Series 3000

STK3494

Service Manual

Preface

This user guide for the STK3494/3494 provides the information you need to install,

Decision Data

B000408790-04

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setup, and maintain your unit.

This User Guide is divided as follows:

Chapter 1: Specifications
Chapter 2: Installation
Chapter 3: Troubleshooting
Chapter 4: Part replacement

Appendix A: Error codes
Appendix B: Spare parts list

NOTE: IIS reserves the right to change specification without prior notice, in line with policy of constant product improvement.

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Warranty/Copyright/Trademarks

All product and company names mentioned in this manual are brand names or patented names of the respective companies.

1SPECIFICATIONS AND MODULE DESCRIPTION

This chapter provides the system specifications and a description of its replaceable modules.

1.1STK3494 System Specifications

Physical Characteristics

Dimension (HxWxD)	2” x 12” x 13 “ (5 cm x 30 cm x 34 cm)
Weight	9 lbs (4 Kg)

Input Power Requirements

Voltage:	110-220V~ ±10% at 50/60 Hz
Current:	0.6-0.3A
Power	40W
Frequency:	47 to 63 Hz
Fuse	0.2 - 0.4A

Environmental Requirements

Operating Environment	
Temperature	+10 to +40° C (+50 to + 104° F)
Humidity	20 to 80% non-condensing
Altitude	Sea level to 9,000 m (30,000 ft)
Storage Environment	
Temperature	-40 to +70 C° (-40 to + 158° F)
Humidity	5 to 95% non-condensing
Altitude	Sea level to 9,000 m (30,000 ft)

1.2Controller Assemblies

The controller consists of the following major assemblies:

Main Board	Contains an 80386 Microprocessor and a Coprocessor. The coprocessor controls communications to the host system as well as the attached terminals and printers.
Token Ring or Ethernet Adapter	Support both AS/400 attachment and Gateway attachment concurrently. Using Token Ring and Ethernet adapters one can be defined as a gateway to the other. Ethernet adapter can be used for both purposes using the same adapter. Each adapter working in a Gateway configuration, enables up to 80 PWSs per adapter, with a maximum of 4 Ethernet adapters per controller for a total of 320 PWSs.
V.24 Adapter	The V.24 adapter is a communication card that can send or receive information on the SNA communication line at speeds up to 19.2 Kbps. The adapter conforms to CCITT V.24 standard.
V.35 Adapter	The V.35 adapter is a communication card that can send or receive information on each SNA communication line at speeds up to 56 Kbps. The adapter conforms to CCITT V.35 standard.
X.21 Adapter	The X.21 communication card can send/receive information on the SNA communication line at 56 Kbps.
Floppy Disk Drive Assembly	Contains a 1.44 Mb 3 ½" Floppy disk drive.
Power Supply Assembly	Converts AC line voltage (either 115 VAC or 230 VAC) into regulated DC voltage required by the controller.

2INSTALLATION

This chapter provides a step by step explanation on how to install the STK3494STK unit and software and begin working with the controller.

2.1Before you Begin

Read the following sections carefully. Be sure you have the complete STK3494 package and the necessary equipment and that all the environmental and safety conditions are fulfilled.

STK3494 Controller Package

- STK3494 Controller
- STK3494 System Diskette
- STK3494 Users Manual
- Power Cord
- Twinax cable
- Communication interface cable

Equipment

Depending on your installation, you may need the following:

- Modem or DCE
- Twinaxial Expansion kit for 28 additional devices
- Token-Ring Adapter kit or Ethernet Adapter kit

Environmental Requirements

1. The STK3494 controllers should be installed indoors where it is dry, reasonably cool and clean, but otherwise it is not sensitive to environmental conditions or position as long as the specifications, described below, are adhered to.
2. Its location should be convenient for access to cable channels. It should be installed where it will not be subjected to extreme vibrations, dust, or fumes which could damage the disk drives.
3. Enough clear space should be left at the front and back of the controller to allow the free circulation of air and easy access.
4. Communication cables may be connected to the rear of the unit, therefore at least three feet (approx. 1 m) clearance should be allocated behind the controller to allow cables to be accessed and boards to be replaced.
5. Be sure the power receptacle is properly grounded and that your Twinax cable and cable installation comply with Twinax standards.

2.2Connecting the Cables

This section describes how to connect all cables.

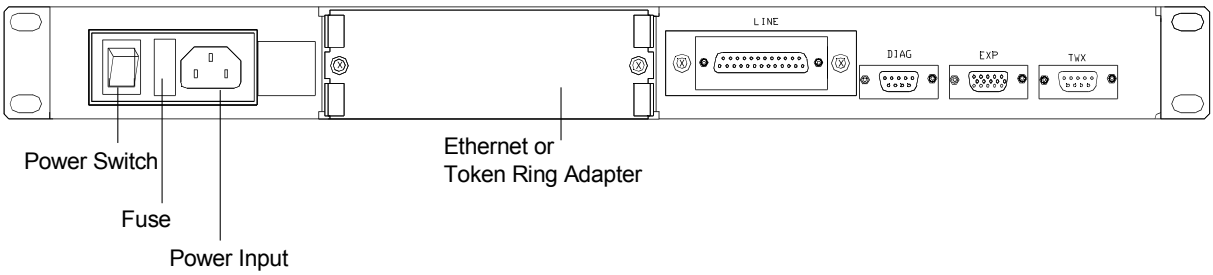
2.2.1General Instructions

Refer to the following illustration of the controller back panel when following the instructions for the connections of the cables.

- Route unshielded cables carefully in order to avoid noise sources such as fluorescent lights.
- Cable connectors should be tightly sealed and secured.
- It is recommended that the controller be switched off while cables are being inserted or removed.

ATTENTION!! Before connecting the communication cables, turn off the power to the STK3494 unit and to the modem and unplug the power cables from the outlets.

Cable Connections



1. **Connect the communication cable as follows:**

   a. **Turn off the power to the STK3494 unit and to the modem and unplug the power cables from the outlets.**

   b. Connect the supplied communication cable between the STK3494 Rear Panel LINE connector and the corresponding connector on your modem.

   c. Reconnect your modem and STK3494 unit power cables to properly grounded power source outlets. Turn the modem and controller ON.

   NOTE: Pre-terminated modem cable is supplied as part of your order. The DB-25 to DB-25 cables are supplied for RS-232 communication option. If you specified other communication options in your order (V.35 or X.21), the appropriate modem cable is provided.

2. **Connect the Twinax cable as follows:**

   Connect the 4289 multiplexer cable to the DB9 connector on the TWX connector.

If you are using the external Twinax expansion unit, connect the expansion cable to the EXP connector on the controller rear panel, and the multiplexer cable to the DB9 connector on the Twinax expansion unit.

3. **Connect the Token-Ring adapter cable (where applicable) as follows:**

   Connect the Token-Ring cable to the DB9 connector on the TRN connector on the controller front panel.

4. **Connect the Ethernet adapter cable (where applicable) as follows:**

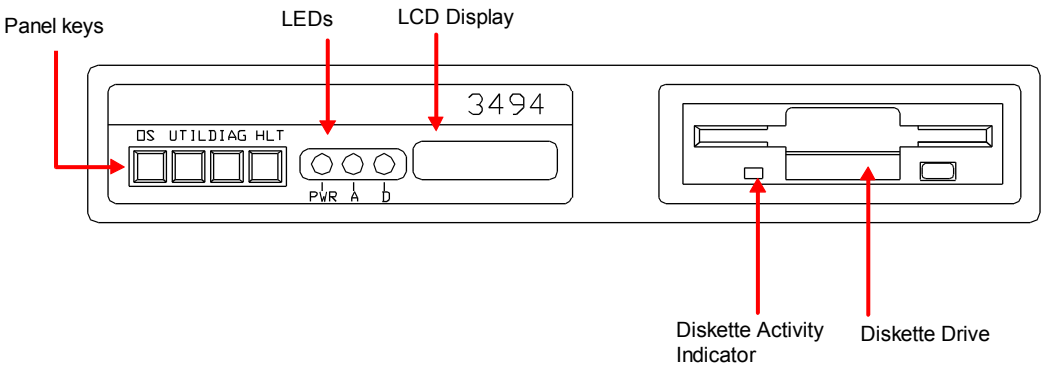
   For Twisted pair cable make sure that your cable connector is appropriately wired for standard 10 Base-T adapter cards. Insert the RJ-45 plug on the end of the twisted pair cable in the connector on the front panel.

2.3Loading the Software

This section describes the front panel interfaces and the procedure for loading the setup menus.

2.3.1Front Panel

The front panel provides status information and allows direct control of the controller activities. This section explains the functions of the LEDs and panel keys. Note that the front panel illustrated below, is of the 3494. The STK3494 front panel looks slightly different, however, the functions are the same.



Diskette Activity Indicator: The green diskette activity indicator on the front of the controller comes on when the disk drive is active. Do not remove the diskette from the drive when the indicator light is on.

Panel LED's: The three front panel LEDs indicate communication line activity:

PWR Communication is occurring

A Active Sync line

D Token-Ring/Ethernet line is active.

Display When the controller is initialized, (or the OS button is pressed), the controller executes a self-test diagnostics which is stored in ROM. The LEDs should all light and then should flash. Also the ALPHANUMERIC display should light. The currently running diagnostics test is displayed on the ALPHANUM display.

If the diskette has been inserted in the disk drive, the operating system should load automatically. At the conclusion of the diagnostics and loading operation, the ALPHANUM display should show “* STK3494 *”,

"STK3494 E" (for Ethernet) or "STK3494 T" (for Token-Ring).

Should an error occur during start-up, an error code will begin flashing on the display. Refer to Appendix-A for a description of the error codes.

ATTENTION: Do not remove the diskette while the controller is loading the operating system.

Panel Keys

Four panel keys provide system override functions; three are used to load a different stand-alone application from the System diskette, while the fourth -- the ***HALT*** key, stops Controller operation.

ATTENTION*:* Do not press any of these keys while the Controller is engaged in host communications. Advise the users in session that the system is going down before pressing any of these keys.

Key	Function
OS	Switch loads the operating system from the diskette. Pressing this button boots the operating system for normal use. The controller runs a diagnostic self-test routine. The controller is ready to operate when the model number is displayed **[* STK3494 *]**.
UTIL	Loads **SET-UP** menus. Pressing this button loads the **SET-UP** menus used to configure the Controller.
DIAG	Initiates memory DUMP (see Memory DUMP procedure) or provides access to more diagnostics information.
HALT	**Do not use this key without authorization.** Pressing this key causes the Controller to halt all operations.

2.3.2Booting and Rebooting the Controller

The Controller is booted from the System diskette. Diagnostics are automatically executed when power is applied and will also run if either ***OS*** or ***UTIL*** front-panel keys are depressed. If an error occurs, a code is displayed on the front panel.

1. Insert the System diskette in the drive and power on the Controller (the power switch is at the back).
2. The Controller runs a diagnostics self-test program and loads the operating system from the diskette. This operation lasts approximately 1 minute. Once loaded correctly, ***STK3494*, *STK3494 E*** (for Ethernet) **or *STK3494 T*** (for Token-Ring) appears on the character display.
3. **To reload the system**, simply ensure that the System diskette is in the drive and press the ***OS*** key on the front panel.

NOTE: Do not remove the diskette while the operating system is being loaded.

3TROUBLESHOOTING

3.1Fault Isolation

The cause of equipment failure can often be traced by reviewing the functional description of the components and assemblies.

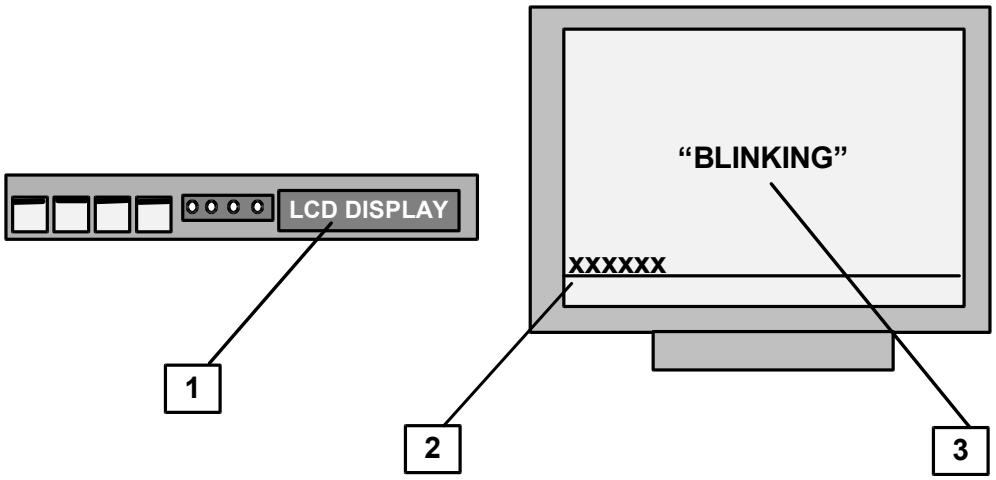
Before attempting to isolate a problem:

1. Check that AC power is available.
2. Check cabling for proper connections.
3. If ONLINE state can be achieved, check the software version by pressing the keys **Hex** followed by **v.** The software version is displayed on the screen error line (bottom left corner).
4. Power OFF the controller, remove all the connecting cables and cover (chapter-4) and check the labels on each of the hardware modules to make sure the correct version is installed.
5. If power is available, turn the power switch OFF. Check the fuse located in the switch module. Replace the fuse if required (chapter 4).
6. Turn the power switch OFF, disconnect all cables and remove the cover (chapter 4). Check that all cables and connectors are tightly connected and the boards are securely seated.

3.2Where and when are Error Codes Displayed ?

Error codes are displayed in the following locations:

1. On the LCD display, on bootup and during operation;
2. On the NWS devices error lines;
3. As blinking messages on the terminal screen, after the boot-up procedure is completed.



Error codes are displayed under the following circumstances:

- The 3494 runs power-on diagnostics when it is switched ON, the ***OS*** or ***UTIL*** keys are pressed. During this time, status and error codes (if errors are detected) are displayed on the front-panel alphanumeric display.
- On successful completion of the diagnostics routine, the 3494 loads the operating system software from the system diskette.
- If the diagnostics routine ends routinely and the software is loaded successfully, the characters [*3494*] will appear on the alphanumeric display. However, if the process appears to end prematurely, and if a hexadecimal code is displayed (for more than 30 seconds), an error has occurred in the process, and the system stops.

ATTENTION
The displayed error code identifies the type of error. Make note of the exact error code and consult the appropriate section for an explanation of the error and suggested actions. Appendix A includes a list of all the errors.

3.3Front Panel Messages

Under normal operations, the front panel alphanumeric display shows the model number. Abnormal conditions detected by the firmware or software results in a system halt. An error message blinks on the front panel.

The three basic categories of errors are:

1. **Loading Errors**. These usually occur during a program power-on or software loading phase. They are caused by one of the following conditions:
   - No diskette is installed, or
   - the diskette does not contain the necessary software, or
   - the diskette is damaged or corrupted.
1. **Device errors.** These can be either a device or controller hardware loading error.
2. **Power-on errors.** These are displayed on the front panel during automatic power-up diagnostics.

3.4Status Code Indicators

The front panel contains three LEDs and the alphanumeric display. When the controller is turned on, or when the OS or UTIL switch is depressed, the unit executes power-on diagnostics. Then it runs through a series of steps necessary to load the software. A series of codes will appear in the alphanumeric display. This allows you to track the progress of the loading sequence. If errors do not occur, the display will show the model number - STK 3494.

Under normal operating conditions these codes will appear briefly. If any code appears for more than 30 seconds, the system has detected an error and stopped. The code on the display suggests the problem. Make a note of the exact error code. Then refer to the STK 3494 Controller User's Manual for an explanation of the error and suggested solution.

The information provided on the front panel display may be very important in detecting the problem and correcting it.

3.5SYSTEM TROUBLESHOOTING

3.5.1Troubleshooting

The main board firmware has three main functions. It runs hardware diagnostics, loads and executes the System Loader from a diskette, and contains a software debugger.

The Alphanumeric display can be used to isolate failures of major components. ROM based diagnostics include a power-up test that is performed automatically each time the controller is turned on or reset.

3.5.2Diagnostics Modes

The system has two levels of diagnostics: Level one runs after each cold start (power-up or reset). Level two is performed after pressing the DIAG switch. This level includes additional tests including some requiring external cable connections. This test will run continuously until a cold start is executed.

3.5.3Main Board Troubleshooting

The circuitry on the main board is essential to the operation of the entire controller. A failure on the main board will usually prevent controller operation. Most controller problems will show up as an error on the alphanumeric display.

3.5.4User Interface

Test messages are displayed on the front panel as they start. If a test fails the message starts blinking. Press the DIAG switch to stop the blinking and start scrolling additional information about the failure. Press the HALT switch during scrolling to stop the scrolling of information. To continue scrolling, press HALT again.

3.6Front Panel Messages

The front-panel display can be used to monitor the progress of the power-up sequence. Messages show the current state; blinking messages suggest a problem.

Most messages that blink have additional information available. Press the DIAG switch to start scrolling an extended message. After the message has started scrolling, it can be stopped by pressing the HALT switch. To resume, press HALT again.

3.6.1Short Messages:

These messages appear during the low-level testing of the controller. None of the following messages have additional information.

MESSAGE	EXPLANATION AND SUGGESTED ACTION
LED test:	All LEDs are turned On for about one second.
MAIN CPU:	Main CPU failure; appears only if the CPU reports an error in its internal diagnostics. Probable cause: bad 386 chip. Solution: Replace main board.
ROM n.nn:	Firmware version message; displayed for about one second (n.nn is the ROM version number;).
LOW RAM:	Testing the lowest 64 Kb of system RAM. Sync-A LED blinks as well. If the Low RAM test fails, one of the following blinking messages will appear:
RAM BYTE:	Failed to write correctly to separate bytes or words of RAM. Probable causes: Bad memory module, a problem in low address or Bank Enable signals.
PAR CTL:	RAM Parity logic does not work correctly.
RAM “0”:	Data from RAM does not match expected data; one bit or more could not be written as logical zero. Probable causes: Bad memory module, a problem in data bus signals.
RAM “1”:	Data from RAM does not match expected data; one bit or more could not be written as logical one. Probable causes: Bad memory module, a problem in data bus signals.
RAM:	RAM Parity Error. Probable causes: Bad memory module, bad DRAM control logic.
RAM VRFY:	Data from RAM does not match expected data. (Data was read immediately after writing it). Probable cause: Bad memory module.
RAM RAND:	Data from RAM does not match expected data. (Data was read after all the checked RAM was filled with data). Probable causes: Bad memory module, bad DRAM control logic, a problem in address bus signals. Solution: Make sure jumper J1 is set correctly (1-2 for 4 Mb configuration; 2-3 for 8 Mb configuration). Make sure memory modules are inserted correctly. Replace memory modules. Replace main board.

3.6.2Extended Messages

All the following messages have additional information in case of failure.

NOTE: The additional information is important for diagnostics - write it down if possible.

MESSAGE	EXPLANATION AND SUGGESTED ACTION
ALL RAM:	Testing all system RAM. Sync-A, Sync-B and Sync-C LEDs blink to show various stages. If the test fails, the same error messages as the LOW RAM test appears. Additional information: memory address, expected data, actual data. Solution: The same as LOW RAM test.
SYN HOST:	Testing synchronous host ports. If the test fails, one of the following blinking messages appear: SYn INIT: Error in initializing Serial Port device. Data read back from registers of the device does not match expected data. SYn TxRx: Error in transmit/receive test: data received from the receiver does not match data sent by the transmitter. Probable cause: Bad Serial chip. Solution: Replace main board
ADAPTERS:	Testing I/O adapters (expansion cards). If the test fails, a blinking error message appears. There are many error messages, some general and some specific to one adapter type. All messages start with "SLn . . . ". This shows the slot number. NOTE: Slot 0 (Twinax Adapter) is an integral part of the main board Probable causes: Bad adapter, connector problem, problem with IOP interface logic on main board. Solution: Check indicated adapter's bus connector (DIN-96 connector) for bent or broken pins. Remove indicated adapter. Remove all adapters. Replace main board.
TIMER	Tests the Real Time Clock (RTC) chip. Tests validity of current time and resets it to default (00:00:00) if invalid. Checks the clock for normal advance. If it fails, the message RTC FAILS is displayed for about one second and the start-up sequence continues Probable cause: Bad RTC chip (U95). Solution: Replace main board. NOTE 1: RTC failure is not critical. However, it is highly recommended to replace a main board with a bad RTC. NOTE 2: To know which program displayed the error message, the program name is displayed right after the short message that identifies the whole message. FW- Firmware, LOADER SYSTEM LOADER, and SYS-Main system or utilities. Variable messages are signified by Xn.
BOOTING	Loading the System Loader program from the diskette. If the loading fails, one of the following blinking messages will appear Disk Error messages:

MESSAGE	EXPLANATION AND SUGGESTED ACTION
DSK INIT	I/O error occurred while initiating system disk. Error message:"DSK INIT: X1.Error in init drive X2.Codes: X3, X4, X5, X6, X7." Parameters: X1 = Current program: "FW", "LOADER" or "SYS." X2 = Drive name of system disk: 'A' for diskette, X3 - X7 = Codes: Five internal disk error codes. Solution: Reset by pressing OS/UTIL buttons. If persistent, check disk cables. If error recurs, replace the disk drive and/or main board.
DRIVE	Error occurred while trying to work with the drive. Error message:X1.Unable to select drive X2 Codes:X3, X4, X5, X6, X7. Parameters: X1 = Current program: "FW", "LOADER" or "SYS." X2 = Drive name of system disk: 'A' for diskette, X3 - X7 = Codes: Five internal disk error codes. Solution: Reset by pressing OS/UTIL buttons. If persistent, check disk cables. If error recurs, replace disk drive and/or main board.
FL OPEN	An error occurred while trying to open a file or a file was not found on the disk. Error message:"FL OPEN: X1.Error in opening file X2 or file not found in drive X3. Codes:X4, X5, X6, X7, X8." Parameters: X1 = Current program: "FW", "LOADER" or "SYS." X2 = File name: One of the system files. X3 = Drive name of system disk: 'A' for diskette, X4-X8 = Codes: Five internal disk error codes. Solution: Try another diskette.
FL READ	An error occurred while trying to read a file from the disk. Error message: "FL READ: X1.Error in read file X2. Read X3 from X4 sectors or file not found in drive X5.Codes: X6, X7, X8, X9, X10.". Parameters: X1 = Current program: "FW" or "LOADER" or "SYS" X2 = File name: One of the system files. X3 = Number of sectors read successfully. X4 = Number of sectors to be read. X5 = Drive name of system disk: 'A' for diskette X6 - X10 = Codes: Five internal disk error codes. Solution: Try another diskette.
DISKFAIL	The reason for disk end operation is not legal. Error Message: DOSFAIL: X1 is illegal end of IO operation Parameters: X1 = Code of end of disk operation

MESSAGE	EXPLANATION AND SUGGESTED ACTION
DOS FAIL	Memory overflow occurred or critical error. Error Message: DOSFAIL: Memory overflow or Error No X1 Parameters: X1 = Code of error Solution: DISKFAIL or DOS FAIL error. Contact VENDOR
BAD LOAD	Invalid System Loader header format. Solution: Try another diskette.

3.7ROM Debugger

The ROM DEBUGGER port is for engineers only. DO NOT USE**.**

3.8System Software Failure Handler

The System Software Failure handler is invoked by the system when it recognizes an unrecoverable software error. The handler executes the following actions:

- All IOPs are notified of system failure; communications IOPs can shutdown cleanly.
- If a Trace card is installed, tracing is stopped.
- If the ROM Debugger was invoked before the software failure, the Debugger is activated: the system fail parameters are displayed, all registers are displayed as they were when the failure occurred.
- If the ROM Debugger was not invoked, the ROM enters Fail/Front-panel mode:
- The front-panel displays the error message (usually "ABT nnnn") in blinking characters.
- Pressing the DIAG key will start the extended-message to scroll on the display.
- Pressing HALT after DIAG will toggle the scrolling off and on.
- Press DIAG to save is appended to the error message; pressing DIAG again will save the failure Info (Error Log, Memory Dump and Execution Trace if installed).

If saving to disk was successful (auto or user-initiated), the message SAVE OK is displayed for about three seconds. Then the original error message is displayed again. Pressing DIAG will start scrolling the message, without the appended Press DIAG to save. Pressing DIAG again has no effect.

If saving to disk failed, the message * FAIL * is displayed for about three seconds. Then the original error message is displayed again. Pressing DIAG will start scrolling and Press DIAG to save is appended to the original message. Pressing DIAG again will retry saving the failure info to the disk.

Failed Info is NOT saved on disk under the following conditions:

- System Failed before System Loader had been loaded to memory.
- Error log file exists but has a wrong format.

1. Fatal Disk error.

4REPLACING MODULES

This chapter describes the procedure for removing and installing the main replaceable modules in the STK3494 controller.

CAUTION !!!

THE POWER SWITCH MUST BE OFF AND THE POWER CORD UNPLUGGED BEFORE PERFORMING ANY MAINTENANCE PROCEDURE.

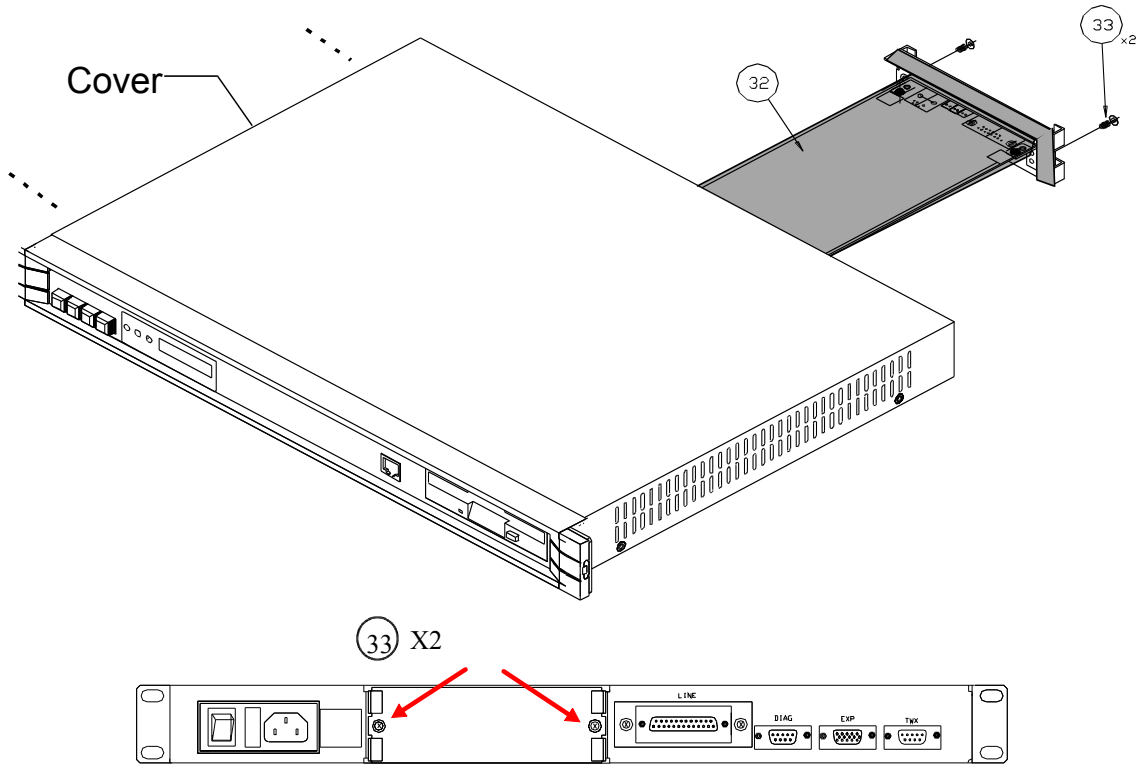
When replacing IC's:

Many ICs are electrostatic-sensitive and can be damaged by static electricity if handled improperly.

a. When you disassemble an IC or card from its mounting or from its protective packing, do not lay it down or let go of it until it is installed in the controller.

b. If you need to bend the leads of an IC, hold the device in one hand and place the other on the work surface before placing the IC or card on the work surface. This will equalize the static charges between you, the IC or card and the work surface.

4.1Replacing the Token Ring or Ethernet Adapter



Item	Description	Catalog No.
32	Token Ring	A000231460
	Ethernet	A000231470
33	2x screws FH 100° NC 6-32 x .250”	H000106113

To disassemble the adapter

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Unscrew **Item-33** on the rear panel (save the screws for reuse) and slide **Item-32** out.

To assemble the adapter

1. Unscrew **Item-33** on the back panel slot and save the screws for reuse.
2. Slide **Item-32** in.
3. Reconnect the power cord and other external cables that were disconnected at Step 1 and power ON the controller.

4.2Replacing Controller Cover

NOTE: The adapter board (section 4.1) or slot covering must be disassembled before the cover can be disassembled.

To disassemble the cover

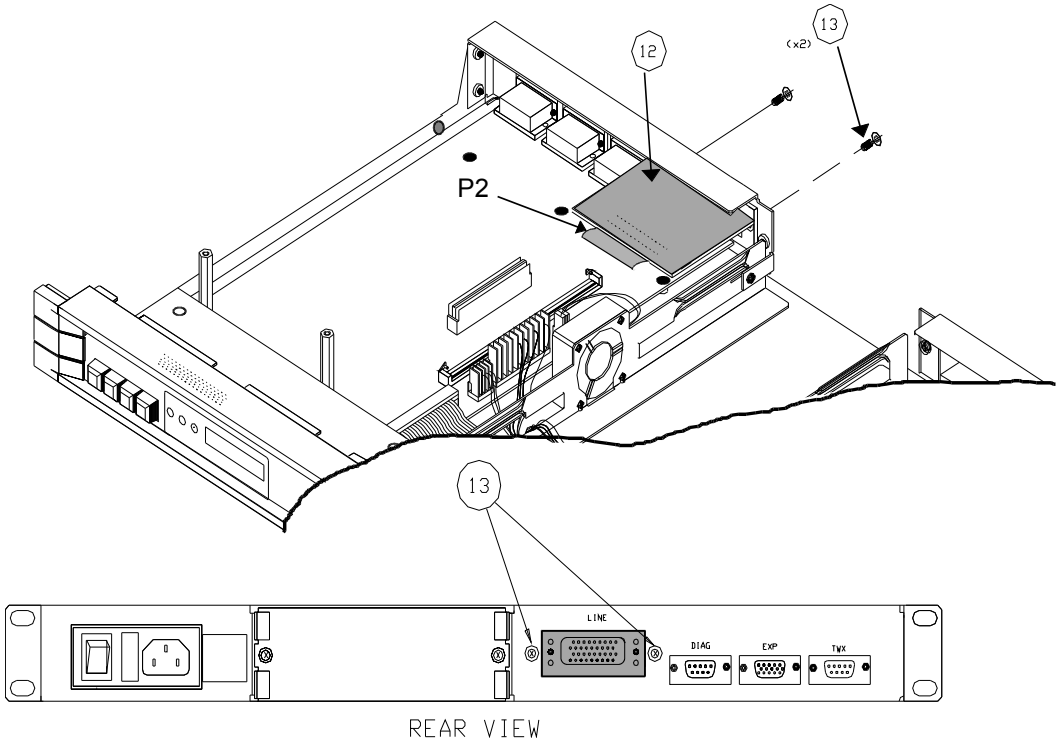
1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the adapter (section 4.1) or adapter slot covering at the rear of the unit.
3. Unscrew the 4x screws (two on each side) securing the cover to the chassis and slide it out towards the rear of the unit.

To assemble the cover

1. Slide the cover towards the front of the controller and secure it to the chassis with 4x screws (two on each side).
2. Install the adapter (section 4.1) or the slot covering at the rear of the unit.
3. Reconnect the power cord and all external cables and power ON the controller.

4.

4.3Replacing the V.24/V.35 or X.21 Adapters



Item	Description	Catalog No.
12	V.24	A00068989
	V.35 adapter	LD80020200
13	2x screws P.H. NC 6-32 x.375	H000106139

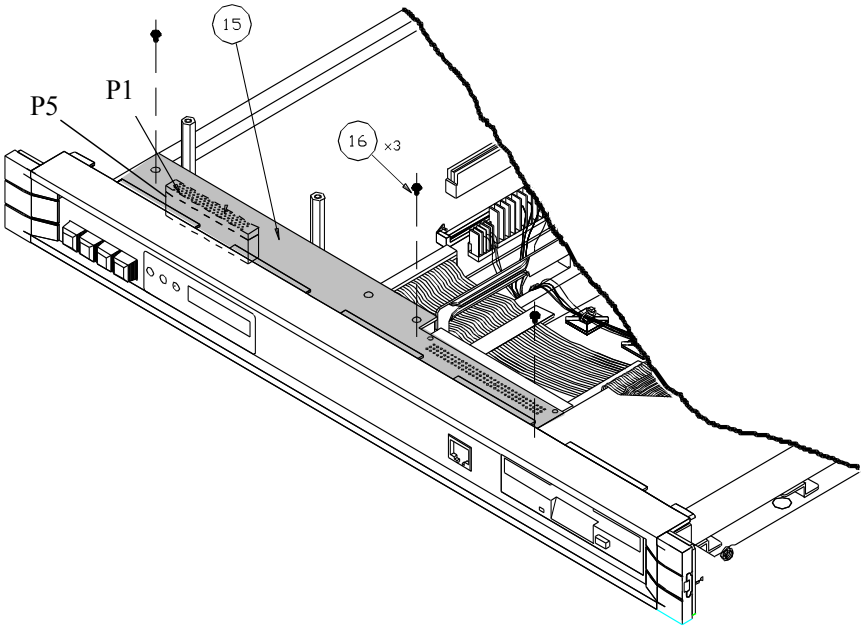
To disassemble the V.35/V.24 adapter

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Unscrew **Item-13** on the back panel.
4. Disconnect the adapter flat cable from **P2** on the Main board and disassemble the adapter.

To assemble the V.35/V.24 adapter

1. Fit the V.24 or V.35 adapter into the “Line” port on the rear panel, component side down.
2. Connect its cable to **P2** on the Main board.
3. Secure the adapter to the rear panel using **Item-13** (2x screws).
4. Reassemble the controller cover.
5. Reconnect the power cord and all external cables and power ON the controller.

4.4Replacing the Interface Board



Item	Description	Catalog No.
15	Interface board	A000689080
16	3x screws PH NC6-32 x.250 " + CMS	LD62470050

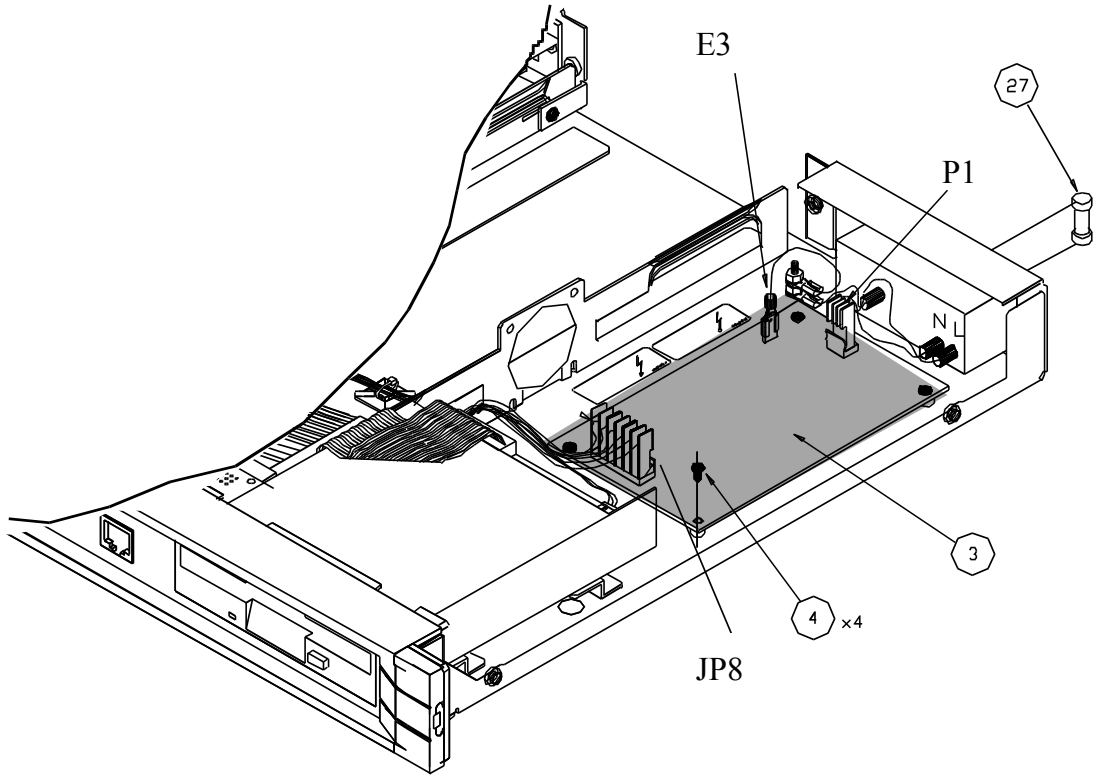
To disassemble the Interface Board

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Unscrew **Item-16** (3x screws) securing the board to the chassis.
4. Disconnect Interface Board connector **P1** (80 pin connector) from Main Board connector **P5** and free the board.

To assemble the Interface Board

1. Position the board as illustrated above and insert the Interface Board connector **P1** into **P5** on the Main board.
2. Secure the board using **Item-16** (3x screws).
3. Reassemble the controller cover (section 4.2).
4. Reconnect the power cord and all external cables and power ON the controller.

4.5Replacing the Power Supply



Item	Description	Catalog No.
3	Power Supply	E000606450
4	4x screws FH NC6-32 x .250	LD62470050

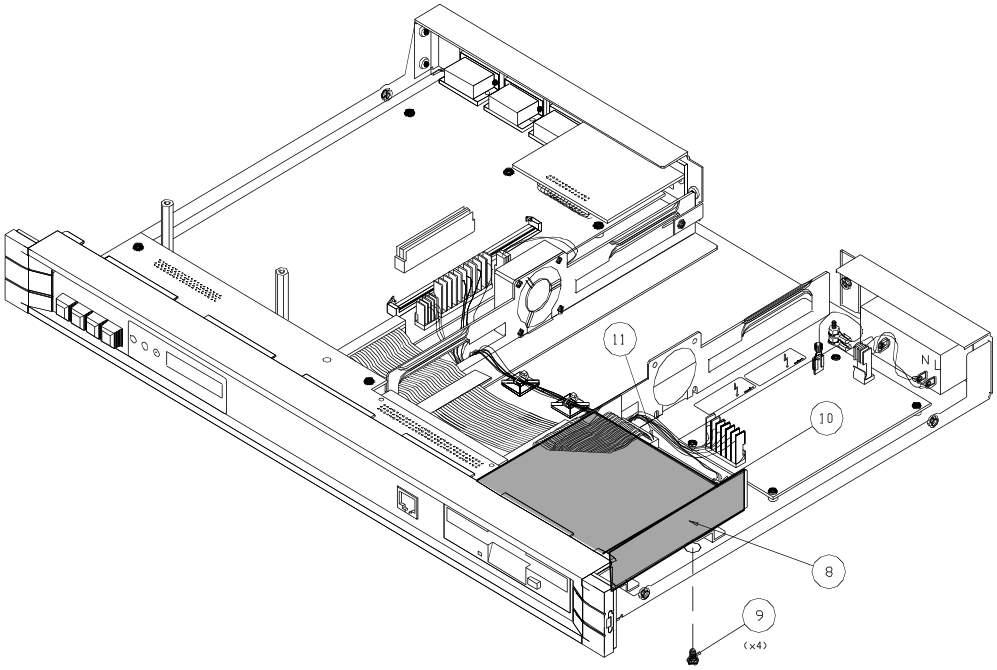
To disassemble the Power Supply

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Disconnect the power supply connectors **P1**, **JP8** and ground tab **E3.**
4. Unscrew **Item-4** (4x screws) and the Power Supply.

To assemble the Power Supply

1. Position the Power Supply **Item-3** as illustrated above.
2. Connect connectors **P1**, **JP8** and ground tab **E3.**
3. Secure the Power Supply using **Item-4.**
4. Reassemble the controller cover (section 4.2).
5. Reconnect the power cord and all external cables and power ON the controller.

4.6Replacing the Disk Drive



Item	Description	Catalog No.
8	Disk Drive 1.44	LD82510004
9	4x screws M3x 6mm	LD62440001
10	Power Cable	
11	Data Cable	

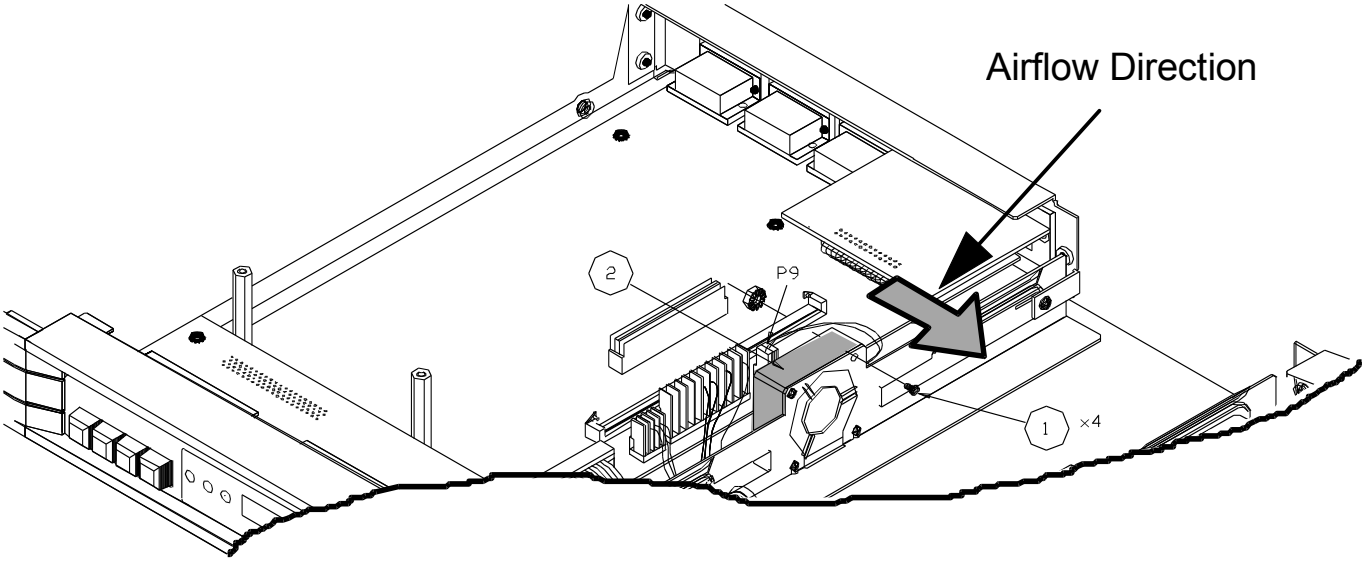
To disassemble the Disk Drive

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Disconnect the **data** cable from the drive. Disconnect the **power** cable from **P8** on the Power Supply.
4. Unscrew **Item-9** (4x screws) from the underside of the unit, and disassemble the drive.

To assemble the Disk Drive

1. Insert the drive in the slot, adjusting it till it is s even with the panel opening surface.
2. Connect the **data** connector from the Mother Board and the **power** connector to the Power Supply.
3. Secure the drive using **Item-9** (4x screws) inserted from the underside of the unit.
4. Reassemble the controller cover (section 4.2).
5. Reconnect the power cord and all external cables and power ON the controller.

4.7Replacing the Fan



Item	Description	Catalog No.
1	4x screws NC4-40 x .750” + nuts	H000104063
2	Fan	A000230870

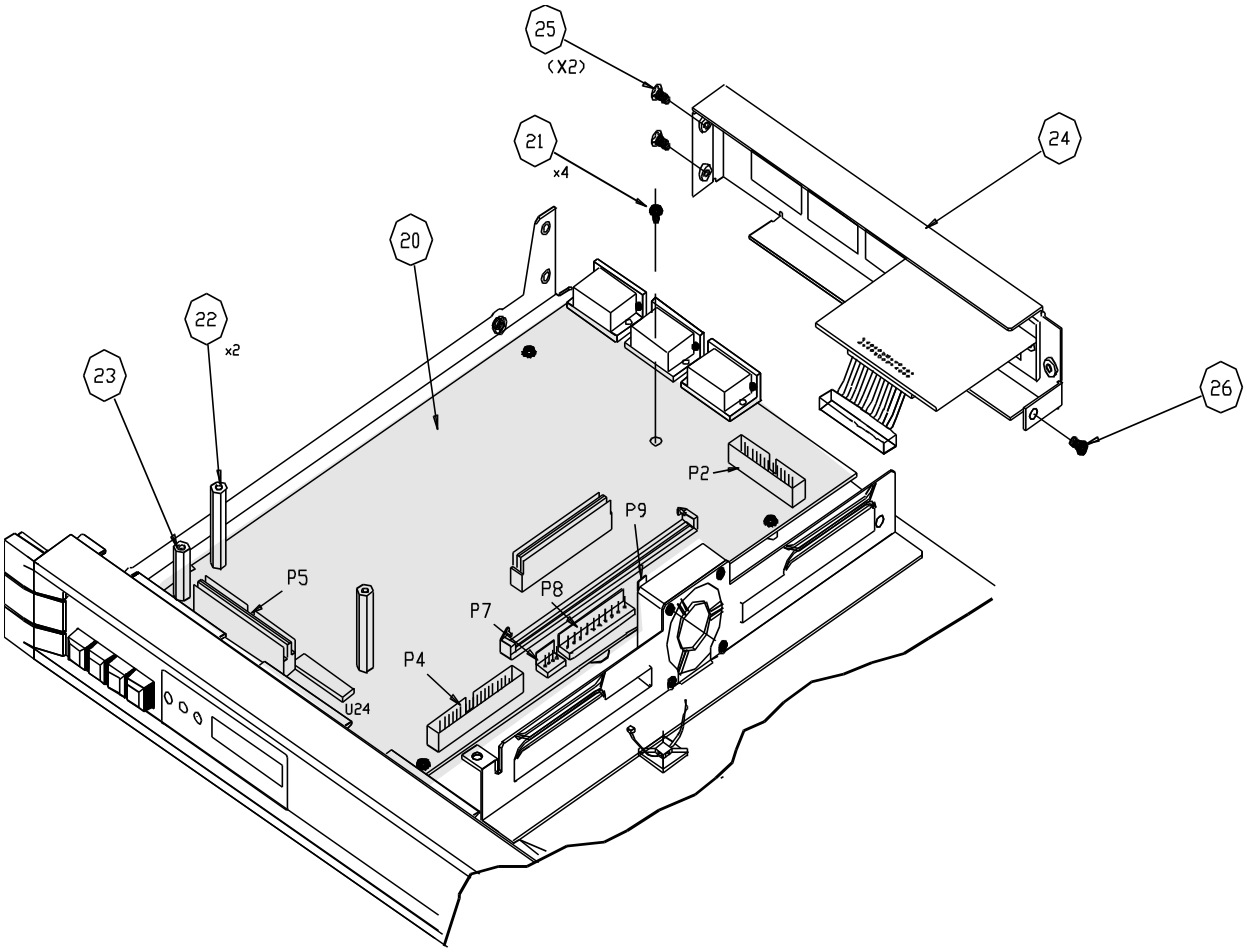
To disassemble the Fan

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Disconnect **P9.**
4. Unscrew **Item-1** (4x screws) and disassemble the Fan.

To assemble the Fan

1. Position the Fan **Item-2** as illustrated above and secure it to the chassis using **Item-1** (4x screws). **Note the airflow direction.**
2. Connect **P9** as illustrated above.
3. Reassemble the controller cover (section 4.2).
4. Reconnect the power cord and all external cables and power ON the controller.

4.8Replacing the Main Board



Item	Description	Catalog No.
20	Main board	A000689230
21	4x screws PH 6-32 x .250”	LD62470050
22	2x spacers 6-32 x 1.35”	H000101730
23	1x spacer 6-32 11/16”	H000100970
24	Rear panel	M000218540
25	2x screws F.H. 100° NC4-40 x.250”	H000104115
26	1x screw PH NC4-40 x .250”	H000104018

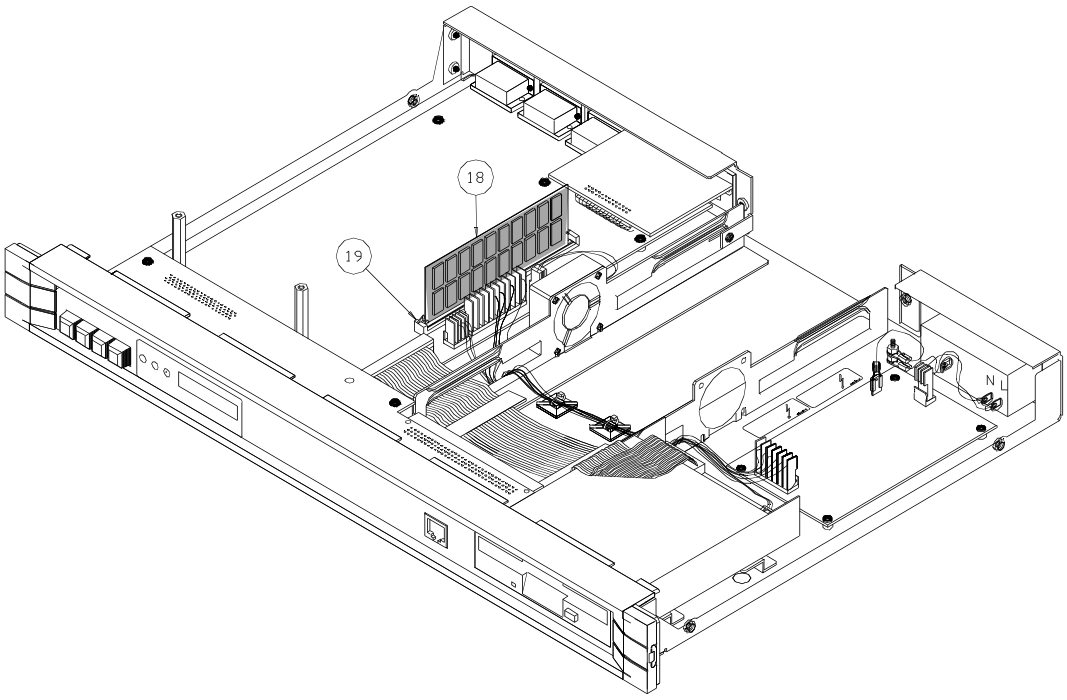
To disassemble the Main Board

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Disassemble the Interface Board (section 4.4).
4. Disassemble the Rear Panel by removing **Item-25** and **Item-26**. **Do not pull yet !!!**
5. Disconnect the V.35 or V.24 connector from **P2** on the Main board and disassemble the Rear Panel.
6. Disconnect connectors **P4, P5, P7, P8** and **P9** from the Main board.
7. Unscrew **Items-22** and **23**.
8. Unscrew **Item-21** and disassemble the Main board.

To assemble the Main Board

1. Position the Main Board as illustrated in the above drawing.
2. Secure the Main Board using standoffs **Item-22** and **Item-23** and 4x screws **Item-21**.
3. Connect connectors **P4, P5, P7, P8** and **P9** to the Main board.
4. Connect the V.35 or V.24 connector to **P2** on the Main board and secure the Rear Panel to the chassis using screws **Item-25** and **Item-26**.
5. Reassemble the Interface Board (section 4.4)
6. Reassemble the controller cover (section 4.2).
7. Reconnect the power cord and all external cables and power ON the controller.

4.9Replacing the SIMM Board



Item	Description	Catalog No.
18	SIMM Board	E000785010
19	SIMM1 Connector	On Main Board

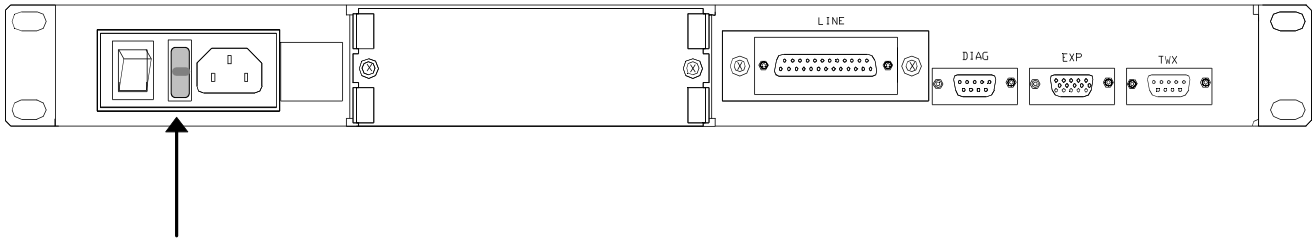
To disassemble SIMM

1. Power OFF the controller and disconnect the power cord and all external cables.
2. Disassemble the cover (section 4.2).
3. Disassemble SIMM from its socket on the Main Board by pulling it out evenly.

To assemble SIMM

1. Evenly insert SIMM in its socket on the Main Board noting the direction.
2. Reassemble the controller cover (section 4.2).
3. Reconnect the power cord and all external cables and power ON the controller.

4.10Replacing the Fuse



Fuse Location

To replace the fuse:

1. Use a small flat edged screw drive to disassemble the cover from the fuse location on the back panel.
2. Replace the fuse with a Fuse 0.6A 250V fuse.
3. Snap the cover in place.

APPENDIX A . ERROR CODES

11. Messages Common to FIRMWARE, BOOTER, LOADER, SYSTEM

The following Error messages, have the same error ID that prevents saving the error message onto the disk. This ID is not displayed on the front panel; instead, a short message is displayed to identify the whole message.

In addition, these messages, can be displayed during one or more of the separate programs that run on the controller. In order to know which program displayed the error message, the program name is displayed right after the short message which identifies the whole message.

The programs names are:

"FW" - Identifies the firmware

"LOADER" - Identifies the system loader

"SYS" - Identifies the main system or the utilities

"BOOTER" - Identifies communication problems

DSK INIT : I/O error occurred while initiating system disk

Error message:"DSK INIT:*X1*.Error in init drive *X2*.Codes:*X3,X4,X5,X6,X7*."

Parameters : *X1*- Current program: "FW" or "LOADER" or "SYS".

X2 - Drive name of system disk: 'A' for diskette,

X3 -X7 - Codes: 5 internal disk error codes.

DRIVE : Error occurred while trying to work with drive.

Error message:"DRIVE :*X1*.Unable to select drive *X2*.Codes:*X3,X4,X5,X6,X7*."

Parameters : *X1* - Current program: "FW" or "LOADER" or "SYS".

X2 - Drive name of system disk: 'A' for diskette,

X3 -X7 - Codes: 5 internal disk error codes.

FL OPEN : Error occurred while trying to open file or file was not found on disk.

Error message:"FL OPEN :*X1*.Error in opening file *X2* or file not found in drive *X3*.Codes:*X4,X5,X6,X7,X8*."

Parameters : *X1*- Current program: "FW" or "LOADER" or "SYS".

X2 - File name: One of the system files.

X3 - Drive name of system disk: 'A' for diskette,

X4 - X8 - Codes: 5 internal disk error codes.

FL READ : Error occurred while trying to read file from disk.

Error message:"FL READ :*X1*.Error in reading file *X2*.Read *X3* from *X4* sectors
from drive *X5*.Codes:*X6*,*X7*,*X8*,*X9*,*X10*."

Parameters : *X1*- Current program: "FW" or "LOADER" or "SYS".
X2- File name: One of the system files.
X3- Number of sectors which were read successfully.
X4- Number of sectors which had to be read.
X5- Drive name of system disk: 'A' for diskette,
X6 - X10 - Codes: 5 internal disk error codes

DISKFAIL: The reason for disk end operation is not legal.

Error message:"DISKFAIL:*X1* is illegal end of IO operation"

Parameters : X1 - Code of end of disk operation

DOS FAIL: Memory overflow occurred or critical error.

Error message:"DOS FAIL:Memory overflow or Error No *X1*"

Parameters : X1- Code of error

1Messages Common To FIRMWARE, BOOTER, LOADER

BLD GDT : Current program failed to prepare next program for running.

Error message:"BLD GDT :*X1*.Unable to build GDT from *X2* header."

Parameters : *X1* - Current program: "FW" or "LOADER"
X2 - Next program:4030boot.bin (LOADER) or system.bin (SYS) or util.bin (SYS)
The available parameters combinations are:
"FW" + 4030boot.bin
"LOADER" + system.bin
"LOADER" + util.bin

SLn DEAD: Slot hasn't respond to command from main card.

Error message:"SL n DEAD: *X1*.CMD=*X2*, NO REPLY"

Parameters : n- Slot number (hexadecimal number).
X1 - Current program: "FW" or "LOADER".
X2 - The main command which hasn't get a response.

SLn FAIL: Slot failed to execute the command from main card.

n - slot number (hex number)

Error message:"SL N FAIL:*X1*.CMD=*X2*, IOP MSG=*X3*"

Parameters : *N*- Slot number (hexadecimal number).

X1- Current program: "FW" or "LOADER".

X2- The main command which hasn't get a response.

X3- A message from the Slot.

SLn BAD : Slot has respond whith wrong reply to command from main card.

Error message:"SL *N* BAD :*X1*.CMD=*X2*, REPLY=*X3*"

Parameters : ` n- Slot number (hexadecimal number).

X1 - Current program: "FW" or "LOADER".

X2 - The main command.

X3 - The slot reply.

22. Loading Errors

These errors are displayed on the LCD display. Setup errors also appear on the terminal as “blinking” messages.

If the 3494 stops during a program power-on or the software loading phase, the most common problem is a loading error which is normally due to diskette problems such as:

- Diskette contains incompatible software
- Diskette is damaged or corrupted
- Diskette is write protected

In these situations try replacing the operating system diskette with either a new copy or your backup copy and reload the operating system.

32.1 Setup Errors

The message ‘SETUP ERR’ displayed on the front panel LCD display, can be caused by two types of problems: card setup error, or incompatible setup file:

In case of a card setup error, the following message is displayed on all terminals:

CARDS SETUP ERROR: USE CONFIGURATION UTILITY TO CORRECT THE HARDWARE SETUP

This type of error is a hardware mismatch which can be worked around; you can still configure the controller from the main menu by doing the following:

1. Be sure the controller is booted via the UTIL option and select the following menus: Device configuration / Adapter configuration
2. Define the correct adapters installed in your controller; and reset the controller to enable the changes.

In case of an incompatible setup file, the following message is displayed on all terminals:

INCOMPATIBLE SETUP FILE: USE CONFIGURATION UTILITY TO LOAD DEFAULT PARAMETERS

To resolve this type of error:

1. Be sure the controller is booted via the UTIL option and select the following menus: Device configuration / Adapter configuration
2. Enter the Setup/Utilities function and load the default configuration.

43. Abort and Slot XX Errors

These error types are displayed on the LCD display as ABTXXXX or SLOTXXX . Abort errors are critical software error. To solve the problem, perform memory dump according to the following procedure:

1. Press DIAG front panel key and record the scrolled message.
2. Insert an empty formatted diskette into the 1.44Mb disk drive.
3. Press the DIAG front panel key. The message ‘S A V I N G’ will be displayed on the front panel LCD display. Wait until this message disappears and the ABORT message reappears (this may take up to 15 minutes).
4. Remove the diagnostics diskette from the drive and replace it with the system diskette.
5. Reboot the controller.
6. Send the information recorded on the diagnostics diskette to your technical support.

54. Error Codes

Error Codes are four or six digit hexadecimal codes that may appear on the error line in your terminal workstation display during operation.

1Error code ranges

Refer to the Error Code Range Chart below, and then go the appropriate chart.

Error Code Range	Description of Error Code and Suggested Response
0000 to 003F	An operator error occurred during an entry operation Locate the exact code and follow the instructions. See Operator Entry Errors Codes
0040 to 005F	An error occurred on the communication network during controller/host communication. Check the modems, cables, line and connections to the host system.
0060 to 0069	An operation error occurred when trying Ideographic Support. See Ideographic Support Error Codes.
0070 to 007F	An operator error occurred. See Text Entry Assist Error Codes while using the text processing function.
0090 to 009F	A display station operator Error Codes. See Host Support System caused an error that involves the host system.
100000 to 10FFFF	A display station operator attempted to enter an incorrect or invalid, X.25 command or parameters from the keyboard. See X.25 Error Codes
110000 to 1FFFFF	An error was detected by the DTE or DCE X.25 Network. See sections Call Systems and try to re-establish the communications.
400000 to 400900	Linking errors.
400A00 to 411300	XID Errors
420000 to 441200	LU6.2 Errors
540404 to 540408	LAN AS/400 attachment errors

60000 to 0038, Operator Entry Error Codes

Refer to the following Operator Entry Error Code Chart if the code displayed is in the range from 0000 through 003F. Note the following:

1. If an operator entry error occurs, further input tasks are suspended until the problem is resolved. The error might be an invalid key, input or a entering data at too high a rate.
2. In some applications you can press the HELP key to get more information about the nature of the error.
3. To recover from the error, press the Error Reset key at the operator workstation involved. The ***FIELD-***, ***FIELD+***, or ***FIELD EXIT*** key to blank all of the field.

Operator Entry Error Code Chart

Error Code	Error Description and Suggested Recovery
0000	***HELP*** Key Not Allowed.
0001	Keyboard Overrun. Entering information at too high a rate.
0002	Invalid Scan Code.
0003	Invalid Command/PF Key
0004	Data Not Allowed in This Field
0005	Cursor in Protected Area of Display.
0006	Key Following ***SYS REQ*** Key Not Valid.
0007	Mandatory Enter Field - Must Enter Data
0008	This Field Must Have Alphabetic Characters
0009	This Field Must Have Numeric Characters
0010	Only Characters 0 Through 9 Permitted.
0011	Key For Sign Position of Field Not Valid.
0012	Insert mode--no room to insert data.
0013	Insert Mode - Only Data Keys Permitted
0014	Mandatory Fill Field - Must Fill to Exit
0015	Modulo 10 or 11 Check Digit Error. You entered data into a self-check field.
0016	F - Key Not Valid in this field
0017	To recover - press the ***ERROR RESET*** key. Enter data to the end of the field or move the cursor to the start of the field and use
0018	Key Used to exit this field not valid
0019	***DUP*** or ***FIELD-MARK*** keys not permitted in this field
0020	Function key not valid for right adjust field

Error Code	Error Description and Suggested Recovery
0021	Data must be entered in this field.
0022	Status of field not known
0023	Hex Mode - Entry not valid
0024	Decimal Field - Entry Not Valid
0026	F-Key Entry Not Valid
0027	The key pressed is undefined and therefore cannot be used.
0029	Diacritic Character not valid.
0031	Data Buffer overflow
0032	MSR data error
0033	MSR data received was secured and this field was not specified for secured data.
0034	MSR data exceeds length of field. Data received from card exceeds length of field.
0035	MSR Error. Card incorrectly inserted or damaged.
0036	Cursor Select not allowed in field-exit required state.
0037	This is a non-selectable field - you've pressed cursor select.
0038	Light Pen and MSR Use Not Allowed.

70040 to 005F Communication Network Errors

0042Receive Clock Failure This error indicates that the receive clock signal became inactive during data transfer.00443 0-Second Timeout (switched line only). Indicates that no valid data has been received for 30 seconds. The DTR signal goes inactive to disconnect the line0045DCE Will Not Activate (X.25 only) Indicates that either a Disconnect mode (DM) or a DISCONNECT (DISC) command was received during the link setup sequence.Cau se Code Description and Suggested Recovery 0040	Modem or DCE is not ready or not functioning properly. Data Set Ready (DSR) Line Inactive (Model 01); DCE Not Ready (Model 02) This error indicates that the modem or DCE was not ready during required intervals of normal operation. The operating state of the modem or DCE is checked at different times, depending on the specific link-level protocol in use.
00460041Idle condition detected (X.25 only). This error indicates that the receive line was idle for 15 or more contiguous bit-	Frame Reject Received. The control unit received an FRMR from the network, indicating that an error was detected in the last frame transmitted. The error log entry of this code includes three sense bytes, which preserve the contents of the FRMR I-field.

times.	
0047	Unexpected Disconnect Mode (DM) or DISCONNECT (DISC) Command Received. Indicates that either a Disconnect mode (DM) or a DISCONNECT (DISC) command was received while in information transfer state.
0048	Unexpected Unnumbered Acknowledgment (UA) Frame Received. The control unit received a UA frame while in information transfer state.
0049	An SABME was received while the controller was in information transfer state.
0050	Ready For Sending (RFS) Error. This error occurs when either the RFS line is inactive for up to 30 seconds while the RTS line is active or the RFS line is active when the RTS line is inactive. (except during V.25 bis call establishment).
0051	Transmit Clock Failure. The transmit clock failed during a transmit operation.
0052	Transmit Hardware Error. The link adapter hardware failed to complete a transmit operation within 30 seconds, but no transmit clock or other DCE signal failure was detected.
0053	Expiration of Retry Count (X.25 only). No acknowledgment of a transmission was received within allowed timeout. (Timeout retry count (N2) and retry interval (T1) are specified in CSU Field 7)
0054	Frame Reject Sent. The control unit has sent a link-level FRMR response to the host system after receiving an invalid SDLC or LAPB command. Sense bytes S1, S2 and S3 preserve the contents of the FRMR I-field.

80060 to 0069 Ideographic Errors

Error Code	Error Description and Suggested Recovery
0060	Ideographic or Bidirectional support error. Invalid data or key pressed. To correct error, press Error-Reset at the work station and if it is an Ideographic error, this field only accepts double-data characters--enter the correct data.
0061	Ideographic or Bidirectional support error. Invalid data or key pressed. To correct error, press Error-Reset at the work station and if it is an Ideographic error, this field only accepts alphanumeric data--enter the correct data.
0062	The cursor is not in position to change the data type. Press Error-Reset and re-attempt.
0063	Invalid Ideographic character entered in Alternate Entry mode. Press Error-Reset.
0064	The keyboard mode does not support the key pressed. Press Error-Reset.
0065	The cursor is in a column reserved for shift-out or shift-in characters. Press Error-Reset.
0066	This is not a data character and therefore, cannot be repeated. Press Error-reset.
0067	The workstation extension character RAM is full. Press Error-Reset.
0068	The output data stream to the 3494 is not valid for extension characters. Press Error-Reset.
0069	Ideographic or Bidirectional support error. Ideographic error--The extension characters to the 3494 are undefined; Bi-directional error--a terminating character cannot be inserted. Press Error-Reset.

90070 to 0078, Text Entry Assist Error Codes

If you are using the Display Write program and an error code in the range 0070 through 007F is displayed, refer to the following Text Entry Assist Error Code Chart for a detailed description of the problem and a suggested recovery action.

Text Entry Assist Error Code Chart

Error Code	Description and Suggested Recovery
0070	Word Wrap/Carrier Return Error. To recover - press the Error Reset key. For more information, press the Help key.
0071	Command Conflict. To recover - press the Error Reset key. Try the operation again when the operation in progress is complete.
0072	Key Not Valid For Cursor Position. To recover - press the Error Reset key. Move the cursor to the correct position and try again.
0073	Invalid Attempt To Delete. To recover - press the Error Reset key. Press the general prompt command key to delete or replace instruction and format change characters. For more information, press the Help key.
0074	Invalid Entry During General Prompt. To recover - press the Error Reset key
0075	Character Not Found. To recover - press the Error Reset key. Try the operation again when the operation in progress is complete.
0076	Continuous Insert Mode Failed To recover - press the Error Reset key. Wait until the host system processes the text on the screen and try again.
0077	Function Key Selection Not Valid. To recover - press the Error Reset key.
0078	Required Scale Line Not Defined to Control Unit There is an error in the application program. No scale line is defined for this line.

100097 to 0099 Host Support Error Codes

Refer to the following chart if the error code displayed is in the range from 0097 through 0099.
Note: When one of these codes is displayed, the required host support will not be available.

Host Support Error Code Chart

Error Code	Description and Suggested Recovery
0097	Test Request Function Not Supported. Contact host system operator and determine why the function is not supported.
0098	Undefined Hardware Error To recover - press the Error Reset key.
0099	Host Support Not Currently Available To recover - press the Error Reset key.

11100000 to 101D00 X.25 Error Codes

When a keyboard entry error occurs while in X.25 Communication mode, a six-digit error code between 100000 and 10FFFF is displayed. Error codes along with a short description and suggested recovery action(s) are listed below:

For errors 100200 - check the system configuration. If the settings match, press the ***ERROR RESET*** key, check options and repeat the operation. Refer to Host Access Section for procedure on restarting communications. If this too fails, call your System Operator.

Error Code	Description and Suggested Recovery
100000	Previous CALL command in progress. Wait until the previous call is complete, or an error code other than 100000 is displayed.
100100	Virtual circuit already established. Wait for the virtual circuit to be detached before trying CALL/OPEN commands. It is possible to communicate over one virtual circuit at a time.
100200	ANSWER command entered for a PVC - Permanent Virtual Circuit`.
100300	CALL command entered for a PVC - Permanent Virtual Circuit
100400	Invalid logical channel ID. (Less than 3 characters long)
100500	Invalid logical channel ID. (Not a hexadecimal value between 001 and FFF).
100600	Invalid password. (More than 8 characters)
100700	Invalid Host Network Address. (TO network address exceeds 15 digits)
100800	Invalid Host Address. (FROM network address exceeds 15 digits)
100900	Invalid Host Network Address
100A00	Attempt to enter manual options or flow control negotiation from the keyboard with these parameters disabled.

Error Code	Description and Suggested Recovery
100B00	Facility option entered incorrectly. (Characters entered are not hexadecimal - 0 through 9 or A through F)
100C00	Invalid packet window size option. (Less than 02)
100D00	Invalid packet window size option. (Greater than 07 with Modulo 8 specified)
100E00	Invalid packet window size option. (Greater than 15 with Modulo 128 specified)
100F00	Packet size not equal to 064, 128, 256 or 512.
101000	Invalid closed user group option. (Does not contain two decimal digits)
101100	Invalid control character entered.
101200	Host network address missing a CALL command.
101300	First control character (A, O, C or D) has already been entered.
101400	Network address was entered for a permanent virtual circuit (PVC).
101500	Password option was entered for a permanent virtual circuit (PVC)
101600	Invalid password option. (All not alphanumeric characters)
101800	Invalid password option. (All not alphanumeric characters)
101900	The Q or the E option was selected with the ANSWER command.
101A00	F or R control character entered for an ANSWER command or a PVC. [F=Facility; R=Reversed charging].
101B00	The Q or the E option was selected with the ANSWER command.
101C00	CALL entered for an answer-only SVC.
101D00	OPEN entered for an answer-only SVC

12 DTE Diagnostic Codes

SNA Code	ISO Code	Description and Suggested Recovery
00		Normal Initialization or Termination
01		Invalid LLC Type
10		Packet type invalid
11		Packet type invalid for state r1
12		Packet type invalid for state r2
13		Packet type invalid for state r3
14		Packet type invalid for state p1
15		Packet type invalid for state p2
16		Packet type invalid for state p3
17		Packet type invalid for state p4
18		Packet type invalid for state p5
19		Packet type invalid for state p6
1A		Packet type invalid for state p7
1B		Packet type invalid for state d1
1C		Packet type invalid for state d2
1D		Packet type invalid for state d3
20		DCE Timer Expired
21		DCE Incoming call timer expired
22		DCE Clear Indication timer expired
23		DCE Reset indication timer expired
24		DCE Restart indication timer expired
30		DTE Timer Expired
31	31	DTE Call request Timer expired. Report problem to host system operator.
32	32	DTE Clear request timer expired. Report problem to host system operator.
33		DTE Reset request timer expired
34		DTE Restart request timer expired
40		Unassigned
50		QLLC General error
51		Undefined C-field Code.
52		Unexpected C-field
53		Missing I-field
54		Undefined I-field
56		Frame Reject Received

SNA Code	ISO Code	Description and Suggested Recovery
57		Header Invalid
58		Data Received in wrong state
59		Time-out condition
60		PSH General error
61		Sequence error
62		Header too short
63		PSH format invalid
64		Command undefined
65		Protocol invalid
66		Data received in wrong
69		Time-out condition
70		General PAD error
71		PAD Access facility failure
72		SDLC FCS Error
73		SDLC Time-out.
74		SDLC Frame Invalid.
75		I-field too long.
76		SDLC Sequence error.
77		SDLC Frame aborted..
78		SDLC FRMR Received
79		SDLC Response invalid.
7B		Invalid Packet type.
7F		PAD Inoperable
80		Product specific
90		Network specific.
91		DDX-P RNR Packet Received
A0		Packet not allowed.
A1		Invalid "M" bit Packet sequence
A2		Invalid Packet type received
A3		Invalid Packet on PVC
A4		Unassigned LC
A5		Diagnostic Packet Received
A6	26	Packet too short. Ensure that the packet size entered in the configuration or entered manually, matches the network subscription.
A7	27	Packet too long. Ensure that the packet size entered in the configuration or entered manually, matches the network subscription.
A8		Invalid GFI
A9		Not identifiable
AA		Not supported
AB	01	Invalid Ps. Report the error to the network service representative.

SNA Code	ISO Code	Description and Suggested Recovery
AC	02	Invalid Pr Report the error to the network service representative.
AD		Invalid `D' bit Received
AE		Invalid `Q' bit Received
B0		DTE specific NPSI Gate/Date
B1		No LU-to-LU session
C0		DTE specific general
C1		Termination pending
C2		Channel Inoperative
C3		Unauthorized interrupt confirmation
C4		Unauthorized interrupt request
C5		PU (PVC) Not available
C6		Inactivity time-out
D0	F4	General Resources. Retry the operation. Other applications may operate
D1		Buffers depleted
D2	F5	PIU too long Retry the operation. Other applications may operate
E0	69	Local Procedure General error Report the error to the host system
E1		Packet with LC=0 not received
E2		Restart or Diagnostic Packet on LCI ±`0'
E3		Incoming call received on wrong LC
E4		Facility not subscribed
E5		Packet does not Restart, or Diag on LCI=`0'
E6	42	Facility parameters not supported. Report the error to the host system
		operator.
E7	41	Facility not supported. Report the problem to the host system operator.
E8	46	Unexpected calling DTE. Ensure that the network address is correct.
		Retry the operation. Report the problem to the host system operator if
E9		Invalid `D' bit request
EA		Reset indication on virtual call
EB		Invalid protocol identifier
EC		Connection identifier mismatch
ED		Missing Cause/Diagnostic code
F0-FF		Remote procedure general error
00		No additional information
20		Packet not allowed

11100ff or 1180ff System Reference Codes

The 3494 issued a Clear Request packet after detecting an error; [**ff**] is the DTE Diagnostic Code for the previous list of codes.

21200ff or 1280ff System Reference Codes

The 3494 issued a Reset Request packet after detecting an error; [**ff**] is the DTE Diagnostic Code for the previous list of codes.

13DCE Diagnostic Codes

Error Code	Description and Suggested Recovery
00	No additional information
01	Invalid packet send sequence number (PS)
02	Invalid packet receive sequence number (PR)
10	Packet type invalid
11	Packet type invalid for state r1
12	Packet type invalid for state r2
13	Packet type invalid for state r3
14	Packet type invalid for state p1
15	Packet type invalid for state p2
16	Packet type invalid for state p3
17	Packet type invalid for state p4
18	Packet type invalid for state p5
19	Packet type invalid for state p6
1A	Packet type invalid for state p7
1B	Packet type invalid for state d1
1C	Packet type invalid for state d2
1D	Packet type invalid for state d3
20	Packet Not Allowed
21	Unidentifiable packet
22	Call on one way logical channel
23	Invalid packet type on a PVC
24	Packet on unassigned logical channel
25	REJECT not subscribed to

Error Code	Description and Suggested Recovery
26	Packet too short
27	Packet too long
28	Invalid general format identifier
29	Restart with non-zero in bits 1-4, 9-16 0
2A	Packet type not compatible with facility
2B	Unauthorized interrupt confirmation
2C	Unauthorized interrupt
30	Timer Expired
31	Timer expired for incoming call
32	Timer expired for clear indication
33	Timer expired for reset indication
34	Timer expired for restart indication
40	Call setup Problem
41	Facility code not allowed
42	Facility parameter not allowed
43	Invalid called address
44	Invalid calling address
50	Call clearing problem
51	Non-zero address length field
52	Non-zero facility length field
60	Not Assigned
70	Not Assigned
80-FF	Reserved for Network Specific Diagnostics

1DCE 18ccdd Cause Codes

An 18ccdd Cause code is issued when the data circuit-terminating equipment issues a Clear indication packet after detecting an error.

[18] General error category.
[cc] Cause code.
[dd] Diagnostic code.

The cause codes listed are defined by CCITT Recommendation X.25.

Cause Code	Description and Suggested Recovery
00	Call clearing originated at host system. Report the error to the host system operator.
01	Host busy. Wait. Then retry the operation.
03	Invalid facility request. Ensure that the facility request was entered correctly and retry the operation. If the error recurs, report the problem to the network service representative.
05	Network congestion. Wait. Then retry the operation. If the error recurs, report the problem to the network service representative and the host system operator.
09	Out of order - host not ready.
	Wait. Then retry the operation. If the error recurs, report the problem to the network service representative and the host system operator
0B	Access to the host not allowed. Ensure that the correct network address for the host system has been entered. Then retry the operation. If the problem persists, report the error to the host system operator
0D	Unrecognized host network address. Make sure that you entered the correct network address for the host system. Then retry the operation. If the problem continues, report the error to the host system operator
11	Error at the host system. Report the error to the host system operator. Include the diagnostic code (dd).
13	Controller error. Look at the diagnostic code (dd). Retry the operation. If the error recurs, report it to the person who planned the procedures.
15	Recognized Private Operating Agency (RPOA) out of order. Make sure that the correct RPOA facility is selected or select a different RPOA. If the error recurs, report the problem to the host system operator.
19	Reverse charging not subscribed Ensure that the correct host system address and the correct number for the reverse charge has been entered. Retry the operation. If the error recurs, report the problem to the host system operator
21	Incompatible destination. Ensure that the correct address has been entered. If the address is correct, report the problem to the host system operator.
29	Fast select not subscribed. Ensure that call establishment is correct. This facility should not be selected.
80-FF	Call clearing originated at host system. Report the error to the host system operator.

2DCE 19ccdd Cause Codes

An **[19ccdd]** Cause code is issued, when the data circuit-terminating equipment issues a Reset indication packet after detecting an error.

[19] General error category.

[cc] Cause code.

[dd] Diagnostic code.

The cause codes listed are defined by CCITT Recommendation X.25. When any of these codes are displayed, contact your supervisor. The job will have to be restarted. To restart communications.

Cause Code	Description and Suggested Recovery
00	Reset originated at host system. Report the error to the host system operator.
01	Out of order. Disconnected host system. Wait. Then retry the operation. If the error recurs, report the problem to the network service representative and the host system operator.
03	Error at the host system. Report the error to the host system operator. Include the diagnostic code (dd).
05	Controller error. Check the diagnostic code. (dd). Retry the operation. If the error recurs, report it to the person who planned the procedures.
07	Network congestion. Wait. Then retry the operation. If the error recurs, report the problem to the network service representative and the host system operator.
09	Remote DTE operational. Normal condition at startup. Not an error.
0F	Network operational. Normal condition at startup. Not an error.
11	Incompatible destination. Ensure that the correct address has been entered. If the address is correct, report the problem to the host system operator.
1D	Network out of order. Retry the operation. If the error recurs, report the problem to the network service representative and the host system operator.
80-FF	Reset originated at host system.

3DCE 1Accdd Cause Codes

An **[1Accdd]** Cause code is issued when the data circuit-terminating equipment issues a Restart after detecting an error.

[1A] General error category.

[cc] Cause code.

[dd] Diagnostic code.

The cause codes listed are defined by CCITT Recommendation X.25. When any of these codes are displayed, contact your supervisor. The job will have to be restarted.

Cause Code	Description and Suggested Recovery
00	DTE (host) originated. Not an error.
01	Local procedure error. Check the diagnostic code (dd). Then retry the operation. If the error recurs, report the problem to the network planner.
03	Network congestion. Retry the operation. If the error recurs, report the problem to the network service representative and the host system operator.
07	Network is operational. Normal startup condition. Not an error.
7F	Registration/Cancellation confirmed. Not an error.

141BCC00, System Reference Codes

A restart request packet was issued by the 3494 after detecting an error.

[CC] is the cause code. A description of each code follows:

SNA Cause Code	ISO Cause Code	Description
11	11	Unsolicited Restart Confirmation received.
34	34	Restart Confirmation packet not received within 200 seconds.
A5	A5	Diagnostic packet received.
A6	A6	Packet too short
A7	A7	Packet too long
A8	28	Invalid GFI (Restart Indication/Confirmation only)
E2	29	LCID is not equal to 0 on Restart Indication/Confirmation
E5	24	LCID=0 on non-Restart/Diagnostic packet

15400000 - 400900, Linking Errors

Error Code	Description and Suggested Recovery
400000	A connection attempt is in progress - wait for logon screen
400100	Failed connection - Retry.
400200	Data entered in wrong format. [H] must be first.
400300	You have selected the wrong AS/400 System to disconnect from - correct
400400	The Controller is not configured for the selected AS/400 System.
400500	Incorrect command for the first configuration.
400600	Invalid request format.
400700	Connection number is not configured for the selected AS/400 System.
400800	Link already exists.
400900	Controller is already establishing link.

164100000 - 411300 XID Errors

The following errors are due to mismatching in the AS/400 programming or 3494 configuration.

Error Code	Description and Suggested Recovery
410000	A XID exchange protocol error occurred. If it does not correct itself in 1 minute then there may be a configuration problem.
410100	XID command length error: 29 bytes > I-field > 255 bytes.The XID-field and I-field lengths do not match.
410200	XID command contained an unsupported I-field format.
410300	The XID command exchange state indicators are set to "not supported".
410400	SDLC link protocol was not specified.
410500	Asynchronous balanced mode support.
410600	An ALS is secondary.
410700	Maximum BTU length less than 265 bytes.
410800	An SDLC profile that is either invalid or not supported.
410900	A maximum I-frame's outstanding value that is invalid or not supported.
411200	Error received by the AS/400 System from the Controller.
411300	An XID command that did not originate from an AS/400 System is received by the Controller.

17420000 - 470200, LU6.2 Errors

Error Code	Description and Suggested Recovery
420000	Timeout occurred during CNOS exchange. Restart communications
420100	Unacceptable values contained in the CNOS reply. Check AS/400 System configuration - verify mode configuration
4203xx	An abnormal CNOS GDS reply was returned by the AS/400 System. System configuration problem.
421000	Controller received a negative response to a CNOS BIND. Check System configuration.
4211xx	Controller received an UNBIND of type XX. Check configuration.
421200	Error in establishing a LU6.2 CNOS session between the Controller and the System. This can be a normal termination, or a configuration problem.
4311xx	Error in the Controller session establishment or progress. Verify System or Controller configuration. The 3494 received UNBIND of type XX.
431200	Error in the Controller session establishment or progress. The 3494 received FMH7 for termination. This could be a normal termination, or a configuration problem
4321xx	Error during LU6.2 Controller session establishment or progress. UNBIND of type xx was sent by the Controller, indicating a system problem.
438900	The System did not accept the 3494 request to connect
438904	Controller description was not defined in the AS/400 System.
438905	Connection request rejected because the Controller description was already active.
438908	Controller description was varied offline.
438909	Controller recovery is pending.
438910	Controller recovery is canceled.
438911	Controller description is in a fail state.
438912	AS/400 System has an internal error.
439900	Invalid data received from AS/400 System.
4411xx	AS/400 problem caused the Controller to receive an xx type UNBIND on a DWS session.
441200	The Controller received an FMH7 indicating abnormal session termination of a DWS session.
4421xx	UNBIND type xx sent by Controller or DWS session indicates a network or System AS/400 problems.
470100	A BIND request with an incorrect ODAI value was received. The communication link to the AS/400 System was deactivated.
470200	A BIND request with an incorrect SIDH/SIDL value was received. The communication link to the AS/400 was deactivated.

18520000 to 520003, Copy-To-Printer Codes

Refer to the following Copy-to-Printer Error Code Chart if the error code displayed is from the series 52000x.

Copy-to-Printer Error Code Chart

Error	Description and Suggested Recovery
520000	The 3494 did not find a printer available for local copy-to-printer operation. To recover, Make sure your printer is powered on, is on-line, and has been configured in the 3494 setup menu. Retry the operation.
520001	The device at the address selected for the copy-to-printer operation is not a printer. Your configuration information may be incorrect. Return to the 3494 physical configuration menus and verify port and address information. Retry the operation.
520002	The designated printer is busy, powered off, or in an error condition, or no device is powered at this site. To recover, If the designated printer is busy, wait for it to complete the current task and try again. Otherwise correct the error condition and try again.
520003	The 3494 unit lost communication with the local printer during the print operation. To recover, CReset originated at host system. Check cables, connections and retry the operation.80-FF.

LAN AS/400 Attachment Errors

Error	Description and Suggested Recovery
540404	No AS/400 response to the 3494 TEST command. Communication problems. Controller will continue sending the TEST commands until the AS/400 responds or the operator initiates a disconnect.
540405	No AS/400 response to the 3494 XID3 command. Communication problems. Controller will continue sending the XID3 commands until the AS/400 responds or the operator initiates a disconnect.
540407	LAN frames transmission error. LAN data link is disconnected. The controller continues to send the TEST commands to the LAN to reestablish communications.
540408	Failed command to Ethernet adapter.

APPENDIX B. SPARE PARTS LIST

Field Replacement			*Recommended Lab Replacement*	
Feature	**Part Number**	**Description**	**Part Number**	**Description**
		Boards		
	A000689230	PWA F69102TX Main Board		
3285	A000689890	PWA F69039 - V.24 Board		
STK3801	A000231460	Token Ring Adapter	A000689290	PWA F69014 - TR Board
STK3867	A000231470	ETH Adapter	A000689740	PWA F69150 - ETH Board
4800	A000689080	PWA F69128 - Adapter Board		
3866	LD80020200	PWA 80020200 - V.35 Board		
		Various Parts		
	E000606450	Power supply		
	A000230870	Fan Assy		
	LD82510004	FDD 1.44MB		
	E000785010	Simm Dram 4MB		
	E000633360	Fuse 0.6A 250V S.B.		
		Cables		
	LD82100008	Power Cord US		
	LD82100021	Power Cord German		
	LD83700005	Cable Modem 25 Feet		
	LD83700383	Cable External V.35		
	A000651510	TX Multiplexer cable		
		Manuals		
	B000408790	User's Manual		
		Software		
	S0085125xx	3601 Offline setup diskette		
	S0085126xx	3601 Win 32 setup diskette		
	S0085417xx	3030 , 3494 , STK 3494 -System		
	S0085452xx	Pal Configuration 4MB U24		
	A000232310	***External Expansion unit Additional 28 devices***		