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SWL-SVR4-1P

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(R08/31/92)

(P) SWL-SVR4-1P

Manuals for McIAS™ 1610/68

P/N 40328420, Rev. 0.04

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Revision History

))

Manuals for McIAS 1610/68 P/N 40328420

Changes from Rev. 0.03 to Rev. 0.04

McIAS 1610 System Manual P/N 41314010, from Rev. 3.04 to Rev. 3.05

McIAS 1610 System Manual Volume II, P/N 51314050, from Rev. 2.03 to Rev. 2.04
Changes include:

- Appendixes A & B now include reference to additional part number for T1 board.

McIAS 16xx Telephony Interface Boards and Trunk Connections Manual P/N 41315000 from Rev. 6.02 to Rev. 6.04 (includes Rev. 6.03)

- Information about the new McTi-MR board has been added in the following areas:
  Pages 1 & 2
  Section 2.9 (all new)
  Appendix B

- Page B-1: New part number for McTi-24 board (T1 Interface Board with power off switch) has been added.

McIAS™ 1610

SYSTEM MANUAL

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P/N 41314010, Rev. 3.05

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McIAS™ 1610
SYSTEM MANUAL

VOLUME I

INTRODUCTION
AND
INSTALLATION

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Part of
System Manual 41314010

Rev. 3.04
51314030

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1.0 Introduction

1.1 McIAS 1610 Overview

Depending on the type of Single Board Computer (SBC) installed, the McIAS 1610 can be configured as either a McIAS 1610/68 or McIAS 1610/IP. References to the McIAS 1610 in this manual apply to both configurations, unless otherwise specified. See Section 1.3.1 for descriptions of the SBC boards available.

McIAS 1610 is a powerful general purpose computing platform designed for voice processing applications. A single McIAS 1610 provides up to 24 analog, 72 T1 (DS0) digital or 90 E1 digital voice ports. At the factory, several standard announcements and music are installed. Custom announcements are easily recorded using a standard TouchTone telephone and are saved to the high capacity hard disk drive.

McIAS 1610 is an Open Architecture platform which can be tailored to suit a customer's specific requirements. The McIAS 1610/68 allows the installation of one McIAS AppSOFT application software module; the McIAS 1610/IP allows the installation of multiple AppSOFT application software modules. Refer to Section 1.3.1 for SBC board descriptions. Installation of the Expanded Announcement Software Module (EASM) application enables the McIAS 1610 to provide voiced announcements for CLASS services, automatic number announcements (ANA), Changed Number Intercept (CNI) services and Simplified Message Desk Interface (SMDI) announcements.

1.2 What the 1610 System Manual Contains

This manual is divided into two volumes as follows:

Volume I, INTRODUCTION AND INSTALLATION, provides a physical description of the McIAS 1610 unit including information about each of the system's individual hardware components. The following topics are also covered: 1) unpacking and inspecting the unit, 2) system power connections, 3) external connections, 4) optional Ethernet LAN connections, 4) alarm relay contacts, and 5) system power-up.

Volume II, MAINTENANCE AND TROUBLESHOOTING, includes information on jumper connections, LEDs, filter maintenance, board replacement, hard component removal/installation, and fuse replacement.

Depending on the type of SBC board installed in your system (boards are described in Section 1.3.1), refer to either the McIAS 16xx/68 Series System Operation Manual (Part Number 41318300) or the McIAS 16xx/IP Series System Operation Manual (Part Number 41318310) for information about system start-up and system administration.

Refer to the McIAS Telephony Interface Boards and Trunk Connections Manual (Part Number 41315000) for information on connecting the telephony interface boards from McIAS to the telco trunks.

1.3 Physical Description

McIAS 1610 is a rack mount unit that is easily installed in a standard telco rack. The interior of the unit includes a card file with five slots, a hard disk drive, a cartridge disk drive, a fan and a filter. Refer to Figure 1-1 below for a front view of the system.

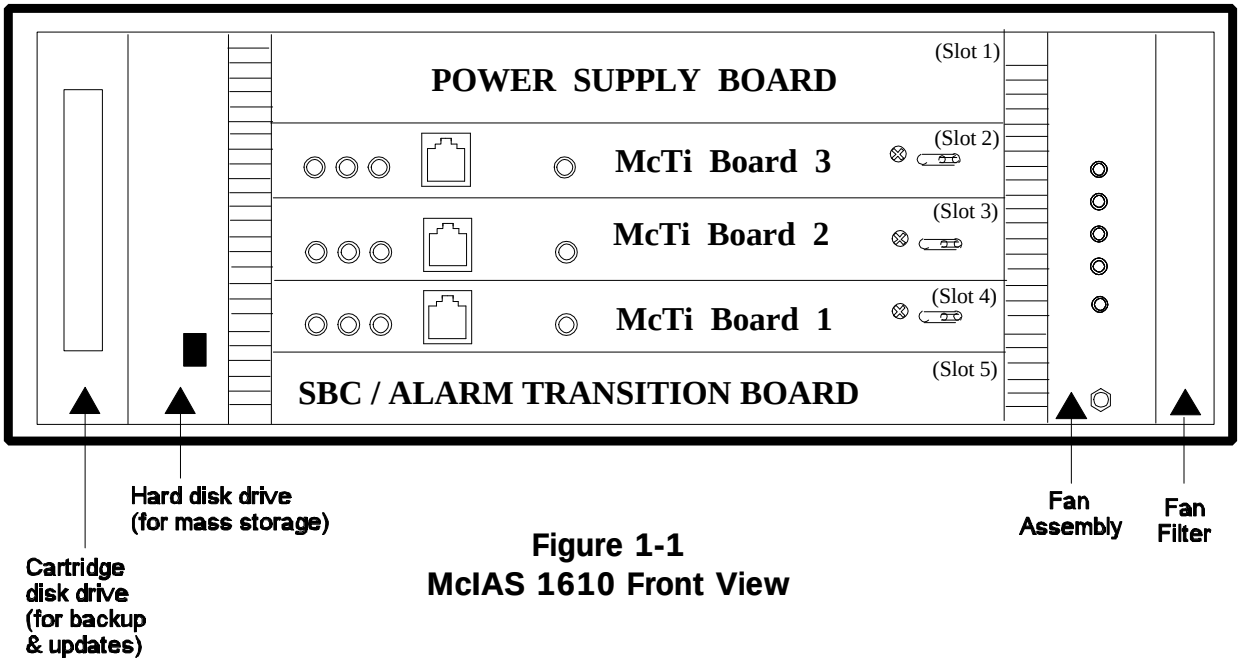


Figure 1-1
McIAS 1610 Front View

The standard unit is 17 inches wide, 5.25 inches high and 12 inches deep. The 17" McIAS 1610 Assembly is delivered with two mounting brackets attached which adapt it to 19 inches for rack mounting.

Optional mounting brackets may be attached to the front of the unit to adapt it to 21, 23, 25 or 26 inch racks. Refer to Table 1-1 for information on the system dimensions and characteristics.

Size	17" (432mm) wide x 5.25" (140mm) high x 12" (305mm) deep
Mounting	19" (483mm), 21" (533mm), 23" (584mm), 25" (635mm) or 26" (660mm)
Power	-42 to -60 vdc (-48 vdc nominal)
Maximum current	2.5 amps
LED Indicators	Power, status, logic voltages, major and minor alarms
Audio Output	-3 to -15 dBm
SIT Encoding	Meets Bellcore and CCITT standards
Telephony Interfaces	Digital: North American, μ-law DS-1 (T1) European, A-law PCM/30 (E1) Analog: 4-wire E&M; Ring-Trip ISDN (in development): Primary Rate, 23B + D
Voice ports T1 E1 Analog	Up to three telephony interface boards 24 to 72 30 to 90 8 to 24
In-Band Signaling	MFR1 and DTMF
Voice Storage	Dependent upon disk capacity
Backup/Upgrades	Removable disk media
Ports	4 Serial; 1 Parallel
Ethernet LAN Connections (1610/IP option)	AUI; 10Base2; 10BaseT
Physical connections	Power: Screw terminals E1/T1 Interface: DB15P (15-pin), male required Analog Interface: 25-pair telco type connector, male required Alarms: 25 pair telco type connector, male required
Administration	VT100-compatible terminal and DTMF telephone
Trouble notification	Major and minor alarm relay contact closures
Compliances	Meets applicable Bellcore, CCITT, UL/CSA and FCC/DOC requirements
Environmental	Temperature: 10° to 40° C operational; 10° to 45° C short term Humidity: 5% to 95%, non-condensing Cooling: Filtered forced air
Finish	Brushed aluminum

Table 1-1
McIAS 1610 Technical Specification

1.3.1 Board Descriptions

SBC/Alarm Transition Board

The Single Board Computer (SBC)/Alarm Transition board must be installed in the bottom slot (Slot 5) of the card file (see Figure 1-1). This single board computer contains on-board DRAM, a programmable timer/counter, system interrupt handling and status monitoring. It also includes a VMEbus interface, SCSI bus interface and an Ethernet interface.

A McIAS 1610/68 SBC board allows the installation of one McIAS AppSOFT Module; a McIAS 1610/IP board (SBC-187 or SBC-197) allows the installation of multiple McIAS AppSOFT Modules. The McIAS 1610/68 and McIAS 1610/IP SBC boards currently available are described below.

- The McIAS 1610/68 SBC board has four LEDs on the front panel: FAIL, STAT, RUN, and SCON.

- The McIAS 1610/IP SBC board (SBC-187 or SBC-197) contains the FAIL, RUN, SCON, LAN, SCSI and VME indicators. The SBC-187 also contains a STAT and +12V (LAN power) LED.

The LEDs on all SBC board types will light at system power-up. Major and minor alarm LEDs are provided on the front panel of the system.

All SBC board types have two switches. The black ABORT switch is a processor switch and should not be pressed. The red RESET switch is a "panic button" that should not be used during normal system operation. If necessary, the RESET switch may be used to re-start the system.

Attached to the rear of the SBC is the Alarm Transition board as indicated in Figure 1-2 below.

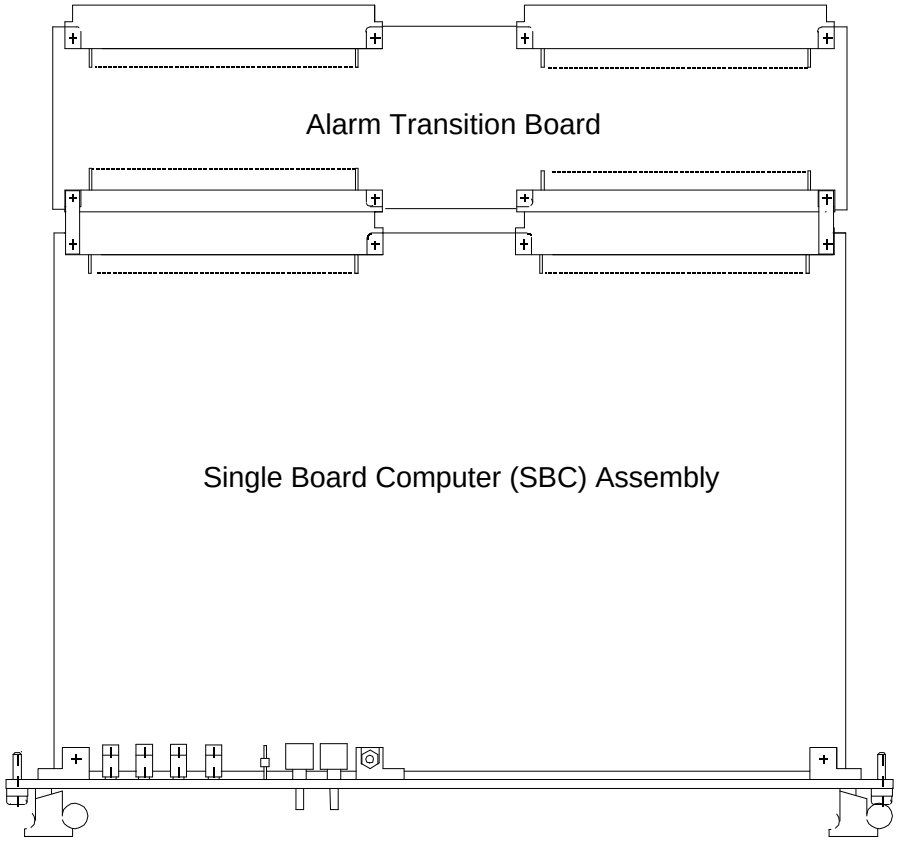


Figure 1-2
SBC/Alarm Transition Board
(P/N 43313970)

There are two internal connectors at the rear of the Alarm Transition board which are inserted into a set of connectors on the interior backplane when the SBC/Alarm Transition board is positioned in Slot 5 of the card file.

The Alarm Transition board provides an alarm circuit interface to the switch consisting of dry contact relays which have been divided into major and minor alarms. The contact relays are accessed via a 50-pin trunk interface connector (J5) located on the exterior backplane.

Depending on the type of SBC board installed, the LEDs and switches located on the board's outside panel will vary as described earlier in this section.

Telephony Interface Boards

Refer to the McIAS Telephony Interface Boards and Trunk Connections Manual (Part Number 41315000) for detailed information on the four types of telephony interface boards supported by McIAS 1610.

Power Supply Board

The Power Supply board (P/N 44303220) is housed in Slot 1, the uppermost slot in the card file. The outside panel of this board consists of several LEDs and the system's ON/OFF switch. The LEDs indicate the status of the input power and output power. FRAME BATTERY lights green and refers to the main -48 volt input power. SIGNAL BATTERY lights green and refers to the separate signal -48 volt power. The remaining three LEDs all light green and refer to the output power from the power supply that is used to drive the rest of the system (-12v, +12v and +5v).

1.3.2 Data & Voice Storage Devices

Two storage devices are installed in McIAS 1610. One device is a fixed hard disk and is used for system and application data and voice storage; the other device is a removable cartridge hard disk used for backing up data and voice files as well as for importing software and new voice files. Depending on the configuration, these drives vary in capacity.

As illustrated in Figure 1-1, the two disk drives are mounted vertically on the wall to the left of the card file.

1.3.3 Backplane Description

The exterior backplane which is located at the rear of the McIAS 1610 unit consists of screw terminals, fuses, and several different types of connectors. See Figure 1-3 below.

Five screw terminals located in the upper left corner of the exterior backplane provide the following power connections: Signal Ground, Signal Battery, Frame, -48v Return and -48v Negative Supply. Refer to Section 2.4 for a detailed description of each connection.

Three fuses are also located in the upper left section. F1, the main fuse, is 3 amps. When -48v system power is applied, it goes directly to the power supply through this fuse. F2, the signal battery fuse, is 1 amp. F3, the fuse that provides power to the SCSI terminator, is 1 amp.

Backplane Connector Descriptions (functions dependent on McIAS AppSoft Module)

- **Serial Ports**

  McIAS 1610/68: Local Console (P1)
  Modem (P2)
  SMDI, if installed, and/or printer (P3 and/or P4, interchangeably)

  McIAS 1610/IP: Console (P1)
  Modem (P2)
  Local Terminal (P3)
  SMDI, if installed (P4)

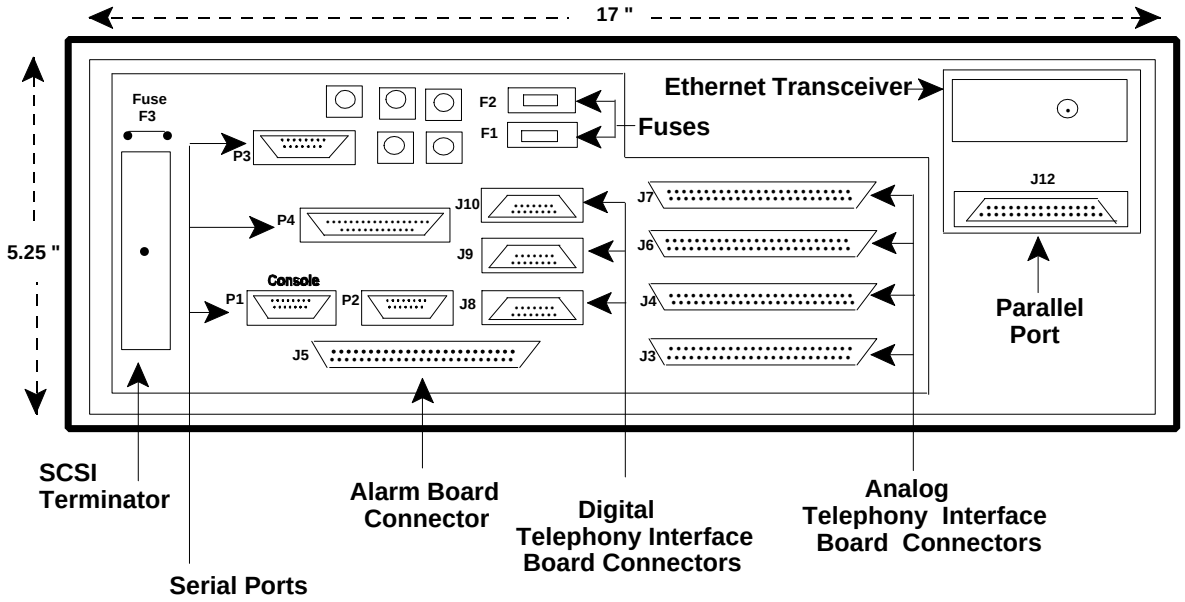


Figure 1-3
McIAS 1610 Backplane

Backplane Connector Descriptions (continued from previous page)

- **SCSI Terminator**
  Used to terminate SCSI bus or to provide external devices (disk or telephony interface)

- **Ethernet Transceiver (McIAS 1610/IP option only)**
  Network connection options are:
  Option 1: Standard AUI port provided through use of DB15F connector
  Option 2: Connection to network via 10Base2 (BNC Connection)
  Option 3: Connection to network via 10BaseT (RJ-45 modular jack)

- **Parallel port**
  McIAS 1610/68: Not used
  McIAS 1610/IP: Printer

- **Telco connectors** Described in McIAS Telephony Interface Boards and Trunk Connections Manual

The interior backplane includes the following:

1) internal connectors for the boards installed in Slots 1 through 5,
2) 64-pin connector that connects the disk drive shuttle assembly,
3) 15-pin connector for the fan and LEDs, and
4) 16-pin AUI Port to Ethernet Transceiver

Figure 1-4 below illustrates the connectors found on the interior backplane.

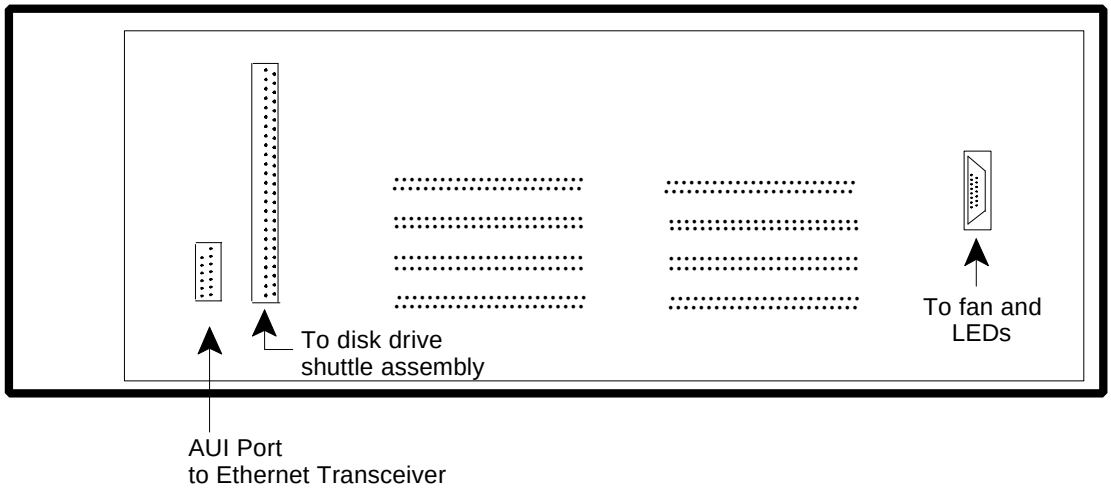


Figure 1-4
McIAS 1610 Interior Backplane Connectors

2.0 Installation

2.1 Site Selection

Consider the following when selecting a permanent location for the McIAS 1610 unit.

1. Required power services must be easily accessible (-48 VDC, 3A maximum).

CAUTION: Make certain that the -48VDC power service will accommodate 3A current requirements. Service wiring should be at least 18 AWG. Refer to Figure 1-3 for the location of the screw terminals used for -48 volt hookup.

2. Ease of access by the technician to the rear of the unit (backplane) for telephony interface connections.

3. Ease of access to the front of the unit for examination of the LEDs mounted on the front edge of the printed circuit boards, and removal or replacement of the printed circuit boards within the card file.

2.2 Unpacking and Handling

Before unpacking any equipment, inspect the carton(s) for evidence of rough handling that might have caused damage to their contents. The carrier who delivered the shipment should be notified immediately if there is any visible damage.

CAUTION: The components on the assembly are sensitive to electrostatic discharge (ESD). Use an ESD protected environment and procedure when working with the PC boards.

Remove each item from the packing containers carefully, checking to make sure that everything listed on the packing slip is accounted for. Report any discrepancies to Cognitronics Corporation (see Section 4.0 in Volume II). Handle all items with care.

After unpacking, make sure that all of the following system components have been delivered:

1. McIAS 1610 Enclosure including backplane, fan and front panel assembly

2. Card File including the following:

   Slot 1: Power Supply Board

   Slots 2, 3 and/or 4: Any combination of the following telephony interface boards:

   McTi-8E (4-wire E&M)
   McTi-8R (Ring-Trip)
   McTi-8L (Loop Reversal)
   McTi-24 (T1)
   McTi-30 (E1)

   Slot 5: Single Board Computer (SBC) / Alarm Transition Board

3. Drive Shuttle Assembly:
   Standard Hard Disk Drive & Removable Drive
   or
   Large Hard Disk Drive & Removable Drive

System Options

1. McIAS AppSOFT Software Module

2. Ethernet Transceiver Assembly

3. DB15 to BNC Conversion Cable (McTi-30 connection to telco)

4. Digital Connector Block

5. Analog Connector Block

6. Mounting brackets to widen unit to:

   19"
   21"
   23"
   25"
   26"

   Mounting brackets are packaged as a kit; each kit contains two brackets and mounting hardware.

2.3 Visual Inspection

After carefully unpacking McIAS 1610, perform the following visual inspections:

* Examine the exterior of the McIAS 1610 unit for evidence of damage during shipping. Report *any* signs of damage no matter how insignificant to the appropriate authorities within your company for possible claim against the carrier.

* If boards have been dislodged or damage is apparent, individually remove and examine each printed circuit board contained within the McIAS 1610 card file. If defects are found (i.e. broken components, cracked connectors, etc.) attach a tag noting the defect(s) and return the printed circuit board(s) to Cognitronics Corporation. See Section 4.0 in Volume II for return instructions.

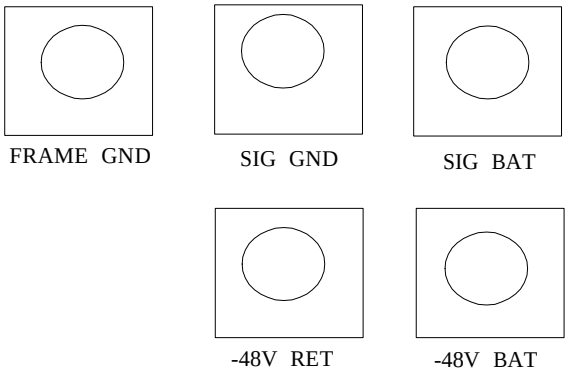
If no defects are found, re-install the board.

2.4 System Power Connections

Connect the -48 volt battery (-48V BAT) system power and -48 volt return (-48V RET) to the screw terminals located in the upper left section of the exterior backplane as illustrated below. Make certain that the -48 vdc power service will accommodate 3A requirements. Service wiring should be at least 18 AWG.

Note: A McIAS 1610 unit with one or more analog boards installed requires connection to battery and ground also. Frame ground, -48 volt return and signal ground are isolated from McIAS logic ground. (Do not change any jumpers on the Power Supply board.) A separate connection for signal battery and signal ground is provided via screw terminals. This separate connection completely isolates signal battery and signal ground from unfiltered frame battery and ground. If filtered battery is to supply power to both inputs, run a jumper from -48V BAT to signal battery and from -48V RET to signal ground.

Screw terminals appear on the backplane as follows:



2.5 Telephony Connections

Refer to the McIAS Telephony Interface Boards and Trunk Connections Manual for instructions on the process of connecting the telephony interface boards to the telco trunks.

2.6 External Connections

The McIAS 1610 provides connection to a terminal, modem, SMDI (if installed), and/or printer. An Ethernet interface can be provided on the McIAS 1610/IP only. Below are the pin assignments for each type of connection. Terminal settings and cable pin connections are discussed in Section 2.6.1.

P1-1	No connection
P1-2	RXD1
P1-3	TXD1
P1-4	DTR1
P1-5	Gnd
P1-6	DSR1
P1-7	RTS1
P1-8	CTS1
P1-9	No connection

Serial Port P1
Console
(1610/68 & 1610/IP)

P2-1	DCD2
P2-2	RXD2
P2-3	TXD2
P2-4	DTR2
P2-5	Gnd
P2-6	DSR2
P2-7	RTS2
P2-8	CTS2
P2-9	No connection

Serial Port P2
Modem
(1610/68 & 1610/IP)

P3-1	DCD3
P3-2	RXD3
P3-3	TXD3
P3-4	DTR3
P3-5	Gnd
P3-6	DSR3
P3-7	RTS3
P3-8	CTS3
P3-9	No connection

Serial Port P3
1610/68: printer or SMDI (optional)
1610/IP: Local Terminal

P4-1	No connection
P4-2	TXD4
P4-3	RXD4
P4-4	RTS4
P4-5	CTS4
P4-6	DSR4
P4-7	Gnd
P4-8	DCD4
P4-9	No connection
P4-10	No connection
P4-11	No connection
P4-12	No connection
P4-13	No connection
P4-14	No connection
P4-15	No connection
P4-16	No connection
P4-17	RXCI4
P4-18	No connection
P4-19	No connection
P4-20	DTR4
P4-21	No connection
P4-22	No connection
P4-23	No connection
P4-24	TXCO4
P4-25	No connection

Serial Port P4
1610/68: SMDI (optional) or printer
1610/IP: SMDI (optional)

J12-1	PRSTB
J12-2	PRD0
J12-3	PRD1
J12-4	PRD2
J12-5	PRD3
J12-6	PRD4
J12-7	PRD5
J12-8	PRD6
J12-9	PRD7
J12-10	PRACK
J12-11	PRBSY
J12-12	PRPE
J12-13	PRSEL
J12-14	No connection
J12-15	PRFAULT
J12-16	INPRIME
J12-17	No connection
J12-18	LOGICGND
J12-19	LOGICGND
J12-20	LOGICGND
J12-21	LOGICGND
J12-22	LOGICGND
J12-23	LOGICGND
J12-24	LOGICGND
J12-25	LOGICGND

Parallel Port (J12)
1610/68: Not Used
1610/IP: Printer

Table 1-2
Serial/Parallel Port Pin Assignments

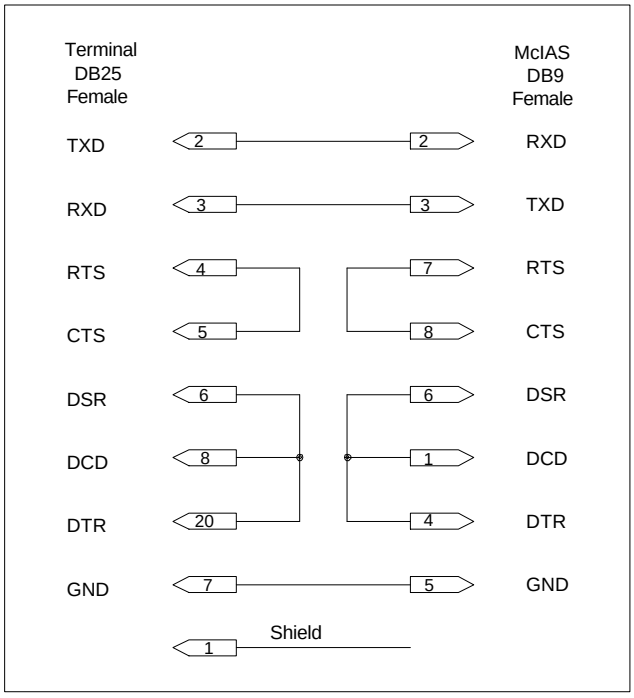
2.6.1 Terminal Setup

All peripherals must be acquired independently by the user. A terminal is required for McIAS 1610 system administration. Set up the terminal to emulate a DEC VT100 with the following parameters:

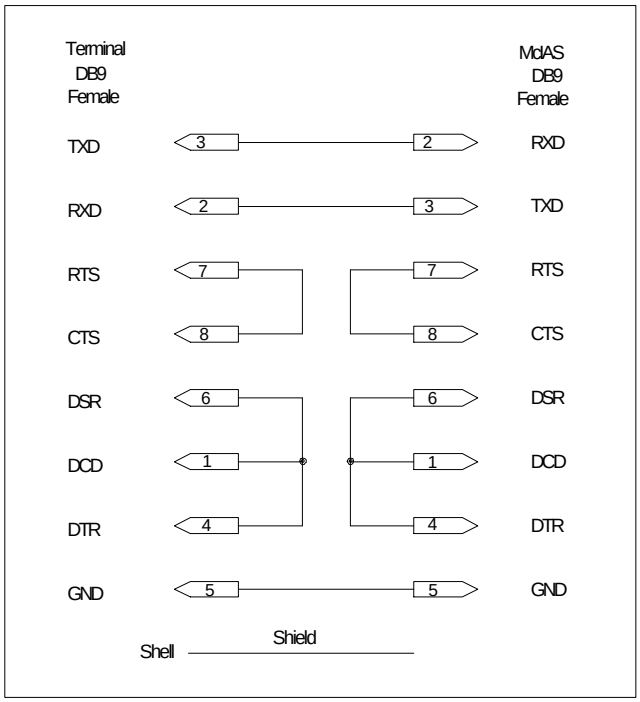
Communication	Full Duplex
Data Length	8 bits
Parity	None
Stop bits	1
Echo	Off

2.6.2 Null Modem Cable (no handshake)

A "no handshake" null modem cable with the following pinouts must be used when connecting the terminal to the McIAS 1610/IP backplane:



OR



Note: The McIAS 1610/IP "autoboots" to the baud rate of the terminal. After the terminal is connected, if miscellaneous characters appear on the screen instead of the "Login" prompt, a terminal baud rate difference may exist. To correct the problem, press the "Break" key, wait two seconds and press <Enter>. Repeat this key sequence up to 10 times. If the "Login" prompt still does not appear, check configuration settings.

2.6.3 Printer Connections (optional)

For the McIAS 1610/IP, a parallel printer may be connected to the parallel port located on the McIAS backplane; for the McIAS 1610/68, a serial printer may be connected to either serial port “P3" or “P4". Refer to Table 1-2 for information about printer connections.

2.6.4 SMDI Connection (optional)

Use the serial port labeled "P3" or “P4" to connect the SMDI link to McIAS if the SMDI option is installed.

The Simplified Message Desk Interface (SMDI) is an analog interface between the local Stored Program Control (SPC) switching system and the McIAS. Over this interface, the SPC switching system provides information to the Cognitronics Voice Mail system running on the McIAS about calls terminated to a set of associated lines. The SPC switching system also receives requests from the Cognitronics Voice Mail system to control Message Waiting Indicators for Voice Mail subscribers. A Message Waiting Indicator can be a lamp on the telephone that is turned on to indicate a message pending or the presence of a "stutter" dialtone heard by the residential subscriber when the telephone is picked up.

Cognitronics' Voice Mail for Residential Subscribers (VM/R) AppSOFT Module adheres to the Bellcore specification, "Simplified Message Desk Interface", Generic Requirements, TR-NWT-000283, Issue 2, May 1991.

The SMDI interface can also be used in the EASM 1.0 AppSOFT Module to provide out-of-band signaling for Changed Number Intercept (CNI) and Automatic Number Announcement (ANA) calls.

2.7 Ethernet LAN Connections (McIAS 1610/IP option)

The sub-sections to follow describe the types of available Ethernet LAN connections.

2.7.1 10Base2 (BNC Connection)

In order to establish a 10Base2 Ethernet LAN connection for each node, connect an RG58/U cable (BNC connection) to both ends of the Ethernet "tee" located on the McIAS 1610 backplane. The cable used must have a 50 ohm characteristic impedance. Connect the cable to every node in the network. The two nodes that reside at the ends of the network, however, must have a 50 ohm terminator plugged into one end of the tee on each node.

NOTE: If it ever becomes necessary to disconnect only one node from the network, disconnect the entire tee in order to avoid breaking the Ethernet loop; otherwise, the entire Ethernet system connection will be broken.

2.7.2 10BaseT (RJ-45 Connection)

In order to establish a 10BaseT Ethernet LAN connection, use a Category 5 Unshielded Twisted Pair (UTP) cable to connect to the RJ-45 connector on the McIAS 1610 backplane on one end and to the hub at the other end.

The table below describes the pins on a Category 5 Unshielded Twisted Pair (UTP) cable:

Pin #	Function
1	+ TD
2	-TD
3	+ RD
4	Not Used
5	Not Used
6	-RD
7	Not Used
8	Not Used

2.8 Alarm Relay Connections

Connections for major and minor alarms are made via dry contact closures on the Alarm Transition board. These closures are connected from a male 50-pin cable connector to the alarm panel at the CO. Backplane connector J5 serves the alarm circuits; see Figure 1-3. Alarm relay pin connections are shown below.

Pin Number	Connect to	Pin Number	Connect to
50	Not used	25	Not used
49	Not used	24	Not used
48	Not used	23	Not used
47	Not used	22	Not used
46	Not used	21	Not used
45	Not used	20	Not used
44	Not used	19	Not used
43	Not used	18	Not used
42	Not used	17	Not used
41	Not used	16	Not used
40	Not used	15	Not used
39	Not used	14	Not used
38	Not used	13	Not used
37	Not used	12	Not used
36	Not used	11	Not used
35	Not used	10	Not used
34	Not used	9	Not used
33	Not used	8	Not used
32	Not used	7	Not used
31	Not used	6	Not used
30	**Minor alarm 4 (NO)***	5	**Minor alarm 4 (COM)***
29	**Minor alarm 3 (NO)**	4	**Minor alarm 3 (COM)**
28	**Minor alarm 2 (NO)**	3	**Minor alarm 2 (COM)**
27	**Minor alarm 1 (NO)**	2	**Minor alarm 1 (COM)**
26	**Major alarm (COM)**	1	**Major alarm (NO)**

NOTE: Requires one 25 pair male connector and cable.

NOTES:

NO = Normally open contacts during idle, non-alarm conditions. Contacts close during alarm conditions.

COM = Common relay contact point.

* No LED indication of Minor 4 alarm on front panel. Activation of this relay indicates failure of signal battery input or Fuse 2.

Table 1-3
Alarm Relay Connections (J5)

2.9 Installation Summary

Below is a summary of the installation process:

1. Mount the McIAS 1610 in the telco rack.

2. Set up and connect a terminal. Refer to Section 2.6 for external connections.

3. Connect a modem and printer, if desired. Refer to Section 2.6 for external connections.

4 Connect telephony interface board(s) to the telco end via connectors J3, J4, J6, J7 (analog) or J8, J9, J10 (digital). For digital boards, test internal digital McTi connections by jumpering together the appropriate pins on either the backplane connector(s) or on the Digital Connector Block. See Section 2.0 in the McIAS Telephony Interface Boards and Trunk Connections Manual for more information.

5. Connect alarm relays to the telco end via J5 connector.

6. Connect Ethernet LAN, if applicable.

7. Apply -48 volt system power and -48 volt return (ground) to the screw terminals located on the lower rear section of the unit. If analog board(s) are installed, connect signal battery and ground. Refer to Section 2.4 for more information.

Note: When power is applied to the McIAS 1610 backplane, the red major alarm LED and the green power LED should light brightly. The major alarm LED will remain lit until the initialization process is complete. If the major alarm LED does not light when power is applied, check for a blown fuse or reversed wires.

8. Proceed to Section 2.10 for power-up instructions.

2.10 System Power Up

With power applied to the backplane, the McIAS 1610 red major alarm LED should be lit.

Note: Prior to turning on the McIAS 1610 power switch, make certain that a terminal is connected and power to it is turned on.

McIAS 1610 will take approximately 2 minutes to initialize.

1. Turn on system power to the McIAS 1610 using the switch located on the power supply board. The red major alarm LED is lit and will remain lit until the system has finished initializing. The green power LED should remain lit continually.

2. When the power switch is turned on, all of the LEDs on the SBC will come on briefly. As the system initializes, LEDs on the SBC will either flicker or remain on steadily. A series of self tests and processes being started up will be displayed on the terminal during initialization.

3. When the system has completed initialization, the installer should see the following:
   - **!** McTi board LEDs:
     - McTi-30: All LEDs are off
     - McTi-24: Green LED is on
     - McTi-8L: Activity flashes
   - **!** Red major alarm LED is off (if this LED is still lit, see Note below)
   - **!** "Login" prompt appears on the terminal
   - **!** SBC LEDs: See Section 1.3.1
   - **!** Power LED is lit brightly
   - **!** All other LEDs are off

Note: If the red major alarm LED is still lit at the end of initialization, this could be caused by more than 50% of the trunks not connected to the CO.

4. If there appears to have been a problem with system initialization, push the RESET switch on the front of the SBC board.

5. Display the Error Log (McIAS 1610/IP) or Alarm Log (McIAS 1610/68) to see if any errors occurred during system initialization. Refer to the applicable document for more information:
   - McIAS 16xx/IP System Operation Manual (P/N 41318310), Section 3.4
   - McIAS 16xx/68 EASM Operator's Guide (P/N 51315820), Section 2.4.2.1

6. Correct errors, if any.

7. Before proceding, check to make sure that all alarm LEDs are off and McTi board LEDs are in a normal state as follows:
   If a McTi-30 board is installed, all LEDs are off.
   If a McTi-24 board is installed, the green LED is on.
   If a McTi-8L board is installed, Activity LED is flashing.

8. Test the alarm relays to verify that they are properly connected to the CO. Refer to the applicable document for more information:
   McIAS 16xx/IP System Operation Manual (P/N 41318310), Section 3.4.2
   McIAS 16xx/68 EASM Operator's Guide (P/N 51315820), Section 2.4.2.3

IMPORTANT!
Do not press the ABORT button on the SBC. Cognitronics Product Support is available for assistance if initialization problems are encountered at (203) 830-3560 Monday through Friday from 8:30 a.m. to 5:00 p.m. ET.

McIAS™ 1610
SYSTEM MANUAL

VOLUME II

MAINTENANCE
AND
TROUBLESHOOTING

Cognitronics Corporation
3 Corporate Drive
Danbury, CT 06810

Phone: (203) 830-3400
Facsimile: (203) 830-3405

Part of
System Manual 41314010

Rev. 2.04
51314050

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1.0 Maintenance

McIAS 1610 is designed to require very little maintenance. It is recommended that the unit be installed in an environment that is free of dust and dirt. Whenever necessary, however, a mild solution of water and detergent may be used on the exterior of the unit when it is powered down.

1.1 Jumper Connections

McIAS 1610 employs jumpers on several different boards and on the disk drives. Most of these jumper connections are set at the factory and should not be changed at the customer site.

Note: The trunk interface jumpers on the McTi-8E board, however, can be changed by the user to select the ground options for E&M Types I, II and III. The McTi-8L also has jumpers that are configurable by the user. Refer to the McIAS Telephony Interface Boards and Trunk Connections Manual (P/N 41315000) for details on these jumper settings.

1.2 Electrical Maintenance - LED Indicator Checks

McIAS 1610 utilizes light emitting diode (LED) indicators on the SBC, telephony interface and the Power Supply boards to signify specific system functions. If an LED (other than Internal Signal Battery) on the Power Supply board is not lit, a voltage problem exists. The board must be pulled and replaced.

McIAS 1610 LEDs are described in Table 1-1 below.

LED LOCATION	LED COLOR	LED NAME	DESCRIPTION WHEN LIT
SBC (McIAS 1610/68) Slot 5	Red	FAIL	Indicates system reset. Cleared by firmware upon successful SBC initialization.
	Yellow	STATUS	When fully lit, the processor has halted.
	Green	RUN	Indicates SBC is in operation.
	Green	SCON	Indicates that the SBC is the VME BUS system controller.
SBC (McIAS 1610/IP) Slot 5	Red	FAIL	Indicates system reset. Cleared by firmware upon successful SBC initialization.
	Yellow	STAT	When fully lit, the processor has halted.
	Green	RUN	Indicates SBC is in operation.
	Green	SCON	Indicates that the SBC is the VME BUS system controller.
	Green	LAN	Indicates that the LAN chip is enabled.
	Green	+12V (LAN)	Indicates that power is available to the Ethernet transceiver interface.
	Green	SCSI	Indicates that the SCSI chip is enabled.
	Green	VME	Indicates VMEbus activity.
Power Supply Board Slot 1	Green	FRAME BATTERY	-48 volt input power. (Fuse F1 is functional.)
	Green	SIGNAL BATTERY	-48 volt input power. (Fuse F2 is functional.)
	Green	-12v	3 LEDs to indicate the output from the Power Supply to drive the rest of the system.
	Green	+12v	
	Green	+5v	

Table 1-1 (Part 1)
LED Indicator Functions

LED LOCATION	LED COLOR	LED NAME	DESCRIPTION WHEN LIT
T1 Board (McTi-24) Slot 2, 3 or 4	Red	RA	Received red alarm. Indicates that McIAS is unable to synchronize to the signal received from the switch. May indicate a loss of signal or an unframed signal (e.g. AIS/Blue Alarm).
	Yellow	RY	Yellow alarm signal received from the switch.
E1 Board (McTi-30) Slot 2, 3 or 4	Red	MR	McIAS unable to synchronize to Multi-frame level.
	Yellow	MY	McIAS receiving Multi-frame yellow alarm from switch.
	Red	FR	Indicates that McIAS is unable to synchronize to the signal received from the switch. May indicate a loss of signal or an unframed signal (e.g. AIS/Blue Alarm).
	Yellow	FY	McIAS receiving a yellow alarm signal from the switch.
	Red	LOC	McIAS receiving no signal from the switch.
	Yellow	AIS	Indicates that the switch is receiving no signal from McIAS.
McTi-8L Board	Red	FAULT	Indicates loss of -48v or thermal shutdown has occurred. (This LED blinks when board is in boot code.)
	Green	Activity	As calls are received, indicates line activity. Blinking will accelerate as the number of calls increases. If all lines are idle, will pulse at a rate of 2 seconds on, 2 seconds off.
	Green	Answer 1 . . Answer 8	Indicates that the line is off-hook; polarity is reversed.
Hard Disk Drive	Green		Indicates drive is in use.
Cartridge Disk Drive	(LED color depends on drive type)		LED functionality varies according to the type of drive installed. For removable cartridge drive information, refer to the appropriate manual as follows: McIAS 1610/68: McIAS 16xx/68 System Operation Manual (P/N 41318300), Appendix A. McIAS 1610/IP: McIAS 16xx/IP System Operation Manual (P/N 41318310), Appendix D.
Front Panel Visual Alarm Indicators	McIAS 1610/68:	See McIAS 16xx/68 EASM Operator's Guide Vol. I (P/N 51315820), Appendix G	
	McIAS 1610/IP:	See the McIAS 16xx/IP System Operation Manual (P/N 41318310), Appendix A	
	Red	Major Alarm	
	Yellow	Minor Alarm 1	
	Yellow	Minor Alarm 2	
	Yellow	Minor Alarm 3	
	No LED	Minor Alarm 4*	Indicates loss of Battery/Ground or loss of Fuse 2.

***** Minor Alarm 4 has only relay contacts and no LED indicator.

Table 1-1 (Part 2)
LED Indicator Functions

1.3 Filter Maintenance

The air filter located at the extreme right of the McIAS 1610 (see Figure 1-1 in Volume I) should be replaced as required, depending on the amount of air-borne contaminants in the CO environment.

To replace the air filter, open the front panel of the unit and slide the old filter straight out. Replace the filter with a new one and return it to its original position by sliding it straight in.

Filters can be ordered from Cognitronics according to the part number listed in Appendix A.

1.4 PC Board Replacements

The replaceable printed circuit boards include the SBC/Alarm Transition board, the McTi boards and the Power Supply board which are illustrated in the diagram below. Most board jumpers are factory-set and should not require any change by the customer. Refer to Section 1.1 for information about jumpers. Follow these steps when replacing PC boards:

SAFETY PRECAUTIONS: McIAS 1610 uses plug-in modules with circuit components that are sensitive to Electrostatic Discharge (ESD), therefore, qualified ESD wrist straps must be employed whenever personnel handle these modules. Wrist straps must be connected to the frame in accordance with Telco safety practices.

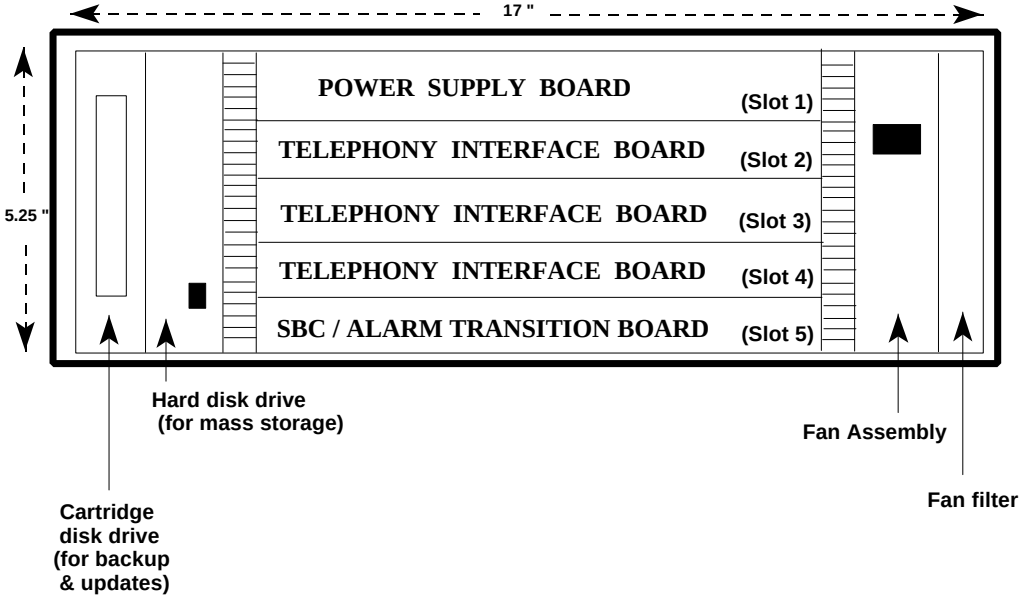
1. Turn the power switch located on the Power Supply board to OFF.

2. Loosen the fastening screws and then remove the board, pulling the two end tabs (pull straight out) and replace the board with a known good one (with proper jumpers installed).

   NOTE: Take extreme care when removing and inserting the processor boards. There are components mounted on both sides of the boards. Do not let these components brush against anything, especially the edge of an adjacent board or panel.

3. Return power switch to "ON". McIAS 1610 will initialize.

McIAS 1610/IP NOTE: OAM&P allows the replacement (hot swap) of one McTi-24 board with another by powering down only the McTi board and not the entire system. Refer to the McIAS 16xx/IP System Operation Manual, Section 3.2 for more information.



1.5 Fixed Component Removal and Installation Procedures

1.5.1 Fan Assembly

The fan assembly is easily detached by removing the single screw on its front and sliding the fan unit straight out from the front of the McIAS. To install, reverse the procedure.

The fan filter is located along the right side of the assembly and also slides straight out. When installing a new filter, be sure that the pull tab is pointing toward the center of the unit.

1.5.2 Disk Drives

The disk drives are mounted on a removable assembly which is located to the left of the card file. This facilitates removal of the drives whenever necessary.

To remove the drive assembly from a powered down unit:

1. Loosen the two screws on the front of the plate.

2. Pull the drive assembly straight out on the slides.

To install, reverse the procedure.

1.6 Fuse Replacement

The McIAS 1610 unit has three fuses which are located on the exterior backplane (see Figure 1-3 in Volume I). These fuses have been selected to ensure safe operation of the system and must always be replaced by fuses with identical ratings.

Following is the fuse rating detail:

F1 (3 amp, 60VDC) - This is the main fuse. When -48v system power is applied, it is directed to the power supply through this fuse. The fuse is Littelfuse, #401003 or equivalent. (Cognitronics P/N 70303320)

F2 (1 amp, 60 VDC) - This is the signal battery fuse which protects the system if external power is applied. The fuse is Littelfuse, #401001 or equivalent. (Cognitronics P/N 70303310)

F3 (1 amp) - This is the fuse which provides power to the SCSI bus terminator. Subminiature axial fuse. Littelfuse, #251001 or equivalent.
(Cognitronics P/N 70316130)

2.0 Troubleshooting

McIAS 1610 diagnostics consist of LED indicators and alarms to provide an indication that a fault has occurred.

The following sub-sections describe these fault indication sources along with procedures to follow in identifying and resolving system problems.

2.1 Alarms

McIAS 1610 transmits alarms which indicate a system malfunction to a central office (CO) scan point via the Alarm Transition board. There are two alarm classifications: major and minor. A major alarm indicates that there is a problem which has forced McIAS 1610 to discontinue operation. A minor alarm indicates that there is an area of McIAS 1610 that is not operational, but the system is still able to service some incoming calls.

There are four alarms recorded by McIAS 1610: a major alarm (the most critical) and three minor alarms. Refer to Table 1-1, LED Indicator Functions, for alarm details.

The Alarm Transition board is attached to the SBC and installed in Slot 5 of the card file. The Alarm Transition board uses four sets of "dry" (electrically isolated) contacts. The major alarm is associated with a pair of normally open (NO) contacts. In the idle condition, these contacts are open. When an alarm condition occurs, the contacts close to transmit the alarm signal. The minor alarms are associated with normally open (NO) contacts. In the idle condition, these contacts are open. When an alarm condition occurs, the contacts close to transmit the alarm signal. Upon successful reinitialization, the contacts revert to their normal position.

In response to most error conditions, the system will recover in one of two ways: the affected individual component will be reset or, if this is not sufficient, the entire system will be reset.

In some cases, it may become necessary to manually shut down the system. This may include performing a "cold start" and/or removing, inspecting or replacing boards and their connections. Refer to Section 1.4 for information on the steps to follow in powering down the system and subsequently inspecting or replacing printed circuit boards.

For detailed information about the alarm conditions that may occur during McIAS 1610 operation, refer to the appropriate documentation, depending on the configuration:

McIAS 1610/68:	McIAS 16xx/68 EASM Operator's Guide Vol. I (P/N 51315820), Appendix G
McIAs 1610/IP:	McIAS 16xx/IP System Operation Manual (P/N 41318310), Appendix A

3.0 General Technical Assistance

McIAS 1610 PRODUCT SUPPORT

Available: Monday - Friday, 8:30 AM to 5:00 PM ET

Telephone Number: 203-830-3560
Fax Number : 203-830-3574

4.0 Return and Repair Services

REPAIR COORDINATOR

Available: Monday - Friday, 8:30 AM to 4:30 PM ET

Telephone Number: 203-830-3483
Fax Number : 203-830-3405

4.1 Return and Repair Procedure and Policy

Cognitronics will repair (or replace if under warranty) defective material within three working days provided all of the following procedures are adhered to and all related papers are in order. No return authorization is required.

Send paperwork to:

Cognitronics Corporation
Attn: Sales
3 Corporate Drive
Danbury, CT 06810-4130

1. Purchase Order Number (or copy of the P.O.) that will cover the repair cost.

2. Ship-to and Bill-to addresses.

3. Name and phone number of contact person.

4. Serial Number of defective material.

Send defective component to:

Cognitronics Corporation
Attn: Repair Department
3 Corporate Drive
Danbury, CT 06810-4130

1. The component, well padded in a sturdy carton; use original packing and carton, if available.

2. Name and phone number of contact person.

3. Copies of all paperwork sent to Sales.

5.0 New Product Sales

SALES REPRESENTATIVE

Available: Monday - Friday, 8:30 AM to 5:00 PM ET

Telephone Number: 203-830-3532
Fax Number : 203-830-3554

Appendix A

Hardware Part Numbers

HARDWARE	PART NUMBER
McIAS 1610 Assembly	44320240
Single Board Computer (SBC)/Alarm Transition Board Assembly	
1610/68 4M RAM	43319340
1610/68 8M RAM	43316650
1610/68 32M RAM	43313970
Single Board Computer (SBC)/Alarm Transition Board Assembly	
1610/IP 32M RAM	43318240
1610/IP 64M RAM	43323660
4-wire E&M Interface Board (McTi-8E)	44309910
Ring-Trip Interface Board (McTi-8R)	44311420
2-wire Loop Reversal Interface Board (McTi-8L)	44327070
T1 Interface Board (McTi-24)	44311410
T1 Interface Board with power off switch (McTi-24)	44321720 or 44338180
E1 Interface Board (McTi-30)	44313020
One of the following Drive Shuttle Assemblies:	
Standard Drive Shuttle	44316000
Standard Drive Shuttle II	44336400
Large Drive Shuttle	44315870
Large Drive Shuttle II	44336410
Power Supply Board	44303220
Backup/Restore Cartridge Disk (68 Series)	41314960
Backup/Restore Cartridge Disk (IP Series)	41322870
Fan Assembly	43316040
Air Filter	42310970
McIAS 1610/IP LAN Options:	
Ethernet 10Base2 LAN	42316100
Ethernet 10BaseT LAN	42318270
Ethernet AUI LAN	42318280
Digital Connector Block	42302460
Analog Connector Block	43124600

Hardware Part Numbers (cont.)

HARDWARE	PART NUMBER
19" Mounting Brackets*	40316350
21" Mounting Brackets*	40316460
23" Mounting Brackets*	40316360
25" Mounting Brackets*	40316470
26" Mounting Brackets*	40316480
F1 Fuse (3 amp)	70303320
F2 Fuse (1 amp)	70303310
F3 Fuse (1 amp)	70316130
SCSI Terminator	70318900

* Two of each are required and are packaged together as a kit.

Appendix B

Critical Spares List

HARDWARE	PART NUMBER
One of the following:	
Single Board Computer (SBC)/Alarm Transition Board Assembly	
1610/68 4M RAM	43319340
1610/68 8M RAM	43316650
1610/68 32M RAM	43313970
Single Board Computer (SBC)/Alarm Transition Board Assembly	
1610/IP 32M RAM	43318240
1610/IP 64M RAM	43323660
One of the following:	
4-wire E&M Interface Board (McTi-8E)	44309910
Ring-Trip Interface Board (McTi-8R)	44311420
2-wire Loop Reversal Interface Board (McTi-8L)	44327070
T1 Interface Board (McTi-24)	44311410
T1 Interface Board with power off switch (McTi-24)	44321720 or 44338180
E1 Interface Board (McTi-30)	44313020
Power Supply Board	44303220
One of the following Drive Shuttle Assemblies:	
Standard Drive Shuttle	44316000
Standard Drive Shuttle II	44336400
Large Drive Shuttle	44315870
Large Drive Shuttle II	44336410
Model 2513 Removable Drive Cleaning Kit	40331020
Model 2513 Removable Media Cleaning Kit	40331260
Backup/Restore Cartridge Disk (68 Series)	41314960
Backup/Restore Cartridge Disk (IP Series)	41322870
Fan Assembly	43316040
Air Filter	42310970
If LAN Option is installed, one of the following (as applicable):	
Ethernet 10Base2 LAN	42316100
Ethernet 10BaseT LAN	42318270
Ethernet AUI LAN	42318280

McIAS™ 16xx Series

TELEPHONY INTERFACE BOARDS AND TRUNK CONNECTIONS

MANUAL

Cognitronics Corporation
3 Corporate Drive
Danbury, CT 06810

Rev. 6.04
41315000

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List of Tables

1.0 McIAS 16xx Series Telephony Interface Boards - Overview

This manual pertains to the telephony interface boards that can be installed in McIAS 16xx Series systems. The McIAS 16xx Series currently consists of the McIAS 1685, McIAS 1607, McIAS 1610 and McIAS 1623/IP.

Depending on the type of Single Board Computer (SBC) installed, the McIAS 1607 can be configured as a McIAS 1607/68 or McIAS 1607/IP; likewise, the McIAS 1610 can be configured as a McIAS 1610/68 or McIAS 1610/IP. Refer to Appendix A for SBC board descriptions. Throughout this manual, all references to the McIAS 1607 and McIAS 1610 apply to both configurations, unless otherwise specified.

McIAS 1607 and 1610 can be configured with either analog or digital telephony interface boards. McIAS 1685 provides only an analog connection. McIAS 1623/IP provides only digital connections.

Analog connections are provided through the use of McTi-8E (4-wire E&M), McTi-8R (Ring-Trip) or McTi-8L (Loop Reversal) boards. Each McTi board slot is associated with a trunk connector located on the backplane through which connection is made to the telephone company trunks. Cognitronics recommends, in a McIAS 1610, that analog McTi boards are installed in the lowermost slots followed by digital McTi boards, in ascending order. Board addresses are set according to Table 4-1 or Table 4-2.

Digital connections are provided using McTi-24 (T1) boards which supply 24 voice ports each or McTi-30 (E1) boards which supply 30 voice ports each. As an option, the McIAS 1623/IP also allows the installation of up to two of the following boards: McTi-24MR digital T1 board, McTi-30MR digital E1 board, V/S24T1 digital T1 board or V/S30E1 digital E1 board.

McIAS 16xx/IP systems configured with McTi-24 boards Rev. 1 (and newer) and/or McTi-MR boards allow the replacement (hot swap) of one McTi board with another by powering down only the McTi board and not the entire system. Refer to the McIAS 16xx/IP System Operation Manual (P/N 41318310) for detailed information.

Note: McIAS 16xx/68 systems do not allow the hot swap of McTi boards; the entire McIAS 16xx/68 system must be powered down before McTi boards are replaced.

The table below describes the interface characteristics of each type of telephony interface board.

Interface Characteristics

Digital McTi-24 or McTi-30 Boards:

Trunk Interface: 24-channel T1 or 30-channel E1

Telco Connection: DB15F (male required)

Digital (Audio) Output Level: + 4 dBm (maximum)

Analog McTi Boards:

Trunk Interface: Subscriber Line, 4-wire E&M connection, or 2-wire Loop Reversal

Telco Connection: 25-pair (50-pin) telco type (male required)

DTMF Level Input (Subscriber only): 0 to -25 dBm

Audio Output Level:
+ 1 dB over recorded input level at Subscriber Line Tip & Ring

Audio Frequency Response: 300 Hz to 3000 Hz

Audio Channel Crosstalk: less than 55 dBrn

McTi-24MR Boards

Trunk Interface: 24-channel T1

Telco Connection: T1 - DB15F (male required), RJ-48C

V/S24T1 or V/S30E1 Board

Trunk Interface: 24-channel T1 or 30-channel E1

Telco Connection: T1 - DB15F (male required), RJ-48C
E1 - DB15F (male required), RJ-48C

Digital (Audio) Output Level: + 4 dBm (maximum)

2.0 McTi Digital Telephony Connections (McIAS 1607, 1610 and 1623/IP only)

The following sub-sections describe the process of connecting McTi-24 and McTi-30 boards from the McIAS unit to telephone company equipment. (If applicable, see Section 2.9 for information about connecting the optional McTi-MR boards or Section 2.8 for information about optional V/S24T1 and V/S30E1 connections.)

2.1 McTi-24 Digital Connections

DB15F (female) connectors, located on the back of the McIAS, are used to connect each McTi-24 board to the telco trunks. The channels associated with each digital connector are discussed in Section 2.3.

The table below lists the DB15F pin connections.

1. Transmit (Tip) XMIT1
2. Not used
3. Receive (T1) RCV1
4. Not used
5. Not used
6. Not used
7. Not used
8. Not used
9. Transmit (Ring) XMIT2
10. Not used
11. Receive (R1) RCV2
12. Reserved
13. Reserved
14. Reserved
15. Frame

Table 2-1
McTi-24 Digital Telephony Connections

Note: It is a good practice to test internal McTi-24 connections using a loopback connector (DB15M male) attached directly to the digital backplane connector with pins 1 & 3 and 9 & 11 jumpered together. A successful test will result in the illumination of the green NORMAL LED on the front panel of the McTi-24 board installed in the slot associated with the connector being tested.

2.2 McTi-30 Digital Connections

DB15F (female) connectors located on the back of the McIAS are used to connect a McTi-30 board to the telco E1 facility. An optional conversion cable may be required for connection to the telco (see Section 2.2.1). The channels associated with each digital connector are discussed in Section 2.3.

The table below lists the DB15F pin connections.

1. Transmit (XMIT1)
2. Not used
3. Receive (RCV1)
4. Not used
5. Not used
6. Not used
7. Not used
8. Not used
9. Transmit (XMIT2)
10. Not used
11. Receive (RCV2)
12. Reserved
13. Reserved
14. Reserved
15. Frame

Table 2-2
McTi-30 Digital Telephony Connections

2.2.1 DB15 to BNC Conversion Cable (optional)

An optional 75 ohm coaxial conversion cable with female BNC connector is available for connecting the McIAS to the telco E1 facility. At one end, the cable must be attached to a DB15F (female) connector on the McIAS backplane and at the other end to the Cross Connect Point (BNC) at the telco.

One of the McIAS female BNC connectors on the cable is labeled "McIAS Transmit (1 & 9)"; the other is labeled "McIAS Receive (3 & 11)". Connection must be made from the McIAS Transmit female connector to the Cross Connect Point BNC male Receive connector. Connection must also be made from the McIAS Receive female connector to the Cross Connect Point BNC male Transmit connector.

The table below lists the conversion cable pin connections.

DB15F (McIAS backplane)	Conversion Cable BNC (female)	Cross Connect Point BNC (male)	Conductor
1	XMIT1	Telco Receive	center
9	XMIT2	Telco Receive	shield
3	RCV1	Telco Transmit	center
11	RCV2	Telco Transmit	shield

Table 2-3
DB15 to BNC Conversion Cable Pin Connections

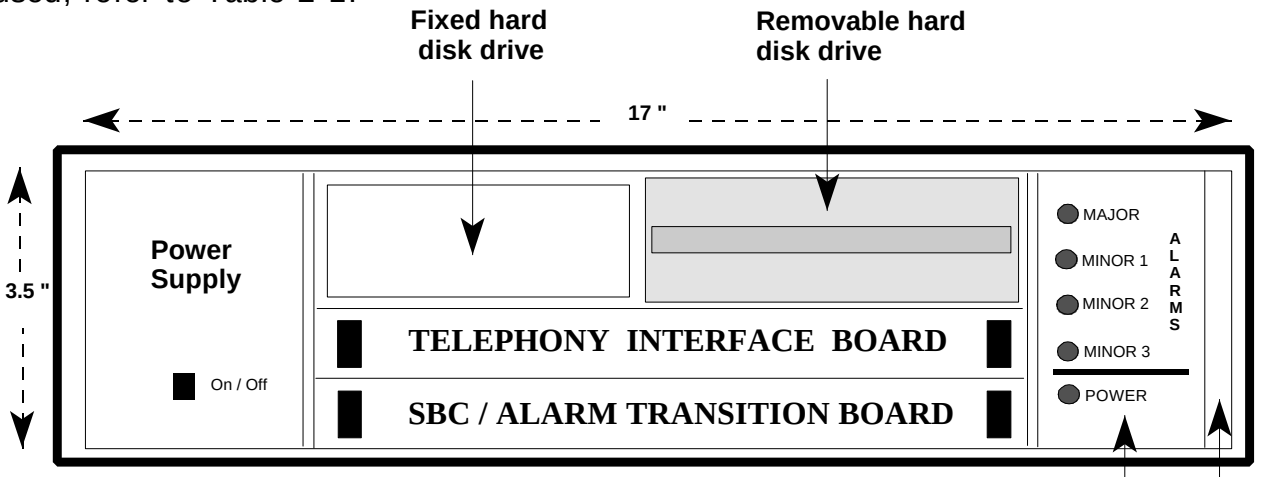
2.3 McIAS Digital (DB15F) Connectors (McTi-24 & McTi-30)

The sub-sections to follow describe the correspondence between the McTi-24/McTi-30 digital connectors on the McIAS backplane with McTi boards installed in the McIAS card file. The connectors are "DB15-Female".

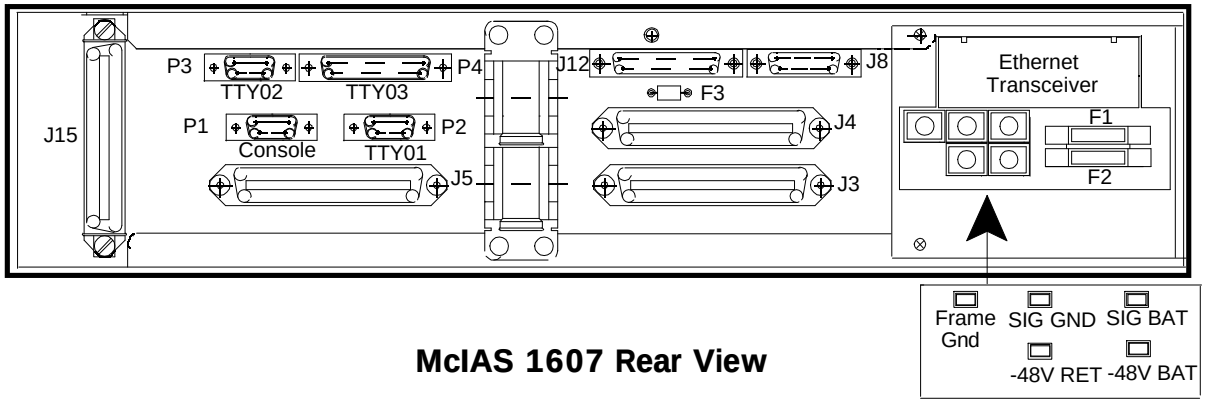
2.3.1 McIAS 1607 Digital Connector

McIAS 1607 pin connections pertain to the channels coming from the McTi-24 or McTi-30 board installed in the slot located directly above the SBC board. See McIAS 1607 front view below. This slot corresponds to digital connector J8. See McIAS 1607 rear view below.

Note: If a connector block is used, refer to Table 2-4; if a connector block is not used, refer to Table 2-1.



McIAS 1607 Front View



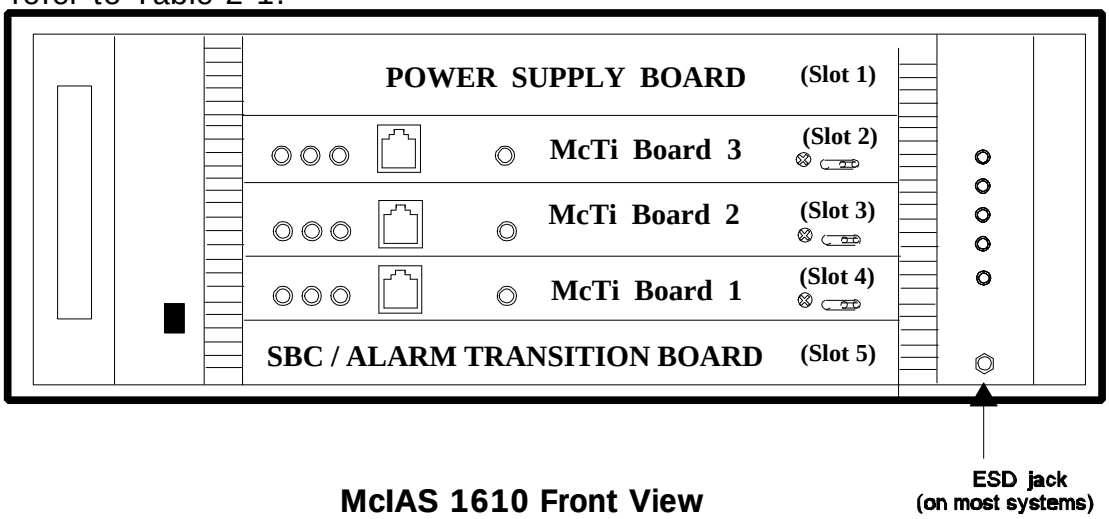
McIAS 1607 Rear View

2.3.2 McIAS 1610 Digital Connectors

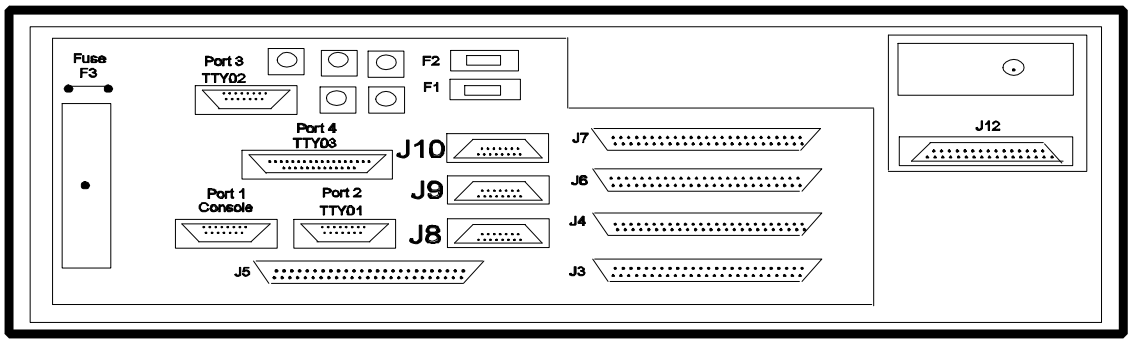
McIAS 1610 pin connections pertain to the channels coming from the McTi board(s) installed in Slots 4, 3 and 2. Slot 4 corresponds to digital connector J8, Slot 3 corresponds to J9 and Slot 2 corresponds to J10. For installations that are exclusively configured with digital McTi boards, channels would be distributed as follows:

McTi-24:	J8 (board in Slot 4)	= Channels 1-24
	J9 (board in Slot 3)	= Channels 25-48
	J10 (board in Slot 2)	= Channels 49-72
McTi-30:	J8 (board in Slot 4)	= Channels 1-30
	J9 (board in Slot 3)	= Channels 31-60
	J10 (board in Slot 2)	= Channels 61-90

Note: If a connector block is used, refer to Table 2-4; if a connector block is not used, refer to Table 2-1.



McIAS 1610 Front View



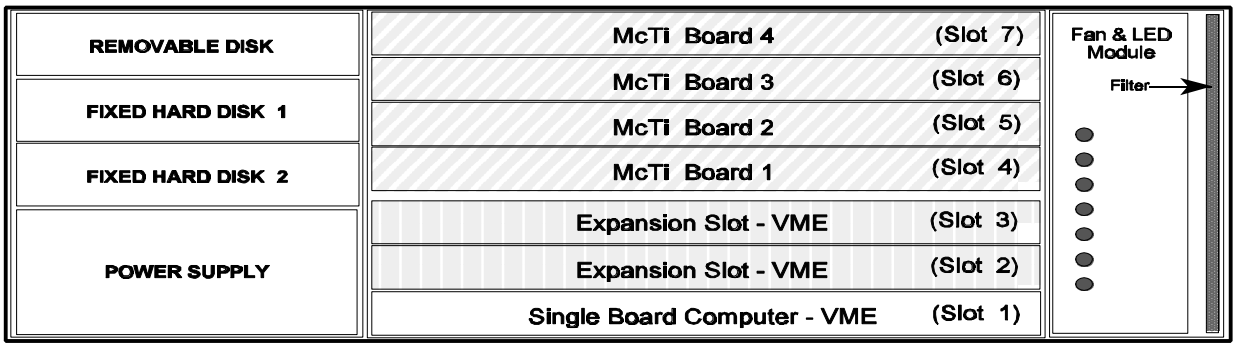
McIAS 1610 Rear View

2.3.3 McIAS 1623/IP Digital Connectors

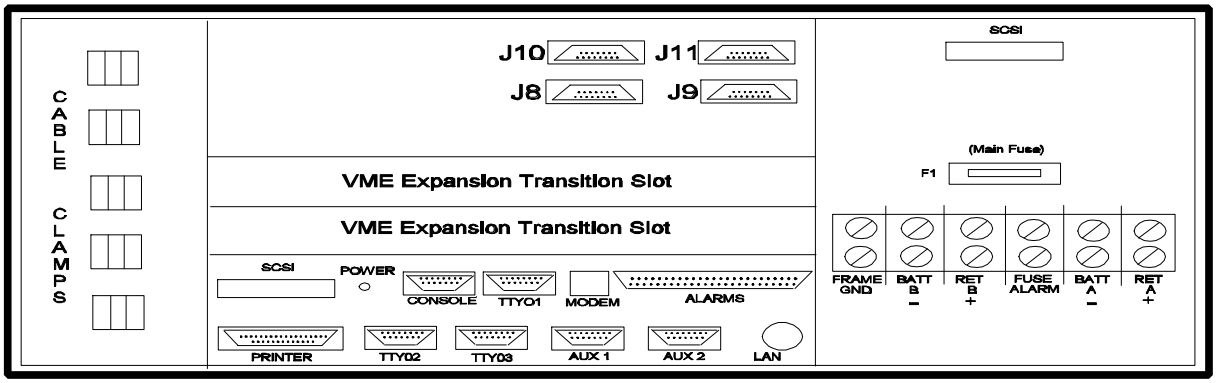
The McIAS 1623/IP pin connectors described in this section pertain to the channels coming from the McTi boards installed in Slots 4, 5, 6 and 7. Slot 4 corresponds to digital connector J8, Slot 5 corresponds to J9, Slot 6 corresponds to J10, and Slot 7 corresponds to J11. Channels are distributed as follows:

McTi-24:	J8 (board in Slot 4)	= Channels 1-24
	J9 (board in Slot 5)	= Channels 25-48
	J10 (board in Slot 6)	= Channels 49-72
	J11 (board in Slot 7)	= Channels 73-96
McTi-30:	J8 (board in Slot 4)	= Channels 1-30
	J9 (board in Slot 5)	= Channels 31-60
	J10 (board in Slot 6)	= Channels 61-90
	J11 (board in Slot 7)	= Channels 91-120

Note: If a connector block is used, refer to Table 2-4; if a connector block is not used, refer to Table 2-1.



McIAS 1623/IP Front View



McIAS 1623/IP Rear View

2.4 McIAS 16xx Digital Connector Block (optional)

A digital connector block can be used to provide digital telco connections as indicated in the table below. J5A, J5B, J5C, J5D and J5E correspond to DB15F (female) backplane connectors as appropriate to your system.

DB15F Connector	Connector Block
J5A	
1	
9	1 T1 S1 XMT1
3	26 T1 S1 XMT2
11	2 T1 S1 RCV1
	27 T1 S1 RCV2
J5B	
1	
9	5 T1 S2 XMT1
3	30 T1 S2 XMT2
11	6 T1 S2 RCV1
	31 T1 S2 RCV2
J5C	
1	
9	9 T1 S3 XMT1
3	34 T1 S3 XMT2
11	10 T1 S3 RCV1
	35 T1 S3 RCV2
J5D	
1	
9	13 T1 S4 XMT1
3	38 T1 S4 XMT2
11	14 T1 S4 RCV1
	39 T1 S4 RCV2
J5E	
1	17 T1 S5 XMT1
9	42 T1 S5 XMT2
3	18 T1 S5 RCV1
11	43 T1 S5 RCV2

Table 2-4
McIAS 16xx Digital Connector Block
McTi-24 Pin Assignments

2.4.1 McTi-24 Digital Internal Test Connections

There are two methods of testing McTi-24 internal connections. One method is to use a loopback connector (DB15M male) attached directly to the digital backplane connector with pins 1 & 3 and 9 & 11 jumpered together. The second method is listed below for each type of system.

A successful test will result in the illumination of the green NORMAL LED on the front of the McTi-24 board associated with the connector being tested.

McIAS 1607
Use the digital connector block with pins 1 & 2 and 26 & 27 jumpered together.

McIAS 1610
Jumper the following pins together on the Digital Connector Block for the board(s) installed in the slots indicated:

Slot 4	Slot 3	Slot 2
pins 1-2	pins 5-6	pins 9-10
pins 26-27	pins 30-31	pins 34-35

McIAS 1623/IP
Jumper the following pins together on the Digital Connector Block for the board(s) installed in the slots indicated:

Slot 4	Slot 5	Slot 6	Slot 7
pins 1-2	pins 5-6	pins 9-10	pins 13-14
pins 26-27	pins 30-31	pins 34-35	pins 38-39

2.5 Digital Signaling

2.5.1 McTi-24 Signaling

The McTi-24 telephony interface board(s) require a DS-1 (1.544 Mb) facility from the central office switch. The DS-1 signal must emulate a 4-wire E&M circuit or be configured for D3/D4 superframe format with E&M robbed-bit (A,B) signaling. Digital signal states are shown below.

	2- OR 4-WIRE E&M EMULATION				
	TRMT @ to McIAS		RCV @ from McIAS		
E&M INPUT	A	B	A	B	E&M OUTPUT
M-LEAD GRD OR OPEN	0	0	*	*	*
M-LEAD BATTERY	1	1	*	*	*
	*	*	*	*	0 E-LEAD OPEN
	*	*	*	*	1 E-LEAD GRD OR LOOPED

NOTES: @ Signaling channel states in the DS-1 Signal.
* Designates either 1 or 0.

Table 2-7
McTi-24 Digital Signal States

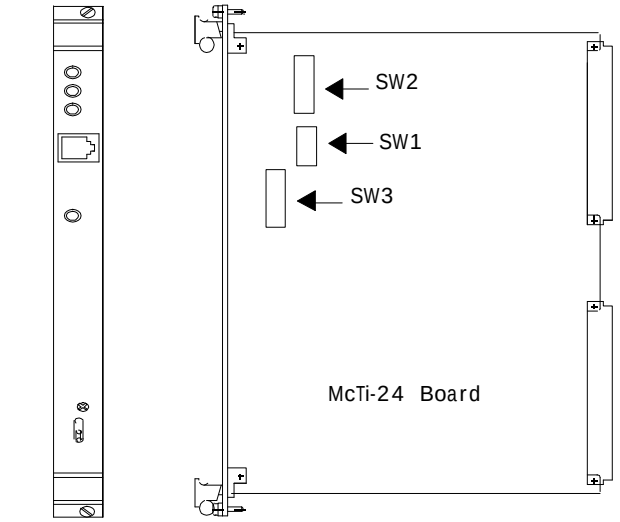
2.5.2 McTi-30 Signaling

The McTi-30 telephony interface board(s) require a CEPT PCM-30 format at 2.048 Mbps with 16 frames per multiframe and 32 time slots per frame. ABCD common channel signaling is supported in time slot 16.

2.6 McTi-24 T1 Facility Distance Compensation

Each McTi-24 board is equipped with a bank of dip switches (SW2) which allows compensation for the cable length between the originating T1 facility or repeater and the McIAS unit. The illustration below indicates the location of this switch bank and the available cable lengths.

CAUTION: The components on the assembly are sensitive to electrostatic discharge (ESD). Use an ESD protected environment and procedure when working with the boards.



Front Panel View

T1 Cable Distance Compensation			
One Way Distance Between McIAS and Switch (in feet)	SW2 Dip Switch Settings 1	2	3
0 - 110 *	ON	ON	ON
111 - 220	OFF	ON	ON
221 - 330	ON	OFF	ON
331 - 440	OFF	OFF	ON
441 - 550	ON	ON	OFF
551 - 660	OFF	ON	OFF

* Factory setting (minumum distance compensation).
Loopback requires minimum distance compensation.

NOTE: All other settings on SW2 must remain in the default position (all OFF).

2.7 McTi-24/McTi-30 Board LED Descriptions

LED LOCATION	LED COLOR	LED NAME	DESCRIPTION WHEN LIT
T1 Board (McTi-24)	Red	RA	Received red alarm. Indicates that McIAS is unable to synchronize to the signal received from the switch. May indicate a loss of signal or an unframed signal (e.g. AIS/Blue Alarm).
	Yellow	RY	Yellow alarm signal received from the switch.
	Green	NORM	Indicates normal operation.
	Green	Activity	As calls are received, indicates line activity. Blinking will accelerate as the number of calls increases. If all lines are idle, will pulse at a rate of 2 seconds on, 2 seconds off.
E1 Board (McTi-30)	Red	MR	McIAS unable to synchronize to Multi-frame level.
	Yellow	MY	McIAS receiving Multi-frame yellow alarm from switch.
	Red	FR	Indicates that McIAS is unable to synchronize to the signal received from the switch. May indicate a loss of signal or an unframed signal (e.g. AIS/Blue Alarm).
	Yellow	FY	McIAS receiving a yellow alarm signal from the switch.
	Red	LOC	McIAS receiving no signal from the switch.
	Yellow	AIS	Indicates that the switch is receiving no signal from McIAS.

Table 2-8
McTi-24 / McTi-30 LED Indicator Functions

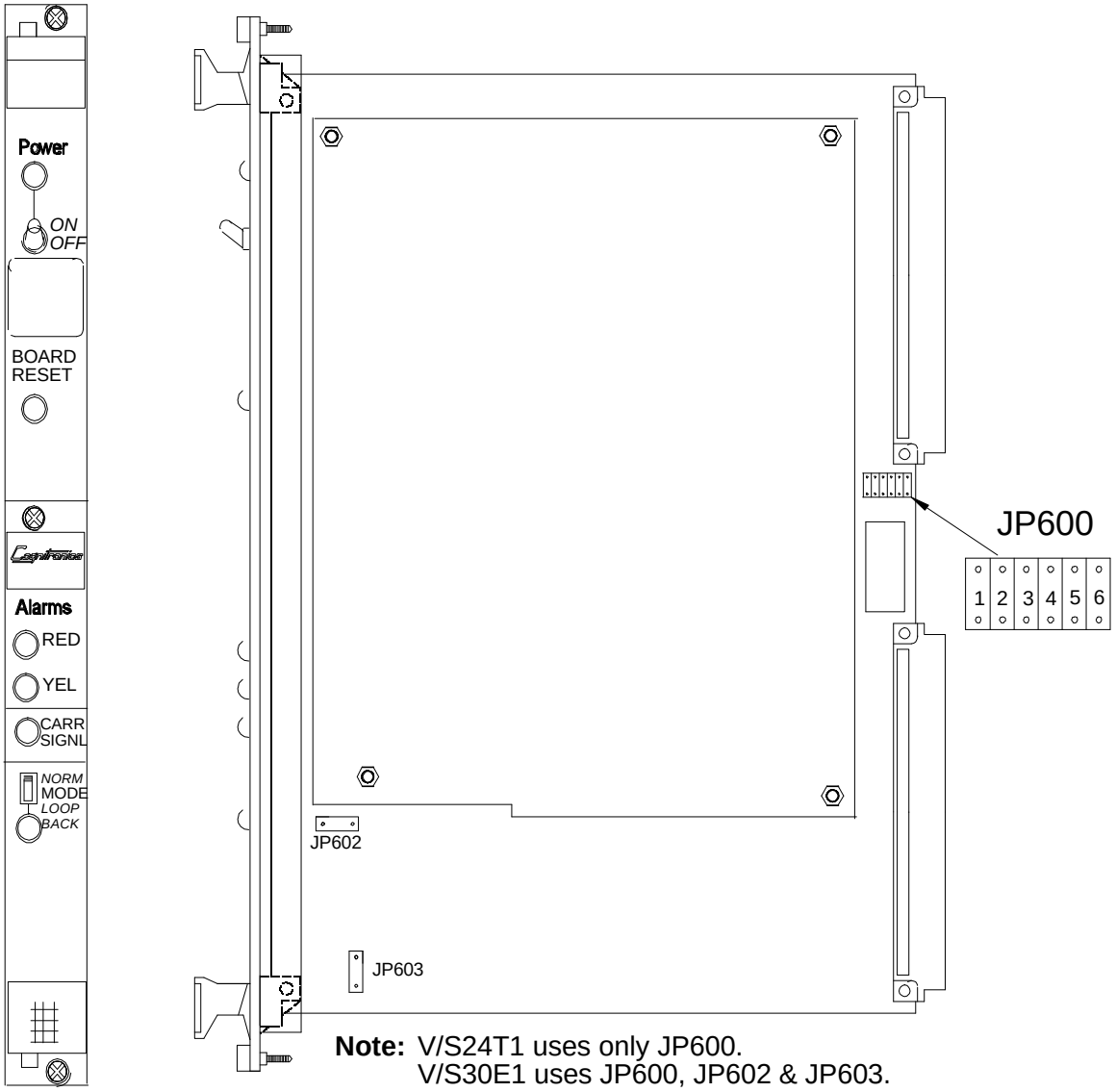
2.8 V/S24T1 & V/S30E1 Telephony Interface Boards (Optional) (McIAS 16xx/IP systems only)

Warning! *Never* turn the power switch on the front panel of the V/S24T1 or V/S30E1 board to the OFF position. This switch *must always* remain in the ON position.

The following sub-sections describe the optional V/S24T1 or V/S30E1 digital telephony interface boards.

2.8.1 Board Description

The front panel and top view of the V/S24T1 and V/S30E1 boards are shown below.



Note: V/S24T1 uses only JP600.
V/S30E1 uses JP600, JP602 & JP603.

2.8.2 Setting the Board Identification Number (V/S24T1 & V/S30E1)

Each V/S24T1 or V/S30E1 board installed in the McIAS 16xx/IP must have a unique board identification number which is set up using JP600 (shown below). If a board is determined to be faulty and must be replaced, it is essential for the new board to have the same board ID as the board that was removed. Use the switch settings on the faulty board as a guide for setting the switches on the new board. **Do not set two boards to the same board ID number.**

The following table indicates the proper JP600 jumper settings to identify each board:

JP600 Jumper Settings (V/S24T1 & V/S30E1)

	1	2	3	4	5	6
V/S Board 1 (McIAS 1607/IP, 1610/IP & 1623/IP)	in	out	out	out	out	in
V/S Board 2 (McIAS 1623/IP only)	out	in	out	out	out	in

Recommendation: See diagrams in Section 2.8.4.3 for slot locations.
*McIAS 1607/IP & 1610/IP: Install V/S board in the slot directly above the SBC.
McIAS 1623/IP: Install V/S Board 1 in Slot 2 and Board 2 (if applicable) in Slot 3.

***Note:** To use a V/S24T1 or V/S30E1 board, McIAS 1607/IP & 1610/IP require the installation of the "2 + 2 Module."

2.8.3 Grounding One Side of the Transmit/Receive Lines (V/S30E1 only)

The DTI circuitry on the V/S30E1 board is shipped with jumpers installed so that one side of the transmit and receive lines of the DB15F connector is grounded. If desired, to change the grounding configuration, refer to the following table:

DB15F Connector	Direction	Ground	Jumper	Setting
Pin 9	transmit	grounded	JP602	in
Pin 9		not grounded	JP602	out
Pin 11	receive	grounded	JP603	in
Pin 11		not grounded	JP603	out

2.8.4 V/S24T1 & V/S30E1 Telephony Connections

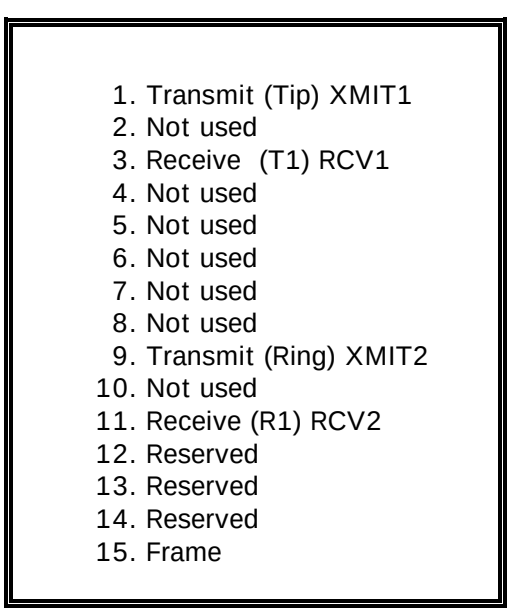
2.8.4.1 V/S24T1 Connections

One V/S24T1 board can be installed in the McIAS 1607/IP or McIAS 1610/IP in the slot directly above the SBC. **Note:** The McIAS 1607/IP and 1610/IP require the installation of the "2 + 2 Module" for use with the V/S24T1 board. To connect the V/S24T1 board installed in the McIAS 1607/IP or 1610/IP to the telco, use J8, the DB15F (female) connector located on the back of the McIAS.

Up to two V/S24T1 digital telephony interface boards may be installed in the VME expansion slots of the McIAS 1623/IP. For each V/S24T1 board installed in the McIAS 1623/IP, use one of the following connectors located on the back of the McIAS (Slot 2 or Slot 3) to connect to the telco: either the DB15F (female) connector or the RJ-48C connector.

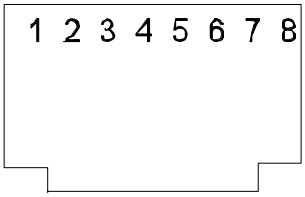
A diagram showing these connectors and the channels associated with each connector are provided in Section 2.8.4.3.

Pin connections for the V/S24T1 are as follows:



DB15F Connections
(McIAS 1607/IP, 1610/IP & 1623/IP)

OR



RJ-48C

Pin descriptions:
1 RCV_RING
2 RCV_TIP
3 UNUSED
4 XMIT_RING
5 XMIT_TIP
6 UNUSED
7 CHASSIS GROUND
8 CHASSIS GROUND

(McIAS 1623/IP only)

2.8.4.2 V/S30E1 Connections

One V/S30E1 board can be installed in the McIAS 1607/IP or McIAS 1610/IP in the slot directly above the SBC. **Note:** The McIAS 1607/IP and 1610/IP require the installation of the "2 + 2 Module" for use with the V/S30E1 board. To connect the V/S30E1 board installed in the McIAS 1607/IP or 1610/IP to the telco, use J8, the DB15F (female) connector located on the back of the McIAS.

Up to two V/S30E1 digital telephony interface boards may be installed in the VME expansion slots of the McIAS 1623/IP. For each V/S30E1 board installed in the McIAS 1623/IP, use one of the following connectors located on the back of the McIAS (Slot 2 or Slot 3) to connect to the telco: either the DB15F (female) connector or the RJ-48C connector.

A diagram showing these connectors and the channels associated with each connector are provided in Section 2.8.4.3.

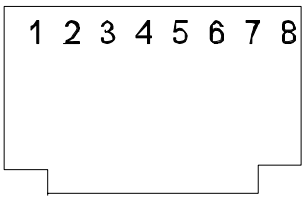
Note: An optional conversion cable may be required for connection to the telco (see Section 2.2.1).

Pin connections for the V/S30E1 are as follows:

1. Transmit (Tip) XMIT1
2. Not used
3. Receive (T1) RCV1
4. Not used
5. Not used
6. Not used
7. Not used
8. Not used
9. Transmit (Ring) XMIT2
10. Not used
11. Receive (R1) RCV2
12. Reserved
13. Reserved
14. Reserved
15. Frame

DB15F Connections
(McIAS 1607/IP, 1610/IP & 1623/IP)

OR



RJ-48C

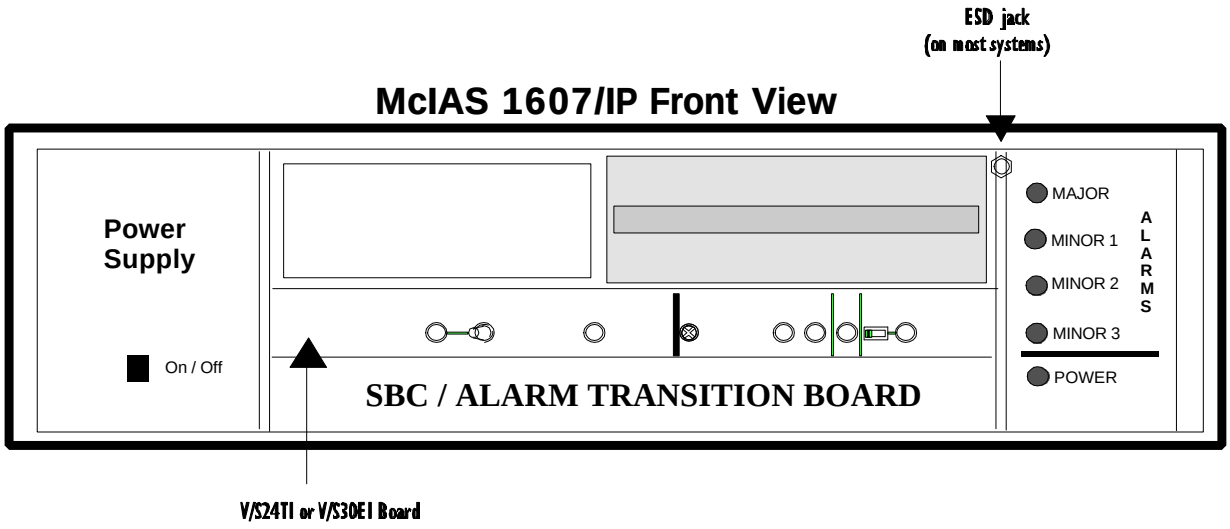
Pin descriptions:
1 RCV_RING
2 RCV_TIP
3 UNUSED
4 XMIT_RING
5 XMIT_TIP
6 UNUSED
7 CHASSIS GROUND
8 CHASSIS GROUND

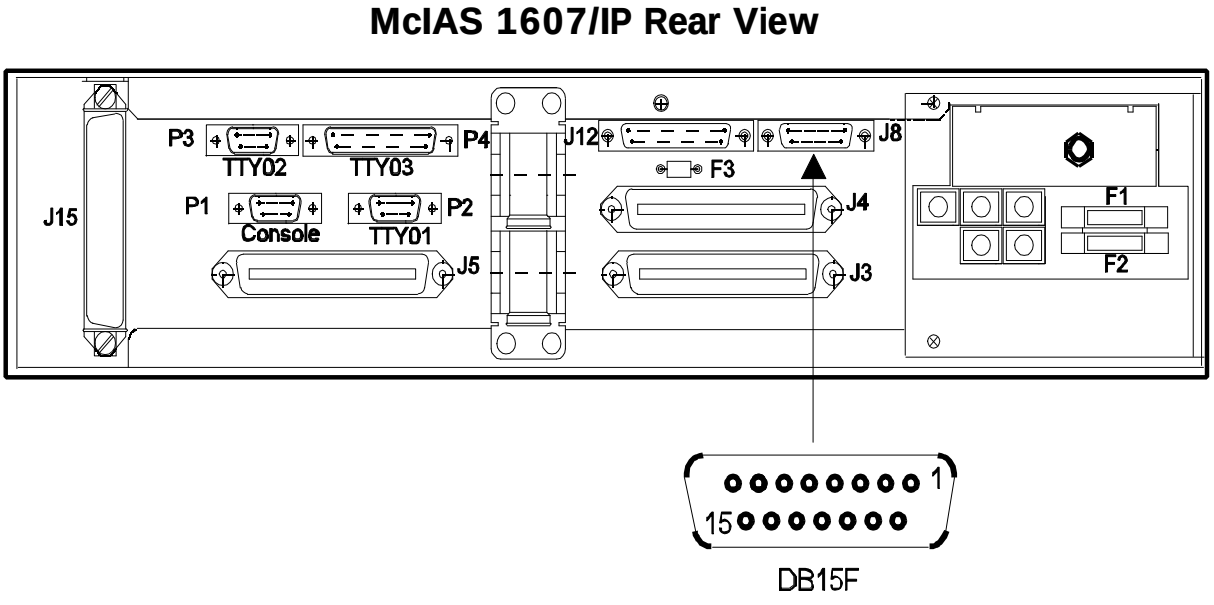
(McIAS 1623/IP only)

2.8.4.3 McIAS 16xx/IP Connectors

McIAS 1607/IP

The DB15F connector (J8) shown below in the diagram of the McIAS 1607/IP backplane is associated with the 24 channels coming from the V/S24T1 or V/S30E1 board installed in the slot directly above the SBC.

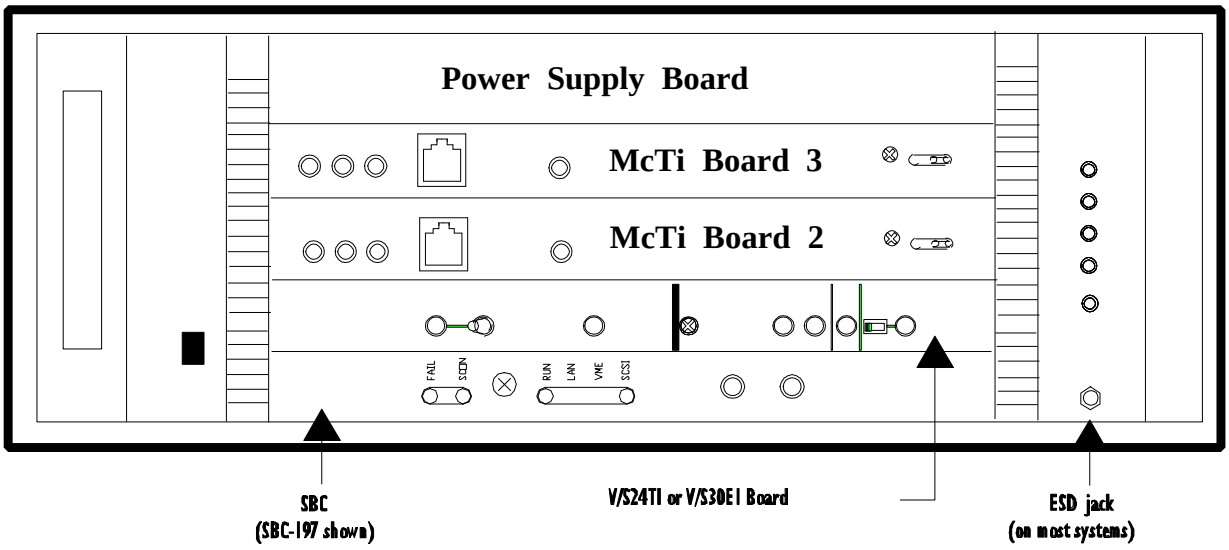




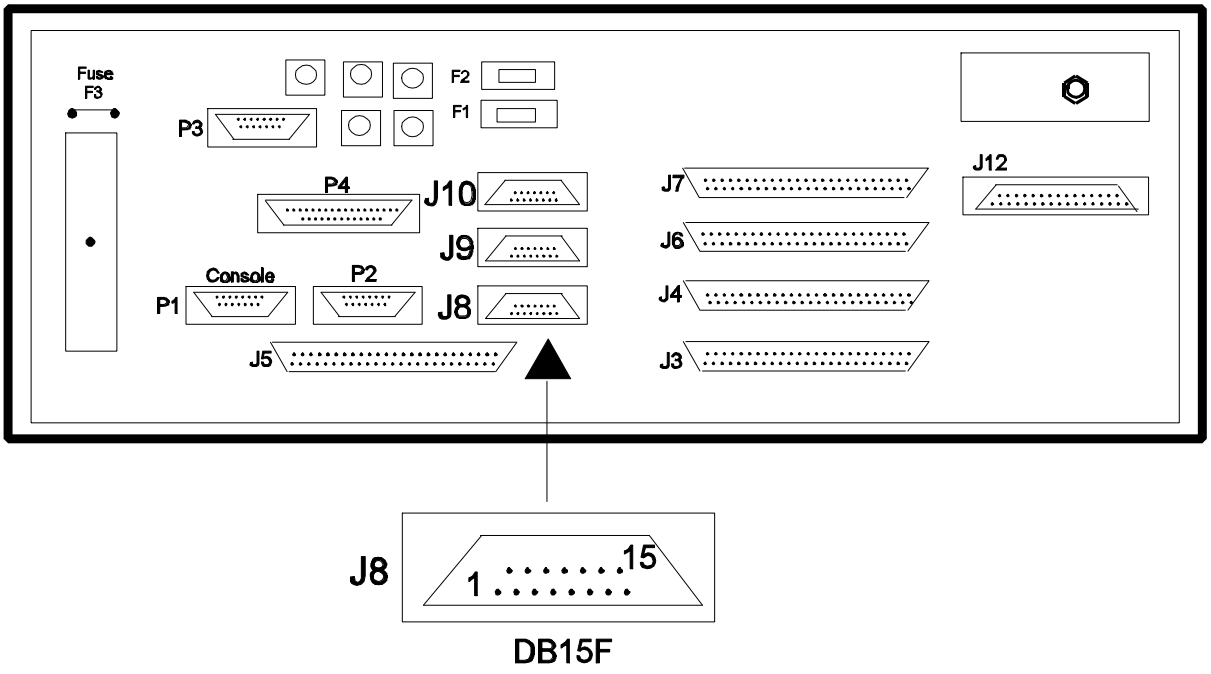
McIAS 1610/IP

The DB15F connector (J8) shown below in the diagram of the McIAS 1610/IP backplane is associated with the 24 channels coming from the V/S24T1 or V/S30E1 board installed in the slot directly above the SBC.

McIAS 1610/IP Front View



McIAS 1610/IP Rear View

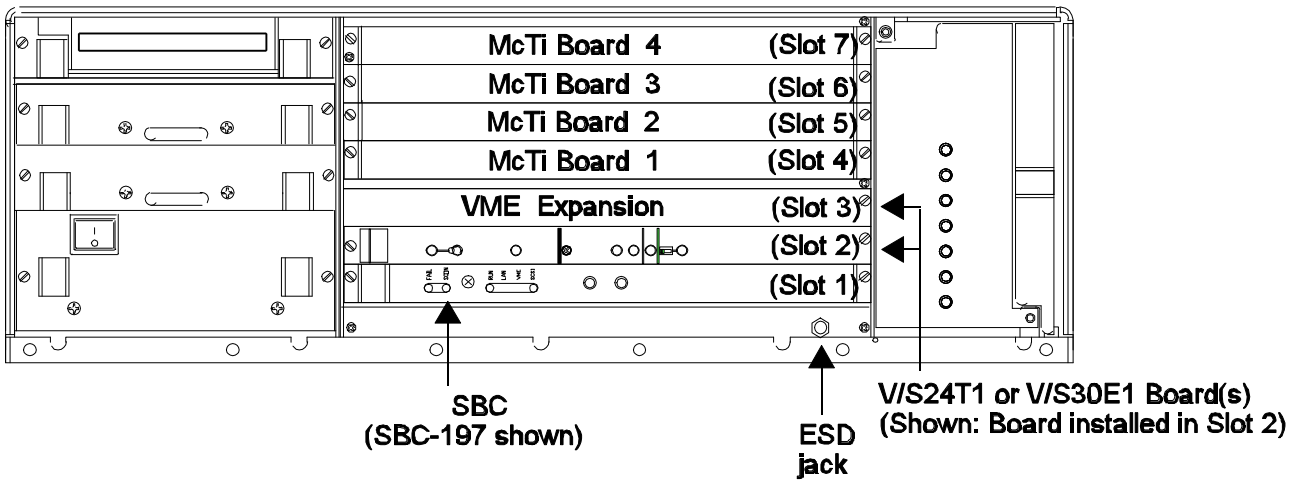


McIAS 1623/IP

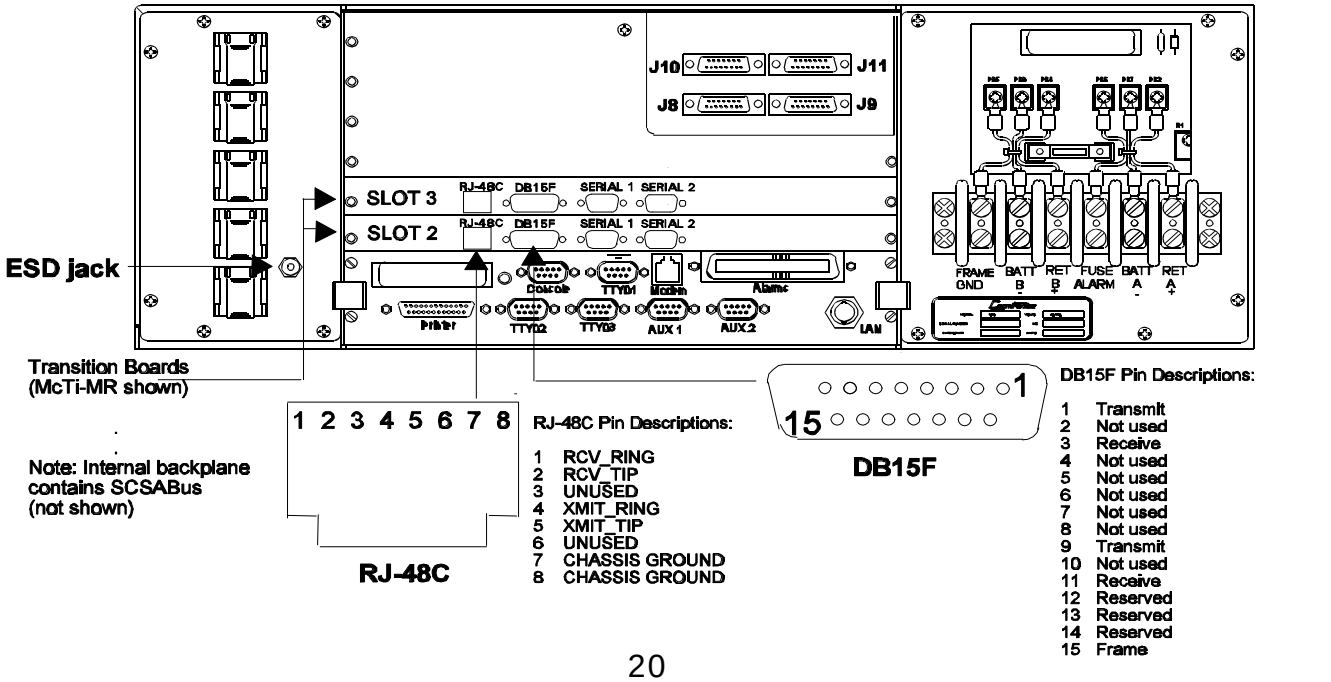
The McIAS 1623/IP DB15F and RJ-48C connectors shown in the diagram below are associated with the channels coming from the V/S24T1 or V/S30E1 board(s) installed in Slots 2 and 3. Connections are made via the Transition Board(s) installed in Slot 2 and/or Slot 3 at the rear of the McIAS 1623/IP. Channels are distributed as follows:

	V/S Board #	Slot #	Channels
Recommended	1	2	1-24
Configuration:	2 (if installed)	3	25-48

McIAS 1623/IP Front View

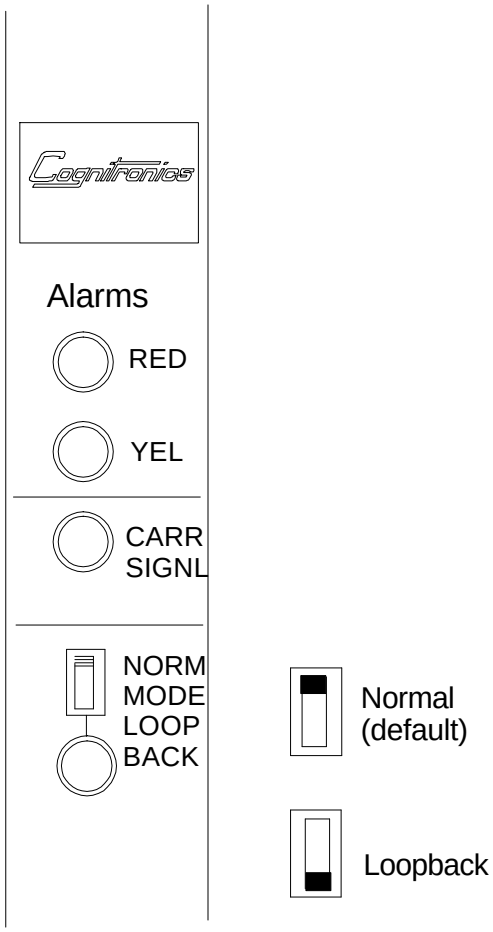


McIAS 1623/IP Rear View



2.8.5 Setting the Remote Loopback Switch

At the factory, V/S24T1 and V/S30E1 boards have the remote loopback switch set to normal mode (default). Once installed, McIAS 16xx/IP T1 and E1 connections may be tested by setting the switch to loopback mode as illustrated below. In loopback mode, if the LED lights red then T1 or E1 connections to the switch are operating properly.



2.8.6 V/S24T1 & V/S30E1 Front Panel LED Indicators

Light emitting diode (LED) indicators on the V/S24T1 and V/S30E1 boards provide information about the state of the board as indicated below.

LED NAME	LED COLOR	DESCRIPTION WHEN LIT
Power	Green	Power to the board has been turned on with the On/Off switch.
Board Reset	Red	Indicates that the board is in reset mode.
Red Alarm	Red	Indicates that McIAS is unable to synchronize to the signal received from the switch.
Yellow Alarm	Yellow	Indicates loss of frame synchronization from the switch.
Carrier Signal	Green	Indicates that the board is powered up and receiving signal from external T1 or E1 facility.
Remote Loopback	Red	Indicates remote loopback switch in "loopback" position and T1 or E1 connections to the switch are operating properly.

Table 2-9
V/S24T1 & V/S30E1 LED Indicator Functions

2.9 McTi-MR (Multi-Resource) Boards (Optional) (McIAS 1623/IP only)

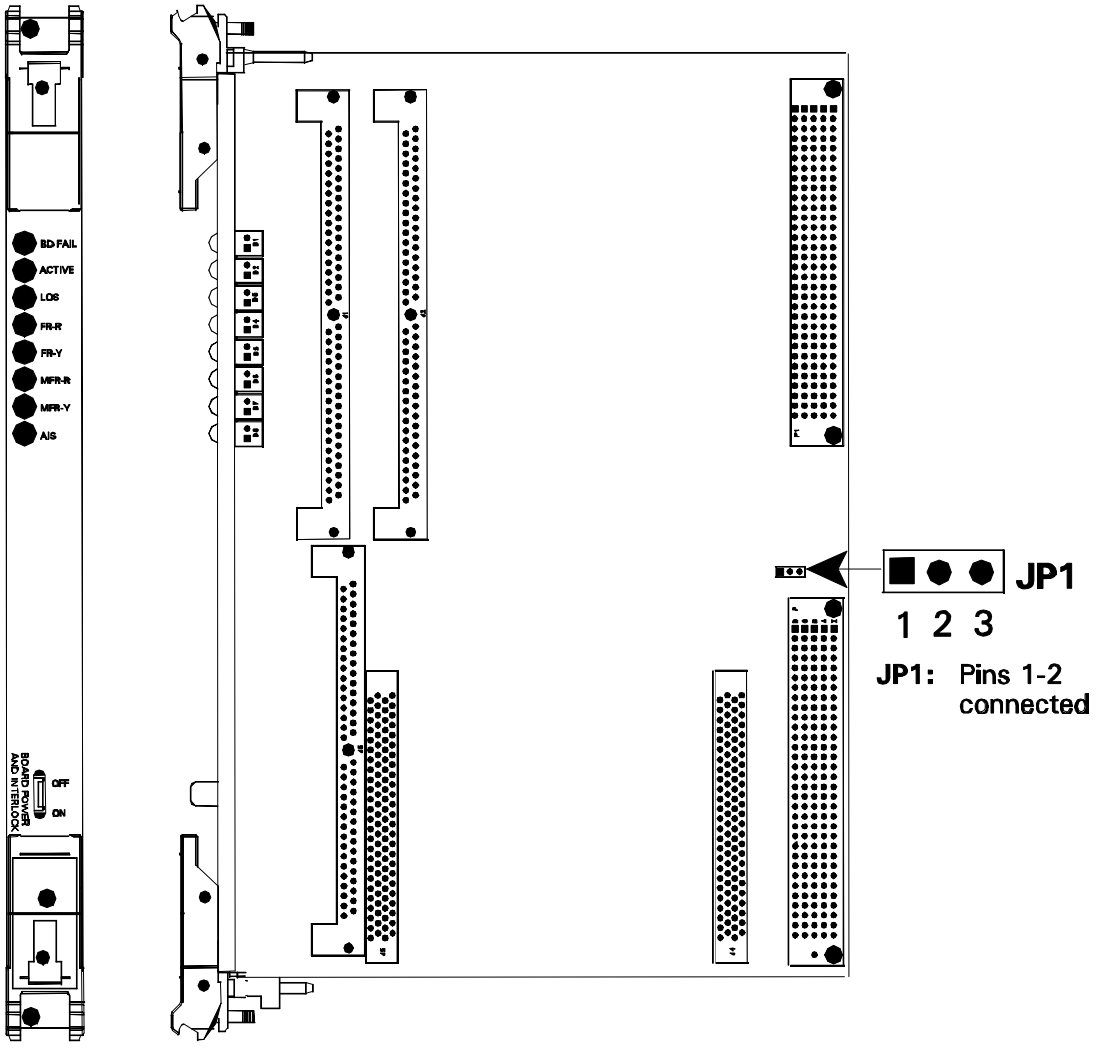
Important! McTi-MR Board 5 and McTi-MR Board 6 may be installed in McIAS 1623/IP Slot 2 and Slot 3, respectively; however, if Board 5 is powered OFF then it must be removed from the unit in order to ensure proper operation of Board 6.

There are two types of McTi-MR digital telephony interface boards available:

McTi-24MR (24 channels)
McTi-30MR (30 channels)

2.9.1 McTi-MR Board Description

The diagram below illustrates the front panel and top view of a McTi-MR board.



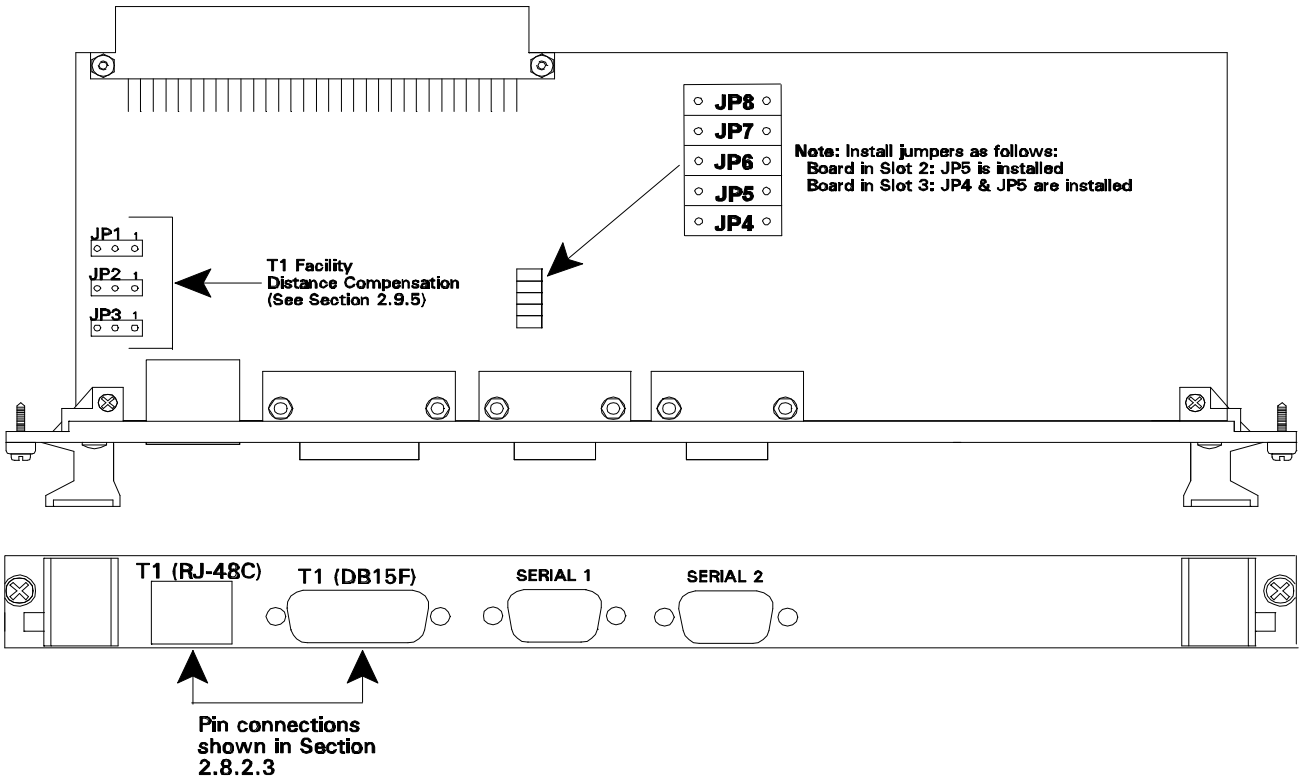
2.9.2 McTi-MR Board Connections

Up to two McTi-24MR or McTi-30MR boards may be installed in McIAS 1623/IP Slot 2 and/or Slot 3. Telephony connections for each board are provided through an associated T1 or E1 Transition Board. The McTi-MR board plugs into the McIAS from the front and its associated transition board plugs into the McIAS from the rear.

Important! If a McTi-MR board is installed in Slot 2, then the corresponding transition board must be installed in Slot 2 from the rear of the unit; if a McTi-MR board is installed in Slot 3, then the corresponding transition board must be installed in Slot 3 from the rear of the unit.

2.9.2.1 McTi-24MR Digital Connections via T1 Transition Board

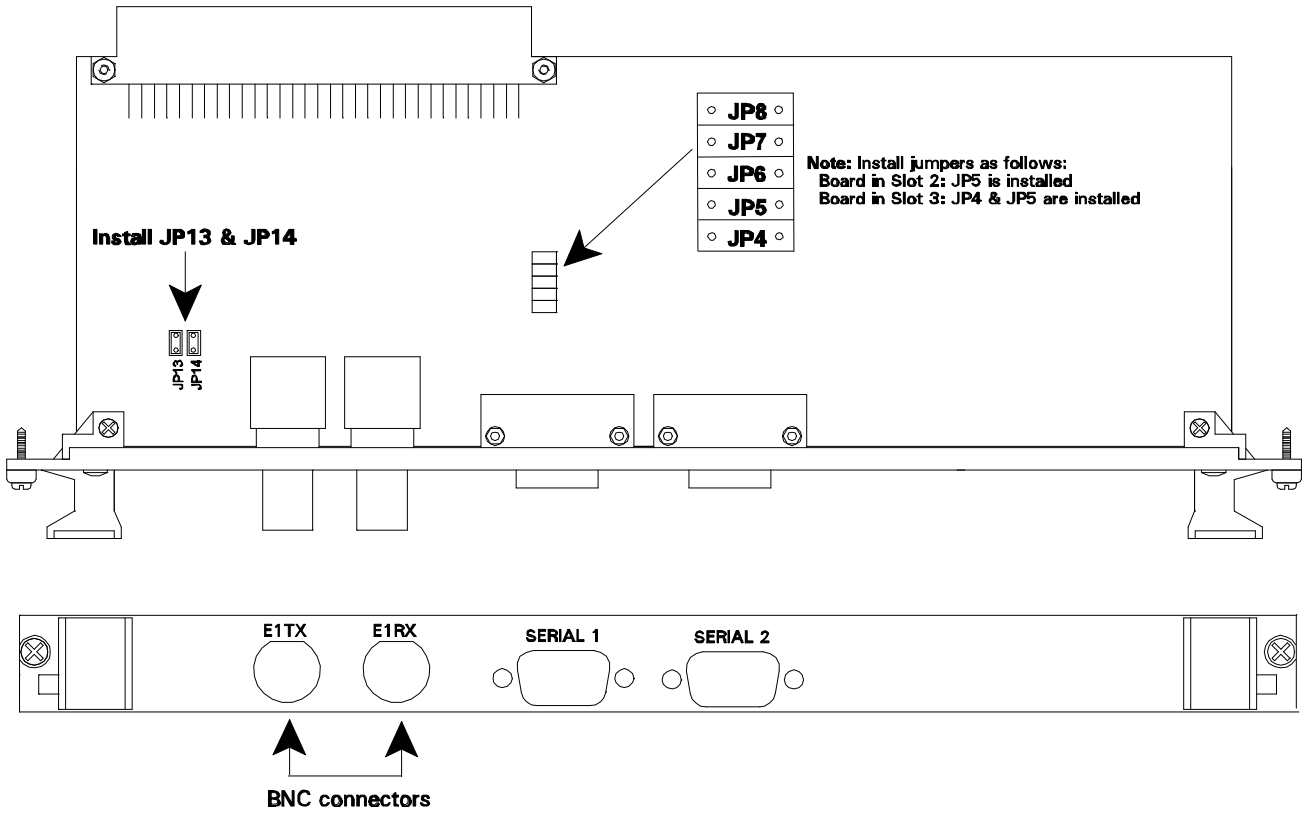
The T1 Transition Board provides connections via a DB15F (female) connector or RJ-48C connector to the telco from the McIAS. McTi-24MR T1 Transition Board jumper and connector locations are illustrated below.



McTi-24MR T1 Transition Board

2.9.2.2 McTi-30MR Digital Connections via E1 Transition Board

The E1 Transition Board provides BNC connection to the telco from the McIAS. McTi-30MR E1 Transition Board jumper and connector locations are illustrated below.



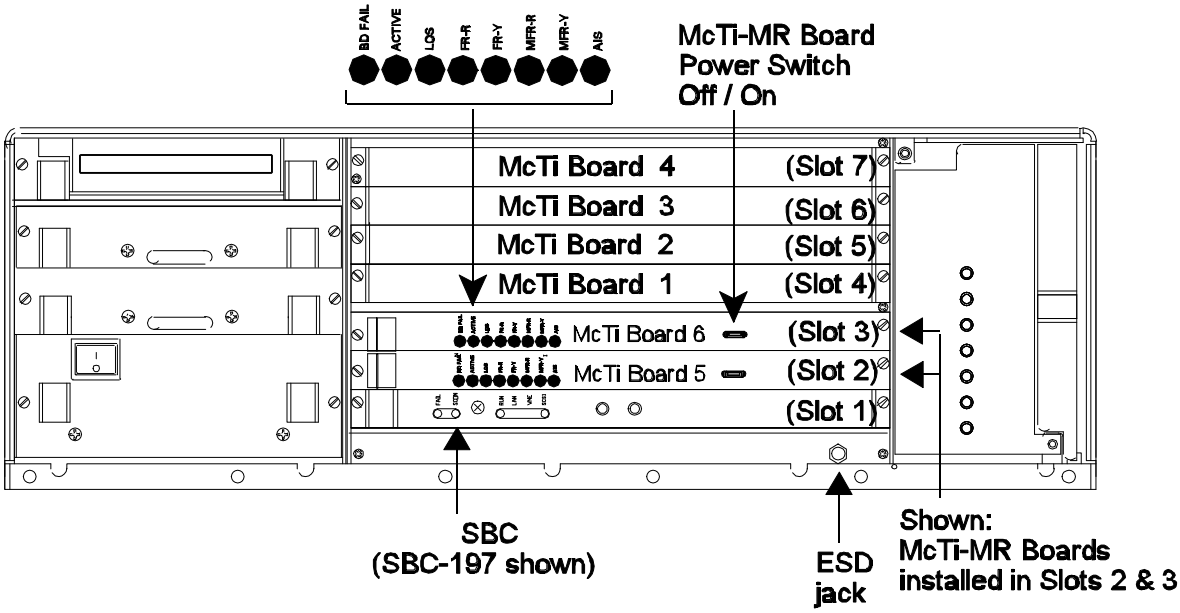
McTi-30MR E1 Transition Board

One of the McIAS female BNC connectors is labeled "E1TX"; the other is labeled "E1RX". Connection must be made from the McIAS E1TX female connector to the Cross Connect Point BNC male Receive connector. Connection must also be made from the McIAS E1RX female connector to the Cross Connect Point BNC male Transmit connector.

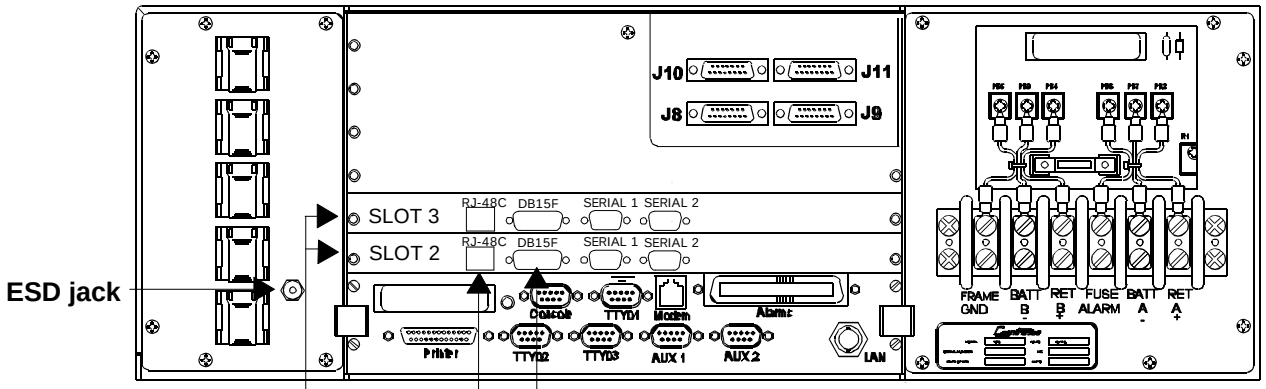
E1 Transition Board BNC (female)	Telco Cross Connect Point BNC (male)	Connector
XMIT1 →	→ Telco Receive	center
XMIT2 →	→ Telco Receive	shield
RCV1 ←	← Telco Transmit	center
RCV2 ←	← Telco Transmit	shield

2.9.2.3 McIAS 1623/IP with McTi-MR Board(s) Installed

The DB15F and RJ-48C connectors shown in the diagram below are associated with the channels coming from the McTi-MR board(s) installed in Slots 2 and/or 3 of the McIAS 1623/IP. Connections are made via the Transition Board(s) installed at the rear of the McIAS. A sample McIAS 1623/IP channel configuration which includes McTi-MR boards is provided on the next page.

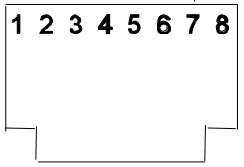


McIAS 1623/IP Front View



Transition Boards (McTi-MR)

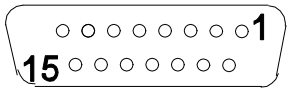
Note: Internal backplane contains SCSABus (not shown)



RJ-48C

RJ-48C Pin Descriptions:

1 RCV_RING
2 RCV_TIP
3 UNUSED
4 XMIT_RING
5 XMIT_TIP
6 UNUSED
7 CHASSIS GROUND
8 CHASSIS GROUND



DB15F

DB15F Pin Descriptions:

1 Transmit
2 Not used
3 Receive
4 Not used
5 Not used
6 Not used
7 Not used
8 Not used
9 Transmit
10 Not used
11 Receive
12 Reserved
13 Reserved
14 Reserved
15 Frame

McIAS 1623/IP Rear View

McIAS 1623/IP Channel Configuration Example:

As an example, a McIAS 1623/IP with four McTi-24 boards installed and two McTi-24MR boards installed may have channels distributed as follows:

McTi Board #	Slot #	Channels	Connector
1 (McTi-24)	4	1-24	J8
2 (McTi-24)	5	25-48	J9
3 (McTi-24)	6	49-72	J10
4 (McTi-24)	7	73-96	J11
5 (McTi-24MR)	2	97-120	DB15F or RJ-48C (T1 Transition Board)
6 (McTi-24MR)	3	121-144	DB15F or RJ-48C (T1 Transition Board)

Refer to the McIAS 1623/IP MOP Guide (P/N 51325920), MOP 510 for line assignment instructions.

Note: It is a good practice to test internal McTi-MR connections (see MOP 308 to connect loopback). A successful test will result in all McTi-MR board front panel LEDs turned off with the exception of the “Active” LED which should be blinking.

Important! McTi-MR Board 5 and McTi-MR Board 6 may be installed in McIAS 1623/IP Slot 2 and Slot 3, respectively; however, if Board 5 is powered OFF then it must be removed from the unit in order to ensure proper operation of Board 6.

2.9.3 McTi-MR Front Panel LED Indicators

Light emitting diode (LED) indicators on the McTi-MR board provide information about the state of the board as indicated below.

LED LOCATION	COLOR	LED NAME	LED DESCRIPTION WHEN LIT
McTi-MR	Red	BD FAIL	Board is in failure mode.
	Green	ACTIVE	As calls are received, indicates line activity. Blinking will accelerate as the number of calls increases. If all lines are idle, will pulse at a rate of 2 seconds on, 2 seconds off.
	Red	LOS	McIAS receiving no signal from the switch.
	Red	FR-R	Indicates that McIAS is unable to synchronize to the signal received from the switch. May indicate a loss of signal or an unframed signal (e.g. AIS/Blue Alarm).
	Yellow	FR-Y	McIAS receiving a yellow alarm signal from the switch.
	Red	MFR-R	Indicates that McIAS is unable to synchronize to the multiframe structure received from the switch.
	Yellow	MFR-Y	McIAS receiving a multiframe yellow alarm from the switch.
	Yellow	AIS	Indicates that the switch is receiving no signal from McIAS.

Table 2-10
McTi-MR LED Indicator Functions

2.9.4 Digital Connector Block for McTi-MR (optional)

A digital connector block can be used to provide digital telco McTi-24MR/McTi-30MR connections as indicated in the table below. DB15P (male) connectors J5A and J5B correspond to the DB15F connectors located on the Transition Boards in Slot 2 and Slot 3, respectively.

DB15P Connector	Connector Block
McTi-24MR/McTi-30MR Source - Slot 2 J5A	
1	1 T1 S1 XMT1
9	26 T1 S1 XMT2
3	2 T1 S1 RCV1
11	27 T1 S1 RCV2
McTi-24MR/McTi-30MR Source - Slot 3 J5B	
1	5 T1 S2 XMT1
9	30 T1 S2 XMT2
3	6 T1 S2 RCV1
11	31 T1 S2 RCV2

McIAS 1623/IP Digital Connector Block
McTi-MR Telephony Interface Pin Assignments

To test internal McTi-MR connections, jumper the following pins together on the Digital Connector Block for the McTi-MR boards installed in the slots indicated:

Slot 2	Slot 3
pins 1-2	pins 5-6
pins 26-27	pins 30-31

Another way to test McTi-MR connections is to use a loopback connector (DB15P male) attached directly to the digital connector with pins 1 & 3 and 9 & 11 jumpered together. A successful test will result in all McTi-MR board front panel LEDs off with the exception of the “Active” LED which should be blinking.

Refer to MOP 308 for detailed McTi-MR loopback instructions.

2.9.5 T1 Transition Board Facility Distance Compensation (McTi-24MR only)

Each McTi-24MR T1 Transition Board is equipped with jumpers (JP1, JP2 and JP3) which allow compensation for the cable length between the originating T1 facility or repeater and the McIAS unit. The illustration of the transition board in Section 2.9.2.1 shows the locations of these jumpers.

CAUTION: The components on the assembly are sensitive to electrostatic discharge (ESD). Use an ESD protected environment and procedure when working with the boards.

T1 Cable Distance Compensation

One Way Distance Between McIAS and Switch (in feet)	T1 Transition Board Jumpers JP1	JP2	JP3
0 - 115 *	2-3	2-3	1-2
82 - 213	2-3	1-2	2-3
180 - 312	2-3	1-2	1-2
279 - 410	1-2	2-3	2-3
377 - 508	1-2	2-3	1-2
476 - 607	1-2	1-2	2-3
574 - 689	1-2	1-2	1-2

* Factory setting (minumum distance compensation).
Loopback requires minimum distance compensation.

3.0 Analog Telephony Connections (McIAS 1685, 1607 and 1610 only)

3.1 McTi-8E (4-wire E&M) Connection

An analog connection from the McTi-8E board(s) to the telco is made via the female 50-pin connectors on the exterior backplane. The McIAS 1607 and 1685 analog interface connectors are identified as J3 and J4 which together handle a maximum of 8 channels. The McIAS 1610 connectors are J3, J4, J6 and J7 which together handle up to 24 channels. (An optional analog connector block can be used to make a connection from the McIAS backplane connectors to the telco end.)

McTi-8E pin connections are shown below.

Pin Number	Connect to	Pin Number	Connect to
50	Not used	25	Not used
49	M (Ch. 18,20,22,24)	24	SIGNAL BATTERY (Ch. 18,20,22,24)
48	E (Ch. 18,20,22,24)	23	SIGNAL GROUND (Ch. 18,20,22,24)
47	T1 (Ch. 18,20,22,24) (SIG IN)	22	R1 (Ch. 18,20,22,24) (SIG IN)
46	Tip (Ch. 18,20,22,24) (SIG OUT)	21	Ring (Ch. 18,20,22,24) (SIG OUT)
45	M (Ch. 17,19,21,23)	20	SIGNAL BATTERY (Ch. 17,19,21,23)
44	E (Ch. 17,19,21,23)	19	SIGNAL GROUND (Ch. 17,19,21,23)
43	T1 (Ch. 17,19,21,23) (SIG IN)	18	R1 (Ch. 17,19,21,23) (SIG IN)
42	Tip (Ch. 17,19,21,23) (SIG OUT)	17	Ring (Ch. 17,19,21,23) (SIG OUT)
41	M (Ch. 4,8,12,16)	16	SIGNAL BATTERY (Ch. 4,8,12,16)
40	E (Ch. 4,8,12,16)	15	SIGNAL GROUND (Ch. 4,8,12,16)
39	T1 (Ch. 4,8,12,16) (SIG IN)	14	R1 (Ch. 4,8,12,16) (SIG IN)
38	Tip (Ch. 4,8,12,16) (SIG OUT)	13	Ring (Ch. 4,8,12,16) (SIG OUT)
37	M (Ch. 3,7,11,15)	12	SIGNAL BATTERY (Ch. 3,7,11,15)
36	E (Ch. 3,7,11,15)	11	SIGNAL GROUND (Ch. 3,7,11,15)
35	T1 (Ch. 3,7,11,15) (SIG IN)	10	R1 (Ch. 3,7,11,15) (SIG IN)
34	Tip (Ch. 3,7,11,15) (SIG OUT)	9	Ring (Ch. 3,7,11,15) (SIG OUT)
33	M (Ch. 2,6,10,14)	8	SIGNAL BATTERY (Ch. 2,6,10,14)
32	E (Ch. 2,6,10,14)	7	SIGNAL GROUND (Ch. 2,6,10,14)
31	T1 (Ch. 2,6,10,14) (SIG IN)	6	R1 (Ch. 2,6,10,14) (SIG IN)
30	Tip (Ch. 2,6,10,14) (SIG OUT)	5	Ring (Ch. 2,6,10,14) (SIG OUT)
29	M (Ch. 1,5,9,13)	4	SIGNAL BATTERY (Ch. 1,5,9,13)
28	E (Ch. 1,5,9,13)	3	SIGNAL GROUND (Ch. 1,5,9,13)
27	T1 (Ch. 1,5,9,13) (SIG IN)	2	R1 (Ch. 1,5,9,13) (SIG IN)
26	Tip (Ch. 1,5,9,13) (SIG OUT)	1	Ring (Ch. 1,5,9,13) (SIG OUT)

"SIG IN" denotes signals sent from the McIAS to the switch
"SIG OUT" denotes signals sent from the switch to the McIAS

Table 3-1
McTi-8E Pin Connections

McIAS 1607 and 1685 Analog Connectors

The McTi-8E pin connections given in Table 3-1 assume that Channels 1-4 (J3) and Channels 5-8 (J4) come from the McTi board installed directly above the SBC board.

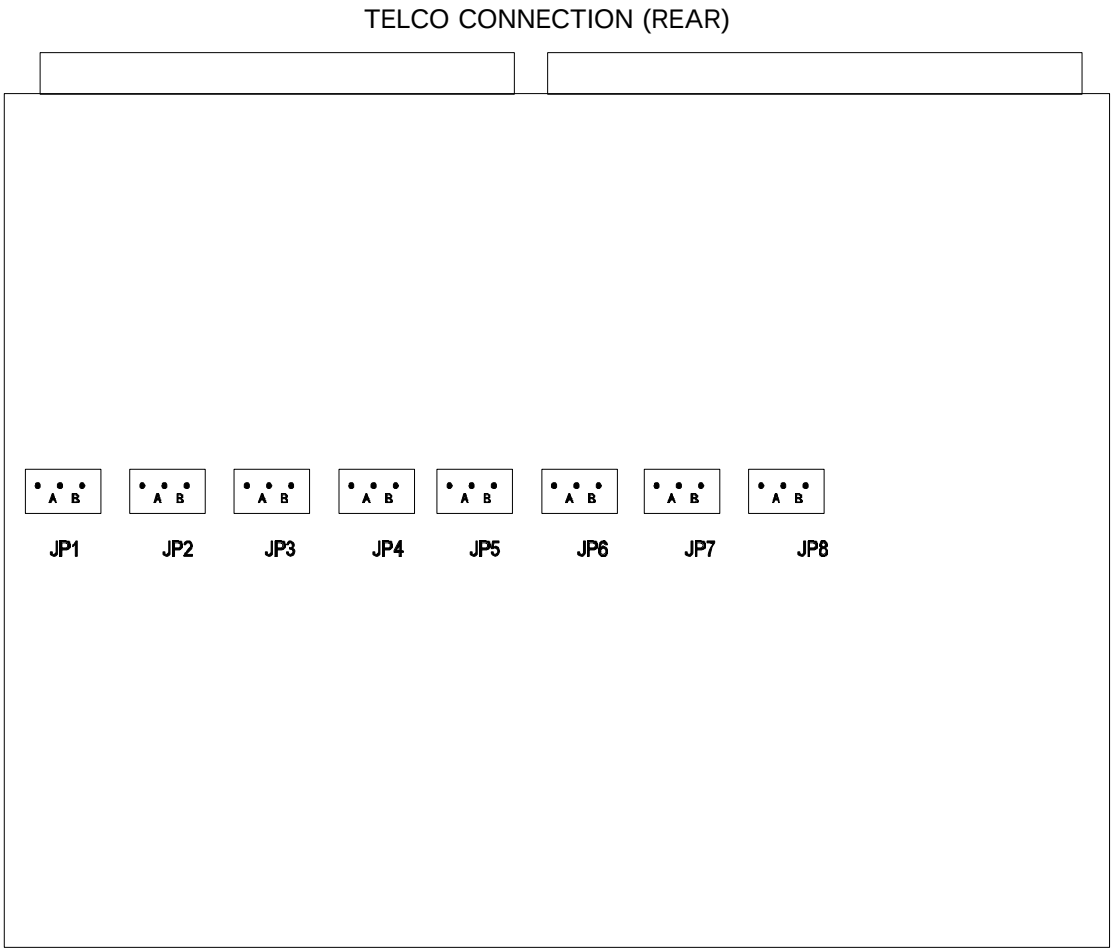
McIAS 1610 Analog Connectors and Associated Slots

For installations that are exclusively configured with analog McTi boards, the channels would be distributed as follows:

Channels 1-4 (J3) and Channels 5-8 (J4) come from the board in Slot 4, Channels 9-12 (J6) and Channels 13-16 (J7) come from the board in Slot 3, and Channels 17 & 18 (J3), Channels 19 & 20 (J4), Channels 21 & 22 (J6), and Channels 23 & 24 (J7) come from the board in Slot 2.

3.1.1 McTi-8E Trunk Interface Jumpers

The trunk interface jumpers installed on 4-wire E&M boards are used to select ground options. Each 4-wire E&M board has eight jumpers: JP1, JP2, JP3, JP4, JP5, JP6, JP7 and JP8. These jumpers select the ground options for E&M Types I, II and III. For E&M Types I and III, the left two pins on each jumper should be connected (position A). For E&M Type II, the right two pins on each jumper should be connected (position B). Jumper positions are illustrated below.



3.2 McTi-8R (Ring-Trip) Connection

An analog connection from the McTi-8R board(s) to the telco is made via the male 50-pin connectors on the exterior backplane. The McIAS 1607 and 1685 analog interface connectors are identified as J3 and J4 which together handle a maximum of 8 channels. The McIAS 1610 connectors are J3, J4, J6 and J7 which together handle up to 24 channels. (An optional analog connector block can be used to make a connection from the backplane connectors to the telco end.)

McTi-8R pin connections are shown below.

Pin Number	Connect to	Pin Number	Connect to
50	Not used	25	Not used
49	Not used	24	Not used
48	Not used	23	Not used
47	**Tip (Channels 18,20,22,24)**	22	**Ring (Channels 18,20,22,24)**
46	Not used	21	Not used
45	Not used	20	Not used
44	Not used	19	Not used
43	**Tip (Channels 17,19,21,23)**	18	**Ring (Channels 17,19,21,23)**
42	Not used	17	Not used
41	Not used	16	Not used
40	Not used	15	Not used
39	**Tip (Channels 4,8,12,16)**	14	**Ring (Channels 4,8,12,16)**
38	Not used	13	Not used
37	Not used	12	Not used
36	Not used	11	Not used
35	**Tip (Channels 3,7,11,15)**	10	**Ring (Channels 3,7,11,15)**
34	Not used	9	Not used
33	Not used	8	Not used
32	Not used	7	Not used
31	**Tip (Channels 2,6,10,14)**	6	**Ring (Channels 2,6,10,14)**
30	Not used	5	Not used
29	Not used	4	Not used
28	Not used	3	Not used
27	**Tip (Channels 1,5,9,13)**	2	**Ring (Channels 1,5,9,13)**
26	Not used	1	Not used

Table 3-2
McTi-8R Pin Connections

McIAS 1607 and 1685 Analog Connectors

The McTi-8R pin connections given in Table 3-2 assume that Channels 1-4 (J3) and Channels 5-8 (J4) come from the McTi board installed directly above the SBC board.

McIAS 1610 Analog Connectors and Associated Slots

For installations that are exclusively configured with analog McTi boards, the channels would be distributed as follows:

Channels 1-4 (J3) and Channels 5-8 (J4) come from the board in Slot 4,
Channels 9-12 (J6) and Channels 13-16 (J7) come from the board in Slot 3, and
Channels 17 & 18 (J3), Channels 19 & 20 (J4), Channels 21 & 22 (J6), and Channels 23 & 24 (J7) come from the board in Slot 2.

3.3 McTi-8L (Loop Reversal) Connection

The McTi-8L (Loop Reversal) board provides a 2-wire reverse loop circuit. Each channel goes off-hook upon detection of loop current and reverses the tip and ring polarity. Channel 1 on this board can be used for call-in system administration and Channel 8 has speaker output capability.

An analog connection from a McTi-8L board to the telco is made via male 50-pin connectors on the exterior backplane. The McIAS 1607 and 1685 analog interface connectors are identified as J3 and J4 which together handle a maximum of 8 channels. The McIAS 1610 connectors are J3, J4, J6 and J7 which together handle up to 24 channels. As an option, an analog connector block can be used to make a connection from the backplane connectors to the telco end.

McTi-8L pin connections are shown below.

Pin Number	Connect to	Pin Number	Connect to
50	Not used	25	Not used
49	Not used	24	Not used
48	Not used	23	Not used
47	**Tip (Channels 18,20,22,24)**	22	**Ring (Channels 18,20,22,24)**
46	**Speaker B (Channel 24)**	21	**Speaker A (Channel 24)**
45	Not used	20	Not used
44	Not used	19	Not used
43	**Tip (Channels 17,19,21,23)**	18	**Ring (Channels 17,19,21,23)**
42	Not used	17	Not used
41	Not used	16	Not used
40	Not used	15	Not used
39	**Tip (Channels 4,8,12,16)**	14	**Ring (Channels 4,8,12,16)**
38	**Speaker B (Channels 8,16)**	13	**Speaker A (Channels 8,16)**
37	Not used	12	Not used
36	Not used	11	Not used
35	**Tip (Channels 3,7,11,15)**	10	**Ring (Channels 3,7,11,15)**
34	Not used	9	Not used
33	Not used	8	Not used
32	Not used	7	Not used
31	**Tip (Channels 2,6,10,14)**	6	**Ring (Channels 2,6,10,14)**
30	Not used	5	Not used
29	Not used	4	Not used
28	Not used	3	Not used
27	**Tip (Channels 1,5,9,13)**	2	**Ring (Channels 1,5,9,13)**
26	Not used	1	Not used

Table 3-2
McTi-8L Pin Connections

McIAS 1607 and 1685 Analog Connectors

The McTi-8L pin connections given in Table 3-2 assume that Channels 1-4 (J3) and Channels 5-8 (J4) come from the McTi board installed directly above the SBC board. The speaker output leads (A and B) for Channel 8 are associated with the J4 connector.

McIAS 1610 Analog Connectors and Associated Slots

For installations that are exclusively configured with analog McTi boards, the channels would be distributed as follows:

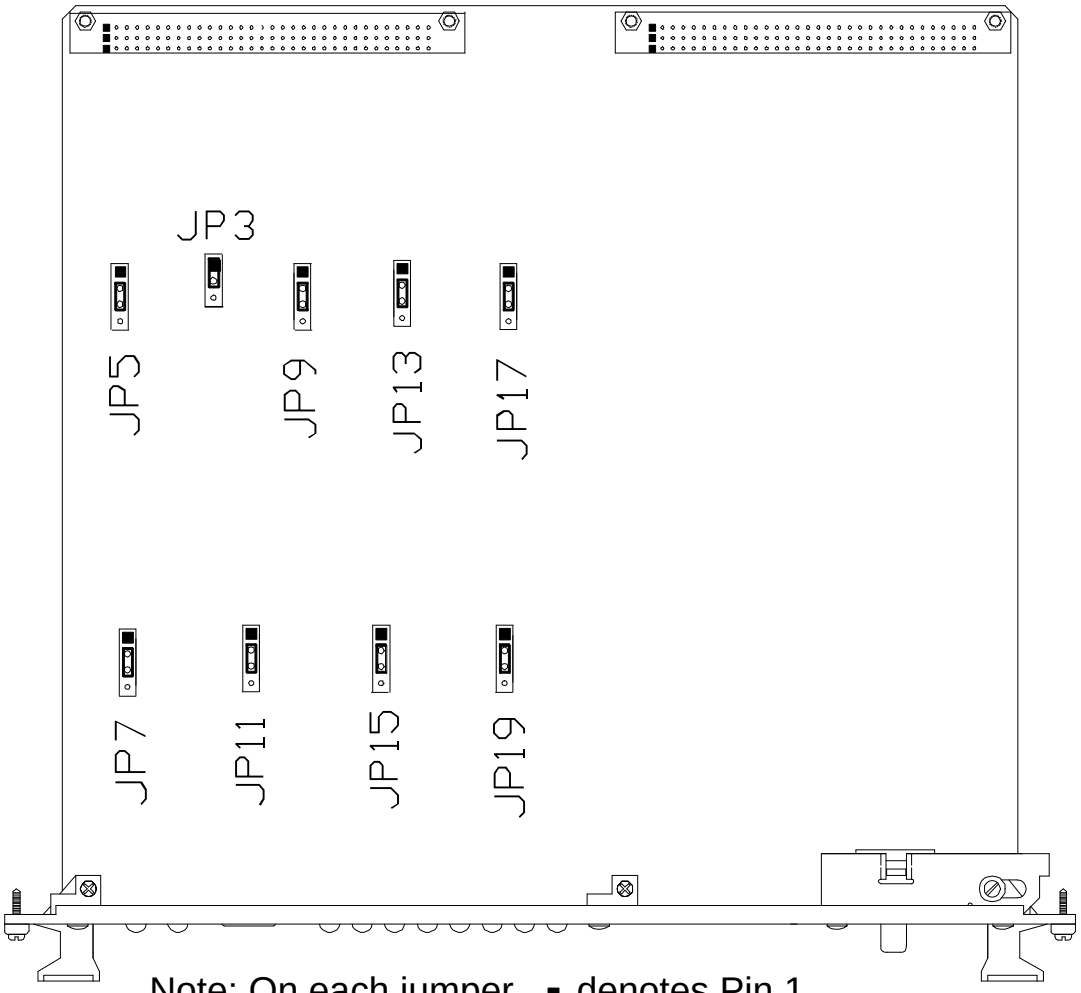
Channels 1-4 (J3) and Channels 5-8 (J4) come from the board in Slot 4,
Channels 9-12 (J6) and Channels 13-16 (J7) come from the board in Slot 3, and
Channels 17 & 18 (J3), Channels 19 & 20 (J4), Channels 21 & 22 (J6), and Channels 23 & 24 (J7) come from the board in Slot 2.

Speaker output leads (A and B) are distributed as follows, depending on the number of McTi boards installed:

Channel 8 (J4) comes from the board in Slot 4,
Channel 16 (J7) comes from the board in Slot 3, and
Channel 24 (J7) comes from the board in Slot 2.

3.3.1 McTi-8L Trunk Interface Jumpers

Trunk interface jumpers installed on 2-wire Loop Reversal boards can be used to specify the voice output gain for any channel. These jumpers are: JP3, JP5, JP7, JP9, JP11, JP13, JP15, JP17 and JP19. Jumper JP3 can be used to set the record input gain on Channel 1 when it is used for administration purposes, if applicable. McTi-8L board trunk interface jumpers are indicated below (jumper defaults are shown).



Note: On each jumper, ▪ denotes Pin 1

McTi-8L gain options can be set using the jumpers illustrated on the previous page. Gain options are shown in Tables 3-3 and 3-4 below.

Channel 1 Record Input Gain		
Jumper	**Gain = 1.5 (Default)**	**Gain = 2**
JP3	1-2	2-3

Table 3-3
McTi-8L Record Input Gain Options

Channels 1 - 8 Voice Output Gain					
Channel	**Jumper**	**0 db (Default)**	**-3 db**	**-6 db** *See Note	**-12 db**
1	JP5	2-3	3-4	No jumper	1-2
2	JP7	2-3	3-4	No jumper	1-2
3	JP9	2-3	3-4	No jumper	1-2
4	JP11	2-3	3-4	No jumper	1-2
5	JP13	2-3	3-4	No jumper	1-2
6	JP15	2-3	3-4	No jumper	1-2
7	JP17	2-3	3-4	No jumper	1-2
8	JP19	2-3	3-4	No jumper	1-2

*Note: To set gain at -6 db, do not install jumper.

Table 3-4
McTi-8L Voice Output Gain Options

3.3.2 McTi-8L Board LED Descriptions

LED LOCATION	LED COLOR	LED NAME	DESCRIPTION WHEN LIT
McTi-8L Board	Red	FAULT	Indicates loss of -48v or thermal shutdown has occurred. (This LED blinks when board is in boot code.)
	Green	Activity	As calls are received, indicates line activity. Blinking will accelerate as the number of calls increases. If all lines are idle, will pulse at a rate of 2 seconds on, 2 seconds off.
	Green	Answer 1 . . Answer 8	Indicates that the line is off-hook; polarity is reversed.

Table 3-5
McTi-8L LED Indicator Functions

4.0 McTi Board ID Switch Bank Settings

A bank of dip switches on each McTi board is used to identify the board on the SCSI bus. If a McTi board is determined to be faulty and must be replaced, it is essential for the new board to have the same address ID as the board that was removed. Use the switch settings on the faulty board as a guide for setting the switches on the new board. The sub-sections to follow describe switch banks by board type.

4.1 Dip Switch Settings for McTi-8E, McTi-8R, McTi-8L and McTi-24 Boards

Switch bank SW1 on each McTi-8E, McTi-8R, McTi-8L and McTi-24 board identifies the board on the SCSI bus. To view the location of SW1, refer to the appropriate McTi board drawing. The table below lists the SW1 dip switch settings.

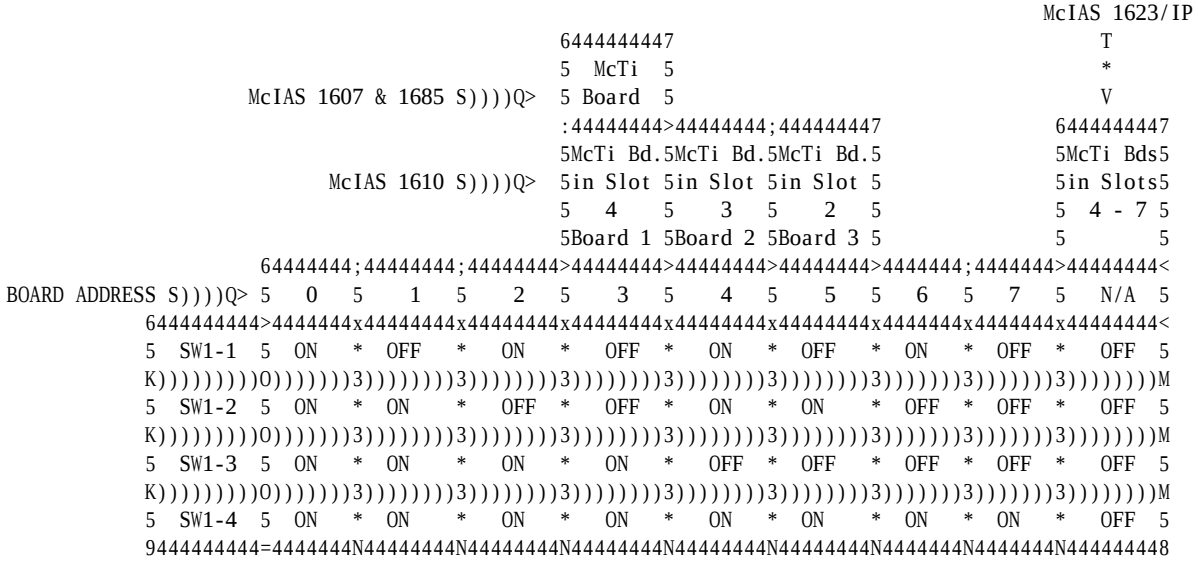


Table 4-1
McTi-8E, McTi-8R and McTi-24 Board
SCSI Bus Dip Switch Settings

NOTE 1: Addresses 0, 1, 2, 6 & 7 should not be used by McIAS 1610 McTi boards.
Addresses 0, 1, 2, 4, 5, 6 & 7 should not be used by McIAS 1685 and 1607 McTi boards.

NOTE 2: McIAS 1623/IP with McTi-24 Rev. 1 (and newer) boards requires that all SW1 dip switches be set to the "off" position. McIAS 1623/IP board addresses are set by the backplane, not SW1.

McTi-24 boards have two other switch banks: SW2 and SW3. SW3 is set at the factory and should not be changed by the user. SW2 can be changed by the user for T1 facility distance compensation. Refer to Section 2.6 for more information on SW2 settings.

4.2 Dip Switch Settings for McTi-30 Boards

Switch bank SW3 on each McTi-30 board identifies the board on the SCSI bus. To view the location of SW3, refer to the McTi-30 board drawing. The table below lists the SW3 dip switch settings.

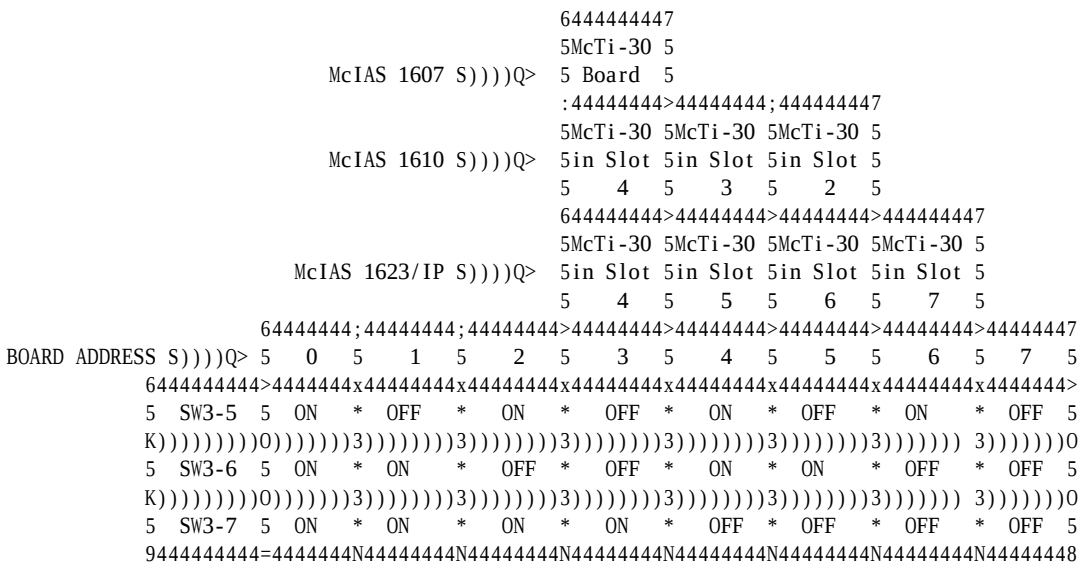


Table 4-2
McTi-30 Board
SCSI Bus Dip Switch Settings

NOTE: Addresses 0, 1, 2, 6 & 7 should not be used by McIAS 1610 McTi boards.
Addresses 0, 1, 2, 4, 5, 6 & 7 should not be used by McIAS 1607 McTi boards.
Addresses 0, 1, 2 and 7 should not be used by McIAS 1623/IP McTi boards.

Switch bank SW3 has four other dip switches (SW3-1, SW3-2, SW3-3 and SW3-4) that are used for signaling variations based on customer specific protocol. McTi-30 boards have one other switch bank, SW2, which is not used.

Appendix A

SBC Board Descriptions

A McIAS 16xx/68 Series SBC board allows the installation of one McIAS AppSOFT Module; a McIAS 16xx/IP board (187 or 197 model) allows the installation of multiple McIAS AppSOFT Modules. SBC boards can be installed in McIAS 16xx Series systems as follows:

The McIAS 1685 has a McIAS 16xx/68 Series SBC board installed.

The McIAS 1607 and McIAS 1610 allow the installation of either a McIAS 16xx/68 Series SBC board or a McIAS 16xx/IP Series SBC board.

The McIAS 1623/IP has a McIAS 16xx/IP Series SBC board installed.

The McIAS 16xx/68 and McIAS 16xx/IP SBC boards are described below.

The McIAS 16xx/68 Series SBC board has four LEDs on the front panel: FAIL, STAT, RUN, and SCON.

The McIAS 16xx/IP Series SBC board (187 and 197 models) contains the FAIL, RUN, SCON, LAN, SCSI and VME indicators. The SBC-187 also contains a STAT and +12V (LAN power) LED.

All SBC board LEDs will light at system power-up. Major and minor alarm LEDs are provided on the front panel of the system.

All SBC boards have two switches. The black ABORT switch is a processor switch and should not be pressed. The red RESET switch is a "panic button" that should not be used during normal system operation.

Appendix B

Telephony Interface Board Part Numbers

Board	Cognitronics Part Number
4-wire E&M Interface Board (McTi-8E)	44309910
Ring-Trip Interface Board (McTi-8R)	44311420
2-Wire Loop Reversal Board (McTi-8L)	44327070
T1 Interface Board (McTi-24)	44311410
T1 Interface Board with power off switch (McTi-24)	44321720 or 44338180
E1 Interface Board (McTi-30)	44313020
Multi-Resource T1/E1 Interface Board (McTi-24MR/McTi-30MR)	44334600
McTi-24MR T1 Transition Board	44333700
McTi-30MR E1 Transition Board	44337530
V/S24T1 Board	43325010
V/S30E1 Board	43325020
Transition Board (For V/S24T1 or V/S30E1)	43327420

McIAS™ 16xx/68 Series

SYSTEM OPERATION MANUAL

Cognitronics Corporation
3 Corporate Drive
Danbury, CT 06810

Phone: (203) 830-3400
Facsimile: (203) 830-3405

Part Number 41318300 Rev. 1.02

TABLE OF CONTENTS

SYSTEM OPERATION - OVERVIEW

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This document describes system start-up as well as the process of installing application and voice file software on the McIAS 16xx/68 Series platform.

Part 1 discusses system start-up including the confidence tests run on the Single Board Computer (SBC).

Part 2 describes the Disk Utility Program which is used to install application and announcement/message software from a cartridge to the hard disk. The Disk Utility Program is installed at the factory.

With the Disk Utility Program installed on the hard disk, applications and voice files can be installed. Part 3 provides detailed instructions on the process of accessing the disk utility and installing an application from a cartridge to the hard disk. Part 4 describes the process of accessing the disk utility to install voice files from a cartridge to the hard disk.

PART 1

SYSTEM START-UP

Refer to the appropriate McIAS 16xx Series System Manual for detailed system installation instructions.

1. Turn on system power using the switch located on the Power Supply board. (No Cognitronics AppSOFT modules are required to be installed at this time.) During the boot up process McIAS will list the disk drives currently installed in the system and their addresses on the data highway bus. Also during boot up, a confidence test is run on the Single Board Computer (SBC).

2. If the confidence test is successful and no failures are found, the application program that exists on the hard disk (if any) will be executed.

3. If the confidence test fails, the test is aborted when the first fault is encountered and the FAIL LED on the front panel of the SBC lights and remains lit until the fault is corrected. In this case, McIAS sets a major alarm which will remain active until the problem is corrected. If possible, a system message will appear on the terminal screen indicating where the fault occurred. In this case, contact Cognitronics Product Support at (203) 830-3560 for assistance.

PART 2

INSTALL DISK UTILITY PROGRAM (Factory Use Only.)
(Proceed to Part 3 if Disk Utility is already installed and functional)

The process of installing the Disk Utility Program from cartridge to the hard disk is described in the instructions to follow. Once it is installed, the Disk Utility Program is used to install application and announcement/message software from a cartridge to the hard disk (described in Parts 3 and 4).

1. Press the reset button located on the SBC board.

2. To invoke the PROM Utility Menu, press **P** during system boot up after the following appears on the screen (it may take a few minutes for this to appear):

```
Application will start from hard disk.
Press any key within 5 seconds to enter disk utility.
```

Note: At system start-up, if McIAS does not find an application program or disk utility program on the hard disk, the above prompt will not appear and the PROM Utility Menu will automatically be displayed (without pressing **P**).

The PROM Utility Menu appears as follows:

```
PROM UTILITY MENU

1 - Install disk utility from cartridge to hard disk
2 - Initialize hard disk
3 - Load and run the disk utility
4 - Call 147BUG

Enter:
```

WARNING! Selection 2, **Initialize Hard Disk**, should only be used at the customer site if the instructions accompanying the new software direct the user to do so.

3. Insert the System Software cartridge into the removable cartridge drive.
   Note: Refer to Appendix A for instructions on how to operate the type of drive installed in your system.

4. With the cartridge properly inserted in the drive, press **1** from the PROM Utility Menu to begin the process of installing the disk utility software from the cartridge disk onto the hard disk. The following prompt will appear:

```
READY Y/N
```

5. Press **Y** to continue. The following will appear:

```
In process, please wait
```

   After the software has been installed, the PROM Utility Menu will be displayed again.

6. Press **3** from the PROM Utility Menu to load the disk utility software. The Disk Utility Main Menu will then be displayed as follows:

```
McIAS 1610 Disk Utility
Main Menu

1 - Install Software from Cartridge to Hard Disk
2 - Run System Diagnostics
3 - Exit to Debug Monitor

Enter Selection:
```

7. For instructions on installing the application software from the cartridge to the hard disk using the Disk Utility Main Menu, proceed to Part 3 Step 3.

PART 3

INSTALL APPLICATION

The process of installing an application from a cartridge to the hard disk is described in the instructions to follow.

1. Press the reset button located on the SBC board.

Note: The absence of an application and the presence of the disk utility on the hard disk will automatically display the Disk Utility Main Menu on the System Administration local terminal during system boot up without the user pressing any key.

2. To access the disk utility and display the Disk Utility Main Menu, press any key other than **P** during system boot up after the following appears on the screen (it may take a few minutes for this to appear):

```
Application will start from hard disk.
Press any key within 5 seconds to enter disk utility.
```

The following will appear after pressing any key (other than **P**):

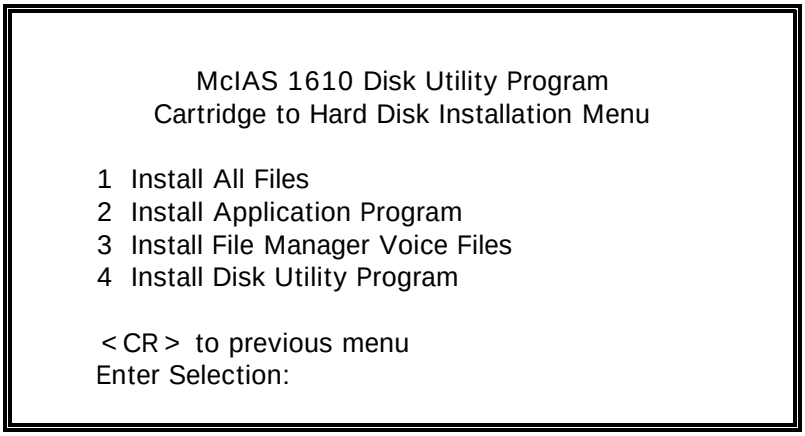
```
McIAS 1610 Disk Utility
Main Menu

1 - Install Software from Cartridge to Hard Disk
2 - Run System Diagnostics
3 - Exit to Debug Monitor

Enter Selection:
```

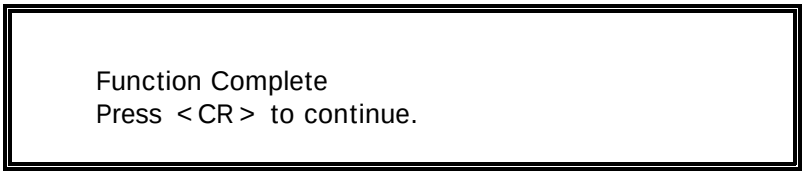
3. Insert the System Software cartridge into the removable cartridge drive.
   Note: Refer to Appendix A for instructions on how to operate the type of drive installed in your system.

4. With the cartridge properly inserted in the drive, press **1** followed by **<CR>** from the Disk Utility Main Menu to install software onto the hard disk. The following will appear:



IMPORTANT! DO NOT SELECT 1, INSTALL ALL FILES.

5. Press **2** followed by **< CR >** from the Cartridge to Hard Disk Utility Installation Menu to install the application program files onto the hard disk. When the files have been installed, the following will be displayed:



6. Press **< CR >** to display the Disk Utility Main Menu.

7. Remove the System Software cartridge from the drive. **Note:** Refer to Appendix A for instructions on how to operate the type of drive installed in your system. Store the cartridge in a secure location, away from magnetic fields.

PART 4

INSTALL ANNOUNCEMENTS/MESSAGES

The process of installing announcements/messages from a cartridge to the hard disk is described in the instructions to follow. **Note:** If the Disk Utility Main Menu is already displayed on your screen (from Part 3), proceed to Step 3.

1. Press the reset button located on the SBC board.

Note: The absence of an application and the presence of the disk utility on the hard disk will automatically display the Disk Utility Main Menu on the System Administration local terminal during system boot up without the user pressing any key.

2. To access the disk utility and display the Disk Utility Main Menu, press any key other than **P** during system boot up after the following appears on the screen (it may take a few minutes for this to appear):

```
Application will start from hard disk.
Press any key within 5 seconds to enter disk utility.
```

The following will appear after pressing any key (other than **P**):

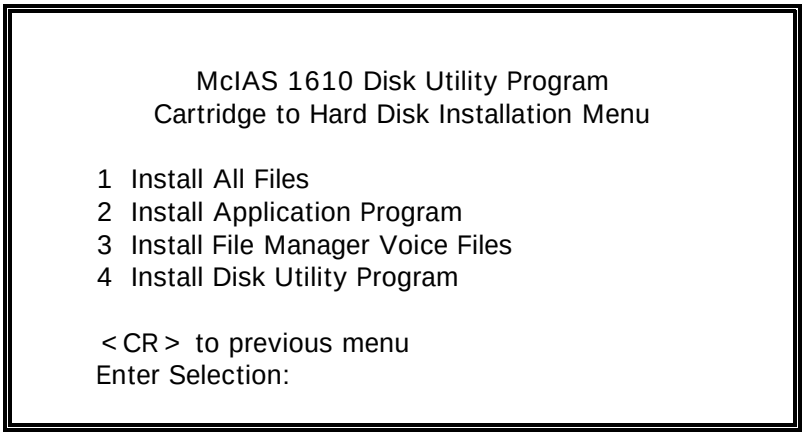
```
McIAS 1610 Disk Utility
Main Menu

1 - Install Software from Cartridge to Hard Disk
2 - Run System Diagnostics
3 - Exit to Debug Monitor

Enter Selection:
```

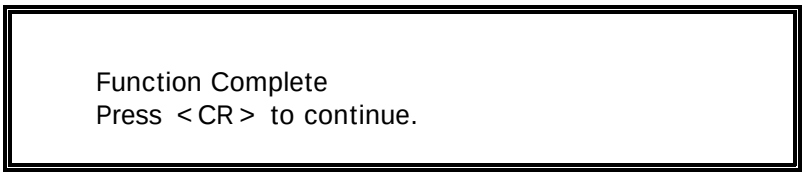
3. Insert the McIAS 16xx Announcement/Message Assembly Disk 1 into the removable cartridge drive. **Note:** Refer to Appendix A for instructions on how to operate the type of drive installed in your system.

4. Press **1** followed by **<CR>** from the Disk Utility Main Menu to display the Cartridge to Hard Disk Utility Installation Menu. The following will appear:



IMPORTANT! DO NOT SELECT 1, INSTALL ALL FILES.

5. Press **3** followed by **< CR >** from the Cartridge to Hard Disk Utility Installation Menu to install voice files. After several minutes, the following will appear:



6. Press **< CR >** and the Disk Utility Main Menu will be displayed.

7. Remove the Announcement/Message Assembly Disk 1 from the drive.
   Note: Refer to Appendix A for instructions on how to operate the type of drive installed in your system.
   Store the cartridge in a secure location, away from magnetic fields.

8. From the Disk Utility Main Menu, select Exit to Debug Monitor by pressing **3** followed by **< CR >**. This will re-boot the system and start the application.

Appendix A
McIAS 16xx/68
Removable Cartridge Drive Information
Removable Cartridge Drive
- Operation - Maintenance - Handling -

Table of Contents

Introduction

This appendix provides information about the different types of removable cartridge drives that can be installed in the McIAS 16xx/68. Cognitronics distributes software and announcement/message assemblies on various types of removable cartridge media. Depending on your system, any one of the following removable cartridge drives may be installed:

105MB

MODEL 2513

MODEL 2513EL

The pages to follow provide information and operating/maintenance instructions for each type of drive and cartridge. Please read and understand the information for the removable drive in your system before attempting to use the drive.

WARNING ! FAILURE TO USE THE DRIVE AND CARTRIDGE PROPERLY MAY RESULT IN DAMAGE TO THE DRIVE AND/OR CARTRIDGE !

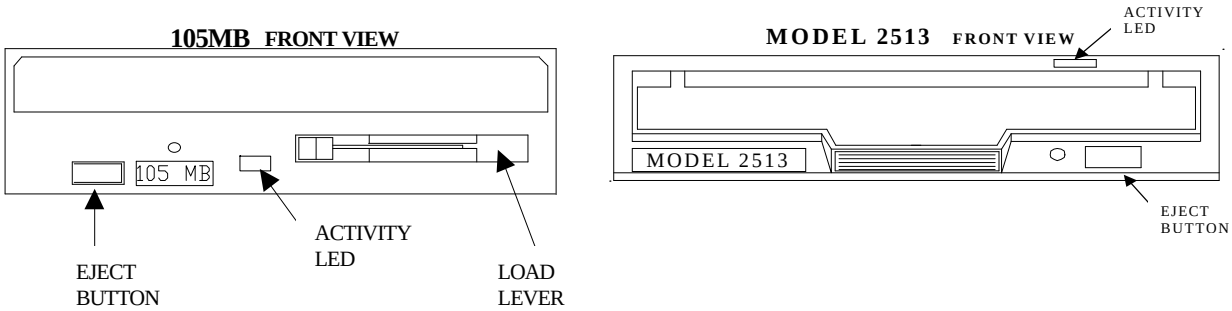
REMOVABLE CARTRIDGE GUIDE

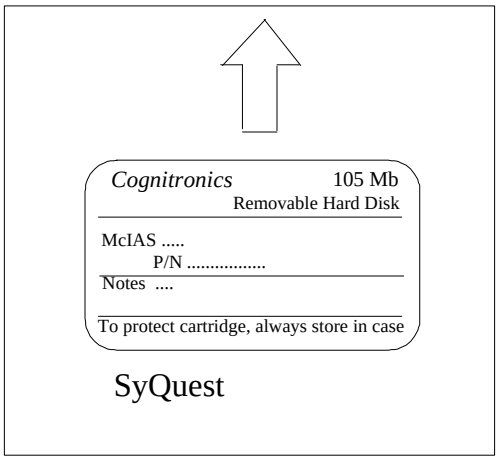
Cognitronics distributes software on various types of removable cartridge media. This guide provides the necessary information to determine which type of drive and cartridge is used in your system. Once this is determined, refer to the appropriate operating instructions and care & handling instructions for the drive installed.

WARNING! THE CORRECT CARTRIDGE *MUST* BE USED IN THE CORRECT DRIVE, OTHERWISE DAMAGE TO THE DRIVE AND/OR CARTRIDGE CAN OCCUR.

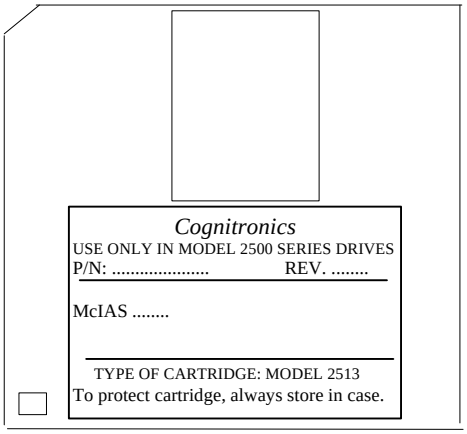
Drive Descriptions

Currently there are three types of removable drives: 105MB and MODEL 2513 are shown below. Model 2513EL is shown on the next page.





SyQuest Cartridge Disk Media
TOP VIEW
GOES IN 105MB ONLY



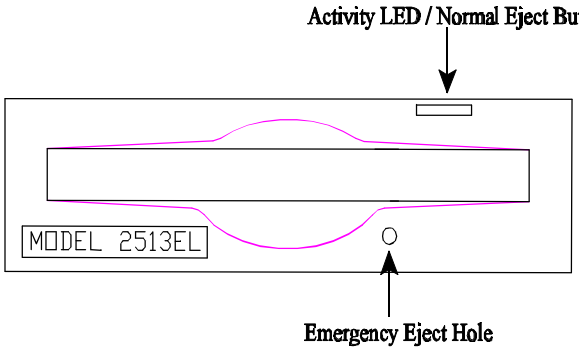
Model 2513 Cartridge Disk Media
TOP VIEW
GOES IN MODEL 2500 SERIES DRIVES ONLY

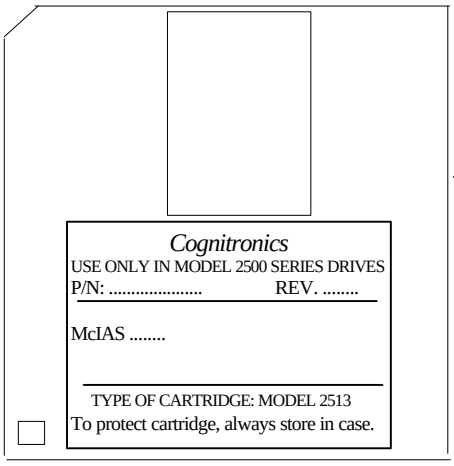
Cartridge Types

The 105MB drive uses a SyQuest 105Meg magnetic cartridge disk media. This drive only supports the 105 Mb cartridges. These cartridges are labeled “105 Mb Removable Hard Disk”.

The MODEL 2513 and 2513EL drives use a 3.5” Magneto-Optical (M.O.) cartridge disk media. The MODEL 2513 and 2513EL drives support 128, 230 and 540 Megabyte cartridges which are labeled “TYPE OF CARTRIDGE: MODEL 2513”. These cartridge disks are physically smaller than the 105MBSyQuest cartridge. They are the same length and width as a standard 3.5” floppy, but are twice as thick.

MODEL 2513EL Front View

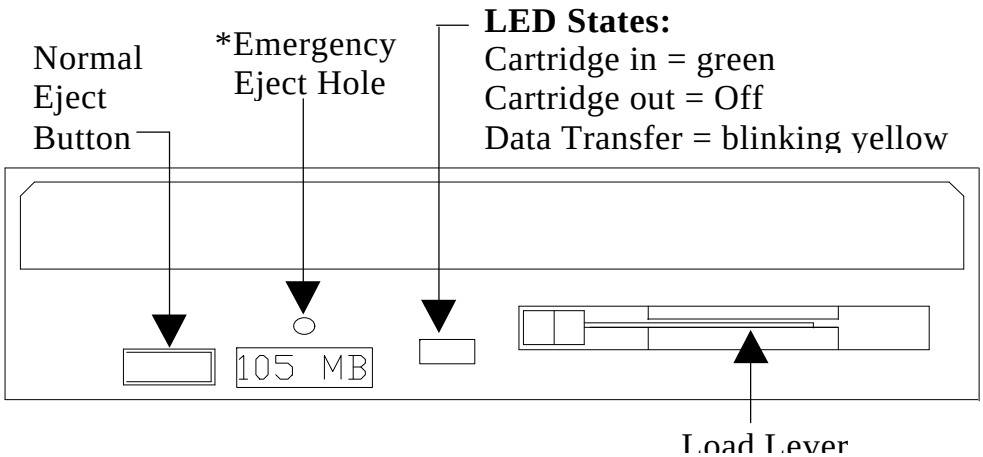




MODEL 2513EL Cartridge Disk Media
(same as Model 2513)
TOP VIEW

Operating instructions for all three types of McIAS 16xx/68 removable cartridge drives (105MB, MODEL 2513 and MODEL 2513EL) are provided on the pages to follow.

105MB Drive Operation Instructions



FRONT VIEW

*** WARNING ! THE EMERGENCY EJECT HOLE SHOULD ONLY BE USED TO EJECT THE CARTRIDGE WHEN POWER IS TURNED OFF. DAMAGE TO THE DRIVE AND/OR CARTRIDGE CAN OCCUR IF THE CARTRIDGE IS REMOVED WHILE IT IS STILL SPINNING. READ ALL INSTRUCTIONS BEFORE ATTEMPTING TO USE THIS FEATURE.**

105MB

How to Insert a Removable Cartridge into the Drive

1. Hold the cartridge so the silver cartridge head access door faces the drive and the Cognitronics label is up so you can read it. Insert the cartridge into the removable cartridge drive so that the cartridge is flush with the front of the drive. The load lever will pop out slightly.

2. Push the lever firmly in the opposite direction, holding it until it locks in place and the drive's LED begins to flash.

3. When the cartridge is properly inserted, the drive's LED will turn green after a few seconds.

How to Remove a Cartridge from the Drive

1. Press the eject button on the drive.

2. The drive's LED will blink for several seconds after which the lever partially releases. Push the lever firmly in the opposite direction until the cartridge ejects.

3. Remove the cartridge, place it in its protective case and store it in a secure location, away from magnetic fields.

105MB DRIVE/CARTRIDGE CARE & HANDLING PRECAUTIONS

Introduction

It is essential to properly handle the various types of removable cartridge media that can be used in McIAS systems. It is equally important to know how to use the drive correctly. Observing the precautions and following the procedures described in this document will maintain reliable operation and secure data storage. Refer to the "Removable Cartridge Guide" to determine which type of drive and cartridge is used in your system.

WARNING ! THE CORRECT CARTRIDGE *MUST* BE USED IN THE CORRECT DRIVE, OTHERWISE DAMAGE TO THE DRIVE AND/OR CARTRIDGE CAN OCCUR.

Handling and Safety Precautions

- Observe Electrostatic-discharge (ESD) precautions.
- Never leave a cartridge partially inserted in the drive.
- Only use Cognitronics approved cartridge media.
- Make sure the cartridge media is the correct type for the drive.
- Keep the cartridge media free of dust and dirt by placing it in the protective case when not in use.
- Allow the cartridge media to stabilize at room temperature before using it in the system.
- Do not store or use the cartridge in direct sunlight.
- Do not place heavy objects on the cartridge.
- Do not apply cleaners or lubricants to the drive or cartridge.
- Never open the cartridge; this may contaminate the recording surface.
- Never leave the cartridge in the drive when moving the system.
- Do not drop the cartridge.
- Do not use a bulk tape-eraser on the cartridge media. This will destroy the embedded servo information.
- Never apply a cartridge label over another cartridge label.
- Do not write on the cartridge label with a graphite pencil.
- Do not expose the cartridge to magnetic fields.
- Never manually eject the cartridge from the drive using the "Emergency Eject Hole" unless power to the system is OFF. Wait 30 seconds after using the Emergency Eject Hole for the cartridge to stop spinning before removing the cartridge from the drive.

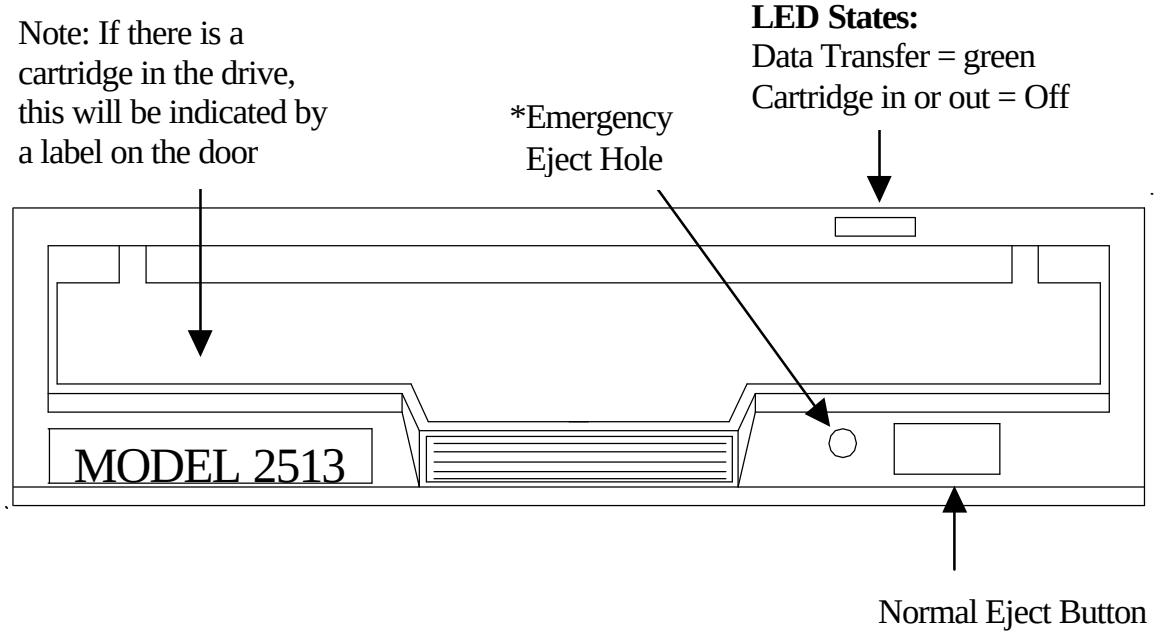
105MB DRIVE/CARTRIDGE MAINTENANCE INSTRUCTIONS

Introduction

The 105MB Drive and Cartridge require no special maintenance. Observing the precautions and following the procedures described in the "105MB DRIVE / CARTRIDGE CARE & HANDLING PRECAUTIONS " will maintain reliable operation and secure data storage.

WARNING ! FAILURE TO USE THE DRIVE AND CARTRIDGE PROPERLY MAY RESULT IN DAMAGE TO THE DRIVE AND/OR CARTRIDGE !

MODEL 2513 Drive Operation Instructions



*** WARNING! THE EMERGENCY EJECT HOLE SHOULD ONLY BE USED TO EJECT THE CARTRIDGE WHEN POWER IS TURNED OFF. DAMAGE TO THE DRIVE AND/OR CARTRIDGE CAN OCCUR IF THE CARTRIDGE IS REMOVED WHILE IT IS STILL SPINNING. READ ALL INSTRUCTIONS BEFORE ATTEMPTING TO USE THIS FEATURE.**

Model 2513

How to Insert a Removable Cartridge into the Drive

1. Hold the cartridge so the shutter points toward the drive and the Cognitronics label is up so you can read it. Insert the cartridge into the removable cartridge drive. Push the cartridge into the slot until it stops. When inserted, a label on the drive's door will indicate that a cartridge is in the drive.

2. While the disk is spinning up, the drive's green LED will flash. After a few seconds, the LED will go off. During system operation, the LED will only light when the disk is being accessed.

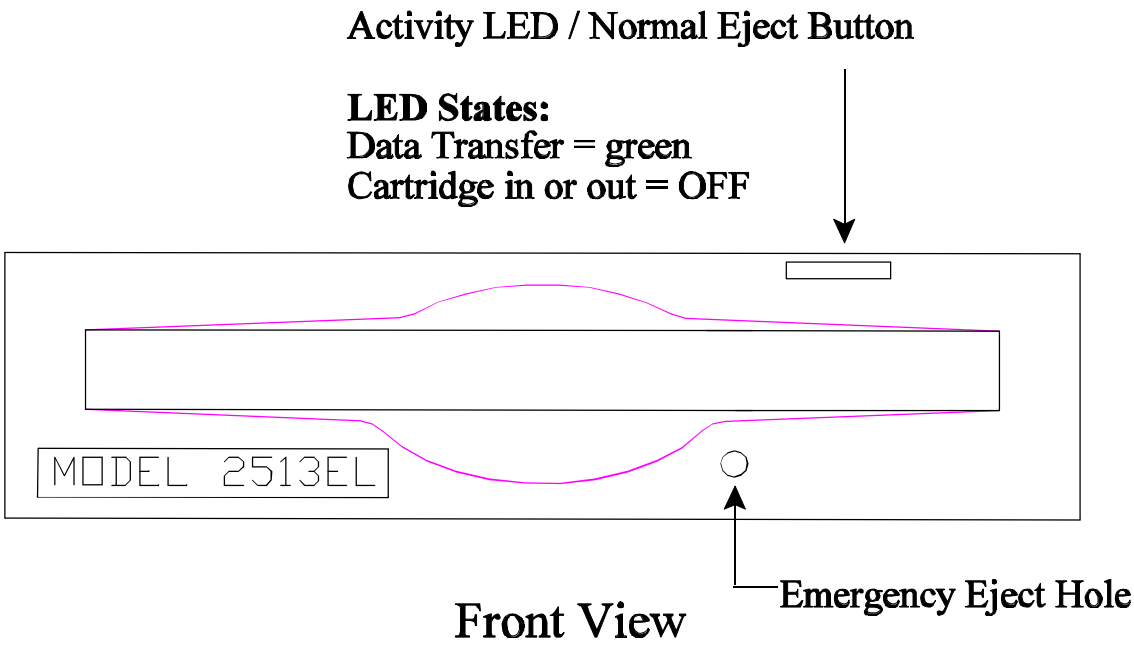
How to Remove a Cartridge from the Drive

1. Press the normal eject button on the drive.

2. The drive's LED will blink for several seconds after which the cartridge will eject and the LED will go off.

3. Remove the cartridge, place it in its protective case and store it in a secure location, away from magnetic fields.

MODEL 2513EL Drive Operation Instructions



*** WARNING! THE EMERGENCY EJECT HOLE SHOULD ONLY BE USED TO EJECT THE CARTRIDGE WHEN POWER IS TURNED OFF. DAMAGE TO THE DRIVE AND/OR CARTRIDGE CAN OCCUR IF THE CARTRIDGE IS REMOVED WHILE IT IS STILL SPINNING. READ ALL INSTRUCTIONS BEFORE ATTEMPTING TO USE THIS FEATURE.**

Model 2513EL

How to Insert a Removable Cartridge into the Drive

1. Hold the cartridge so the shutter points toward the drive and the Cognitronics label is up so you can read it. Insert the cartridge into the removable cartridge drive. Push the cartridge into the slot until it stops.

2. While the disk is spinning up, the drive's green LED will flash. After a few seconds, the LED will go off. During system operation, the LED will only light when the disk is being accessed.

How to Remove a Cartridge from the Drive

1. Press the normal eject button on the drive.

2. The drive's LED will blink for several seconds after which the cartridge will eject and the LED will go off.

3. Remove the cartridge, place it in its protective case and store it in a secure location, away from magnetic fields.

MODEL 2513 & MODEL 2513EL DRIVE/CARTRIDGE CARE & HANDLING PRECAUTIONS

Introduction

It is essential to properly handle the various types of removable cartridge media that can be used in McIAS systems. It is equally important to know how to use the drive correctly. Observing the precautions and following the procedures described in this document will maintain reliable operation and secure data storage. Refer to the "Removable Cartridge Guide" to determine which type of drive and cartridge is used in your system.

WARNING ! THE CORRECT CARTRIDGE *MUST* BE USED IN THE CORRECT DRIVE, OTHERWISE DAMAGE TO THE DRIVE AND/OR CARTRIDGE CAN OCCUR.

Handling and Safety Precautions

- Observe Electrostatic-discharge (ESD) precautions.
- Never leave a cartridge partially inserted in the drive.
- Only use Cognitronics approved cartridge media.
- Make sure the cartridge media is the correct type for the drive.
- Keep the cartridge media free of dust and dirt by placing it in the protective case when not in use.
- Allow the cartridge media to stabilize at room temperature before using it in the system.
- Do not store or use the cartridge in direct sunlight.
- Do not place heavy objects on the cartridge.
- Avoid touching the cartridge media surface when the shutter is open.
- Never leave the cartridge in the drive when moving the system.
- Avoid dropping the cartridge.
- Do not use a bulk tape-eraser on the cartridge media. This will destroy the embedded servo information.
- Never apply a cartridge label over another cartridge label.
- Do not write on the cartridge label with a graphite pencil.
- Do not expose the cartridge to strong magnetic fields.
- NEVER manually eject the cartridge from the drive using the "Emergency Eject Hole" unless power to the system is OFF. Wait 30 seconds after using the Emergency Eject Hole for the cartridge to stop spinning before removing the cartridge from the drive.

MODEL 2513 & MODEL 2513EL DRIVE MAINTENANCE INSTRUCTIONS

Introduction

This document contains the procedure for cleaning and maintaining the MODEL2513 drive. The cleaning period varies depending on usage and environment. Usually it is necessary to clean the drive once every six months. Refer to the “Removable Cartridge Guide” and verify which type of drive is used in your system before attempting to use this procedure.

Materials Required

McIAS16xx/68 system with a MODEL2513 removable drive.

Cleaning kit, Model 2513 Drive, Cognitronics P/N 40331020,
Contains this document and Fujitsu cleaner disk,
(Note: Fujitsu Cleaning Kit for 640MB, M2513A Drive, P/N CA90002-C980)

WARNING! DO NOT USE ANY CLEANING KIT OTHER THAN COGNITRONICS P/N 40331020 OR FUJITSU P/N CA90002-C980. DAMAGE TO THE DRIVE LENS AND HEAD MAY OCCUR IF OTHER TYPES OF MAGNETO-OPTICAL CLEANING PRODUCTS ARE USED !

Procedure

Caution: Check the cleaning brush state by opening the shutter door of the head cleaner cartridge. If the tips of the bristles are open, use a new head cleaner cartridge.

Hold the head cleaning cartridge so the shutter points toward the drive and the label is up so you can read it. Insert the head cleaning cartridge into the removable cartridge drive. Push the cartridge into the slot until it stops. When inserted, a label on the drive's door will indicate that a cartridge is in the drive.

Once inserted, the head cleaner will start and finish automatically. The cleaning operation takes about 10 seconds.

MODEL 2513 & MODEL 2513EL CARTRIDGE MEDIA MAINTENANCE INSTRUCTIONS

Introduction

This document contains the procedure for cleaning and maintaining cartridge disk media used in the MODEL2513 drive. The cleaning period varies depending on usage, environment and handling. Usually it is necessary to clean a cartridge disk media once every three months. Refer to the "Removable Cartridge Guide" and verify which type of drive is used in your system before attempting to use this procedure.

WARNING ! DO NOT USE THIS CLEANING KIT ON FLOPPY DISKETTES OR OTHER TYPES OF OPTICAL DISKS.

General Precautions

- There is a magnet in the revolving knob of the Setting Case. Be careful not to place any floppy diskettes or other sensitive magnetic media near the knob. The M.O. cartridge disk media is not sensitive to weak magnetic fields.
- Make sure the cap is tight on the cleanser container before storing.
- Do not use or store in direct sunlight.

Materials Required

- Media Cleaning Kit, for M.O. cartridge disks used in MODEL2513 drive. Cognitronics P/N 40331260 (contains Fujitsu P/N CA90003-0702 & instructions).
- Disposable gloves (recommended).

Procedure

Refer to the instructions that are in the "Cartridge Disk Media Cleaning Kit" for the latest information. Below is a summary of the procedure. Perform this procedure in a clean area. Use disposable gloves to avoid getting fingerprints on the cartridge disk media.

1. Slide the shutter completely open.
2. Place the cartridge disk (Cognitronics label side down) in the setting case so that the shutter is held open by the tab on the setting case.
3. Close the setting case cover and engage the revolving knob to the hub of the cartridge disk media.
4. Moisten the cleaning cloth with a few drops of cleanser.
5. Wipe the disk surface from the center out.
6. Turn the knob to the next section of media surface and clean with cloth.
7. Remove any excess cleaner from the disk surface with the cleaning cloth.
8. Rotate the knob and look for any smudges or damage.