 and 9300 product lines. Note that when running current software levels, the 9300 will identify itself as an 1174-25S.

It should also be noted that on some utility panels, the SCON products will also identify themselves as 1174s.

This document provides information for determining causes for problems on LINCS platforms. It lists error conditions displayed on a LINCS platform operator's panel that may be encountered while IMLing LINCS; error indications displayed at the user's terminal that occurred while LINCS was online; and anomalies that appear in LINCS error and exception logs. It presents descriptions of the set of off-line utilities for isolating problems and diagnostic functions for hardware problem determination. Most error indications are common for all LINCS platforms, those specific to a particular platform are noted. Sections found in this document are:

- Table of Contents
- Section 1. Problem Determination: Assists in guiding you to other locations in this or other LINCS manuals.
- Section 2. Errors: Identifies error types and describes displayed errors including IML states and errors.
- Section 3. Utility Functions: Describes off-line utility functions.
- Section 4. Offline Testing: Describes how to choose, initiate, and execute off-line extended diagnostics tests.

Models Supported by this Manual

This manual provides information to support all Visara (and Memorex Telex) platforms that run the LINCS operating system. This includes the following models:

- 1174-25S
- 1174-65S
- 1174-90S
- 1174-15X *
- 1174-25X *
- 1174-60C
- 1174-65R *
- 9300 (includes 9301, 9311, 9341)
- SCON-20L
- SCON-22L
- SCON-25L
- SCON-28L
- SCON-3074

* Denotes models that also were capable of running the Generation B operating system, to which this manual does not apply.

Diagnostic Tools Provided By LINCS and the LINCS Hardware Platforms

16 Character LCD Panel – Displays status and error messages. These messages can be looked up and interpreted by using information contained in this manual, in Chapter 2.

Front Panel LEDs – Provides additional status information to the administrator, such as indication of ESCON channel status (online/offline) and when the hard drive is being accessed. Information about the status offered by the Front Panel LEDs is described in the appropriate Hardware Reference manual for the LINCS platform you are working with.

Event Logs – Lists approximately 200 latest noteworthy general events that have occurred on the platform. Additional logs are kept for individual ports, LUs, etc. Logs may be view from coax or other CUT device, and/or copied through use of FTP connection or through Media Management tools. Refer to the LINCS Central Control Mode manual for details on the Event Logs that are available. Look up events in Chapter 2 of this manual. If you have a copy of the Visara eManager product, you may also view Event Logs and perform automatic Event Code lookups.

Box\$Fail.txt File – Keeps log of catastrophic failures, IML errors, and hardware failures that have occurred on the platform. The file may be retrieved using Media Management (copy file to floppy) or through an FTP connection. Chapter 5 discusses this file in more detail.

ESCON Trace File – Provides an internal trace of the communications between the Luminex ESCON card and the LINCS hardware logic concerning ESCON communications. The file may be retrieved using Media Management (copy file to floppy) or through an FTP connection. More information on how to access the ESCON trace facility and how to retrieve the file can be found in the LINCS Central Control Mode manual.

Dumps – Created anytime that there is a catastrophic failure or through operator initiation. Up to 8 dumps may be stored on the LINCS platform at one time. Files may be retrieved using Media Management (copy dump to floppy) or through an FTP connection. More information can be found in Chapter 5 of this manual.

Online Event Codes (Displayed on attached Coax Terminals) – Posted to alert users to status and errors occurring that may be affecting their session. These codes may be looked up in the event code listings found in this manual in Chapter 2.

Central Control Mode Utilities – A number of Central Control Mode utilities may be used to obtain status and error logs for operations occurring on the LINCS platform. These utilities can be run from an attached coax device, through a Telnet connection, from the Visara eManager product, and through a NetView Central Control Facility connection. Details of these utilities can be found in the LINCS Central Control Manual.

eManager Interface – An interface is provided to the Visara eManager product. This tool provides a number of utilities through a network interface, to assist in the retrieval and interpretation of information and the management of multiple LINCS platforms. eManager is a separate product offered by Visara and can be ordered for a nominal fee through normal sales channels.

2. Error Types

This chapter describes the types of errors and failures that can occur while LINCS is operating.

The five main types of errors or failures are:

- IML errors.
- Disk errors.
- Exception errors.
- Hardware failures.
- Online errors.

Error Indicators

The following describes the indicators that may be used to tell you that one of the above conditions has occurred. One or more of the indicators may be used to determine a particular condition.

Event Log

The Event Log records the Online errors described later in this chapter along with other important event information. The Event Log is available as online utility 7/1. See “Events Logs Menu” in your Configuration and Central Control Manual for instructions on how to display the Event Log. This log contains at most, approximately 200 entries, and wraps.

Status Line of Attached Terminal

The status line of attached terminals shows many of the Online errors that occur. See the Online Errors section of this chapter for additional information about Online errors. Most of these errors will also be recorded into the Event Log described above.

Operator Panel Display

The 16-character operator panel LCD display indicates a wide variety of states and errors. Among these are:

- Errors occurring during the IML process. Errors occurring during IML before the operator panel is initialized are not displayed.
- Communication errors.
- Hardware failure (exception errors)
- Software failure errors.

Operator Panel Check Light

The operator panel Check Light is located on the operator panel. When it is lit, an error or failure has occurred that requires corrective action.

BOX\$FAIL.TXT File

Contains a list of all IML errors, Hardware Failure errors, and Machine Check errors that occur on the platform. This file can be copied from the platform for viewing using the Copy File Media Management utility (3/4) or by using FTP.

IML Errors (ERR ____)

IML stands for Initial Machine Load. It occurs when the LINCS node is turned on, or when the IML key on the operator panel is pressed. During IML, LINCS executes a series of tests that checks the machine's ability to operate.

An IML error message looks like this on the operator panel:

ERR XXX*

where:

- ERR indicates the occurrence of an IML error.
- XXX is the IML state in which the error occurred.
- * indicates that additional messages are available that describe the error (not always present).

IML states give visual indication of the bring-up process. Each IML state number is unique to a particular operation in the bring-up sequence. States can be of two distinct types: progression or error. Progression states indicate the current operation being executed during the bring-up process. Error states indicate that LINCS has stopped the bring-up process because of a problem it can't resolve without user intervention.

In the LINCS diagnostics subsystem, IML errors are uniquely different from hardware failures, and the two terms should never be used interchangeably. IML errors are most often operator recoverable; they often result from bad input, either from the operator keypad or configuration data, or from bad diskette media. Detailed instructions are given for recovering from each IML error in the following pages.

If a LINCS node does stop in an IML error state, it is imperative that the operator obtain the extended data provided. The extended data is obtained by pressing and releasing the Adv key on the operator panel keypad. The asterisk (*) in the last character position of the initial error message frame is a reminder that extended data follows. Failure to note the extended data seriously compromises the ability to quickly resolve many IML errors. Note that this information can also be copied from the hard drive onto floppy if you are able to reboot the platform onto the default configuration. The file that contains this information is called 'box\$fail.txt', and may be copied using the Media Management Utility 3/4 - Copy File. If you have network access into the platform, you may also pull the file off with FTP.

It is also to the user's advantage to become very familiar with the LINCS platform's physical slot numbering and logical slot IDs. Since many of the IML states contain either a slot number or a logical slot ID, familiarity with them will enable much faster error correction. This information can be found in the Hardware Reference Manual for the LINCS platform you are working with.

Note that LINCS should never "hang" in an IML state of 300 or greater. If such an event occurs, it should be reported as a software problem. A hardware failure that occurs during IML is reported not as an IML error but as a specific hardware failure using the message conventions developed solely for such events. Exceptions may also result during bring-up; the user should refer to the appropriate paragraph of this manual for a description of the exception message format. Being alert to the different formats of these three exceptional condition messages (IML errors, hardware failures, and exceptions) can greatly aid the user in resolving bring-up problems.

IML Procedure

The following describes the procedure to IML the LINCS node using LINCS software. During IML, microcode will always be loaded from the hard disk. By default, the System Microcode in the production state will be loaded from the first hard disk which contains a System disk subdirectory. This default can be overridden at IML state 500.

The "mode prompt" appears on the LCD at state 500:

IML 500 M=

At this state, the LINCS node will pause for five seconds waiting for input from the operator keypad illustrated below. If nothing is specified within five seconds, the default IML will proceed.

- <ADV> - Continue IML with system microcode. No extended BATs are executed. If an alternate drive and state have been entered (see ENTER options below), then load the specified system microcode. Otherwise, load the system microcode in production on the first hard disk which contains a System Disk subdirectory.
- <ALT>, <ADV> - Same as ADV, but executes extended BATs during IML.
- <DIAG> - Enters Diagnostics mode.
- <CONFIG> - Loads default customization data objects instead of the ones defined in the system subdirectory. This option is useful when a problem with the customization data affects the operation of the LINCS node. This option allows IML with default customization parameters. Loading the default configuration also allows you to enter the Configuration utility without entering a password. Once the default customization data objects have been loaded and the LINCS node has IMLed, the data objects may be modified as desired.
- <ALT>, <CONFIG> - Same as CONFIG, but executes extended BATs during IML.
- <CLEAR> - Clears system microcode currently on hard disk and loads new system microcode from floppies using the Merge Utility. This operation will not affect customization data objects that already exist on the hard disk. These data objects will be automatically upgraded for the new level of microcode (if necessary) once they

are read into memory during the IML process. The customization data objects on the hard disk remain intact until an operator performs a save operation using one of the customization utilities on the Customization Data menu in Central Control mode.

Upon pressing this key, if there is more than one hard disk present, the “drive prompt” will appear as follows: IML 500 D= At this point, the user should enter one of the following options:

- <3> for Hard Drive C
- <4> for Hard Drive D
- Upon selecting a destination drive (or immediately if only one hard drive is present), the user will be prompted to insert System disk 1. Once System 1 is inserted and Enter is pressed, system microcode will be copied onto the hard disk and the user will be prompted for System disk 2. This process will continue until all system microcode has been loaded, at which time IML will proceed with the newly loaded microcode.
- <ENTER> - Need to specify an IML drive and data object state when Central Site Change Management is being used. If pressed at state 500, the “drive prompt” will appear as follows:

IML 500 D=

At this point, enter a drive option as defined below. Note that options 1 and 2 are only valid when entering Diagnostics mode. A full IML must always be performed from a hard drive.

- <1> for Floppy Drive A
- <2> for Floppy Drive B
- <3> for Hard Drive C
- <4> for Hard Drive D

Once the operator makes a selection, the data object “level prompt” will be displayed:

IML 50x L=_____

where x=drive selected (A, B, C or D)

At this point, enter one of the following options:

- <1> for Production level
- <2> for Back level
- <3> for On-Trial level

(Note that only the production level option will be valid unless a back level or trial level has been loaded by the host using Central Site Change Management.)

After a selection is made, the mode prompt will be redisplayed. Pressing the Adv key will continue IML using the chosen options. During IML, data objects in the specified state will be loaded from the specified disk drive. When back-level or on-trial data objects are specified but not present on the specified drive, production data objects are loaded instead.

- <1> - Pressing the <1> key at state 500 will cause LINCS to boot from the Trial directory (sometimes referred to as the Merge directory) if any code has been copied to that directory. Code may be copied into this directory by connecting to the platform

with FTP and logging on as 'merge', or by using the Central Control utility 3/9. If no valid LINCS code can be found in the Trial directory, then a boot failure will occur.

- <2> - Pressing the <2> key at state 500 will cause LINCS to boot from the Production directory (System directory). This will result in the same action as when you press the <ADV> key.
- <3> - Pressing the <3> key at state 500 will cause LINCS to boot from the Backup directory if any code has been copied to that directory. Code may be copied into this directory by connecting to the platform with FTP and logging on as 'backup', by issuing the 'site backupsys' command via FTP, or by using the Central Control utility 3/7. If no valid LINCS code can be found in the Backup directory, then a boot failure will occur.

IML Recovery Process

During the IML process, errors may be encountered which prevent completing the IML process. The following section lists the various IML errors which may occur. If hardware or configuration changes were made, just prior to the IML, they are usually operator correctable. (These errors are usually of the 9Fx, B5x, B6x, or B7x variety.) If errors are encountered during IML, the user may recover by one of the following methods:

- Power off the LINCS node and install hardware which may be required.
- IML using a default configuration (press <Config> at IML state 500); then, using the configuration utility, read configuration data from the hard drive and do one of the following, depending upon the error encountered:
 - Activate features which require feature activation OR, if the appropriate feature activation disk is not present, turn off features which require feature activation.
 - Default the hardware setup panel to the hardware installed in the LINCS node. Modify any panels which may have referenced the deleted hardware.

Once the configuration data has been modified, IML the platform in the normal manner.

IML States 1XX - SCP Critical Path BAT

The 1XX IML state series describes the sequence of BAT testing on the SCP or Motherboard. On the 1174-15X type controller, these states do not display on the LCD. However, they can be read directly from the SCP local memory location BAT.IML State, if an emulator is available.

State	Activity	Recovery
IML 147	This state indicates the completion of the SCP critical path BAT memory test. By inference, the processor and ROM CRC test were also completed successfully. No errors are associated with this state. SCP (15x only) diagnostic LEDs will display binary 0001. This is the only external indication available since the LCD display has not yet been initialized.	Check for a possible power supply problem. If the power looks ok, then replacement of the SCP or Motherboard is required, depending on the model. This diagnosis can be made with a high degree of accuracy, since no accesses external to the SCP have been made.

IML States 2XX

The 2XX series of state number indicate the progression of Op Panel testing. This consists of initializing the LCD display and testing its RAM. Should LINCS hang in the 2XX states, replacement of boards in the following order is indicated: 1) Op Panel, 2) OPL, 3) SCP or Motherboard.

State	Activity
IML 200	The SCP (15X only) sets the diagnostic LEDs to indicate binary 0010. At this time the OP panel logic memory test is run. If a failure occurs, the system will halt. No error is displayed on the LCD panel for this error since the LCD circuitry has not been initialized or enabled yet.
IML 280	The operator panel keypad is initialized during this state. If a failure occurs, no error message will be posted on the LCD since it has not been initialized or enabled yet.
IML 290	During this state the Op Panel LCD is initialized. If the attempt to initialize the LCD fails, a halt occurs, and the SCP halt light (15X only) will be lit. No message will be posted on the LCD panel, since it has not been initialized and enabled yet.
IML 291	This state runs the Op Panel LCD memory test. A failure will cause a halt light to appear on the SCP card. No message will be posted on the LCD panel, since it has not been initialized and enabled yet.
IML 29E	This state posts the initial message (IML 29E) on the LCD if all of the state 2XX BATs have completed. There are no errors associated with this state. Typically the LINCS node passes through this state so quickly, the operator will not notice it.

IML States 3XX

The 3XX series states are dedicated to the SCSI Controller circuitry. The 1174-15X has a separate board, the SHA to contain the SCSI controller circuitry. On other models, the SCSI Controller circuitry is typically found on the Motherboard or SCP. Note that on more recent models, a SCSI hard disk is no longer shipped, but IDE hard disk is used along with a SCSI to IDE converter card that is mounted on the back of the IDE drive. All test failures result in a Halt condition and a posting of the error on the LCD.

State	Activity
IML 300	The SCP LEDs are set to a binary value of 0011 (15X only). On the 15X, Slot J07 is checked for the SHA board. If Slot J07 does not contain the SHA board, the program jumps to State 400.
IML 310	A Read/Write test is performed on SCI Port 0, control port.
IML 311	A Read/Write test is performed on SCI Port 1 LEDs.
IML 312	SCI Port 2 is checked for the board ID test.
IML 316	A Read/Write test is performed on SCI Port 6, diagnostic registers.
IML 320	Bounds are set for SHA board.
IML 321	Bounds set in State 320 are verified.
IML 330	Dual Port RAM test is performed on the SHA board.
IML 340	The Write Port Interrupt Latch is set to point to the SCP board.
IML 348	Remove from reset.
IML 350	SBC reset test.
IML 352	SBC Read/Write test.
IML 360	DMA reset test.
IML 362	DMA Read/Write test.
IML 364	DMA Dual Port RAM to Dual Port RAM transfer test.
IML 370	Clear Dual Port RAM.
IML 380	LED rotate test. Jump to State 400.

IML States 4XX - Disk Subsystem Initialization and Test

The 4XX series of IML states test and initialize the LINCS node floppy disk and hard disk subsystem.

State	Activity
IML 400	During this IML state, only the 37C65 floppy disk LINCS node chip is reset and initialized. The SCP LEDs (15X) are set to a binary display of 0100. A halt condition will occur if a Wait IRQ failure occurs, a Sense Interrupt Status fails, or a Specify fail condition is detected. 400 indicates that the OPL board shared memory used by the disk controller is being initialized.
IML 410	This IML state identifies which drive(s) are installed and checks their ready signals. If no floppy drives are detected, the SCP will halt.
IML 420	The Hard Disk Subsystem is initialized.
IML 430	Check hard drives (C, D) to determine whether they are present and ready.

State	Activity
IML 450	Unable to find a valid LINCS disk. Usually occurs when attempting to boot from a floppy, but the floppy is not installed in the drive, is corrupted, or is missing the volume label.
IML 460	No drives were detected.
IML 46X - 4CX	States 46X-4CX are run for each drive until there is a boot load with no errors. The order in which to use the drives is specified by Media Management. The "X" in the IML state is filled in by the hex digit corresponding to the drive being used (currently A=1, B=2, C=3, or D=4). States 4AX-4CX are run for each bootable logical disk (subdirectory) found on a hard drive before moving on to the next drive. A halt occurs if no successful boot load can be made.
IML 46X	Read the master boot block on the hard disk.
IML 47X	Verify the master boot block on the hard disk.
IML 48X	During this IML state, the first cylinder (BOOT/FATS/ROOT), Track 0, is read if the drive is a floppy drive. For hard drives, the bootable partition's boot block is read.
IML 49X	Verification of the boot track is performed during this IML state.

IML States 5XX - Mode Initiation States

The 5XX IML state series marks the operator's progression through mode selection operations. These states are most notable in that they are the first generated by loaded code; all previous states were generated by SCP/Motherboard PROM code.

State	Activity
IML 500	Sets SCP LEDs (15X only) to binary 0101. Determine the LINCS node type (error 5F0). Build the map table. Turn off all Op Panel LEDs. Turn on Op Panel IML LED. Initialize the OPL write port. Initialize the serial port. Initialize RTC. Hardware enable interrupts. Initialize off-line floppy disk subsystem. Initialize the off-line hard disk subsystem. State 500 identifies the 5-second time delay generated to allow the operator to select a mode. Prompt for keypad input to decide the IML mode with IML 500 M=_ . If invalid key input is received, display a ?. If an Enter is received from the keypad, prompt for the drive input with IML 500 D=_ . Upon getting a proper drive input, prompt for the software level with IML 500 L =_ . Upon getting a proper level input, return to prompting for the IML mode with IML 50X M=_ where X = 1-4 for Drives A-D. Refer to "IML Procedure" in this chapter and "Configuration and Central Control document" for additional information.
IML 510	Indicates the <Adv> key has been pressed during 5-second time delay generated to allow the operator to select a mode. Continue IML with system microcode. No extended BATs are executed. If an alternate drive and state have been entered, then load the specified system microcode. Otherwise, load the system microcode in production on the first hard disk which contains a system disk subdirectory.
IML 511	Indicates the <Alt>, <Adv> keys were pressed during 5-second delay. Same results as if the <Adv> key were pressed (State 510 above), but executes extended BATs during IML.
IML 512	State 512 indicates that the <Config> key was pressed to terminate 5-second delay. Loads default customization data objects instead of the ones defined in the system subdirectory. This option is useful when a problem with the customization data affects the operation of the LINCS node. This option allows IML with default customization parameters. Loading the default configuration also allows you to enter the Configuration utility without entering a password. Once the default customization data objects have been loaded and IML has been completed, the data objects may be modified as desired.

State	Activity
IML 513	State 513 indicates that the <Alt>, <Config> keys were pressed. Same outcome as State 512 above, but extended BATs are executed during IML.
IML 514	<p>Indicates <Clear> key was pressed during 5-second delay. Clears system microcode currently on hard disk and loads new system microcode from floppies. This operation will not affect customization data objects that already exist on the hard disk. These data objects will be automatically upgraded for the new level of microcode (if necessary) once they are read into memory during the IML process. The customization data objects on the hard disk remain intact until an operator performs a save operation using one of the customization utilities on the Customization Data menu in Central Control mode. The “Clear” option should be used when another level of software is to be installed. Upon pressing this key, if there is more than one hard disk present, the “drive prompt” will appear as follows:</p> <p>IML 500 D= At this point, the user should enter one of the following options:</p> <ul style="list-style-type: none"> • 3 for Hard Drive C • 4 for Hard Drive D <p>Upon selecting a destination drive (or immediately if only one hard drive is present), the user will be prompted to insert System disk 1. Once System 1 is inserted and Enter is pressed, system microcode will be copied onto the hard disk and the user will be prompted for System disk 2. This process will continue until all system microcode has been loaded, and the words 'MERGE COMPLETE' will display. Note that the floppy light may stay lit. You can now press the IML button to boot onto the new code.</p>
IML 518	State 518 indicates that the <Diag> key was pressed, selecting Offline Extended Diagnostics. LINCS will continue bring up only to the point of building the slot population table, loading bounds, and initializing memory management parameters; flow of control will then switch to the diagnostic control software.
IML 52X	During this state, Drive x is searched for the appropriate logical disk. If no drive was specified, all drives are checked in the order specified by Media Management until an appropriate logical disk is found. IML cannot now proceed until a system disk is found in a disk drive, or, for configuration, a utility disk is found. Errors are handled by disk loader code. Refer to the beginning of this chapter for disk error states.
IML 53X	During this state, files from the boot load list based on the IML selections at State 500 are loaded. The last digit represents the drive that file is to load from (drive letters A, B, C, D)
IML 540	This state checks to see if the hardware installed is LINCS compatible.
IML 544	Check for a serial number of all zeros. This is usually the result of someone changing one of the hardware cards. You will need to use offline diagnostic utility 04 to set in the proper serial number (the 8 least significant digits on serial tag label). Entering the serial number information requires the use of a special password and should be done by authorized service personnel.
IML 548	LINCS software feature activation is checked. This error should not occur at higher levels of LINCS software. If the error does occur, try upgrading the software to current levels.
IML 5F0	State 5F0 is an error state which indicates that the controller type value generated by the IML code is not a valid LINCS node type. This could be a symptom of an SCP local memory failure, or could also indicate that the wrong boot PROMs are installed.
IML 5FF	This state is in fact an error message indicating a disk error. See “Generic Disk Error States” in this chapter for information on this error.

IML States 6XX - Slot Population Identification

The 6XX IML states mark the building of a data structure known as the slot population table. This structure contains vital information about the boards installed in each slot of a LINCS node. The state can be either a progression indicator, or an error indicator; interpretation is based on whether it is preceded by the word “IML” or “ERR.

State	Activity
IML 6XX	<p>Set SCP LEDs (15X only) to 0110. Note that the general format of the remaining 6XX states is 6JJ , where JJ is the connector “J” number as defined by the backplane connectors.</p> <p>To recover from an “ERR 6JJ * state, perform the following:</p> <ol style="list-style-type: none"> 1. Press the Adv key to display the extended data. 2. Record the board ID contained in WD8. 3. Record the slot count contained in WD9. 4. Press and release the Adv key to display the next frame of extended data. 5. Record the contents of WDA and WDB. These form a long word address corresponding to the SCI base address for the slot. 6. Verify that the board ID recorded in Step 2 is correct for the board installed in Slot JJ. (See the slot population tables in Chapter 6.) If not, replace the board, and re-IML. An incorrect board ID is usually indicative of an SCI problem on the failing board. However, it could also be a backplane or SCP problem as well, and the replacement of these items should be considered if replacing the board which generated the error gives the same error when re-IMLed. 7. Note that when SCP, MCC, and MBR functions are located on the LINCS node’s Mother board they cannot be individually replaced. 8. Verify the slot as follows: If the value contained in WD9 is 0DH or less, it corresponds directly to the slot ID. Consult a J to slot ID conversion table to determine that the recorded slot count is correct. If the value contained in WD9 is greater than 0DH, add 0BH to generate the corresponding slot ID, and consult a conversion table as above. If the slot ID is incorrect, the problem may be in the SCI subsystem of another board; replace all boards, one at time, until the problem is eliminated. 9. If an emulator or debugger is available, examine the contents of the 16 bytes beginning at the address formed by WDA and WDB. Use an SCI register map to verify that the values are correct.
IML 6F0	<p>The total number of Comm boards (SCC, TRC, CHP, ETH, FET, HSC, ESC) found installed is checked. The number of boards supported is dependent upon the model type. A failure indicates that too many Comm boards are present. To recover, verify the installation of Comm boards is correct.</p>
IML 6F1	<p>The total number of each specific board type is checked. An error here indicates that too many boards of a specific board type have been detected. (For example 3 ESC cards installed when only 2 are allowed.)</p>

State	Activity
IML 6F2	Proper bus termination is checked on the model 15X. Causes of Error: <ul style="list-style-type: none"> • 15X SCP is installed in J16 and it is not populated with bus terminators (bad board). • A terminated RAM board is not installed in J03.
IML 6F3	Common memory on the SCP board is checked. A failure indicates that the common memory is improperly installed or has failed. Check memory installation on board and replace if necessary.
ERR 6FF	This state is in fact an error message indicating a disk error. See “Generic Disk Error States” in this chapter for information on this error.

IML States 7XX - Bounds Register Loading

Bounds registers define the memory address range that dual port or common memory spaces respond to. Contained within the SCI subsystem, the bounds registers are loaded to establish a dynamically allocated system memory map.

The bounds registers for each LINCS node is different. In the 1174-15X, the dual port memory is typically found on the IOP cards. On models with a Motherboard the dual port memory is taken from the common memory pool. The following states are model dependent, so any specific state may not appear on every platform.

State	Activity	Recovery
IML 700	Determines the amount of common memory that is installed on a SCP and bounds the terminated RAM board in J03 if it is installed (Model 15X only). If a terminated RAM board is installed in J03, then it must be either a TRM or a RXT board. If the installed board is not one of these then a IML error of 700 will be reported.	<ol style="list-style-type: none"> 1. Press and release the Advance key to display the first frame of extended data. 2. Note the board ID contained in WD8. 3. If the board in J03 is a TRM or RXT, replace it with another of the same kind and reIML. 4. The SCI subsystem is suspect on the failing board. Re-IML. If the problem recurs, proceed to Step 5. 5. If the board in Slot J03 is not a TRM or RXT, replace it with one that is. Suspect that the SCI on the replaced board is bad, especially if the value recorded in Step 2 was a TRM or RXT board ID; re-IML. If the problem recurs, continue with Step 6. 6. Press the operator panel Advance key until extended data WDA and WDB are displayed. Using an emulator or debugger, view the word operand at the address formed by WDA and WDB. If the operand is the correct board ID for the board installed in J03 (TRM or RXT only), suspect an SCP memory problem. If the board ID is incorrect, suspect a backplane or SCP memory problem. 7. Further troubleshooting assistance is provided by WD9 which contains the raw ID byte consisting of a 5-bit board ID and a 3-bit rev level.

LINCS Problem Determination

State	Activity	Recovery
IML 710	Loads the bounds for the SHA board (15X only) if present.	There are no errors associated with this state.
IML 720	Loads the dual port bounds registers for IOP cards that do not have onboard dual port RAM.	There are no errors associated with this state.
IML 730	Loads the dual port bounds registers for IOP cards that have onboard dual port RAM which must reside in the lower 27.5 MB of system address space.	There are no errors associated with this state.
	Loads the dual port bounds registers for IOP cards that have onboard dual port RAM which must be parked in either the extended or lower system address space range.	
IML 740	Used to load the dual port bounds registers for the IOP cards that are installed. This includes the TRC, MCC, AIC, and SCC cards.	There are no errors associated with this state
IML 750	Loads the dual port bounds registers for IOP cards that have onboard dual port RAM which must be parked in either the extended or lower system address space range.	There are no errors associated with this state
IML 760	Loads the dual port bounds registers for MCC, SCC, and AIC boards that can be bounded in either the extended or lower system address space range.	There are no errors associated with this state
IML 770	Establishes the bounds register loading of all unterminated RXU memory boards installed.	
IML 780	Indicates the bounds registers loading for all unterminated RAM boards that are installed	There are no errors associated with this state.

State	Activity	Recovery
IML 7C0	Indicates the bounding if the installed CDA boards is in progress.	
IML 7D0	Performs a check to insure that there is enough common memory installed to satisfy the requirements of the IOP boards with no onboard RAM.	
IML 7E0	Initializes the memory management parameters for common memory.	
IML 7F0	Indicates that a bounds overlap conflict is present. This can occur when the total amount of dual port and common memory installed exceeds the available address space in the system memory map. If a bounds overlap exists, an ERR 7F0 will be displayed.	<ol style="list-style-type: none"> 1. Press the operator panel Advance key to display WDA and WDB. Record the long word address that they form. This is the lowest dual port address assigned. 2. Press the operator panel Advance key to display WDC and WDD. Record the long word address they form. This is the address that would correspond to the top of common memory. 3. Subtract the dual port address obtained in Step 1 from the common memory address obtained in Step 2. This is the amount of overlap. 4. Using the value calculated in Step 3 as a guide, remove the dual port or RAM board(s) of your choice. The amount of memory removed must equal or exceed that overlap. Note that dual port boards consume 0.5M bytes regardless of their physical memory population. Re-IML.
IML 7F1	Indicates that there is insufficient memory available for system common memory requirements. This situation arises when the dual port memory requirements of the installed hardware exceed the amount of installed common memory, or consume so much of the common memory array that not enough is left for the system.	<p>Recovery is limited to 1) adding more memory in the form of an expansion RAM board, or 2) reducing the amount of hardware requiring dual port RAM. Note that the types of the CDAs installed in the 1174-65X affect the amount of dual port memory allocated to the MCC. In either case, powering off the unit is required to add or remove hardware, and IML must be initiated.</p> <p>Useful information available for display with this error includes the common memory top value in DRB words C and D, and the common memory base value in DRB words E and F. If the base is larger than the top, the amount of memory needed is the base minus the top. If the top is larger, the amount of memory needed is DRB words A and B, or the insufficient amount that is currently left.</p>

LINCS Problem Determination

State	Activity	Recovery
IML 7F2	<p>It is an indication of an illegally installed CDA configuration on one of the models: 1174-65R, 1174-65S, 1174-90S, SCON-20L, SCON-22L. Unlike the 1174-1X, the 1174-6X CDAs have no SCI module, and must be identified by reading a port which indicates whether a 9- or 16-BNC CDA is installed in each CDA slot. If these bits indicate a combination of CDAs that is not allowed, this error is posted.</p>	<p>Recovery from this error is limited to analyzing the installed CDAs and replacing them with a legal configuration. If the existing configuration is in fact legal, then diagnostics should be initiated to determine the hardware failure causing the problem.</p> <p>Useful information available for display includes the raw CDA bits in DRB word A. For detailed investigation, the valid CDA bits table start address is contained in DRB words C and D, and the table index is in word 9.</p>
IML 7F3	<p>Indicates that a bounds value that satisfies the current boards' needs cannot be determined. It is not operator recoverable, and should be treated as a programming problem, since it indicates a problem with the algorithm that determines the value to load in the bounds register. No known combination of boards exists that can cause this error, but it is provided for ease in troubleshooting should this situation occur with some board developed in the future.</p>	
IML 7F4	<p>Indicates that an ERM board's SCI bank installed bits describe an illegal bank population. An ERM board has four bank bits; one for each of the four 512KB RAM banks that can be installed on the board. To be able to bound the ERM requires that these banks be populated contiguously, that is, with no unpopulated banks between populated banks, and, consecutively, from the lowest bank to the highest bank (Bank 0 to Bank 3). If these conditions are not met, as represented by an illegal bank bit combination, the bounds process cannot continue, and, therefore, an IML error is logged.</p> <p>The 4 bank bits can represent 16 different combinations. Of these possible 16 combinations, only 4 meet the preceding requirements. They are as follows:</p> <ul style="list-style-type: none"> • 0001 - Bank 0 only populated • 0011 - Bank 0 and Bank 1 populated • 0111 - Bank 0, Bank 1, and Bank 2 populated • 1111 - All banks populated <p>Note in the above list, a "1" represents an installed bank and a "0" represents an unpopulated bank. Also, the first leftmost bit represents Bank 3, and the rightmost Bank 0.</p>	<p>While this condition is logged as an IML error, in actuality, it is a hardware failure. The following steps detail the recovery procedure for this error.</p> <ol style="list-style-type: none"> 1. Record the isolated, right justified bank bits displayed in word 9 of the LCD message. 2. Power off. 3. Replace the failing ERM board. 4. Reapply power and reinitiate the IML procedure.
IML 7F5	<p>CHP bank installed bits are invalid.</p>	<p>Recovery is limited to replacing the CHP board.</p>

State	Activity	Recovery
IML 7F6	Illegal CDA configuration on the 25X. Either more than two CDAs installed in J2, J6, J1, and J5, or more than two CDAs installed in J3, J8, J4, and J7.	Check and ensure the correct population of CDA boards.
ERR 7F7	An ERM board was installed but the amount of common memory on the SCP was an odd number of MB. An ERM can only be installed in a 65X when the SCP has an even number of MB of common memory.	
IML 7F9	ASCII option installed and no local SCP expansion memory installed.	Recovery is limited to removing ASCII option or installing expansion memory for SCP.
IML 7FA	RAM expansion bank installed bit invalid.	Recovery is limited to replacing RAM Expansion board.
IML 7FB	RAM expansion slot installed bit invalid. The 1174-25X has three RAM expansion slots. These slots must be populated in sequential order. RAM expansion Slot X must be populated before RAM expansion Slot X+1. Extended error data available: <ul style="list-style-type: none"> • WD8 - IML state at which failure occurred. • WD 9 - Bank installed bits that were read from the MBR SCI. 	Check and ensure the RAM expansion slots are properly populated.
IML 7FC	RAM installed size (amount) bit invalid. The size of the expansion RAMs used may be either 1.0 Mbyte or 2.0 Mbyte. The RAMs may be mixed; however, once a RAM expansion slot is populated with a 2.0 Mbyte RAM, the remaining expansion slots must have 2.0 Mbyte RAMs. If RAM expansion Slot X has a 2.0 Mbytes RAM installed, then RAM expansion Slot X+1, X+2, etc., must also have 2.0 Mbyte RAMs installed. Extended error data available: <ul style="list-style-type: none"> • WD8 - IML state at which failure occurred. • WD9 - RAM size bits that were read from the SCP SCI. 	Check and ensure the RAM expansion slots are properly populated.
IML 7FF	This state is in fact an error message indicating a disk error. See “Generic Disk Error States” in this chapter for information on this error.	

IML States 8XX - Basic Assurance Tests (BATs)

The 8XX series of IML state provides indication of the Basic Assurance Test (BAT) part of the LINCS node bring-up process. The substates displayed in this series are dependent on the location of boards within the LINCS node card cage. This gives the operator visual indication of exactly what board is under test at any given time.

Prior to running any tests, all boards in the main card cage must be booted. Booting is the process by which the resident diagnostic manager for a board is loaded on the board, and activated. However, the memory that the boot code is loaded into, either dual port RAM, in the case of IOPs, or common memory RAM, in the case of busmasters, must be tested and initialized prior to boot.

Therefore, the 8XX series begins with memory tests, continues with board boot, and finishes with the actual tests.

Note that all three major sequences proceed from left to right across the card cage. Observe the onboard diagnostic LEDs of each board; they also provide useful indication of the 8XX sequence.

State	Activity	Recovery
IML 800	Two processes are included in State 800. First, the current operational mode is translated into the corresponding diagnostic mode. Next, all common memory spaces are tested. Note that common memory is found on termi-RAM (TRM) and EDC RAM boards (RXU) in the 1174-1X controllers, in the 1174-65X/90S/25X/SCON-20L/22L Mother board RAM, and on the SCP and VHP cards found in the 1174-25S/SCON-25L/28L/3074. At present, no substates indicating the particular board under test are provided. Set SCP LEDs to binary 1000 (15X only).	<ol style="list-style-type: none"> 1. Press and release the Adv key to display the first two words of extended data. Record these values. If the value in WD8 is invalid, replace the SCP/motherboard, and re-IML. If the value in WD8 is a valid operational mode, continue with Step 2. 2. Re-IML, noting the 51X state. Refer to the appropriate section of this paragraph and verify that the 51X state is correct for the key entered at State 500. If not, replace the operator panel and re-IML. 3. If the above steps did not correct the problem, replace the OPL board and re-IML. If the error persists, replace boards until the SCP, OPL, and Op panel have all been replaced. If the error remains, replace the backplane. 4. Although rather unlikely, bad diskette media or disk drives have the potential to cause this problem also. If this is suspected, re-IML using a different floppy disk, and, if using a 2-drive system, try an IML from the other disk.

State	Activity	Recovery
IML States 810 to 81C	The states from 810 to 81C denote the execution of dual port RAM Basic Assurance Tests. The states contain, in their least significant digit, the logical slot ID of the board whose dual port RAM is being tested. Only those states corresponding to populated slots will appear on the operator panel LCD display. For example, if a 1174-1X controller is populated with an SCC in Slot J02, and an MCC in Slot J13, States 810 and 81A will appear, in that order, on the LCD.	There are no operator recoverable errors associated with these states. Hardware failures are reported via the standard hardware failure message type.
IML States 820 to 82C	HPP/VHP boards are booted in this series of IML states. The least significant digit of the state indicates the logical slot ID of the board being booted. Note that when a board has been successfully booted, its least significant onboard diagnostic LED flashes, indicating that the board is in its idle state, polling its receive DRB for commands from the SCP.	There are no operator recoverable errors associated with this state. Onboard critical path BAT failures that occur during the boot are reported as hardware failures.
IML State 830 to 83C	The CHP, HSC, TRC, and Ethernet boards are booted. The least significant digit of the state indicates the logical slot ID of the board being booted. When a board has been successfully booted, its least significant onboard diagnostic LED flashes, indicating that the board is in its idle state, polling its receive DRB for commands from the SCP.	There are no operator recoverable errors associated with this state. Onboard critical path BAT failures that occur during the boot are reported as hardware failures.
IML States 840 to 84C	80188 microprocessor based dual port RAM boards, commonly known as IOPs, are booted during these states. The board types which are included in this class are the AIC, MCC, and SCC. The sequence of board booting proceeds left to right across the card cage. The least significant digit of the state contains the logical slot ID of the board being booted. The least significant onboard diagnostic LED flashes when a board has been booted successfully, indicating that it has entered its idle loop and is polling its SCP receive DRB for commands.	There are no operator recoverable errors associated with these states. Hardware failures which occur during the critical path BAT phase of the boot are reported using hardware failure messages.
IML 850 to 85C	The CHC board is loaded and booted during these IML states and HSC boards load and boot their onboard field programmable devices. (CHC circuitry is part of CHS board on Model 15x.) The errors that can occur during this state are distinguished by the extended data that is present in the DRB WD8 through WDE. 1. The CHC was not seen as installed by the CHP. WD8 = J# of CHC, WD9 = CHC Board ID, WDA = 851, WDB = Data that was read from the CHP read port that resulted in this failure	There are no operator recoverable errors associated with State 850. Hardware failures are reported using the hardware failure convention. Recovery is limited to replacing the failed board.

LINCS Problem Determination

State	Activity	Recovery
	<p>2. The CHP could not reset the CHC.</p> <ul style="list-style-type: none"> • WD8 = J# of CHC, CHS • WD9 =CHC Board Id • WDA = 852 • WDB = Data that was read from the CHP read port that resulted in this failure. • WDC <ul style="list-style-type: none"> • For a 15X CHP/CHC = 0 • For 25X, 9300 CHP/CHC <ul style="list-style-type: none"> • WDC = 0 CHC seen as installed • WDC = 851 CHC not seen as installed 	
	<p>3. Verification of the code loaded onto the CHC failed.</p> <ul style="list-style-type: none"> • WD8 = 000B • WD9 = 0 • WDA = Source address in common memory of CHC load file • WDC = Destination address in WCS that failed <ul style="list-style-type: none"> • For a 15X CHP/CHC = 0 • For 25X, 9300 CHP/CHC <ul style="list-style-type: none"> • WDC = 0 CHC seen as installed • WDC = 851 CHC not seen as installed • WDE = Correct data that should have been read • WDF = Incorrect data read for CHC write control store. 	
	<p>4. The CHC could not be removed from reset.</p> <ul style="list-style-type: none"> • WD8 = J# of CHP, CHS • WD9 = CHC Board Id • WDA = 853 <p>WDB = Data that was read from the CHP read port that resulted in this failure</p>	
	<p>5. The CHC was removed from reset, but no response was received by the CHP from the CHC.</p> <ul style="list-style-type: none"> • WD8 = J# of CHP, CHS, CHX • WD9 =CHC Board Id • WDA = 854 <p>WDB = Data that was read from the CHP read port that resulted in this failure</p>	
	<p>6. CHC MSG FIFO status error during critical path.</p> <ul style="list-style-type: none"> • WD8 = J# of CHP, CHS, CHX • WD8 = CHC Board Id • WDA = 855 • WDB = Message FIFO status read • WDC = Incorrect value read from message FIFO • WDD = Correct value that should have been read from message FIFO • WDE = Message Interrupt status read 	

State	Activity	Recovery
	<p>7. CHC MSG Interrupt status error during critical path. WD8 = J# of CHP, CHS, CHX, WD9 = CHC Board Id, WDA = 856, WDB = Message FIFO status read, WDC = Incorrect value read from message FIFO, WDD = Correct value that should have been read by message FIFO, WDE = Message Interrupt status read</p> <p>8. CHP/CHC communication failure during critical path. WD8 = J# of CHP, CHS, CHX, WD8 = CHC Board ID, WDA = 857, WDB = Message FIFO status read, WDC = Incorrect value read from message FIFO, WDD = Correct value that should have been read by message FIFO.</p> <p>9. WDE = Message Interrupt status read</p>	
ERR 85X	<p>Where X is slot Id of HSC that detected the error WD8 = J# of HSC WD9 = Board Id of HSC</p>	<p>There are no operator recoverable errors associated with this state. Hardware failures detected are reported using the hardware failure reporting conventions.</p>
IML 860	<p>The SCP/motherboard is tested at State 860. The tests used expand the coverage of the critical path testing performed in the PROM during the 1XX states. The SCP is tested prior to the other boards because it is the master processor for all diagnostic operations and must be in perfect working order prior to attempting to boot and test any of the other boards.</p>	<p>There are no operator recoverable errors associated with this state. Hardware failures detected are reported using the hardware failure reporting conventions.</p>
IML 862	<p>The OPL circuit (model 15x) is tested during State 862. This circuitry may be located on the SCP, motherboard or back panel on some models. Like SCP State 860, this testing augments that performed in the PROM critical path testing. The placing of this state in the overall BAT sequence is also important. The OPL contains the floppy disk controller - it must be verified before attempting to load the test files for each board.</p>	<p>There are no operator recoverable errors associated with this state. Hardware failures detected are reported using the hardware failure reporting conventions.</p>
IML 880 to 89F	<p>The 88X series of states identifies the actual execution of the BAT. Each installed board is tested, starting with the leftmost and proceeding to the right as viewed from the front of the 1174-1X, or the rear of the other models. Only those states corresponding to populated slots are displayed. The least significant two digits of the state indicate the logical slot ID of the board under test.</p>	<p>There are no operator recoverable errors associated with these states. Hardware failures are reported using the hardware failure mechanism.</p>
IML 8FF	<p>This state is in fact an error message indicating a disk error. See “Generic Disk Error States” in this chapter for information on this error.</p>	

IML 9XX - Board Allocation States

Board allocation is the process by which the physically installed hardware resources are matched to the operator specified configuration requirements.

State	Activity
IML 980	The slot population table is transferred from SCP local memory to common memory during this state. This is strictly a memory to memory transfer of the table. There are no operator recoverable errors associated with this state; it is a progression only indicator.
IML 990	During progression indicator only State 990, the slot population table is dumped out the serial port. This formatted printout allows generation of a hard copy of the table, showing the kind and number of boards on a slot by slot basis. There are no operator recoverable errors associated with this operation.
IML 9F2	<p>State 9F2 is an operator recoverable error condition known as the “no resource” error. It occurs when insufficient hardware is present in the LINCS node to meet the configured needs. For example, if 64 coax ports are configured, which requires two MCC boards, and only one MCC board is installed, a 9F2 error will be logged.</p> <p>Recovery from this condition can follow one of two paths; either add sufficient hardware to meet the configuration requirements, or reconfigure to reduce the hardware requirements to that installed in the LINCS node. Extended information is provided as follows:</p> <ul style="list-style-type: none"> DRB WD8: Board ID of the missing board type. DRB WD9: The amount of boards required. DRB WDA: The amount of boards installed. DRB WDE-F: Configuration loader mask 2. <p>Note that WD8 alone provides the information required to resolve most 9F2 errors.</p>
IML 9F4	<p>The configuration data contains a record that specifies how much common memory is required to meet the needs of both the system and the configured features. This value is compared to the amount of installed common memory available, as contained in the auxiliary device table (ADT) common memory block (CMB). Should the amount of memory available be less than the amount required, the IML error 9F4 is posted.</p> <p>Error data for a 9F4 error consists of three long words formed by the DRB word pairs 8 and 9, A and B, and C and D. The long word formed by DRB Words 8 and 9 indicates the amount of memory, in bytes, that is required, as taken from the BRL common memory record. The long word formed by DRB Words A and B identifies the amount of memory present, in bytes, that is available in the LINCS node, as defined in the ADT CMB common memory size long word. The third long word, formed by DRB Words C and D is the amount of memory shortfall, in bytes. It is calculated by subtracting the amount of available memory from the required amount ($WD8+9 - WDA+B = WDC+D$).</p> <p>Recovering from a 9F4 IML error can be done in one of two ways: first, more hardware, in the form of additional Memory modules, can be added; second, the LINCS node can be reconfigured to require less memory. To accomplish the first method, power the LINCS node off and install the appropriate Memory modules. Refer to the appropriate Configuration and Central Control Manual for instructions on configuring feature memory. Once the memory requirements have been reduced below the amount available, save the configuration and re-IML.</p>
IML 9F6	This state checks for an ESC or ESX card in models not supporting the ESC or ESX card. Note model may support ESC but not ESX or vice versa.
IML 9F7	This state verifies that the configuration being loaded is for this model. This typically should only occur if an existing configuration file from another platform has been copied onto this one.
IML 9FF	This state is in fact an error message indicating a disk error. See “Generic Disk Error States” in this chapter for information on this error.

IML States AXX

The loader, as its name implies, loads all application software required into the appropriate memory spaces. The loader uses bit fields obtained from the slot population table to determine what software files are loaded.

The loader IML states can be both progression and error states, depending on whether they are preceded by the word “IML” or “ERR.” In either case, the least significant two digits indicate the logical slot ID of the board being loaded. Only those states that correspond to populated slots are displayed; different board populations and slot arrangements will result in different sequences of IML states, so care must be exercised when comparing one LINCS node to another.

If the AXX display is preceded by “ERR,” a loader error has occurred. Press and release the Adv key to display the following extended data:

1. DRB WD8: Loader error code
2. DRB WD9: Disk error code
3. DRB WDA: PROC ID
4. DRB WDB-F: Filename in ASCII

For disk errors, refer to “Generic Disk Error States.” Loader errors usually require that code be reloaded onto the hard drive through the “Merge” process. If the error occurs after changing the configuration, try restoring the old configuration if possible first.

IML States BXX - Initialization

IML INIT is the process by which software operating system functions and application software are initialized and started on the installed boards, and is the final process in the IML sequence. Once the LINCS node has completed this process, it is online.

The series of States B00 - B1F is similar to the AXX series in that the least significant two characters of the state identify the logical slot ID of the board currently being initialized. Like the AXX states, the init states also can be both progression and error states.

B00 - B1F error states are not normally operator recoverable, as they indicate a software problem. Pressing and releasing the Adv key displays an error code in Word 8 and an error code qualifier in Word 9. These values must be recorded and reported for the error to be resolved. If you have recently made a configuration change, resulting in this error occurring, you should be able to back out the configuration change to allow operations until the problem can be resolved. To back out the changes, reboot the platform and press the <Config> button at state 500, to boot on the default configuration. Edit the configuration stored on the C drive to remove the changes that are causing the problem.

The B5X, B6X, and B7X series of error states indicates operator recoverable problems regarding feature activation and configuration. These errors indicate that the features associated with them have been configured, but not enabled through use of a Feature Activation diskette. Activation is performed using a special Activation disk and the Activation utility in Central Control mode. If the feature is not desired, reconfigure the LINCS node to eliminate it. Refer to your Configuration and Central Control Manual for instructions.

State	Feature Not Enabled Via FAD
B51	Windowing
B52	Multiple Synchronous Lines
B54	LANSYS
B55	Outgoing TCP Connections
B56	Outgoing LAT Ports
B57	SDLC DAP
B58	Extended Non-SNA Lus
B59	Generation C
B5A	Extended Attached Devices
B5B	TCP/IP SNA Encapsulation
B5C	Incoming LAT Connections
B5D	Incoming TELNET Connections
B5E	IPX SNA Server
B5F	Frame Relay

IML State B80

The number of LPARs supported by the ESCON hardware is checked and if the ESCON card that is installed is not valid for the hardware model it is installed in, an error will be displayed. Extended data:

- WD8 = Slot ID of Invalid card
- WD9 = Board ID of Invalid card (58 = ESC card, 5A = ESX card)

Generic Disk Error States

Within many of the major subdivisions of the IML process, disk operations are performed, such as reading code and data files, and logging errors and failures. Should a disk subsystem error be detected during one of these operations, it will be displayed and logged using the format:

ERR XFF *

where the "X" is the hundreds digit associated with the IML process subdivision that the disk error occurred in. For example, during the bounds process, which encompasses the states numbered 700 to 7FF, the error 7FF message indicates that a disk subsystem error occurred.

The DRB (Diagnostic Results Block) information for a disk subsystem error is quite useful in that many of the more common errors are operator correctable. Word 8 of the DRB displays the number of the IML progression state at the occurrence of the disk error. Word 9 displays the disk error code. If the disk operation that resulted in the error involved the manipulation of a file, DRB words C-F will display the first eight characters of the file name, as ASCII codes.

State XFF is the generic disk operations error state. It provides extended data detailing the specifics of the failure as follows:

- WD7 = XFF, Generic error state
- WD8 = State at which the disk error occurred
- WD9 = Disk error code
- WDA = File name address
- WDC-F = File name in ASCII

State XFF displays only as an error state; it is never a progression state. Most commonly, State XFF results from floppy media, drive, or operator errors. However, since some test files are loaded prior to detailed tests, a hardware failure could cause this error.

Assuming that the XFF error is not hardware related, recover as follows:

1. Press and release the Adv key to display extended data. Record each word.
2. Refer to the floppy and hard disk subsystem error codes and take the appropriate action.
3. If a hardware problem is suspected, try using a different diskette and a different drive, if the LINC8 node has two drives, before swapping boards.
4. If the error persists, replace the SCP/Motherboard first, the drives next, and the SCP last.
5. If the problem is still present, the backplane, if one exists, should be replaced.

Floppy Disk Subsystem Error Codes

Code	Description
01	RQM not set after timeout in WAIT__ONLY__RQM
02	EXM set after timeout in WAIT__EXM__OFF
03	RQM not set after timeout in WAIT__RQM
04	RQM and DIO not set after timeout in WAIT__RQM__DIO
05	RECALIBRATE failed - track 0 not found in RECAL
06	SEEK error - track not found in SEEK
07	READ error - data not found or CRC error in READ
08	Bad Boot Sector on media in CK__BOOT
09	Invalid Cluster Number in CN2LSN
0A	File not found - FIND__FILE__N__DIR
0B	Invalid Cluster Number in FAT2CN
0C	Invalid Logical Sector Number in LSN2TSS
0D	Invalid Track or Sector in TS2LSN
0E	Invalid Logical Sector Number in LSN2CN
0F	BOOTLOAD.TXT not found in Directory

Code	Description
10	Bad ASCII address for file in BOOTLOAD.TXT
11	Bootable disk not found
12	Bad CN in Directory found in READ__FILE
13	Drive(s) not installed
14	Drive(s) not ready
15	Reset failed
16	File named in CLOSE is not OPEN
17	Directory full
18	Invalid character in file name
19	Invalid space in file name
1A	FAT full
1B	FAT entry to mark in FIND__FAT__ENTRIES is not 0
1C	Invalid handle passed to DSK\$READ or DSK\$WRITE
1D	Invalid buffer size to DSK\$READ
1E	Invalid buffer passed to DSK\$READ
1F	File not open or not open for read passed to DSK\$READ
20	Invalid file access attribute (DSK\$CREATE, DSK\$OPEN)
21	File not open or not open for write passed to DSK\$WRITE
22	Invalid write buffer passed to DSK\$WRITE
23	Not enough room on diskette to write file in DSK\$WRITE
24	Invalid buffer size to DSK\$WRITE
25	Error in writing data in WRITE
26	Failure to write FAT & Dir after writing to diskette
27	Invalid command on READ
28	Diskette not ready or ready changed during operation
29	Read command status unavailable
2A	EXM not set after timeout in WAIT__EXM__ON
2B	Reserved
2C	Wait IRQ error
2D	Sense Interrupt Status failed
2E	Specify failed
2F	DMA data count not 0
30	File name passed to DSK\$RENAME\$L already exists
31	Reserved
32	Buffer out of range - WRITE
33	Attempted operation beyond End of File
34	Attempted operation conflicts w/ attribute
35	End of File Record not found
36	Attempted to open locked file
37	Write Request on file open by another user
38	Invalid drive specification
39	Invalid command to 37C65
3A	Invalid write to track 0
3B	Disk Full
3C	FAT entry should not be zero (0)
3D	DMA interrupt received

Hard Disk Subsystem Error Codes

Code	Description
50	Can't CREATE a hidden, system, directory
51	Can't DELETE a hidden, system, directory
52	Can't OPEN a hidden, system, directory
53	Branch in path not a subdirectory
54	Can't CREATE already opened file
55	Can't DELETE already opened file
56	File already opened for write
57	File not opened for read access
58	File not opened for write access
59	Bad offset passed to FPOS
5A	Can't CLOSE an unopened file
5B	Can't MKDIR already existing directory
5C	Can't RMDIR "." or ".."
5D	Can't RMDIR the root directory
5E	Can't RMDIR a non-empty directory
5F	Named file not a subdirectory
60	Named directory entry not volume label
6A	No more FDBs available
6B	No more opened files in list
6C	Filename too long
6D	Zero length filename
6E	Only "." and ".." start with "."
6F	Only one "." allowed per filename
70	Filename extension too long
71	Filename base too long
72	Invalid character in filename
Code	Description
73	Invalid space(s) in filename
74	Path name too long
7A	File not found
7B	No available entries in root directory
7C	No more sectors for this subdirectory
80	"Not yet allocated" run into
81	"End of file" run into
82	File Allocation Table (disk) full
8A	Low level (SCSI) read error
8B	Low level (SCSI) write error
8C	Low level (SCSI) format error

Exception Errors (XCP ____)

Exception Error Format

Exception errors are detected by a processor and occur during IML. Exception errors are nonrecoverable and require recording the error information and then IMLing to resume operation.

Exception error messages look like this on the operator panel:

XCP JSS:BB:EEE*

where:

- XCP indicates an exception error.
- JSS indicates the physical slot number of the board where the error occurred.
- BB shows the board ID in hexadecimal format.
- EEE shows the type of exception error.
- * indicates additional messages that give more information about the error (not always present).

When an Exception error occurs, IML and attempt to resume normal operation. If the error occurs again, do this:

Record all of the exception error message. Use the Adv key to access additional message panels. Use the board ID to identify the failing board. Exception errors are also recorded in the BOX\$FAIL.TXT file found in the systems directory.

Slot Numbers

The JSS member of the exception error message (XCP JSS:BB:EEE *) corresponds to the slot number where the failing board is located. Refer to the appropriate Hardware Reference Manual for your model.

Board ID Codes

The BB member of the exception error message (XCP JSS:BB:EEE *) corresponds to the board type of the failing board.

ID	Description	ID	Description
00	No board installed	A0	2/4/6 Mbyte RBT (RAM terminated)
10	SCP board (mother board on 25X, 65R, 65S, 90S)	A8	2/4/6 Mbyte RBU (RAM unterminated)
18	HPP board (25X)	B0	.5/1/1.5/2 Mbyte ERM board
20	SCP (15X) HPP (15X)	D0	.5/1/2 Mbyte RXT board
30	SCC board - all models	D8	.5/1/2 Mbyte RXU board
38	HSC board	E0	SHA board
40	MCC board MCC II board	F0	TRM board TRM II board (1174-15X)
48	CDA board MCDA board TWA board	F8	Main board RAM (1174-25X, 65R, 65S, 90S)
50	AIC (ASCII) board	100	Floppy Drive A
58	ESC board	110	Floppy Drive B
68	FET board	120	Hard Drive C
70	TRC (Token-Ring) board TRC II board	130	Hard Drive D
78	VHP board	140	Operator Panel
80	CHC board	150	OPL II
88	CHP board CHS board	160	ADA
90	ETH board	200	Pseudo ID for common memory

Exception Error Codes

The EEE member of the exception error message (XCP JSS:BB:EEE *) corresponds to the error uncovered by the failing board. Valid values for EEE are in the following table.

Value	Description
ADR	Address Error
AU1	Level 1 Autovector
AU2	Level 2 Autovector
AU3	Level 3 Autovector
AU4	Level 4 Autovector
AU5	Level 5 Autovector
AU6	Level 6 Autovector
AU7	Level 7 Autovector
BUS	Bus Error

Value	Description
CHK	CHK Register Against Bounds Instruction
FMT	Format Error, Invalid format code for stack during XCP processing
ILG	Illegal Instruction
PRV	Privilege Violation
RSV	Unassigned, Reserved
SPR	Spurious Interrupt
TRC	Trace
TRV	TRAPV Instruction
TRx	TRAP Instructions (where x=0-F hex)
UIV	Uninitialized Interrupt
UNA	Unassigned User Interrupt (Spurious)
ZRO	Zero Divide
101	Line 1010 Emulator
111	Line 1111 Emulator

Hardware Failures (FAIL ____)

Hardware failures show specific hardware problems. They may occur during IML or testing mode. Code verification errors may also display as a hardware failure.

Error messages display on the operator panel as shown below:

- Hardware - FAIL JSS:BB:TNN*
- Code Verification - FAIL JSS:BB:MOV*

where:

- FAIL indicates a hardware error.
- JSS is the slot number of the failing board.
- BB shows the board type ID in hexadecimal format.
- T is the failing test type.
- NN is the failing test number.
- MOV indicates that the diagnostic code a processor board moved to its local memory does not match the code from where it was moved.
- * indicates additional messages that give more information about the error.

The section “Offline Testing”, contains additional information about Hardware failures.

Failure Reporting

Hardware failures and code verification errors can occur during IML or during execution of a testing mode. They notify you that a LINCS node hardware problem exists, and they require repair or replacement of the failing hardware. Code verification errors notify you that a processor board could not successfully move its diagnostic test code to its local memory for execution. Once the hardware problem is corrected, you must IML to resume operation.

If the selected test fails, a hardware or code verification error message of the following format appears on the operator panel LCD display:

- Hardware - FAIL JSS:BB:TNN *
- Code Verification - FAIL JSS:BB:MOV*
 - FAIL indicates a hardware failure.
 - JSS identifies the slot the failing board resides in.
 - BB identifies the board ID of the failing board.
 - TNN indicates the failing test.
 - MOV indicates that the diagnostic code the processor board moved to its local memory does not match the code from where it was moved.

Optionally, an asterisk may appear in the last character position indicating that additional data further describing the failure is available. Note that the initial display contains all the information necessary to isolate the failure to a single failing board.

If an asterisk is present in the last character position of the LCD message, additional data can be viewed by pressing and releasing the operator panel Adv key. The additional data is formatted into four 16-character frames, each of which contains two words of data and accompanying reference labels.

The following items summarize failure message scrolling:

1. Pressing and releasing the operator panel Adv key advances to the next failure message frame.
2. Pressing and releasing the operator panel Alt/Adv key sequence displays the immediately preceding failure message frame.
3. Pressing and releasing the operator panel Alt/Enter key sequence displays the first frame of the failure message.
4. Pressing and releasing the operator panel Alt/Clear key sequence displays the last frame of the failure message.
5. Both Adv and Alt/Adv wrap. Pressing and releasing the Adv key when at the fifth (last) message frame causes the display of the first frame, etc.

When a hardware failure message appears, IML and attempt to resume normal operation. If the error recurs, record all the hardware failure messages. Use the Adv key to access all message panels. Get the failing board replaced and keep a copy of the failing error codes with the board.

Slot Numbers

The JSS member of the hardware failure message (FAIL JSS:BB:TNN *) corresponds to the slot number where the failing board is located.

Board Identification Codes

The BB member of the hardware failure message (FAIL JSS:BB:TNN *) corresponds to the board type of the failing board.

Test Number Codes

The TNN member of the hardware failure message (FAIL JSS:BB:TNN *) corresponds to the test number of the test that has failed. The values that are valid for this parameter can be found in the section, “Offline Testing.” Use the BB value to determine which board to find the tests under.

Online Errors

Online errors show problems that occur while the LINCS node is online with its host and attached devices. Online error numbers may appear on the operator panel (some 300- and 500-type errors only), preceded by an indication of which attached host system is involved, and may be displayed on an attached display’s status line preceded by X.

Online errors may occur during online operation with the host or during IML.

Online errors are:

- Displayed on the status line of attached terminals preceded by X.
- Logged in the Error Log (accessible in Central Control utility). See your Configuration and Central Control document for details.

Additionally:

- Some error codes are returned to the host via an Alert if this feature is enabled.
- The LINCS node’s operator panel display shows some 300- and 500-type error codes. These error codes are preceded by the letter designation of the affected host and are followed by the time at which the error occurred. For example, an operator panel display of “B: 501-01 11:34” would indicate that a 501-01 error (Data Set Ready not present) occurred on a connection with host B at 11:34. Any subsequent displayable errors will overwrite the current displayed error information.

Online error codes may be grouped into the following general categories:

- 0XX - Local Format Storage Errors
- 1XX - Events logged for informational purposes only
- 2XX - Device and Coax Subsystem Errors
- 3XX - LINCS Node Microcode and Hardware Failures
- 4XX - Protocol and Host Programming Errors
- 5XX - Host Communications Link Status and Errors
- 6XX - DFT Microcode and Hardware Failures
- 7XX - DFT Detected Protocol and Host Programming Errors

Note that only the 3XX category of errors indicates that there is a true LINCS node error occurring that should be reported via normal CE escalation procedures to the engineering department. The remainder of the error codes indicate possible host environment, coax subsystem, device, or host link errors. Although it is possible for the LINCS node to

create these error conditions, it is much more probable that the error is not the fault of the LINC node.

Use the charts in this chapter to determine what to do if you have an online error.

0XX Category Online Error Codes

This category of error codes will occur only if the Local Format feature has been enabled. To enable this feature, the Extended Feature Support FAD is required. This category of errors generally indicates a problem with the host application used to download formats into the LINC node.

Following are the category 0XX error codes that are defined.

Code	Error Description	Recovery
000-01	No format groups loaded.	Suspect host application used to load formats.
000-02	Format name not found.	Same as above.
000-04	Group name error, no format groups loaded.	Same as above.

1XX Category Online Error Codes

Category 1XX events do not indicate a failure. They are logged for informational purposes only.

Code	Error Description
100-01	IML occurred without executing BATs.
100-02	IML occurred. BATs were executed.
100-03	Same as 100-01, except default customization data files were loaded.
100-04	Same as 100-02, except default customization data files were loaded
100-05	Online
100-06	Soft IML
100-07	Soft Extended Diagnostics
100-08	Factory burn IML
100-11	Customization Data Object was written to disk. Extended Data: B1 - B4 = ASCII string defining data object
100-20	Event log was cleared.
100-21	Summary counters were cleared.
100-22	LAN adapter counters were cleared.
100-30	DLUS Connected
100-31	DLUS Not Connected
100-32	Backup DLUS Connected
100-33	FAD Usage Stats Reset to Zero
100-40	BOOTP Request Error

2XX Category Online Error Codes

Category 2XX error codes are generally not the fault of the LINCS node and are used to report problems on the device network subsystem. This includes coax subsystem errors, device errors, device feature errors, and device compatibility. Note that these error codes typically appear in the status line (first 3 digits only) of the device.

Following are the category 2XX error codes that are defined.

Code	Error Description	Recovery
201-01	Coax Timeout.	Switch the terminal from Normal mode to Central Control mode and back to Normal mode. Turn the terminal's power off, wait 5 seconds, and turn power back on. Check the terminal's cable connections.
201-02	No RTR on coax.	Same as above.
201-03	Coax Parity error.	Same as above.
202-01	Coax overrun.	Turn the terminal's power off, wait 5 seconds, and turn power back on.
203-31	Terminal feature error. The feature bit was set in a response to a poll.	Press the terminal's Reset key and retry operation. Turn the terminal's power off, wait 5 seconds, and turn the power on.
204-01	Terminal buffer parity error.	Probably a terminal problem.
204-53	Printer buffer parity error.	Probably a printer problem.
207-01	Missing "device complete."	Turn the terminal's power off, wait 5 seconds, and turn the power on. Check the cable connections.
207-02	Too many DFT expedited status resets.	Turn the terminal's power off, wait 5 seconds, and turn the power on.
208-31	Unexpected Op Complete status.	An Op Complete was received from the device, but the 1174 did not know that an operation was underway. Typically a device or a coax problem.
210-01	Invalid keyboard ID.	Confirm keyboard configuration for keyboard type. This may be switches on keyboard or display terminal configuration.
210-02	Invalid 102 keyboard ID.	Same as above.
211-01	Illegal device status. Response to a poll was status but status bits not set. Extended Data: B1-B2 = invalid status word received from device	Turn the terminal's power off, wait 5 seconds, and turn the power on.
211-02	Illegal coax status (DFT).	Turn the terminal's power off, wait 5 seconds, and turn the power on. Check cable connections.
211-31	Illegal device status.	A device status was received that was unexpected. Could be a device or coax problem.
212-31	Illegal key scan code received. A hex code received as a keyscan that is not defined.	Press the terminal's Reset key and retry operation.
222-31	Selector pen status error.	Press the terminal's Reset key and retry operation.
223-01	ESCA buffer parity problem.	
224-31	Magnetic stripe status error.	Perhaps a faulty Mag stripe card reader.
225-01	ESCA status failure.	

LINCS Problem Determination

Code	Error Description	Recovery
231-01	Printer equipment check.	Unrecoverable printer error. Consult your printer's operator's manual. If you cannot fix the problem, call your next level of technical support.
231-02	Printer op complete timeout.	Same as above.
231-03	Printer status transition timeout.	Same as above.
231-04	Printer Disable poll timeout.	Same as above.
232-01	Printer load programmed symbol order error.	Attempt to load symbols again, and report problem if problem continues.
233-01	Unexpected coax response. Extended Data: B1 = coax status	Unrecoverable printer error. Call your next level of technical support.
234-01	ESCA ROM not in terminal.	You will most likely need to have terminal upgraded for ESCA
239-01	Invalid device type. A response to a Read Terminal ID indicates a printer or DFT. Byte 0C of the device buffer when read indicates neither (Bit 0 = printer, Bit 1 = DFT, other combinations are undefined).	Turn the terminal's power off, wait 5 seconds, and turn the power on.
240-01	Synchronization error based on DFT problem.	Turn the terminal's power off, wait 5 seconds, and turn the power on. Report problem to DFT vendor.
241-01	Synchronization error based on a LINCS node problem.	Turn the terminal's power off, wait 5 seconds, and turn the power on. If problem continues, call your next level of technical support.
242-01	DFT permanent error reported to the LINCS node.	Turn the terminal's power off, wait 5 seconds, and turn the power on. Report problem to DFT vendor.
243-01	Function request does not result in Function Completed Status or Expedited Status.	Turn the terminal's power off, wait 5 seconds, and turn the power on. Report problem to DFT vendor.
245-60	LPD Buffer Overflow. All of the memory space allocated to this printer has been filled.	This may indicate that the amount of memory space allocated for this printer is inadequate. It is recommended that the hard drive be used to buffer these prints whenever possible. You may want to reconsider this in your configuration.
245-61	The LPR print job was not successfully sent to the LAN printer.	If LINCS was configured to "hold" the print job, it should still be in the queue. You can correct the problem with the printer and reinitiate the job from the management panel.
245-62	LPR Disk Write Error	Enable RPQ to 'Make Hard Disk Priority Higher' in LINCS configuration.
245-63	LPR Disk Read Error	Enable RPQ to 'Make Hard Disk Priority Higher' in LINCS configuration.

Code	Error Description	Recovery
245-64	A Function Management Header is being sent by the host application to the printer that is not supported.	This implies that the host gen or host application is configured incorrectly for the printer type.
246-01	3180 explicit partition status.	Turn the terminal's power off, wait 5 seconds, and turn the power on. Check with application programmer.
247-01	3180 explicit partition protocol unavailable.	Turn the terminal's power off, wait 5 seconds, and turn the power on. Check with application programmer.
280-01	Configured LINC'S node and attached device Extended Vital Product Data labels do not match.	Update the device's XVPD. Some terminals provide a special Setup mode to update XVPD; otherwise, use Central Control mode to update XVPD.
285-01	Session unavailable. Extended Data: B1 = coax status	Memory is not available for a session of the port. Press Reset to continue operation on available sessions. Additional memory is needed for the current configuration. B1 = session number that could not POR.
285-02	No memory available for calculator.	Press Reset to continue without calculator. Additional memory is needed for the current configuration.
285-03	No memory for cut and send.	
285-04	Cut and send timer has expired.	
286-01	No memory available for windowing.	Press Reset to continue without windowing. Additional memory is needed for the current configuration.
287-01	Illegal swap - swap into ASCII Setup mode.	Repeat the action that generated this problem, and if problem persists, report the problem.
293-01	Unconfigured port.	
294-01	DFT POR on port where session A is not defined to preconnect to a 3270 host.	Move DFT to another port or change session to be a 3270 session in configuration.
2EE-21	Mod 1 not supported.	Disconnect Mod 1 display and attach appropriate display terminal.
2EE-31	Keyboard not configured.	Confirm keyboard configuration for keyboard type and language.
2EE-37	Keyboard not supported.	Confirm supported features and keyboard type.

3XX Category Online Error Codes

This category of errors reports failures in the microcode of the LINC'S node. These problems should be properly documented and escalated to engineering per the proper channels.

Following are the category 3XX error codes that are defined.

LINCS Problem Determination

Code	Error Description	Recovery
300 - 330	Microcode failure. A dump should normally take place to one of the dump directories on the hard drive. In the case of the 1174-90S, you must have a floppy disk labeled for a dump, located in a floppy drive to capture the dump.	If any of these errors occur, call your next level of technical support using the proper escalation procedures. If the platform does not perform an IML after the dump completes ('DUMP COMPLETE' message appears on the LCD) you may manually initiate the IML sequence. Refer to the chapter on dumps for retrieval of the dump information.
300-01	INIT error: GPP to IOP map	
300-02	INIT error: Interrupt table	
300-03	INIT error: Global memory	
300-04	INIT error: Major or Minor ID	
300-05	ASCII Device transmit queue overflow	Check for a flow control configuration conflict.
300-06	INIT error: Global Message Queue	
300-07	INIT error: Local GPP	
300-08	INIT error: IOP init DRB	
300-09	INIT error: IOP start DRB	
300-10	INIT error: Slot ID not found	
300-11	INIT error: No circ on board	
300-12	INIT error: Dual Port memory allocation failure.	
300-13	INIT error: Common memory allocation failure. D0 = partitioning ID D1 = number of members	
300-14	INIT error: Himemory allocation failure.	
300-15	INIT error: GPP init DRB.	
300-16	INIT error: GPP start DRB.	
300-20	IP message: Invalid slot ID. D0 = message receiver application ID D1 = invalid slot	
300-21	IP Message: No board in slot.	
300-22	IP Message: IP queue full. D0 = message receiver application ID D1 = IP message q-header	
300-25	IP mail: mailbox full D0 = receivers application ID D1 = destination application node	
300-26	INT invalid SCI data D0 = SCI data D1 = SCI address	
300-27	INT invalid wakeup data D0 = address of wakeup queue D1 = application node address	
300-28	INT invalid slot D0 = SCI data D1 = slot ID	

Code	Error Description	Recovery
300-30	No message buffers are available D0 = message buffer free - q	
300-31	Invalid buffer type. D0 = message type D1 = message buffer pointer	
300-32	PCM wait queue overflow. D0 = current node pointer D1 = queue address	
300-33	Invalid message buffer Q ID. D1 = message pointer	
300-34	PCM in another queue. D0 = PCM in error	
300-35	Coax Semaphore not locked.	
300-40	Application start: priority zero. D0 = Application ID D1 = priority	
300-41	Change priority: priority zero	
300-45	PCALL: already active. D0 = procedure ID for PCALL D1 = PCALL stack pointer	
300-46	PCALL: not active D1 = application node pointer	
300-47	DSCALL: already active	
300-48	DSCALL: not active	
300-50	No application nodes available. D0 = application node free q	
300-51	Invalid Major ID. D0 = application ID D1 = Major table entry	
300-52	Invalid Minor ID. D0 = application ID D1 = major table entry	
300-53	Invalid semaphore address. D0 = semaphore structure	
300-54	Busy wait timeout. D0 = semaphore structure	
300-55	Dual semaphore use exceeded.	
300-60	Void procedure called. D0 = process ID	
300-61	Problem w/q-frames on TOQ junk. D0 = 1, got FC and q_frames not set = 2, got FC and FC return address not saved = 3, set q_frames and it was already set	
300-65	TJMP error. D0 = command	

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Code	Error Description	Recovery
300-66	TJSR error. D0 = command	
300-67	TGOTO error. D0 = command	
300-68	TCALL error. D0 = command	
300-69	TPCALL error. D0 = command	
300-71	Invalid message received. D0 = message pointer D1 = application ID of message receiver	
300-72	Invalid mail received. D1 = invalid mail	
300-73	Stack error at suspend. D0 = application ID D1 = current sp debug pointer	
300-75	Reference to invalid block. D0 = pointer to MUP table D1 = block number	
300-80	Invalid Dynamic Area pointer. D0 = memory pointer D1 = callers return address	
300-81	Invalid Link Queue Header. D0 = bad link item D1 = bad free queue header pointer	
300-82	Link already in a queue. D0 = bad link item D1 = bad free queue header pointer	
300-83	Link NOT in a queue. D0 = bad link item D1 = bad free queue header pointer	
300-84	START: application already exists D0 = application ID D1 = minor table pointer	
300-85	Invalid MFP interrupt.	
300-86	Send message to application which doesn't exist. D0 = Minor table entry D1 = message pointer	
300-87	Send mail to application which doesn't exist. D0 = receivers application ID D1 = minor table entry	
300-88	Device MODE invalid on none set. D0 = Mode long word D1 = SDA pointer	
300-90	FUSION / LNS State error. See fns\$equ.src for error equates.	
300-91	FUSION code panic.	

Code	Error Description	Recovery
300-92	Invalid LAN AXC command.	
300-93	FUSION routing error.	
300-94	FET 3Com Host Error Interrupt.	
307-51	Lost machine check log.	
310-01	GW/DSN error. Reference bottom of GDC\$EQU.SRC for definition of extended data.	Same as above.
311-01	LAT error. Reference bottom of LAT\$EQU.SRC for definition of extended data.	
313-01	Op panel failure occurred.	Check Op Panel hardware connections.
313-02	OP panel failure occurred.	Check Op Panel hardware connections.
313-51	Op panel I/O timeout.	Check Op Panel hardware connections.
313-52	Op panel I/O timeout.	Check Op Panel hardware connections.
313-53	Op panel I/O parity error.	Check for faulty Op Panel hardware.
313-54	Op panel I/O parity error.	Check for faulty Op Panel hardware.
315-01	Fatal CSCM error.	Same as codes 300-330 recovery.
315-02	FIG error, no scratch memory	Same as above.
320-00	IOP exception - division by zero.	Same as above.
320-01	IOP exception - NMI.	Same as above.
320-02	IOP exception - Array.	Same as above.
320-03	IOP exception - Opcode.	Same as above.
320-04	IOP exception - invalid interrupt.	Same as above.
320-05	IOP - no PCMs available	
320-06	IOP - invalid message read	
320-07	IOP - PCM already in queue	
320-08	IOP - PCM free chain error	
320-09	No response to IOP message	
330-02	Bus error.	Same as above.
330-03	Address error.	Same as above.
330-04	Illegal instruction.	Same as above.
330-05	Zero divide.	Same as above.
330-06	Check register against bounds instruction.	Same as above.
330-07	TRAPV on overflow instruction.	Same as above.
330-08	Privilege violation.	Same as above.
330-09	Trace.	Same as above.
330-10	Line 1010 Emulator.	Same as above.
330-11	Line 1111 Emulator.	Same as above.
330-12	Unassigned, Reserved.	Same as above.
330-14	Format error. Invalid format code for stack during XCP processing.	Same as above.
330-15	Uninitialized interrupt.	Same as above.

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Code	Error Description	Recovery
330-24	Spurious interrupt	Same as above.
330-25	Level 1 Autovector	Same as above.
330-26	Level 2 Autovector	Same as above.
330-27	Level 3 Autovector	Same as above.
330-28	Level 4 Autovector	Same as above.
330-29	Level 5 Autovector	Same as above.
330-30	Level 6 Autovector	Same as above.
330-31	Level 7 Autovector	Same as above.
330-32	TRAP instructions. Note: A 330-32 error is logged when a dump disk is forced by pressing the Alt/9 keys from the operator panel.	
330-64	Unassigned User Interrupt	Same as above.
331-01	Unrecoverable HSC Error	Same as above.
331-02	HLC fatal error.	Same as above.
331-03	Frame Relay fatal error.	Same as above.
331-04	X.25 fatal error.	Same as above.
341-02	TMS Driver fatal error.	Same as above.
370-21	IPX protocol stack microcode error.	Same as above.
381-21	Channel Adapter Microcode Failure (Machine Check). Refer to Check LCH\$INTF.SRC for extended data translate.	Same as above.
381-22	Non-SNA Channel microcode failure.	Same as above.
382-01	Fatal TN3270 delete byte error	Same as above.
385-01	Drive not ready while trying to record an error in the Events Log.	Ensure that the System diskette is properly installed and that the diskette drive lever is closed.
385-02	LPD Print Server memory was not available. A small amount of memory is used to provide data areas for each print job. The more concurrent print jobs to be performed, the more memory needs to be allocated.	It may be necessary to allocate more memory for this function in configuration.
385-03	Presentation buffers were unavailable for a LPD print job.	This usually indicates that LINCS does not have enough feature memory available. You may need to add feature memory to the platform.
385-04	No LPD connections available	An error of this variety should have resulted in a dump. This dump should be retrieved and forwarded to Visara support for analysis. A solution to the problem may result, to prevent future occurrences.
385-05	User disk space is unavailable. There was no room on the disk to queue up the print job.	This may indicate the need for a larger hard drive, especially if this event is logged often.

Code	Error Description	Recovery
385-06	LPD Disk Error while writing	This may reflect a problem with the hard drive or supporting hardware on the SCP or Motherboard.
385-07	LPD Disk Error while reading	This may reflect a problem with the hard drive or supporting hardware on the SCP or Motherboard.
386-01	TCP port conflict on TLAD	An error of this variety should have resulted in a dump. This dump should be retrieved and forwarded to Visara support for analysis. A solution to the problem may result, to prevent future occurrences.
388-01	Diskette media failure while trying to record an error in the Events Log.	Replace the System disk. IML by pressing the IML key on the operator panel.
390-01	Incorrect diskette installed while attempting to record an error in the Events Log.	Ensure that the System diskette is properly installed. If the problem continues, install the backup System diskette.
391-01	Write protect condition detected while trying to record an error in the Events Log.	Remove the write protect tab from the System diskette.
392-01	Diskette full or End of File (EOF) condition occurred while trying to record an error in the Events Log.	Replace the System diskette. B1 = 01 diskette full, B1 = 02 diskette directory full, B1 = 03 diskette EOF error B2 = 00
393-01	Diskette was changed while attempting to record an error in the Events Log.	Reinsert the correct diskette.
399-01	KDU language mismatch	B1 = 00 if KDU not applied during IML, B1 = 01 if KDU pretest failed, B2 = KDU language code, B3-B4 = CFG languages
399-02	ADU language mismatch	B1 = 00 if ADU not applied during IML, B1 = 01 if ADU pretest failed, B2 = ADU language code, B3-B4 = CFG languages
399-03	KDU upgrade required	B1 = 00 if KDU not applied during IML, B1 = 01 if CSCM pretest failed, B2 = KDU format, B3 = KDU format required
399-04	ADU upgrade required	ADU files may have been created at an older version of code and the current code is incompatible. The existing ADU files need to be upgraded or replaced with a new ADU file. B1 = 00 if ADU not applied during IML, B1 = 01 if CSCM pretest failed, B2 = ADU format, B3 = ADU format required
399-10	CFG for VPD (Vital Product Data), but no VPD DO	An error of this variety should have resulted in a dump. This dump should be retrieved and forwarded to Visara support for analysis. A solution to the problem may result, to prevent future occurrences. B1 = 00 if VPD deconfigured, B1 = 01 if pretest failed

Code	Error Description	Recovery
399-50	During CSCM pretest, the customization data object being installed is an incompatible format for the system microcode.	Resend CFG data upgraded to system microcode release level, or send system microcode release level to match CFG data. B1 - B4 = ASCII string defining the data object being installed. , B5 - B6 = Customization data format , B7 - B8 = Highest format allowed by microcode.
399-52	CFG/Hardware mismatch	Check to see if you inadvertently toggled the number of boards in configuration on the Product Definition panel of configuration. B1- B2 = 9FX error indicator, B3-B4=Board ID,B5-B6=Number of boards required,B7-B8=Number of boards installed
399-53	Configured features not activated	Check the library members of the Central Site unit for features activated. Activate features at Network Site and resend the configuration data. B1, B2 = BXX IML error code
399-54	Translate Tables not defined	Check to see if Translate Tables are specified in the configuration unintentionally. Use the translate table utility to see if the tables have been created. Create the necessary user defined translate table, if one is needed. B1= Primary language 0 - No problem, 1 - User-defined 1 is specified, but not found, 2 - User-defined 2 is specified but not found, B2 = Secondary language 0 - No problem, 1 - User-defined 1 is specified, but not found, 2 - User-defined 2 is specified but not found.

4XX Category Online Error Codes

Category 4XX errors typically indicate a problem in the protocol of the host datastream. These problems may be a result of an error in the host application, an error in the host gen, or a software error. Errors occurring of this type should be reported to the host programmer. A data trace of the host link may be required. This can be done by using the Central Control utilities, use of a datascope/data monitoring device, or by taking the appropriate data trace at the host. You may also use the LINCS host trace facility of eManager.

Code	Error Description	Recovery
401-01	Valid command received that is invalid for the terminal to which it was sent. May also indicate that an invalid select command chain sequence was received.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
401-02	Invalid command received (non-SNA only) Logged by SNA as 540-21.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.

Code	Error Description	Recovery
401-03	<p>Invalid command received in the datastream.</p> <p>Extended Data:</p> <p>B1-B4 = one of the following:</p> <p>If the error is in a write structured field (WSF):</p> <p>B1-B2 = The displacement in hex (zero origin) from the beginning of the WSF transmission to the structured field (SF) containing the error.</p> <p>B3-B4 = The displacement in hex (zero origin) from the beginning of the SF in error to the byte in error. If there is not enough data to process an SBA, SFE, RA, EUA, MF, or SA order, then B3-B4 equals 0001.</p> <p>If the error is not in a WSF:</p> <p>B1-B2 = 0000</p> <p>B3-B4 = The displacement in hex (zero origin) from the beginning of the transmission to the byte in error. If there is not enough data to process an SBA, SFE, RA, EUA, MF, or SA order, then B3-B4 equals 0001.</p> <p>B5-B6 = The data in error.</p> <p>B7-B8 = Structured field type, or 0000 if the transmission has no WSF.</p>	<p>Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.</p>
401-04	<p>Invalid command while in data chain state.</p>	<p>Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.</p>
401-05	<p>WCC reset bit not set while in data chain state.</p>	<p>Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.</p>
402-01	<p>A Modify Field Attribute order was sent when the current buffer address did not contain a field attribute.</p> <p>Extended Data:</p> <p>B1-B8 = see Extended Data information for error code 401-03</p>	<p>Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.</p>
402-02	<p>The address following a Set Buffer Address (SBA), Repeat to Address (RA), or Erase Unprotected to Address (EUA) order is invalid.</p> <p>Extended Data:</p> <p>B1-B8 = see extended data information for error code 401-03</p>	<p>Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.</p>
402-03	<p>The parameters following a Set Attribute (SA), Start Field Extended (SFE), Modify Field (MF), or Graphic Escape (GE) order are invalid.</p> <p>Extended Data:</p> <p>B1-B8 = see extended data information for error code 401-03</p>	<p>Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.</p>

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Code	Error Description	Recovery
402-04	An invalid alias was detected in Byte 4 of the structured field during the processing of a load program symbols set. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
402-05	Invalid data following a Read, Read Modified, or Erase All Unprotected command. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
402-06	Datastream ended before all of the required data bytes were received on an SBA, RA, SF, SFE, MF, EUA, or SA order. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
402-07	Unsupported order or invalid control code received in the datastream between hex 01 and hex 3F. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
402-20	An error has been detected in the data stream while receiving transparent data in an LU3 data stream.	Retry the print job to the printer and contact the system programmer if the problem persists.
403-02	Invalid parameter detected during structured field processing. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
403-03	Read partition state error detected.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
403-05	The Start Print bit did not occur in a Last-in-Chain frame.	Retry the print job to the printer and contact the system programmer if the problem persists.
404-01	Error during the processing of an SF. The device receiving the datastream does not have the hardware to support the SF in the datastream. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
404-02	Invalid data chain SF sequence. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.

Code	Error Description	Recovery
404-03	Received a data chain SF that was not the first SF to follow a WAF command.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
404-04	Received a data chain Structured Field that was received out of sequence.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
404-05	A Structured Field spanned transmissions.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
405-01	Bisync buffer overflow.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
406-01	Bisync transmission block exceeds 3500 bytes and exceeds the buffer size of the receiving terminal.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
406-02	Bisync transmission block exceeds 7000 bytes and exceeds the buffer size of the receiving terminal.	No action necessary. If the problem continues, contact the system programmer.
406-03	Too many bytes of Programmed Symbols data received.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-01	Invalid structured field length for a copy command. Extended Data: B1-B8 = see extended data information for error code 401-03 Press Reset at the attached terminal and retry the operation.	If the problem continues, contact the system programmer.
407-02	Data received after the SF containing the Copy command. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-03	Address for the terminal to be copied from is not a valid host address. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-04	Bisync copy attempted from a DFT. Bisync copies are not allowed to or from DFTs. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-05	Bisync copy attempted with one or both of the terminals being in an explicit partition state. This is not allowed. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.

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Code	Error Description	Recovery
407-06	The "from" terminal was busy during a copy operation. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-07	The "from" terminal is allocated for local copy only. Bisync copy is not allowed. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-08	The "from" terminal had a recoverable parity error during a Bisync copy operation. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-09	The "to" terminal buffer contents are protected and cannot be copied. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-10	Terminal buffer sizes are incompatible for a Copy operation. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
407-11	Extended function copy not allowed. Extended function copy is only allowed from a display to a printer. Extended Data: B1-B8 = see extended data information for error code 401-03	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
408-01	Bisync datastream error detected. Possible Cause: - Escape character (ESC) missing from start of command sequence - No data - Read Modified All command received - WSF command received followed by a chained command Extended Data: B1-B2 = first two bytes of the transmission (after STX) B3-B4 = number of bytes in the line buffer	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
410-01	RU length error. More than 4096 bytes of data were received. SNA sense = 1002	If this problem continues, contact the system programmer.

Code	Error Description	Recovery
410-02	RU loading into the attached printer's buffer is larger than the maximum specified in the bind command. SNA sense = 1002	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
410-06	The host function is not supported. SNA sense = 1003	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
410-07	An unsupported data flow control, session control, network control, or FM data request was received by a terminal. SNA sense = 1007	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
410-08	The host function is not supported. The unsupported request was sent to the physical unit (PU) or to an invalid logical unit (LU). SNA sense = 1007	If the problem continues, contact the system programmer.
410-09	RU data error (LU 6.2). Extended Data: B1, B2 = Sense Data SNA sense = 1001 Possible Cause: Logical record truncated by End Chain indicator Received response from FM data or LUSTAT request - Transaction Program's receive buffer starts on logical boundary and contains PS header or logical record with invalid length field.	Contact the system programmer. Session must be reinitialized.
412-01	Invalid OAF-DAF combination. A request was addressed to a physical unit, but the OAF was not the SSCP. SNA sense = 800F	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
412-02	Received a message from a host for an unbound logical unit. SNA sense = 8005	No action necessary. If the problem continues, contact the system programmer.
412-03	Bad DAF. A message was received from a host for a terminal address that is not configured. SNA sense = 8004	No action necessary. If the problem continues, contact the system programmer.
412-04	Received a message from a host before receiving an ACTPU. SNA sense = 8008	No action necessary. If the problem continues, contact the system programmer.
412-05	Received a message from a host for a terminal that is not active. An ACTLU is required. SNA sense = 8009	No action necessary. If the problem continues, contact the system programmer.
412-07	Incomplete Transmission Header received.	No action necessary. Probably a problem with the phone lines or modem/data set equipment.
415-01	Request was received with an exception response, but no exception response request was specified in the Bind. SNA sense = 4006	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.

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Code	Error Description	Recovery
415-02	Request was received with a definite response, but no definite response request was specified in the Bind. SNA sense = 4007	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
415-03	Request with the format indicator (FI) bit set in the Request Header was received; however, the session was not bound with FM header support. SNA sense = 400F	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
415-04	Incomplete Request Header (RH) received. Session was terminated by the LINCS node. SNA sense = 4005 Possible Cause: Communications line error Application program error	No action is required.
415-05	Bad RU category specified.	Retry the operation. If problem persists, contact the system programmer.
415-08	FM data request received with begin bracket (BB) bit set with not begin chain specified, or did not contain an attach header. Extended Data: B1-B3 = Request header bytes 0 - 2 B4-B8 = RU bytes 0 - 4 B9 = Number of valid RU bytes logged SNA sense = 4003	Contact the system programmer. Session must be reinitialized.
415-09	Conditional end bracket or end bracket not allowed. Extended Data: B1-B3 = Request header bytes 0 - 2 SNA sense = 4004 Possible Cause: FM data or LUSTAT request received with End Bracket (EB) bit set (EB bit not supported for FM profile 19). FM data request received with Conditional End Bracket (CEB) bit set without End Chain specified. FM data or LUSTAT request received with CEB bit set but response category of RQE2 or RQE3 specified. FM data or LUSTAT request received with BB and CEB bit set and response category set to exception response. Bidder LU cannot send this type request. First in chain FM data received with BB bit set and last in chain FM data request received with CEB bit set and response set to exception response.	Contact the system programmer. Session must be reinitialized.

Code	Error Description	Recovery
415-10	FM data request received specifying definite response but not specifying end chain. Extended Data: B1-B3 = Request header bytes 0 - 2 SNA sense = 4007	Contact the system programmer. Session must be reinitialized.
415-11	Change direction (CD) not allowed. Extended Data: B1-B3 = Request header bytes 0 - 2 B4-B8 = RU bytes 0 - 4 B9 = Number of valid RU bytes logged SNA sense = 4009 Possible Cause: BIS, RTR, or SIGNAL request received with CD bit set. FM data or LUSTAT request received with CD bit set but request specified response category of RQD1. FM data request received with CD bit set but End Chain not specified by request. FM data or LUSTAT request received with CD bit set and CEB bit set. CD and CEB cannot be generated by transaction program verbs.	Contact the system programmer. Session must be reinitialized.
415-12	Incorrect specification of request code. Extended Data: B1 = Transmission header byte 0 B2-B4 = Response header bytes 0 - 2 B5-B9 = RU bytes 0 - 4 B10 = Number of valid RU bytes logged SNA sense = 4012 Possible Cause: Expedited Data Flow Control (DFC) response received but it was not a SIGNAL response. The only expedited DFC response supported by LU 6.2 is SIGNAL response. Normal flow DFC response received and it had request code different from request code of last DFC request sent.	Contact the system programmer. Session must be reinitialized.
415-13	Incorrect queued response indicator (QRI) setting with bidder's begin bracket. Extended Data: B1-B3 = Request header bytes 0 - 2 SNA sense = 4018 Possible Cause: FM data or LUSTAT request received with BB bit set but QRI bit not set. Request from bidder carrying BB must also carry QRI. BB chain from bidder is only chain receivable with QRI bit set. FM data or LUSTAT request specifying begin chain received with QRI bit set but BB bit not set.	Contact the system programmer. Session must be reinitialized.

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Code	Error Description	Recovery
415-14	<p>Incorrect indicators on last in chain (LIC) request.</p> <p>Extended Data: B1-B3 = Request header SNA sense = 4019 bytes 0 - 2</p> <p>Possible Cause: FM data or LUSTAT request specifying End Chain and response category of exception response received but neither CD bit nor CEB bit set. FM data request specifying End Chain and response category of RQD1 received but CEB bit not set.</p>	Contact the system programmer. Session must be reinitialized.
416-01	<p>Request with an invalid sequence number was received. This is an application program error. SNA sense = 2001</p>	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
416-02	<p>Chaining error. This is an application program error. SNA sense = 2002</p>	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
416-03	<p>Bracket error. This is an application program error. SNA sense = 2003</p>	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
416-04	<p>Request received that can be processed only if Data Traffic is active. Data Traffic is in a reset state. This is an application program error. SNA sense = 2005</p>	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
416-05	<p>Half-duplex error. The LU was not in the correct Send/Receive state to process the request. SNA sense = 2004</p>	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
416-12	<p>Request with BB bit set on received after a bracket initiation stopped (BIS) request received. SNA sense = 2008</p>	Contact the system programmer. Session must be reinitialized.
416-14	<p>FM data request received with QRI bit set differently from the way it was set for the other requests received in same chain. Extended Data: B1-B3 = Request header bytes 0 - 2 SNA sense = 200B</p>	Contact the system programmer. Session must be reinitialized.
416-16	<p>Second BIS request received on same session, or BIS reply received. SNA sense = 2010</p>	Contact the system programmer. Session must be reinitialized.
416-19	<p>Bracket error detected by an application program. SNA sense = 2003.</p>	
417-01	<p>Session limit exceeded. Bind received with an OAF that is different from the primary LU to which the session is already bound. SNA sense = 0805</p>	If the problem continues, contact the system programmer.

Code	Error Description	Recovery
417-02	Session limit exceeded. Bind received for LU 6.2 session that was already bound. SNA sense = 0805	If the problem continues, contact the system programmer to correct the error in the host application program. Session must be reinitialized by the host application program.
418-01	Printer not available. SNA sense = 0801 Possible Cause: Unconfigured printer Printer busy with local copy function FM data received that exceeded the pacing counts specified in the bind	No action necessary. If the problem continues, contact the system programmer.
418-02	Bracket bid reject (No RTR). BID has been received, but the operator has already initiated a Bracket, or the operator has ownership of the keyboard. SNA sense = 0813	If the problem continues, contact the system programmer.
418-03	Bracket Bid reject. A Begin Bracket or BID has been received for a printer that is busy with a local copy function. Ready to Receive (RTR) will be sent when the printer becomes available. SNA sense = 0814	This is a normal action for a shared printer. If this occurs more frequently than desired, additional printers may be required to handle the work load.
418-04	Receiver in Transmit mode. SNA sense = 081B	If the problem continues, contact the system programmer.
418-05	Function not executable.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
418-06	Change Direction required. Read type command was received without a Change Direction or with an End Bracket. SNA sense = 0829	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
418-07	LU2 or LU3 terminal received a WCC with the start print bit on, but it was not sent in Definite Response mode, or Exception Response mode and Change Direction. SNA sense = 0843	No action necessary. If the problem continues, contact the system programmer.
418-08	Terminal owned by an alternate session. SNA sense = 082D	If the problem continues, contact the system programmer.
420-01	Bind Reject error. Profile error. Extended Data: B1-B2 = location of the failing byte in the Bind command SNA sense = 0835	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
420-02	Bind reject. Primary protocol error. Extended Data: B1-B2 = location of the failing byte in the Bind command	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
420-03	Bind reject. Secondary protocol error. Extended Data: B1-B2 = location of the failing byte in the Bind command	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.

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Code	Error Description	Recovery
420-04	Bind reject. Common protocol error. Extended Data: B1-B2 = location of the failing byte in the Bind command	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
420-05	Bind reject. Invalid screen size. Extended Data: B1-B2 = location of the failing byte in the Bind command	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
420-06	Bind reject. LU profile error. Extended Data: B1-B2 = location of the failing byte in the Bind command	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
420-07	BIND reject - LU1 error. Sense code 0835.	Contact the system programmer.
420-11	Bind received that had an error in the bytes specifying the pacing window size, or the maximum RU size. Extended Data: B1-B2 = location of failing byte in the Bind command B3 = contents of failing byte SNA sense = 0835	Contact the system programmer. Check Bind extended data B1 and B2.
420-12	Bind received with error in bytes specifying user data fields. Extended Data: B1-B2 = location of failing byte in the Bind command SNA sense = 0835	Error in host application program; contact the system programmer. Session must be reinitialized by host application. Check Bind extended data B1 and B2.
420-13	Bind received with error in bytes specifying length of LU names or the URC field length. Extended Data: B1-B2 = location of failing byte in the Bind command SNA sense = 0835	Error in host application program; contact the system programmer. Session must be reinitialized by host application. Check Bind extended data B1 and B2.
420-14	Bind received with error in bytes specifying synchronization level. A level other than CONFIRM or ALL was specified. Extended Data: B1-B2 = location of failing byte in the Bind command SNA sense = 0835	Error in host application program; if the failure continues, contact the system programmer. Session must be reinitialized by host application. Check Bind extended data B1 and B2.
422-01	Unsupported Network Services (NS) request.	If the problem continues, contact the system programmer.
422-02	Invalid Network Services header was received. SNA sense = 1007	If the problem continues, contact the system programmer.
422-03	Maximum number of REQMS/RTM requests has been queued in the LINCS node. SNA sense = 0815	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
422-04	Invalid REQMS type was received. An application program error. SNA sense = 080C	No action necessary. If the problem continues, contact the system programmer.

Code	Error Description	Recovery
422-05	NMVT request received with invalid parameters. Extended Data: B1-B2 = Byte in error location in the NMVT SNA sense = 0835	No action necessary. If the problem continues, contact the system programmer.
422-06	Signal request received with incorrect extension value, or an LUSTAT request received with incorrect status value. Extended Data B1-B3 = Request header bytes 0 - 2 B4-B8 = Request unit bytes 0 - 4 SNA sense = 1005	Contact the system programmer. Session must be reinitialized.
422-08	The requested function is not supported. Extended Data B1 = Transmission data byte 0 B2-B4 = Request header bytes 0 - 2 B5-B9 = RU bytes 0 - 4 B10 = Number of valid RU bytes logged SNA sense = 1003	Contact the system programmer. Session must be reinitialized.
422-09	Invalid FM header received. Extended Data: B1-B7 = RU bytes 0 - 6 B8 = Number of valid RU bytes logged B9, B10 = Sense data SNA sense = 1008	Contact the system programmer. Session must be reinitialized.
422-10	Error detected while executing Central Site Control Facility.	B2, B2 = SNA Sense code
423-51	Response Time Monitor (RTM) counter overflow.	No action necessary. The host system should send an RTM request to reset the counter. If the problem continues, the NetView configuration may not match the RTM feature on the LINC S node. Contact the system programmer.
430-04	SNA distribution services transaction program detected an error while sending data to NetView DM. Extended Data: B1-B4 = SNA/DS message unit ID B5-B8 = SNA/DS SNA registered sense code B9, B10 = SNA/DS message unit type B11, B12 = LU 6.2 return code B13, B14 = DS.SEND detailed error code B15, B16 = Reserved Possible Cause: - Hardware failure - Microcode error - Host programming error	Retry the operation on another LINC S node unit. If the failure continues, contact the system programmer.

LINCS Problem Determination

Code	Error Description	Recovery
430-05	SNA distribution services transaction program detected an error while receiving data from NetView DM. Extended Data: B1-B4 = SNA/DS message unit ID B5-B8 = SNA/DS SNA registered sense code B9, B10 = SNA/DS message unit type B11, B12 = LU 6.2 return code B13, B14 = DS.RECEIVE detailed error code B15, B16 = Reserved Possible Cause: - Hardware failure - Microcode error - Host programming error	Retry the operation on another LINCS node unit. If the failure continues, contact the system programmer.
430-51	CSCM was attempted while customization resources were locked. SNA sense = 0843	Retry the operation at a later time.
434-01	End user not authorized. Extended Data: B1-B3 = Request/Response header bytes 0 - 2 B4, B5 = Sense data SNA sense = 080F	Contact the system programmer. Session must be reinitialized.
440-01	NetView DM function was rejected because of an exception condition. Extended Data: B1-B4 = SNA registered sense code	
440-10	NetView Distribution Manager (NDM) function aborted. This function deals with the distribution and retrieval of LINCS microcode.	Do not power down control unit before reattempting the operation.
442-01	Informational status indicating LINCS modified by a Central Site Change Management (CSCM) operation. Extended Data: B1 = Command where: X'41' = Delete X'31' = Send (destruction allowed) X'62' = Send (destruction not allowed) X'81' = Install X'83' = Remove X'85' = Accept B2-B9 = Sixth field of canonical name of data object, or fifth field of canonical name if date object is a patch	No action is required.
460-01	Error in Print Authorization Matrix definition.	Retry operation. If the problem continues, contact the system programmer.
468-01	Printer detected error in the LU1 datastream. There are invalid parameters in the datastream. Extended Data: B1-B2 = SNA sense set by the printer	Retry operation. If the problem continues, contact the system programmer.
468-02	Printer detected error in a Load Structured Field order.	Retry operation. If the problem continues, contact the system programmer.
468-10	Bad FM header in LU1 datastream.	Retry operation. If the problem continues, contact the system programmer.

Code	Error Description	Recovery
468-11	Bad structured field detected by printer in LU1 mode.	Retry operation. If the problem continues, contact the system programmer.
497-01	Segmenting error. The host system has sent an invalid segment and the current LU will be unbound.	Restart the session. If the problem continues, contact the system programmer.
497-02	Segmenting error without host notification. Host system has sent an invalid segment.	No action is required.
498-01	A negative response has been received. An invalid request was sent to the host.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.
499-01	Exception request. An upstream node has detected an error.	Press Reset at the attached terminal and retry the operation. If the problem continues, contact the system programmer.

5XX Category Online Error Codes

The 5XX error codes indicate communications and line state conditions. These codes normally occur during operations and do not normally indicate a problem with the LINC/S node. These codes may indicate when the comm link is down or when the modem is defective and may give some indication as to why it is down. In most cases the host will initiate recovery from the 5XX comm states.

Code	Error Description	Recovery
500-01	A previous communication error has cleared. Communication is now available.	No action is required.
501-01	Data Set Ready (DSR) is not present. Possible Cause: Communication cable Modem	Verify that the communication cable is connected and that the modem is powered on.
501-02	Clear to Send (CTS) is not present. Possible Cause: Communication cable Modem	Verify that the communication cable is connected and that the modem is powered on.
501-03	Modem error.	Verify the operation of the modem.
501-04	Transmit timeout. There is a problem with the transmit clock signal. Possible Cause: Communication cable Modem	Verify that the communication cable is connected and that the modem is powered on.
501-05	x.21 Comparator error.	Verify that the communication cable is connected and that the X.21 modem is powered on.
501-06	HSC adapter cable, physical layer interface module (PLIM), or HSC comm cable not installed for a configured line or comm cable type does not match PLIM.	Install HSC adapter cable, PLIM, and correct HSC comm cable. NOTE: Unit must be powered off before installing HSC adapter cable or PLIM.
501-07	HSC comm cable type does not match configuration. Transmit clock must be "external" for DTE cable. Transmit baud rate must be selected for DCE cable.	Reconfigure or install correct HSC comm cable.

LINCS Problem Determination

Code	Error Description	Recovery
503-01	Channel interface offline for IML.	No action is required.
503-02	Channel interface switched from online to offline.	Check for disconnected ESCON interface cable. B1 values: 0x19=System Reset command was received; 0x1A=LINCS issued invalid function instruction to adapter; 0x1B=No Light; 0x1C=Invalid; 0x1D=Channel Execute bit timeout(2 secs); 0x29=Channel Command failure after 3 retries
503-03	Online not connected.	Common condition if no device is powered on when the ESCON interface comes up. Ensure that at least one device is powered on.
503-04	Indicates that the ESCON interface was switched from online to offline.	Use the same sequence to switch the ESCON interface back online. <Alt><1><Enter> switches ESCON Channel 1 online, <Alt><2><Enter> switches ESCON Channel 2 online.
504-01	Disconnected (SDLC).	No action is required.
504-02	Disconnect received (SDLC, X.25). LINCS is waiting for the host to reopen the line.	No action is required.
504-03	Normal initialization sequence (X.21, X.25).	Initiate a call or wait for an incoming call.
504-04	X.21 Network problem.	No action is required. Contact the networking service provider if problem continues.
504-05	Maximum retries attempted (X.21).	Make sure connections to the X.21 modem are in place, and report the problem to the networking service provider if problem persists.
504-06	Character other than + or BELL received.	
504-07	CLEAR received (X.21).	No action is required.
504-08	Timeout occurs while attempting an OPEN function (X.21).	No action is required. Contact the data center or networking service provider if problem persists.
504-09	Write Halt X.21 short hold.	
505-01	Normal message after IML (SDLC, X.25). The host system must send a Set Normal Response (SNRM) for SDLC or Set Asynchronous Balanced mode for X.25.	No action is required.
505-01	Normal message after IML (SNA, non-SNA) or after switching channel interface switch Offline/Online switch to online.	Mode Set command required (Connect, Contact, SNRM, SABMS, etc.).
505-02	Control DISCONNECT command received while INITIALIZED but PU not active. Extended Data B1 = Channel address	No action is required. If failure continues, contact the host operator.
505-03	System Reset received	No action is required.
505-04	Control command received that was not CONNECT or DISCONNECT. Extended Data: B1-B4 = First four bytes of Link Header B5 = Channel Address	Connect command required. If failure continues, contact the system programmer.

Code	Error Description	Recovery
505-06	Invalid Control CONNECT command received. Extended Data: B1-B10 = Control CONNECT frame B11 = Channel Address	If failure continues, contact the system programmer.
505-07	Control CONNECT received while already initialized. Extended Data: B1 = Channel Address	Action required. If failure continues, contact the system programmer.
505-08	Control DISCONNECT command received while the PU was active. Extended Data: B1 = Channel address	Connect command required. If failure continues, contact the host operator.
505-10	Host activation. Activate physical unit (ACTPU) is required.	Contact the host operator.
506-01	Waiting for Data Communication Equipment (DCE) (X.25).	No action is required. This is normal at startup. If the 506-01 is displayed for an extended period of time, verify that the communication cable is connected and that the modem is powered on.
506-02	DCE not available.	
513-01	X.25 channel is not available. Possible Cause: Modem - Communication link	If an outgoing call was attempted, retry. If no outgoing call was attempted, wait for the network to retry.
513-02	X.25 call timeout.	No action is required. Host may be busy. Report problem to data center if problem persists.
520-01	Unexpected circuit event.	
531-01	Command Reject (SDLC). Possible Cause: NR sequence error Data with a command that does not require data Invalid command	No action is required. Host recoverable.
531-02	Interrupt not expected.	
531-51	A Negative Acknowledgment (NAK) has been transmitted. Possible Cause: Modem - Communication link	Verify that the modem and communication cables are functioning properly.
531-52	A Negative Acknowledgment (NAK) has been received. Possible Cause: Modem - Communication link	Verify that the modem and communication cables are functioning properly.
531-53	An Inquiry (ENQ) or Temporary Text Delay (TTD) has been received. Possible Cause: Temporary busy condition at the host Modem - Communication link	Verify that the modem and communication cables are functioning properly.

LINCS Problem Determination

Code	Error Description	Recovery
531-54	Overrun or underrun (BSC).	No action is required. Host recoverable. Report problem to service provider if problem persists.
531-55	CU sent WACK , got data. A WACK was sent to the host, but data was received anyway.	No action is required. Report problem if problem persists.
531-56	Write retry (SDLC). LINCS has to retransmit a previously transmitted message.	No action is required. The host forces retransmission.
531-57	Overrun (SDLC, X.21, X.25).	No action is required.
531-58	Underrun (SDLC, X.21, X.25).	No action is required.
531-59	Frame check sequence (FCS) error (SDLC, X.21, X.25).	No action is required.
531-60	Primary abort (SDLC, X.21, X.25).	No action is required.
531-61	No buffers available.	Report problem to MTX.
532-01	Count exceeded. Wrong length message (SDLC).	Host recovery.
532-02	Nonproductive (NPRO) timeout (SDLC). The host system is not sending any data to the LINCS node. This condition is reset upon receipt of a valid frame or a frame containing a poll. Possible Cause: Host Communication link Communication adapter	Verify that the modem and communication cables are functioning properly.
532-03	Idle timeout (SDLC). The host system is not sending any data to the LINCS node. This condition is reset upon receipt of a valid frame or a frame containing a poll. Possible Cause: Host Communication link Communication adapter	Verify that the modem and communication cables are functioning properly.
532-04	Connection problem (SDLC). Possible Cause: Communication link Communication adapter	Verify that the modem and communication cables are functioning properly.
532-05	Command reject.	No action required. Report as problem to data center or service provider if it persists.
532-10	The BSC line is idle. Possible Cause: Host Modem Communication link	Verify that the host, modem, and communication cables are functioning properly.
532-11	BSC retry count exceeded. Possible Cause: Modem Communication link	Verify that the host, modem, and communication cables are functioning properly.

Code	Error Description	Recovery
532-12	15 Negative Acknowledgments (NAKs) have been received. Possible Cause: Host Modem Communication link	Verify that the host, modem, and communication cables are functioning properly.
532-13	15 incorrect acknowledgments have been received. Possible Cause: Modem Communication link	Verify that the host, modem, and communication cables are functioning properly.
532-20	X.25 Receive timeout.	Wait. If the failure continues, verify that the X.25 network is operating properly.
532-21	X.25 packet timeout.	Wait. If the failure continues, verify that the X.25 network is operating properly.
532-22	SABM received when in ABM.	Wait. If the failure continues, verify that the X.25 network is operating properly.
532-23	Frame reject response (FRMR) received. Extended Data: B1-B3 = Frame reject response (FRMR). Possible Cause: Host Communication link	Wait. If the failure continues, verify that the X.25 network is operating properly. Refer to the X.25 protocol manual for details about this data.
532-24	Unexpected Unnumbered Acknowledgement received. A UA was received when with the current logical state would not expect one to be received.	Wait. If the failure continues, verify that the X.25 network is operating properly.
532-25	N(p) count exceeded.	Wait. If the failure continues, verify that the X.25 network is operating properly.
532-26	Invalid I-frame Frame Reject sent.	Wait. If the failure continues, verify that the X.25 network is operating properly.
532-38	Maximum link level retries have occurred.	Problem associated with the network having gone down. No action to take.
533-01	Clear packet sent. Packet or Logical Link Control (LLC) level error, or an incoming call was rejected. Extended Data: B1 = 00 B2 = diagnostic code (see DTE Diagnostic codes) B3,B4 = one of the following: 0000 LLC header when the diagnostic code equals 5X or 6X diagnostic modifier (see diagnostic modifier codes at the end of this chapter) Display data: LCCDD where: L = clear packet sent CC = 00 DD = diagnostic code (see DTE Diagnostic Codes)	If outgoing calls are allowed, initiate a call. If not, wait for an incoming call to reopen the circuit.

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Code	Error Description	Recovery
533-02	<p>Reset packet sent. Packet or Logical Link Control (LLC) level error.</p> <p>Extended Data: B1 = 00 B2 = diagnostic code (see DTE Diagnostic Codes) B3,B4 = one of the following: 0000</p> <p>LLC header when the diagnostic code equals 5X or 6X diagnostic modifier (see diagnostic modifier codes at the end of this chapter)</p> <p>Display data: MCCDD where: M = reset packet sent CC = 00 DD = diagnostic code (see DTE Diagnostic Codes)</p>	<p>Wait. If the failure continues, verify that the X.25 network is operating properly.</p>
533-03	<p>Restart packet sent. Packet or Logical Link Control (LLC) level error, or an incoming call was rejected.</p> <p>Extended Data: B1 = 00 B2 = diagnostic code (see DTE Diagnostic codes)</p> <p>Display data: NCCDD where: N = restart packet sent CC = 00 DD = diagnostic code (see DTE Diagnostic Codes)</p>	<p>Wait. LINCS is trying to recover.</p>
533-04	<p>Clear packet received.</p> <p>Extended Data: B1 = cause code (see Clear Packet Cause Codes) B2 = diagnostic code (see DCE Diagnostic Codes)</p> <p>Display data: PCCDD where: P = clear packet received CC = cause code (see Clear Packet Cause Codes) DD = diagnostic code (see DCE Diagnostic Codes)</p>	<p>If outgoing calls are allowed, initiate a call. If not, wait for an incoming call to reopen the circuit.</p>

Code	Error Description	Recovery
533-05	Reset packet received. Extended Data: B1 = cause code (see Reset Packet Cause Codes) B2 = diagnostic code (see DCE Diagnostic Codes) Display data: QCCDD where: Q = reset packet received CC = cause code (see Reset Packet Cause Codes) DD = diagnostic code (see DCE Diagnostic Codes)	Wait. LINCS is trying to recover.
533-06	Restart packet received. Extended Data: B1 = cause code (see Restart Packet Cause Codes) B2 = diagnostic code (see DCE Diagnostic Codes) Display data: RCCDD where: R = reset packet received CC = cause code (see Restart Packet Cause Codes) DD = diagnostic code (see DCE Diagnostic Codes)	Wait. LINCS is trying to recover.
540-01	BOC on Data (SNA/non-SNA). Extended Data: B1-B2 = Sense Data B3 = Channel Address	Possible channel cable or hardware problem. Request service.
540-02	BOC on Command. Extended Data: B1-B2 = Sense Data B3 = Channel Address	Possible channel cable or hardware problem. Request service.
540-03	Selective Reset Received. Extended Data B1-B2 = Current Processing State B3 = Channel Address	No action is required.
540-04	Data Streaming Error.	Possible channel cable or hardware problem or data rate incompatible. Request service.
540-07	Invalid Count on a Read Command. Extended Data: B1-B2 = Link Header Count B3-B4 = Transferred Count B5 = Channel Address	If failure continues, contact the system programmer.
540-08	Invalid Count on a Write, Write Break, or Control Command. Extended Data B1-B2 = Link Header Count B3-B4 = Transferred Count B5 = Channel Address	If failure continues, contact the system programmer.

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Code	Error Description	Recovery
540-09	Read retry. Extended Data: B1 = Channel Address B2 = 00 - Received same Read Start 01 - Old Read Chain never terminated	No action is required.
540-10	Invalid Write/Write Break Function Code Extended Data B1 = Channel Address B2 = Function Code	If failure continues, contact the system programmer.
540-20	Channel Overrun on a Write or Write Break Command (if Host Circuit PU and FIS or OIS should see 410-01 logged right behind this one) Extended Data. B1-B2 = Link Header Count B3-B4 = Transferred Count B5 = Channel Address	See 410-01.
540-21	Invalid Channel Command received (SNA) Logged by non-SNA as 401-02. Extended Data: B1-B2 = Sense Data B3 = Channel Address B4 = Command	If failure continues, contact the system programmer.
540-22	Interface Disconnect Received. Extended Data: B1-B2 = Current Processing State B3 = Channel Address B4 = Pending Channel Status (Zero if none)	No action is required.
540-23	PU2.1 command response timeout.	No action is required. Network has probably gone down.
540-24	PU 2.1 XID Negotiation error: B1 = Channel Address B2 = Error detected by flags 0x01 - Error detected in Upstream Node XID by LINCS 0x02 - Error detected by Upstream Node 0x03 - Error detected by Downstream Node XID by LINCS 0x04 - Error detected by Downstream Node B3-B4 = Byte offset to data in error B5 = Bit offset of data in error (IBM format) B6 = Data in error. B7 -B8 = SNA Sense Data B9-B10 = SNA Sense Data extension B11-B16 = Data in error	This may indicate a configuration problem in either the LINCS platform, or the one to which LINCS is communicating.
540-51	Command Retry Requested. Extended Data B1-B2 = Sense Data B3 = Channel Address	No action is required.

Code	Error Description	Recovery
540-80	This error occurs when a host attempts to establish an ESCON path for which LINCS is not configured.	Make the necessary configuration in LINCS, or change the host gen to remove the CNTLUNIT definition that is causing the problem.
540-81	A request to establish an ESCON path has been received, but the path has already been established by a different LPAR. B1=LPAR Number, B2=Source Link Address, B3=CU Image Number	This error indicates that Channel Path Filtering is incorrectly configured in LINCS or is not used, and the Device Candidate List has not been configured correctly in the host HCD. A proper configuration of either will resolve the problem.
540-82	ESCON Non-SNA Read Timeout	Enable RPQ to 'Reset Session on Non-SNA ESCON read timeout'.
540-83	Non-SNA Deferred Status Chain Error	Check for a printer device attempting to access a host session defined for a console display.
540-84	Logical Path Established	Normal event when a new channel path gets established. B1=LPAR Number, B2=Source Link Address, B3=CU Image Number
540-85	Logical Path Removed. B1=LPAR Number, B2=Source Link Address, B3=CU Image Number	Normal response to a 'Remove Logical Path' command from the host, and typically received when an LPAR is taken down or CHPID is brought down.
540-99	Last Channel Error repeated more than three consecutive times.	See last channel error code.
541-01	Intervention required.	
550-01	CALL CONNECT packet too big. (X.25)	If problem persists, contact MTX.
550-02	Throughput changed (X.25).	No action is required.
551-01	X.25 DIAG packet received.	No action is required.
551-02	X.25 packet discarded.	No action is required.
551-03	Exchange ID (XID) received (SDLC).	No action is required.
551-04	Xtest received (SDLC).	No action is required.
551-05	Xtest sent (SDLC).	No action is required.
551-12	Number of PVCs exceeds maximum. The network has attempted to activate a new PVC when 256 are in use. Extended Data B1-B2 = Engineering B3-B4 = DLCI number (decimal)	Change network subscription so that total number of PVCs assigned to this HSC is 256 or less. Another HSC may be installed to support additional PVCs.
552-01	PVC is up. Extended Data B1-B2 = DLCI number (decimal)	No recovery required.
552-03	PVC is down. Extended Data B1-B2 = DLCI number (decimal)	Contact network administrator if problem persists.
553-01	A CALL is being established (X.21, X.25).	No action is required.
553-10	X.25 DIAL (terminal is dialing host)	No action is required.
553-11	The dial screen has been activated (X.21, X.25).	No action is required.

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Code	Error Description	Recovery
553-20	X.25 disconnect in progress.	No action is required.
560-01	CALL progress of 2X or 6X.	No action is required.
560-03	Character other than + or BELL.	No action is required.
560-04	Unexpected X.21 condition	No action is required. Report problem to MTX if problem is persistent.
561-01	CALL progress of 0X.	No action is required.
561-02	X.21 format error.	No action is required.
561-03	No buffer for received data.	No action is required. Report problem to MTX if problem is persistent.
562-01	Call progress signal received.	No action is required.
562-02	X.21 network not ready.	Check condition of X.21 modem and cable connections.
562-03	X.21 CLEAR timeout.	No action is required.
563-01	XID error at connect time.	Verify configuration at both ends of the network.
563-02	XID error at reconnect time.	
571-01	DAP: DSR not present. Possible Cause: Communication cable Modem	Verify that the modem and communication cables are functioning properly.
571-02	DAP: CTS not present. Possible Cause: Communication cable Modem	Verify that the modem and communication cables are functioning properly.
571-04	DAP: TX timeout: no TXclk. Possible Cause: Communication cable Modem	Verify that the modem and communication cables are functioning properly.
571-57	DAP: Receiver overrun.	No action required.
571-58	DAP: Transmitter underrun.	No action required.
571-59	DAP: Received CRC error.	No action required.
571-60	DAP: Received frame aborted.	No action required.
572-01	DAP: Received frame greater than 521.	Host recovery.
573-01	DAP: Unexpected SNRM.	Contact the network manager.
573-02	DAP: Unexpected DISC.	Contact the network manager.
573-03	DAP: Unexpected TEST.	Contact the network manager.
573-04	DAP: Unexpected XID.	Contact the network manager.
573-05	DAP: Unexpected GRP POLL.	Contact the network manager.
573-06	DAP: Received DM response.	Contact the network manager.
573-07	DAP: Received FRMR response. Extended Data: B1-B3 = Frame reject response (FRMR).	Contact the network manager.
573-08	DAP: FRMR sent. Extended Data B1 - B3 = FRMR data	Contact the network manager.
573-09	DAP: Unexpected poll received	Contact the network manager.
574-01	DAP: RETRY count exceeded.	Contact the network manager.
574-02	DAP: RNR count exceeded.	Contact the network manager.

Code	Error Description	Recovery
575-01	Reset Downstream selected on the Gateway Circuits Status panel of Central Control Mode.	This was initiated by the LINCS Administrator.
575-02	Reset Upstream selected on the Gateway Circuits Status panel of Central Control Mode.	This was initiated by the LINCS Administrator.
575-03	Request Discontact selected on the Gateway Circuits Status panel of Central Control Mode.	This was initiated by the LINCS Administrator.
580-01	<p>A failure occurred while attempting to open the adapter during the ring insertion process.</p> <p>Extended Data: B1 = XY X, the open command phase, is defined as: 1 = lobe media test 2 = physical insertion 3 = address verification 4 = participation in ring poll 5 = request initialization</p> <p>Y, the open error code, is defined as: 1 = function failure 2 = signal loss 3 = wire fault 4 = frequency error 5 = timeout 6 = ring failure 7 = ring beaconing 8 = duplicate node address 9 = request parameters A = remove received</p> <p>Possible Cause: - Token Ring cables - Media access unit (MAU) - Token Ring adapter</p>	Re-IML. If the failure continues, troubleshoot the Token Ring for the possible causes shown below.
580-02	Token Ring OPEN failure: ring protocol errors	Check LAN with sniffer if available. Check for errors.
580-03	<p>An attempt to open the adapter during the ring insertion process failed due to ring beaconing.</p> <p>Extended Data: Refer to extended data information for error code 580-01 Possible Cause: - Token Ring cables - Media access unit (MAU) - Token Ring adapter</p>	Re-IML. If the failure continues, troubleshoot the Token Ring for the possible causes shown below.
580-04	<p>An attempt to open the adapter during the ring insertion process failed. The adapter received a Remove Station frame.</p> <p>Extended Data: Refer to extended data information for error code 580-01 Possible Cause: - The network manager issued the remove command</p>	Contact the network manager.

LINCS Problem Determination

Code	Error Description	Recovery
580-05	A wire fault has been detected. Possible Cause: Token Ring cables Media access unit (MAU) Token Ring adapter	Verify that all cables and connections are secure. If the failure continues, troubleshoot the Token Ring for the possible causes shown below.
580-06	The Token Ring adapter has detected an internal error and removed itself from the ring.	Replace the Token Ring adapter.
580-07	A Remove Station frame has been received. Possible Cause: - The network manager issued the remove command	Contact the network manager.
580-08	Token Ring failure.	Contact your service representative.
580-10	Token Ring failure.	Contact your service representative.
580-11	Token Ring BUD failure.	Replace the Token Ring adapter.
580-12	Token Ring BUD failure.	Replace the Token Ring adapter.
580-13	Token Ring init failure.	Replace the Token Ring adapter.
580-14	Token Ring command failure.	Contact your service representative.
580-15	Software initiated close.	No action is required.
580-16	Token Ring issue CMD failure: command reject	
580-58	Token Ring - temporary beaconing condition.	
581-01	Duplicate Address Test (DAT) failure. A duplicate address has been detected on the Token Ring/Ethernet. Extended Data: B1-B6 = Token Ring/Ethernet address	Each node on the Token Ring Ethernet must be assigned a unique address. Reconfiguration may be required.
581-21	Ethernet - TCP/IP failure due to duplicate address detected.	Change the address of LINCS platform or the other station with the same address.
583-02	A Frame Reject (FRMR) frame was transmitted. Extended Data: B1-B2 = link number B3-B8 = remote station TR/ETH address B9 = remote station SAP B10-B16 = Frame Reject data	No action is required.
583-03	A DM or DISC frame was received. Extended Data: B1-B2 = link number B3-B8 = remote station TR/ETH address B9 = remote station SAP	No action is required.
583-04	A Frame Reject (FRMR) frame was received. Extended Data: B1-B2 = link number B3-B8 = remote station TR/ETH address B9 = remote station SAP B10-B16 = Frame Reject data	No action is required.

Code	Error Description	Recovery
583-05	A Set Asynchronous Balanced Mode (SABME) frame was received by a connected station. Extended Data: B1-B2 = link number B3-B8 = remote station TR/ETH address B9 = remote station SAP	No action is required.
583-07	Token Ring - T1 timeout.	If persistent, increase the value of the T1 timer in the LINCOS configuration. Check the T1 timer setting of the station that LINCOS is communicating with too.
583-08	Inactivity timer (T1) expired. Extended Data: B1-B2 = link number B3-B8 = remote station TR/ETH address B9 = remote station SAP	No action is required.
583-09	Unsuccessful link recovery. Extended Data: B1-B2 = link number B3-B8 = remote station TR/ETH address B9 = remote station SAP	No action is required.
583-21	SSP: I frame counter overflow. Extended Data: B1-B10 = data link ID	No action is required.
583-22	SSP: TCP connection lost. Extended Data: B1-B10 = data link ID	No action is required.
583-23	SSP: HALF_DL received. Extended Data: B1-B10 = data link ID	No action is required.
583-25	SSP: RELSTART_DL received. Extended Data: B1-B10 = data link ID	No action is required.
583-27	SSP: CONTACT received. Extended Data: B1-B10 = data link ID	No action is required.
583-28	SSP: Invalid event or command. Extended Data: B1-B10 = data link ID	No action is required.
583-xx	These LLC events will be logged as they are for LAN boards except B3-B6 is undefined and B7-B8 is the DLCI number in decimal. Extended Data B1-B2 = Engineering use B3-B6 = undefined B7-B8 = DLCI number (decimal)	Same as currently specified.

LINCS Problem Determination

Code	Error Description	Recovery
584-01	<p>I-frame counter overflow.</p> <p>Extended Data:</p> <p>B1-B2 = link number</p> <p>B3 = counter that overflowed where:</p> <ul style="list-style-type: none"> - 01 = T1 timer expiration counter - 04 = I-frame transmit counter - 05 = I-frame receive error counter - 09 = I-frame transmit error counter - 0A = I-frame receive counter <p>B4-B5 = number of I-frames transmitted</p> <p>B6-B7 = number of I-frames received</p> <p>B8 = number of I-frames transmitted with errors</p> <p>B9 = number of I-frames received with errors</p> <p>B10-B11 = number of T1 timer expirations</p>	No action is required.
584-02	<p>Receive congestion counter overflow.</p> <p>Extended Data:</p> <p>B1-B2 = link number</p> <p>B3 = line errors counter</p> <p>B4 = internal errors counter</p> <p>B5 = burst errors counter</p> <p>B6 = ARI/FCI errors counter</p> <p>B7 = abort delimiter counter</p> <p>B8 = reserved</p> <p>B9 = lost frame counter</p> <p>B10 = receive congestion counter</p> <p>B11 = frame copied errors counter</p> <p>B12 = frequency errors counter</p> <p>B13 = token errors counter</p>	No action is required.
584-03	<p>Error counter other than the receive congestion counter overflowed.</p> <p>Extended Data:</p> <p>B1-B2 = link number</p> <p>B3 = line errors counter</p> <p>B4 = internal errors counter</p> <p>B5 = burst errors counter</p> <p>B6 = ARI/FCI errors counter</p> <p>B7 = abort delimiter counter</p> <p>B8 = reserved</p> <p>B9 = lost frame counter</p> <p>B10 = receive congestion counter</p> <p>B11 = frame copied errors counter</p> <p>B12 = frequency errors counter</p> <p>B13 = token errors counter</p>	No action is required.
584-20	<p>Success Counter overflow.</p> <p>Extended Data:</p> <p>B1 = counter that overflowed</p> <ul style="list-style-type: none"> - 01 = successful transmissions - 02 = successful receptions 	No action is required.

Code	Error Description	Recovery
584-21	Error counter overflow. Extended Data: B1 = which counter overflowed 01 = transmissions with collisions 02 = deferred transmissions 03 = late collisions 04 = excessive collisions 05 = excessive deferrals 06 = internal transmission errors 07 = receive CRC errors 08 = frame alignment errors 09 = internal receive errors	Contact network manager about potential wiring problems.
584-30	Line Counters cleared by user	No action is required
584-31	This event is logged whenever the user clears the Frame Relay line counters in test mode.	No action is required
584-32	This event is logged whenever the user clears the Frame Relay PVC counters in test mode. Extended Data B1-B2 = DLCI number (decimal)	No action is required
589-01	IPX packets discarded counter overflow. 256 IPX packets have been discarded. Extended Data: B1-B4 = IPX network number B5 = IPX line number B6 = IPX MAC layer protocol B7-B8 = IPX packets discarded total	See "Communications Menu," in your Configuration and Central Control Manual for more information on the Display/Update IPX Network Status Central Control Utility.
589-02	IPX router reset. Logged when the Reset IPX Router Central Control Utility is used to reset the IPX router.	See your Configuration and Central Control Manual for more information.
589-03	IPX link up. Indicates that a LAN adapter connection to the network has been made available.	See your Configuration and Central Control Manual for more information.
589-04	IPX link down. Indicates that a LAN adapter connection to the network has been made unavailable.	See your Configuration and Central Control Manual for more information.

LINCS Problem Determination

Code	Error Description	Recovery
589-05	<p>IPX network number conflict. Indicates that another IPX node on a direct connect network segment is sending IPX packets which indicate a network number that conflicts with the network number configured on this IPX router. Either the sending node or this IPX router is configured incorrectly. Extended data indicates the node address and network number of the node in question.</p> <p>Extended Data: B1 = IPX line number B2 = IPX MAC layer protocol 01 = Ethernet version 2 02 = Ethernet 802.3 03 = 802.2 04 = SNAP B3-B8 = Source node address B9-B12 = Configured IPX network number B13-B16 = Detected IPX network number</p>	See your Configuration and Central Control Manual for more information.
589-11	<p>RIP packet discarded. Indicates that a RIP packet has been received which contains an invalid packet format.</p> <p>Extended Data: B1 = RIP packet discarded cause 00 - Invalid packet length 01 - Invalid RIP operation field B2 = Undefined B3-B4 = Packet length if B1 is invalid packet length B5-B8 = Source network B9-B14 = Source node B15-B16 = Source socket</p>	See your Configuration and Central Control Manual for more information.
589-21	<p>SAP packet discarded. Indicates that a SAP packet has been received which contains an invalid packet format.</p> <p>Extended Data: B1 = SAP packet discarded cause 00 = Invalid packet length 01 = Invalid SAP operation field B2 = Undefined B3-B4 = Packet length if B1 is invalid packet length B5-B8 = Source network B9-B14 = Source node B15-B16 = Source socket</p>	See your Configuration and Central Control Manual for more information.
589-30	IP Router restarted	No action is required
589-31	IP Router Line Counter reset/cleared	No action is required
589-50	SPX Invalid Connect ID Received	
589-51	SPX Invalid Connect ID to Xmit	
589-52	SPX Connect failed, no SCE	

Code	Error Description	Recovery
589-60	SAA Invalid connection ID received	
589-61	SAA Invalid DGRID received	
589-62	SAA Invalid QEL Cmd received	
589-63	SAA Invalid ID for disconnect	
589-64	SAA Connection ID in use	
590-01	DFT has not been polled.	
591-01	ESCON Failed interactive diagnostic	Replace the ESCON adapter.
591-02	ESCON Failed Loopback test	Replace the ESCON adapter.
595-01	Failover Primary Host Circuit is Idle.	Normal state before PU has been activated, or if Failover Backup Host Circuit is active.
595-02	Failover Backup Host Circuit is Idle.	Normal state before PU has been activated, or if Failover Primary Host Circuit is active.
595-03	Failover Primary Host Circuit is Active.	Normal operational state for a Host Circuit that is configured to be a Failover Primary Host Circuit.
595-04	Failover Backup Host Circuit is Active.	Normal operational state for a Host Circuit that is configured to be a Failover Backup Host Circuit, if the Failover Primary host has become inactive.
599-01	LOCAL mode.	No action is required.

6XX Category Online Error Codes

Category 6XX error codes indicate error conditions identified by the DFT on which the codes are displayed. These error situations are usually device related but may also include reference to the DSL disk for those DFTs that must have the code down-loaded from the LINCS node. Other than the DSL media, the 6XX category of error codes does not usually indicate a LINCS based problem.

Code	Error Description	Recovery
610	The LINCS node is not ready.	Check that the DSL diskette is installed in the LINCS node. Ensure that the proper DSL files for this type of DSL device are on the disk. IML. Power off/on the device. Check for coax cable problem.
611	Diskette file ID does not match.	Same as above.
612	Diskette file is destroyed.	Power off/on the device. Wait 2 minutes.
613	Diskette language ID is not supported.	Check configuration of DSL and verify that language matches that of LINCS.
614	Diskette language ID does not match the attached keyboard type.	Verify that keyboard attached is supported by the language configured in the DFT.
615	Invalid completion code.	Press Reset and retry the operation.
616	Invalid TCA interrupt 1.	Power off/on the device.
617	Invalid TCA interrupt 2.	Power off/on the device.
618	Invalid external interrupt.	See the IBM 3179-G Operator Reference and Problem Solving Guide (GA18-2271).
619	Invalid mail parameter.	See the IBM 3179-G Operator Reference and Problem Solving Guide (GA18-2271).
620	Invalid keyboard scan code.	Press Reset and retry the operation.
621	Keyboard parity error.	See the IBM 3179-G Operator Reference and Problem Solving Guide (GA18-2271).

Code	Error Description	Recovery
622	Keyboard timeout.	Same as above.
628	Mail queue overflow.	Same as above.
629	Error log overflow.	Same as above.
630	Unknown diskette or hardware error.	Press Reset and retry the operation.
631	Diskette file not found.	Press Reset and retry the operation. Verify that the correct diskette is in the drive.
632	Diskette media error.	Press Reset and retry the operation. Verify that the correct diskette is in the drive. You may check the directory of the disk on a PC to verify quality. Replace diskette if problem continues.
633	Diskette overrun.	Press Reset and retry the operation.
634	Unable to write diskette file.	Ensure that the proper diskette is installed.
635	Diskette not ready.	Verify that the correct diskette is installed. Press Reset and retry the operation.
636	Diskette file locked (another operator is using the file).	Press Reset and retry the operation when the other operator is finished.
637	Diskette file overflow.	Press Reset and retry the operation.
638	Not able to read the diskette file.	Press Reset and retry the operation.
639	Diskette file not locked.	Press Reset and retry the operation.
640	Incorrect diskette in the LINCS node.	Insert the correct DSL diskette. Press Reset and retry the operation.
641	Mouse parity error/overrun.	Press Reset and retry the operation.
642	Mouse timeout.	Press Reset and retry the operation.
643	Mouse failure.	Press Reset and retry the operation.
644	Mouse invalid data.	Press Reset and retry the operation.
645	Printer error.	Verify that the printer is powered on and in ready mode. Ensure that interface cable is properly seated. Press Reset and retry the operation.
646	Printer out of paper.	Insure that paper is installed in the printer. Press Reset and retry the operation.
648	Expansion unit interrupt error.	Insure that the cabling is properly seated between the base unit and the expansion unit. Press Reset and retry the operation.
649	Expansion unit timeout.	Insure that the cabling is properly seated between the base unit and the expansion unit. Press Reset and retry the operation.
651	Permanent RAM parity error.	Power off/on the device. Wait 2 minutes or until the device has completely booted.
653	Permanent RAM parity error.	Same as above.
654	LINCS node to device protocol error.	Verify that the protocol (SNA/BSC) matches the LINCS node's configuration.
656	Ready timeout error.	Power off/on the device and wait 2 minutes or until the device has completely booted.
660	Microcode divide by zero error.	Problem is in the DFT microcode. Power off/on the device and wait 2 minutes or until the device has completely booted. Report problem to DFT vendor.

Code	Error Description	Recovery
661	Microcode overflow error.	Same as above.
662	Microcode error.	Same as above.
663	Microcode invalid jump error.	Same as above.
664	Microcode invalid interrupt error.	Same as above.
665	Microcode error.	Same as above.
670	Keyboard error.	Problem may be in DFT keyboard. Power off the device and wait 2 minutes or until the device has completely booted and attempt keyboard operation again.
697	Expedited status queue overflow.	Problem is in the DFT and/or DFT microcode. Power off/on the device and wait 2 minutes or until the device has completely booted. Report problem to DFT vendor.
698	Asynchronous status queue overflow.	Same as above.
699	Undetermined error.	Same as above.

7XX Category Online Error Codes

Category 7XX errors only occur on a DFT device and are errors detected by the DFT device. LINCS has nothing to do with the error codes of this category. These errors typically indicate a problem in the protocol of the host datastream being sent to the DFT. These problems may be a result of an error in the host application, an error in the host gen, or a soft error in the DFT programming. Errors occurring of this type should be reported to the host programmer. A data trace of the host link may be required. This can be done by using the LINCS monitor facilities, by using a datascope/data monitoring device, or by taking the appropriate data trace at the host. Recovery procedures in all cases is to Press Reset and retry the operation. If the problem continues, advise the customer's application programmer.

Code	Error Description
701	Category not supported. SNA sense = 1007
702	RU of 1536 bytes or more received. (SNA buffer overrun.) SNA sense = 1002
703	Function not supported. Indicates unsupported session control request, unsupported data flow request, or invalid signal request code. SNA sense = 1003 BSC sense = Op Check
704	Format indicator (FI) bit not allowed. SNA sense = 400F
705	Sequence number error. SNA sense = 2001
706	Chaining error. SNA sense = 2002
707	Bracket state error. SNA sense = 2003
708	Data traffic reset state. SNA sense = 2005
709	HDX error. SNA sense = 2004
711	Session limit exceeded. SNA sense = 0805
712	Bracket bid reject. SNA sense = 0813
713	Session already bound. SNA sense = 0815
714	No LU-LU session established. SNA sense = 8005
715	LU not active. SNA sense = 8009
716	Not enough bytes in BIND RU. SNA Sense = 0821
717	Invalid support level (Bind bytes 1-3). SNA Sense = 0821
718	Invalid PLU protocol (Bind byte 4). SNA Sense = 0821

Code	Error Description
719	Invalid SLU protocol (Bind byte 5). SNA Sense = 0821
720	Invalid common protocol (Bind bytes 6-7). SNA Sense = 0821
721	Less than 64-byte RU length specified (Bind byte 10). SNA Sense = 0821
722	Invalid combination of outbound Pacing count and maximum outbound RU size. SNA Sense = 0821
723	Invalid LU type (Bind byte 14). SNA Sense = 0821
724	Invalid screen size (Bind bytes 20-24). SNA Sense = 0821
725	Cryptography not supported (Bind byte 26). SNA Sense = 0821
726	Negative SNA response from host.
727	SNA exception request received.
728	RM, RMA, or RB command or Read Partition SF type received with EB and/or CD. SNA sense = 0829
729	Read Partition SF received in retry state. SNA sense = 0871 BSC sense = Op Check
747	Invalid FM Header. SNA sense = 1008
750	Invalid command received. SNA sense = 1003
751	SFE, MF, or SA order with invalid character set value in range hex 01-FE. SCS invalid CS value. SNA sense = 0863 BSC sense = Op Check
752	Invalid address received following SBA, RA, or EUA order or MF order addressed to notified attribute location. SNA sense = 1005 BSC sense = Op Check
753	Data follows RM, RMA, or EUA order. GE or RA order received with invalid character. SFE, MF, or SA order with invalid attribute value for highlight or color or character set value of hex FF. SNA sense = 1005 BSC sense = Op Check
753	SCS invalid order/SA parameter. SNA sense = 1003
754	Datastream ended before all required bytes for SBA, RA, EUA, SF, SFE, MF, SA, or GE order were received. SCS incomplete order. SNA sense = 1005 BSC sense = Op Check
755	Invalid order received (EBCDIC value less than hex 40 is not recognized). SNA sense = 1003 BSC sense = Op Check
756	Invalid SF type. SF type not supported for current configuration. SNA sense = 1003 BSC sense = Op Check
757	Load PS SF with invalid PS alias. Load PS SF load type not supported. SNA sense = 1003 BSC sense = Op Check
758	Set reply mode SF received with invalid mode. SNA sense = 1003 BSC sense = Op Check
759	Read partition SF not last SF. SF type incomplete. Length invalid. Set Reply mode SF with Field/Ext Field mode and data following SF. Length 0000 but not last SF. Load PS SF length error. SNA sense = 1005 BSC sense = Op Check
760	Erase/reset SF reserved fields not zero. Set reply mode SF attribute type reserved. SNA sense = 1003 BSC sense = Op Check
761	SF type PID invalid. Query PID is not hex FF. SNA sense = 1005 BSC sense = Op Check
762	Create Partition SF parameter error. SNA sense = 1005 BSC sense = Op Check
764	Load PS SF addressed PS invalid. Load PS SF extension invalid color bits. SNA sense = 084C BSC sense = Op Check
765	Load PS SF with invalid load start point, invalid code point of hex FF, contains too many symbol definitions. SNA sense = 1005 BSC sense = Op Check
766	Load PS SF with incomplete PS cell data, with invalid end flag for type 2 PS, with invalid type 2 header (end flag encountered and not end of data). SNA sense = 1005 BSC sense = Op Check
767	Create Partition SF with invalid address mode, with bits 0-3 of byte 4, not zero. SNA sense = 1003 BSC sense = Op Check

Code	Error Description
768	Load PS SF extension invalid x units, invalid y units, invalid extended parameter length, or extended parameter length missing. Ending code point value less than starting code point. SNA sense = 1005 BSC sense = Op Check
769	Load PS SF extension with invalid byte 8 (bits 3-7 not zero), byte 11 not zero, or invalid byte 12 (bits 5-7 not zero). SNA sense = 1003 BSC sense = Op Check
770	Outbound 3270DS SF with a Start Print bit in WCC, but not the last Structured Field. SNA sense = 1001 BSC sense = Op Check
771	Invalid command in Structured Field. SNA sense = 1003 BSC sense = Op Check
772	Requested resource is unavailable. SNA sense = 084B BSC sense = Op Check
773	Invalid SF following a Destination/Origin SF. SNA sense = 1005 BSC sense = Op Check
779	LU1 Pacing Algorithm overrun. SNA sense = 0801
780	Miscellaneous Graphics Program Check. OEM Data, Graphic Data, Picture, or Control SF, spanning SF inconsistency. SNA sense = 1003/1005 BSC sense = Op Check
781	Graphic Drawing Processor Check. Drawing Order error. SNA sense = 1003/1005 BSC sense = Op Check
782	Graphic Procedure Processor Check. Procedural Instruction error. SNA sense = 1003/1005 BSC sense = Op Check
791	SCS Invalid ESC command. SNA sense = 1005
792	SCS Invalid SVF/SHF parameter. SNA sense = 1005
793	SCS Invalid SLD parameter. SNA sense = 1005
794	SCS Invalid VCS parameter. SNA sense = 1005
795	WCC with Error. BSC sense = Op Check

Async ASCII Events

The following presents events logged onto the Online ASCII Event Log. There are no error codes associated with these events. The ASCII Events Log displays only the last 16 events with each being identified by the first letter of the error type (ex., "F" for a frame error).

Event	Description	Recovery
Frame Error	Data frame error (no Stop bit).	Check wiring and/or configuration.
Parity Error	Data parity error.	Check wiring and/or configuration.
Overrun	Line receive.	Check wiring and/or configuration.
Xmit Error	Internal queue.	Check flow control.
Special Error	Internal queue.	Check flow control.

X.25 Cause and Diagnostic Codes

In the status line of a display connected to the LINCS node that is configured for X.25, you may find Call Progress status symbols in the format:

-/_ Lcddd

This consists of the Z shaped communications symbol followed by one of the letters L, M, N, P, Q, or R, which in turn is followed by a 4-digit hex code in the format *ccdd*, where *cc* is the

Cause Code and *dd* is the Diagnostic Code. The letter codes L, M, N, P, Q, R translate as indicated below:

- L = Clear Packet Transmitted
- M = Reset Packet Transmitted
- N = Restart Packet Transmitted
- P = Clear Packet Received
- Q = Reset Packet Received
- R = Restart Packet Received

Charts listing the definition of the Cause Codes and Diagnostic Codes are found on the next few pages. Use these charts and the definitions above to translate the Call Progress status message.

As an example, a Call Progress message of L0000 translates to:

A Clear Packet was transmitted.

A Clear Packet Cause Code of 00 = From the DTE (LINCS).

A DTE Diagnostic Code of 00 = Normal Operation (Disc Key sequence was pressed).

Clear Packet Cause Codes

Code	Description
00	From DTE (not from network)
01	Number busy
03	Invalid facility requested
05	Network congestion
09	Out of order
0B	Access barred
0D	Not obtainable (wrong HNAD)
11	Remote procedure error
13	Local procedure error
15	RPDA out of order
19	Reverse-charging facility not subscribed
21	Incompatible destination
29	Fast-select facility not subscribed

Notes:

1. If a Clear Packet Cause Code = 00, the packet was generated by the DTE; LINCS (L) or the Host - NPSI (P). If the Clear Packet has a value other than 00, then the packet was generated by the DCE (X.25 Network).
2. If LINCS sends the Clear Packet, a 533-01 Online Status message is posted on the LCD of the LINCS node.
3. If LINCS receives the Clear Packet, a 533-04 Online Status message is posted on the LCD of the LINCS node.

Reset Packet Cause Codes

Code	Description
00	From DTE (not from network)
01	Out of order
03	Remote procedure error
05	Local procedure error
07	Network congestion
09	Remote DTE operational
0F	Network operational
11	Incompatible destination

Notes:

1. If a Reset Packet Cause Code = 00, the packet was generated by the DTE; LINCS (M) or the Host - NPSI (Q). IF the Reset Packet has a value other than 00, then the packet was generated by the DCE (X.25 Network).
2. If LINCS sends the Reset Packet, a 533-02 Online Status message is posted on the LCD of the LINCS node.
3. If LINCS receives the Clear Packet, a 533-05 Online Status message is posted on the LCD of the LINCS node.

Restart Packet Cause Codes

Code	Description
01	Local procedure error
03	Network congestion
07	Network operational

DCE Diagnostic Codes (from DCE)

Code	Description
00	No additional information
01	Invalid P (send)
02	Invalid P (receive)
10	Invalid packet type - general
11	Invalid packet type for state R1 (layer 3 ready)
12	Invalid packet type for state R2 (DTE awaiting RESTART confirmation)
13	Invalid packet type for state R3 (DCE awaiting RESTART confirmation)
14	Invalid packet type for state P1 (ready - no call in existence)
15	Invalid packet type for state P2 (DTE awaiting CALL acknowledgment)
16	Invalid packet type for state P3 (DCE awaiting CALL acknowledgment)
17	Invalid packet type for state P4 (data transfer)
18	Invalid packet type for state P5 (CALL collision)
19	Invalid packet type for state P6 (DTE awaiting CLEAR confirmation)
1A	Invalid packet type for state P7 (DCE awaiting CLEAR confirmation)
1B	Invalid packet type for state D1 (flow control ready)
1C	Invalid packet type for state D2 (DTE awaiting RESET confirmation)
1D	Invalid packet type for state D3 (DCE awaiting RESET confirmation)

Code	Description
20	Packet not allowed - general
21	Packet not allowed - unidentifiable
22	Packet not allowed - call on one-way circuit
23	Packet not allowed - invalid packet type on PVC
24	Packet not allowed - packet on unassigned LCN
25	Packet not allowed - reject not subscribed
26	Packet not allowed - packet too short
27	Packet not allowed - packet too long
28	Packet not allowed - invalid GFI
29	Packet not allowed - restart with nonzero GFI
2A	Packet not allowed - packet type incompatible with facility
2B	Packet not allowed - unauthorized INTERRUPT confirmation
2C	Packet not allowed - unauthorized INTERRUPT
30	Timer expired - general
31	Timer expired - incoming call
32	Timer expired - CLEAR indication
33	Timer expired - RESET indication
34	Timer expired - RESTART indication
40	CALL setup problem - general
41	CALL setup problem - facility code not allowed
42	CALL setup problem - facility parameter not allowed
43	CALL setup problem - invalid called DTE address
44	CALL setup problem - invalid calling DTE address
50	CALL clearing problem - general
51	CALL clearing problem - nonzero address lengths field
52	CALL clearing problem - nonzero facility lengths field

DTE Diagnostic Codes (from DTE)

Code	Description
00	Normal operation
0C	Invalid LLC type (PSH:C2 QLLC:C3)
10	Invalid packet type - general
11	Invalid packet type for state R1 (layer 3 ready)
12	Invalid packet type for state R2 (DTE awaiting RESTART confirmation)
13	Invalid packet type for state R3 (DCE awaiting RESTART confirmation)
14	Invalid packet type for state P1 (ready - no call in existence)
15	Invalid packet type for state P2 (DTE awaiting CALL acknowledgment)
16	Invalid packet type for state P3 (DCE awaiting CALL acknowledgment)
17	Invalid packet type for state P4 (data transfer)
18	Invalid packet type for state P5 (CALL collision)
19	Invalid packet type for state P6 (DTE awaiting CLEAR confirmation)
1A	Invalid packet type for state P7 (DCE awaiting CLEAR confirmation)
1B	Invalid packet type for state D1 (flow control ready)
1C	Invalid packet type for state D2 (DTE awaiting RESET confirmation)

LINCS Problem Determination

Code	Description
1D	Invalid packet type for state D3 (DCE awaiting RESET confirmation)
20	DCE timer expired - general
21	DCE timer expired - incoming call
22	DCE timer expired - CLEAR indication
23	DCE timer expired - RESET indication
24	DCE timer expired - RESTART indication
30	DTE timer expired - general
31	DTE timer expired - incoming call
32	DTE timer expired - CLEAR indication
33	DTE timer expired - RESET indication
34	DTE timer expired - RESTART indication
50	QLLC error - general
51	QLLC error - undefined C field
52	QLLC error - unexpected C field
53	QLLC error - missing I field
54	QLLC error - undefined I field
55	QLLC error - I field too long
56	QLLC error - QFRMR received
57	QLLC error - invalid QLLC header
58	QLLC error - data received, not in info transfer state
59	QLLC error - timeout condition
60	PSH error - general
61	PSH error - sequence error
62	PSH error - PS header too short
63	PSH error - PSH format invalid
64	PSH error - command undefined
65	PSH error - invalid PSH protocol
66	PSH error - data received, not in info transfer state
67	PSH error - timeout condition
A0	Packet not allowed - general
A1	Packet not allowed - invalid M bit packet sequence
A2	Packet not allowed - invalid packet type received
A3	Packet not allowed - invalid packet on PVC
A4	Packet not allowed - packet on unassigned LCN
A5	Packet not allowed - diagnostic packet received
A6	Packet not allowed - packet too short
A7	Packet not allowed - packet too long
A8	Packet not allowed - invalid GFI
A9	Packet not allowed - not identifiable
AA	Packet not allowed - not supported
AB	Packet not allowed - invalid P (send)
AC	Packet not allowed - invalid P (receive)
AD	Packet not allowed - invalid D bit received
AE	Packet not allowed - invalid Q bit received
C1	Termination pending

Code	Description
C2	Channel inoperative
C3	Unauthorized INTERRUPT confirmation
C4	Unauthorized INTERRUPT request
C5	PVC resource not available
D0	Resource not available - general
D1	Resource not available - buffers depleted
D2	Resource not available - PIU too long
E0	Local procedure error - general
E1	Local procedure error - packet received with nonzero LCN
E2	Local procedure error - RESTART or DIAGNOSTIC with nonzero LCN
E3	Local procedure error - incoming CALL on wrong LCN
E4	Local procedure error - facility not subscribed
E5	Local procedure error - invalid packet for LCN 0
E6	Local procedure error - facility parameters not supported
E7	Local procedure error - facility not supported
E8	Local procedure error - unexpected calling DTE address
E9	Local procedure error - invalid D bit received
EA	Local procedure error - RESET indication on CALL
EB	Local procedure error - invalid protocol identifier
EC	Local procedure error - connection identifier mismatch
F0	Remote procedure error - general

Diagnostic Code Modifiers

Code	Description
0000	No additional information
0001	Calling DTE address is missing
0002	Calling DTE address mismatch
0003	Unexpected facility (other than RPOA)
0004	Reserved
0005	Facility included but not configured
0006	Incoming CUG mismatch
0007	Reverse charging requested but not configured
0008	Reverse charging not requested but configured
0009	Window size negotiated but not configured
0010	CID mismatch because CID not included
0011	CID mismatch
0012	Protocol ID not included (PSH:C2 or QLLC:C3)
0013	Protocol ID mismatch
0014	CUG not included
0015	Throughput Class facility expected, but not included
0016	Reserved
0017	Reverse-charge facility expected, but not included

APPN Problem Determination Messages

Introduction

This section lists all the audit, exception and problem log messages produced by APPN components to help diagnose operating problems. Each message described contains the following information.

- Message code
- Subcode
- Call type

Problem and exception calls (but not audit calls) also contain the following.

- Cause type
- Cause
- Effect
- Action
- Message text associated with the code

APPN Message

These fields are described below.

Message Code	This field identifies the call.
Subcode	The subcode is an internal identifier which uniquely identifies the point at which the audit, exception or problem occurred within the software. This is so that Data Connection support personnel can go straight to the point in the code at which the problem occurred. This document does not list the possible subcodes for each message. Note: These are currently set to zero, and will not be found in the Message Formats section.
Call Type	The Call Type specifies the type of the problem determination call. The type can be one of the following: <ul style="list-style-type: none"> • Problem • Exception • Audit
Cause Type	The Cause Type identifies what the source of the problem or exception can be attributed to. This is one of the following: <ul style="list-style-type: none"> • Resource - There is a resource shortage (such as memory or disk space). • External - There has been a hardware failure (for instance, modem or hard disk). • API - A bad verb has been issued across an API. • SNA - A protocol violation has been received, such as an invalid BIND or pacing response. • Config - An error or inconsistency has been detected in configuration information. • Internal - An internal inconsistency has been detected or some internal corruption has occurred.
Cause	This field describes the events that caused the problem.
Effect	This field describes the effect the problem will have on the user.
Action	Action describes the action that should be taken.

A bulleted list of the parameters supplied on each call is included at the end of each call description.

The APPN messages that follow are grouped according to function. These groupings are:

Function Group	Message Code
Messages	5-58
Configuration services	61-129
Presentation Services	131-171
Path Control	180-192
Node Operator Facility	252-261
Session Manager	270-319
Address Space Manager	320-349
Management Services	353-387
Conventional Half sessions	450-459
General Protocol Code errors	460-461
Topology and Routing Services	470-482
Directory Services	490-534
Session Connector	536-537
Session Connector Manager	540-555
LU Manager	560-577
DLUR	581-590
HPR Manager	630-645
Rapid Transport Protocol	660-689
Session Services	719-742
CPI-C	760-765

Messages

Resources Manager

Message:	5
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to start the transaction program instance and conversation requested by a received Attach (FMH5).
Effect:	If other instances of the same transaction program are active, APPN will queue the Attach waiting for one of them to become free. Otherwise, the session will be deactivated (with a sense code of 08640000).
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

- Local LU (Alias)
- Partner LU (Alias)
- Mode name
- Session identifier
- TP name

LINCS Problem Determination

Message:	8
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to start a new conversation requested by ALLOCATE, MC_ALLOCATE or CMALLC.
Effect:	[MC_]ALLOCATE will fail with primary_rc of NAP_UNEXPECTED_SYSTEM_ERROR, or CMALLC with fail with return_code of CM_PRODUCT_SPECIFIC_ERROR
Action:	number of active sessions), or make more storage available to number of active sessions), or make more storage available to APPN

Local LU (Alias)

Partner LU (Alias)

Mode name

TP name

Message:	18
Type:	EXCEPTION
Cause Type:	API
Cause:	An APPC transaction program or CPI-C application has ended abnormally with active conversations. This usually indicates an error in the application.
Effect:	APPN will deactivate all sessions currently being used by the application.
Action:	Run a trace on the APPC API or the CPI-C API to see the sequence of verbs causing the problem.

Local LU (Alias)

TP name

Message:	19
Type:	PROBLEM
Cause Type:	Resource
Cause:	Deactivating session because of insufficient storage.
Effect:	APPN will deactivate the session.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Local LU (Alias)

Partner LU (Alias)

Mode name

Session identifier

Message:	20
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to initiate session activation requested by ALLOCATE, MC_ALLOCATE or CMALLC.
Effect:	[MC_]ALLOCATE will fail with primary_rc of NAP_ALLOCATION_ERROR and secondary_rc of NAP_ALLOCATION_FAILURE_NO_RETRY. CMALLC will fail with return_code of CM_ALLOCATION_FAILURE_NO_RETRY
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Local LU (Alias)

Partner LU (Alias)

Mode name

TP name

Message:	27
Type:	PROBLEM
Cause Type:	SNA
Cause:	LU-LU verification failed. The partner LU has sent an incorrect response to a challenge sent by a local LU. This is either a security attack or a defect in the software at the partner LU location
Effect:	The session will be deactivated
Action:	Check the identity of the partner LU. If this is a defect in the software at the partner LU location then contact support

Local LU (Alias)

Partner LU (Alias)

Sense Code

Message:	28
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to deactivate limited resource session.
Effect:	The limited resource session will not be deactivated (although it may be deactivated later). This could result in limited resource links being kept active while they are not required. Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Local LU (Alias)

Partner LU (Alias)

Mode name

Session identifier

LINCS Problem Determination

Message:	32
Type:	AUDIT
Comment:	The session limits for a local LU, partner LU and mode have changed. The termination count indicates the number of sessions APPN will deactivate as a result of the change in session limits.

Local LU (Alias)
Partner LU (Alias)
Mode name
New session limit
Mini contention winner limit
Mini contention loser limit
Termination count

Message:	42
Type:	PROBLEM
Cause Type:	SNA
Cause:	LU-LU verification protocol error. This may indicate an interoperability problem.
Effect:	The session will be deactivated with the specified sense code.
Action:	Contact support with details of the problem.

Sense code
Local LU (Alias)
Partner LU (Alias)
Mode name
Session identifier

Message:	47
Type:	PROBLEM
Cause Type:	SNA
Cause:	APPN was unable to activate a new session because the maximum session limit specified for the mode or the local LU would be exceeded.
Effect:	ALLOCATE, MC_ALLOCATE or CMALLC verbs will either fail or hang waiting for a session to become free.
Action:	The mode session limit can be increased using DEFINE_MODE (via the mode_max_neg_sess_limit parameter). The LU session limit can be increased using DEFINE_LOCAL_LU.

Local LU (Alias)
Partner LU (Alias)
Mode name

Message:	48
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to start the transaction program instance requested by TP_STARTED.
Effect:	If other instances of the same transaction program are active, APPN will queue the TP_STARTED waiting for one of them to become free. Otherwise, the TP_STARTED verb will fail with primary_rc of NAP_UNEXPECTED_SYSTEM_ERROR.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Local LU (Alias)

TP name

Message:	49
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to initiate automatic session activation.
Effect:	Fewer active sessions will be available on the specified mode, which may cause application delays or failures.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Local LU (Alias)

Partner LU (Alias)

Mode name

Message:	50
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to initiate session activation requested by ACTIVATE_SESSION verb.
Effect:	ACTIVATE_SESSION will fail with NAP_ACTIVATION_FAIL_NO_RETRY
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Local LU (Alias)

Partner LU (Alias)

Mode name

LINCS Problem Determination

Message:	51
Type:	PROBLEM
Cause Type:	SNA
Cause:	Bracket protocol error. This may indicate a problem in the partner LU. The sense codes are as follows: 20080000 - partner LU attempted to start bracket after sending BIS 20030000 - partner LU attempted to start bracket after local LU had BID for session successfully, or unexpected RTR request received 20100000 - Received negative response to BID with sense code 088B0000 from a partner LU who supports parallel BIS protocol error
Effect:	The session will be deactivated with the specified sense code.
Action:	Contact support with details of the problem.

Sense code Mode name
Local LU (Alias) Session identifier
Partner LU (Alias)

Message:	52
Type:	PROBLEM
Cause Type:	SNA
Cause:	Attach protocol error. This may indicate a problem in the partner LU. The sense codes are as follows . 080F6051 - Attach security protocol violation 10086040 - sync level not supported by session, or already-verified not accepted from partner LU 10086031 - PIP not allowed by TP
Effect:	The session will be deactivated with the specified sense code.
Action:	Contact support with details of the problem.

Sense code Session identifier
Local LU (Alias) Attach RU
Partner LU (Alias)
Mode name

Message:	53
Type:	PROBLEM
Cause Type:	SNA
Cause:	Attach rejected because security information invalid. This indicates an attempt to access a secure TP by an unknown user, or a known user who has specified and incorrect password.
Effect:	The Attach will be rejected.
Action:	Use the information in the log to locate the attempted security violation.

Sense code Session identifier
Local LU (Alias) TP name
Partner LU (Alias) User identifier
Mode name Password supplied

Message:	54
Type:	PROBLEM
Cause Type:	SNA
Cause:	Attach rejected because the specified sync level is not supported by the specified transaction program. This may be a mismatch in the capabilities of the originating transaction program and the destination transaction program, or it may simply be a configuration error.
Effect:	The Attach will be rejected.
Action:	Check the sync level supported by the specified transaction program, and check that it matches the sync_level defined for the transaction program (using QUERY_TP). If they match, or the transaction program is not defined, there is a mismatch between the originating and destination transaction programs.

Sense code Session identifier
 Local LU (Alias) TP name
 Partner LU (Alias) Sync level
 Mode name

Message:	55
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Attach rejected because the specified TP is temporarily disabled.
Effect:	The Attach will be rejected.
Action:	This condition is not currently supported by APPN, so this log should not occur.

Sense code Mode name
 Local LU (Alias) Session identifier
 Partner LU (Alias) TP name

Message:	56
Type:	PROBLEM
Cause Type:	SNA
Cause:	Attach rejected because the specified TP is permanently disabled. This should only occur if an application has explicitly disabled the transaction program by issuing DEFINE_TP with enabled set to NAP_NO.
Effect:	The Attach will be rejected.
Action:	If the transaction program should not be disabled, reissue DEFINE_TP with enabled set to NAP_YES.

Sense code
 Local LU (Alias)
 Partner LU (Alias)
 Mode name
 Session identifier
 TP name

Message:	63
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to activate link.
Effect:	Link activation will fail.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN

Sense code

Port name

LS name

Adjacent CP name

Message:	64
Type:	PROBLEM
Cause Type:	Config
Cause:	An XID3 from an adjacent back-level LEN node (ie. not carrying a network name control vector) was received and there was not a link configured to that back-level LEN node. An implicit link cannot be activated because the adjacent node's CP name is not known.
Effect:	Inbound link activation will fail.
Action:	Define a link station (using DEFINE_LS) with adj_cp_type set to NAP_BACK_LEVEL_LEN_NODE.

Sense code

Port name

LS name

Message:	65
Type:	PROBLEM
Cause Type:	Config
Cause:	Link to back-level node not configured correctly (that is, not configured as back-level, or configured to expect a node identifier).
Effect:	Link activation will fail.
Action:	Redefine (or define) link station (using DEFINE_LS) with back_lvl_len_end_node set to NAP_BACK_LVL_XID3 and adj_node_id set to all zeros.

Sense code

Port name

LS name

LINCS Problem Determination

Message:	66
Type:	PROBLEM
Cause Type:	SNA
Cause:	<p>XID protocol error during activation exchange. This may indicate an interoperability problem between this node and the adjacent node, or it may be caused by the adjacent node resetting and restarting the exchange without sending a DISC or DM frame. The sense codes are as follows.</p> <p>0806002C - the adjacent node has changed its network name during the course of an XID exchange</p> <p>0809003A - received a null XID when an XID format 3 was expected</p> <p>0809003C - prenegotiation XID received when not expected (had already received a negotiation proceeding XID3)</p> <p>0809003D - nonactivation XID received when a null XID or activation XID was expected</p> <p>08090040 - received an unexpected or invalid mode-setting command (eg. SNRM or SABME)</p> <p>08090045 - the adjacent node has stopped supporting exchange state indicators in the middle of an XID exchange</p> <p>08090046 - the adjacent node had previously indicated it did not support exchange state indicators, but has sent a XID with exchange state indicators set</p> <p>08090047 - received XID after receiving mode-setting command (eg. SNRM or SABME)</p> <p>08090048 - received unsolicited XID from NRM secondary link station</p> <p>08090049 - the adjacent node sent an XID error control vector (x'22')</p> <p>08090055 - invalid VRN in TG descriptor CV of XID3</p> <p>086F0000 - XID3 control vector length error 088C1000 - the adjacent node is a network node, but did not include a product set identifier control vector in the XID3</p> <p>088C0EF1 - the adjacent node is type 4 or 5, but did not include a PU name control vector</p> <p>088C0EF4 - the adjacent node has not been inconsistent in including a network name control vector</p> <p>08910004 - the network name control vector does not contain a valid network identifier</p> <p>08910005 - the network name control vector does not contain a valid CP name</p> <p>0895xxyy - XID3 control vector error (xx indicates key of first control vector in error, yy indicates . offset of error within control vector).</p> <p>08960000 - control vector too long</p> <p>08960001 - network name control vector is too long</p>

Cause:	<p>10150001 - received XID3 is too short (less than 29 bytes) 10150002 - length of received XID3 does not match length indicated in XID3 10160000 - the adjacent node indicated an invalid BIND pacing setting 10160001 - the maximum number of I-frames that the adjacent node can receive before sending an acknowledgement is set to zero 10160003 - the maximum BTU size the adjacent node can receive is set to less than 99 bytes 10160004 - unexpected XID format 10160005 - the adjacent end node supports receipt of BIND segments, but does not support BIND segment generation 10160006 - the adjacent end node does not support receipt of BIND segments and has a maximum BTU size less than 265 bytes 10160007 - the adjacent network node does not support receipt of BIND segments and has a maximum BTU size less than 521 bytes 10160008 - adjacent node has been inconsistent in its setting of networking capabilities 10160009 - the adjacent network node supports CP-CP sessions but does not provide CP services 1016000B - the adjacent node has selected zero as the TG number (which is invalid) 1016000C - the adjacent network node does not support BIND segment generation and has a maximum BTU size less than 521 bytes 1016000D - the adjacent node does not support the SDLC command/response profile (which is the only profile supported by APPN and LEN nodes). 1016000E - product set identifier on XID3 has changed 10160010 - the ABM support indicated in sent and received XID3s is inconsistent 10160013 - the DLC type in sent and received XIDs are not in agreement 10160014 - adjacent node changed role from non-negotiable to negotiable 10160015 - the adjacent node supports BIND pacing as sender only 10160017 - after two exchanges, randomised node IDs sent by this node and adjacent node are still identical 1016001A - the adjacent node is inconsistent in its support for parallel TGs 1016001B - the adjacent node provides or requests CP services but does not support CP-CP sessions 1016001C - the adjacent node indicated an LS role that was not primary, secondary or negotiable 1016001E - the adjacent node did not send its CP name in XID3 but requested CP-CP sessions on this link 10160020 - adjacent node is not type 2, 4 or 5 10160028 - adjacent node has specified an invalid error mode in its HPR Capabilities CV</p>
Effect:	Link activation will fail.
Action:	Contact support with details of the problem.

Sense code

Port name

LS name

Adjacent CP name

Byte offset

Bit offset

XID frame

LINCS Problem Determination

Message:	67
Type:	PROBLEM
Cause Type:	SNA
Cause:	No free TG numbers between this node and the specified adjacent node. This should only occur if there re already 236 parallel TGs between this node and the adjacent node.
Effect:	Link activation will fail.
Action:	Re-configuring the network to reduce the number of parallel TGs between this node and the specified adjacent node.

Sense code

Port name

LS name

Adjacent CP name

Message:	68
Type:	PROBLEM
Cause Type:	SNA
Cause:	XID protocol error during non-activation exchange. This may indicate an interoperability problem between this node and the adjacent node. The sense codes are as follows. 0809003E - activation XID received when non-activation XID expected 0809003F - adjacent node initiated a secondary-initiated non-activation XID exchange on a link that does not support secondary-initiated non-activation XID exchanges 0809003B - received a null XID when an XID format 3 was expected 08090042 - nonactivation exchange initiation indicator not set when expected 0809004E - received a non-null XID from a secondary NRM link station, when a null XID was expected 10160002 - adjacent node has been inconsistent in its setting of ACTPU suppression indicator 10160008 - adjacent node has been inconsistent in its setting of networking capabilities 1016000B - adjacent node attempted to change TG number during nonactivation exchange to a TG number that was already in use 10160019 - adjacent node has attempted to change its CP name when CP-CP sessions supported on link station, or link station not quiesced
Effect:	The link will be deactivated.
Action:	Run a trace on the link station or port to obtain more diagnostic information on the problem. Contact support with details of the log and trace.

Sense code

Port name

LS name

Adjacent CP name

Byte offset

Bit offset

XID frame

Message:	69
Type:	PROBLEM
Cause Type:	Config
Cause:	Link to host not configured correctly (that is, configured as a link to a DSPU).
Effect:	Link activation will fail.
Action:	Redefine (or define) link station (using DEFINE_LS) with adj_cp_type set to NAP_HOST_XID3 or NAP_HOST_XID0

Sense code

Port name

LS name

Message:	70
Type:	PROBLEM
Cause Type:	Config
Cause:	An unexpected SET_MODE (ie. received before XID exchange had completed) was received from an adjacent host and there was not a link configured to that host. An implicit link cannot be activated because there is not a local PU defined to use the link.
Effect:	Inbound link activation will fail.
Action:	Define a link station (using DEFINE_LS) with adj_cp_type set to NAP_HOST_XID3 or NAP_HOST_XID0.

Sense code

Port name

LS name

Message:	71
Type:	EXCEPTION
Cause Type:	Config
Cause:	Attempted to activate more than one TG to an adjacent node that does not support parallel TGs.
Effect:	Link activation will fail.
Action:	Modify the configuration so that there is only one link station defined to the specified adjacent node. (Alternatively, several links to the adjacent node can be defined, but only one can be active concurrently.)

Sense code

Port name

LS name

Adjacent CP name

LINCS Problem Determination

Message:	72
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to perform orderly link deactivation, performing immediate deactivation instead.
Effect:	None.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Port name

LS name

Adjacent CP name

Message:	73
Type:	PROBLEM
Cause Type:	Config
Cause:	Conflicting requirements for error recovery between the local node and a partner node when attempting to activate a link that is HPR-capable.
Effect:	Link will activate but will not be HPR-capable.
Action:	To allow HPR protocols to be used on the link the local and partner nodes must be able to accomodate the other's error recovery requirement. At the minimum this will require reconfiguration but may not always be possible.

Sense code

Port name

LS name

Adjacent CP name

Message:	74
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to update ANR routing tables following deactivation of an HPR-capable link.
Effect:	The node may not be able to free resources that are no longer required but will otherwise operate normally.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN

Port name

LS name

ANR Label

Adjacent CP name

Message:	75
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to update ANR routing tables following activation of an HPR-capable link.
Effect:	HPR traffic using this ANR label will not be routed correctly, which may cause RTP connections to path-switch, or fail altogether.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN

Port name
 LS name
 ANR Label
 Adjacent CP name

Message:	77
Type:	PROBLEM
Cause Type:	Internal
Cause:	A DLC has ended abnormally.
Effect:	All ports and link stations defined on the DLC will be inoperative.
Action:	Restart the DLC (using START_DLC and START_PORT). If the problem is persistent, look for DLC specific logs giving more information on the reason for the failure.

DLC name

Message:	79
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to forward Alert generated by DLC.
Effect:	Alert will be discarded.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Alert length
 Alert data

Message:	82
Type:	PROBLEM
Cause Type:	Internal
Cause:	Unable to deactivate port.
Effect:	STOP_PORT verb will fail, port may not restart successfully.
Action:	If required, attempt to restart the port. If this fails, look for DLC specific logs giving more information on the reason for the failure.

DLC name
 Port name

LINCS Problem Determination

Message:	84
Type:	PROBLEM
Cause Type:	Internal
Cause:	Unrecoverable DLC failure.
Effect:	The DLC will be destroyed, and all ports and link stations defined on the DLC will be inoperative.
Action:	Restart the DLC and ports (using START_DLC and START_PORT). If these operations fail, or this problem is persistent, run a trace on the DLC and contact support with the log and trace information.

DLC name

Diagnostic info

Message:	85
Type:	EXCEPTION
Cause Type:	Config
Cause:	A session or application required APPN to automatically activate a link station, but the link station was not configured to be automatically activated.
Effect:	The session or application will fail, with the specified sense code.
Action:	Either manually activate the link (using START_LS), or redefine the link to support automatic activation (using DEFINE_LS).

Sense code

Port name

LS name

Message:	86
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A session or application required APPN to automatically activate a link station, but the request was failed because it would have exceeded the port activation limits. This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session or application will fail, with the specified sense code.
Action:	If possible, increase the port link-activation limits. Otherwise, check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code

Port name

LS name

Message:	87
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A session required APPN to automatically activate a link station, but APPN was unable to identify the requested link. This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session will fail, with the specified sense code.
Action:	Check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code

Adjacent CP name

TG number

Message:	88
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A session required APPN to automatically activate a dynamic link station, but the request was failed because it would have exceeded the port activation limits. This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session will fail, with the specified sense code.
Action:	If possible, increase the port activation limits. Otherwise, check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code

Port name

CN name

Message:	89
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A session required APPN to automatically activate a dynamic link station, but APPN was unable to identify the requested connection network. This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session will fail, with the specified sense code.
Action:	Check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code

CN name

LINCS Problem Determination

Message:	90
Type:	PROBLEM
Cause Type:	Config
Cause:	An incoming call was rejected because the port link-activation limits would be exceeded.
Effect:	The link activation will fail.
Action:	If possible, increase the port link-activation limits.

Port name

Message:	91
Type:	PROBLEM
Cause Type:	Config
Cause:	The CP name on an XID3 received from an adjacent node is different to that expected
Effect:	The link activation will fail.
Action:	If the received adjacent CP name is correct, correct the link station configuration using DEFINE_LS. Depending on other aspects of the link station definition, the CP name check can be disabled by issuing DEFINE_LS with the adj_cp_name field set to all zeros.

Sense code

Port name

LS name

Received CP name

Message:	92
Type:	PROBLEM
Cause Type:	Config
Cause:	The node ID on an XID3 received from a back level node is different to that expected.
Effect:	The link activation will fail.
Action:	If the received node ID is correct, correct the link station configuration using DEFINE_LS. Depending on other aspects of the link station definition, the node ID check can be disabled by issuing DEFINE_LS with the adj_node_id field set to all zeros.

Sense code

Port name

LS name

Received node ID

Message:	93
Type:	PROBLEM
Cause Type:	Config
Cause:	The node type indicated on an XID3 received from an adjacent node is different to that expected.
Effect:	The link activation will fail.
Action:	If the received node type is correct, correct the link station configuration using DEFINE_LS. Depending on other aspects of the link station definition, the node type check can be disabled by issuing DEFINE_LS with the adj_node_type field set to NAP_LEARN_NODE.

Sense code

Port name

LS name

Received node type

Message:	94
Type:	PROBLEM
Cause Type:	Config
Cause:	Both sent and received XIDs indicate the same, non-negotiable, link station role.
Effect:	The link activation will fail.
Action:	Either correct the local port definition, or the remote definition, so that the link station roles are complementary, or at least one link station is negotiable.

Sense code

Port name

LS name

LS role

Message:	96
Type:	EXCETION
Cause Type:	SNA
Cause:	A session or application required SNAP APPN to automatically activate a link station, but the request was failed because it would have exceeded the maximum number of concurrently active outbound links allowed for the owning port. This number is the total link-activation limit minus the inbound link-activation limit (that part of the total limit reserved for active inbound links).
Effect:	The session or application will fail, with the specified sense code.
Action:	If possible, increase the port link-activation limits. Otherwise, check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code

Port name

LS name

Outbound link count

Total link-activation limit

Inbound link-activation limit

LINCS Problem Determination

Message:	97
Type:	EXCETION
Cause Type:	SNA
Cause:	A session required SNAP APPN to automatically activate a dynamic link station, but the request was failed because it would have exceeded the port total link-activation limit. This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session or application will fail, with the specified sense code.
Action:	If possible, increase the port activation limits. Otherwise, check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code
Port name
CN name
Total link-activation limit
Inbound link count
Outbound link count

Message:	98
Type:	EXCETION
Cause Type:	SNA
Cause:	A session required SNAP APPN to automatically activate a dynamic link station, but the request was failed because it would have exceeded the maximum number of concurrently active outbound links allowed for the owning port. This number is the total link-activation limit minus the inbound link-activation limit (that part of the total limit reserved for active inbound links). This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session or application will fail, with the specified sense code.
Action:	If possible, increase the port activation limits. Otherwise, check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code
Port name
CN name
Outbound link count
Total link-activation limit
Inbound link-activation limit

Message:	99
Type:	AUDIT
Cause:	A non-APPN link station to an upstream host has been successfully started.

Port name
LS name
Host PU name

Message:	100
Type:	AUDIT
Cause:	A non-APPN link station to a downstream PU has been successfully started.

Port name
 LS name
 DSPU name

Message:	101
Type:	AUDIT
Cause:	A non-APPN link station to an upstream host has been successfully stopped.

LS name
 Port name
 Host PU name

Message:	102
Type:	AUDIT
Cause:	A non-APPN link station to a downstream PU has been successfully stopped.

Port name
 LS name
 DSPU name

Message:	103
Type:	EXCETION
Cause Type:	SNA
Cause:	A locally initiated dependent session activation request required SNAP APPN to automatically activate a link to a specified PU name, but SNAP APPN was unable to identify the a link to the PU. This problem indicates an inconsistent local configuration which is transient and is caused by a recent modification.
Effect:	The session or application will fail, with the specified sense code.
Action:	Check the consistency of the local configuration (link definitions can be viewed using the QUERY_LS verb).

PU name
 Sense code

Message:	104
Type:	AUDIT
Cause:	An APPN Link Station has been successfully started

Port name
 LS name
 Adjacent CP name
 Adjacent CP type
 TG number
 Last TG number

LINCS Problem Determination

Message:	110
Type:	AUDIT
Cause Type:	Config
Cause:	Remote activation of LS has been disabled.
Effect:	Incoming call is rejected.
Action:	Re-enable remote activation of this LS by issuing a START_LS with the NAP_REMOTE_ACT bit turned on in the enable field, or re-define the link station using DEFINE_LS

Port name

LS name

Message:	111
Type:	PROBLEM
Cause Type:	Resource
Cause:	Intra-node session support ended abnormally. This should only occur because of a shortage of available storage.
Effect:	Any active intra-node sessions will fail, and no more intra-node sessions will be activatable.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Message:	112
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A session required APPN to automatically activate a dynamic link station, but APPN was unable to identify the requested connection network TG. This problem usually indicates an inconsistent network topology, which may be transient (that is, caused by a normal race condition), or permanent (indicated by logs 127 or 128).
Effect:	The session will fail, with the specified sense code.
Action:	Check the consistency of the network topology (network topology can be viewed using the QUERY_NN_TOPOLOGY_* verbs).

Sense code

CN name

TG number

Message:	114
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to generate link Alert.
Effect:	Alert will not be sent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Port name

LS name

Adjacent CP name

Message:	115
Type:	AUDIT
Cause:	A Link Station has been successfully started.

Port name
 LS name
 Adjacent CP name
 Adjacent CP type
 TG number
 Last TG number
 HPR support
 ANR label
 Link level error recovery
 Adjacent RTP support

Message:	116
Type:	AUDIT
Cause:	A Link Station has been successfully stopped.

Port name
 LS name
 Adjacent CP name
 Adjacent CP type
 TG number

Message:	117
Type:	AUDIT
Cause:	A DLC has been successfully started.

DLC name

Message:	118
Type:	AUDIT
Cause:	A DLC has been successfully stopped.

DLC name

Message:	119
Type:	AUDIT
Cause:	A Port has been successfully started.

DLC name
 Port name

Message:	120
Type:	AUDIT
Cause:	A Port has been successfully stopped.

DLC name
 Port name

LINCS Problem Determination

Message:	121
Type:	EXCEPTION
Cause Type:	Config
Cause:	This network node requested CP-CP sessions on the specified link to an adjacent network node, but the adjacent node is not configured to support CP-CP sessions on the link.
Effect:	CP-CP sessions will not be established.
Action:	Correct the configuration mismatch, either by removing CP-CP sessions support from the local link station definition (using DEFINE_LS), or by adding it to the adjacent node's link station definition.

Port name

LS name

Adjacent CP name

Message:	122
Type:	PROBLEM
Cause Type:	Resource
Cause:	A DLC could not be started either because of insufficient resources, or because the specified DLC type is not supported.
Effect:	The DLC is inoperative.
Action:	If the DLC type is supported, then either decrease the system load (for example, by reducing the number of active sessions, or make more storage available to APPN.

DLC name

DLC type

Message:	123
Type:	PROBLEM
Cause Type:	Config
Cause:	The specified link station is configured with a pre-defined TG number but the adjacent node has sent a different non-zero TG number.
Effect:	Link activation will fail.
Action:	Correct mismatched TG number configuration at this node (using DEFINE_LS) or at adjacent node.

Sense code

Port name

LS name

Adjacent CP name

Received TG number

Pre-defined TG number

Message:	124
Type:	PROBLEM
Cause Type:	Config
Cause:	Adjacent node has attempted to use a TG number for this link which is already pre-defined on another link station.
Effect:	Link activation will fail.
Action:	Correct mismatched TG number configuration at this node (using DEFINE_LS) or at adjacent node.

Sense code
 Port name
 LS name
 Adjacent CP name
 Received TG number
 Pre-defined LS name

Message:	125
Type:	PROBLEM
Cause Type:	SNA
Cause:	Adjacent node has attempted to use a TG number for this link which is already in use by another link station. This may indicate an interoperability problem.
Effect:	Link activation will fail.
Action:	Run a trace on the link station or port to get more diagnostic information on the problem, and contact support with the log and trace.

Sense code
 Port name
 LS name
 Adjacent CP name
 Received TG number
 Conflicting LS name

Message:	126
Type:	AUDIT
Cause Type:	SNA
Cause:	An adjacent node has changed its CP name.

Port name
 LS name
 Previous CP name
 Current CP Name
 Previous TG number
 Current TG number

LINCS Problem Determination

Message:	127
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to update topology database with link station information
Effect:	Topology will be inconsistent, which may result in unexpected session activation failures (typically with sense codes 8014xxxx, 0806002B, or 08500001).
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN. Cycling the specified link station (ie. either activating then deactivating, or deactivating then activating) may clear the condition.

Port name

LS name

Adjacent CP name

TG number

Message:	128
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to update topology database with connection network information.
Effect:	Topology will be inconsistent, which may result in unexpected session activation failures (typically with sense codes 8014xxxx, 0806002B, or 08500001).
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN. Cycling the specified port (ie. either activating then deactivating, or deactivating then activating) may clear the condition.

Port name

CN name

TG number

Message:	129
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to enable intra-node sessions.
Effect:	Intra-node session cannot be activated.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Presentation Services

Message:	131
Type:	PROBLEM
Cause Type:	SNA
Cause:	Attach rejected because the specified conversation type is not supported by the specified transaction program. This may be a mismatch in the capabilities of the originating transaction program and the destination transaction program, or it may simply be a configuration error.
Effect:	The Attach will be rejected.
Action:	Check the conversation type or types supported by the specified transaction program, and check that this matches the conversation type supported defined for the transaction program (using QUERY_TP). If they match, or the transaction program is not defined, there is a mismatch between the originating and destination transaction programs.

Sense code

Local LU (Alias)

Partner LU (Alias)

Mode name

Session identifier

TP name

Conversation type

Message:	133
Type:	PROBLEM
Cause Type:	SNA
Cause:	The session being used by a conversation has been deactivated because of a protocol error, causing the conversation to fail.
Effect:	The conversation will be terminated, either by an APPC primary_rc of NAP_CONV_FAILURE_NO_RETRY, or a CPI-C return_code of CM_RESOURCE_FAILURE_NO_RETRY.
Action:	This log gives information on which TPs and conversation have been affected by a protocol error on a session. Other, more specific problem or exception logs give more information on the protocol error. Use the Session identifier to correlate this log with other related logs.

TP name

TP identifier

Conversation identifier

Local LU (Alias)

Partner LU (Alias)

Mode name

Session identifier

LINCS Problem Determination

Message:	134
Type:	PROBLEM
Cause Type:	SNA
Cause:	The session being used by a conversation has been deactivated because of a session outage, causing the conversation to fail.
Effect:	The conversation will be terminated, either by an APPC primary_rc of NAP_CONV_FAILURE_RETRY, or a CPI-C return_code of CM_RESOURCE_FAILURE_RETRY.
Action:	This log gives information on which TPs and conversation have been affected by a session outage. Other, more specific, problem or exception logs give more information on the reason for the session outage. Use the Session identifier to correlate this log with other related logs.

TP name
 TP identifier
 Conversation identifier
 Local LU (Alias)
 Partner LU (Alias)
 Mode name
 Session identifier

Message:	135
Type:	EXCEPTION
Cause Type:	SNA
Cause:	APPN detected a protocol error on an APPC conversation. Sense codes are as follows. 10010000 - invalid GDS logical length FMH7 or log data mismatch (for example, FMH7 not received when expected, or log data truncated, or CEB not set on FMH7 when expected) 10086000 - eceived FMH but not FMH7 1008200E - FMH7 format error (log data concatenation not valid) 1008200A - FMH7 received with no sense data (sense data is zero)
Effect:	The conversation will be terminated, either by an APPC primary_rc of NAP_CONV_FAILURE_NO_RETRY, or a CPI-C return_code of CM_RESOURCE_FAILURE_NO_RETRY, and the session deactivated.
Action:	Report the protocol error to partner LU support. If additional diagnostic information is required, run a link trace (the session identifier can be used to correlate this log to other logs which contain the appropriate link station name).

Sense code
 TP name
 TP identifier
 Conversation identifier
 Local LU (Alias)
 Partner LU (Alias)
 Mode name
 Session identifier
 Half Session

Message:	137
Type:	EXCEPTION
Cause Type:	External
Cause:	The partner TP issued a [MC_]SEND_ERROR verb. Either the conversation with the partner TP could not be established, or an error state was generated by the partner TP.
Effect:	A new conversation will fail to begin, or an existing one will experience a problem. Subsequent recovery or termination of the conversation will be determined by the applications.
Action:	Check that both the local TP and the partner TP exist, are correctly named, and are working properly.

TP name
 TP identifier
 Conversation identifier
 Local LU (Alias)
 Partner LU (Alias)
 Mode name
 Session identifier
 Error data received

Message:	138
Type:	EXCEPTION
Cause Type:	External
Cause:	The local TP issued a [MC_]SEND_ERROR verb. Either a conversation with the local TP could not be established, or an error state was generated by the local TP
Effect:	A new conversation will fail to begin, or an existing one will experience a problem. Subsequent recovery or termination of the conversation will be determined by the applications
Action:	Check that both the local TP and the partner TP exist, are correctly named, and are working properly

TP name
 TP identifier
 Conversation identifier
 Local LU (Alias)
 Partner LU (Alias)
 Mode name
 Session identifier
 Error data sent

LINCS Problem Determination

Message:	150
Type:	EXCEPTION
Cause Type:	Config
Cause:	CRV exchange failed. This indicates the cryptography keys configured at this LU and the partner LU are inconsistent.
Effect:	Session will be deactivated with the specified sense code (08350001).
Action:	Use information on the session deactivated problem log (log 271) to identify the local LU and partner LU, and correct the mismatch in cryptography keys.

Sense code

FQPCID

Message:	151
Type:	EXCEPTION
Cause Type:	SNA
Cause:	LU6.2 session state error. This may indicate an interoperability problem. Sense codes are as follows. 20020000 -chaining sequence error 20030000 -bracket state error 20040000 -received normal flow request when half-duplex flip-flop state not receive 200A0000 -immediate request mode violated by partner LU 200B0000 -queued response indicator invalid 200E0000 -unexpected SIGNAL response 200F0000 -received unexpected response 20120000 -unexpected sense code on negative response 40040000 -received RQE, BB, CEB chain from contention loser 40110000 -RU category of response doesn't match request 40120000 -request code of response doesn't match request 40210000 -QRI setting on response doesn't match request
Effect:	The session will be deactivated with the specified sense code.
Action:	Use information on the session deactivated problem log (271) to identify the local LU and partner LU. If required, run a trace on the specified link station and contact support with the log and trace.

Sense code

LS name

LFSID

FQPCID

Message:	153
Type:	EXCEPTION
Cause Type:	SNA
Cause:	<p>LU6.2 session format error. This may indicate an interoperability problem. Sense codes are as follows.</p> <p>080F6051 -security error (FMH12 error)</p> <p>10030000 -function not supported (unrecognised request code)</p> <p>10050000 -SIGNAL or LUSTAT request too short</p> <p>10084001 -invalid FM header type (not 5, 7 or 12)</p> <p>40030000 -BB not allowed</p> <p>40040000 -CEB or EB not allowed</p> <p>40070000 -definite response not allowed</p> <p>40090000 -CD not allowed</p> <p>400B0000 -chaining error</p> <p>400C0000 -bracket error</p> <p>400F0000 -incorrect use of format indicator (FI)</p> <p>40100000 -alternate code not supported</p> <p>40110000 -incorrect specification of RU category</p> <p>40120000 -incorrect specification of request code</p> <p>40130000 -incorrect specification of SDI and RTI</p> <p>40140000 -incorrect use of DR1I, DR2I and ERI</p> <p>40150000 -incorrect use of QRI</p> <p>40160000 -incorrect use of EDI</p> <p>40170000 -incorrect use of PDI</p> <p>40180000 -incorrect setting of QRI with bidder's BB</p> <p>40190000 -incorrect indicators with last-in-chain request</p>
Effect:	The session will be deactivated with the specified sense code.
Action:	Use information on the session deactivated problem log (271) to identify the local LU and partner LU. If required, run a trace on the specified link station and contact support with the log and trace.

Sense code TH
 LS name RH
 LFSID RU
 FQPCID

Message:	154
Type:	EXCEPTION
Cause Type:	SNA
Cause:	<p>LU6.2 response correlation error. This may indicate an interoperability problem. Sense codes are as follows.</p> <p>200E0000 - uncorrelated positive response, or uncorrelated RTR response</p>
Effect:	Session will be deactivated with the specified sense code.
Action:	Use information on the session deactivated problem log (271) to identify the local LU and partner LU. If required, run a trace on the specified link station and contact support with the log and trace.

Sense code TH
 LS name RH
 LFSID RU
 FQPCID

LINCS Problem Determination

Message:	155
Type:	EXCEPTION
Cause Type:	Resources
Cause:	LU6.2 session ended abnormally because of insufficient storage.
Effect:	Session will be deactivated with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

LS name

LFSID

FQPCID

Message:	156
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Protocol error during CRV exchange. This indicates a possible interoperability problem. Sense codes are as follows. 0090000 -CRV request received from secondary LU, or CRV response received from primary LU, or RV not received when expected . 10020000 -CRV RU too short 400F0000 -CRV with FI not set 400B0000 -CRV chain indicators not set to BC, EC 40140000 -CRV not RQD1 40110000 -CRV not expedited 40150000 -CRV with QRI not set 40080000 -CRV with PI set 400C0000 -CRV request with BBI, EBI or CEBI set 400D0000 -CRV request with CDI set 40100000 -CRV request with CSI set to CODE1 40160000 -CRV request with EDI set 40170000 -CRV request with PDI set 40130000 -CRV response RTI and SDI inconsistent
Effect:	Session will be deactivated with specified sense code.
Action:	Use information on the session deactivated problem log (271) to identify the local LU and partner LU. Run a trace on the specified link station, and contact support with the log and trace.

Sense code

LS name

LFSID

FQPCID

Message:	170
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Session pacing error. This may indicate an interoperability problem. Sense codes are as follows. 20110000 -sender has overrun pacing window, or PI not set on first RU of window 20110001 -unexpected IPM 20110002 -PI set on other than first RU in window 20110003 -invalid pacing response 10010003 -invalid IPM format 10020000 -RU length error
Effect:	The session will be deactivated with the specified sense code.
Action:	Use information on the session deactivated problem log (271) to identify the local LU and partner LU. If required, run a trace on the specified link station and contact support with the log and trace.

Sense code
LS name
LFSID
TH
RH
RU

Message:	171
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Session segmentation error. This may indicate an interoperability problem. Sense codes are as follows. 80070000 -segmenting error 80070001 -segmentation not supported on this link
Effect:	The session will be deactivated with the specified sense code.
Action:	Use information on the session deactivated problem log (271) to identify the local LU and partner LU. If required, run a trace on the specified link station and contact support with the log and trace.

Sense code
LS name
LFSID
TH
RH
RU

Path Control

Message:	180
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to route intra-node session data. This usually indicates a race condition when an intra-node session is deactivating.
Effect:	None.
Action:	None.

LFSID

Message:	184
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to generate Alert to report invalid received data.
Effect:	Alert is not generated.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code TH
 LS name BIU

LFSID

Message:	185
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to route inter-node session data. This usually indicates a race condition when an inter-node session is deactivating.
Effect:	None.
Action:	None.

LS name
 LFSID

Message:	189
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Failed to forward an HPR Network Layer Packet because the ANR label could not be matched to an outgoing link. This is usually a normal race condition when an HPR-capable link is deactivated, although it may also be caused by an earlier resource shortage (look for log 192).
Effect:	An RTP connection will attempt to path switch, or may fail.
Action:	Use QUERY_LS to look for an active HPR-capable link with the specified ANR label. If there is one, then the problem has been caused by a storage shortage. Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

LS name
 ANR label
 Network header

Message:	190
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to start link-inactivity timer.
Effect:	Limited resource link will not be automatically deactivated.
Action:	If the link is idle (that is, not being used by any sessions), deactivate it using STOP_LS.

LS name

Message:	191
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to forward HPR Network Layer Packet.
Effect:	NLP will be discarded. If this error occurs frequently, it may cause RTP connections to path-switch or fail altogether.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

LS name

Network header

Message:	192
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to register ANR label.
Effect:	HPR traffic using this ANR label will not be routed correctly, which may cause RTP connections to path-switch, or fail altogether.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

LS name

ANR label

Node Operator Facility

Message:	252
Type:	AUDIT
Cause:	Node has been successfully started.

CP name (Alias) Node info
Node type

Message:	253
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to start APPN.
Effect:	APPN was not started.
Action:	Make more storage available to APPN.

CP name (Alias) Node info
Node type

Message:	254
Type:	AUDIT
Cause:	Node has been successfully stopped.

CP name (Alias) Node info
Node type

Message:	257
Type:	PROBLEM
Cause Type:	Config
Cause:	Failed to dynamically load an APPC transaction program or CPI-C application.
Effect:	The received Attach will be failed with the specified sense code.
Action:	Check for errors in the configured attach_routing data (using QUERY_LOCAL_LU) and TP characteristics (using QUERY_TP)

Sense code
LU alias
TP name

Message:	260
Type:	PROBLEM
Cause Type:	SNA
Cause:	Insufficient storage to process received ACTLU
Effect:	LU-SSCP session will not be started (an ACTLU -ve response with the specified sense code is sent).
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code ACTLU RU
PU name
NAU address

Message:	261
Type:	PROBLEM
Cause Type:	Config
Cause:	ACTLU received for LU which is not defined locally, and implicit LU definition is not supported. This typically indicates a mismatch between this node and the host configuration.
Effect:	LU-SSCP session is not activated (ACTLU is rejected with specified sense code).
Action:	Either define the LU locally (using DEFINE_LOCAL_LU DEFINE_LU_0_TO_3 or DEFINE_LU_0_TO_3_RANGE), remove the LU from the host configuration, or configure support for implicitLU definition (using START_NODE)

Sense code

PU name

NAU address

ACTLU RU

Session Manager

Message:	270
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to define a new LU type 6.2.
Effect:	DEFINE_LU or START_NODE will fail.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

LU name (Alias)

Message:	271
Type:	PROBLEM
Cause Type:	SNA
Cause:	Fatal error detected on LU6.2 session.
Effect:	Session will be deactivated with specified sense code.
Action:	This log gives additional information on the failed session, but is preceded by an exception log (150, 151, 153, 154, 155 or 156) giving more specific information about the fatal error.

Sense code

Local LU name

Partner LU name

Mode name

LS name

LFSID

Session identifier

LINCS Problem Determination

Message:	275
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to activate LU6.2 session.
Effect:	Session activation will fail with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Local LU name

Partner LU name

Mode name

Session identifier

Message:	280
Type:	PROBLEM
Cause Type:	SNA
Cause:	Format error in received LU6.2 BIND request. Sense codes are as follows. 0835xxxx -parameter error at offset xxxx in BIND RU 088C6000 FQPCID not included in extended BIND 083B0000 invalid FQPCID format
Effect:	Session activation will fail with specified sense code.
Action:	Contact support with details of the problem.

Sense code

Local LU name

Error offset

BIND RU

Message:	281
Type:	PROBLEM
Cause Type:	SNA
Cause:	Format error in received LU6.2 BIND response. Sense codes are as follows. 0835xxxx - parameter error at offset xxxx in BIND RU
Effect:	Session activation will fail with specified sense code.
Action:	Contact support with details of the problem.

Sense code

Local LU name

Partner LU name

Error offset

RSP(BIND) RU

Message:	282
Type:	PROBLEM
Cause Type:	SNA
Cause:	LU-mode session limit exceeded. This problem normally should not occur, since the session limits are negotiated with a CNOS exchange prior to sessions being activated. However, this og can also be caused by a normal race condition when the session limits are reset, or when this node has been restarted after having previously had sessions with this partner LU.
Effect:	Session activation will fail with specified sense code.
Action:	If problem persists, check the session limits and active session counts on the specified local LU, partner LU, mode using QUERY_MODE.

Sense code
 Local LU name
 Partner LU name
 Mode name
 Active session count
 LU-mode session limit

Message:	283
Type:	EXCEPTION
Cause Type:	SNA
Cause:	BIND race with single-session partner LU. This is a normal network race condition. The race is resolved in favour of the LU with the higher name. In this case the partner LU lost the race.
Effect:	Session activation will fail with specified sense code.
Action:	None.

Sense code
 Local LU name
 Partner LU name
 Mode name

Message:	284
Type:	PROBLEM
Cause Type:	SNA
Cause:	Detected consistency errors in received BIND request. This may indicate an interoperability problem. Sense codes are as follows. 0835xxxx -parameter error at offset xxxx in BIND RU 080F6051 -security error
Effect:	Session activation will fail with specified sense code.
Action:	Contact support with details of the problem.

Sense code
 Local LU name
 Partner LU name
 Error offset
 BIND RU

LINCS Problem Determination

Message:	285
Type:	PROBLEM
Cause Type:	SNA
Cause:	Detected consistency errors in received BIND response. This may indicate an interoperability problem. Sense codes are as follows 0835xxxx -parameter error at offset xxxx in BIND RU 080F6051 -security error
Effect:	Session will be deactivated with specified sense code.
Action:	Contact support with details of the problem.

Sense code

Local LU name

Partner LU name

Error offset

RSP(BIND) RU

Message:	286
Type:	PROBLEM
Cause Type:	SNA
Cause:	Format error in received UNBIND request. This may indicate an interoperability problem. Sense codes are as follows. 0835xxxx -parameter error at offset xxxx in UNBIND RU 0895xyyy -format error in control vector, where xx is key of control vector, and yy is offset into control vector of byte in error 10020000 -RU length error
Effect:	None (session will still be deactivated).
Action:	Contact support with details of the problem.

Sense code

Local LU name

Error offset

UNBIND RU

Message:	288
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to correlate received BIND response. This is probably caused by a normal race condition (a BIND request, followed immediately by an UNBIND request and then by another BIND request using the same LFSID - the response to the first BIND request will not be correlated).
Effect:	None (BIND response will be discarded).
Action:	None.

Sense code

Local LU name

Error offset

RSP(BIND) RU

Message:	290
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to correlate received INIT-SELF response. This is a normal race condition (caused by the session being deactivated before the INIT-SELF response has arrived).
Effect:	None (response is discarded).
Action:	None.

Sense code

Local LU name

Message:	291
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to correlate received UNBIND request. This is a normal race condition (caused by UNBIND requests crossing).
Effect:	None (will send a +ve response to UNBIND).
Action:	None.

Local LU name

UNBIND RU

Message:	300
Type:	EXCEPTION
Cause Type:	SNA
Cause:	ACTLU received when LU already "active".
Effect:	ACTLU will be rejected with specified sense code.
Action:	Run a trace on the link station corresponding to the specified PU name. Contact host support with details of the problem.

Sense code

Local LU name

PU name

NAU address

Message:	301
Type:	PROBLEM
Cause Type:	SNA
Cause:	Insufficient storage to activate LU-SSCP session.
Effect:	ACTLU will be rejected with specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Local LU name

PU name

NAU address

LINCS Problem Determination

Message:	302
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to activate a new session since it would exceed the LU-mode session limits. This problem is a normal race condition, and so should occur infrequently.
Effect:	Session activation will fail with specified sense code (which may cause ALLOCATE, MC_ALLOCATE or CMALLC requests to fail)
Action:	None.

Sense code
Local LU name
Partner LU name
Mode name
Session polarity
Contention winner sessions
Contention loser sessions
Session limit
Min contention winner limit
Min contention loser limit

Message:	303
Type:	PROBLEM
Cause Type:	SNA
Cause:	Insufficient storage to reassemble received BIND response.
Effect:	Session will be deactivated with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code
Local LU name

Message:	304
Type:	PROBLEM
Cause Type:	SNA
Cause:	Partner LU name on received BIND request is badly formed.
Effect:	Session activation will fail with the specified sense code.
Action:	Contact support with details of the problem.

Sense code
Local LU name
Partner LU name

Message:	305
Type:	PROBLEM
Cause Type:	SNA
Cause:	Mode name on received BIND request is unrecognized.
Effect:	Session activation will fail with the specified sense code.
Action:	Either modify the partner LU configuration so it does not attempt to use the unrecognized mode, or define the mode at this node (using DEFINE_MODE).

Sense code

Local LU name

Partner LU name

Mode name

Message:	306
Type:	PROBLEM
Cause Type:	SNA
Cause:	Unable to activate session to single session partner LU, because there is already an active session on another mode. This usually indicates contention between two or more APPC transaction programs or CPI-C applications for the same dependent LU6.2.
Effect:	Session activation will fail with specified sense code (which may cause ALLOCATE, MC_ALLOCATE or CMALLC requests to fail).
Action:	Modify the transaction programs and/or applications to use separate LUs.

Sense code

Local LU name

Partner LU name

Requested mode

Active mode

Message:	307
Type:	AUDIT
Comment:	An LU6.2 session has been activated.

Local LU (Alias)

Partner LU (Alias)

Mode name

Session identifier

Session polarity

Session type

LS name

LFSID

LINCS Problem Determination

Message:	308
Type:	AUDIT
Comment:	An LU6.2 session has been deactivated.

Sense code
Local LU (Alias)
Partner LU (Alias)
Mode name
Session identifier
LS name
LFSID

Message:	310
Type:	EXCEPTION
Cause Type:	SNA
Cause:	LU-mode session limit exceeded - BIND race. This is normal race condition caused by both the local LU and partner LU attempting to activate the last session on the mode simultaneously. The race will be resolved in favour of the node with the higher name. In this case the partner LU has lost the race.
Effect:	Session activation will fail with specified sense code.
Action:	None.

Sense code
Local LU name
Partner LU name
Mode name
Active session count
Pending session count
LU-mode session limit

Message:	311
Type:	PROBLEM
Cause Type:	SNA
Cause:	FQPCID collision. The FQPCID specified on a received BIND request matches the FQPCID being used for an existing active session. This can be caused by a collision in the hashing algorithm used to generate an FQPCID, or it may indicate a problem in the node generating the FQPCID.
Effect:	Session activation will fail with specified sense code.
Action:	If problem is persistent or occurs often, contact support with details of the problem

Sense code
Local LU name
Partner LU name
Mode name
PCID

Message:	312
Type:	PROBLEM
Cause Type:	SNA
Cause:	Session identifier collision. The session identifier specified on a received BIND request matches the session identifier being an existing active session.
Effect:	Session activation will fail with specified sense code.
Action:	If problem is persistent or occurs often, contact support with details of the problem.

Sense code

Local LU name

Partner LU name

Mode name

Session identifier

Message:	313
Type:	AUDIT
Comment:	An LU-SSCP session has been activated for LU type 6.2.

PU name

NAU address

LU name

Message:	314
Type:	AUDIT
Comment:	An LU-SSCP session has been deactivated for LU type 6.2.

PU name

NAU address

LU name

Message:	315
Type:	PROBLEM
Cause Type:	SNA/Config
Cause:	LU-LU verification protocol mismatch. The partner LU requested that the basic protocol is used when the local LU runs only the enhanced protocol with the partner LU. The local LU may be configured to run only the enhanced protocol with partner LU or it may be configured to run either protocol with the partner LU and has determined that the partner LU can the enhanced protocol. This is either (i) a mismatch in (ii) a migration problem (iii) a security attack.
Effect:	Session activation will fail.
Action:	Check the identity of the partner LU. If the problem is (i) reconfigure the verification protocol that the local LU uses with the partner LU using the verb DEFINE_LU_LU_PASSWORD or reconfigure the verification protocol that the partner LU uses at the partner (ii) upgrade the software at the partner LU's location (iii) investigate the security attack.

LINCS Problem Determination

Local LU (Alias)
Partner LU (Alias)
Sense Code

Message:	316
Type:	PROBLEM
Cause Type:	SNA/Config
Cause:	LU-LU verification failed. The partner LU has sent an response to a challenge sent by a local LU. This is either a mismatch in configuration or a security attack.
Effect:	Session activation will fail.
Action:	Check the identity of the partner LU. If this is a mismatch in configuration then reconfigure the password either at the LU using the verb DEFINE_LU_LU_PASSWORD or at the partner (or at both LUs), so that both LUs have the same password.

Local LU (Alias)
Partner LU (Alias)
Sense Code

Message:	317
Type:	PROBLEM
Cause Type:	External
Cause:	Duplicate random data received. A list is kept of all random data sent as challenges by the local LU. Receiving duplicate random data from a partner LU should be a rare event, and is evidence of a security attack.
Effect:	Session activation will fail.
Action:	Check the identity of the partner LU. Check that the random number generators available to the local and partner LUs good quality (and therefore unlikely to generate matching data). Investigate recurrences of this problem as security attacks.

Local LU (Alias)
Partner LU (Alias)
Sense Code

Message:	318
Type:	EXCEPTION
Cause Type:	SNA
Cause:	<p>BIND(-RSP) received in response to a BIND request. This may indicate a configuration error, or a protocol error. Common sense codes which typically indicate a configuration error or a normal race condition include</p> <p>0805xxxx - the session could not be activated as session activation limits have been reached</p> <p>08060014 - the partner LU is not known</p> <p>0806xxxx - the BIND specified a resource which is not known</p> <p>080Fxxxx - security authorization failed</p> <p>0821xxxx - the BIND supplied an invalid session parameter</p> <p>0835xxxx - parameter error in BIND RU at offset xxxx</p> <p>Other sense codes include</p> <p>0812xxxx - session activation failed due to resource shortage at the remote node</p> <p>083Bxxxx - invalid PCID in BIND RU</p> <p>0852xxxx - duplicate session activation request</p> <p>0861xxxx - invalid COS name in BIND RU</p> <p>088Cxxxx - control vector or subfield missing from BIND RU</p> <p>0895xxxx - BIND RU contained a control vector that was in error</p> <p>0896xxxx - BIND RU contained a control vector that was too long</p>
Effect:	Session activation will fail with the specified sense code.
Action:	If the sense code indicates a configuration error, check for inconsistencies between the configuration at the local LU and the configuration at the partner LU. If the configuration is consistent and the problem persists, contact support with details of the problem.

Sense code

Local LU name

Partner LU name

Mode Name

BIND RU

LINCS Problem Determination

Message:	319
Type:	EXCEPTION
Cause Type:	SNA
Cause:	<p>UNBIND request received in response to a BIND request. This may indicate a configuration error, or a protocol error. Common sense codes which typically indicate a configuration error or a normal race condition include</p> <p>0805xxxx - the session could not be activated as session activation limits have been reached</p> <p>08060014 - the partner LU is not known</p> <p>0806xxxx - the BIND specified a resource which is not known</p> <p>080Fxxxx - security authorization failed</p> <p>0821xxxx - the BIND supplied an invalid session parameter</p> <p>0835xxxx - parameter error in BIND RU at offset xxxx</p> <p>Other sense codes include</p> <p>0812xxxx - session activation failed due to resource shortage at the remote node</p> <p>083Bxxxx - invalid PCID in BIND RU</p> <p>0852xxxx - duplicate session activation request</p> <p>0861xxxx - invalid COS name in BIND RU</p> <p>088Cxxxx - control vector or subfield missing from BIND RU</p> <p>0895xxxx - BIND RU contained a control vector that was in error</p> <p>0896xxxx - BIND RU contained a control vector that was too long</p>
Effect:	Session activation will fail with the specified sense code.
Action:	If the sense code indicates a configuration error, check for inconsistencies between the configuration at the local LU and the configuration at the partner LU. If the configuration is consistent and the problem persists, contact support with details of the problem.

Sense code

Local LU name

Partner LU name

Mode Name

BIND RU

UNBIND RU

Address Space Manager

Message:	320
Type:	PROBLEM
Cause Type:	Config
Cause:	Received BIND request directed at this node (that is, either without an RSCV, or at the last hop on the RSCV) with an unrecognised secondary LU name. This usually indicates a configuration error at the primary LU.
Effect:	Session activation will fail with the specified sense code.
Action:	Correct primary LU configuration to access a secondary LU that is defined on this node (QUERY_LOCAL_LU will provide a list).

Sense code

Secondary LU name

BIND RU

Message:	322
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to generate Alert to report a BIND segmentation or pacing error.
Effect:	The Alert will not be sent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

LS name

Message:	323
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to process received BIND request.
Effect:	The BIND will be rejected with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

LS name

LFSID

BIND RU

Message:	324
Type:	PROBLEM
Cause Type:	SNA
Cause:	ACTPU, ACTLU, DACTPU or DACTLU received over a link on which dependent LUs are not supported. This may indicate an interoperability problem.
Effect:	Request will be rejected with the specified sense code.
Action:	Contact support with details of the problem.

Sense code

LS name

LFSID

RU

Message:	331
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received BIND request with badly formed secondary LU name. This may indicate an interoperability problem.
Effect:	Session activation will fail with the specified sense code.
Action:	Contact support with details of the problem.

Sense code

Secondary LU name

BIND RU

LINCS Problem Determination

Message:	332
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received BIND request where network identifier of secondary LU does not match local network identifier.
Effect:	Session activation will fail with the specified sense code.
Action:	Contact support with details of the problem.

Sense code

Secondary LU name

Local network ID

Primary LU name

BIND RU

Message:	335
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to deactivate a link.
Effect:	The link will not be deactivated.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

LS name

Message:	338
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to correlate received BIND response. This is a normal race condition, caused by a BIND being followed immediately by an UNBIND for the same session.
Effect:	BIND response is discarded.
Action:	None.

LS name

LFSID

RSP(BIND) RU

Message:	339
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received BIND using LFSID that is already in use. This is usually caused by a race condition (a BIND, UNBIND, BIND sequence all using the same LFSID, where the second BIND overtakes the UNBIND). Nodes at the current level of APPN contain 'LFSID ageing' processing to minimise the changes of this race condition, but some older implementations may not support this processing.
Effect:	BIND will be rejected with specified sense code.
Action:	If problem is persistent, or occurs frequently, contact support with details of the problem.

Sense code

LS name

LFSID

BIND RU

Message:	342
Type:	PROBLEM
Cause Type:	SNA
Cause:	Session control request received with invalid local form session identifier (that is, the LFSID is not in a range appropriate for the request). This may indicate an interoperability problem.
Effect:	Request will be rejected with the specified sense code.
Action:	Contact support with details of the problem.

Sense code

LS name

LFSID

RU

Message:	344
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to create local form session identifier routing table for a link station.
Effect:	Link activation will fail.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

LINCS Problem Determination

Message:	345
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Unable to extend local form session identifier routing table.
Effect:	Session activation will fail with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

LS name

Message:	346
Type:	EXCEPTION
Cause:	An independent LU-LU session has been deactivated because the local LU has been deleted.
Effect:	None.
Action:	None.

Local LU name

LFSID

LS name

Message:	347
Type:	PROBLEM
Cause Type:	SNA
Cause:	Detected fatal BIND or UNBIND protocol error. This may indicate an interoperability problem. Sense codes are as follows. 20110000 -BIND pacing window overrun, or PI not set when expected 20110001 -unexpected solicited BIND IPM 20110002 -PI set when not expected 20110003 -pacing response not IPM 10020000 -RU (BIND, UNBIND or BIND IPM) length error 10010003 -BIND IPM format error 80070000 -BIND or RSP(BIND) segment out of sequence, or segmented UNBIND or RSP(UNBIND) 80070002 -BIND or RSP(BIND) segments interleaved 800F0000 -LFSID incorrect for SC request 800F0001 -ODAI incorrect
Effect:	Link will be deactivated.
Action:	Contact support with details of the problem.

Sense code

LS name

Message:	348
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received BIND IPM on link where adaptive BIND pacing is not supported. This may indicate an interoperability problem.
Effect:	BIND IPM will be discarded.
Action:	Contact support with details of the problem.

LS name

Message:	349
Type:	EXCEPTION
Cause:	A dependent LU-LU session has been deactivated because the LU has been deleted.
Effect:	None.
Action:	None.

PU name
NAU address
LFSID

Management Service

Message:	353
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to deliver MDS_MU to a registered application.
Effect:	The MU will be returned to the sender indicating a resource shortage error.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

MS application name

Message:	355
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to allocate memory to process an incoming TRANSFER_MS_DATA or SEND_MDS_MU or register signal.
Effect:	The signal will be returned to the sender noting the resource shortage error.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	356
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to add the product set id or the date time stamp requested due to either memory shortage or the addition causing an NMVT to exceed maximum size.
Effect:	Additions will not be made to the signal.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	357
Type:	AUDIT
Comment:	TRANSFER_MS_DATA/SEND_MDS_MU data has arrived.

Originator ID
Alert data

LINCS Problem Determination

Message:	358
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to allocate memory and was thus unable to log data supplied by the user.
Effect:	The data will not be logged.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	359
Type:	EXCEPTION
Cause Type:	API
Cause:	A signal was received which was unrecognized and could not be returned to the sender.
Effect:	The signal memory will be freed.
Action:	Check that issued signals are acceptable according to the API specification.

Message:	360
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Memory failure in trying to allocate space to route a back-level alert to the parent MS process.
Effect:	The alert will not be sent. It is logged here.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Source component Originator ID
Component type Data

Message:	362
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to allocate control block space to process an incoming verb.
Effect:	The verb will not be processed and it will be returned to the sending application with a primary return code of NAP_UNEXPECTED_SYSTEM_ERROR.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Opcode

Message:	363
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to allocate memory needed to send an alert.
Effect:	The alert will not be sent, however, the sense code of the alert will be logged.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Message:	364
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to needed memory for processing an MDS_MU.
Effect:	The MDS_MU will not be processed. If the MDS_MU originated at the local node the SEND_MDS_MU verb containing the MDS_MU will be returned to the sending application noting the error. If the MDS_MU did not originate from the local node, an error message will be returned to the originating application.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	365
Type:	EXCEPTION
Cause Type:	API
Cause:	A correlation error was detected while processing an MDS_MU.
Effect:	The MDS_MU will not be processed. If the MDS_MU originated at the local node the SEND_MDS_MU verb containing the MDS_MU will be returned to the sending application noting the error. If the MDS_MU did not originate from the local node, an error message will be returned to the originating application. An error message may also be sent to other applications if they are affected by the correlation clash.
Action:	User should reissue the SEND_MDS_MU but with a correct correlator value.

Message:	366
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to pass Alert to registered Alert Handler.
Effect:	The alert will not be sent, however, it will be logged.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Alert data

Message:	367
Type:	EXCEPTION
Cause Type:	API
Cause:	The system received a send failure for an alert stored on the send alert queue. No held alert function is available to store the alert until another focal point is established. alert to the alert handler.
Effect:	The alert will not be sent, however, it will be logged.
Action:	None.

Alert data

LINCS Problem Determination

Message:	368
Type:	EXCEPTION
Cause Type:	API
Cause:	The system was unable to correlate an error received on an alert send with the alerts stored in the send alert queue. The send alert queue is either too small and the original alert has been deleted or a previous error prevented the alert from being held on the queue
Effect:	The alert will not be sent to the focal point.
Action:	Investigate definition of send alert queue size (configurable on the START_NODE) or if prior memory shortage caused alert not to be held on the queue.

Message:	372
Type:	PROBLEM
Cause Type:	SNA
Cause:	MS Capabilities received an error message reporting a format error on an MDS_MU our node supposedly sent.
Effect:	The error message will be logged, however, no further action can be taken. Ignoring the message may lead to further unexpected occurrences.
Action:	Contact support with details of the problem.

Error data

Message:	373
Type:	EXCEPTION
Cause Type:	Resource
Cause:	MS Capabilities failed to get space to send a message.
Effect:	The message will not be sent. If the intended message was a request for focal point services, MS will pursue focal point services alternatively. If the intended message was to revoke a previous focal point, the message will not be sent. The node will still appear in the focal point's sphere of control list.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	374
Type:	EXCEPTION
Cause Type:	External
Cause:	MS Capabilities received an error message. This is assumed to be the result of a send failure.
Effect:	The error message received will be logged so that send failure types can be examined. MS capabilities will take appropriate recovery action if the failed send effects the focal point table.
Action:	Contact support with details of the problem.

Sense code

Error data

Message:	377
Type:	EXCEPTION
Cause Type:	Resource
Cause:	MDS failed to get needed memory during the creation sequence.
Effect:	The MDS creation will fail.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	378
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to processed received MS Capabilities information.
Effect:	The category for which this failure occurred will be reset.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	379
Type:	EXCEPTION
Cause Type:	SNA
Cause:	MDS received an MDS_MU that it could not parse correctly.
Effect:	An alert will be raised. If the MDS_MU originated from a local application, the SEND_MDS_MU will be returned with the return codes NAP_PARAMETER_CHECK and NAP_INVALID_MDS_MU_FORMAT.
Action:	Investigate syntax of MDS_MU sent, correct syntax, and reissue the SEND_MDS_MU.

Message:	380
Type:	EXCEPTION
Cause Type:	Internal
Cause:	An MDS Transaction Program received an unexpected return code.
Effect:	The transaction program will re-initialize. The MDS_MU that was being sent will be returned to the originator if the error was detected at the originating node, or the originator will be notified of the send failure via an error message.
Action:	Investigate cause of unexpected return code.

Primary return code

Secondary return code

Message:	381
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to queue Alert for error correlation
Effect:	The alert will not be queued, and thus, if an error message regarding the failure to send this alert is received, MDS will be unable to correlate it. If the alert is sent successfully, no further problems will result.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

LINCS Problem Determination

Message:	382
Type:	EXCEPTION
Cause Type:	Resource
Cause:	MDS unable to get buffer to send TP_ENDED for SEND_TP.
Effect:	TP_ENDED will not be sent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	383
Type:	EXCEPTION
Cause Type:	Resource
Cause:	MDS unable to get memory for a SNASVCMG session control block.
Effect:	The control block will not be obtained.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	384
Type:	EXCEPTION
Cause Type:	Internal
Cause:	An MDS Transaction Program received an unexpected what_received.
Effect:	The transaction program will re-initialize. The MDS_MU that was being sent will be returned to the originator if the error was detected at the originating node, or the originator will be notified of the send failure via an error message.
Action:	Investigate cause of unexpected what_received.

What_received

Message:	386
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system received a send failure for a local MS capabilities originated message.
Effect:	MS capabilities will treat the send failure as a loss of connectivity to the partner node. If focal point relationships are affected then MS capabilities will take appropriate recovery action.
Action:	Investigate cause of failed send.

Message data

Message:	387
Type:	EXCEPTION
Cause Type:	Resource
Cause:	The system was unable to allocate resource to set up a link control block for a received PU_STATUS message.
Effect:	The active link will be treated as unknown by MS. Any messages received over the link will be returned as undeliverable. Any TRANSFER_MS_DATA or SEND_MDS_MUs received from applications specifying the link in the PU_STATUS will be returned with link_name unknown.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Conventional Half Session

Message:	450
Type:	EXCEPTION
Cause Type:	SNA
Cause:	LU type 0,1,2 or 3 format error. This may indicate an interoperability problem.
Effect:	The PIU containing the error is discarded.
Action:	Contact support with details of the problem

Sense code

LFSID

TH

RH

RU

Message:	451
Type:	EXCEPTION
Cause Type:	SNA
Cause:	LU type 0,1,2 or 3 session ended abnormally because insufficient storage
Effect:	Session will be deactivated with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

LFSID

Message:	454
Type:	EXCEPTION
Cause Type:	API
Cause:	LU type 0,1,2 or 3 application sent invalid Data message.
Effect:	Status Acknowledge (NACK-2) sent to application.
Action:	Investigate the error in the application.

Error code

LFSID

Message:	455
Type:	EXCEPTION
Cause Type:	API
Cause:	LU type 0,1,2 or 3 application sent invalid Status Control message.
Effect:	Status Control (NACK-2) sent to application.
Action:	Investigate the error in the application.

Error code

LFSID

LINCS Problem Determination

Message:	456
Type:	EXCEPTION
Cause Type:	API
Cause:	LU type 0,1,2 or 3 application sent invalid Acknowledgment or Status message.
Effect:	Status Error sent to application.
Action:	Investigate the error in the application.

Error code

LFSID

Message:	458
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to report RTM statistics to host.
Effect:	RTM statistics displayed by host will be inconsistent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

NAU address

Message:	459
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to report RTM status to application.
Effect:	RTM statistics reported and displayed by application may be inconsistent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

NAU address

General Protocol Code Errors

Message:	460
Type:	EXCEPTION
Cause Type:	Resource
Cause:	APPN could not allocate necessary storage.
Effect:	Some operation may fail. See other logs.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	461
Type:	PROBLEM
Cause Type:	Resource
Cause:	APPN could not allocate necessary storage.
Effect:	Some operation will fail. See other logs/verbs.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Topology and Routing Services

Message:	470
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A Class of Service name specified for a session activation could not be associated with a valid COS.
Effect:	A session activation will fail with the specified sense code.
Action:	Either add a class of service definition for the specified COS name (using DEFINE_COS), or ensure no mode-to-COS mapping tables at the origin node or its network node server use the unrecognised COS.

Sense code

COS name

Origin node

Destination node

Message:	471
Type:	EXCEPTION
Cause Type:	SNA
Cause:	No suitable TG could be found from the origin end node to the backbone network for the class of service specified for a session activation. This may be caused by a temporary link failure between the origin node and a network node.
Effect:	A session activation will fail with the specified sense code.
Action:	First check for a link failure at the origin node that explains the route failure. If no link failure is found, either - change the mode-to-COS mapping on the origin node or its network node server to use a different class of service, or - reconfigure the network to ensure there is a useable route from the origin node to the backbone network (for example, by defining and/or activating another link from the origin node to a network node).

Sense code

Origin node

Destination node

COS name

Origin TG vectors

LINCS Problem Determination

Message:	472
Type:	EXCEPTION
Cause Type:	SNA
Cause:	No suitable TG could be found from the backbone network to the destination end node for the class of service specified for a session activation. This may be caused by a temporary link failure between the destination node and a network node.
Effect:	A session activation will fail with the specified sense code.
Action:	First check for a link failure at the destination node that explains the route failure. If no link failure is found, either - change the mode-to-COS mapping on the origin node or its network node server to use a different class of service, or - reconfigure the network to ensure there is a useable route from the destination node to the backbone network (for example, by defining and/or activating another link from the destination node to a network node).

Sense code

Origin node

Destination node

COS name

Destination TG vectors

Message:	474
Type:	EXCEPTION
Cause Type:	SNA
Cause:	No suitable route could be found for a session activation with the specified Class of Service. This may be caused by a temporary link failure between two network nodes somewhere in the network
Effect:	A session activation will fail with the specified sense code.
Action:	First check for any link failures in the backbone network that explain the route failure. If no link failure is found, either - change the mode-to-COS mapping on the origin node or its network node server to use a different class of service, or - reconfigure the network to ensure there is a useable route between the specified origin and destination nodes.

Sense code

Origin node

Destination node

COS name

Origin TG Vectors

Destination TG Vectors

Message:	475
Type:	EXCEPTION
Cause Type:	SNA
Cause:	No suitable route could be found for a directed search. This may indicate the destination node is inoperative, or it may be caused by a link failure between two network nodes.
Effect:	A session activation may fail (even though APPN will try to locate the target LU using a broadcast search, it will most likely be unavailable).
Action:	Check the network topology to see if the destination node is inoperative, or for link failures that explain the directed search failure.

Sense code

Origin node

Destination node

Message:	476
Type:	EXCEPTION
Cause Type:	SNA
Cause:	No suitable TG could be found for a session activation to an adjacent node for the given Class of Service. This may be caused by a link failure.
Effect:	A session activation will fail with the specified sense code.
Action:	Check for a link failure (using QUERY_LOCAL_TOPOLOGY or QUERY_LS) that explains the failure. If no link failure is found, either change the mode-to-COS mapping (using DEFINE_MODE) to use a different class of service, or reconfigure the network to ensure there is a useable link between this node and the specified adjacent node.

Sense code

Destination node

COS name

CP-CP Sessions?

Message:	477
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Route Selection Control Vector generated for route was too long (must be less than 256 bytes long).
Effect:	A session activation will fail with the specified sense code.
Action:	Reconfigure the network to ensure there is a short enough route between the origin and destination nodes.

Sense code

Origin node

Destination node

COS name

Number of hops

RSCV length

LINCS Problem Determination

Message:	478
Type:	PROBLEM
Cause Type:	SNA
Cause:	A node record RSN space has wrapped.
Effect:	This is a normal system event which occurs after more than 2 ³² topology state changes for the local node (at one change per second, this would take 69 years!). This log may indicate a duplicate CP name within the network.
Action:	Node must be shut down and restarted with a new CP name. If the problem occurs frequently, look for a another network node with the same CP name within the network.

Message:	480
Type:	EXCEPTION
Cause Type:	SNA
Cause:	An adjacent node has temporarily stopped receiving topology information sent by this node. To preserve TDU buffers, no more topology updates are sent to the adjacent node until it has 'caught up', flagged by log 481. This may indicate a problem in the adjacent node (eg. insufficient processing power), or a problem in the network (eg. an unstable link or links causing a large amount of TDU traffic).
Effect:	Topology updates may be delayed. Network topology may become inconsistent.
Action:	Check for log 481 indicating that the adjacent node has restarted its processing, or for logs indicating that CP-CP sessions to the adjacent node have been deactivated. If the former, use QUERY_NN_TOPOLOGY_STATS to monitor the amount of TDU traffic on the network. If this is abnormally high, use QUERY_NN_TOPOLOGY_NODE and QUERY_NN_TOPOLOGY_TG to look for a resource with an increasing RSN value, which indicates frequent state changes. If the TDU traffic is normal, consider upgrading the adjacent node, or removing CP-CP session support on links between this node and the adjacent node.

Adjacent node

Message:	481
Type:	EXCEPTION
Cause Type:	SNA
Cause:	An adjacent node has restarted processing topology updates sent by this node.
Effect:	Network topology should become consistent.
Action:	None. See log 480 for more details of this condition.

Adjacent node

Message:	482
Type:	PROBLEM
Cause Type:	SNA
Cause:	A TG record RSN space has wrapped.
Effect:	This is a normal system event which occurs after more than 2 ³² topology state changes for the specified TG (at one change per second, this would take 69 years!). This log may indicate a duplicate CP name within the network.
Action:	Node must be shut down and restarted with a new CP name. If the problem occurs frequently, look for a another network node with the same CP name within the network.

Adjacent node

TG number

Directory Services

Message:	490
Type:	PROBLEM
Cause Type:	Config
Cause:	Unable to register resources owned by a served end node because the directory is full.
Effect:	The specified resource will not be registered (and the registration request rejected). Network searches for the resource may fail if the end node is unable to register it.
Action:	The problem can be cleared (if required) by restarting this node increasing the max_dir_entries parameter on START_NODE. Alternatively, specifying zero in this field means there is no upper bound on the number of entries in the directory.

Sense code

Maximum entries

Adjacent CP name

Resource name

Resource type

Message:	491
Type:	PROBLEM
Cause Type:	Config
Cause:	Network search not started because it would exceed the maximum number of concurrent locates supported by this node.
Effect:	Session activation will fail with the specified sense code.
Action:	The problem can be avoided by restarting this node increasing the max_locates parameter on START_NODE.

Sense code

Origin CP name

Origin LU name

Destination LU name

Maximum locates

LINCS Problem Determination

Message:	492
Type:	EXCEPTION
Cause Type:	Resource
Cause:	A network search for which this node was the originator or the network node server has failed. The most common sense codes are as follows (the sense code is an amalgam of sense codes received from the various nodes that took part in the search). 08900060 -insufficient storage to process Locate search 08900010 -routing error on a directed Locate search 08900070 -session outage in the search tree 0812000A -insufficient resources at the CDS These sense codes usually indicate a transient problem in the network (either a resource shortage, or link failure).
Effect:	Session activation will fail with the specified sense code.
Action:	Retry the session activation. If the problem persists, contact support with details of the problem.

Sense code

Origin CP name

Origin LU name

Destination LU name

Message:	493
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received badly formed Locate from an adjacent node. This may indicate an interoperability problem. Sense codes are as follows. 1010B080 -missing command parameters control vector in Found GDS variable 10140080 -GDS variable or control vector length error 1014A082 -missing search argument directory entry in Find GDS variable
Effect:	CP-CP sessions with adjacent node will be deactivated with the specified sense code.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Locate

Message:	494
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to process Locate received from adjacent node.
Effect:	CP-CP sessions with the adjacent node will be deactivated (this avoids possible deadlocks).
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Adjacent CP name

Locate

Message:	495
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Received Locate with no Find GDS variable.
Effect:	None (the Locate is discarded).
Action:	None.

Adjacent CP name

Locate

Message:	499
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage for CP-CP sessions.
Effect:	CP-CP sessions will be deactivated with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Adjacent CP name

Message:	500
Type:	EXCEPTION
Cause Type:	SNA
Cause:	CP-CP sessions deactivated while broadcast Locate in process.
Effect:	Session activation may fail.
Action:	This log simply flags the fact that a session failure impacted a pending broadcast Locate. Other, more specific, logs give reasons for the session failure and appropriate actions.

Sense code

Adjacent node

Origin CP name

Origin LU name

Destination LU name

Message:	501
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received a registration or deletion request from an unknown end node. This may indicate an interoperability problem, but is not considered fatal.
Effect:	The registration request is discarded.
Action:	None.

Adjacent CP name

LINCS Problem Determination

Message:	502
Type:	PROBLEM
Cause Type:	Resources
Cause:	Insufficient storage to register resources owned by a served end node.
Effect:	The specified resource will not be registered (and the registration request rejected). Network searches for the resource may fail if the end node is unable to register it.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	503
Type:	PROBLEM
Cause Type:	Config
Cause:	Failed to register resource for a served end node because the resource is already registered but with a different parent resource. This typically occurs when the same LU is defined on two or more end nodes.
Effect:	The registration request is rejected, which may result in other resources not being registered, and subsequent network search failures.
Action:	Remove or rename the LU on one of the end nodes.

Sense code

Adjacent CP name

Resource name

Resource type

Owning resource name

Owning resource type

Message:	504
Type:	PROBLEM
Cause Type:	SNA
Cause:	Registration failure GDS variable received from the network node server is badly formed. This may indicate an interoperability problem.
Effect:	CP-CP sessions to node will be deactivated.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Register GDS variable

Message:	505
Type:	PROBLEM
Cause Type:	SNA
Cause:	Link or session failure while registering resources with the network node server.
Effect:	CP-CP sessions to node will be deactivated.
Action:	This log flags the fact that a registration request was disrupted by the link or session failure. Other, more specific logs give details on the reasons for the failure, and the appropriate actions.

Sense code

Adjacent CP name

Message:	507
Type:	PROBLEM
Cause Type:	SNA
Cause:	Protocol error while registering resources with the network node server.
Effect:	CP-CP sessions to node will be deactivated.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Message:	508
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Local node timed out waiting for a Locate response from the specified adjacent node. This typically indicates a problem in another node in the network not responding to Locates (possibly because only one CP-CP session is active with an adjacent node).
Effect:	CP-CP sessions with the adjacent node will be deactivated with the specified sense code.
Action:	Verify that the locate timer is not too small (using QUERY_NODE). Then verify that there are no nodes in the network with a single CP-CP session active to an adjacent node.

Sense code

Adjacent CP name

Message:	510
Type:	EXCEPTION
Cause Type:	SNA
Cause:	The directory information received in a Locate conflicted with information in the local directory. This may indicate one or more duplicate names in the network.
Effect:	Unexpected network behavior may result.
Action:	Check the definition of the specified resource name, and look for duplicate names configured elsewhere in the network.

Resource name

LINCS Problem Determination

Message:	511
Type:	PROBLEM
Cause Type:	SNA
Cause:	A served end node attempted to delete a directory entry that is defined as a home entry at this node. This normally occurs when DEFINE_DIRECTORY_ENTRY or DEFINE_ADJACENT_LEN_NODE has been used to define LUs owned by served end or LEN nodes.
Effect:	The Delete request is rejected with the specified sense code.
Action:	Use DELETE_DIRECTORY_ENTRY or DELETE_ADJACENT_LEN_NODE to remove the home entry from the directory.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	512
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A served end node attempted to delete a directory entry that does not exist. This is normally caused by a network race condition, causing the Delete request to arrive when the resource has not been registered.
Effect:	The Delete request is rejected with the specified sense code.
Action:	None.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	513
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Served end node attempted to delete a resource, when it was not registered as the owner of the resource. This may indicate an interoperability problem.
Effect:	The Delete request is rejected with the specified sense code. This may cause the end node to deactivate CP-CP sessions.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Resource name

Resource type

Owning resource name

Owning resource type

Message:	514
Type:	PROBLEM
Cause Type:	SNA
Cause:	Received a Register or Delete GDS variable from an served end node which contained format errors. Sense codes are as follows. 08950000 -GDS variable or control vector length error. 10140080 -invalid control vector
Effect:	Register or delete attempt is rejected. The resources specified will not be registered
Action:	Contact support with details of the problem.

Sense code
Adjacent CP name
Error offset
Register/Delete GDS variable

Message:	516
Type:	PROBLEM
Cause Type:	Config
Cause:	The network node server has rejected a Register request with a sense code indicating this node is not authorized to register resources at the network node. This usually indicates a mismatch between the network node server's configuration (to consider this end node unauthorized) and this node's configuration (to register resources).
Effect:	No further resource registration will occur until CP-CP sessions are deactivated and re-established.
Action:	Either modify the network node server configuration to consider this node authorized, or stop this node from registering its resources (by setting reg_with_nn on START_NODE to NAP_NO).

Sense code
Adjacent CP name
Resource name
Resource type

Message:	517
Type:	PROBLEM
Cause Type:	SNA
Cause:	A resource registration failed because the network node server's directory is full. This may indicate a shortage of storage at the network node, or a configured upper bound on the size of it's directory.
Effect:	No further resource registration will occur until CP-CP sessions are deactivated and re-established.
Action:	Increase the size of the directory at the network server. This may be a simple configuration change, or it may require freeing up storage by reducing the load at the server.

Sense code
Adjacent CP name
Resource name
Resource type

LINCS Problem Determination

Message:	518
Type:	PROBLEM
Cause Type:	SNA
Cause:	A resource registration failed because the resource conflicted with existing resources in the network node server's directory. This most commonly occurs when two LUs with the same name are defined on two different end nodes being served by the same network node. It may also occur if the network node has a home directory entry defined for the same resource.
Effect:	Registration of the resource in question will fail, other resources should still be registered correctly.
Action:	Check the network node's directory for the duplicate entry. If it is a home entry, then remove the home entry from the directory. If it is a registered entry owned by a different end node, redefine the LU to use a different name.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	519
Type:	PROBLEM
Cause Type:	SNA
Cause:	A resource registration failed because the network node server detected a protocol error in the Register request. This may indicate an interoperability problem.
Effect:	Registration of the resource in question will fail, other resources should still be registered correctly.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	520
Type:	PROBLEM
Cause Type:	SNA
Cause:	A resource registration failed with an unknown sense code. This may indicate an interoperability problem.
Effect:	No further resource registration will occur until CP-CP sessions are deactivated and re-established.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	521
Type:	PROBLEM
Cause Type:	SNA
Cause:	Delete reply received with a sense code that is unrecoverable.
Effect:	CP-CP sessions to node will be deactivated.
Action:	Contact support with details of the problem.

Received sense code

Generated sense code

Adjacent CP name

Resource name

Resource type

Message:	522
Type:	PROBLEM
Cause Type:	SNA
Cause:	Directory Error Correlator returned on a Register or Delete reply cannot be correlated to a directory entry. This is considered a protocol error and may indicate an interoperability problem.
Effect:	CP-CP sessions to node will be deactivated.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Data received

Message:	523
Type:	PROBLEM
Cause Type:	Config
Cause:	The network node server has rejected a Delete request with a sense code indicating this node is not authorised to register resources at the network node. This usually indicates a mismatch between the network node server's configuration (to consider this end node unauthorised) and this node's configuration (to register resources).
Effect:	No further resource registration or deletion will occur until CP-CP sessions are deactivated and re-established.
Action:	Either modify the network node server configuration to consider this node authorised, or stop this node from registering its resources (by setting reg_with_nn on START_NODE to NAP_NO).

Sense code

Adjacent CP name

Resource name

Resource type

LINCS Problem Determination

Message:	524
Type:	EXCEPTION
Cause Type:	SNA
Cause:	A Delete request failed, either because the entry was defined as a home entry at the network node server, or because the resource was not found. Neither error is severe, and will not affect future registration and deletion, or other aspects of network operation.
Effect:	Delete attempt has failed, further deletion and registration will continue unaffected.
Action:	None.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	525
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Invalid resource name in received register request.
Effect:	Register request will fail.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Resource name

Resource type

Message:	526
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Central Resource Registration failure
Effect:	Network performance may degrade because of additional broadcast Locate searches.
Action:	None.

Sense code

CDS name

Resource name

Resource type

Message:	527
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Central Resource Registration failure and invalid correlator received.
Effect:	Network performance may degrade because of additional broadcast Locate searches.
Action:	None.

CDS name

Register data received

Message:	528
Type:	AUDIT
Cause Type:	SNA
Comment:	Central Directory Server located

CDS name

Message:	530
Type:	PROBLEM
Cause Type:	Config
Cause:	Locate received from adjacent node exceeded the maximum number of concurrent locates supported by this node.
Effect:	CP-CP sessions with the adjacent node will be deactivated (this avoids possible deadlocks).
Action:	The network will recover from this problem (that is, the CP-CP sessions will be reactivated). The problem can be avoided by restarting this node increasing the max_locates parameter on START_NODE.

Sense code

Adjacent CP name

Maximum locates

Locate

Message:	531
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to start a network search.
Effect:	Session activation will fail with the specified sense code.
Action:	The problem can be avoided by restarting this node increasing the max_locates parameter on START_NODE.

Sense code

Origin CP name

Origin LU name

Destination LU name

LINCS Problem Determination

Message:	532
Type:	PROBLEM
Cause Type:	SNA
Cause:	CP-CP sessions deactivated while directed Locate in process.
Effect:	Session activation may fail.
Action:	This log simply flags the fact that a session failure impacted a pending directed Locate. Other, more specific, logs give reasons for the session failure and appropriate actions.

Sense code

Adjacent node

Origin CP name

Origin LU name

Destination LU name

Message:	533
Type:	PROBLEM
Cause Type:	Resource
Cause:	A network search for which this node was the originator or the network node server failed to locate the target LU. This may be caused by the target LU name being incorrect, the target system being inoperative, or by link errors in the backbone of the network.
Effect:	Session activation will fail with the specified sense code.
Action:	If the target LU name is correct, check that the system the LU is defined on is active. If the system is active, check the topology of the network (using the QUERY_NN_TOPOLOGY_* verbs) to ensure that the target system (or its network node server) is reachable from this node.

Sense code

Origin CP name

Origin LU name

Destination LU name

Session Connector

Message:	534
Type:	EXCEPTION
Cause Type:	Config
Cause:	CP-CP sessions have been established with an adjacent end node which was previously defined by DEFINE_DIRECTORY_ENTRY or DEFINE_ADJACENT_LEN_NODE.
Effect:	The invalid directory definitions for the end node and any of its LUs will be removed.
Action:	Do not configure the invalid entries in future

Resource Name

Session Connector

Message:	536
Type:	EXCEPTION
Cause Type:	SNA
Cause:	APPN detected a protocol error in an PIU received on an intermediate session. This typically indicates a problem on an adjacent node. The sense codes are as follows. 10010003 -invalid IPM format 10020000 -RU length error 10030000 -CLEAR request on secondary stage, or CLEAR response on primary stage 20110000 -sender has overrun pacing window, or PI not set on first RU of window 20110001 -unexpected IPM 20110002 -PI set on other than first RU in window 20110003 -invalid pacing response 80070000 -segment error
Effect:	The intermediate session will be deactivated.
Action:	Report the problem in the adjacent node to support (running a trace on the specified link if more diagnostics are required).

Sense code TH
FQPCID BIU
LS name

Message:	537
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Deactivating intermediate session because of insufficient storage.
Effect:	The intermediate session will be deactivated.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code
FQPCID

Session Connector Manager

Message:	540
Type:	PROBLEM
Cause Type:	Config
Cause:	Intermediate session activation failed because APPN is not configured to support any more intermediate sessions. This is usually caused by a normal network race condition (since APPN will inform other network nodes that it has reached its limit on intermediate sessions via topology).
Effect:	ISR session activation will fail with the specified sense code (0805000D).
Action:	If required, restart APPN to support a larger number of intermediate sessions (via START_NODE).

Sense code Primary LU name
Active ISR sessions Secondary LU name
LS name BIND RU

LINCS Problem Determination

Message:	541
Type:	PROBLEM
Cause Type:	SNA
Cause:	Protocol error in received ISR BIND request. This may indicate an interoperability problem. Sense codes are as follows. 08350008 -secondary-to-primary staging indicator incorrect 0835000C -primary-to-secondary staging indicator incorrect 10010024 -unextended non-LU6.2 BIND 10020000 -BIND RU length error
Effect:	ISR session activation will fail with the specified sense code.
Action:	Report the problem to support (running a trace on the specified link if more diagnostics are required).

Sense code

LS name

Primary LU name

Secondary LU name

BIND RU

Message:	543
Type:	PROBLEM
Cause Type:	SNA
Cause:	Unable to identify or activate the next hop of an ISR session.
Effect:	ISR session activation will fail with the specified sense code.
Action:	This log is preceded by other logs giving more specific reasons for the failure. Follow the actions given in those logs.

Sense code

FQPCID

Primary LU name

Secondary LU name

BIND RU

Message:	544
Type:	PROBLEM
Cause Type:	SNA
Cause:	ISR detected a fatal error in an intermediate session.
Effect:	The ISR session will be deactivated with the specified sense code.
Action:	This log should be preceded by a log 536 or 537. Follow the actions given in those logs.

Sense code

FQPCID

Message:	545
Type:	PROBLEM
Cause Type:	SNA
Cause:	ISR session failed because of link outage or error.
Effect:	The ISR session will be deactivated with the specified sense code.
Action:	This log gives information on which ISR sessions are affected by a link outage or error. Preceding logs give more specific information about the reason for the link outage or error.

Sense code

FQCPID

Failing LS name

Message:	546
Type:	PROBLEM
Cause Type:	Resource
Cause:	Unable to assign a local-form session identifier (LFSID) to the secondary stage of an ISR session. This problem is probably caused by insufficient storage to extend the appropriate LFSID routing table, although it could also indicate that the table is full (each link can route a maximum of 64770 ISR sessions).
Effect:	ISR session activation will fail with the specified sense code.
Action:	This log gives information on which ISR session is affected by a failure in the LFSID table management. Preceding logs give more detail on the reason for the failure.

Sense code

FQPCID

LS name

Primary LU name

Secondary LU name

BIND RU

Message:	547
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to correlate BIND response received during ISR session activation.
Effect:	None. This is a normal race condition (caused by a BIND request being immediately followed by an UNBIND request for the same session).
Action:	None.

LS name

LFSID

BIND RU

LINCS Problem Determination

Message:	548
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Failed to correlate an UNBIND request received for an ISR session.
Effect:	None (+RSP(UNBIND) is sent in reply). This is a normal race condition (typically caused by UNBIND requests for the same session crossing).
Action:	None.

LS name

LFSID

Message:	549
Type:	AUDIT
Cause Type:	SNA
Cause:	An ISR Session has been activated.

FQPCID

Primary LU name

Secondary LU name

Mode name

COS name

RSCV

Primary stage LS name

Primary stage LFSID

Secondary stage LS name

Secondary stage LFSID

Message:	550
Type:	AUDIT
Cause Type:	SNA
Cause:	An ISR Session has been deactivated.

FQPCID

Deactivation reason

Pri->Sec: All frames

Pri->Sec: FMD frames

Pri->Sec: Bytes

Sec->Pri: All frames

Sec->Pri: FMD frames

Sec->Pri: Bytes

LINCS Problem Determination

Message:	554
Type:	PROBLEM
Cause Type:	Config
Cause:	ISR is unable to support fixed receive pacing window requested on non-negotiable BIND request or response. Sense codes are as follows. 08350009 -maximum primary send window size is larger than that supported by ISR 0835000D -maximum secondary send window size is larger than that supported by ISR
Effect:	ISR session activation will fail with the specified sense code.
Action:	If required, restart the node increasing the isr_rcv_pac_window parameter on START_NODE to be greater or equal to the value specified in the log.

Sense code
Requested window size
Primary LU name
Secondary LU name
BIND RU

Message:	555
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to activate ISR session
Effect:	ISR session activation will fail with the specified sense code (08120014).
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code
Primary LU name
Secondary LU name
BIND RU

LU Manager

Message:	560
Type:	AUDIT
Comment:	An LU-SSCP session has been activated.

PU name
NAU address
LU name

Message:	561
Type:	AUDIT
Comment:	A PLU-SLU session has been activated.

PU name
NAU address
Secondary LU name
Primary LU name

LINCS Problem Determination

Message:	567
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to report RTM status to application.
Effect:	RTM statistics reported and displayed by application may be inconsistent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

PU name

NAU address

LU name

Message:	572
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to activate LU-SSCP session for LU type 0,1,2 or 3.
Effect:	ACTLU request will not be sent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Downstream PU name

Downstream NAU address

Downstream LU name

Message:	573
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to activate LU type 0,1,2 or 3 PLU-SLU session.
Effect:	BIND request will be rejected with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

PU name

NAU address

LU name

Message:	574
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to activate LU-SSCP session for LU type 0,1,2 or 3.
Effect:	ACTLU request will not be rejected with the specified sense code.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

PU name

NAU address

LU name

Message:	575
Type:	PROBLEM
Cause Type:	External
Cause:	<p>A BIND request was received by an LU type 0,1,2, or 3 that failed parameter checks. The sense codes that apply to this condition are: 0835xxxx -parameter error at offset xxxx in BIND RU. The offsets that apply to this sense code are: 0002 - invalid FM profile 0003 - invalid TS profile 0004 - invalid primary FM usage 0005 - invalid secondary FM usage 0006 - invalid common FM usage 0007 - invalid common FM usage 0008 - invalid secondary send pacing 0009 - invalid secondary receive pacing 000A - invalid secondary send RU size 000B - invalid secondary receive RU size 000E - invalid PS profile (ie. invalid session type) 000F - invalid PS usage (applies to RJE BIND only) 0010 - invalid primary half-session PS usage (applies to RJE BIND only) 0014 - invalid default screen size: rows (applies to 3270 display BIND only) 0014 - invalid default buffer size: rows (applies to 3270 printer BIND only) 0015 - invalid default screen size: columns (applies to 3270 display BIND only) 0015 - invalid default buffer size: columns (applies to 3270 printer BIND only) 0016 - invalid alternate screen size: rows (applies to 3270 display BIND only) 0016 - invalid alternate buffer size: rows (applies to 3270 printer BIND only) 0017 - invalid alternate screen size: columns (applies to 3270 display BIND only) 0017 - invalid alternate buffer size: columns (applies to 3270 printer BIND only)</p>
Effect:	BIND request will be rejected with the specified sense code. PLU-SLU session is not activated.
Action:	If possible investigate the configuration of the system that sent the BIND request. If a configuration error is found then correct it, otherwise contact support with details of the problem.

Sense code

PU name

NAU address

LU name

BIND RU :

LINCS Problem Determination

Message:	576
Type:	PROBLEM
Cause Type:	API
Cause:	A BIND request received by an LU type 0,1,2 or 3 was rejected by an application connected to SNAP APPN.
Effect:	BIND request will be rejected with the specified sense code. PLU-SLU session is not activated.
Action:	sense code should help with this). It may be necessary to investigate the configuration of the system that sent the BIND request (if this is possible). If a configuration error is found then correct it, otherwise contact support with details of the problem.

Sense code

PU name

NAU address

LU name

BIND RU :

Message:	577
Type:	PROBLEM
Cause Type:	External
Cause:	A BIND request received by an LU type 0,1,2 or 3 was rejected because the application connection was not open. This may be caused by a normal window condition or it may indicate the the system that sent the BIND request is incorrectly configured or is defective.
Effect:	BIND request will be rejected with the specified sense code. PLU-SLU session is not activated.
Action:	Investigate the cause of the problem. If it indicates that the system that sent the BIND request is incorrectly configured then correct the configuration error. If it appears that the system is defective then contact support with details of the problem

Sense code

PU name

NAU address

LU name

DLUR

Message:	581
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Unable to correlate received UNBIND request to a DLUR-supported session. This is a normal race condition (caused by UNBIND requests crossing).
Effect:	None (will send a +ve response to UNBIND).
Action:	None.

LFSID

Message:	582
Type:	PROBLEM
Cause Type:	SNA
Cause:	DLUS rejects REQACTPU with given sense code.
Effect:	An SSCP-PU session with the given DLUS will not be activated. If a backup DLUS is configured for the PU, DLUR will attempt to activate the PU via the backup DLUS.
Action:	Examine sense code and retry activation if appropriate.

Sense code

DLUS name

PU name

Message:	583
Type:	EXCEPTION
Cause Type:	SNA
Cause:	LU supports extended BINDs but does not support network qualified names.
Effect:	Network qualified names will be included in the extended portion of the bind.
Action:	Investigate LU configuration.

Message:	585
Type:	EXCEPTION
Cause Type:	SNA
Cause:	CPSVRMGR pipe failed to specified DLUS.
Effect:	Any PUs using the specified DLUS are deactivated (that is, DACTPU(cold) is sent. DLUR may attempt to contact one or more backup DLUS's, if configured.
Action:	If a pipe with backup DLUS is not initiated automatically manually restart any required PUs

DLUS partner

Message:	588
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Inconsistent DLUS Names. The Host has requested the activation of a Downstream link to a PU by sending an ACTPU. The link is configured to request a different DLUS.
Effect:	The DLUS initiating the activation is used.
Action:	None required. If the Host DLUS is the regular DLUS (i.e not a backup) then adjust the downstream link configuration when convenient.

PU name

DLUS sending ACTPU

DLUS from Downstream Link

LINCS Problem Determination

Message:	589
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Protocol Error from DLUS. Received an RU too large for SSCPSession. This is typically due to the SSCP sending too large a LOGON Screen.
Effect:	The Data is thrown away.
Action:	If you are expecting an SSCP LOGON screen, enter your LOGON command as usual.

Sending DLUS Name

Message:	590
Type:	EXCEPTION
Cause Type:	SNA
Cause:	The DLUR has failed to contact either the DLUS or the backup/default DLUSs after the configured number of retries.
Effect:	Contact is not made with the DLUS
Action:	Check earlier logs for causes of individual failures to contact Host. Resolve any problems or increase the timeout or retry count and try again

PU Name

HPR Manager

Message:	630
Type:	EXCEPTION
Cause Type:	External
Cause:	An HPR Route Setup RU has been received with format errors
Effect:	The message cannot be processed, and will be discarded.
Action:	Report error to remote end.

Sense code

Message:	631
Type:	EXCEPTION
Cause Type:	External
Cause:	Unable to correlate HPR Route Setup Reply
Effect:	The message cannot be processed, and will be discarded.
Action:	Report error to remote end.

FQPCID

Message:	632
Type:	PROBLEM
Cause Type:	Resource
Cause:	Unable to activate RTP Connection
Effect:	In certain situations, the origin may retry activation.
Action:	Examine sense code and retry activation if appropriate.

Sense code

Message:	633
Type:	EXCEPTION
Cause Type:	External
Cause:	Link failure between this node and source of Route Setup req
Effect:	The route setup request is dropped by this node. The partner node on that link should generate -ve reply.
Action:	Investigate link failure.

FQPCID

Message:	634
Type:	EXCEPTION
Cause Type:	Resource
Cause:	HPR manager failed to get memory to send an RTP indication.
Effect:	The data_lost flag will be set in the next indication successfully sent.
Action:	Investigate memory shortage.

Message:	635
Type:	EXCEPTION
Cause Type:	External
Cause:	An NLP has been received with format errors
Effect:	The message cannot be processed, and will be discarded.
Action:	Report error to remote end.

Message:	636
Type:	EXCEPTION
Cause Type:	External
Cause:	An NLP has been received for an RTP connection which no longer exists
Effect:	The message cannot be processed, and will be discarded.
Action:	Report error to remote end.

Message:	637
Type:	EXCEPTION
Cause Type:	External
Cause:	An NLP has been received, but this node does not support the HPR transport tower
Effect:	The message cannot be processed, and will be discarded.
Action:	Report error to remote end.

Message:	638
Type:	EXCEPTION
Cause Type:	External
Cause:	A connection setup NLP has been received, specifying a previous instance of this NCE. The NCE must have been shut down and restarted since processing the Route Setup request
Effect:	No RTP connection can be started, so the NLP will be discarded.
Action:	Report error to remote end.

Specified target NCE instance

Current NCE instance

Partner node name

LINCS Problem Determination

Message:	639
Type:	EXCEPTION
Cause Type:	External
Cause:	The local node has received an HPR Route Setup RU that it cannot forward because the next hop in the route is not HPR-capable. The local node does not support RTP so it can not act as the destination node and replies with the backout sense code.
Effect:	The Route Setup between the origin node and the destination fail. RTP Connections cannot be activated between these two nodes. This is a normal event when the local node has an auto-activateable link to a node that does not support HPR. It may be possible for an intermediate node in the route that supports RTP to take over the role of the destination node for the Route Setup. If this happens sessions that originate at (or beyond) the origin node will use HPR from the origin to the new destination and use ISR from the new destination to the local node (and beyond it). If no intermediate node is able to act as the destination then HPR will not be used at all by such sessions.
Action:	None.

FQPCID

Next hop CP name

Next hop TG number

Sense code

Message:	640
Type:	EXCEPTION
Cause Type:	External
Cause:	The local node has received an HPR Route Setup RU that it cannot forward because the next hop in the route is not HPR-capable. The local node supports RTP so can act as the destination.
Effect:	The Route Setup will be between the origin node and the local node (the new destination). RTP Connections will be activated between these two nodes. This is a normal event when the local node has an auto-activateable link to a node that does not support RTP. Sessions that originate at (or beyond) the origin node will use HPR from the origin to the new destination and use ISR from the new destination and beyond it.
Action:	None.

FQPCID

Next hop CP name

Next hop TG number

Message:	641
Type:	EXCEPTION
Cause Type:	External
Cause:	The local node has received an HPR Route Setup Reply that contains the backout sense code and is able to act as the new destination for the Route Setup. The Route Setup has been successfully backed out.
Effect:	The Route Setup is between the origin node and the local node (the new destination). RTP Connections will be activated between these two nodes. This is a normal event when a node in the route has an auto-activateable link to a node that does not support RTP or HPR. Sessions that originate at (or beyond) the origin node will use HPR from the origin node to the new destination and use ISR from the new destination and beyond it.
Action:	None.

FQPCID

Message:	642
Type:	EXCEPTION
Cause Type:	External
Cause:	The local node has received an HPR Route Setup Reply in which the destination node is not the same as the destination node that was in the corresponding Route Setup Request. The Route Setup has successfully backed out.
Effect:	The Route Setup is between the origin node and the new destination. RTP Connections will be activated between these two nodes. This is a normal event when a node in the route has an auto-activateable link to a node that does not support RTP or HPR. Sessions that originate at (or beyond) the local node will use HPR from the local node to the new destination and use ISR from new destination and beyond it.
Action:	None.

FQPCID

Original destination

New destination

Message:	643
Type:	EXCEPTION
Cause Type:	External
Cause:	The local node has received an HPR Route Setup Reply with the backout sense code. The Route Setup has failed because the destination node does not support RTP. No intermediate node supports RTP and was able to become the new destination.
Effect:	The Route Setup has failed and HPR will not be used for the session that is being activated. This is a normal event when a node in the route has an auto-activateable link to a node that does not support RTP or HPR.
Action:	None.

FQPCID

Intended destination

Sense code

LINCS Problem Determination

Message:	644
Type:	EXCEPTION
Cause Type:	External
Cause:	The local node has received an HPR Route Setup RU as the destination node but cannot accept it because it does not support RTP. The local node replies with the backout sense code.
Effect:	The Route Setup between the origin node and this node will fail. RTP Connections cannot be activated between these two nodes. This is a normal event when another HPR-capable node has an auto-activateable link to this node. It may be possible for an intermediate node in the route that supports RTP to take over the role of the destination node for the Route Setup. If this happens sessions that originate at (or beyond) the origin node will use HPR from the origin to the new destination and use ISR from the new destination to the local node (and beyond it). If no intermediate node is able to act as the destination then HPR will not be used at all by such sessions.
Action:	None.

FQPCID

Adjacent CP name

TG number

Sense code

Message:	645
Type:	EXCEPTION
Cause Type:	External
Cause:	A connection setup NLP has been received from a remote NCE which has shut down and restarted. An RTP connection still exists from that NCE before it shut down.
Effect:	The old RTP connection will be disconnected
Action:	None.

Partner node name

Partner NCE

New partner NCE instance

Previous partner NCE instance

Local TCID

Rapid Transport Protocol

Message:	660
Type:	AUDIT
Comment:	The RTP Connection has connected

Connection name

Partner name

COS name

Local TCID

Remote TCID

Message:	661
Type:	AUDIT
Comment:	The RTP Connection has disconnected normally

Connection name

Message:	662
Type:	EXCEPTION
Cause Type:	External
Cause:	The RTP Connection has disconnected due to an error
Effect:	Sessions using the connection will fail
Action:	Investigate the cause of the error

Sense code

Connection name

Message:	663
Type:	EXCEPTION
Cause Type:	External
Cause:	The RTP Connection has disconnected due to an error
Effect:	Sessions using the connection will fail
Action:	Investigate the cause of the error

Sense code

Connection name

Message:	676
Type:	EXCEPTION
Cause Type:	Config
Cause:	Find processing not complete on timer expiry
Effect:	No retry of FIND frame on this timer expiry
Action:	If possible, increase the FIND timer value to allow time for the Discovery request to complete. Otherwise, contact support with details of the problem.

Message:	677
Type:	EXCEPTION
Cause Type:	Config
Cause:	Invalid correlator on received FOUND frame. This is may be due to a protocol error at a Discovery server, or may be caused by the FIND timer being set too low.
Effect:	Frame discarded
Action:	If possible, increase the FIND timer value to allow time for the Discovery request to complete. Otherwise, contact support with details of the problem

Message:	678
Type:	EXCEPTION
Cause Type:	Config
Cause:	Invalid correlator on received NOTIFY frame. This may be due to a protocol error at a Discovery server, or may be caused by the QUERY timer being set too low.
Effect:	Frame discarded
Action:	If possible, increase the QUERY timer value to allow time for the Discovery request to complete. Otherwise, contact support with details of the problem

LINCS Problem Determination

Message:	679
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to start Discovery application
Effect:	Discovery fails to initialize application
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to SNAP APPN.

Message:	680
Type:	EXCEPTION
Cause Type:	Config
Cause:	Unexpected FIND frame response received, indicating that the FIND timer is set too low
Effect:	Response discarded
Action:	If possible, increase the FIND timer value to allow time for the Discovery request to complete. Otherwise, contact support with details of the problem.

Message:	681
Type:	EXCEPTION
Cause Type:	Config
Cause:	Unexpected QUERY frame response received, indicating that the QUERY timer is set too low
Effect:	Response discarded
Action:	If possible, increase the QUERY timer value to allow time for the Discovery request to complete. Otherwise, contact support with details of the problem

Message:	682
Type:	EXCEPTION
Cause Type:	Config
Cause:	Unexpected SOLICIT frame response received, indicating that the SOLICIT timer is set too low
Effect:	Response discarded
Action:	If possible, increase the SOLICIT timer value to allow time for the Discovery request to complete. Otherwise, contact support with details of the problem.

Message:	684
Type:	EXCEPTION
Cause Type:	External
Cause:	Subvector of unexpected length in frame. This protocol error may indicate an interoperability problem
Effect:	Subvector is ignored
Action:	Contact support with details of the problem

Frame

Message:	687
Type:	EXCEPTION
Cause Type:	External
Cause:	<p>Error reported on adapter. Possible error types are as follows.</p> <p>0x04 - All SAPs for this device must be closed down</p> <p>0x07 - This SAP must be closed down</p> <p>Possible error codes are as follows.</p> <p>0x11 - General device open/lan insertion failure</p> <p>0x12 - Ring closedown due to excessive Beaconsing</p> <p>0x13 - Hardware/microcode error in adapter</p> <p>0x14 - PC Network failure</p> <p>0x15 - Forced off ring during insertion process</p> <p>0x16 - Error detected during wrap test</p> <p>0x17 - Forced off ring</p> <p>0x18 - Error detected in lobe wiring</p> <p>0x19 - Beaconsing error on insertion to the network</p> <p>0x1A - Another adapter on the network with same address</p> <p>0x1B - Network hardware error</p> <p>0x1C - Adapter has been reset</p> <p>0x30 - SAP has failed</p>
Effect:	Adapter is no longer used by Discovery
Action:	Investigate the cause of the adapter failure

Error type

Error code

Message:	688
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to process an incoming Discovery frame
Effect:	Frame parsing abandoned and frame discarded
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to SNAP APPN.

Message:	689
Type:	EXCEPTION
Cause Type:	External
Cause:	Unable to send Discovery request frame
Effect:	Frame may be resent on a timer, so no effect

Session Services

Message:	719
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Network Node server not required. This is logged when a back-level APPN network node (i.e. one that does not support function set 1015) attempt to activate CP-CP sessions with APPN (EN) when it already has a network node server.
Effect:	The CP-CP session will be deactivated with the specified sense code. APPN cannot subsequently use this network node as its server unless all links to it are deactivated (and at least one restarted).
Action:	None.

Sense code

Adjacent CP name

Message:	720
Type:	PROBLEM
Cause Type:	SNA
Cause:	CP capabilities exchange failed because of contention loser CP-CP session failure.
Effect:	Contention winner CP-CP session will be deactivated. APPN will attempt to reactivate CP-CP sessions with this adjacent CP.
Action:	This log flags the fact that a CP-CP session failed. Other logs give more details on the reason for the session failure (eg. insufficient resources, link failure).

Sense code

Adjacent CP name

Message:	722
Type:	PROBLEM
Cause Type:	Resource
Cause:	Insufficient storage to generate Alert CPSS003 (protocol error in received BIND or LOCATE).
Effect:	Alert will not be sent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Sense code

FQPCID

Adjacent CP name

Message:	723
Type:	PROBLEM
Cause Type:	SNA
Cause:	CP capabilities exchange has failed because of protocol error. This may indicate an interoperability problem. Sense codes are as follows. 08060030 -CP capabilities requested by unknown CP 08210002 -CP capabilities requested on other than CPSVCMG mode 08150007 -CP capabilities requested when CP-CP session already established 08B60000 -CP-CP sessions not supported by adjacent node 08090039 -CP transaction error
Effect:	CP-CP sessions with the specified adjacent node will be deactivated. APPN will not attempt to reactivate CP-CP sessions with this adjacent CP.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

Message:	724
Type:	PROBLEM
Cause Type:	SNA
Cause:	CP capabilities exchange has failed because of badly formatted CP CAPS GDS variable. Sense codes are as follows. 10101000 -CP capabilities length error 10101002 -Unexpected GDS identifier (not CP capabilities)
Effect:	CP-CP sessions with the specified adjacent node will be deactivated. APPN will not attempt to reactivate CP-CP sessions with this adjacent CP.
Action:	Contact support with details of the problem.

Sense code

Adjacent CP name

CP Capabilities

Message:	726
Type:	AUDIT
Comment:	Adjacent CP contacted.

Adjacent CP name

Message:	727
Type:	AUDIT
Comment:	CP-CP sessions have been successfully established with the adjacent node.

Adjacent CP name

1015 compliant

CP Capabilities

LINCS Problem Determination

Message:	728
Type:	EXCEPTION
Cause Type:	SNA
Cause:	Retrying CP-CP session establishment after error.
Effect:	None.
Action:	None.

Adjacent CP name

Sense data

Message:	731
Type:	PROBLEM
Cause Type:	SNA
Cause:	CP capabilities exchange failed because of contention winner CP-CP session failure.
Effect:	Contention loser CP-CP session will be deactivated. APPN will attempt to reactivate CP-CP sessions with this adjacent CP.
Action:	This log flags the fact that a CP-CP session failed. Other logs give more details on the reason for the session failure (eg. insufficient resources, link failure).

Sense code

Adjacent CP name

Message:	732
Type:	EXCEPTION
Cause Type:	SNA
Cause:	CP-CP sessions established between two network nodes in different networks.
Effect:	CP-CP sessions will be deactivated with the specified sense code.
Action:	None.

Sense code

Adjacent CP name

Message:	740
Type:	AUDIT
Comment:	A PU-SSCP session has been activated.

PU name

PU Manager

Message:	741
Type:	AUDIT
Comment:	A PU-SSCP session has been deactivated.

PU name

Message:	742
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to send RTM statistics to host.
Effect:	RTM statistics displayed by host will be inconsistent.
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

PU name

NAU address

CPI-C

Message:	760
Type:	EXCEPTION
Cause Type:	Resource
Cause:	Insufficient storage to process CPI-C function.
Effect:	CPI-C function call will fail with return_code of CM_PRODUCT_SPECIFIC_ERROR
Action:	Either decrease the system load (for example, by reducing the number of active sessions), or make more storage available to APPN.

Message:	762
Type:	EXCEPTION
Cause Type:	API
Cause:	A CPI-C application specified an unknown symbolic destination name on a CMINIT call.
Effect:	The CMINIT call will fail with CM_PARAMETER_CHECK.
Action:	Either define the symbolic destination name (using DEFINE_CPIC_SIDE_INFO), or modify the application to use a symbolic destination name that is already defined

Symbolic destination name

Message:	765
Type:	EXCEPTION
Cause Type:	API
Cause:	CPI-C application attempted to start more than 64 concurrent conversations.
Effect:	CMACCP, CMINIT, or CMINIC verb will fail with CM_PRODUCT_SPECIFIC_ERROR.
Action:	Modify TP to use 64 or fewer concurrent conversations.

3. Utility Functions

Offline Utility Keypad Operations

Using the operator panel keypad interface, the user can execute off-line utilities that perform routine parameter input, such as setting the time, date, or serial number. Additionally, a number of passive diagnostic functions are also provided.

The following steps describe the procedures for initiating a diagnostic utility using the operator panel keypad and LCD.

1. Enter Off-line Diagnostics mode.
2. Observe that the operator panel LCD displays the message:
Diag MODE = M
3. Press and release the operator panel keypad <5> key to select the Utilities mode, then press the <Enter> key. Press and release the operator panel keypad <7> key to access the FE mode of the utilities. An Engineering mode also exists to allow field personnel to run additional utilities only under the direction of a Visara Engineer if necessary.
4. Observe that the standard utility initiation appears on the operator panel LCD display as follows, with the cursor flashing in the R position:

R:UU

where the R field is a parameter that allows the utility output to be redirected to a different output device and the UU field is a 2-digit unique utility number.

5. Enter a value into the R field by pressing and releasing the operator panel keypad <1> key. This is the current default value; no other values are implemented. A value of 1 in the R field selects the operator panel LCD display as the output device for the utility to be executed.
6. Observe that the input value is echoed in the utility initiation template by the numeral 1 replacing the R. Note also that the flashing block cursor moves to the colon (:) which separates the R and UU fields.
7. Press and release the operator panel keypad <Enter> key to lock in this value. Note that the flashing block cursor moves to the first U in the UU field.
8. Enter a unique utility number by pressing and releasing two operator panel keypad numeric keys.
9. Observe that the keys pressed are echoed in the utility initiation template by the legend numeral of the key pressed replacing one of the U characters. Note that as each key is pressed, the flashing block cursor moves one character to the right, indicating which input the next key pressing corresponds to.
10. Press and release the operator panel keypad <Enter> key to lock in the utility number entered.
11. With the release of the operator panel <Enter> key, the utility is executed. Refer to the page describing the utility selected for details of its execution.

If an unimplemented UU value is entered, the following message will be displayed on the operator panel LCD display:

Utility Not FND

This message tells the operator that the utility software has searched a list of implemented utilities and has not found a match for the entered utility number. To recover, press and release any operator panel key except IML. This action returns the user to the original utility initiation template.

To abort the utility initiation sequence without executing a utility, pressing and releasing the operator panel <Diag> key will return control to the Diag mode template. This must be done prior to pressing and releasing the operator panel <Enter> key after entering the utility number (UU field).

Utility Quick Reference Chart

#	Name	Cust.	FE	Engineer	Password
00	Not Implemented	.	.	.	.
01	Clear Feature Key	X	X	X	No
02	Reserved	.	.	.	.
03	Read Feature Key	X	X	X	No
04	Set Serial Number	.	X	X	Yes
05	Read Serial Number	X	X	X	No
06	Create Diagnostic Disk	.	X	X	Yes
07	Delete Diagnostic Disk	X	X	X	No
08	Set Month, Day, Year	X	X	X	No
09	Read Month, Day, Year	X	X	X	No
10	Set Time	X	X	X	No
11	Read Time	X	X	X	No
12	Read Slot Pop Table	X	X	X	No
13	Display Diag. Results	X	X	X	No
14	Not Implemented	.	.	.	.
15	Read Code & Data Area	X	X	X	No
16	Read SCI Ports	X	X	X	No
17	Not Implemented	.	.	.	.
18	Keypad Test	X	X	X	No
19	Op Panel LCD Test	X	X	X	No
20	Do Dump Disk	X	X	X	No
21	Boot I/O Proc. Boards	X	X	X	No
22	Boot Gen. Purp. Boards	X	X	X	No
23	Set FE Switch	.	X	X	Yes
24	Reset FE Switch	.	X	X	Yes
25	Reserved	.	.	.	.
26	Reserved	.	.	.	.
27	Toggle LCD View Angle	X	X	X	No
28	Print Slot Pop Table	X	X	X	No
29	Read Burn-In Time	X	X	X	No
30	Read Disk A CRC	X	X	X	No
31	Read Disk B CRC	X	X	X	No

#	Name	Cust.	FE	Engineer	Password
32	Clear RTC NVRAM		X	X	Yes
33	Read Prom Rev #	X	X	X	No
34	Reserved	.	.	.	.
35	Reserved	.	.	.	.
36	Initialize Disk C (Hard Drive 0)	X	X	X	No
37	Initialize Disk D (Hard Drive 1)	X	X	X	No
38	Test Unit Ready of Hard Drive	X	X	X	No
39	Inquiry of Hard Drive Parameters	X	X	X	No
40	Read Capacity of Hard Drive	X	X	X	No
41	Format Hard Drive	.	X	X	Yes
42	Boot TRC Boards	X	X	X	No
43	Boot CHP Boards	X	X	X	No
44	Boot CHC Boards	X	X	X	No
45	Boot all processor boards in the LINCS node	X	X	X	No
46	Boot ETH Boards	X	X	X	No
47	Reserved	.	.	.	.
48	Reset Manufacturing Switch	X	X	X	No
49	Determine whether channel goes online at IML	X	X	X	No
50	Not Used	.	.	.	.
51	Not Used	.	.	.	.
52	Not Used	.	.	.	.
53	Lock Bus Test	X	X	X	No
54	Reserved	.	.	.	.
55	15X SCP PROM Upgrade		X	X	Yes
56	Number of Floppy Drives installed on 65X		X	X	Yes
57	Amount of Local Memory installed on a 65X		X	X	Yes
58	Reserved	.	.	.	.
59	Reserved	.	.	.	.
60	Reserved	.	.	.	.

Utility Descriptions

Utility 00

Utility 00 is currently reserved for an as yet unimplemented password protected utility. If selected, the user is prompted for a password. If a password is entered, the only action taken is a return to the Utility Input mode and redisplay of the utility initiation template on the operator panel LCD display.

Utility 01 - Clear Feature Key

Utility 01 is an unprotected utility that enables the user to set or reset the Feature key to all zeros. This provides a means of clearing the Feature key without having to use the password protected Set Feature Key utility.

Caution

Use of this utility will erase any features that have been activated using the Feature Activation Disk (FAD) utility. Once erased the user must use the original FAD to reactivate the feature if desired (or a new FAD must be obtained). A FAD extraction utility is available to withdraw a Feature back onto the FAD, enabling reuse of the FAD onto another LINCS node.

For the convenience of those who enter this utility by mistake, a means of exiting without changing the Feature key is provided through the use of the <Diag> key. See the steps below for a description of this escape mechanism.

The following steps describe the procedure for using the Clear Feature Key utility:

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. The following message is displayed on the operator panel LCD display:
FKEYX FFFFFFFF
where X is the feature key number being displayed and FFFFFFFF is the eight hexadecimal digits of the feature key.
4. Note that no cursor is displayed on the LCD, indicating that this utility does not allow the user to input values for the Feature key.
Note: If you enter this utility by mistake and wish to exit without changing the Feature key, press and release the <Diag> key to return to the utility initiation template. To advance to the next feature key, press the <Adv> key.
5. To clear the Feature key, press and release the operator panel <Clr> key.
6. The operator panel LCD display changes to show an all zero Feature key. This is the actual new, all zero Feature key as read from the nonvolatile memory in the OPL board RTC chip.
7. Press and release any key except the <IML> key to display the next feature key or press and release the <Diag> key to return to the utility initiation template.
8. Repeat Steps 3 - 7 until the <Diag> key is pressed and released or all feature keys have been displayed.

Utility 02 - Reserved

Utility 03 - Read Feature Key

The Read Feature Key utility is an unprotected utility which displays the current value of the 16-character Feature key on the operator panel LCD display (8 values at a time). It is a read only utility; the current value of the Feature key cannot be altered using this utility.

This utility is provided to give the customer a means of reporting the Feature key value without giving them the opportunity to alter it. Authorized personnel with a need to change a Feature key in the field should use a FAD and the Feature Activation utility. Authorized personnel may use Utility 02, Set Feature Key, using the appropriate password.

1. Enter Offline Extended diagnostics.
2. Select Offline Utility mode.
3. The following message is displayed on the operator panel LCD display:
FKEYX FFFFFFFF
where X is the feature key number (0 or 1) being displayed and FFFFFFFF is the eight hexadecimal digits of the Feature key.
4. Note that no cursor is displayed on the LCD, indicating that this is a read only function.
5. To display the next feature key, press and release any operator panel key other than the <IML> key.
6. Repeat Steps 3 - 5 until all feature keys have been displayed.

Utility 04 - Set Serial Number

Utility 04 is a protected utility which allows the user to enter or modify the LINC'S node's 8-digit serial number. The serial number is stored in system nonvolatile memory; it is therefore unaffected by power transitions. The value loaded into the platform in the factory should match the least significant 8 digits of the serial number found on the serial tag of the platform.

Note: This utility is to be used only by authorized service personnel after replacement of the SCP card or Motherboard.

The following steps describe how to use this utility:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad <1> key for the R input, and the <0> and <4> keys for the UU field.
3. Observe that the password prompt message appears on the operator panel LCD display.
4. Enter the FE password.
5. Observe that the operator panel LCD display displays the following message:
SN NNNNNNNN
where NNNNNNNN is the current value of the 8-digit serial number. Note that a flashing cursor is positioned at the first (leftmost) digit of the serial number.
6. To enter or modify a serial number, press and release the operator panel keypad keys corresponding to the desired serial number digits. As each digit is entered, the current digit is replaced by the legend numeral of the key pressed, and the flashing cursor advances to the next serial number digit.
7. Once the desired serial number value has been entered using Step 6 above, press the operator panel <Enter> key to terminate editing mode and write the new serial number to nonvolatile memory. Once the <Enter> key has been pressed, the LCD display and the serial number can no longer be changed without repeating the utility.
8. Observe that the utility initiation template returns to the operator panel LCD display. If desired, the new serial number value can be verified by displaying it using the read only display serial number utility, UU = 05.

Notes:

1. To advance the cursor without changing the current value of a serial number digit, press and release the operator panel <Adv> key. This action will advance the flashing cursor one place to the right without changing the current serial number digit.
2. To move the flashing cursor to a preceding serial number digit, press and release the operator panel <Clear> key. This action will move the flashing cursor to the immediately preceding serial number digit (one digit to the left). This option is active prior to the pressing of the operator panel <Enter> key, which terminates the serial number editing.
3. To abort the execution of this utility without altering the current serial number value, press and release the operator panel <Diag> key. Editing will be terminated, and the utility initiation template will be returned to the operator panel LCD display.

Utility 05 - Read Serial Number

The Read Serial Number utility is an unprotected utility which displays the current value of the 8-digit serial number on the operator panel LCD display. It is a read only utility; the current value of the serial number cannot be altered using this utility.

This utility is provided to give the customers a means of reporting the serial number without giving them the opportunity to alter it. Authorized company personnel with a need to change the serial number should use Utility 04, Set Serial Number.

Note that you can view the serial number in the online Central Control Mode, panel 4/1.

The utility is executed as follows:

1. Enter Offline Extended Diagnostics.
2. Select Offline Utility mode.
3. Observe that the following message is displayed on the operator panel LCD display:
SN NNNNNNNN
where NNNNNNNN is an 8-digit serial number.
4. To return to the utility initiation template, press and release any operator panel key other than the <IML> key.

Utility 06 - Create Diskette Diagnostic Command File

LINCS diagnostic tests and utilities can be automatically initiated and executed using a command file created by this protected utility. A diagnostic command file is useful whenever a fixed sequence of diagnostic tests and utilities must be executed repetitively, such as in factory burn-in or whenever automatic initiation of tests is desired.

The diagnostic command file created by this utility will be automatically executed at IML or POR; in this sense, it alters the normal functioning of the diskette. To return the diskette to its original state, delete the diagnostic command file using Utility 07.

When the command file built by this utility is executed, the commands it contains are executed sequentially in the order in which they were entered using this utility. Any failure will halt the execution of the command file at the failing test or error causing utility. Once a failure occurs, there is no mechanism for restarting the command file other than re-IMLing.

The diagnostic command file can contain a variable number of diagnostic test or utility commands. The maximum number allowed is dependent on the number of characters required by the commands entered. The utility will allow commands to be entered until a maximum number of characters is approached. The current limit is the size of the file buffer, 255 characters.

The following steps create a diagnostic command file on the diskette:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric keys <1> for the R input, and the <0> and <6> keys for the UU input.
3. Observe that the message PASSWORD=? appears on the operator panel LCD display.
4. Enter the appropriate password by sequentially pressing and releasing operator panel keypad keys. Note that the password is not echoed on the operator panel LCD display.
5. Observe that the operator panel LCD display shows the message XDG\$AUTOCMD. This indicates that the auto command file was successfully created.
6. Enter the diagnostic test and utility commands that you wish to include in the command file per the following three steps. Note that the method and templates are identical to normal keypad initiation operations.
7. Press and release the operator panel LCD display keypad <Enter> key. Observe that the standard diagnostic mode template appears on the LCD display.
8. Enter a diagnostic mode by pressing and releasing the appropriate operator panel keypad numeric key, followed by pressing and releasing the operator panel <Enter> key.
9. Observe that the standard extended diagnostic test or utility initiation template appears on the operator panel LCD display. Enter the desired parameters by pressing and releasing the appropriate operator panel keypad numeric keys.
10. Repeat the previous three steps until you have entered all the commands that you desired, or until the maximum number of commands has been entered.
11. Command entering mode is terminated by pressing and releasing the operator panel <Diag> key. Observe that the message XDG\$AUTOCMD appears on the LCD display. Once this message is observed, press and release any operator panel keypad key except <IML> to write the new command file to the diskette.

Note that the new file is not written to the diskette until this final key is pressed and released.
12. Observe that the appropriate disk drive red LED lights, indicating the auto command file is being written to the diskette.
13. Observe that the standard diagnostic utility initiation template is returned to the operator panel LCD display, after the file write is complete. If desired, the presence of the file can be verified by doing a directory command for the file XDG\$AUTO.CMD on a PC/AT with a 1.2-MB floppy drive.

Note: If, after entering the last parameter of a command, the message XDG\$AUTOCMD appears on the operator panel LCD display, you have reached the maximum number of commands. To write the command file to the diskette, press and release any operator panel keypad key except <IML>. Note that the new file is not written to the diskette until this final key is pressed and released!

Utility 07 - Delete Diskette Diagnostic Command File

Diagnostic tests and utilities can be automatically initiated and executed using a command file created by Utility 06. Executing Utility 07 will delete the diagnostic command file created by Utility 06 from the floppy diskette, allowing the LINCS node to IML normally.

Note that this utility is unprotected while the Command File Create utility is protected. This allows a customer to delete a command file that may have been inadvertently left on a diskette without having to know a password or call a field engineer to come on site.

The following steps delete a diagnostic command file from a diskette:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <0> and <7> keys for the UU input.
3. Observe that the operator panel LCD display shows the message XDG\$AUTOCMD. This indicates that the auto command file was successfully deleted.
4. Observe that the standard diagnostic utility initiation template is redisplayed on the operator panel LCD display.

Utility 08 - Set Month, Day, and Year

Utility 08 is an unprotected utility which allows the user to enter or modify the month, day, and year contained in the real-time clock chip. The real-time clock chip stores these values in its nonvolatile memory; they are therefore unaffected by power transitions.

Note that you can also configure this information in an online utility in Central Control Mode, utility 2/1.

The following steps describe how to use this utility:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode.
3. Observe that the operator panel LCD display displays the following message:
DATE MM/DD/YY
where MM, DD, and YY are 2-digit values for the month, day, and year, respectively. Note that a flashing cursor is positioned at the first (leftmost) digit of the month field.
4. To enter or modify a date, press and release the operator panel keypad keys corresponding to the desired month, day, or year digits. Note that as each digit is entered, the current digit is replaced by the legend numeral of the key pressed, and the flashing cursor advances to the next digit in the month, day, or year field, or to the colon (:) field delimiter, if both digits have been entered.
5. When both digits of a field have been entered, press and release the operator panel <Enter> key to save the field value. The flashing cursor will move to the first digit of the next field, if modifying the month or day. If modifying the year field, the <Enter> key pressing saves the year field, terminates execution of the utility, and returns the standard utility initiation template to the operator panel LCD display. If desired, the new month, day, and year values can be verified by displaying them using the read only display date utility, UU = 09.

Notes:

1. To advance the cursor to the next digit or colon delimiter of the month, day, or year field without changing the current digit of that field, press and release the operator panel **<Adv>** key. This action will advance the flashing cursor one place to the right without changing the current month, day, or year field digit.
2. To move the flashing cursor to a preceding month, day, or year field digit, press and release the operator panel **<Clear>** key. This action will move the flashing cursor to the immediately preceding month, day, or year field digit (one digit to the left). This option is active prior to the pressing of the operator panel **<Enter>** key, which terminates the editing of the current field.
3. To abort the execution of this utility without altering the month, day, or year field values, press and release the operator panel **<Diag>** key. Editing will be terminated, and the utility initiation template will be returned to the operator panel LCD display. The original stored date will not be altered.

Utility 09 - Read Month, Day, and Year

Utility 09 is an unprotected utility that allows the user to display, in read only mode, the month, day, and year currently stored in the real-time clock nonvolatile memory.

The following steps describe how to use this utility:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric **<1>** key for the R parameter, and the **<0>** and **<9>** keys to select and initiate this utility.
3. Observe that the following message is displayed on the operator panel LCD display:
DATE MM/DD/YY
where MM, DD, and YY are 2-digit month, day, and year fields that contain the current real-time clock chip values.
4. The date message will be displayed until the user presses any operator panel key other than IML. Pressing and releasing a key will result in the termination of this utility and the redisplay of the standard diagnostic utility initiation template.

Utility 10 - Set Time

The Set Time utility is an unprotected utility which provides the user with the ability to change the current hours, minutes, and seconds values of the real-time clock chip. These values are stored in the real-time clock chip's nonvolatile memory and are therefore unaffected by power transitions. Note that you can also configure this information in an online utility in Central Control Mode, utility 2/1.

The utility is executed as follows:

1. Enter Offline Extended Diagnostics.
2. Select Offline Utility mode. Select this utility by pressing and releasing the operator panel **<1>** and **<0>** keys when in the standard diagnostic utility initiation template UU field.

3. Observe that the following message is displayed on the operator panel LCD display:
TIME HH:MM:SS
where HH, MM, and SS are 2-digit hour, minute, and second fields, which will contain the current real-time clock chip values for these parameters.
4. To enter or modify the time, press and release the desired operator panel keypad numeric keys. Note that as each digit is entered, the current digit is replaced by the legend numeral of the key pressed, and the flashing cursor advances to the next digit in the month, day, or year field, or to the colon (:) field delimiter, if both digits have been entered.
5. When both digits of a field have been entered, press and release the operator panel **<Enter>** key to save the field value. The flashing cursor will move to the first digit of the next field, if modifying the hours or minutes fields. If modifying the seconds field, pressing the **<Enter>** key saves the seconds value, terminates execution of the utility, and returns the standard utility initiation template to the operator panel LCD display. If desired, the new time can be verified by displaying it using the read only Display Time utility, UU = 11. Note that the real-time clock chip continues to keep time in the normal manner while the user initiates another utility.

Notes:

1. To advance the cursor to the next digit or colon field delimiter of the hours, minutes, or seconds field without changing the current digit of that field, press and release the operator panel **<Adv>** key. This action will advance the flashing cursor one place to the right without changing the current hours, minutes, or seconds digit.
2. To move the flashing cursor to a preceding hours, minutes, or seconds field digit, press and release the operator panel **<Clear>** key. This action will move the flashing cursor to the immediately preceding hours, minutes, or seconds field digit (one digit to the left). This option is active prior to the pressing of the operator panel **<Enter>** key, which terminates the editing of the current field.

To abort the execution of this utility without altering the hours, minutes, or seconds field values, press and release the operator panel **<Diag>** key. Editing will be terminated, and the utility initiation template will be returned to the operator panel LCD display. The original values will not be altered. Note that the real-time clock chip continues to keep time in the normal manner while this utility is being executed.

Utility 11 - Read Time of Day

Utility 11 is an unprotected utility that allows the user to display in read only mode the current time of day in hours, minutes, and seconds. The current time of day is stored in the real-time clock nonvolatile memory.

The following steps describe how to use this utility:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric **<1>** key for the R parameter, and the **<1>** key twice to select and initiate this utility.

3. Observe that the following message is displayed on the operator panel LCD display:
TIME HH:MM:SS
where HH, MM, and SS are 2-digit hour, minute, and second fields that contain the current real-time clock chip values.
4. The time message will be displayed until the user presses any operator panel key other than IML. Pressing and releasing a key will result in the termination of this utility and the redisplay of the standard diagnostic utility initiation template.

Utility 12 - Read Slot Population Table Block

The slot population table is a data structure that details the characteristics of each board considered a bus master slot residing in the LINC node. It is organized by ascending slot ID number into blocks of 40 bytes, with one block per slot. This unprotected utility gives the user the capability to passively view the contents of a particular slot population table block.

This utility is of use whenever the user has a question about the board ID, bounds, local memory, dual port memory, or feature masks of a particular board. Note that this information is also available online in the Central Control Mode utility 0/3.

The following steps describe the initiation and execution of this utility:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode.
3. Observe that the following message is shown on the operator panel LCD display:
SLOT JXX
where XX is a slot input field.
4. Press and release the operator panel keypad numeric keys corresponding to the J number of the slot whose block you wish to view. Note that only the combinations 02 through 16 are valid.
5. Press and release the operator panel <Enter> key.
6. Observe that the operator panel LCD display shows the following message:
BRD ID XXXX
where XXXX corresponds to a 4-digit board ID. Currently the first two digits are 00.
7. Press and release the operator panel <Adv> key to view additional slot population table block fields. Each pressing of the <Adv> key displays the next field. The following list describes the fields and their labels:

Field	Description
BRD ID XXXX	Displays the board ID.
SLT ID XXXX	Displays a 4-character logical slot ID.
LM BOT NNNNNNNN	Displays the local memory bottom address.
LM BAS NNNNNNNN	Displays the local memory base (first allocatable) address.
LM CUR NNNNNNNN	Displays the next allocatable local memory address.
LM END NNNNNNNN	Displays the last allocatable local memory address.
LM TOP NNNNNNNN	Displays the physical top local memory address.
LM SIZ XXXXXXXX	Displays the size of local memory.
CM SIZ XXXXXXXX	Displays the size of common memory.
EXFID1 XX	Extended function ID 1 of board.
EXFID2 XX	Extended function ID 2 of board.
BOUNDS XX	Displays the value loaded into the board's bound register.
BD REV XX	Displays revision level of board.
DP SIZ XXXXXXXX	Displays the size, in Kbytes, of dual port memory.
DP BOT NNNNNNNN	Displays dual port memory block bottom address.
DP BAS NNNNNNNN	Displays dual port memory first allocatable address.
DP CUR NNNNNNNN	Displays dual port memory next allocatable address.
DP END NNNNNNNN	Displays dual port memory last allocatable address.
DP TOP NNNNNNNN	Displays dual port memory block top address.
FEA FG XXXX	Feature flags.
# DEV XXXX	Number of devices (valid for SCP/HPP boards).
BD TYP XX	System board type
BD OCC XX	This board's occurrence of the system board type.
STIMER XX	System timer type.

Notes:

1. Note that not all fields are valid for all boards. For example, the dual port memory fields are invalid for a SCP or TRM.
2. Pressing and releasing the operator panel <Clear> key displays the previous frame on the operator panel LCD.
3. The <Adv> and <Clear> keys wrap when at the last or first frame of the message, respectively.
4. To exit from this utility, press the operator panel <Diag> key. The utility is terminated, and the standard diagnostic utility initiation template is returned to the LCD display.

Utility 13 - Display Diagnostic Results Block (DRB)

Diagnostic Results Blocks are data structures which are used to initiate, monitor, and report the results of LINCS diagnostic operations. They are the means by which interprocessor communications are accomplished between the SCP and other processor boards.

This utility provides the user with the capability to display the contents of a particular DRB. To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utilities mode. Use the operator panel keypad <1> key for the R input, and the <1> and <3> keys for the UU input.

3. Observe that the following message appears on the operator panel LCD display:
 SRC J
 where corresponds to the slot number of the board which is the source of the interprocessor communications.
4. Press and release the operator panel keypad numeric keys corresponding to the desired slot number.
5. Press and release the operator panel <Enter> key.
6. Observe that the following message is shown on the operator panel LCD display:
 DEST J
 where 'J' corresponds to the slot number of the board which is the destination of the interprocessor communications.
7. Press and release the operator panel keypad numeric keys corresponding to the correct slot number.
8. Press and release the operator panel <Enter> key.
9. Observe that the following message is shown on the operator panel LCD display:
 COMMND: XX
 where XX is the current value of the DRB command byte.
10. Press and release the operator panel <Adv> key to display additional DRB fields. Each pressing of the <Adv> key displays another field. The labels and definitions of the additional fields are as follows:

Field	Description
PRC ST XX	Processor state byte
STATUS XX	DRB protocol status byte
MODE XX	Diagnostic mode value (M parameter)
X PARM XX	Hardware selection option (X parameter)
Y PARM XX	Control option (Y parameter)
SSL ID XX	Source slot parameter
DSL ID XX	Destination slot parameter
T PARM XX	Test type parameter
N PARM XX	Test number parameter
COUNT XX	Looped execution iteration count
WILD XX	Wild card parameter
FL ADDR NNNNNNNN	Address test file is loaded at
DRBW08 XXXX	DRB Word 8
DRBW09 XXXX	DRB Word 9
DRBW10 XXXX	DRB Word A
DRBW11 XXXX	DRB Word B
DRBW12 XXXX	DRB Word C
DRBW13 XXXX	DRB Word D
DRBW14 XXXX	DRB Word E
DRBW15 XXXX	DRB Word F

Notes:

1. Pressing and releasing the operator panel **<Clear>** key allows the user to view the previous message frame.
2. **<Adv>** and **<Clear>** wrap from the last and first frames, respectively.
3. Note that not all fields are valid for all commands. DRB Words 8 to F in particular are used mainly to transmit extended diagnostic data from failed hardware tests.

Utility 14 - Not Implemented

Utility 14 is not implemented.

Utility 15 - Read Code and Data Area Map Table

Utility 15, Read Code and Data Area Map Table, is an unprotected utility that allows the user to view the absolute long word addresses at which many fixed code and data areas are located. Since the map table is a dynamic structure that can vary in size and content, the labels that are displayed for each map table element are not described in this paragraph.

This utility is of use primarily to development engineering personnel. It is of little or no value to field personnel and the customer.

As noted above, each map table element is a single long word absolute address of an important, fixed address, code, or data area within the system memory map. Included are elements that describe both common and local memory areas. Note that not all boards may have a map table, although this may change in the future. Boards without microprocessors, such as the CDA and OPL, will not have a map table. Memory boards, such as the TRM and RAM boards, will not have their own map table displayed, but will have their common memory structure described as part of the VHP and SCP/Motherboard map table display. Obviously, the common memory portion of the map table will be the same no matter which board it is displayed from.

The following steps describe the procedure for using the Read Map Table utility:

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Observe that the following message is displayed on the operator panel LCD display:

```
DISPLAY MAP JXX
```

where XX is the J number of the slot that contains the board whose map table is to be read. Note that a flashing cursor is displayed under the first X in the message. This indicates to the user that input is required.
4. Enter a 2-digit J number by successively pressing and releasing two operator panel keypad numeric (0-9) keys, followed by pressing and releasing the operator panel **<Enter>** key.
5. Prior to pressing the **<Enter>** key, the J number field may be edited by using the **<Adv>** and **<Clr>** keys to move one character right or left, respectively.

6. If a valid J number was entered, the following message will be displayed on the operator panel LCD display:

LLLLLLLL=AAAAAA

where the LLLLLLLL field is a variable length map table element label and the AAAAAA field is the hexadecimal absolute address of the code area or data structure pointed to by that map table element.

If the slot whose J number was entered is unoccupied, then the following message is displayed on the operator panel LCD display:

NO BOARD IN SLOT

Press and release the operator panel <Diag> key to exit to the utility initiation template if this message is displayed.

If an invalid slot number is entered, the following message is displayed:

INVALID SLOT

Press and release the operator panel <Diag> key to exit to the utility initiation template if this message is displayed.

If a valid, occupied slot is selected, but the board resident in that slot does not have a map table, the following message is displayed:

NO MAP FOR BRD

Press and release the operator panel <Diag> key to exit to the utility initiation template if this message is displayed.

If the slot selected is valid and occupied, but the board within the slot is reset, the following message will be displayed:

BOARD IS RESET

Press and release the operator panel <Diag> key to exit to the utility initiation template if this message is displayed.

7. To display the contents of other map table elements, press and release the operator panel <Adv> or <Clear> key to go forward or back within the map table, respectively.
8. To exit the utility, press and release the operator panel <Diag> key. Observe that the operator panel LCD display again shows the utility initiation template.

Utility 16 - Read SCI Ports 0-7

Utility 16 is an unprotected utility that enables the user to read the contents of SCI Ports 0-7. SCI is a hardware subsystem found on LINC nodes. The subsystem provides control, board identification, memory bounding, parity error control, and interrupt functions within the system.

SCI ports appear to software as byte long registers at fixed absolute addresses for each slot. The definition of each bit within an SCI register is dependent on each board type; while there are some commonalities, the definitions of many bits vary from board to board, and are too extensive to document here. Important from a diagnostic viewpoint are the standards that 1) Port 2 contains the 5-bit board ID and 3-bit rev level, 2) the low nibble of Port 1 contains the board's four programmable diagnostic LEDs, 3) Ports 4 and 5 contain the read odd interrupt register and the read even interrupt register, respectively, and 4) Port 6 is an uncommitted byte wide R/W port whose bit mapping is software dependent (gate array version only).

The following steps describe the procedure for using the read SCI Port utility:

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Observe that the following message is displayed on the operator panel LCD display:

RD SCI PORTS JXX

where XX is the J number of the slot that contains the board whose SCI ports are to be read. Note that a flashing cursor is displayed under the first X in the message. This indicates to the user that input is required.

4. Enter a 2-digit J number by successively pressing and releasing two operator panel keypad numeric (0-9) keys, followed by pressing and releasing the operator panel <Enter> key.
5. Prior to pressing the <Enter> key, the J number field may be edited by using the <Adv> and <Clr> keys to move one character right or left, respectively.
6. If a valid J number was entered, the following message will be displayed on the operator panel LCD display:

SCI PORT N = YY

where N is a single-digit SCI port number, initially 0 for the first template displayed, and YY is a 2-digit hex number representing the current value of Port N.

If an invalid slot number is entered, the following message is displayed:

INVALID SLOT

Press and release the operator panel <Diag> key to exit to the utility initiation template if this message is displayed.

If the slot whose J number was entered is unoccupied, then the following message is displayed on the operator panel LCD display:

NO BOARD IN SLOT

Press and release the operator panel <Diag> key to exit to the utility initiation template if this message is displayed.

7. To display the contents of the other SCI ports, press and release the operator panel <Adv> or <Clear> key until the desired SCI port is displayed.
8. To exit the utility, press and release the operator panel <Diag> key. Observe that the operator panel LCD display again shows the utility initiation template.

Utility 17 - Not Implemented

Utility 17, which was to allow the user to view the board IDs contained in the slot population table, was superceded by Utility 12 and is therefore currently not implemented.

Utility 18 - Keypad Test

Utility 18, the Keypad test, allows the user to verify the operability of all operator panel keypad keys and discrete keys, except for the IML key. The operator panel keypad consists of ten numeric keys, with legends <0>, <1>, <2>, <3>, <4>, <5>, <6>, <7>, <8>, and <9>, and two function keys labeled <Enter> and Alt.

In addition to the twelve keypad keys, the operator panel contains five discrete keys. One of these five keys, the IML key, is not covered by this test because it is tied directly to POR hardware, and, therefore, not under programmable control. The other four discrete keys, labeled Config, <Diag>, <Adv>, and <Clear> are under program control and can be tested with this utility.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <1> and <8> keys for the UU input.
3. Observe that the following message appears on the operator panel LCD display:
Keypad Test
4. Press and release any operator panel key other than the IML key.
5. Observe that the legend of the key pressed is displayed on the operator panel LCD display.
6. Press and release each of the remaining operator panel keys except for the IML key, observing with each pressing that the legend is echoed on the operator panel LCD display. This utility will remain active until every key except the IML key has been pressed and released once. This requires 14 separate key pressings.
7. When all keys have been pressed (at least) once, the next key pressing of any operator panel key except the IML key terminates the utility. The standard diagnostic utility initiation template is returned to the operator panel LCD display immediately following the termination of the utility.

Utility 19 - Operator Panel LCD Display Test

The operator panel LCD display is formatted as 16 characters, each formed from a single 5 x 7 matrix of LCDs. Additionally, a single row of five dots forms an underline underneath each character. This utility provides the user with the ability to visually check all of the LCDs within the matrix by turning on all 640 of them.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <1> and <9> keys for the UU input.
3. Observe that every LCD in all 16 character positions turns on. Any LCD that does not turn on should be considered a hardware failure.
4. Press and release any operator panel LCD key except for the IML key to terminate this utility. When the utility is terminated, the standard diagnostic utility initiation template is returned to the operator panel LCD display.

Utility 20 - Dump Disk Utility

The Dump Disk utility writes vital data areas to one of the dump directories on the Hard Drive for use in failure analysis. The quantity of data written is dependent upon the types of boards installed, and the code loaded on them. Note that on the 1174-90S, there is no hard drive to dump to. On this model a floppy diskette labeled as a Dump diskette is required. A Dump diskette is a blank formatted disk with the label: @A@@@ @@@@174.

Normally a dump is automatically written to the hard drive by LINCS when a catastrophic failure occurs, or when initiated. On the 1174-90S however, and under certain circumstances on other models (Engineering Switch is on or box is configured for 'No Dump and No IML'), the LINCS platform will remain in a failed state waiting for an IML, or to proceed with the dump.

To initiate and execute this utility, you must perform the following steps:

1. Enter Extended Diagnostics mode by pressing the <Diag> key followed by the <Enter> key. If you do not see any indication from the front panel that LINCS is going into Diagnostics mode, then repeat the key sequence. You should see the 'DIAG MODE =' prompt appear.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <0> keys for the UU input.
3. You should begin to see messages appearing on the LCD display indicating that dump files are being written ('WRITING xxxxxxxx'). In the case of the 1174-90S you must have the Dump Diskette installed in a floppy drive when you initiate this step.
The diskette drive LED of the drive containing the System diskette is turned on.
4. When the dump operation is complete, the following message appears on the operator panel LCD display:

DUMP COMPLETE

Notes:

1. If the following message appears, the Dump utility has not found a Dump diskette in either drive (1174-90S only):

NO DISK TO DUMP

2. If an error occurs during the dump, the following message will appear on the operator panel LCD display:

DUMP ERROR: xx

where xx is a disk error code.

Utility 21 - Boot I/O Processor Boards

Utility 21 allows the operator to boot all I/O processor boards installed in the LINCS node. Board types which fall into this category are 80188 based, dual port memory boards.

Currently, the ASCII Interface Controller (AIC), the Multiplexer Coax Controller (MCC), and the Synchronous Communications Adapter (SCC) fall into this category.

The user should note that execution of this utility is a prerequisite for running any Offline Extended Diagnostic tests on any of the boards listed above. Booting removes reset from the board and loads its resident diagnostic manager software; without this process, no tests can be executed.

When initiated, this utility executes all IOPs found in the LINCS node that are occupying valid slots. The utility searches the slot population table starting with Logical Slot 0 (J02), and proceeds to the left, booting each IOP found.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <1> keys for the UU input.
3. Observe that the disk drive LED lights, indicating that the diagnostic manager file is being read from the diskette.
4. Observe that the onboard reset LED (red) is extinguished for each IOP installed.
5. Observe that the least significant programmable diagnostic LED blinks on each installed IOP, indicating that the board has successfully booted, and is polling its SCP receive DRB for a new command.
6. The preceding two steps occur on each board separately, in left to right order across the 1174-1X controller card cage. When the boot is complete, the utility is automatically terminated and the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 22 - Boot General Purpose Processor Boards

Utility 22 allows the operator to boot all general purpose processor boards (SCPs) installed in the LINC node.

The user should note that execution of this utility is a prerequisite for running any Offline Extended Diagnostics tests on any of these boards. Booting removes reset from the board and loads its resident diagnostic manager software. Without this process, no tests can be executed.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> key twice for the UU input.
3. Observe that the disk drive LED lights, indicating that the diagnostic manager file is being read from the diskette.
4. Observe that the onboard reset LED (red) is extinguished for each HPP installed.
5. Observe that the least significant programmable diagnostic LED blinks on each installed HPP, indicating that the board has successfully booted, and is polling its SCP receive DRB for a new command.
6. The preceding two steps occur on each board separately, in left to right order across the 1174-1X controller card cage. When the boot is complete, the utility is automatically terminated and the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 23 - Set the Field Engineering switch

Utility 23 is a protected utility that allows a field engineer to set the Field Engineering switch. The Field Engineering switch allows access to certain Central Control mode operations not normally available to the customer. Note that this utility has the same effect as entering FE mode through using the proper procedure in Central Control mode.

Note: The FE switch should not be left on for normal customer operations. Use Diagnostic Utility 24 or press the <PF10> key from the keyboard of a display in Central Control mode to turn the FE switch off.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <3> keys for the UU input.
3. Observe that the message PASSWORD=? appears on the operator panel LCD display.
4. Enter the appropriate FE password by sequentially pressing and releasing operator panel keypad keys. Note that the password is not echoed on the operator panel LCD display.
5. The message FE SWITCH ON will appear on the operator panel LCD display, indicating that the FE switch has been set.
6. After a short delay, the utility is automatically terminated and the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 24 - Reset the Field Engineering Switch

Utility 24 is a protected utility that allows a field engineer to reset the Field Engineering switch. The Field Engineering switch allows access to certain Central Control mode operations not normally available to the customer. This utility has the same effect as pressing the <PF10> key from the keyboard of a display in Central Control mode.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <4> keys for the UU input.
3. Observe that the message PASSWORD=? appears on the operator panel LCD display.
4. Enter the appropriate FE password by sequentially pressing and releasing operator panel keypad keys. Note that the password is not echoed on the operator panel LCD display.
5. Note that the message FE SWITCH OFF appears on the operator panel LCD display, indicating that the FE switch has been set.
6. After a short delay, the utility is automatically terminated and the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 25 - Reserved

Utility 26 - Reserved

Utility 27 - Toggle Operator Panel LCD Viewing Angle

Utility 27 allows the operator to toggle the viewing angle of the operator panel LCD display. The LINCS hardware provides a single bit output port which allows selection of two viewing angles; one which approximates a 6 o'clock position, another which approximates a 12 o'clock

position. Each execution of this utility toggles this bit, and, thus, toggles the operator panel LCD display viewing angle.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <7> keys for the UU input.
3. Observe that the operator panel LCD display viewing angle changes.
4. Observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 28 - Print the Slot Population Table Via the Serial Port

Utility 28 allows the operator to generate a hard copy of the slot population table via a printer attached to the SCP or motherboard serial port. The slot population table is a data structure that identifies the physical resources, such as boards and drives, installed in the LINCS node. Additionally, it provides useful details of the amount of memory each board is populated with.

Note that Utility 28 differs from Utility 12, Read Slot Population Block as follows: 1) different output devices: Utility 28 uses the SCP/Motherboard diagnostic serial port only, Utility 12 uses the operator panel LCD display only; 2) different amount of data presented: Utility 28 prints the entire slot population table, Utility 12 allows reading only a single block of the table.

To initiate and execute this utility, perform the following steps:

1. Connect a printer to the SCP or motherboard diagnostic port via cable P/N 212054-006.
2. Enter Extended Diagnostics mode.
3. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <8> keys for the UU input.
4. Observe that the slot population table is printed out on the printer.
5. Observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 29 - Read Burn-in Elapsed Time

Utility 29 allows the operator to view the elapsed cumulative burn-in time. Burn-in is a diagnostic mode used in the manufacturing test areas to exercise the LINCS node. As such, it is of little value to anyone other than the factory test personnel.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Enter Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <2> and <9> keys for the UU input.
3. Press and release the <Enter> key.

4. Observe that the operator panel LCD display shows the message:
BURN HH:MM:SS
where HH, MM, and SS are the elapsed burn-in time in hours, minutes, and seconds, respectively. The preceding message remains on the operator panel LCD display until any operator key other than the <IML> key is pressed.
5. After pressing any key other than <IML>, observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 30 - Read Floppy Disk A CRC

This utility generates a Cyclic Redundancy Check value for the data stored on the diskette found in Floppy Drive A (the drive on the left on the 10R or on the top on a 60R or 90R) and compares the value to a CRC value stored on the disk. If an error is encountered, an error message of the format DISK ERR: XX will appear.

Utility 31 - Read Floppy Disk B CRC

This utility generates a Cyclic Redundancy Check value for the data stored on the diskette found in Floppy Drive B (the drive on the right on a 10R or on bottom on the 60R or 90R) and compares the value to a CRC value stored on the disk. If an error is encountered, an error message of the format DISK ERR: XX will appear. You may use the disk error codes found in Chapter 4 to decode the specifics of the error.

Utility 32 - Clear RTC Nonvolatile Memory

Utility 32 is a protected utility that enables the user to set all locations of the RTC nonvolatile memory to all zeros.

Caution

This utility will completely clear all data contained in nonvolatile memory including the Feature key, serial number, burn-in parameters, and FE and Engineering switches. As a result, only development engineering and authorized factory test personnel should use this utility.

Once initiated, this utility executes without intervention, so be sure you really want to completely clear RTC nonvolatile memory before you initiate this utility. *Clearing the data from the RTC nonvolatile memory has a severe impact on the LINCS node, especially with regard to the loss of the Feature key.* If the Feature key is cleared, previously configured features will be disabled, causing IML errors in the B5X, B6X, or B7X series of IML states.

Note that only the nonvolatile memory page of the RTC is cleared. The RTC memory page containing the time and date registers is not altered.

The following steps describe the procedure for using the clear RTC nonvolatile memory utility:

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Observe that the diagnostic utility initiation template is displayed on the operator panel LCD, indicating that the utility has successfully executed.

Notes:

1. If desired, execution can be verified by executing the Read Feature Key (UU = 03) and Read Serial Number (UU = 05) utilities.
2. The time and date should not be cleared by this utility. Use the Read Time (UU = 11) and Read Date (UU = 09) utilities to verify that the time and date were not cleared, if desired.

Utility 33 - Read Prom Rev Number

This unprotected utility allows the operator to view the prom level that is installed in the LINCS platform.

Utility 34 - Reserved**Utility 35 - Reserved****Utility 36 - Initialize Hard Disk (1)**

Identifies and initializes Disk Drive C (Hard Disk Drive 1) for use by the LINCS node.

Caution

Initialization will destroy all data on the hard disk.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <3> and <6> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. The disk drive is initialized.
6. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 37 - Initialize Hard Disk (2)

Identifies and initializes Disk Drive D (Hard Disk Drive 2) for use by the LINCS node.

Caution

Initialization will destroy all data on the hard disk.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.

4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <3> and <7> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. The disk drive is initialized.
6. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 38 - Test Unit Ready of Hard Drive

This utility allows the operator to issue the SCSI “Test Unit Ready” command to an installed hard disk. The command provides a means to check if the hard disk is ready to accept disk access commands.

When initiated, the user is prompted for the desired drive, then the utility checks that the selected drive is installed. If valid, 2K of memory from the top of SHA DPRAM is allocated and, if RAM allocation is successful, the SCSI command is issued to the drive and the results are displayed on the operator panel LCD.

If an error occurs while accessing the drive, the SCSI Request Sense command is issued to determine the cause of the error.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <3> and <8> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Observe that the hard disk drive LED lights. This indicates that the diagnostic manager file is being read.
6. Observe that the operator panel LCD displays the prompt “Drive=?” Enter <3> for Hard Drive C or enter <4> for Hard Drive D.
7. Observe that the selected hard drive LED lights and the “Drive is Ready” message is momentarily displayed on the operator panel LCD.
8. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

If an error occurs during utility execution, the error message “DSK ERR: xxxx *” is displayed on the operator panel LCD, where xxx is the error code value (see Chapter 4).

If the error message contains the asterisk (*) in the rightmost position of the LCD display, a SCSI error has occurred. The following error information is available by pressing the <Adv> key.

Class&Code=XX - SCSI error class and code

Sense Key=XX - SCSI error sense key

Addtnl Sense=XX - SCSI error additional sense key

LB=XXXXXXXX - Logical block associated with SCSI error

If any additional fields are undefined (contain XX), then those fields are not defined in the SCSI sense data. If none of the fields are defined, then the SCSI Request Sense command that retrieves the additional information has also failed.

Utility 39 - Inquiry of Hard Drive Parameters

Utility 39 allows the operator to issue the SCSI Inquiry command to an installed hard disk. The command provides a means of obtaining the manufacturer make, model, revision level, and serial number of the hard drive.

When initiated, the user is prompted for the desired drive, then the utility checks that the selected drive is installed. If valid, 2K of memory from the top of SHA DPRAM is allocated and, if RAM allocation is successful, the SCSI command is issued to the drive and the results are displayed on the operator panel LCD.

If an error occurs while accessing the drive, the SCSI Request Sense command is issued to determine the cause of the error.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <3> and <8> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Observe that the hard disk drive LED lights. This indicates that the diagnostic manager file is being read.
6. Observe that the operator panel LCD displays the prompt "Drive=?". Enter <3> for Hard Drive C or enter <4> for Hard Drive D.
7. Observe that the selected hard drive LED lights.
8. When the Inquiry is complete, the hard drive parameters are displayed. Additional parameters may be viewed by pressing the <Adv> key. Shown below is an example of the parameters displayed for a Seagate mode 125N hard drive.

SEAGATE - Manufacturer

125N - Model

Rev=xxxx - Revision level

SN=xxxxxxxx - Serial number

If the revision level and serial number fields in the data returned by the command are undefined, no data for these fields will be displayed.

9. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display. If an error occurs during utility execution, the error message "DSK ERR: xxxx *" is displayed on the operator panel LCD, where xxx is the error code value (see Chapter 4). If the error message contains the asterisk (*) in the rightmost position of the LCD display, a SCSI error has occurred. The following error information is available by pressing the <Adv> key.

Class&Code=XX - SCSI error class and code

Sense Key=XX - SCSI error sense key

Addtl Sense=XX - SCSI error additional sense key

LB=XXXXXXXX - Logical block associated with SCSI error

If any additional fields are undefined (contain XX), then those fields are not defined in the SCSI sense data. If none of the fields are defined, then the SCSI Request Sense command that retrieves the additional information has also failed.

Utility 40 - Read Capacity of Hard Drive

Utility 40 allows the operator to issue the SCSI Read Capacity command to the hard disk. This command obtains the last logical block of storage on a hard drive and size of an individual block. The number of logical blocks on the hard drive can be determined by adding one to the last logical block value. The capacity (in bytes) is determined by multiplying the number of logical blocks by the block size.

When initiated, the user is prompted for the desired drive, then the utility checks that the selected drive is installed. If valid, 2K of memory from the top of SHA DPRAM is allocated and, if RAM allocation is successful, the SCSI command is issued to the drive and the results are displayed on the operator panel LCD. If an error occurs while accessing the drive, the SCSI Request Sense command is issued to determine the cause of the error.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> and <0> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Observe that the hard disk drive LED lights. This indicates that the diagnostic manager file is being read.
6. Observe that the operator panel LCD displays the prompt "Drive=?". Enter <3> for Hard Drive C or enter <4> for Hard Drive D.
7. Observe that the selected hard drive LED lights.
8. When the command is complete, the hard drive parameters are displayed. Additional parameters may be viewed by pressing the <Adv> key.

LastLB=xxxxxxxx - Last logical block

LBSize=xxxxxxxx - Logical block size in bytes

9. Press any key except the <IML> key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display. If an error occurs during utility execution, the error message "DSK ERR: xxxx *" is displayed on the operator panel LCD, where xxx is the error code value (see Chapter 4). If the error message contains the asterisk (*) in the rightmost position of the LCD display, a SCSI error has occurred. The following error information is available by pressing the <Adv> key.

Class&Code=XX - SCSI error class and code

Sense Key=XX - SCSI error sense key

Addtl Sense=XX - SCSI error additional sense key

LB=XXXXXXXX - Logical block associated with SCSI error

If any additional fields are undefined (contain XX), then those fields are not defined in the SCSI sense data. If none of the fields are defined, then the SCSI Request Sense command that retrieves the additional information has also failed.

Utility 41 - Format Hard Drive

This is a password protected utility that issues the SCSI Format command to the hard disk. The Format command performs a low-level format.

Caution

A low level format will destroy all data on the hard disk.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> and <0> keys, followed by pressing and releasing the operator panel keypad <Enter> key. To abort this utility initiation sequence, press the <Diag> key before pressing the <Enter> key. Pressing the <Diag> key returns control to the Diag mode template.
5. Observe that the hard disk drive LED lights. This indicates that the diagnostic manager file is being read.
6. Observe that the "PASSWORD=?" prompt is displayed on the operator panel LCD.
7. Enter the appropriate password, then press the <Enter> key.
8. Observe that the operator panel LCD displays the prompt "Drive=?". Enter <3> for Hard Drive C or enter <4> for Hard Drive D.
9. Observe that the selected hard drive LED lights and the message "Formatting..." is displayed in the operator panel LCD.
10. When complete, the message "Formatted OK" is displayed in the operator panel LCD.

Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display. If an error occurs during utility execution, the error message "DSK ERR: xxxx *" is displayed on the operator panel LCD, where xxx is the error code value (see Chapter 4). If the error message contains the asterisk (*) in the rightmost position of the LCD display, a SCSI error has occurred. The following error information is available by pressing the <Adv> key.

Class&Code=XX - SCSI error class and code

Sense Key=XX - SCSI error sense key

Addtl Sense=XX - SCSI error additional sense key

LB=XXXXXXXX - Logical block associated with SCSI error

If any additional fields are undefined (contain XX), then those fields are not defined in the SCSI sense data. If none of the fields are defined, then the SCSI Request Sense command that retrieves the additional information has also failed. After running this utility, you will need to run utility 36 (or 37 if you are formatting drive D) to initialize the drive, before you can load new code.

Utility 42 - Boot TRC Boards

Boots all Token Ring boards installed.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> and <2> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Refer to Utility 22 for description.
6. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 43 - Boot CHP Boards

Boots all CHP boards.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> and <3> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Refer to Utility 22 for description.
6. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 44 - Boot CHC Boards

Boots all CHC boards.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.

4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> key twice, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Refer to IML State 850, and Error State 850 if any errors occur.
6. Press any key except the <IML> key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 45 - Boot All Processor Boards

Boots all processor boards in the LINC S platform.

1. Enter Offline Diagnostics mode.
2. Select Offline Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> and <5> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Utilities 21, 22, 42, 43, and 44 are executed.
6. Press any key except the <IML> key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 46 - Boot ETH Boards

Boots ETH boards installed. Refer to Utility 22 for additional information.

1. Enter Off-line Diagnostics mode.
2. Select Off-line Utility mode.
3. Enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
4. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <4> and <6> keys, followed by pressing and releasing the operator panel keypad <Enter> key.
5. Press any key except the IML key and observe that the standard diagnostic utility initiation template reappears on the operator panel LCD display.

Utility 47 - Reserved

Utility 48 - Reset Manufacturing Switch

Utility 49 - Channel Online After IML

This utility sets/clears the channel NVRAM to indicate whether the associated Bus and Tag channel card should go online or stay offline at completion of an IML. By default, Bus and Tag channel will attempt to go to the state it was in when the platform was powered down. The information is stored in NVRAM. This utility allows you to toggle the status.

Utility 50 - Not Implemented

Utility 51 - Not Implemented

Utility 52 - Not Implemented

Utility 53 - Lock Bus Test

This utility performs a test on the lock bus mechanism. During this utility test, the SCP searches the slot population table for a bus master board. When found, the SCP instructs the bus master to move a lock test code (located in common memory) to its local memory. This sequence is then repeated for all bus masters installed.

The SCP then searches the slot population table for any boards with Common Memory or Dual Port Memory. When an installed board is found, the SCP passes the address of this memory as the lock test address (or semaphore address) to the bus masters. A command to execute the lock test code is also passed.

After the SCP verifies that the bus masters are executing the lock test, it then starts execution of the lock test code. If no error is encountered by the SCP or any of the bus masters, the SCP issues an IDLE command to the bus masters to stop executing the current test.

The test cycle is then repeated until an error is encountered or the <Diag> key is pressed on the operator panel.

1. Execute Utility 45.
2. When the utility template reappears, enter the R parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <1> key, followed by pressing and releasing the operator panel keypad <Enter> key.
3. Enter the UU parameter in the standard diagnostic utility initiation template by pressing and releasing the operator panel keypad <5> and <3> keys, followed by pressing and releasing the operator panel keypad <Enter> key. The LCD displays "LOCK TEST, CNT = CCC" where CCC is a counter that increments when a testing cycle is completed. (All boards with Common Memory or Dual Port Memory have been used as the semaphore address). Press the <Diag> key to exit the test.
4. If an error is encountered, "LOCK ERROR JXX" is displayed. Where XX is the physical J number slot of the bus master.
5. Press the <Adv> key on the front panel. One of the following error types will be displayed.

BUS ERROR

TIME OUT

WR = WW, RD = RR

6. Press the <Adv> key again and "SEM=JXX:AAAAAAA" is displayed. Where XX is the physical J number slot of the board with common or dual port RAM on which the semaphore was located, and AAAAAAA is the address of the semaphore.
7. If the <Adv> key is pressed again, the error messages will redisplay. To exit, press the <Diag> key.

Lock Bus Test - Bus Error

A bus error occurs when the bus master fails to lock semaphore or access the semaphore data area.

1. **LOCK ERROR J08**
BUS ERROR
SEM=J04:0067FFE0

The above error messages would mean the bus master board in J08 encountered a BUS ERROR during the lock test using a semaphore address of 67FFE0 located on a RXU board installed in J04.

Lock Bus Test - Time Out

If a bus master is unable to lock the semaphore, a timeout error occurs.

Lock Bus Test - Write//Read

A write/read error “WR = WW, RD = RR” occurs if a bus master was able to lock the bus, but the data written to the semaphore data area is not equal to the data read. WW was the data written (this board’s slot ID) to the semaphore data area and RR was the incorrect data read back.

1. **LOCK ERROR J07**
WR = 04, RD = 09
SEM=J13:00F7FFE0

The bus master board in J07 of a 10X controller (slot ID 4) locked the semaphore and wrote its slot ID to the semaphore data area. However, when the semaphore data was read the value was not the value written for this board’s slot ID. The semaphore is located on J13 at address 0F7FFE0H and the value read from the semaphore data area was 09.

This indicates that the bus master in slot ID 9 (which is J12 on a 10X controller) saw the semaphore as freed and locked it for its use. Two boards had the semaphore locked at the same time.

Error Recovery

Recovery is limited to swapping boards until the error no longer occurs. The most likely boards to be faulty are the ones given in the error messages.

Utility 54 - Reserved**Utility 55 - Program 15X SCP PROM (FE Protected Utility)**

This utility allows the flash programmable PROM on the 15X SCP to be updated from the current IML drive. This file must be on the current IML drive when an IML is performed to update the PROM.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Select Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <5> and <6> key for the UU input.

3. Observe that the message “PASSWORD=?” appears on the operator panel LCD display.
4. Enter the appropriate FE password by sequentially pressing and releasing operator panel keypad keys. Note that the password is not echoed on the operator panel LCD display.

If an error occurs, the message “VERIFY FAILED” is displayed on the LCD. If the PROM was programmed successfully, the message “DONE, PWR OFF/ON” is displayed. Power the 1174-15X off and then back on.

Utility 56 - Number of Floppy Drives Installed on a 65X

This utility allows an authorized service personnel to change the number of floppy drives that are installed on the LINCS platform.

To initiate and execute this utility, perform the following steps:

1. Enter Extended Diagnostics mode.
2. Select Offline Utility mode. Use the operator panel keypad numeric <1> key for the R input, and the <5> and <6> key for the UU input.
3. Observe that the message “PASSWORD=?” appears on the operator panel LCD display.
4. Enter the appropriate FE password by sequentially pressing and releasing operator panel keypad keys. Note that the password is not echoed on the operator panel LCD display.
5. The LCD panel will display the following: #Flp Drives = _
6. The user can enter a <1> or a <2> for the number of floppy drives installed. The entry is validated when the <Enter> key is pressed. Any entry other than <1> or <2> causes a question mark to be displayed in the cursor position. At this point, the user may try again to enter <1> or <2>.

Utility 57 - Amount of Local Memory Installed on a 65R

Utility 57 is a password protected utility that should be run after installing the local memory DRAMs in their sockets. When invoked, the LCD panel will display: Local MEM Siz=_

The user can then enter a <2> or <4> to set the local memory size to 2 or 4 Mbytes. The entry is validated when the <Enter> key is pressed. Any other entry other than <2> or <4> causes a question mark to be displayed in the cursor position. At this point, the user may try again to enter a <2> or <4>.

Utility 58 - Reserved

Utility 59 - Reserved

Utility 60 - Reserved

4. Offline Testing

Diagnostic Test Selection and Initiation

The Offline Extended Diagnostics test mode allows the operator to choose a specific test(s) to execute. Perform the following steps to select, initiate, and execute an Offline Extended Diagnostics test.

Note: Before executing tests on any of the boards with processors, the boards must be booted using the appropriate boot utility. See Utilities 21, 22, 42, 43, 44, 45, or 46.

1. Enter Offline Extended Diagnostics mode.
2. The operator panel LCD displays the following message (note that a reverse block cursor flashes at the M):
DIAG MODE = M
3. Enter the desired value (1) from the diagnostic modes listed by pressing and releasing the appropriate operator panel keypad numeric key:
 - <1> - Selects Offline Extended Diagnostics
 - <3> - Selects Basic Assurance Test (BAT) mode
 - <4> - Selects Factory Burn-in mode
 - <5> - Customer Utility mode
 - <7> - Field Support Utility mode
 - <9> - Raleigh Engineering Utility mode
4. If an unimplemented numeric value is entered for the M, or diagnostics mode, parameter, a question mark (?) replaces the M in the mode template, prompting the user to enter another value.
5. The legend of the key pressed is echoed on the operator panel LCD display.
6. Observe that the standard diagnostic test initiation template appears on the operator panel LCD display in one of the following forms:
XY:JSS:TNN:CC or XY:JSS:DD:TNN:CC
7. Note that in either case above, the cursor flashes at the X position.
8. As template parameters are entered, the cursor moves to the right, always pointing to the currently active parameter field.
9. The X in the template corresponds to a hardware selection parameter. It allows the operator to select a specific hardware element. Press and release an operator panel keypad key to select the desired hardware element per the following list:
 - <1> - Local side individual component level
 - <2> - Local side board level
 - <3> - Local side group level
 - <4> - Local side system level
 - <5> - Bus side individual component level

- <6> - Bus side board level
 - <7> - Bus side group level
 - <8> - Bus side system level
 - <9> - Complete (bus and local) system test
 - <0> - Reserved
10. After pressing and releasing the desired numeric key, the operator panel <Enter> key must also be pressed and released.
 11. If a reserved value is entered, a question mark (?) replaces the X in the standard template, prompting the user to enter another value.
 12. Observe that the flashing cursor moves to the Y character of the standard diagnostic test initiation template when a valid X parameter has been entered and the <Enter> key has been pressed and released.
 13. Note that the terms local side and bus side are analogous to onboard and offboard, respectively.
 14. The Y in the standard diagnostic test initiation template is the test control option. The user selects a test control option by pressing and releasing a numeric key on the operator panel keypad per the following list, followed by pressing and releasing the <Enter> key:
 - <1> - Run selected test once, run on error
 - <2> - Run selected test once, stop on error
 - <3> - Run selected test looped, run on error
 - <4> - Run selected test looped, stop on error
 - <5> - Run selected test CC times, run on error
 - <6> - Run selected test CC times, stop on error
 - <7> - Undefined
 - <8> - Undefined
 - <9> - Undefined
 - <0> - Reserved
 15. Currently, the run on error option is not implemented, and all run on error values default to stop on error.
 16. Once a valid Y control option has been correctly entered, the user should expect the standard diagnostic test initiation template to automatically truncate itself to the minimum number of template fields required by the selected XY combination. For example, if a selection of <1> is made, no CC parameter is needed so it will be truncated from the LCD prompt.
 17. If an undefined or reserved value is entered for the control option, a question mark (?) replaces the Y in the standard diagnostic test initiation template, prompting the operator to enter another value.
 18. Depending on the hardware selection (X) and control option (Y) parameters entered, the initiation operation may be complete. For example, if an XY = 42, local side system level tests executed once in Stop on Error mode, is selected, no further parameters are required and the test is executed. This will be obvious to the user since all other fields will have been automatically truncated off.

19. If the selected XY combination entered above requires a source slot input, the flashing cursor advances to the first S in the JSS field. Press and release two numeric keys on the operator panel keypad to enter the physical slot number of the source board. Press and release the <Enter> key following the two numeric keys. Valid numeric key input combinations are as follows:
- 01 - 18 - Card cage slots
 - 31 - Hard Disk Drive 2
 - 32 - Hard Disk Drive 1
 - 33 - Operator panel logic (OPL) board
 - 34 - Floppy Disk Drive 1
 - 35 - Floppy Disk Drive 2

Note that not all values are valid for every model.

20. If an invalid key is pressed for either of the S inputs, a question mark (?) character replaces the S, prompting the operator to enter a different value.
21. Wild cards can be used in place of numeric keys to select multiple boards. For the source slot field, when wild cards are used, they are limited in definition to choosing all boards. Partial sequences, such as J*X or JX*, are not allowed.
22. To enter a wild card in the JSS field, press and release the <Alt> key on the operator panel keypad. Observe that the two S characters in the JSS field of the standard diagnostic test initiation template are replaced by two asterisks (**). Press and release the operator panel keypad <Enter> key to complete the wild card input.
23. If required by the XY combination entered, a 2-digit destination slot can be entered in the same manner as the source slot, but with the additional limitation that only card cage slots can be used in the DD field. This limits the range of valid inputs to 01 to 18; entering any other value results in the display of a question mark, prompting for a different input.
24. Wild card conventions and usage are also the same as for the source slot (JSS) field.
25. If required by the entered XY parameter combination, a test type and test number must be entered into the TNN field of the standard diagnostic test initiation template. The test type specifier is a single character which represents a broad class of tests.
26. To enter a test type, choose the desired value from the list below and press and release the corresponding operator panel numeric key. A question mark will be displayed if an illegal value is entered. The value entered will be echoed in the standard diagnostic test initiation template displayed on the operator panel LCD display by the legend numeral of the key pressed replacing the T character. The following list contains all valid test type digits:
- <0> - Reserved
 - <1> - Processor tests
 - <2> - Onboard Memory test
 - <3> - Onboard SCI tests
 - <4> - Onboard Peripheral tests *
 - <5> - Reserved

- <6> - Bus Side Common Memory tests
- <7> - Bus Side SCI tests
- <8> - Bus Side Dual Port Memory tests
- <9> - Reserved

* Some peripheral tests require a loopback connector. If the loopback connector is not present, they will fail if DIAG MODE is not equal to BAT.

27. To select a specific test number, refer to a board specific list of test numbers and enter the desired 2-digit number by pressing and releasing two operator panel keypad numeric keys. Note that the keys pressed are echoed in the standard diagnostic test initiation template by the legend numeral replacing an N character.
28. At this point, the test may be executed, or if a Y control option of 5 or 6 was entered, a loop count must be entered.
29. If required, enter a loop count into the CC field of the initiation template displayed on the operator panel LCD display by pressing and releasing two numeric operator panel keypad keys, followed by pressing the <Enter> key.
30. Valid input combinations for the CC field are from 1 to 99, decimal. 1 (a single execution) is more easily initiated by entering a Y control option of 1 or 2.
31. When entering a value into the count field of the initiation template, observe that the values entered are echoed within the template by the legend numeral of the key pressed, replacing one of the C characters.
32. The loop count (CC) field is always the last to be entered, if required. Test initiation, consisting of loading the appropriate test file and locating the test(s) to be run immediately follows the last pressing of the operator panel keypad <Enter> key.

Test Execution and Failure Reporting

The selected test or tests are executed immediately following the final pressing of the operator panel <Enter> key. Upon successful completion of the test, the standard diagnostic test initiation template reappears on the operator panel LCD display.

If the selected test fails, a message of the following format appears on the operator panel LCD display:

FAIL JSS:BB:TNN *

See Chapter 4, "Errors," for the decoding of the test failure message.

Diagnostic Tests

Some tests require the installation of a loopback plug prior to executing the offline test. Following is a list of diagnostic tests that may be run listed by board type.

Note: All tests may not be valid for all LINCS nodes

The numbers listed represent the TNN value of the test initiation expressing of:

XY:JSS:DD:TNN:CC

AIC Board

* Indicates a test that is not included in the BAT.

+ Indicates a test that requires a loopback plug (P/N 210566-001).

\$ Test may be invalid when executed separately, with an MCC installed in J4 and an AIC installed in J5, or with an MCC installed in J11 and an AIC installed in J12.

Test	Description
100	Processor Test
200 *	Local Memory, Sliding 1 and 0 Test
201	Local Memory, Pattern
251	Dual Port RAM
300	SCI Port 0, Control Port
301	SCI Port 1, LED Port
302	SCI Port 2, Board ID Port
306	SCI Port 6, Diagnostic Port
313	Time Stamp Clear
314	Time Stamp Latch and Count
315 *	Time Stamp Rollover and Interrupt
345	SCI Local Interrupt
367	SCI Ports 6, 7
380	SCI Visual LED Check
400 \$	ADA 0 Comm 78808 Reset Test
401 \$	ADA 1 Comm 78808 Reset Test
402 *+\$	ADA 0 RS232 Reset Test
403 *+\$	ADA 1 RS232 Reset Test
410	ADA 0 Comm 78808 Read/Write Test
411	ADA 1 Comm 78808 Read/Write Test
412 *+	ADA 0 RTS/CTS Read/Write Test
413 *+	ADA 1 RTS/CTS Read/Write Test
414 *+	ADA 0 DTR/DSR Read/Write Test
415 *+	ADA 1 DTR/DSR Read/Write Test
416 *+	ADA 0 CDET/BUSY Read/Write Test
417 *+	ADA 1 CDET/BUSY Read/Write Test
430	ADA 0 Soft Reset Test
431	ADA 1 Soft Reset Test
432 *+	ADA 0 RS232 Reset Test
433 *+	ADA 1 RS232 Reset Test
440	ADA 0 XMIT/RCV, Poll, Internal Loopback (ports tested individually)
441	ADA 0 XMIT/RCV Interrupt Driven, Internal Loopback (ports tested individually)
442	ADA 0 XMIT/RCV Interrupt Driven, Internal Loopback (all ports tested at once)
443 *+	ADA 0 XMIT/RCV Poll, External Loopback (ports tested individually)
444 *+	ADA 0 XMIT/RCV Interrupt Driven, External Loopback (ports tested individually)
445 *+	ADA 0 XMIT/RCV Interrupt Driven, External Loopback (all ports tested at once)
450	ADA 1 XMIT/RCV, Poll, Internal Loopback (ports tested individually)
451	ADA 1 XMIT/RCV Interrupt Driven, Internal Loopback (ports tested individually)

Test	Description
452	ADA 1 XMIT/RCV Interrupt Driven, Internal Loopback (all ports tested at once)
453 *+	ADA 1 XMIT/RCV Poll, External Loopback (ports tested individually)
454 *+	ADA 1 XMIT/RCV Interrupt Driven, External Loopback (ports tested individually)
455 *+	ADA 1 XMIT/RCV Interrupt Driven, External Loopback (all ports tested at once)
470 *+	ADA 0 Modem Interrupt - DSR
471 *+	ADA 1 Modem Interrupt - DSR
472 *+	ADA 0 Modem Interrupt - CDET
473 *+	ADA 1 Modem Interrupt - CDET
498	Identify ADAs
499	BAT Identify ADA

Bus Side

These bus side diagnostics tests can be executed by any bus master board.

Test	Description
601	Common Memory Data Pattern Test
602	Common Memory Sliding 1 and 0 Test
603	Common Memory Extended Address and Pattern Test
604	Common Memory Address Line Test
609	Common Memory Initialization to Zeroes
610	Common Memory Byte Access Test
611	Common Memory Long Word Access Test
801	Dual Port Memory Data Pattern Test
802	Dual Port Memory Sliding 1 and 0 Test
803	Dual Port Memory Extended Address and Pattern Test
804	Dual Port Memory Address Line Test
809	Dual Port Memory Initialization to Zeroes
810	Dual Port Memory Byte Access Test
811	Dual Port Memory Long Word Access Test

CDA Board

Test	Description
300	CDA SCI Port 0 Test
301	CDA SCI Port 1 Test
302	CDA SCI Port 2 Test
347	CDA SCI Port 4-7 Test

CHP/CHC Boards

During diagnostics the CHC is viewed as an extension of the CHP, in the same way an ADA is to an AIC. All testing of the CHC is performed by the CHP.

For an 1174-15L: To test the CHC, J02 is entered (the slot of the CHP) as the slot to test, not J01. Similarly on other models supporting the Bus and Tag channel interface, to run tests for the CHC cards, always enter the slot number of the corresponding CHP (1174-25X, 1174-25S).

* Indicates a test that is not included in the BAT.

+ Indicates a test that requires a loopback plug.

! Indicates a test requiring bus and tag loopback plugs and terminators be installed.

Test	Description
201	Dual Port RAM Pattern
202 *	ASC/DES Slide
209	Initialize Dual Port RAM to 0
210	Byte Access
211	Low Word Access
212	Address Line
280	Dual Port Parity Error
281	Dual Port Parity with NMI
282	Parity RAM Address
283	Parity Generation
284 *	Sliding 1 and 0 Parity
300	SCI Control Port
301	SCI Diagnostic LED Port
302	SCI Board ID Port
306	SCI Diagnostic LED Register
313	SCI Timer Counter
314	SCI Timer Counter
315 *	SCI Timer Counter
345	SCI Interrupt
367	SCI ID Port
380	SCI Visual LED Check
381	Slot ID Port
410 *	DMA Reset (Burn-in only)
411	DMA Read/Write
420	DMA CHP Dual Port to CHP Dual Port
421 *	DMA CHP Dual Port to Common
422 *	DMA Common to CHP Dual Port
423 *	DMA Common to Common
424 *	DMA CHP Dual Port to IOP Dual Port
425 *	DMA Common to IOP Dual Port
426 *	DMA IOP Dual Port to CHP Dual Port
427 *	DMA IOP Dual Port to Common
428	DMA Stop Transfer
440	Message FIFO Full Resets CHC
441	Watchdog Resets CHC
442	Message Interrupt
450 *	MFP 68901 Read/Write
451 *	MFP 68901 Timer
452 *	MFP 68901 Internal Loopback
453 *+	MFP 68901 External Loopback
454 *+	MFP 68901 USART Interrupt
460	Write Control Store Pattern

LINCS Problem Determination

Test	Description
461 *	9513A Reset
462	9513A Read/Write
463	9513A Timer
465	CHC Critical Path
466	Data FIFO, Processor Read/Write
467	Data FIFO, Fake DMA
468	Data FIFO, DMA
470	CHC 16-bit Y-bus
471	In & Out Tags Test through Read Port
472	In & Out Tags Test through CC
473	CHB_IN and CHB_OUT
474	Device Status RAM
475	Channel Bus Parity
476	Address Recognize RAM
477	Channel Command PROM
478	Interface Disconnect
479	Selective Reset Sequence
480	System Reset Sequence
481	Low Speed Transfer - Onboard Loopback
482	High Speed Transfer - Onboard Loopback
483	Data Transfer Parity
485	Data FIFO, CHP/CHC - Inbound
486	Data FIFO, CHP/CHC - Outbound
487	Datastreaming Test
490 *!	Channel Bus - Analog Loopback
491 *!	Channel Parity - Analog Loopback
492 *!	Channel Tags - Analog Loopback
493 *!	Selection Logic - Analog Loopback
494 *!	CHI Relays - Analog Loopback
498 *!	Load Extended/Burn Diagnostics
499	Check for datastreaming CHC installed

ETH Board

* Indicates a test that is not included in the BAT.

Test	Description
101	Local RAM Data Pattern Test
102 *	Local RAM Ascending/Decesending Address Sliding 1 and 0 test
103 *	Local RAM Extended Address and Pattern Test
104	Local RAM Address Line Test
109	Local RAM Initialization to Zeroes
110	Local RAM Byte Access Test
111	Local RAM Long Word Access Test
201	Dual Port memory Data Pattern Test
202 *	Dual Port Memory Ascending/decsending Address Sliding 1 and 0 Test
203 *	DualPort RAM Extended Address and Pattern Test
204	Dual Port RAM Address Line Test
209	Dual Port RAM Initialization to Zeroes
210	Dual Port RAM Byte Access Test
211	Dual Port RAM Long Word Access Test
300	SCI Control Port Test
301	SCI Diagnostic LED Port Test
302	SCI Board ID Test
306	SCI Diagnostic Port Test
313	SCI Timer/Counter Test
314	SCI Timer/Counter Test
345	SCI Local Interrupt Test
367	SCI ID Port Test
380	SCI Visual LED Check
400	Initialization of Sonic Chip
410 *	Sonic MAC Loopback
411 *	Sonic ENDEC Loopback
412 *	Sonic Transceiver Loopback

HSC Board

+ Indicates a test that requires a loopback plug and is not included in the BAT.

Test	Description
101	Local ram data pattern test.
102	Local ram ascending/decesending address sliding ones/zeroes test.
103	Local ram extended address and pattern test.
104	Local ram address line test.
109	Local ram initialization to zeroes.
110	Local ram byte access test.
111	Local ram long word access test.
201	Dual port memory data pattern test.
202	Dual port memory ascending/decesending address sliding ones/zeroes test.
203	Dual port ram extended address and pattern test.
204	Dual port ram address line test.
209	Dual port ram initialization to zeroes.
210	Dual port ram byte access test.

Test	Description
211	Dual port ram long word access test.
300	Sci Control port test
301	Sci diagnostic led port test
302	Sci Board Id test
306	Sci diagnostic port test
313	Sci Timer/counter test
314	Sci Timer/counter test
345	Sci local interrupt test
367	Sci ID port test
380	Sci Visual LED Check
390	SCI Bus access test
400	68360 Dual port ram test
401	68360 dual port ram sliding ones and zeroes test.
402	68360 dual port ram initialization to zero.
404	68360 Timer read/write test
405	68360 Timer count test.
406	68360 Timer interrupt Test.
407	68360 periodic interval timer interrupt test.
410	SCC1 RS232 internal loopback test
411 +	SCC1 RS232 DTR/DSR loopback test.
412 +	SCC1 RS232 RTS/CTS loopback test.
413 +	SCC1 V.35 DTR/DSR loopback test.
414 +	SCC1 V.35 RTS/CTS loopback test.
415 +	SCC1 RS232 external loopback test.
416 +	SCC1 V.35 external loopback test.
420	SCC2 RS232 internal loopback test
421 +	SCC2 RS232 DTR/DSR loopback test
422 +	SCC2 RS232 RTS/CTS loopback test.
423 +	SCC2 V.35 DTR/DSR loopback test.
424 +	SCC2 V.35 RTS/CTS loopback test.
425 +	SCC2 RS232 external loopback test.
426 +	SCC2 V.35 external loopback test.
430	SCC3 RS232 internal loopback test
431 +	SCC3 RS232 DTR/DSR loopback test.
432 +	SCC3 RS232 RTS/CTS loopback test.
433 +	SCC3 V.35 DTR/DSR loopback test.
434 +	SCC3 V.35 RTS/CTS loopback test.
435 +	SCC3 RS232 external loopback test.
436 +	SCC3 V.35 external loopback test.
440	SCC4 RS232 internal loopback test
441 +	SCC4 RS232 DTR/DSR loopback test.
442 +	SCC4 RS232 RTS/CTS loopback test.
443 +	SCC4 V.35 DTR/DSR loopback test.
444 +	SCC4 V.35 RTS/CTS loopback test.
445 +	SCC4 RS232 external loopback test.
446 +	SCC4 V.35 external loopback test.

MCC Board

* Indicates a test that is not included in the BAT.

\$ Test may be invalid when executed separately, with an MCC installed in J4 and an AIC installed in J5, or with an MCC installed in J11 and an AIC installed in J12.

BR is board revision level.

Test	Description
100	Processor Test
200 *	Local Memory, Sliding 1 and 0
201	Local Memory, Pattern
251	Dual Port RAM
300	SCI Port 0, Control Port
301	SCI Port 1, LED Port
302	SCI Port 2, Board ID Port
306	SCI Port 6, Diagnostic Port
313	SCI Time Stamp Clear
314	SCI Time Stamp Latch and Count
315 *	SCI Time Stamp Rollover and Interrupt
345	SCI Local Interrupt
367	SCI Ports 6, 7
380	SCI Visual LED Check
400 *	Digital Loopback Test
401 *	Coax Parity Test
403 *\$	Coax Interrupt Test
410 *	BNC 0 Analog Loopback
411 *	BNC 1 Analog Loopback
412 *	BNC 2 Analog Loopback
413 *	BNC 3 Analog Loopback
420 *	J18 CDA Analog Loopback (MCC)
421 *	J17 CDA Analog Loopback (MCC)
422 *	J15 CDA Analog Loopback (MCC)
423 *	J14 CDA Analog Loopback (MCC)
430 *	J18 CDA Analog Loopback (MCC II)
431 *	J17 CDA Analog Loopback (MCC II)
432 *	J15 CDA Analog Loopback (MCC II)
433 *	J14 CDA Analog Loopback (MCC II)
440 *	CDA 0, Analog Loopback, 16-Port BNC
441 *	CDA 1, Analog Loopback, 16-Port BNC
460 *	Digital Loopback Test
461 *	CDA 0, Analog Loopback, 9-Port BNC
462 *	CDA 0, Analog Loopback, 18-Port BNC
463 *	CDA 1, Analog Loopback, 18-Port BNC
490 *	Analog Loopback Test, Main Board/CDA, 5-Port BNC
491 *	Analog Loopback Test, Expansion/CDA
492 *	Analog Loopback Test, Main Board/CDA, 2-Port BNC

MBR Board

* Indicates a test that is not included in the BAT.

Test	Description
201	Data Pattern Test
202 *	Sliding 1 and 0 Test
203 *	Extended Address and Pattern Test
204	Address Lines Test
209	Initialize to 0, Bypass BAT, Write Only
210	Byte Access Test
211	Long Word Access Test
221	Boot MBR (Remove Reset)
280	Parity Error Detection Test
281	Parity Error with Non-Maskable Interrupt
282	Parity RAM Address Test
283	Parity Generation Test
284 *	Sliding, Descending Address Test

RAM Board

* Indicates a test that is not included in the BAT.

Test	Description
201	RAM Board Pattern Test
202 *	Sliding 1 and 0 Test
203 *	Extended Address and Pattern Test
204	Address Lines Test
208	Initialize RAM Array

Test	Description
209	Bypass BAT Initialize
210	RAM Byte Access Test
211	RAM Long Word Access Test
221	Remove Reset Test
224	Bank Bits Test
226	Clear Error Test
227	Initialize EDC Chip Test
250	Reset Pass Through Mode

SCC Board

* Indicates a test that is not included in the BAT.

+ Indicates a test that requires a loopback plug (use P/N 211887-001 for RS-232/ V.35 board 211905-900; use P/N 211887-002 for RS-232/X.21 board 211905-902).

LINCS Problem Determination

Test	Description
100	Processor Test
200 *	Local Memory, Sliding 1 and 0
201	Local Memory, Block Move
251	Dual Port RAM Pattern Test
300	SCI Command Register
301	SCI Port 1
302	SCI Port 2
306	SCI Port 6
313	Time Stamp Clear
314	Time Stamp Latch and Count
315 *	Time Stamp Rollover and Interrupt
345	SCI Local Interrupt
367	SCI Ports 6, 7
380	BAT Loop (LED Rotate) Test
400 *	Channel 0 Data Read/Write
401 *+	Channel 0 CD/DTR Loopback
402 *+	Channel 0 DSR/DTR Loopback
403 *+	Channel 0 RTS/CTS Loopback
404 *+	Channel 0 NRZ Asynchronous Loopback
405 *+	Channel 0 NRZI Asynchronous Loopback
406 *+	Channel 0 NRZ V.35 Asynchronous Loopback
407 *+	Channel 0 NRZI V.35 Asynchronous Loopback
410 *	Channel 1 Data Read/Write
411 *+	Channel 1 CD/DTR Loopback
412 *+	Channel 1 DSR/DTR Loopback
413 *+	Channel 1 RTS/CTS Loopback
414 *+	Channel 1 NRZ Asynchronous Loopback
415 *+	Channel 1 NRZI Asynchronous Loopback
416 *+	Channel 1 NRZ V.35 Asynchronous Loopback
417 *+	Channel 1 NRZI V.35 Asynchronous Loopback

SCP Board

* Indicates a test that is not included in the BAT.

+ Indicates a test that requires a loopback plug.

Test	Description
101	Local Memory Data Pattern Test
102 *	Local Memory Sliding 1 and 0 Test
103 *	Local Memory Sliding 1 and 0 Test
104	Local Memory Address Line Test
109	Local Memory Initialization to Zeroes
110	Local Memory Byte Access Test
111	Local Memory Long Word Address Test
300	SCI Control Port Test
301	SCI Diagnostic LED Port Test
302	SCI Board ID Port Test
306	SCI Gate Array Diag Reg Test
313	SCI Timer Counter Test
314	SCI Timer Counter Test
315 *	SCI Timer Counter Test
345	SCI Local Interrupt Test
367	SCI Port 6 and 7
380	Diagnostic LED Rotate Test
400 *	RTC Alarm and Periodic Interrupt
401	RTC Oscillator Failure Test
402 *	RTC Low Battery Flag Test
403 *	RTC Time Save RAM Test
404 *	RTC Clock Start/Stop Test
405	RTC Control Registers Test
440	DMA Reset, Register Write/Read Test
442	DMA Local Memory to Memory Transfer
444	DMA Local to Common Memory Transfer
445	DMA Local to Local with Interrupt
446	DMA Stop Transfer Test
450 *	MFP 68901 Read/Write Test
451 *	MFP 68901 Timer Test
452 *	MFP USART Internal Loopback
453 *+	MFP USART External Loopback
454 *+	MFP USART Interrupt Test
481	Slot ID Port Test

These additional tests are run by the SCP to each board using Dual Port RAM.

Test	Description
201	Data Pattern Test
202 *	Sliding 1 and 0 Test
204	Address Lines Test
205	Bank Address Decoder Test

LINCS Problem Determination

Test	Description
209	Initialize to 0, Bypass BAT, Write Only
210	Byte Access Test
211 *	Long Word Access Test
280	Parity Error Detection Test
281	Parity Error with Non-Maskable Interrupt
282	Parity RAM Address Test
283	Parity Generation Test
284 *	Sliding, Descending Address Test

These additional tests are run by the SCP to the floppy disk drives.

Test	Description
400	FDD Sector Write/Read Test
410	FDD Seek Track 0 Test

These additional tests are run by the SCP to the hard disk drive.

Test	Description
400	Test Unit Ready
410	SCSI Send Diagnostic
420	Random Block Read
440	Hard Disk Write Then Read Test

SHA Board

The validity of the following tests depend upon the hardware present in the LINCS node being tested.

* Indicates a test that is not included in the BAT.

Test	Description
201 *	Dual Port Pattern Test
202 *	Dual Port Sliding 1 and 0 Test
203 *	Extended Address and Pattern Test
204 *	Dual Port Address Lines Test
209 *	Initialize Memory
210 *	Dual Port RAM Byte Access Test
211 *	Dual Port RAM Long Word Access Test
300	SCI Port 0
301	SCI Port 1
302	SCI Port 2 Board ID
306	SCI Diagnostic Register
313	Time Stamp Clear
314	Time Stamp Latch and Count
315 *	Time Stamp Rollover and Interrupt
345	SCI Local Interrupt

Test	Description
367	SCI ID Register Test
380	Rotate LEDs
399 *	Remove from Reset
420 *	SBC Reset
440 *	DMA Reset, Read/Write
441 *	DMA Read/Write
450 *	DMA SHA Dual Port to SHA Dual Port
Test	Description
451 *	DMA SHA Dual Port to Common
452 *	DMA Common to SHA Dual Port
453 *	DMA Common to Common
454 *	DMA SHA Dual Port to IOP Dual Port
455 *	DMA Common to IOP Dual Port
457 *	DMA Transfer Test IOP Dual Port to Common Memory
458 *	DMA Transfer Test IOP Dual Port to SHA Dual Port

TRC Board

* Indicates a test that is not included in the BAT.

+ Indicates a test that requires a loopback plug.

Indicates test may also be run on a 10R/10L if the TRC has an Eagle chipset.

BR is board revision level.

Test	Description
101	Local Memory Data Pattern Test
102 *	Local Memory Sliding 1 and 0 Test
103 *	Local Memory Sliding 1 and 0 Test
104	Local Memory Address Line Test
109	Local Memory Initialization to Zeroes
110	Local Memory Byte Access Test
111	Local Memory Long Word Address Test
201	Dual Port Pattern Test
202 *	Dual Port Sliding 1 and 0 Test
204	Dual Port Address Lines Test
209	Initialize Memory
210	Dual Port Byte Access Test
211	Dual Port Long Word Access Test
300	SCI Port 0
301	SCI Port 1
302	SCI Port 2
306	SCI Port 6
313	Time Stamp Clear

LINCS Problem Determination

Test	Description
314	Time Stamp Latch and Count
315 *	Time Stamp Rollover and Interrupt
345	SCI Local Interrupt
367	SCI ID Register Test
380	Rotate LEDs
400	TMS 380 Bring Up Diagnostics
410 *	Download of ADS Code
411	Eagle Download and Bud
420 *	DMA from Adapter LAN RAM to Dual Port
430 *	DMA from Dual Port to Adapter LAN RAM
440 *	Wrap Function Test
450 *+	Lobe Function Test
460 *	Watchdog Timer Test
470 *	TMS38030 Interrupt Test
480 *#	Expansion Memory Test
481 *#	Adapter RAM Read/Write Test
482 *#	Adapter RAM Address Test
483 *#	Adapter RAM Extended Test

TRM/RXT/RXU Board

* Indicates a test that is not included in the BAT.

Test	Description
201	RXU Board Pattern Test
202 *	Sliding 1 and 0 Test
203 *	Extended Address and Pattern Test
204	Address Lines Test
205	Bank Address Decoder Test
209	Bypass BAT Initialize
210	Byte Access Test
211	Long Word Access Test
221	Remove Reset (Boot) Test
224 *	Bank Bits Test
280	Parity Error Detection Test
281	Force Parity Error with NMI
282	Parity RAM Address Test
283	Parity Generation Test
284 *	Ascending/Descending Parity Address Test

5. Diagnostic Dumps

What is a Dump

A dump of the LINCS operating system copies valuable information from all of the processor registers and various data areas on each card to a series of binary files, which can be retrieved for analysis by Visara engineers. The dump provides a snapshot of what the state of the machine was at the time the dump was taken, and is a valuable tool for determining complex problems that occur. The LINCS operating system dumps under the following conditions:

- Exception error occurs, detected by the software
- Administrator-initiated

The operating system halts all other operations when a dump event occurs. This is to keep the contents of the registers and memory in the same state as when the failure occurs. An IML after the dump has completed is required to make the unit operational again. The 'machine check options' value in configuration determines whether this IML will occur automatically.

LINCS creates the dump on the hard drive, placing it in a separate "dump" subdirectory. (The 1174-90S does not have a hard drive so a special 'dump diskette' must be used instead.) LINCS automatically creates this subdirectory as needed. Once the dump has been completed, and the LINCS platform has once again been made functional, the dump can be retrieved by using one of the Media Management utilities or by retrieving it using FTP.

For early versions of the LINCS O/S (prior to LINCS 6.0), a single dump directory was used to store the dump. Beginning with LINCS 6.0, changes were made to allow multiple dumps to be stored. Dumps are now written into one of 9 different subdirectories (DMP00001-DMP00009), with a maximum of 8 dumps stored at any given time.

Dumps can be retrieved using the Media Management utilities of Central Control Mode and written to floppy, or if an IP network connection to the LINCS hardware platform exists, an FTP connection can be used to retrieve the files.

Included in the dump is a single text file ('box\$fail.txt') which can be viewed on a PC as needed. All other files are binary, and can not be interpreted in the field. The 'box\$fail.txt' file is the last file to be written into the dump directory (copied from the system directory). If this file is not present, then the dump is not complete.

All dumps, even partial dumps should be submitted to Visara engineers for analysis. Dumps should be sent to epar@visara.com, referencing the EPAR (Emergency Problem Action Report) number opened describing the problem, by authorized support personnel.

Creating a Dump Diskette

The 1174-90S requires the use of a special Dump Diskette to store a dump onto since the 90S does not have a hard drive to dump to.

The dump diskette is a DOS-compatible 2S/2HD 3.5" formatted disk that is identified by the operation system by its unique DOS label. This volume label can be created on a Windows PC with an 3.5" floppy drive by placing the floppy into the floppy drive and displaying the

directory structure of the PC (for example with Windows Explorer or by clicking on My Computer). Find the reference to the floppy drive, and right-mouse-click and select properties. You may enter the label '@A@@@@@174' on the resulting panel.

When copying dumps from a LINCS platform hard drive onto a floppy, it is not necessary to create a special Dump Diskette for the purpose.

LINCS Initiated Dump

A LINCS configuration parameter determines whether a dump is automatically generated when an exception event (machine check) occurs. It is recommended that you configure this option to generate the dump. An exception event will halt the operation of the LINCS platform, requiring a reboot of the platform before normal operations can resume. The dump needs to occur prior to rebooting the platform and typically takes about 5 minutes to write to disk. There are four options that can be configured:

1. Dump and No IML
2. Dump and IML
3. No Dump and IML
4. No Dump and No IML

If options 3 or 4 are selected (No Dump), there will be no detailed record of the event kept. If option 1 or 4 are selected (No IML), the platform will require a manual intervention to cause the reboot to occur. The best option in most cases would be to select option 2, which will cause the platform to generate the dump, then reboot back into normal operations automatically.

If option 4 is selected, the platform will stop in the failed condition with the exception error message displayed, and wait for a manual reboot to be initiated. In this state it is possible to force the dump to take place through manual intervention by pressing the <Diag> key followed by the <Enter> key (you may have to repeat this sequence). Pressing this sequence will cause the LINCS platform to go into Offline Diagnostic Mode, from which you can initiate Offline Diagnostic 20 to complete the dump. When performed this way, you will have to initiate a reboot of the platform manually upon completion of the dump process. (See Chapter 3 for details in running Offline Diagnostic 20.)

Administrator Initiated Dump

Sometimes it is desired to initiate a dump sequence to capture important information related to a failure that occurs that does not result in an exception error (machine check). A dump can be initiated manually from the front panel of the LINCS platform. A dump is initiated by pressing the <ALT> key and releasing it, followed by pressing the <9> key and releasing it. (Note that on early versions of LINCS the sequence to initiate a dump is <ALT><1>.) A message on the LCD of the front panel should indicate an exception error (ERR 330-32 0D *), and if the 1174 is configured to allow the dump to proceed, a message indicating that the dump is proceeding will soon appear on the LCD.

A dump can also be initiated from the IML utility found on the supervisor function menu of Central Control Mode (2/2). Toggle the IML option to 'force a dump and IML' and press <PF10>. This option can be run remotely through a telnet session if needed.

The dump typically takes a few minutes to perform. The LCD message will update with the names of files being written into the dump. When complete, a “DUMP COMPLETE” message will appear on the LCD read-out. While the dump is proceeding, you should see indications of the hard drive or floppy drive being written to. If you observe that the hard drive is not being accessed for a prolonged period of time, and the “DUMP COMPLETE” message is not displayed, it is possible that the dump has aborted. This is not a common event, but has been known to happen on occasion.

If the dump did not proceed for some reason upon entering the correct sequence to initiate the dump (and the error code displayed as it should), use the procedure described for manually forcing the dump described in the LINCS Initiated Dump section above.

Upon completion of the Administrator Initiated Dump, the platform will perform an IML or not, according to the LINCS configuration setting that was described above. For details on changing LINCS configuration settings, refer to the LINCS Configuration Manual or the SCON Configuration Manual.

Copying a Dump from the Hard Drive to Floppy

Dumps created by LINCS are written to the hard drive. These must be retrieved in order to be useful. In Central Control Mode, there is a utility that can be used to copy the dump onto a floppy disk. The utility to use is the Copy Data Object utility. The fast path in Central Control Mode is: 3/1,u.

Once on this panel, select the data object to be copied as “Dumpdisk” for older code levels or select the correct dump directory of “Dumpdisk1-Dumpdisk9” after determining which dump you want. Select the From drive as “C” and the To Drive as “A” and process the operation. Later versions of LINCS software supports multiple Dump subdirectories. You will need to determine the dump that you need and select the correct dump object before performing the copy.

Retrieving a Dump Using FTP

A dump may be retrieved from a LINCS platform by using FTP, if the platform includes a network card configured for IP. This is achieved by logging onto LINCS with the “DUMP” user ID, and identifying the correct FTP password (Supervisor Password defined in the LINCS Configuration, or any text string if no password is defined). On versions of LINCS supporting multiple dump directories, logging in as ‘dump’ should automatically place you into the directory of the most current dump. Once logged into the LINCS FTP Server, you can transfer all of the Dump files found in the dump directory. Dump files must be retrieved using Binary Transfer Mode. It is not recommended that you delete the dump files from the directory, if multiple dumps are supported by the version of LINCS running on the platform. If you wish to navigate to a different dump directory, you can perform the Change Directory (CD) command entering the name of the desired Dump directory, or you can log off, and log back on with a ‘DUMPn’ User ID where n is a value, 1-9, that represents the specific dump directory that you wish to enter.

Working With Multiple Dump Directories

Later versions of the LINCS O/S support multiple dump directories. If a LINCS platform dumps for the first time, the dump is written into the 'DMP00001' directory. The next dump to occur is put into directory 'DMP00002'. Likewise, each dump is placed in the next consecutive directory until 'DMP00009', then the directories get recycled one at a time and the next dump would be placed into 'DMP00001' again. LINCS ensures that the next dump directory in the sequence that will be used is cleared. For example, when LINCS dumps into directory 'DMP00006', it makes sure that directory 'DMP00007' is cleared of any files that might have been there. Using this algorithm, you can determine which dump directory is the most recent by seeing which ones are used and not used. The most recent should be the directory with the number directly preceding the first directory of the series that has no files or does not exist. When connecting in with FTP, and using 'dump' as the FTP user ID, you will be placed in the most recent dump directory. You can FTP directly into any of the directories by adding the number of the directory to the word 'dump' such as 'dump3' to access the 'DMP00003' directory.

Another method to determine the latest dump is to compare the date stamps associated with the dumps. These can be viewed using the Display/Update Disk Information utility.

If copying the dump using Media Management, you must first toggle through the disk types to determine which dump is not present, then go back to the previously listed dump. You may also use the 'Display Disk Information' utility to view the dumps, and select the one with the latest time stamp or the one with the time stamp that corresponds to the dump listed in the box\$fail.txt file that you want.

Dump Difficulties

Things that will cause the Dump not to occur automatically:

FE Switch or Engineering Switch On - It is important to leave the FE and Engineering Switches turned off, in order for dumps to occur spontaneously when an exception error occurs. If problems have occurred where a service technician has been working on the problem, there is a possibility that the FE or Engineering Switch has been left enabled by accident. The FE and Engineering Switches can be detected by going into Central Control (Test) mode and observing the initial Test Mode panel. If there is an indexed entry "0", then one of the two switches are enabled. You can turn these switches off by pressing the <PF10> key, followed by the <PF12> key. Next press the <PF1> key to refresh the screen. The refreshed display should not contain the Field Support menu.

No Dump Disk Found in the 1174-90S Floppy Drive A – Normally you will see the message 'NO DISK TO DUMP' if the labeled diskette is not found. This diskette must be located in Drive A in order to dump to.

LINCS Configured not to Dump – You can change the LINCS configuration.

Dump did not complete (No 'DUMP COMPLETE' message displayed) –

1. IML the LINCS platform back into production.
2. Copy the partial dump off as described above using either Media Management or FTP.
3. Retrieve the 'box\$fail.txt' file from the System directory using either the Media Management file copy utility or using FTP (log in as 'SYSTEM', using the Supervisor password).
4. Submit the Dump to Visara support personnel.

Using eManager with Dumps

A set of Dump utilities are provided with the Visara eManager (management) product, allowing you to initiate and retrieve dumps from a LINCOS platform remotely, when an IP network connection exists. From eManager you can force a Dump, retrieve the Dump, and delete the Dump if needed. eManager will even advise you when the LINCOS platform will not reboot itself afterwards. You can also view the retrieved 'box\$fail.txt' file. Password protection within eManager prevents unauthorized dumping of a LINCOS platform from eManager.

BOX\$FAIL.TXT File

LINCOS software creates and maintains a file called BOX\$FAIL.TXT which can be found in the System directory of LINCOS. This file keeps a record of each Dump, each Hardware Failure, and each IML error that has occurred on the LINCOS platform. The file also indicates whether the dumps completed or not. All of the information available through the Front Panel during a failure is recorded into the file. An example of a BOX\$FAIL.TXT file is shown below. Much of the extended information will be of use only to our Visara programmers, but you can still find a lot of useful information such as how often a problem repeats, when the failures occur, and sometimes information that can lead to identifying a hardware error.

```

11:26:57 06/13      ERR   B14      * W8=000C W9=0000 WA=0000 WB=0003 WC=0000 WD=0000
                    WE=0000 WF=000D

11:24:20 09/24      ERR   9F2      * W8=0030 W9=0001 WA=0000 WB=0000 WC=0000 WD=FFFF
                    WE=0000 WF=0000

12:50:35 09/24      ERR   9F2      * W8=0030 W9=0001 WA=0000 WB=0000 WC=0000 WD=FFFF
                    WE=0000 WF=0000

11:48:49 06/23      ERR   B14      * W8=000C W9=0000 WA=0000 WB=0003 WC=0000 WD=0000
                    WE=0000 WF=000D

14:02:05 07/13      ERR 330-32 0D *14:02 SR = 2000* PC = 083D0CC6 * D0 = 0000008A *
                    D1 = 00000001 * D2 = 00000000 * D3 = 00000000 * D4 = 00000514 *
                    D5 = 00000000 * D6 = FFFFFFFF * D7 = 0000000D * A0 = 0051D050 *
                    A1 = 004430F0 * A2 = 00003FEE * A3 = 00001840 * A4 = FFFF9112 *
                    A5 = FFFF9190 * A6 = 083D0C3A * A7 = 88010F96

                    DUMP COMPLETE

15:17:51 07/13      ERR   B14      * W8=000C W9=0000 WA=0000 WB=0003 WC=0000 WD=0000
                    WE=0000 WF=000D

10:47:39 07/15      ERR 330-32 0D *10:47 SR = 2004* PC = 083C4DD2 * D0 = 083C4D68 *
                    D1 = 0000000F * D2 = 00000003 * D3 = 00000003 * D4 = 0051FA03 *
                    D5 = 0003FF06 * D6 = 00000000 * D7 = 083C52AC * A0 = 00446900 *
                    A1 = 00F7C2D0 * A2 = 00457A40 * A3 = 00843758 * A4 = 00497A40 *
                    A5 = 083C52AC * A6 = 083C4D68 * A7 = 88010F1A

                    DUMP COMPLETE

```

Using eManager with BOX\$FAIL.TXT

The Visara eManager product can be used to retrieve and display box\$fail.txt files. A built in error code lookup function allows you to highlight an error code and display the information associated with it. The Backup function of eManager, when used to back up a LINCOS platform, automatically retrieves the latest box\$fail.txt file.

