Honeywell

LCN System Installation

SW20-500

Total Plant

Honeywell

LCN Installation

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SW20-500
Release 510
CE Compliant
9/96

TotalPlant

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Revision 03 – September 23, 1996

About This Publication

This publication provides instructions for use by the system hardware installation and checkout personnel.

It is designed to help you determine if the system hardware is properly installed and ready for system checkout. Use this publication any time the system is shut down for equipment replacement, expansion, or relocation.

The checkout personnel should be familiar with the contents of the *TPS System Site Planning* manual and the *LCN Planning* manual in the *System Site Planning - 1* binder, and the *LCN System Checkout* manual in the *LCN Installation* binder.

This publication supports **TotalPlant** Solution (TPS) System network Release 510 and CE Compliant hardware. TPS is the evolution of TDC 3000X.

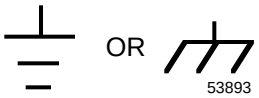
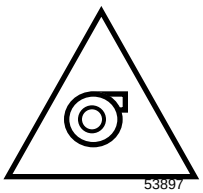
Any equipment designated as "CE Compliant" complies with the European Union EMC and Health and Safety Directives. All equipment shipping into European Union countries after January 1, 1996 require this type of compliance—denoted by the "CE Mark."

Information about equipment manufactured before 1/01/96 has been moved to the respective service manual.

Revision 3 has added the installation of the Classic Console Global User Station.

Change bars are used to indicate paragraphs, tables, or illustrations containing changes that have been made by this update. Pages revised only to correct minor typographical errors contain no change bars.

Standard Symbols

Scope	The following defines standard symbols used in this publication.
ATTENTION	Notes inform the reader about information that is required, but not immediately evident.
CAUTION	Cautions tell the user that damage may occur to equipment if proper care is not exercised.
WARNING	Warnings tell the reader that potential personal harm or serious economic loss may happen if instructions are not followed.
 53893	Ground connection to building safety ground
 53894	Ground stake for building safety ground
 53895	Electrical Shock Hazard—can be lethal
 53896	Electrical Shock Hazard—can be lethal
 53897	Rotating Fan—can cause personal injury

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INTRODUCTION
Section 1

This section lists all support documents and special tools/test equipment required during ***TotalPlant*** *Solution (TPS) LCN System equipment installation.*

1.1 PURPOSE AND SCOPE

The *LCN System Installation* manual provides instructions for installing TPS LCN System equipment cabinets, Universal Stations, Universal Station^X, RULA station, Application Module^X, Scanner Application Module, and Universal Work Stations at the customer site. This manual, along with the TPS equipment installation publications, listed below, are required during the initial system installation and for modifying or expanding a TPS system that is already installed. The installation procedures assume that all intracabinet/console cabling and wiring have been made at the factory before the equipment is shipped.

The installation manual includes general instructions on how to move and position the system equipment, how to connect the power and grounding cables to the equipment, and how to install the Local Control Network (LCN) and Data Hiway (DH) cables that link the functional modules to the system. A successful power-up check concludes the installation phase and signals the beginning of the system-checkout phase.

Included in this publication is the cabling information needed to install cables to equipment located outside the console and cabinets.

1.2 REFERENCE DOCUMENTS

The following documents are either required or will provide assistance during the installation phase of the TPS Local Control Network System equipment.

Title	Binder
Application Module^X Service	Application Module^X
BASIC System Installation (Section 25-110)	BASIC System Summary
Data Hiway Planning	System Site Planning - 2
Data Hiway Subsystem Site Planning	BASIC System Summary
Dual Node Module Service	LCN Service - 2
Engineer's Reference Manual	Implementation/Startup & Reconfiguration - 2
Five/Ten-Slot Module Service	LCN Service - 2
History Module Service	LCN Service - 2
LCN Guidelines - Implementation, Troubleshooting, and Service	LCN Installation
LCN Planning	System Site Planning - 1
LCN System Checkout	LCN Installation
Logic Manager Installation	Implementation/Logic Manager
Logic Manager Planning	System Site Planning - 2
PM and APM Planning	System Site Planning - 1
Process Manager Installation	Implementation/Process Manager - 1
TPS System Site Planning	System Site Planning - 1
UCN Guidelines	UCN Installation
Universal Station (Ergonomic)Service	LCN Service - 1
Universal Station Service	LCN Service - 1
Universal Station^X (Ergonomic) Service	Universal Station^X
Universal Station^X Service	Universal Station^X
Deskside Global User Station Service	Global User Station
Console Global User Station Service	Global User Station
Classic Console Global User Station Service	Global User Station

1.3 SPECIAL INSTALLATION TOOLS AND TEST EQUIPMENT

- Mobile lifter and/or lift truck.
- Set of standard technician's hand tools, including multimeter.

SYSTEM INSTALLATION
Section 2

Please read this section before unpacking or moving the equipment.

2.1 INSTALLATION OVERVIEW

This section provides instructions for receiving, unpacking, and placement of the **TotalPlant** Solution (TPS) System LCN equipment cabinets, Operator Interface Stations (OIS) and Universal Stations (USs), see Figure 2-1. The instructions assume that all of the system LCN modules and all interconnecting LCN cables within the cabinets and consoles have been installed and connected at the factory as shown in Figure 2-2.

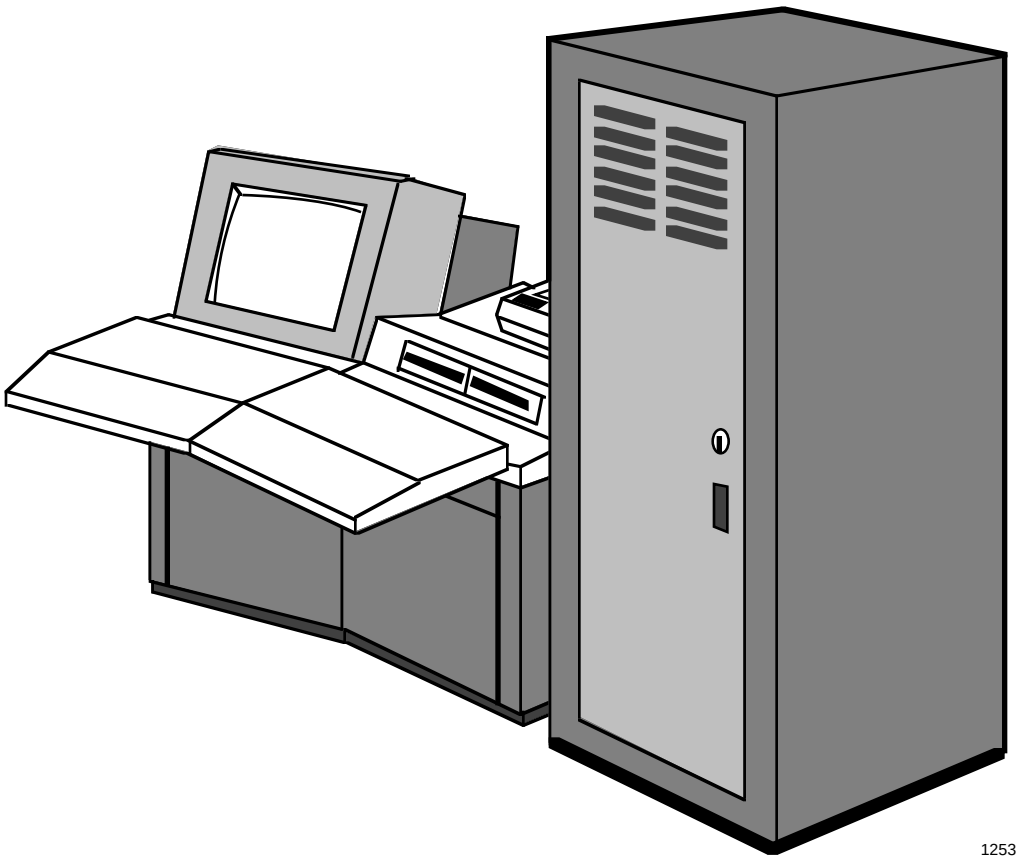


Figure 2-1 —TPS Universal Station and Equipment Cabinet

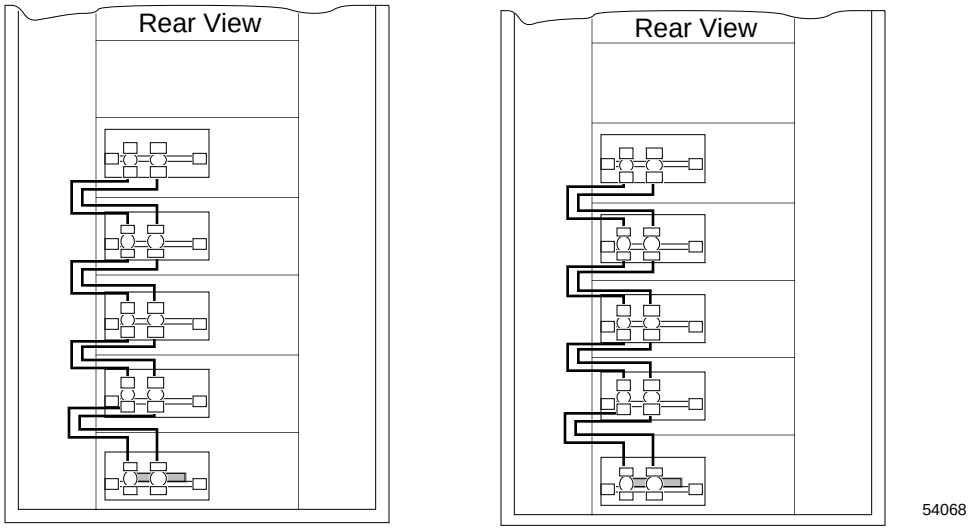


Figure 2-2 — LCN Cabinets with Intracabinet Cables Installed

All LCN coaxial-cable assemblies required to interconnect cabinets and consoles are assembled at the factory to standard or specified lengths and shipped with the system equipment (see Section 3).

The desk-side Universal Work Station is protectively wrapped and shipped in a double-wall pack. Its peripherals are packaged separately.

Refer to publications listed under subsection 1.2 for installation of BASIC System equipment and UCN Subsystem equipment such as:

- Multifunction Controller (MC)
- Advanced Multifunction Controller (A-MC)
- Process Interface Units (PIU)
- Process Manager (PM)
- Advanced Process Manager (APM)
- Logic Manager (LM)
- Operator Stations
- Data Hiway/Fiber Optic cabling
- Hiway Gateway (HG) cabling
- Network Interface Module (NIM) cabling
- Process I/O-signal wiring

An overview drawing of HG preferred-access cabling is presented in Appendix A.

2.2 PRELIMINARY SITE INSPECTION

Inspect the area in which the equipment is to be installed—refer to the "Preparedness Checklist" in Section 6 of the *LCN Site Planning* manual. Check the route from the delivery point to the final destination for adequate space through hallways, doors, and around corners. If, for example, the Universal Station cannot negotiate a narrow hallway or tight corner, it may be necessary to remove the keyboard/panel or table-top assembly before it can be moved into place. Also, the trend-pen recorder option, mounted above the CRT shroud, adds approximately two inches to the overall width (front-to-back). See Appendix A for removal/replacement procedure.

LCN equipment cabinets and the Universal Work Station do not have leveling pads and are designed to be installed on a level floor. Make sure the floor is level before moving the equipment into place. Note that LCN equipment cabinets are not designed for eye-bolt lifting. If cabling is to be run under the false floor, do so before the cabinet is moved into place. Cabinets can be bolted to the floor, if required. Holes are provided in each corner of the base.

2.3 STORAGE

If LCN equipment cabinets, Universal Stations, Universal Station^{X}s, Universal Work Stations, and peripherals are to be placed in storage, the environmental constraints specified in the *LCN Site Planning* manual, Table 2-1, must be followed, with particular emphasis on relative humidity and airborne contaminants.

EQUIPMENT UNPACKING AND PLACEMENT
Section 3

This section provides instructions on how to unpack and move the equipment into place. Also, LCN cable lengths and routing considerations are presented.

3.1 EQUIPMENT UNPACKING

Following factory assembly, inspection, and test, the configured cabinets and consoles are protectively wrapped for domestic shipment, or wrapped and crated for overseas shipment. The LCN equipment cabinets are strapped to a wooden shipping skid or pallet that is blocked on all sides. The Universal Station (US), Universal Station^{X}, and Global User Station are bolted to a shipping skid and wrapped or crated in a similar manner as the cabinets. The USs can be optionally equipped with castors or leveler glides. Castors are available for use after the skid is removed.

All intracabinet/console cables and table-top printers are boxed separately.

NOTE

STATICIDE work area before unpacking equipment. Use antistatic spray on floors, chairs, workbench, mats, tools, etc., in the work area. This inhibits static generation that can damage electronic equipment, see Section 6.

Upon arrival at the system site, remove shipping crate and protective wrapping and carefully inspect the equipment for any physical damage. If damaged, immediately notify the carrier and your Honeywell sales representative as to extent and type of damage. Also check each piece of equipment against the invoice list for any missing items.

3.2 EQUIPMENT PLACEMENT

The cabinets and consoles can be carefully moved into position, by use of lift trucks or mobile lifters. The Universal Stations can be rolled on their casters. Position the equipment according to the system-layout plan (refer to *LCN Site Planning* manual or *System Site Planning* manual). Verify that door openings allow access to LCN modules and controller card files for maintenance and checkout.

The shipping skid can be removed from the cabinet by first removing the wooden block on one side of the skid and gently sliding the cabinet off of the skid and onto the floor. Do not tilt the cabinet beyond 45° as this may cause damage to the doors and side skins. To remove the skid from the Universal Station, unbolt the wooden cleats that span the bottom-entry cutouts and slide the Universal Station off the skid as with the cabinet.

WARNING

Do not lift Operator Interface Stations by the keyboard tray.

3.3 EQUIPMENT PREPARATION

WARNING

The following safety procedures must be followed:

1. The power switch or breaker(s) on the system power control panel must be in the OFF position.
2. All cabinet and console power entry (PE box) circuit breakers must be in the OFF position.
3. If an optional cabinet is installed, its circuit breaker must be in the OFF position.

- Set the LCN equipment cabinets in place according to the site configuration-layout plan. Do not exceed LCN cable-length limits, see LCN/LCNE Cabling, subsection 3.6. Side skins are not removable; however, the front and rear doors can be removed. Cabinets can be placed side-to-side, as if complexed.

- Set the Universal Station in place according to the site configuration-layout plan. Do not exceed LCN cable-length limits, see LCN/LCNE Cabling, subsection 3.6. Universal Station console bays can be complexed; see Appendix A.

- Set the Universal Work Station (UWS) adjacent to a desk that holds the peripheral CRT, keyboard, mouse and optional printer. The UWS electronics package and each of its peripherals are equipped with 6-foot ac power cords. Provide two duplex outlets nearby for their connection. Do not exceed LCN cable length limits; see Appendix A.

- Set the Deskside Global User Station components on a tabletop or desktop. The electronics tower can be placed on the floor under the table or desk, directly under the Monitor and keyboard.

Note that if the Universal Station (US) is located near an outside window, use shades or drapes to ensure that direct sunlight does not fall on the US CRT touchscreen components. Direct sunlight can cause the touch screen (photocells) to activate and the beeper to sound off. Be especially aware of early morning and late evening low sun positions relative to the CRT touch screen position.

- For Data Hiway coaxial cable-length limits and polled device-addressing constraints refer to Section 4 of the *Data Hiway Subsystem Site Planning* manual or to the *System Site Planning* manual.

- Open the front and rear door of the cabinet/console to gain access to the power-entry box and the cable-entry cutout area.

- The Operator Interface Station power connection is located under the footrest cover.
  - Remove the inside covers from each OIS leg.
  - Loosen the three bolts along the top rear edge.
  - Slide the footrest cover forward.

3.4 CONSOLE COMPLEXING—UNIVERSAL STATION FURNITURE

NOTE

Ensure that all cable access ports located at the front bottom right and left sides are open before complexing. See Figure 3-1.

When the task of complexing the console is finished, close the cable access port on each end of the console.

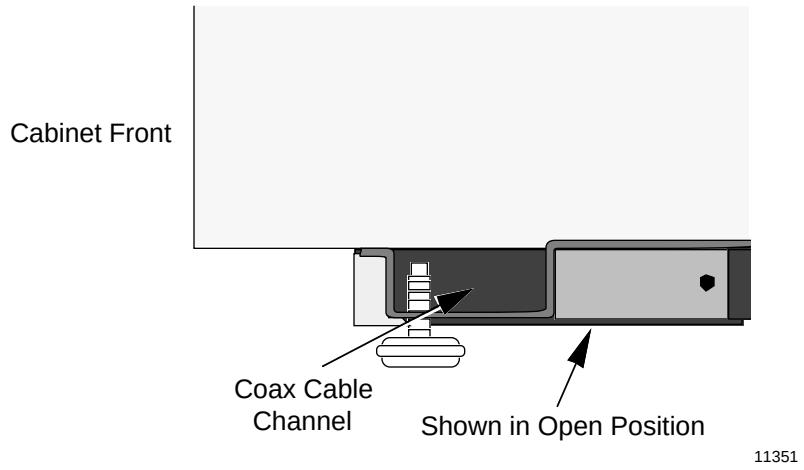


Figure 3-1 — Location of Cable Access Ports in a Universal Station

When Universal Stations (USs) are to be complexed together to form a console, use complexing kit P-ZCKY1. The number of kits required for a console is one less than the number of USs in the console. A complexing plate, 51303672, mounts on the bottom of the keyboard, connecting the two keyboards together. See Figure 3-2.

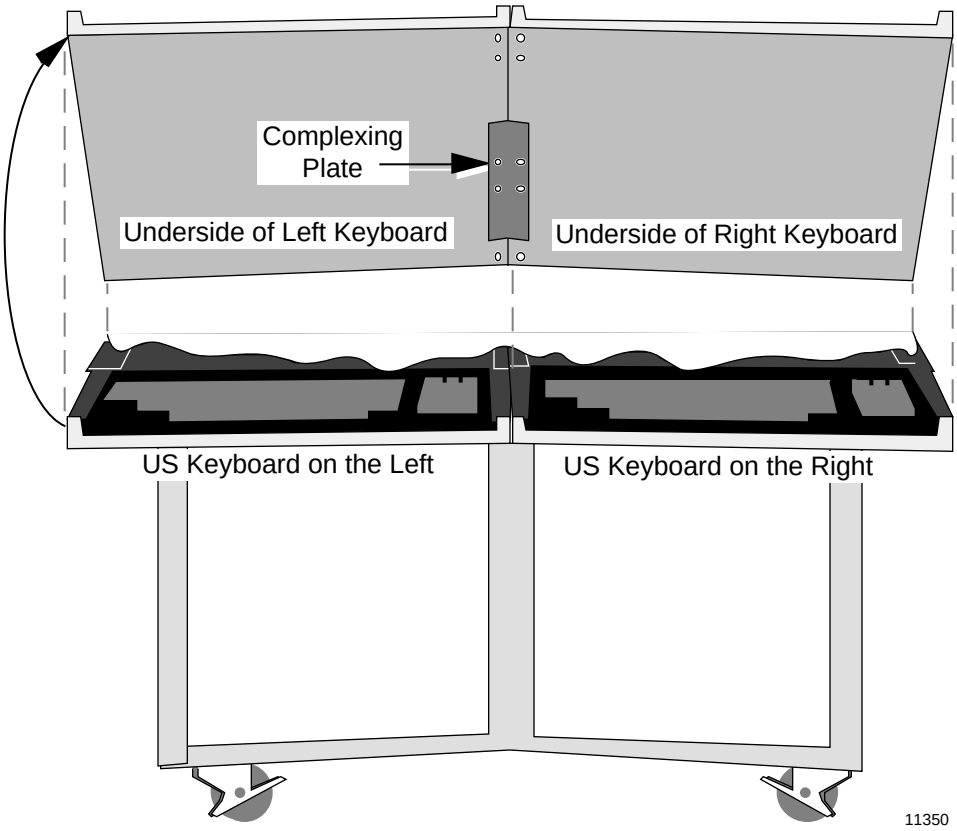


Figure 3-2 — Installation of Complexing Plate under US Keyboard

An angled strap, 51201261, fastens the back of the two USs together. See Figure 3-3.

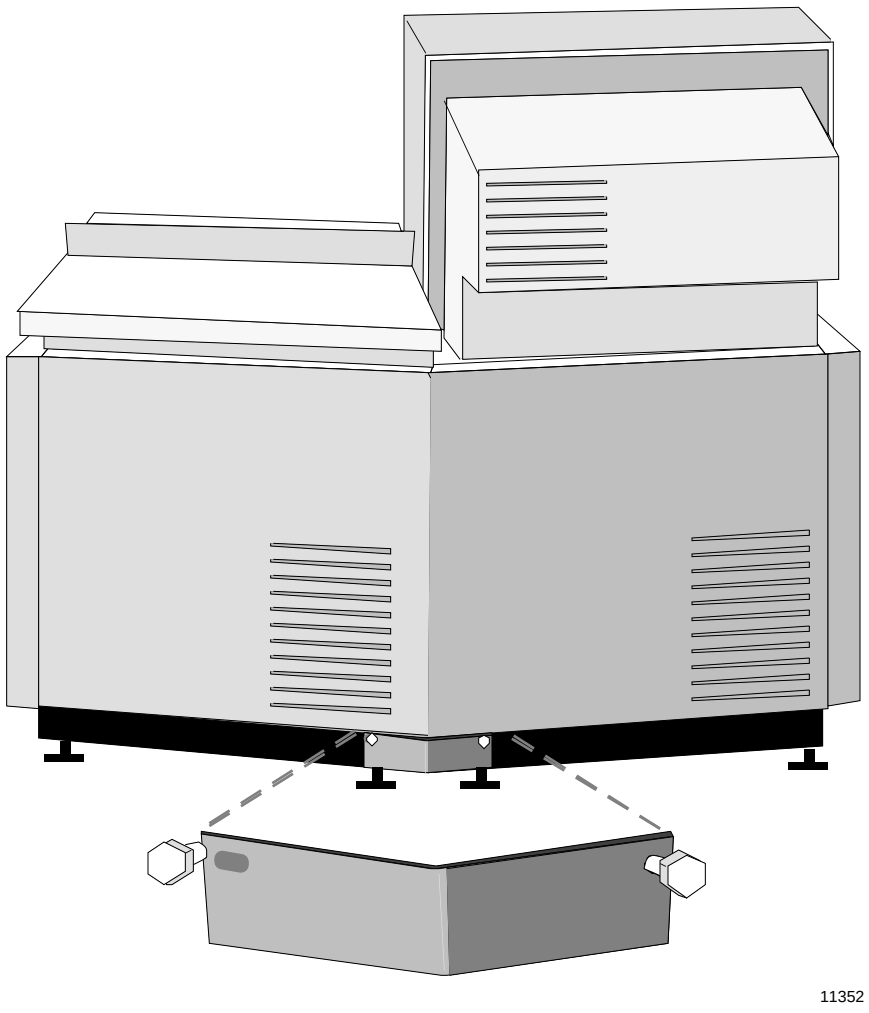


Figure 3-3 — Installation of Complexing Strap to Rear Lower Corner of US

3.5 CONSOLE COMPLEXING—ERGONOMIC UNIVERSAL STATION FURNITURE

Ergonomic US furniture can be complexed in two forms.

- A semicircular arc, where each station is arced 10° from the adjacent station, is formed by bolting the stations together. See Figure 3-4.
- A inline console where wedges are added in between each station to close the gaps left between the front surfaces. See Figure 3-5.

3.5.1 Complexing for an Arced Configuration

The following steps are required for the joining of two stations together. The complexing tie plates (2) are attached to one station, the second station is set in place next to the first, the flexible spacers are inserted, and then the second station is bolted to the two tie plates.

1. Install a Wedge Tie Plate Arc, 51403114-100, to the front of the bottom corner of one of the two stations bases. See Figure 3-4.
2. Install a Tie Plate Arc, 51308037-100, under the keyboard of the same station.

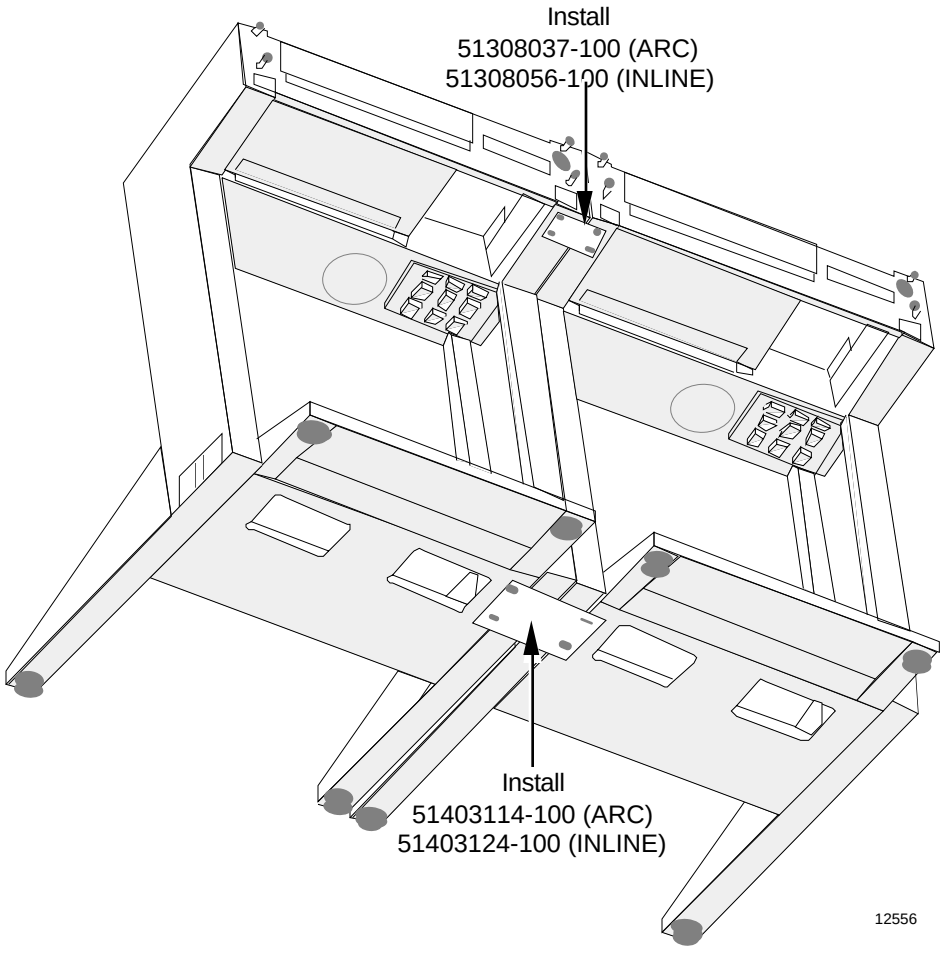


Figure 3-4 — Arced Complexed Universal Stations

3. Place the second station next to the first station.
4. Insert a Flexible Spacer, Bottom Arc, 51308033-100, between the two lower monitors as shown in Figure 3-5. The spacer fits in the groove behind the bezel, on both stations, with the top even with the middle of the CRT Mount (wedge.)
5. Upper Monitors:
   - If there is an upper monitor in both stations, and they are tilted forward, insert a Flexible Spacer, Bottom Arc, 51308033-100, between the two upper monitors. The spacer fits in the groove behind the bezel. See Figure 3-5.
   - If there is an upper monitor in both stations, and they are **not** tilted forward, insert a Flexible Spacer, Top Arc, 51308036-100, between the two upper monitors. The spacer fits in the groove behind the bezel. See Figure 3-6.

   In both cases, the top insert must be tight to the insert below it. Trim the excess upper end of the Flexible Spacer.

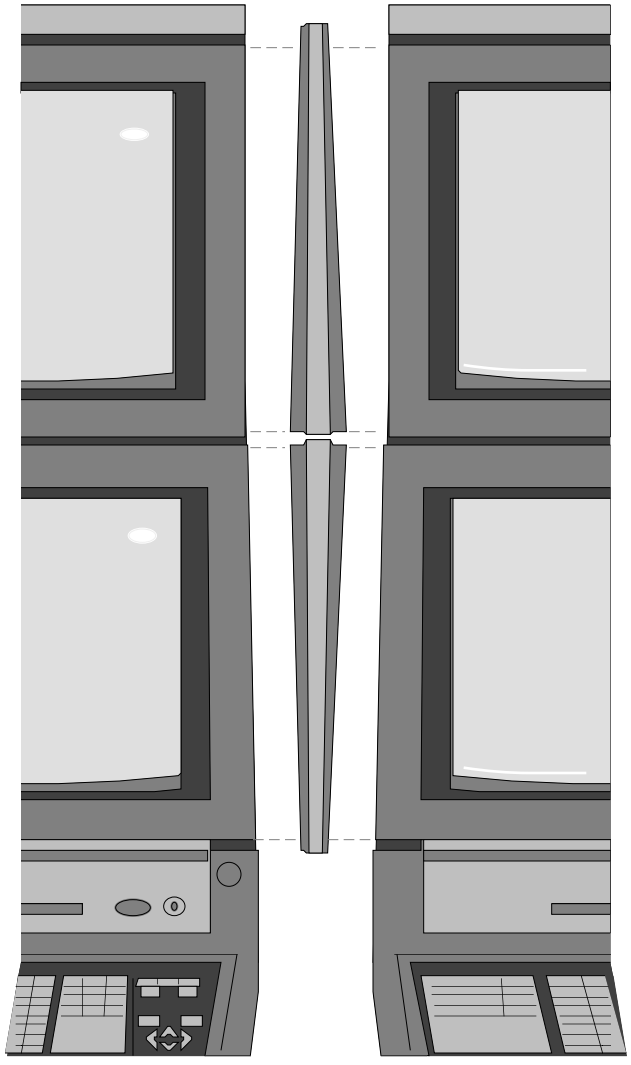


Figure 3-5 — Arc Complexed Ergonomic Universal Stations with Wedges

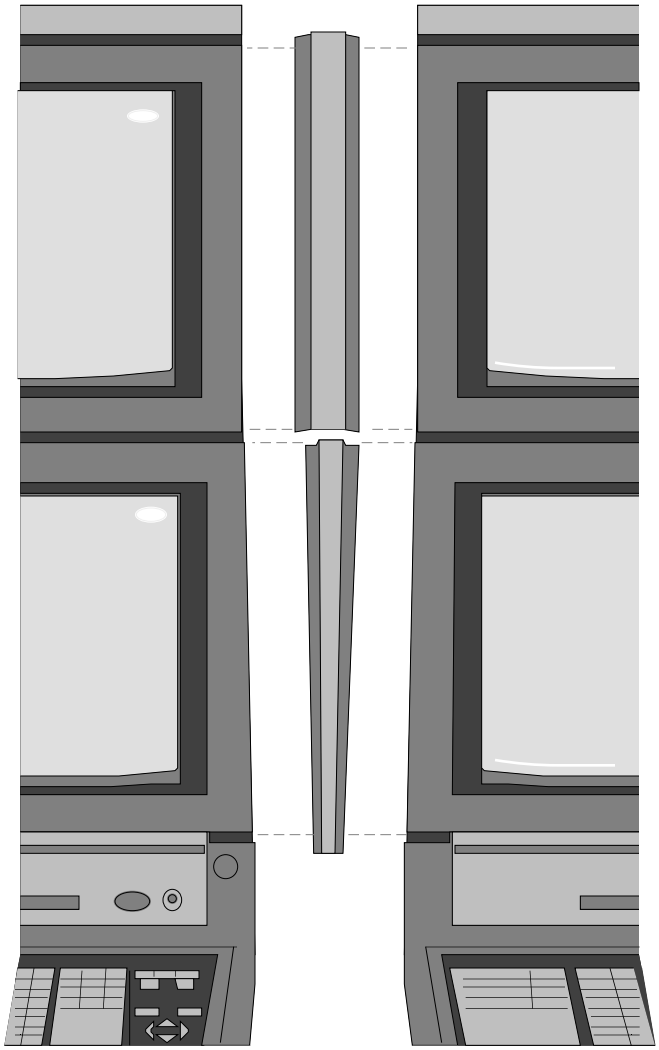


Figure 3-6 — Arc Complexed Ergonomic Universal Stations with Wedges

6. Bolt the second station to both complexing tie plates.

3.5.2 Complexing for an Inline Configuration

The following steps are required for the joining of two stations together. The complexing tie plates (2) are attached to one station, the second station is set in place next to the first, the flexible spacers are inserted, and then the second station is bolted to the two tie plates.

1. Install a Wedge Tie Plate Inline, 51403124-100, to the front of the bottom corner of one of the two stations bases. See Figure 3-4.

2. Install a Tie Plate Inline, 51308056-100, under the keyboard of the same station. See Figure 3-4.

3. Place the second station next to the first station.

4. Insert the two long bolts to the keyboards of each station. Start a nut on each bolt.

5. Insert the Inline Wedge Assembly, 51202034-100, between the keyboards and tighten the nuts.

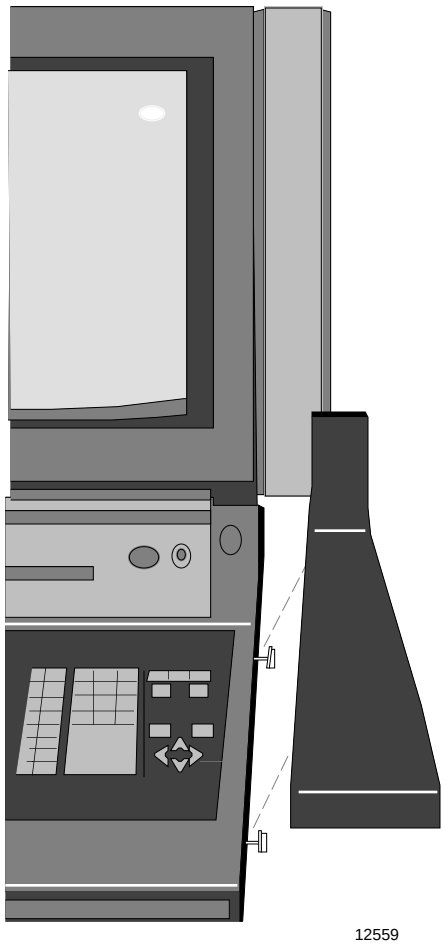


Figure 3-7 — Straight-Line Complexed Operator Interface Stations with Wedges

6. Insert a Flexible Spacer, Bottom Inline, 51308038-100, between the two lower monitors as shown in Figure 3-7. The spacer fits in the groove behind the bezel, on both stations, with the top even with the middle of the CRT Mount (wedge.)

7. Upper Monitors:

   If there is an upper monitor in both stations, and they are tilted forward, insert a Flexible Spacer, Bottom Inline, 51308038-100, between the two upper monitors.

8. Bolt the second station to both complexing tie plates.

3.5.3 Installing Cable Access Port Covers

Install a Cable Cover, 51202027, in the outside leg of the far right and far left station. Insert the Cable Cover plate from the inside of the leg, over the mounting stud, and retain with a nut. The protruding part of the plate will fill the hole, such that the outside of the cabinet leg is smooth.

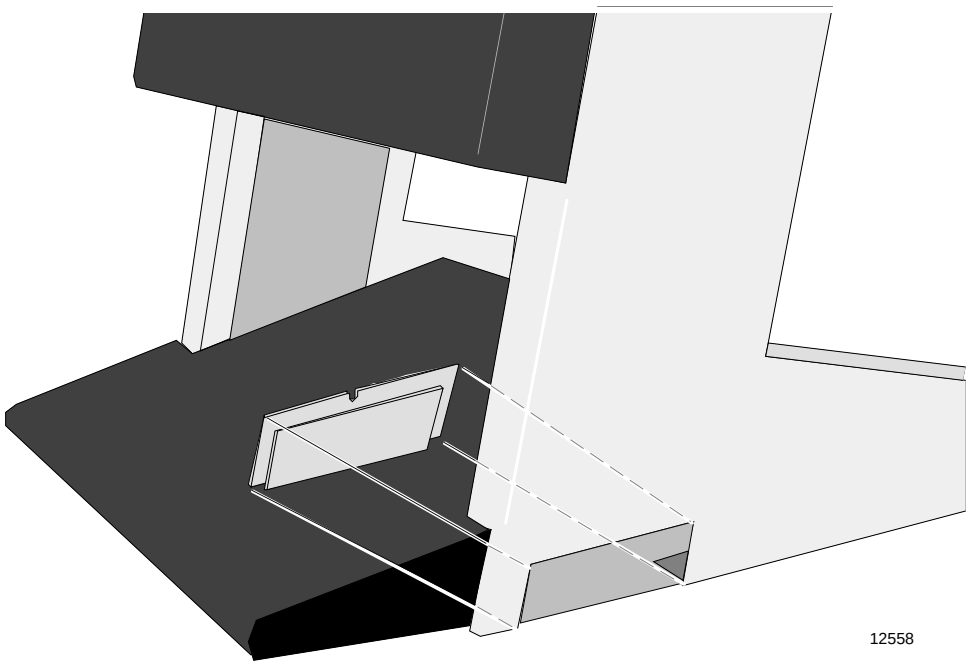


Figure 3-8 — Location of Cable Access Ports in Ergonomic Universal Stations

3.6 LCN CABLING

As shown in Figure 2-2, LCN cabinets have the intracabinet cables installed in the factory. The system is then tested in a system configuration and the cables inside the cabinet are left in place to be shipped with the equipment. The remaining installation task is for the cabinets and the consoles to be cabled together as shown in Figure 3-9, Figure 3-10, and Figure 3-11.

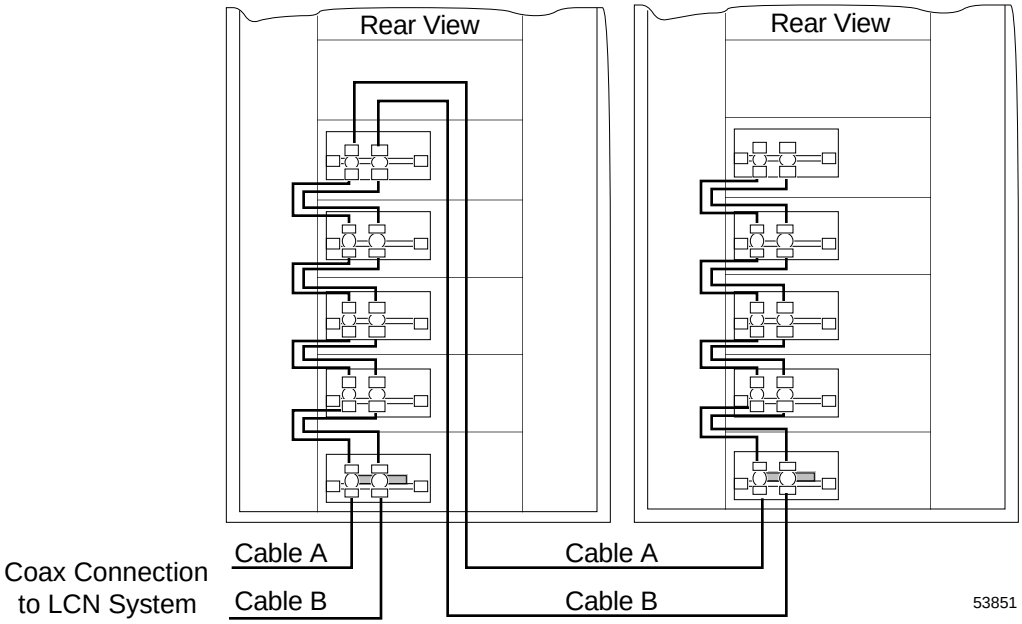


Figure 3-9 — Intracabinet Coax Cabling between LCN Cabinets

After the Universal Stations have been complexed (bolted) together, coax cable can be connected as shown in Figure 3-10 or Figure 3-11. Cables can exit and enter each US through the bottom or through the side openings.

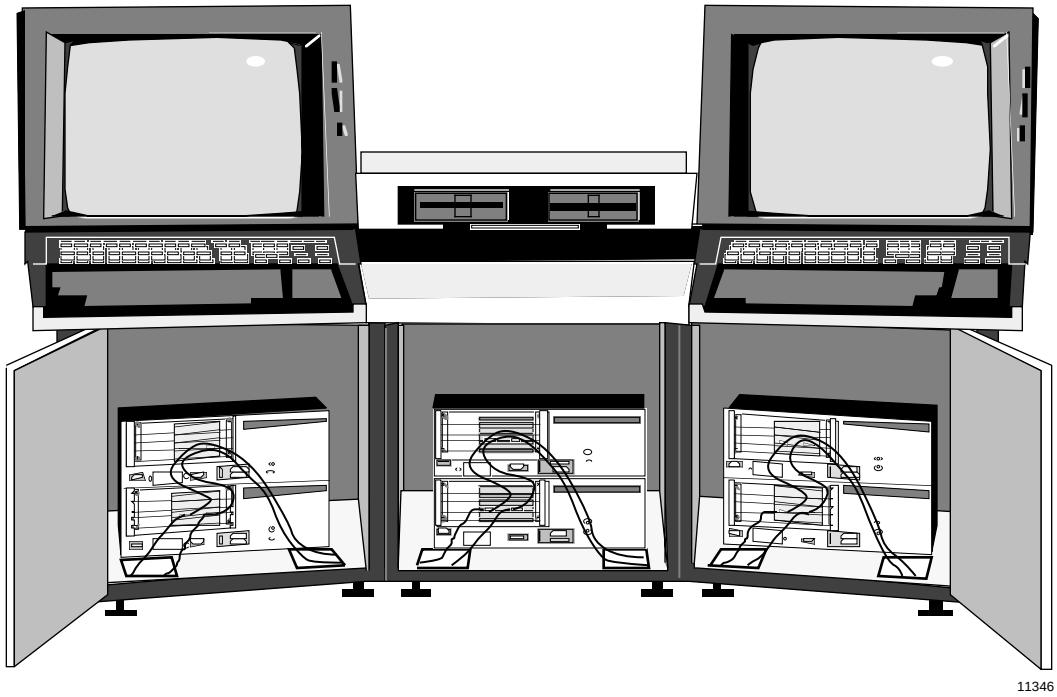


Figure 3-10 — Console Cabling between Universal Stations (Standard Furniture)

Ergonomic furniture cable must be done in the left leg of the station. The right leg is reserved for ac wiring—this applies to wiring that goes all the way to the top monitor position in the station. Excess signal cables are allowed to loop into the left leg.

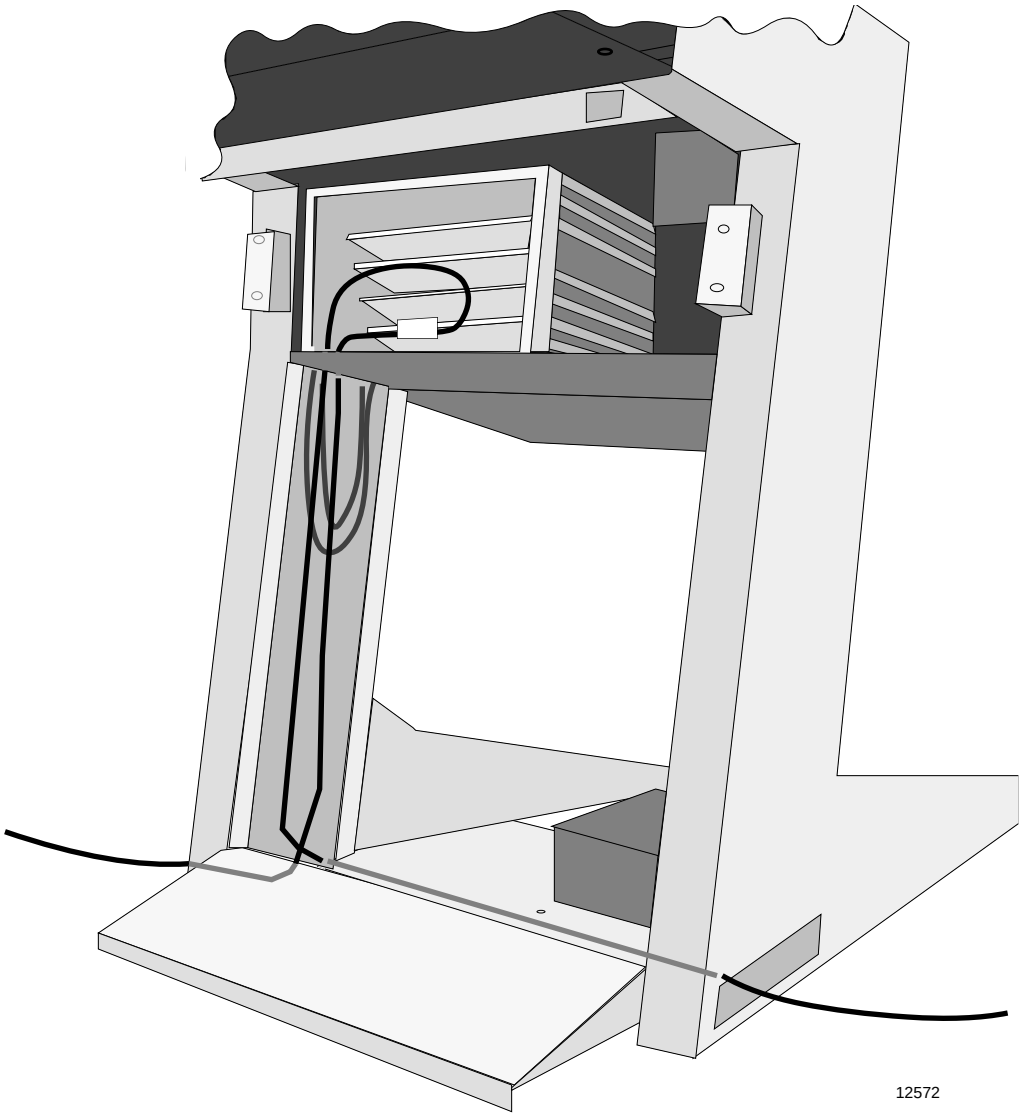


Figure 3-11 — Console Cabling between Universal Stations (Ergonomic Furniture)

3.6.1 LCN Cabling Rules

Local Control Network (LCN) must be

- a maximum coax cable length that is a total of 300 meters (984 feet). This includes cable segments.
- a minimum cable length of 2 meters (6 feet) between any two nodes on the network.

The RS-485 interface on the 4 of DNPKG modules is not a part of the restriction.

WARNING

TotalPlant Solution (TPS) System LCN coaxial cables and associated components have been designed and tested by Honeywell IAC to meet strict standards of performance. Other coaxial cables and components have not been tested and qualified for use in the LCN system; therefore, no substitutions are approved by IAC.

Various lengths of coaxial cable are available as standard products and must be ordered from Honeywell IAC.

Table 3-1 — LCN Coax Cable Components

Maximum cable length	300 meters (984 feet)
Coaxial cable type	**System Cables (LCN coaxial-cable set)** are available in standard and variable lengths. Each set consists of two cables, marked A & B, in the following lengths: **Honeywell Part Number** **Length (meters)** 51308112- 003 3 meters 008 8 meters 015 15 meters 030 30 meters 050 50 meters 100 100 meters 200 200 meters XXX = Variable length Max = 300 meters
Minimum cable length between nodes	2 meters (78 inches). Use 51308111-002, which consists of two cables, one marked Cable A and one marked Cable B. All LCN cables must be marked. It is essential that Cable A is Cable A to all nodes. Make certain that cables are not crossed. Do not substitute with unauthorized cables.
BNC Tee-connectors	51190728-105. **Note that these are not the same as those used on the Data Hiway.**
Termination resistors	**30732052-001**, are required at each end of both coaxial cables.
For fiber optic cable ordering information, see *LCN Guidelines* in the *LCN Installation* binder.	
LCN cabling must not be routed outside the control room building. Consider LCN Extenders (LCNE) and Fiber Optic cables for outside conditions.	
See Section 2 of *LCN Guidelines* in the *LCN Installation* binder for specific LCN cabling rules.	

Use only Honeywell supplied LCN cabling, and always connect cables marked "A" to the A connector of a node, and cables marked "B" to B connector of a node (never interchange "A" and "B" cables). It is strongly recommended that the color-coding system of marking coax cable, T-connectors, terminators, and connectors (board) be used. These materials are available from your Honeywell representative.

NOTE

LCN Coax Cable Color Code Cable A = Yellow Cable B = Green

3.6.2 LCN Cable Connections

The LCN coax cable system consists of a dual run of coax cable called the “A Cable” and the “B Cable.” Each cable connects to the coax connector on the module interface board (CLCN A/B, CLCN A, or CLCN B) with a T-connector. Refer to Figure 3-12 and Figure 3-13.

Five-Slot and Ten-Slot Modules have one set of coax connections for each module. These connections are located on the CLCN A/B card in slot 2 at the rear of the module. A minimum coax cable of 2 meters (6 feet) is used to connect one module to another.

DNPKG Modules have one set of connections for each DNPKG module. The A Cable connection is located on the CLCN A board in the bottom slot (1) of the top node in a DNPKG module. The B Cable connection is located on the CLCN B board in the bottom slot (1) of the bottom node in a DNPKG module. A minimum coax cable of 2 meters (6 feet) is used to connect one module to another.

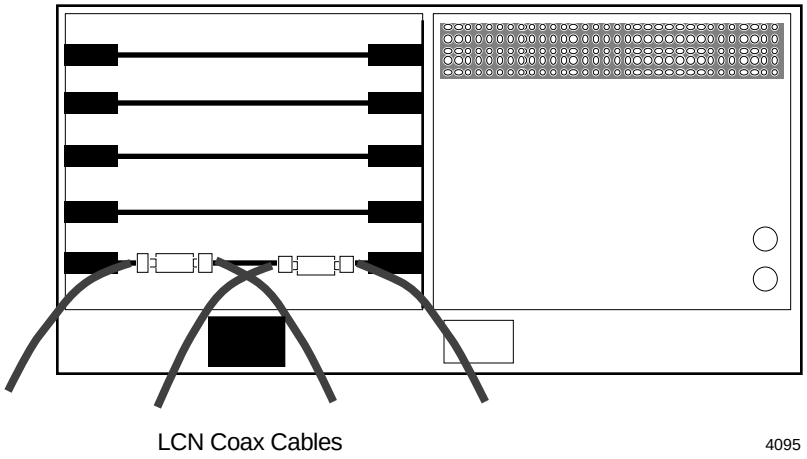


Figure 3-12 — LCN I/O Board Coax Connections

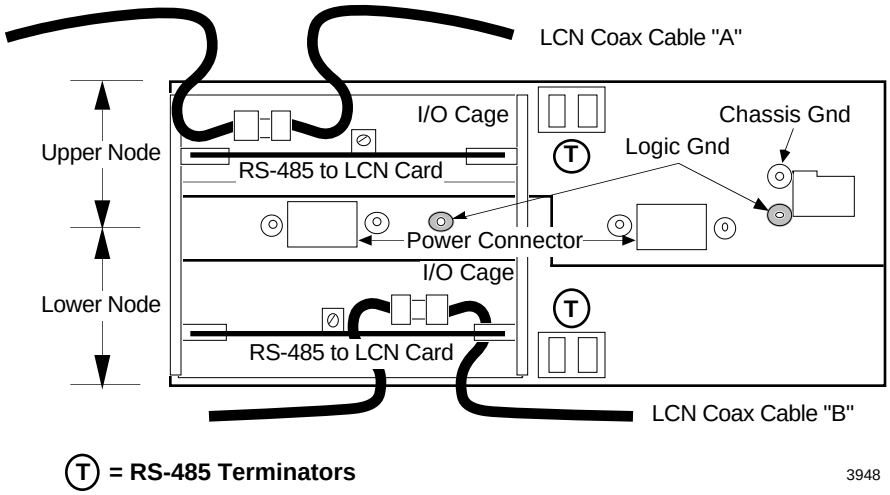


Figure 3-13 — KLCNA/KLCNB Board Coax Connections

3.6.3 Coax Cabling Procedure

1. Connect all “A” cables to the “A” connector on the LCNI I/O cards and KLCNA cards.

2. Load system software or HVTS into the system.

3. Do a CONFIGURATION request to each LCN node configured on the system as shown in the topology map for this system. Each node should report its configuration. If any do not, then they are not connected to the coax cable or are connected to the wrong coax cable.

4. If all nodes properly report their configuration, connect the “B” coax cables to the “B” connectors on the LCNI I/O cards and the KLCNB cards.

3.7 LCN EXTENDER (LCNE) CABLING

LCN Extenders (LCNEs) and fiber optic cables, up to two km (6562 ft.) in length, can be used to interconnect LCN coaxial bus segments. For information about the hardware and connections required to implement this, refer to Section 3 of *LCN Guidelines*.

3.8 INSTALLATION OF FLOATING ENGINEER’S KEYBOARD (U^{X}S Auxiliary)

Install a Floating Engineer’s Keyboard on a Universal Station (US) that is designated to use the Engineer’s Personality or do engineering functions using the Universal Personality. Connect the keyboard cable to the US by plugging it into the connector located on the right-hand side of the gooseneck under the Operator’s Keyboard.

NOTE

In an Arc configuration, keyboard trays cannot be extended on adjacent Operator Interface Stations (OISs).

- Extend the keyboard tray by grasping the tray by the hole, located under the tray in the center and pull forward.

- Keyboard cable connection is located behind the Removable Media door.

- Set the keyboard on the extended tray with the keyboard legs in the elevated position.

3.9 INTERCONNECTION OF PERIPHERALS LOCATED IN SEPARATE SINGLE BAY US FURNITURE

To interconnect the cartridge or floppy drive(s) that are located in single bay furniture, do the following:

1. Place the Universal Station (US) and the single bay furniture next to each other such that the single bay furniture has the folded cables located next to the US. The cartridge/floppy interface cable is folded and clamped to the side of the cabinet, just inside the front door as shown in Figure 3-14.

2. Complex the two cabinets together to prevent damage to the cable should the cabinets be pushed apart.

3. Unfasten the cable clamps that hold the cartridge/floppy cable, but allow the cable to still pass through the cable clamps. Refasten the cable clamps.

4. Route the cable through the hole in the side of the cabinet (or in the bottom of the cabinet and up through the hole in the US) as shown in Figure 3-14.

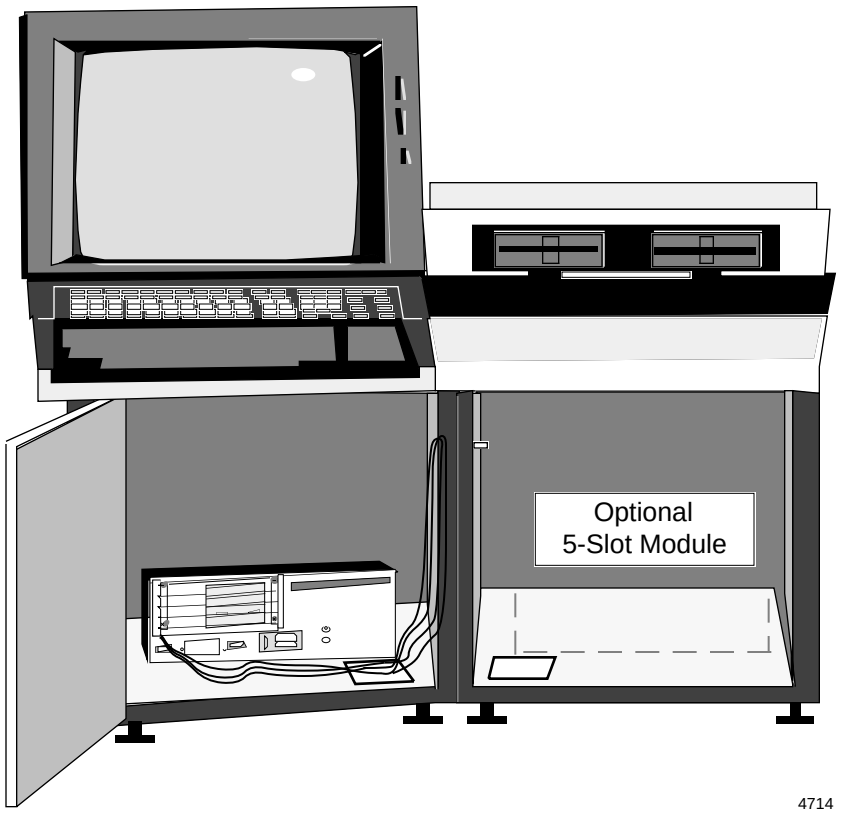


Figure 3-14 — Interconnection of Peripheral Cables between a US and Single Bay Furniture

5. The peripheral cables are folded and retained by cable clamps inside the worksurface cabinet.

   For Classic furniture

   - Unfasten the cable, still passing them through the cable clamp.
   - Pass the cable through the cable pass-through hole in the cabinet side, into the Universal Station (or Universal Station^{X}) cabinet.
   - Connect the peripheral interface cable as follows:
     - Cartridge cable, 51192054-102 to the EPDGC or TPDGC I/O board SCSI connector J2.

   For Ergonomic furniture

   - The cables are stored in the foot of the worksurface furniture. Free the cable and pass the cable through the cable pass-through hole in the cabinet side, into the Universal Station (or Universal Station^{X}) cabinet.
   - Run the interface cable up the left side of the console leg to the I/O card file.
   - Connect the peripheral interface cable(s) as follows:
     - Cartridge cable, 51192054-102 to the EPDGC or TPDGC I/O board SCSI connector J2.

6. If there is any excess cable hanging below the cabinet, pull it into the single bay cabinet and fasten it in the cable clamps on the side of the cabinet.

SYSTEM GROUNDING
Section 4

Proper electrical grounding of the system equipment is presented here.

4.1 GROUND WIRING OVERVIEW

System-grounding requirements are specified in the *LCN Site Planning* manual. Both Universal Stations and cabinets are prewired with the logic grounds and chassis grounds already connected to the LG, HG, and Safety Ground connection points. At installation time, the connection points must be wired to building steel or the appropriate ground stake. In summary, system grounding consists of two steps:

- Step 1 is to ensure that the cabinet/station metal frame is grounded to ac-power safety ground to protect personnel and to establish a good noise ground connection.

  Connect the safety ground lug in each cabinet to the safety ground stake or intermediate star plate. Use a separate wire from each cabinet to the connection point. Only one star plate is allowed between any one cabinet and the safety ground stake collection star plate, located just inside the building.

- Step 2 is to single-point ground Hiway Gateway (HG) cable shields to MRG. This is only done when an HG is used without an HTD. **This must be done if the HTD is removed from the system.**

4.2 GROUNDING LCN CABINETS AND UNIVERSAL STATIONS

STEP 1 Each LCN cabinet and station is equipped with a Safety Ground Terminal, see Figures 4-1 and 4-2. It is recommended by Honeywell and required by many codes, for personnel protection, that each cabinet and station be connected to building steel or other designated safety ground before connecting ac power wiring. Make sure that the safety wire (green or yellow green), if insulated, from the cabinet and station frame ground post is connected to the safety ground terminal block in the control room power panel, dedicated branch circuit power panel, or building steel .

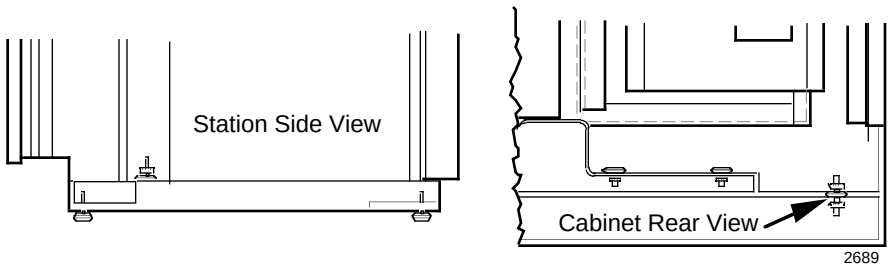


Figure 4-1 — Safety Ground Terminal In Universal Stations and Cabinets

STEP 2

Five-Slot Modules

Hiway Gateway modules that connect to Data Hiways that do not have HTDs must have a ground wire installed from the DHI I/O board to the MRG.

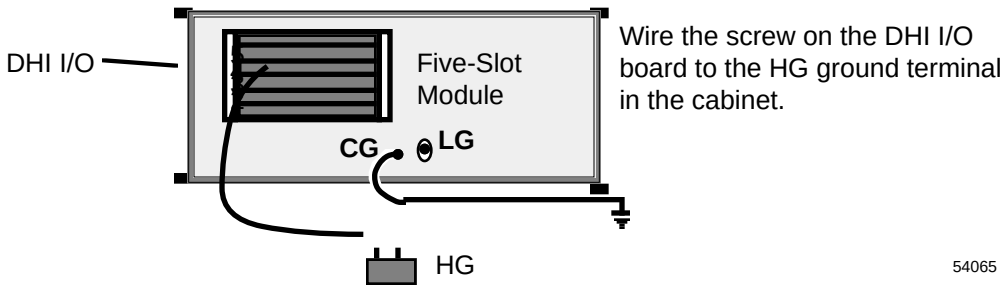


Figure 4-2 — Logic Ground (LG) Connection to Safety Ground Stake

Dual Node Modules

If an HG is used without an HTD, the DHI I/O board ground screw must be connected to the HG connection post (shown in the figures of this section) and the HG connection post must be wired with 4-gauge wire to the Master Reference Ground (MRG), as shown in the *Data Hiway Subsystem Site Planning* manual.

If the HG, used without an HTD, is located in a cabinet, the LG/HG service post must be grounded to an MRG Star Plate with a 5.3 m^2 (#4 AWG) wire.

Daisy chaining of MRG and HG grounds is not allowed.

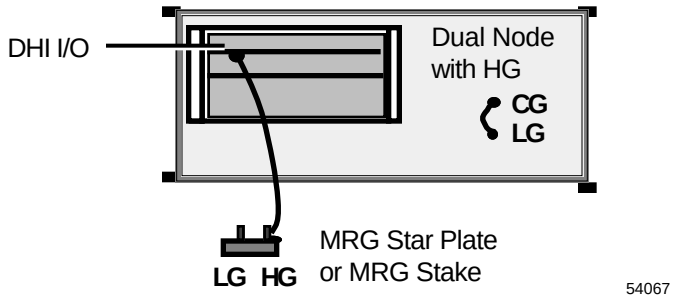


Figure 4-3 — DHI I/O Ground Connection in a Dual Node Module

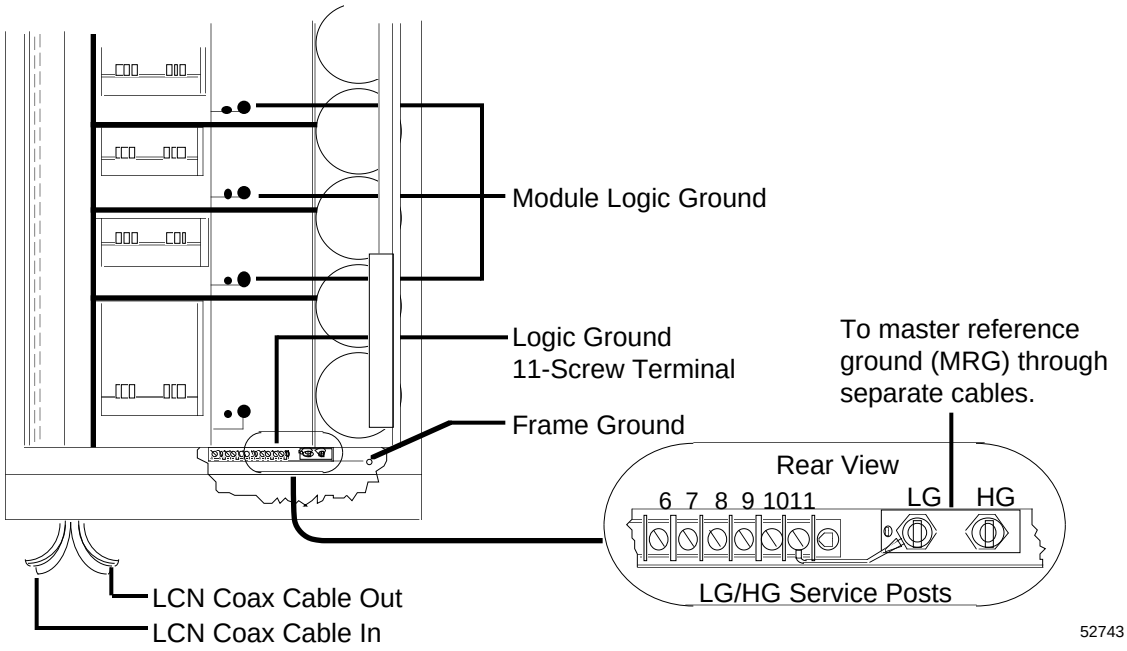


Figure 4-4 — Cabinet Logic Ground Terminal Board

STEP 3 Local Control Network (LCN) cables are grounded in two different schemes.

- Systems with the 12.5 KHz system clock are self-grounding, by way of the cable shield, when the cable is connected to the BNC receptacle on the CS/R paddle board in the clock source node.

- In systems with the 5 MHz bit digital system clock (a segment with only K2LCN boards in the modules), the coax ground connection is made once for each cable (A and B) by a wire from the KLCNA or KLCNB board to chassis ground. This wiring is to be done in one module for each cable, preferably in the Module designated as clock source modules.

  In a segment that has had the processor board (EMPU, HMPU or HPK2) replaced with K2LCN boards, the CS/R board must be retained but placed in an empty slot in a module (the CS/R PWA is now used for grounding only).

  If the system includes Hiway Gateway (HG) module(s) and a Hiway Traffic Director (HTD), the Data Hiway cable shield grounding rules specified in the *Data Hiway Subsystem Site Planning* manual must be followed. An overview of HG preferred-access cabling is presented in Figure A-5.

  If the system does not include the HTD, the Data Hiway cable shield is grounded at the primary HG as follows: connect an AWG #14 wire from terminals 11 and 13 on terminal TB1 of the primary HG, DHI I/O board to the HG service post at the bottom of the cabinet or station. See Figure 4-4. **The HG service post must be connected to Master Reference Ground (MRG) through AWG #4 wire.**

The LCN cable connectors, like the Data Hiway cable connectors, must not be allowed to touch the cabinet frame. All LCN cable connectors that enter or exit the cabinet or station must be covered with heat-shrink tubing insulation.

Note that all LCN cable runs must be terminated the same way as the Data Hiway cables. The 75-ohm terminators are interchangeable; however, the T-adapters are not.

NOTE

For LCN cable, use BNC T-adapter P/N 51190728-105 (Kings No. KC-99-52 or Amphenol 31-208-1051). For Data Hiway cable, use BNC T-adapter P/N 30732055-001.

In an all K2LCN segment of an LCN coax system, a ground must be provided for the coax shield by placing a wire between the grounding screw of the KLCN CA/KLCN CB boards and the logic ground terminal on the back of a Dual Node module. This should only be done at one point on each cable in a coax segment. Ground Cable A and Cable B in different modules.

Verify the integrity of the system ground wiring after the system power has been connected (see Section 7). Any grounding problems must be identified and immediately corrected to eliminate the possibility of any of the following conditions:

- Shock hazard to personnel
- System operating problems
- Damage to equipment

4.3 GROUNDING UNIVERSAL STATIONS/UNIVERSAL STATION^{X}s IN ERGONOMIC FURNITURE

The new US furniture has two collection point ground lugs for in-station grounds (one for chassis ground and one for MRG). There is also a ground lug for collecting the following:

- Logic Ground—in an HG on a Data Hiway that does not have an HTD (see Figures 4-2 and 4-3).

  The HG terminal must be connected to the MRG ground stake with an insulated 5 m^2 (#4 AWG) wire.

- Third post (Safety Ground)—this post is connected to the station sheet metal and can be wired to the safety ground in the power panel or to building steel with an insulated 5 m^2 (#4 AWG) wire.

  NOTE: The power cord has a safety ground connection. This second Safety Ground connection is required by some codes.

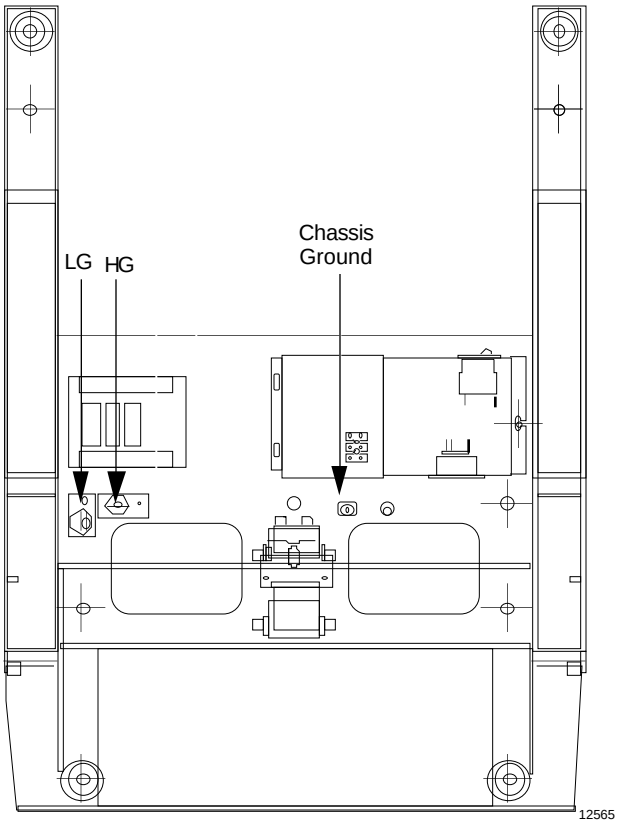


Figure 4-5 — Safety Ground Terminal in Ergonomic Universal Station Furniture

POWER ENTRY WIRING
Section 5

This section provides instructions on how to wire system power to the Honeywell power entry box.

5.1 POWER ENTRY BOX WIRING IN UNIVERSAL STATION FURNITURE AND CABINETS

Both the Universal Station (each implemented bay) and the equipment cabinets include a power entry box, located at the bottom of the cabinet or console bay. The power entry-box circuit breakers, filter, and receptacles are wired at the factory. System power wiring to the terminal board, TB1, in each power entry box is furnished and installed by the user. Note that TB1 accepts solid or stranded wire up to AWG #12/2.5 mm^2.

53895

Trip the circuit breakers on the power entry box and at the control room ac power-supply panel or dedicated branch circuit. Remove the access cover from the power entry box and wire TB1 as shown in Figure 5-1.or Figure 5-2. Strip approximately 7.5 mm (0.3") of insulation, insert wire into tubular breakers in the OFF position.

WARNING

Make sure that the power entry-box circuit breakers are in the OFF position. See Section 7 for power-up procedure.

5.2 WIRING RECOMMENDATION—UNIVERSAL STATION (US)

Wiring entry to a Universal Station (US) can be made from the bottom of the circuit breaker box shown in Figure 5-1.

- Wiring should be AWG 14-3.

SERVICE	BREAKER SIZE
120 Vac	15 Amp
240 Vac	15 Amp

Wiring the power in a Universal Station located in Classic furniture is shown in Figure 5-1 and Figure 5-2.

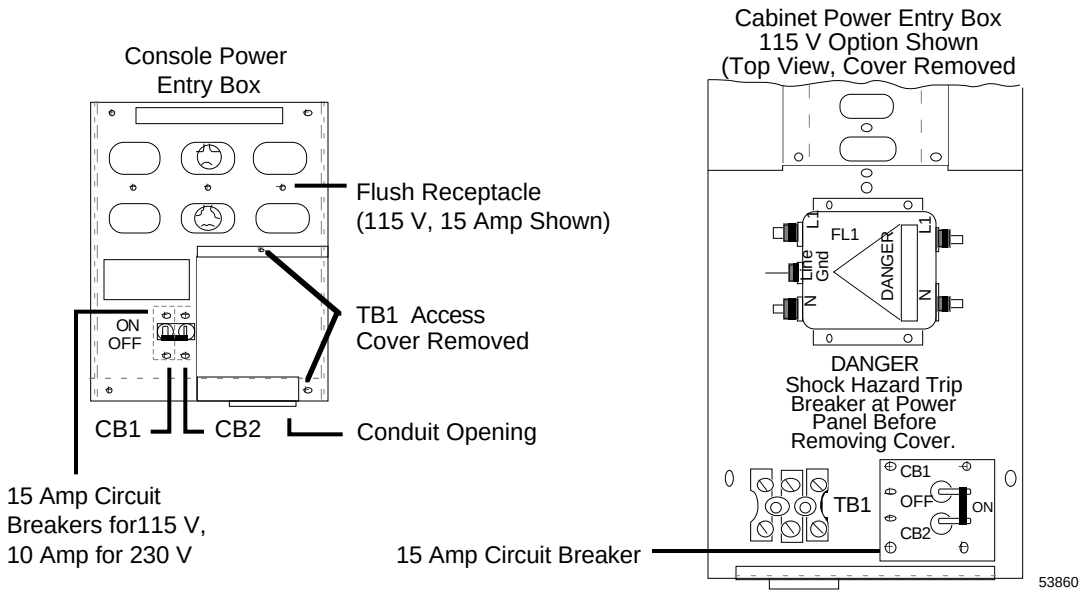


Figure 5-1 — LCN Cabinet/Universal Station Power Entry Box

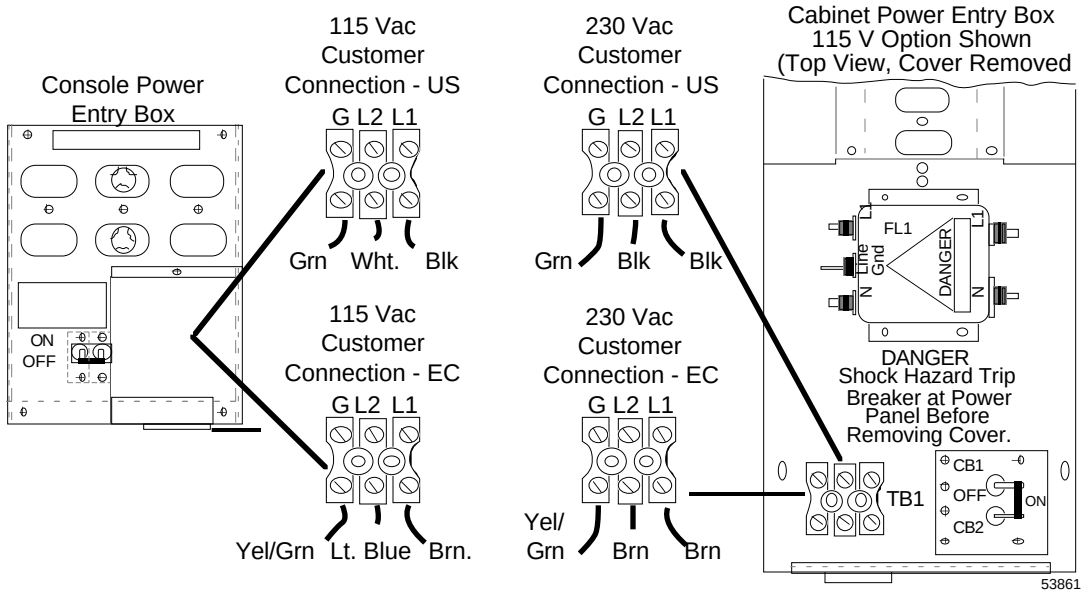


Figure 5-2 — LCN Cabinet/Universal Station Power Entry Box Wiring

5.3 WIRING RECOMMENDATION—ERGONOMIC UNIVERSAL STATION

The ergonomic Universal Station is designed to accommodate conduit access from the rear of the station or from beneath the floor.

- Figure 5-3 shows access from the rear of the station.
- Figure 5-4 shows access from beneath the station.
- Figure 5-5 show the interior of the connection box.

Wiring entry to an ergonomic Universal Station can be made from the rear or through the 1 1/2" hole in the cabinet. The following conduit parts were used in the design of the access.

Table 5-1 — Conduit Parts for Installation of an Ergonomic Universal Station

Function	Source	Part Number
3/4" 90° Pulling Elbow Male to Female	Appleton	MFL-75
	Bridgeport	72-DC
	Midwest/Cooper	811
	O-Z/Gadney	MF-075
	RACO	2663
3/4" Zinc Die Cast Screw-in Connector with Steel Locknut	Appleton	SGC-75DC
	Bridgeport	521-DC
	Midwest/Cooper	772
	O-Z/Gadney	
	RACO	
3/4" Clamp Connector for Onmetallic Sheathed and Flexible Wire	Honeywell	51190714

- Wiring should be AWG 14-3/2.5 mm^2 or larger for greater cable lengths. See *TPS System Site Planning*.

SERVICE	BREAKER SIZE
120 Vac	15 Amp
240 Vac	15 Amp

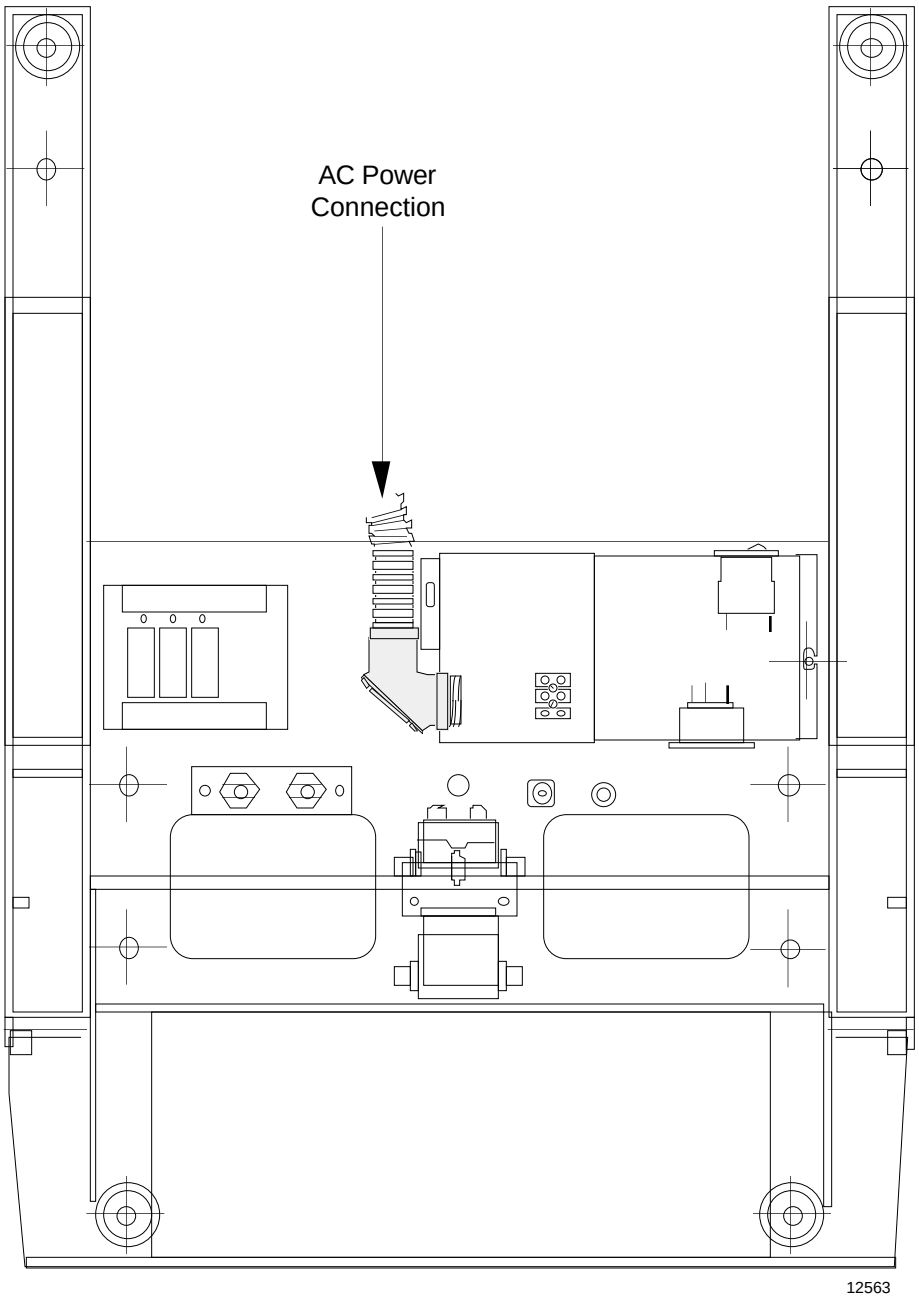


Figure 5-3 — Power Entry to Ergonomic Universal Station (Rear Entry)

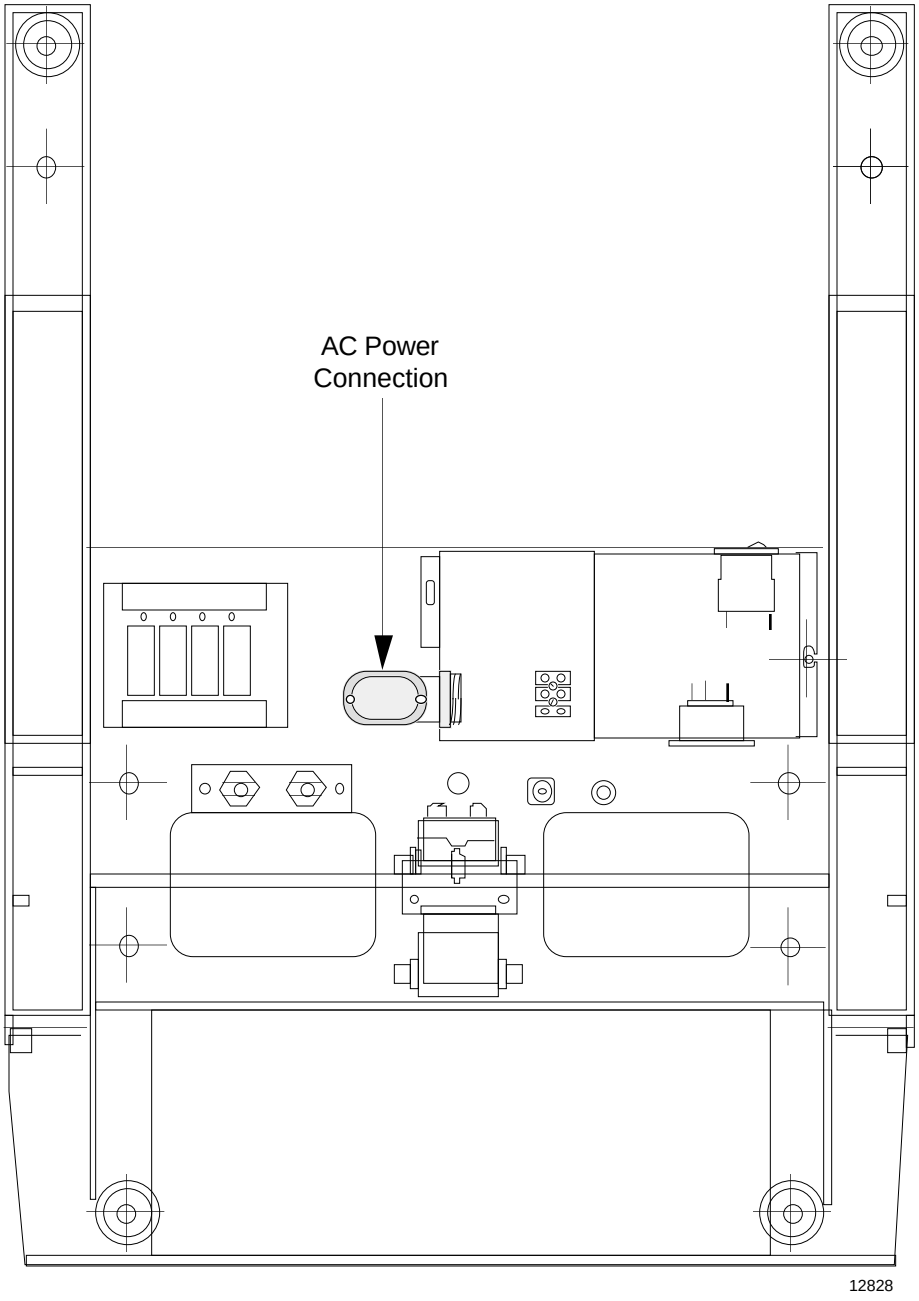


Figure 5-4 — Power Entry to Ergonomic Universal Station (Bottom Entry)

Wire the AC service to the terminals as indicated by the symbols in Figure 5-5.

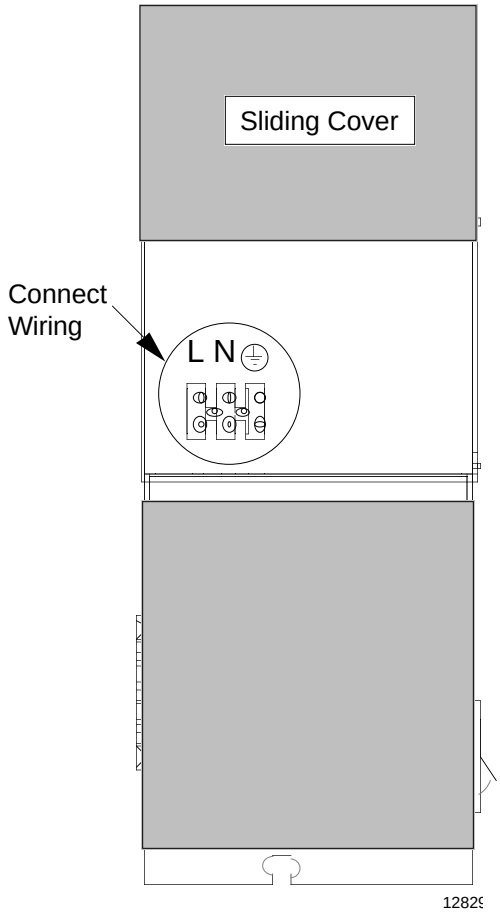


Figure 5-5 — Ergonomic Universal Station Power Entry Box Wiring

GENERAL
Section 6

General information about equipment care and handling.

6.1 ELECTROSTATIC DISCHARGE

Electrostatic Discharge (ESD) and its destructive affect on system electronics components must be understood and kept under control, especially during installation and servicing of all TPS products.

What ESD is and how it can be controlled is summarized by Technical Bulletin, TB NO. ESD-1. How to handle system components is presented in Appendix A of the *LCN System Checkout Manual*. Please follow these guidelines.

6.2 CLEAN UP

With the Equipment Cabinet(s) and Universal Station(s) physically installed and ready for a power-up check, please take time for a general cleanup of the area. From this point on, the habit of maintaining site cleanliness should be developed. The following steps are recommended:

- Make a final check of all shipping containers and wrappings for small parts or smaller containers.
- Arrange for the storage of special containers in which the peripheral devices are shipped. These may be required if such devices are shipped to a new location or returned for repair.
- Discard all unneeded packing materials.
- Have the room cleaned and arrange for it to be kept clean, but avoid raising dust. Damp-mop tile floors or vacuum carpeted floors frequently.

6.3 TOUCH-UP COLORS

For all touch-up requirements, refer to the factory or to your project engineer.

POWER-UP CHECK
Section 7

This section tells you how to initially power up the equipment; carefully follow the instructions.

7.1 POWER-UP PROCEDURE

To ensure that the customer service panel or control room power-distribution panel is correctly wired, and to power up the LCN equipment cabinet(s) and Universal Station(s), proceed as follows:

NOTE

The following procedures apply to each Power Entry Box, one at a time.

- Each Operator Interface Station (OIS) has a rocker switch located on the rear side of the base, between the legs, that controls ac power to the station. Turn the switch to the OFF position.
- Locate the power entry box near the bottom of each implemented cabinet and console bay and open the two circuit breakers (see Figure 5-1). Remove TB1 access cover.
- Locate each LCN module front panel and turn the power switch to the OFF position. Note that a Dual Node Module will have two power switches if both nodes are installed.
- Close the breakers on the control room power-distribution panel and check for proper voltage at the point of power connection (TB1) (see Figure 5-1 for US and cabinets and Figure 5-2 for OISs). If okay, open the distribution panel breakers and then replace TB1 access cover(s).

NOTE

The following procedures apply to each cabinet, OIS, and Universal Station, one at a time.

- Close the breakers on the control room power panel, close the two circuit breakers on the power entry boxes, and turn the OIS rocker switches to the ON position. Find an unused duplex receptacle, or unplug one module, and check for fault voltage between the ground pin on the duplex and the cabinet frame. If voltage is found, correct the problem before proceeding.

- Make sure that each LCN module power cord is plugged in and that the margin-test jumper is in the normal (center) position.

- Turn the power switch ON on each module, one at a time, and check that the green **POWER STATUS** LED is on. Remember that a Dual Node Module may have two power switches. Correct any problems before proceeding to the next module. Refer to the *Five/Ten-Slot Service* manual or *Dual Node Module Service* manual if service is required.

- A Deskside Global User Station has a power-on LED on the front of the electrics tower for deskside models, and an LED on the front of the console module located at the rear of the station.

SYSTEM CONFIGURATION
Section 8

All LCN modules, hiway boxes, and peripheral devices require a unique system device address.

8.1 SYSTEM PINNING

There are no LCN module adjustments; however, the LCN I/O boards have an address pack that must be characterized for the particular node it occupies on the LCN. This normally is done for each system during factory test.

The address of the nodes in an LCN must start with "1" and be assigned in increasing numerical order. In planning for future additions to the system, reserve a number or set of numbers for that. All other addresses are assigned in the order of module placement. Nodes can be added later during system expansion, and can be done so without changing original assignments if gaps in the node numbering are placed to allow more node numbers to be added later. At this time, a topology map should be initiated and maintained.

If the LCN I/O or K2LCN board is replaced on site, or if an additional module is added, the new board or module (including the Universal Work Station) must be set up for the node it will occupy; for example, Figures 8-1 and 8-2 show the location of the address pack on the LCN I/O board and the K2LCN board, jumpered for an address of three (3).

CAUTION

The address pinning is logically ORed together if an LCN I/O board is used with a K2LCN board. **The address must be pinned only on the LCN I/O board and all jumpers removed from the K2LCN board.**

A Universal Station^X node contains a WSI I/O board that is to be pinned as shown in Figure 8-3. The WSI board has a Normal Shutdown switch that should be in the NORMAL position. The SHUTDOWN position disables the Work Station Processor and returns the node to a UNP personality.

An Application Module^X node contains a WSI2 board that is to be pinned for used with an HMPU processor or K2LCN processor. The WSI board has a Normal Shutdown switch that should be in the NORMAL (to the right) position. The SHUTDOWN position disables the Work Station Processor.

The Global User Station node number is configurable by software. Refer to *Configuration User's Guide, GU02-100.*

For Data Hiway device addressing and response priorities, refer to *Data Hiway Subsystem Site Planning* manual. For the Process Interface Units (PIUs), refer to HLPIU-M, LLPIU-M, or LEPIU-M Service manuals.

For peripheral device pinning or function/selection, refer to the *Universal Station Service*.

For keyboard pinning options on the Universal Work Station, refer to Appendix A, paragraph A.7.

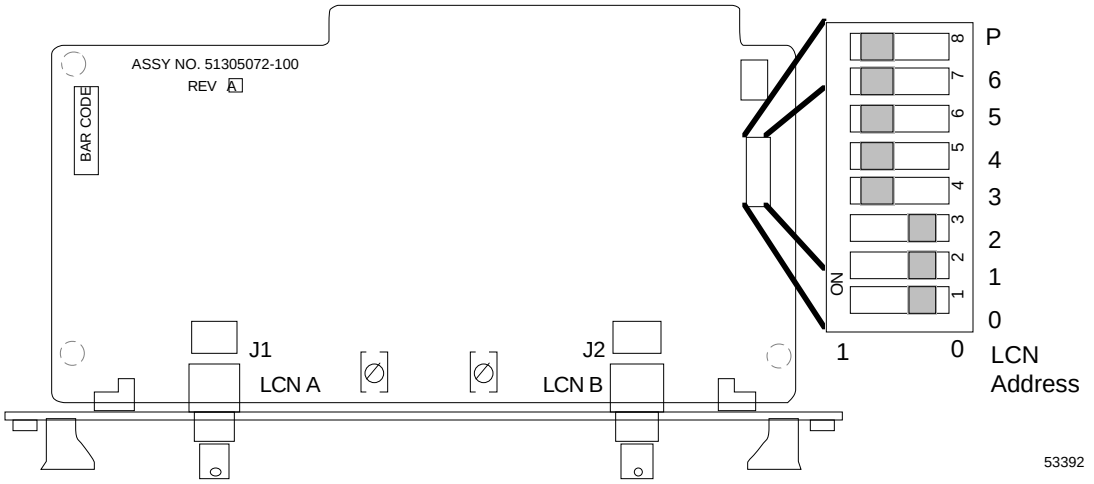


Figure 8-1 — LCN I/O Node Address Jumpers

The CLCN A/B board is located in slot 1 behind the K2LCN board.

A node that has a K2LCN board and an LCN I/O board should have the address pinning on the LCN I/O board. **All address jumpers on the K2LCN should be removed**.

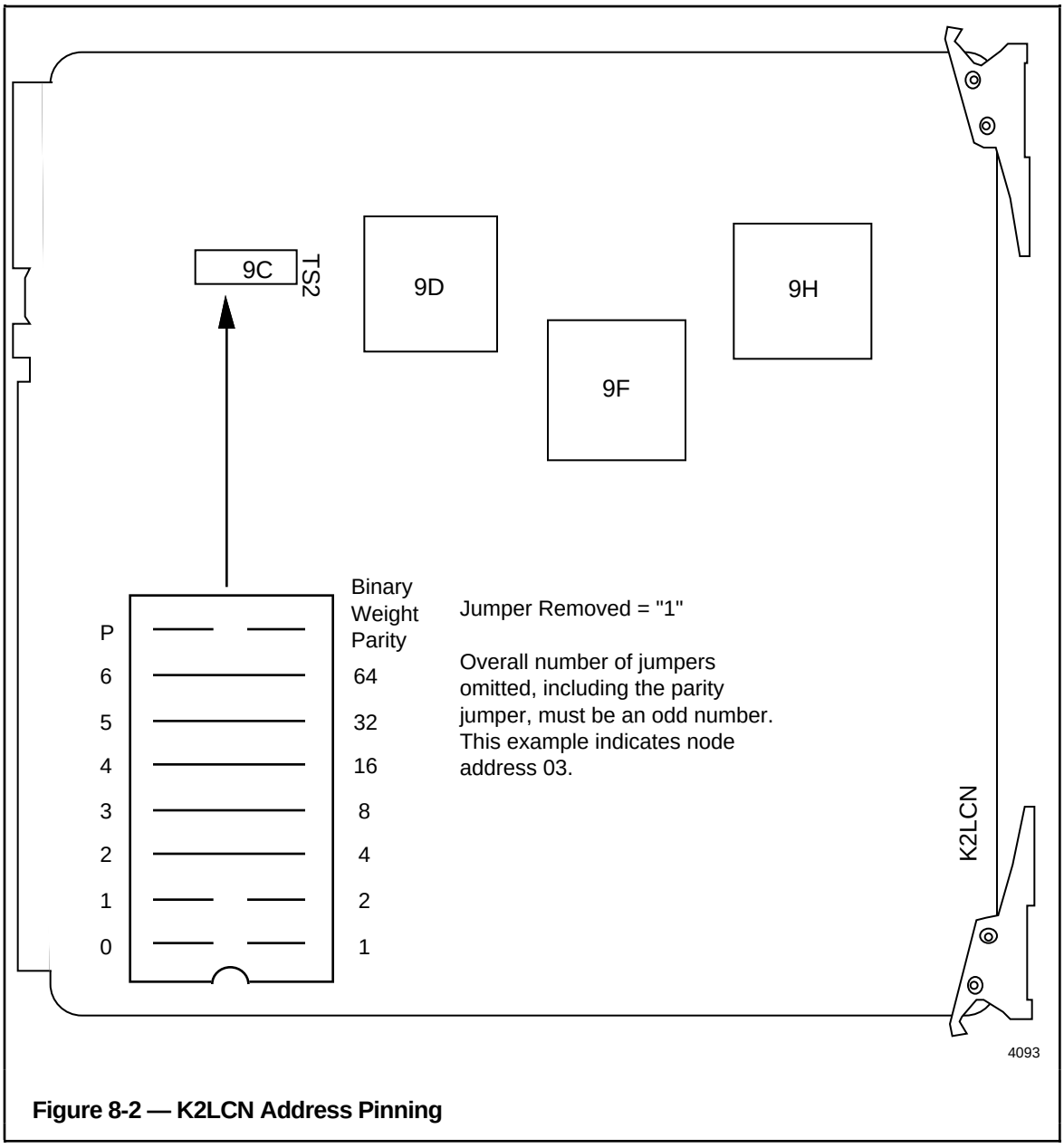


Figure 8-2 — K2LCN Address Pinning

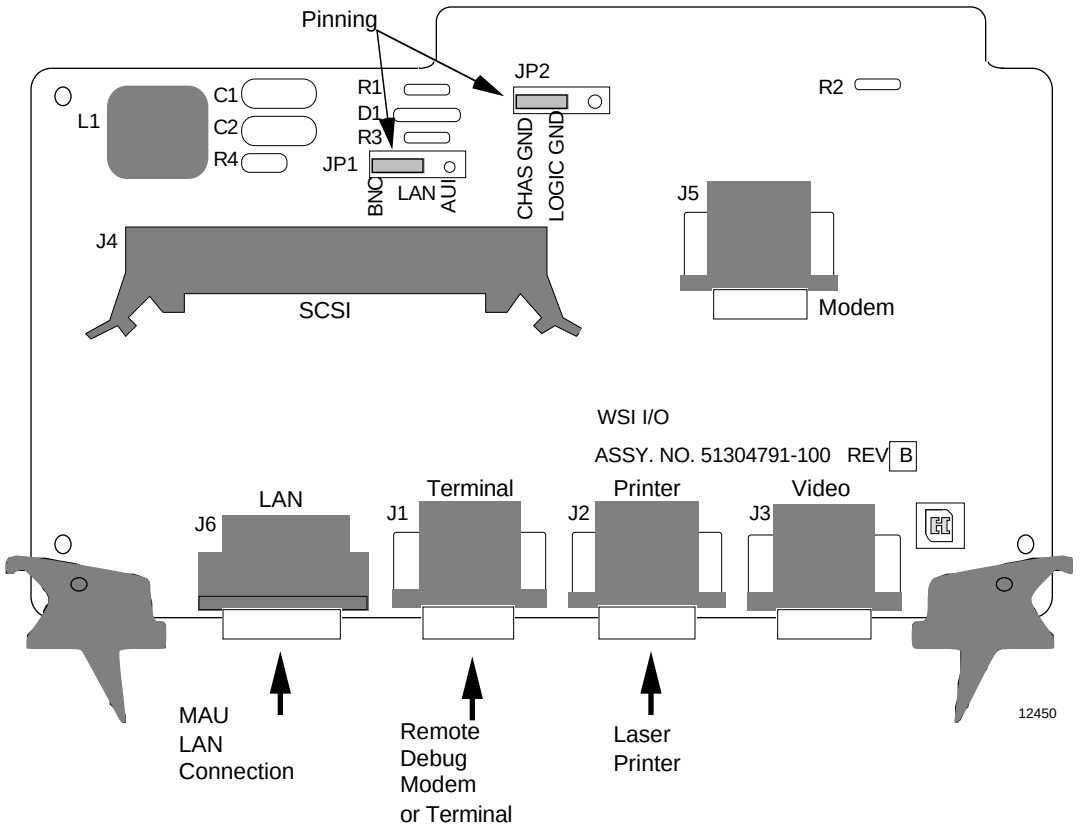


Figure 8-3 — WSI I/O Pinning

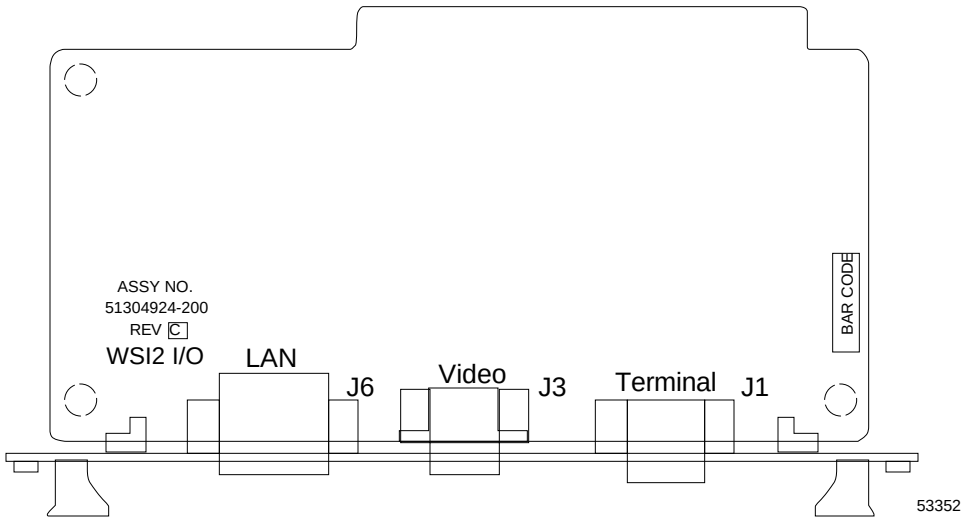


Figure 8-4 — WSI2 Pinning (CE Compliant I/O Board)

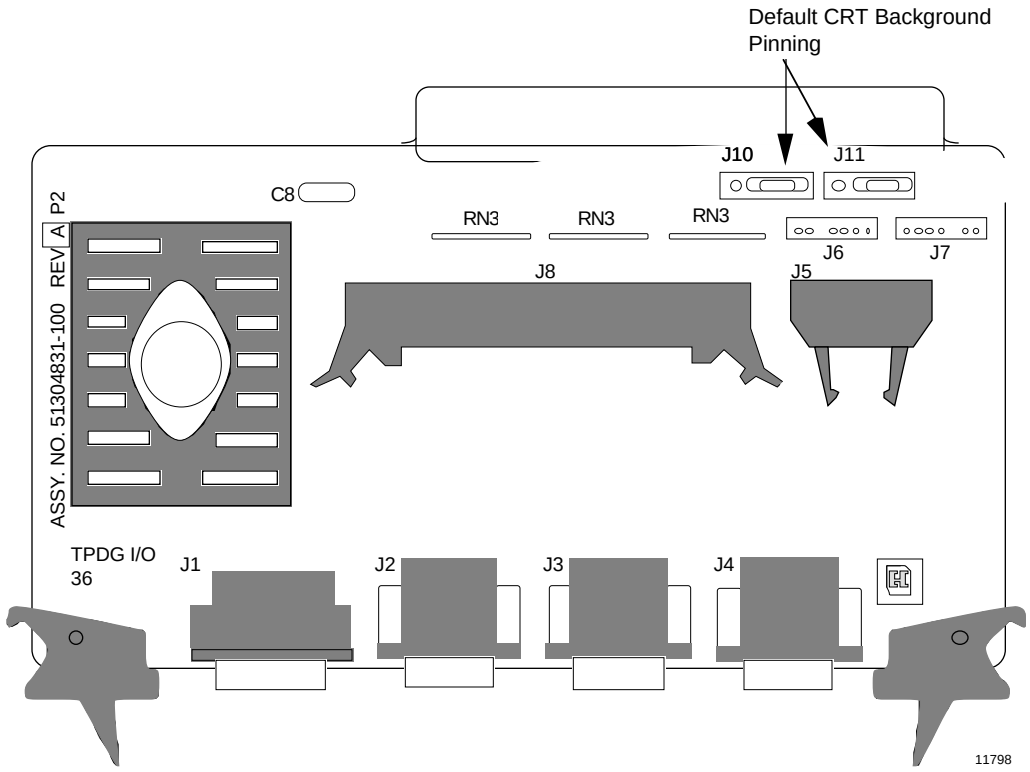


Figure 8-5 — TPDG I/O Pinning

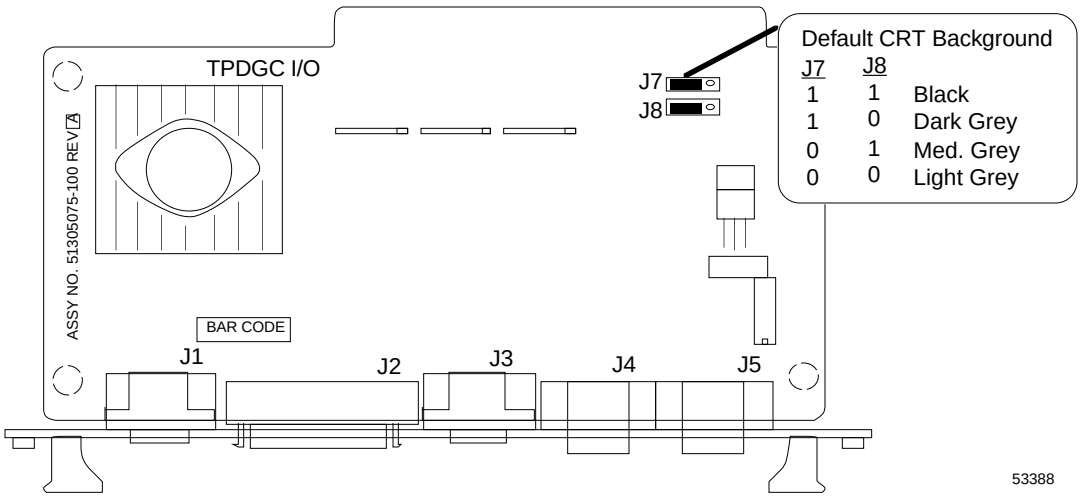


Figure 8-6 — TPDGC Pinning (CE Compliant I/O Board)

UNIVERSAL STATION^X INSTALLATION
Section 9

Provides for the installation of the Universal Station^X station available in Release 410 or later systems.

9.1 PLACEMENT

The Universal Station^X can be placed in any existing console as if it were a Universal Station node. The same complexing instructions apply as if it were a US.

This applies to Universal Station^X in Standard Furniture and in Ergonomic Furniture.

9.2 GROUNDING

The Universal Station^X is grounded the same as a Universal Station with the logic ground connected to the chassis ground (safety ground).

9.3 POWER

The Universal Station^X has the following power consumption:

Table 9-1 — Universal Station^X Current Power Specifications

Avg RMS	True RMS	Peak	Watts	BTUs/hr
2.04	4.2	10.6	332	1132

9.4 LCN CABLE CONNECTION

The LCN A and LCN B cables are connected as any other node in the system—see Section 3.

9.5 ETHERNET NETWORK CONNECTION

The Media Access Unit (MAU) is mounted on the end of the 2 meter adapter cable (Cabletron p/n 9300011-2M). The other end of this cable is connected to J6 on the WSI I/O board in slot 2.

The MAU is connected to a Local Area Network (LAN) using BNC cable. The adapter cable is necessary to avoid interference with the LCN A cable connection.

UCN TAP INSTALLATION
Section 10

Provides for the installation of UCN taps in cabinets and consoles.

10.1 INSTALLATION IN LCN CABINETS

Install two taps in the LCN cabinet that contains the NIM module(s) for this UCN. See Figure 10-1. Mount each tap bracket to the two bolts located at the top of the rear side of the cabinet.

Follow this procedure to mount taps in an LCN cabinet.

Step	Action
1	Locate and remove the four bolts at the top, rear side of the cabinet. There are eight bolts total. Remove the four located nearest the center of the cabinet.
2	Mount a tap mounting bracket inside the left-hand and right-hand side of the cabinet and replace the four bolts, tightening them until the brackets are held firmly in place.
3	Mount the tap to each mounting bracket. • Left side of the cabinet—Isolated port marker must be located on right side of the mounting bracket. Right side of the cabinet—Isolated port marker must be located on the left side of the mounting bracket. • Tighten the mounting bolt to only 25 inch pounds—just enough to hold the tap fixed in place. **Do not crush the body of the tap.**
4	Connect a 14 AWG/2.5 mm^2 ground wire from each tap directly to the nearest safety ground. **Do not daisy-chain the connection.**
5	Connect a drop cable, 51195153-XXX (XXX is the length in meters), to each drop cable connection 1. **It is very important to tighten the drop cable connectors to 25 inch pounds to ensure an error-free UCN system.**
6	Continue to connect drop cables to the tap until all are connected.
7	Go to instruction for connecting trunk cable in *UCN Guidelines* (UN12-410), subsection A.3.

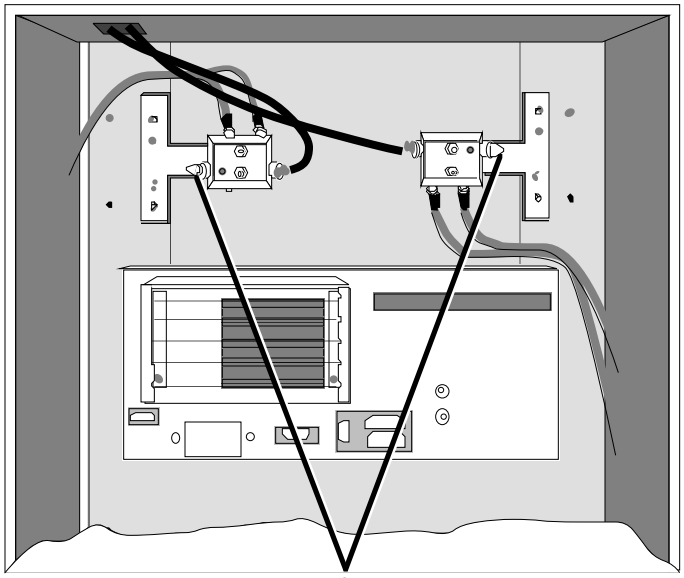


Figure 10-1 — Taps Mounted in an LCN Cabinet

10.2 INSTALLATION IN A UNIVERSAL STATION

A NIM module can be mounted in a Universal Station only if there is an empty console furniture cabinet located adjacent to it. This is because of the bend-radius requirements of UCN Trunk cables. To do this, two mounting brackets must first be mounted inside the lower cavity of the station. Two sets of holes will have to be drilled in the cabinet.

10.3 INSTALLATION IN AN ERGONOMIC UNIVERSAL STATION

If a NIM is to be installed in a Universal Station, the taps are mounted to the mounting brackets as shown in Figure 10-3 or 10-4.

Follow this procedure to install taps in a Universal Station in Ergonomic Furniture.

Step	Action
1	Mount a tap to each mounting bracket. • Isolated port marker must be located on right side of the mounting bracket. • Mount the tap with a bolt through the hole in the tap. **ATTENTION** **Do not mount with the grounding stud**. • Tighten the mounting bolt to only 25 inch pounds—just enough to hold the tap fixed in place. **ATTENTION** **Do not crush the body of the tap.**
2	Connect a 14 AWG/2.5 mm^2 ground wire from each tap directly to the nearest safety ground. **Do not daisy-chain the connection.**
3	Connect a drop cable, 51195153-XXX (XXX is the length in meters), to each drop cable connection 1. **It is very important to tighten the drop cable connectors to 25 inch pounds to ensure an error-free UCN system.**
4	Connect the other end of the drop cables to the NIM Modem card. **ATTENTION** Pay strict attention to connecting the drop cable from Cable A to the Cable A connection on the Modem card and the drop cable from Cable B to the Cable B connection on the Modem card.
5	Install the rest of the UCN Cable System as shown in the publication UN20-100 that is found in the bag of taps. The same instructions are found in Appendix A of *UCN Guidelines*.

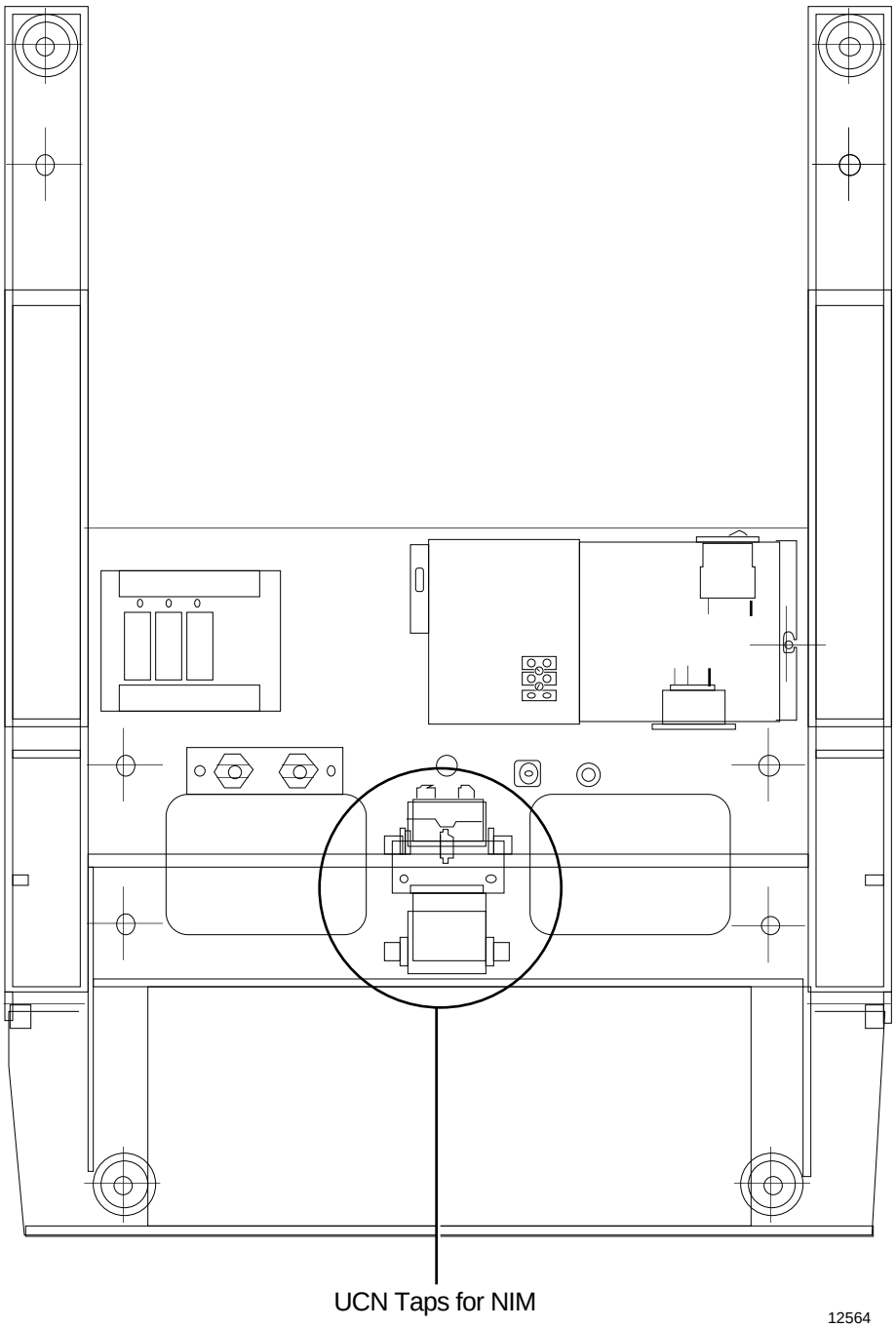


Figure 10-3 — Taps Mounted in a Universal Station (Ergonomic)

10.4 INSTALLATION IN A CONSOLE Global User Station

UCN Taps can be placed in the bottom of a Global User Station if a NIM is located in the same station cabinet.

Follow this procedure to install taps in a Universal Station in Ergonomic Furniture.

Step	Action
1	Mount a tap to each mounting bracket. • Isolated port marker must be located on right side of the mounting bracket. • Mount the tap with a bolt through the hole in the tap. **ATTENTION** **Do not mount with the grounding stud**. • Tighten the mounting bolt to only 25 inch pounds—just enough to hold the tap fixed in place. **ATTENTION** **Do not crush the body of the tap.**
2	Connect a 14 AWG/2.5 mm^2 ground wire from each tap directly to the nearest safety ground. **Do not daisy-chain the connection.**
3	Connect a drop cable, 51195153-XXX (XXX is the length in meters), to each drop cable connection 1. **It is very important to tighten the drop cable connectors to 25 inch pounds to ensure an error-free UCN system.**
4	Connect the other end of the drop cables to the NIM Modem card. **ATTENTION** Pay strict attention to connecting the drop cable from Cable A to the Cable A connection on the Modem card and the drop cable from Cable B to the Cable B connection on the Modem card.
5	Install the rest of the UCN Cable System as shown in the publication UN20-100 that is found in the bag of taps. The same instructions are found in Appendix A of *UCN Guidelines*.

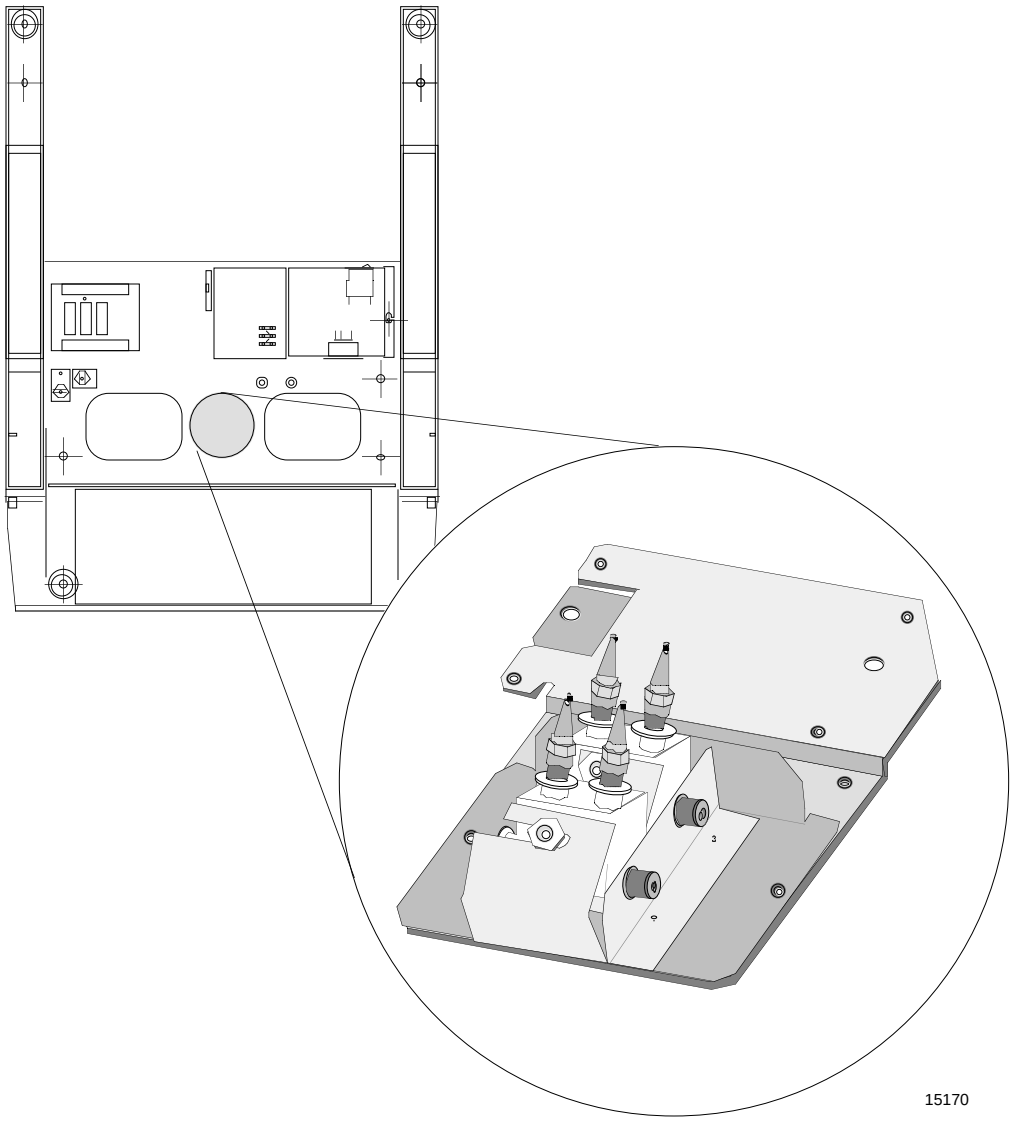


Figure 10-4 — Taps Mounted in a Universal Station (Ergonomic)

RULA INSTALLATION
Section 11

Provides for the installation of a Remote User Link Adapter (RULA) in a Universal Station, Operator Interface Station (OIS), Micro TDC 3000, and Universal Work Station.

11.1 INSTALLATION INSTRUCTIONS

In general, the Dayna SCSI/Link—3 unit is installed on the support tray in a half height upper pod next to a Cartridge Drive. **There must be an existing cartridge drive installed.**

- The old power cable for the cartridge drives is disconnected and a new cable that has an addition connector to provide power to the Dayna SCSI/Link—3 module, is connected to the old cable. The old cable connection is then re-established.
- The old SCSI Interface Cable for the cartridge drives is disconnected and a new cable that has an additional connector to provide connection to the Dayna SCSI/Link—3 module, is connected to the old cable. The old cable connection is then re-established.
- The Dayna SCSI/Link—3 adapter is mounted to a support bracket with hook and loop fastener strips.
- The Ethernet connection is now ready to be made.

Detailed instructions for the four applications are found in two places:

- Upgrade Kit Index UK20-100
- Individual copies are included in the shipment of the hardware.

The four kits are:

- MP-RLKT11 Universal Station applications
- MP-RLKT12 Micro TDC 3000 applications
- MP-RLKT13 Operator Interface Station applications
- MP-RLKT14 Universal Work Station applications

APPLICATION MODULE^{X} INSTALLATION
Section 12

Provides for the installation of the Application Module^{X}.

12.1 PLACEMENT

The Application Module^{X} can be placed where any other Five-Slot or Ten-Slot Module can be placed.

12.2 GROUNDING

The Application Module^{X} (Five-Slot or Ten-Slot) is grounded the same as an Application Module in a Five-Slot Module with the logic ground connected to the Safety Ground.

12.3 AC POWER

Connect the ac power cords attached to the module to the ac power strip in an LCN Cabinet or to the ac distribution box in a Universal Station or Universal Station^{X}.

12.4 LCN CABLE CONNECTION

The LCN A and LCN B cables are connected as any other node in the system—see Section 3.

12.5 ETHERNET NETWORK CONNECTION

The Media Access Unit (MAU) is mounted on the end of the 2 meter adapter cable (Cabletron p/n 51191753-100A). The other end of this cable is connected to J6 on the WSI2 I/O board in slot 2 of a Five-Slot Module or slot 6 of a Ten-Slot Module.

The MAU is connected to a Local Area Network (LAN) using BNC cable. The adapter cable is necessary to avoid interference with the LCN A cable connection.

SCANNER APPLICATION MODULE INSTALLATION
Section 13

Provides for the installation of the Scanner Application Module.

13.1 PLACEMENT

The Scanner Application Module (SAM) can be placed where any other Five-Slot Module can be placed.

13.2 GROUNDING

The Scanner Application Module is grounded the same as an Application Module in a Five-Slot Module with the logic ground connected to the safety ground.

13.3 AC POWER

Connect the ac power cords attached to the module to the ac power strip in an LCN cabinet or to the ac distribution box in a Universal Station or Universal Station^{X}.

13.4 LCN CABLE CONNECTION

The LCN A and LCN B cables are connected to the LCN I/O board as any other node in the system—see Section 3.

13.5 COMMUNICATION CONNECTION TO MC0

There are two types of connections between the SAM and MC0. If the RS232 interface is used, the distance between the SAM and MC0 cabinet is limited to <20 meters (66 ft). If the RS422 interface is used for longer distances, adapters that convert the RS232 signal to RS422 level is used.

For RS232 interface, a shielded cable (Part No. 51196082-115) with three wires is sufficient for the transmission. The cable is connected at the main cable strip of the cabinet.

For RS422 interface, a cable with five wires is sufficient for the transmission. RS422 transmits differential signals that are not sensitive to disturbances.

Current loop interfaces can also be used.

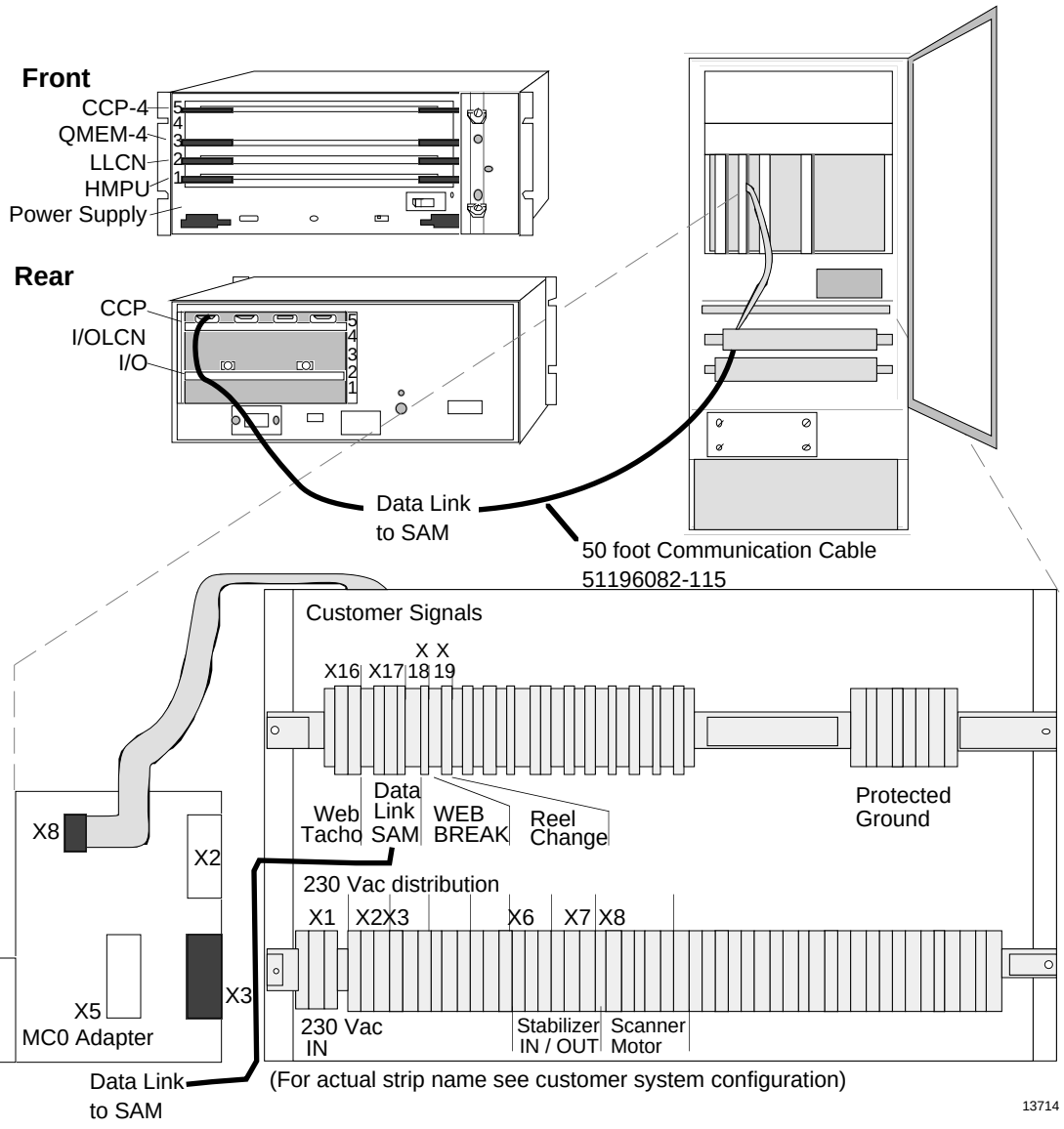


Figure 13-1 — Configuration and Cabling of Scanner Application Module

DESKSIDE GLOBAL USER STATION
Section 14

Provides for the installation of the Deskside Global User Station.

Use an ESD Wrist Strap grounded to the Minitower chassis when connecting or disconnecting cables.

14.1 PREINSTALLATION

Before starting to install the Global User Station hardware, the LCN cables, Cable A, and Cable B must be installed to the location of the Global User Station unit. The T-connectors must be located directly below the location of the Global User Station Minitower.

14.2 AUDIT EQUIPMENT

Audit the components received with the shipment before starting the installation. The list below represents the items identifiable from the outside of the unit. Optional items that are normally located inside the minitower are not listed. These items would not hinder the installation of the unit. All options ordered are already installed.

Item		Description
Part Number/ Model Number	Quantity	
51196900-100	1	PPC Minitower
51196793-100	1	17” Monitor, Power cord and Interface Cable
51196708-180	1	PC Keyboard and Mouse
51305313-100	1	MAU to LCNP cable
51305334-100	1	LCN MAU Cover
51191782-100	1	Ethernet MAU (AUI Interface Module)
Optional Items		
MX-MTMA21-100	1	21 “ Monitor, Power Cord
51192126-400	1	Cable, CRT Signal with Ferrite
HI-DTSC00-100	1	21” Touchscreen for First 21” Monitor
HI-DCRT20-100	1	2nd 21” Monitor, Dual Monitor Driver Board, Cable
HI-MEM000-100	1	Additional 32 MB Parity Ram
HI-DZIP00-100	1	Zip Cartridge Drive
HI-DTAP00-100	1	1 GB Tape Drive for Back-up

14.3 PLACEMENT

The Deskside Global User Station can be placed on a tabletop or desktop as if it were a personal computer The electronics tower can be placed on the floor or on the desktop.

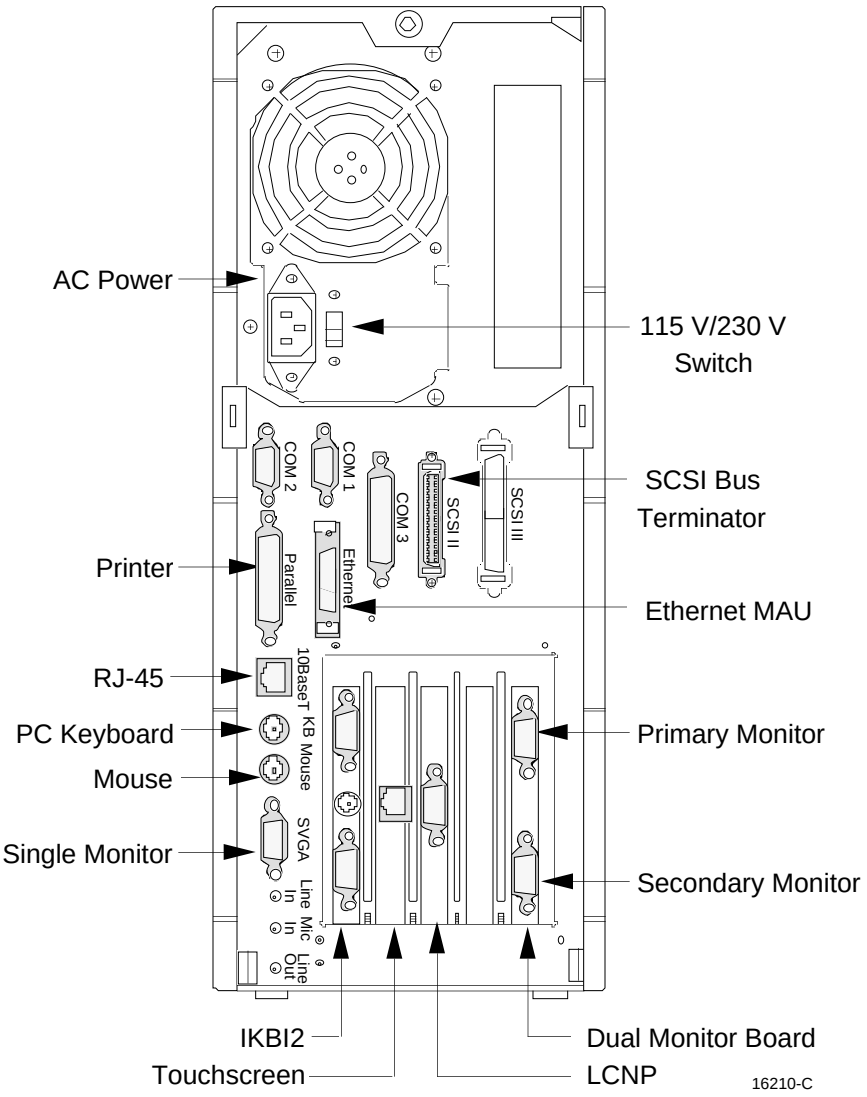


Figure 14-1 — Minitower Cable Connections to Rear Panel

14.4 GROUNDING

The Deskside Global User Station is grounded to safety ground by the third wire in the power cord.

14.5 AC POWER

Connect the ac power cords attached to the module and monitor to an ac power outlet that is connected to the same power source as the rest of the **TotalPlant** Solution (TPS) System. **If the unit is to be used for a window to a process, it is recommended that the ac power outlet is connected to the power circuits from an Uninterruptible Power Source (UPS).** This will prevent loss of unsaved data in the event of a power outage.

14.6 CONNECTING THE MONITOR

Use an ESD Wrist Strap grounded to the Minitower chassis when connecting or disconnecting cables.

Connect the 17-inch monitor interface cable to the SVGA connector on the back of the electronic tower. Connect the other end of the cable to the back of the monitor.

Connect the 21-inch monitor interface cable, 51192126-400, to the SVGA connector on the back of the electronic tower. Connect the other end of the cable to the back of the monitor.

Connecting a dual monitor requires that both monitors be connected to the dual monitor card located in slot 1 (right-hand slot). The primary monitor connects to the top connector and the secondary connects to the bottom connector.

14.7 CONNECTING THE KEYBOARD

There are two keyboard types available:

- Standard PC keyboard
- Optional Integrated Keyboard, 51196694-300

14.7.1 Connecting the Standard Keyboard

Connect the free end of the keyboard interface cable to the KEYBOARD connector on the back of the electronics tower.

Use an ESD Wrist Strap grounded to the Minitower chassis when connecting or disconnecting cables.

14.7.2 Connecting the Optional Integrated Keyboard and Mouse

1. Connect the 15-pin cable connector to the Keyboard connector (right-hand) on the face plate of the left-most ISA card slot.

2. Connect the Mouse Cable 9-pin connector to the Mouse miniature DIN connector on the rear of the minitower.

3. Connect the jumper cable, 51305381-100, to the IKBI2 board in slot 5 (left-most slot) and to the rear panel connection labeled “KB.”

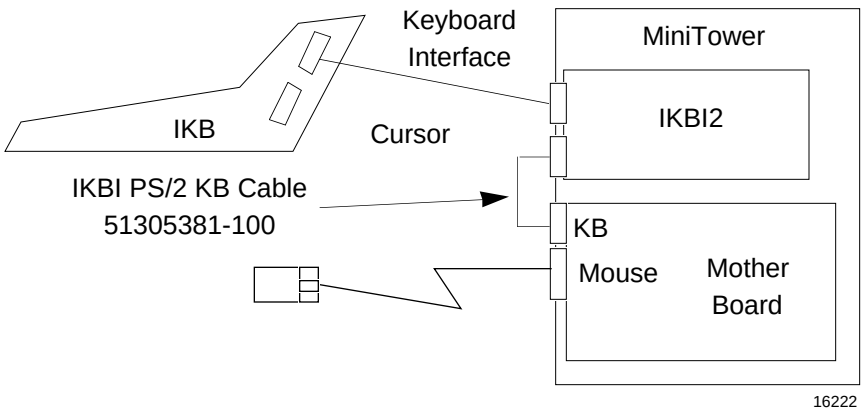


Figure 14-2 — Integrated Keyboard/Mouse Cable Connections to Rear Panel

14.8 CONNECTING THE OPTIONAL TOUCHSCREEN

Connect the free end of the touchscreen cable to the connector in Slot 4 (second slot from the left).

14.9 CONNECTION TO THE ETHERNET

An adapter, 51191782-100, is connected to the Ethernet connector on the back of the electronic tower. This adapter connects to the 10base-5 Ethernet or a 10base-2 Ethernet.

If a 10base-T Ethernet is used, the cable from the hub is connected to the RJ-45 connector on the rear panel.

14.10 CONNECTION TO PRINTER

Use an ESD Wrist Strap grounded to the Minitower chassis when connecting or disconnecting cables.

A single laser or matrix printer can be connected to the PARALLEL port on the rear panel of the minitower. A laser printer can be placed on an adjacent work surface. If a Signum printer is used, it must be placed on a pedestal or other supporting device.

STOP! Do not proceed until you have completed the configuration function detailed in the Configurator. The LCN node number is software-configured and may conflict with another node until it is correctly configured. **If you proceed to connect the LCN cables, parts of the LCN can become ISOLATED.**

14.11 CONNECTION TO LCN COAX CABLES

The LCN A and LCN B cables are connected to the MAU unit that is connected to the LCNP board, located in the middle slot (Slot 3) in the electronics tower by the cable shown below.

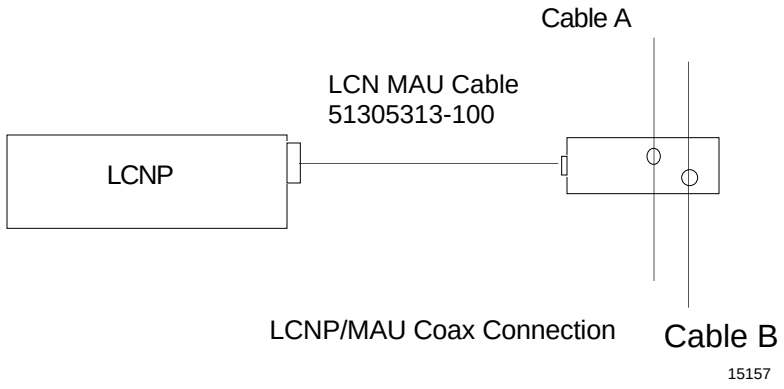


Figure 14-3 — LCN Coax Cable Connection to LCN MAU

The cable connections are protected by the cover assembly, 51305334-100, shown below.

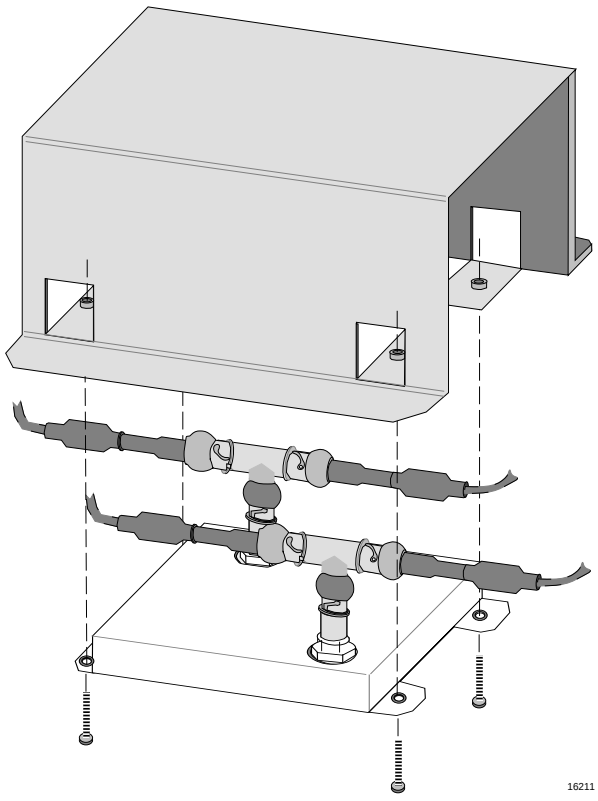


Figure 14-4 — LCN Coax Cable Connection to LCN MAU

CONSOLE GLOBAL USER STATION
Section 15

Provides for the installation of the Global User Station in new console furniture.

Use an ESD Wrist Strap grounded to the Electronics chassis when connecting or disconnecting cables.

15.1 PREINSTALLATION

Before starting to install the Global User Station hardware, the LCN cables, Cable A, and Cable B must be installed to the location of the Global User Station unit. The T-connectors must be located directly below the location of the Global User Station Electronics. The cable must allow enough length to reach into the footrest and connect to the LCN MAU.

15.2 PLACEMENT

A Global User Station in console furniture can be installed as an integral part of a console by following the instructions for complexing stations together as a console as described in subsection 3.5.

15.3 GROUNDING

Connect the safety ground connection to the station as described in Section 4.

15.4 AC POWER

Connect the ac power as described in Section 5.

15.5 CONNECTION TO THE ETHERNET

Use an ESD Wrist Strap grounded to the Electronics chassis when connecting or disconnecting cables.

The connection to the Ethernet is made through a Media Access Unit (MAU) designed to interface a 10base-5 Ethernet or a 10base-2 Ethernet. The MAU is located in the footrest compartment at the end of the Ethernet Extension Cable. See below.

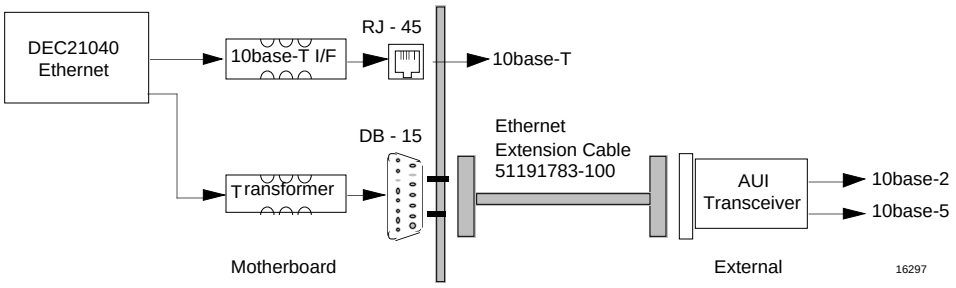


Figure 15-1 — Connection to an Ethernet 10base-5 Network Using an MAU

The 10base-T connection can be made directly into the RJ-45 connection on the rear panel.

- The 10base-T cable from the hub must be long enough to allow for the 15-inch extension of the electronics module when it is being serviced.
- The 10base-T cable must be tie-wrapped to the existing cable bundle, but do not place any tie-wraps between the U-shaped bracket and the bend in the cable bundle (back 15 inches).

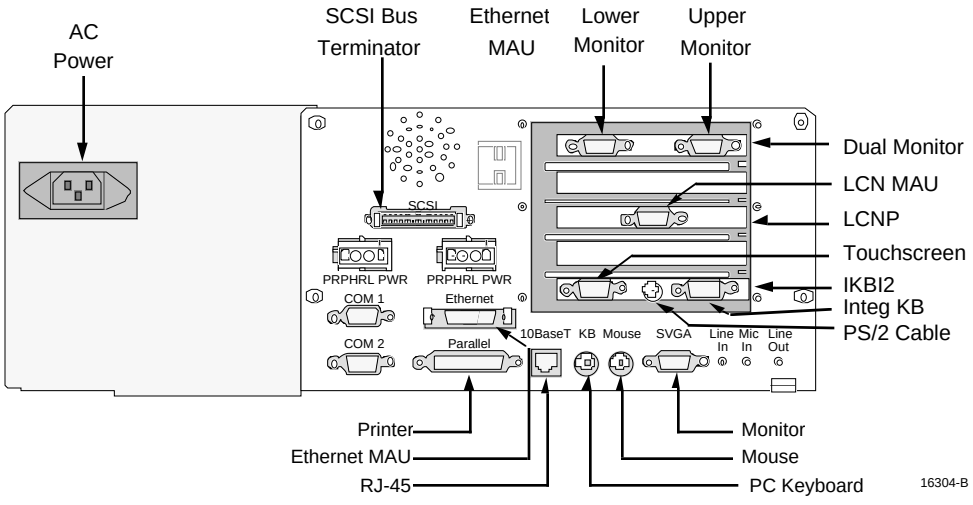


Figure 15-2 — Console Electronics Module Rear Panel Connections

15.6 CONNECTION TO A PRINTER

Use an ESD Wrist Strap grounded to the Electronics chassis when connecting or disconnecting cables.

A single laser or matrix printer can be connected to the PARALLEL port on the rear panel of the electronics. A laser printer can be placed on an adjacent work surface. If a Signum printer is used, it must be placed on a pedestal or other supporting device.

STOP! Do not proceed until you have completed the configuration function detailed in the Configurator. The LCN node number is software-configured and may conflict with another node until it is correctly configured. **If you proceed to connect the LCN cables, parts of the LCN can become ISOLATED.**

15.7 LCN CABLE CONNECTION

The LCN A and LCN B cables must follow the installation rules for cable length and installation practices found in subsection 3.6.

The two LCN coax cables connect to an LCN Media Access Unit (MAU) with coax Tee's. The MAU is connected to the port on the LCNP board located in the middle slot (Slot 3) in the electronics module. The MAU is located in the footrest cavity of the console station. See Figures 15-3, 15-4, and 15-5 for the various mount schemes.

The following illustration shows the connection of the LCN A and LCN B cables to the MAUs, as well as the MAU cable connection to the LCNP board.

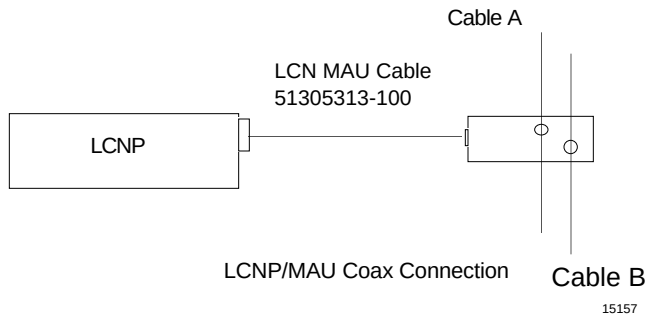


Figure 15-3 — Connection of LCN Cable A and Cable B to the LCN MAU

The mounting of the LCN MAU is done in the footrest of the station. There can be combinations of UCN Tap sets and LCN MAUs:

- 1 LCN MAU and no taps See Figure 15-4
- 1 LCN MAU and 1 tap See Figure 15-5
- 2 LCN MAUs See Figure 15-6

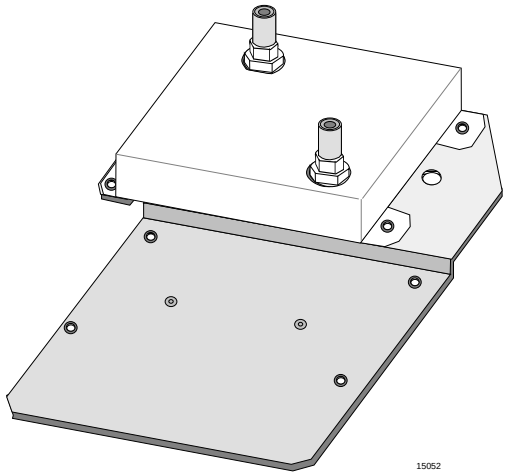


Figure 15-4 — Mounting of an LCN MAU with no UCN Taps

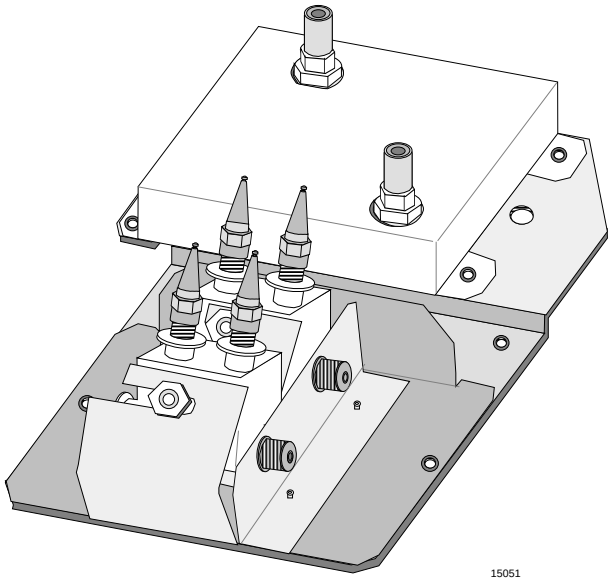


Figure 15-5 — Mounting of an LCN MAU with UCN Taps

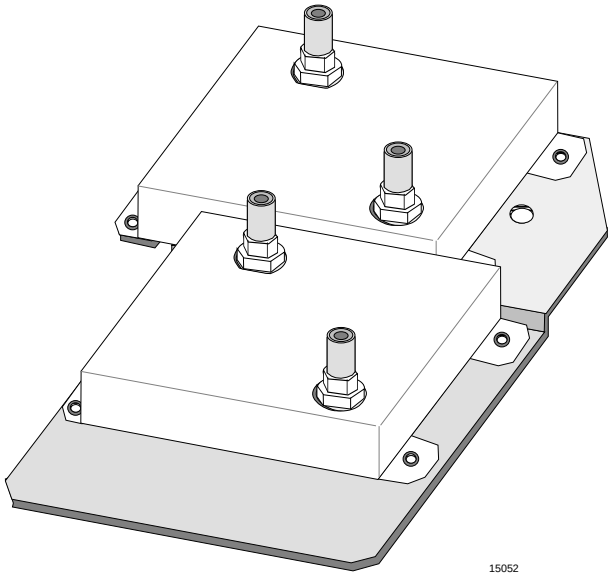


Figure 15-6 — Mounting of an Two LCN MAUs

CLASSIC CONSOLE GLOBAL USER STATION
Section 16

Provides for the installation of the Global User Station in new console furniture.

Use an ESD Wrist Strap grounded to the Electronics chassis when connecting or disconnecting cables.

16.1 PREINSTALLATION

Before starting to install the Global User Station hardware, the additional LCN cables, Cable A and Cable B, must be installed (or run to) **to the location of the Global User Station unit**. The T-connectors (and terminators, if applicable) must be located directly below the location of the Global User Station Electronics. The cable must allow enough length to reach into the LCN MAU in the bottom of the cabinet and connect to the LCN MAU.

16.2 PLACEMENT

A Global User Station in console furniture can be installed as an integral part of a console by following the instructions for complexing stations together as a console as described in subsection 3.5.

16.3 GROUNDING

Connect the safety ground connection to the station as described in Section 4.

16.4 AC POWER

Connect the ac power as described in Section 5.

16.5 CONNECTION TO THE ETHERNET

Use an ESD Wrist Strap grounded to the electronics chassis when connecting or disconnecting cables.

The connection to the Ethernet is made through a Media Access Unit (MAU) designed to interface a 10base-5 Ethernet or a 10base-2 Ethernet. The MAU is located in the bottom, front compartment at the end of the Ethernet Extension Cable. See below.

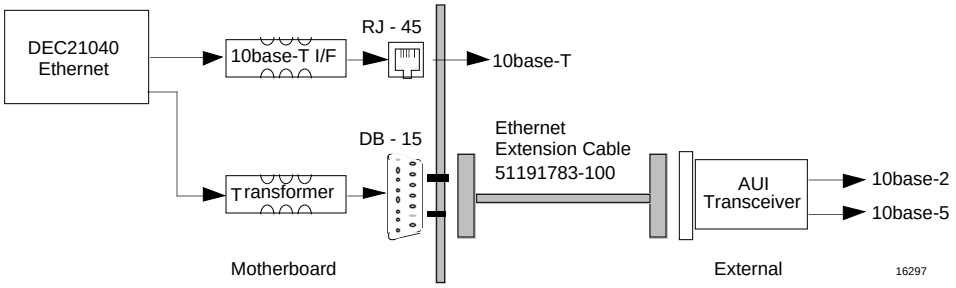


Figure 16-1 — Connection to an Ethernet 10base-5 Network Using an MAU

The 10base-T connection can be made directly into the RJ-45 connection on the rear panel.

- The 10base-T cable from the hub must be long enough to allow for the 15-inch extension of the electronics module when it is being serviced.
- The 10base-T cable must be tie-wrapped to the existing cable bundle, but do not place any tie-wraps between the U-shaped bracket and the bend in the cable bundle (back 15 inches).

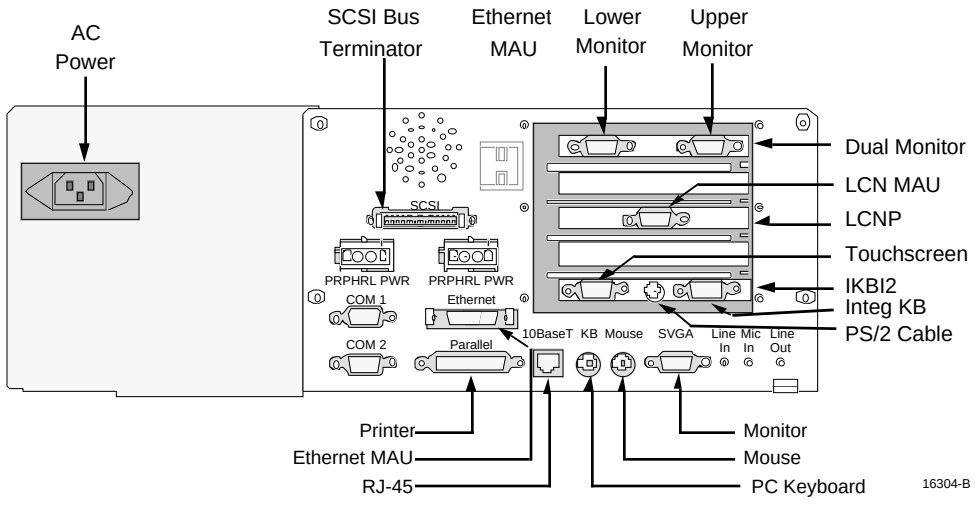


Figure 16-2 — Console Electronics Module Rear Panel Connections

16.6 CONNECTION TO A PRINTER

Use an ESD Wrist Strap grounded to the electronics chassis when connecting or disconnecting cables.

A single laser or matrix printer can be connected to the PARALLEL port on the rear panel of the electronics. A laser printer can be placed on an adjacent work surface. If a Signum printer is used, it must be placed on a pedestal or other supporting device.

STOP! Do not proceed until you have completed the configuration function detailed in the Configurator. The LCN node number is software-configured and may conflict with another node until it is correctly configured. **If you proceed to connect the LCN cables, parts of the LCN can become ISOLATED.**

16.7 LCN CABLE CONNECTION

The LCN A and LCN B cables must follow the installation rules for cable length and installation practices found in subsection 3.6.

The two LCN coax cables connect to an LCN Media Access Unit (MAU) with coax Tee's. The MAU is connected to the port on the LCNP board located in the middle slot (Slot 3) in the electronics module. The MAU is located in the cable cavity of the console station. See Figures 16-3, 16-4, and 16-5 for the various mount schemes.

The following illustration shows the cabling connection of the LCN A and LCN B cables to the MAUs, as well as the MAU cable connection to the LCNP board.

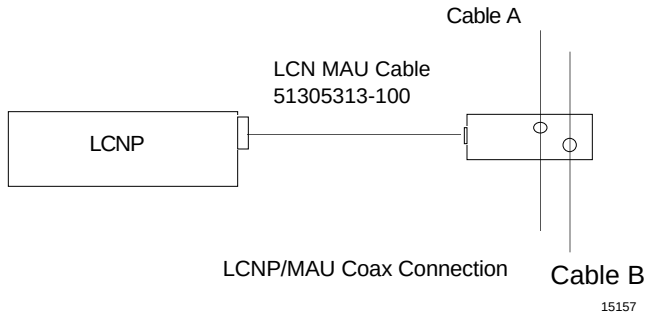


Figure 16-3 — Connection of LCN Cable A and Cable B to the LCN MAU

The mounting of the LCN MAU is done in the bottom, front side of the station. The UCN tap and LCN MAU are located side-by-side under the access plate as shown below.

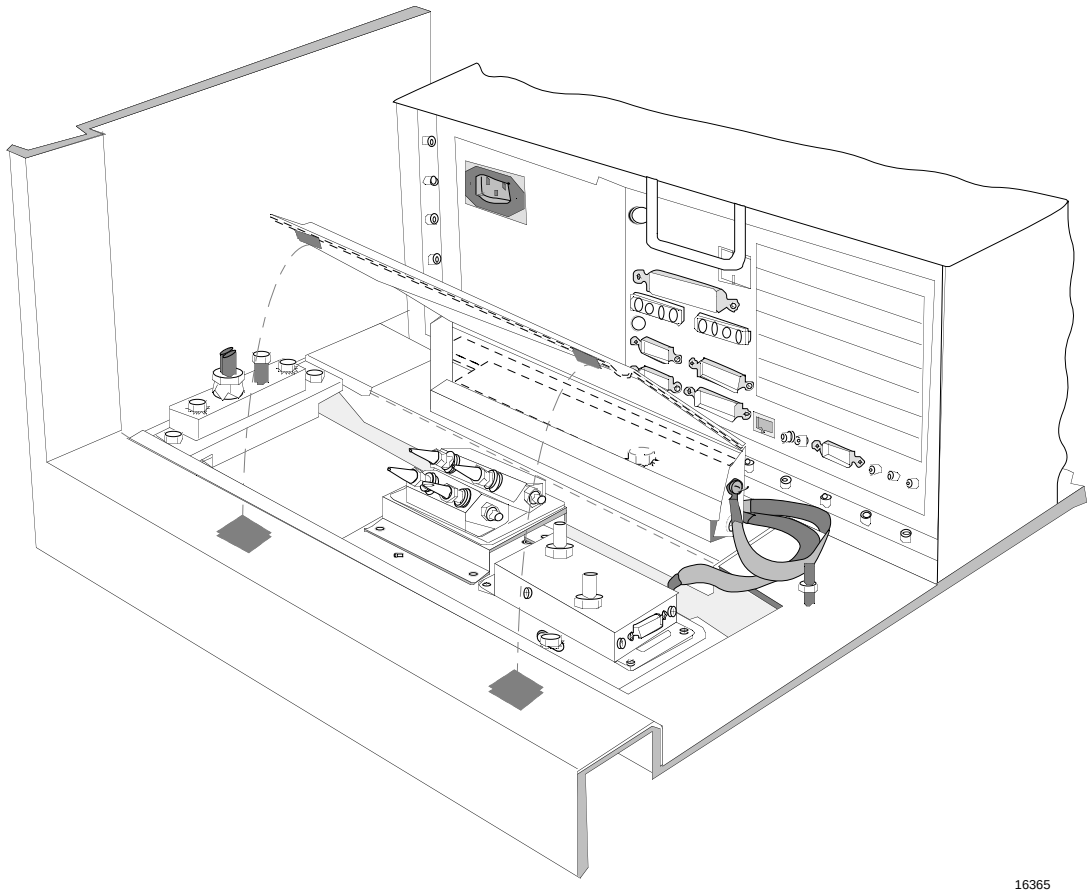


Figure 16-4 — Mounting of an LCN MAU with no UCN Taps

The coax cables and T-connectors required were installed during the preparation phase of the installation. Observe the cable in use display. Immediately after a cable switch, pick the inactive cable and connect its coax T-connector to the appropriate MAU connector for that cable. Then, after the next cable switch to the other cable, connect the other coax T-connector.

– Connect the A cable T to the A cable connector on the MAU.
– Connect the B cable T to the B cable connector on the MAU.

OPTIONS INSTALLATION FOR UNIVERSAL STATIONS
Appendix A

This section provides brief installation procedures for adding an option or feature to an existing ***TotalPlant*** *Solution (TPS) System. These procedures, together with the TPS System Configuration Guide, and the information contained in the various equipment installation and service manuals, provide the necessary information to modify or expand your system.*

NOTE

This section applied to TPS equipment installed before 1/01/96. The newer CE Compliant equipment installation is covered in Appendix C.

A.1 UNIVERSAL STATION COMPLEXING (PHYSICAL)

A complete complexing kit, P-ZCKY1, is available from Honeywell for on-site expansion. The kit includes hardware for complexing the keyboard and work-surface support trays, for complexing the console bases, and the trim kit for the ends of each console complex. See Section 3 for installation instructions. When viewed from the LCN, each station is seen as a separate unit.

A.2 MODULE INSTALLATION

The LCN electronics modules are shipped complete with power cord, front cover, attachment hardware, and LCN intercabinet cables, including tees and terminators. Refer to installation drawings for connection details. See Section 8 for system pinning (node addressing).

A.3 PERIPHERAL INSTALLATION AND CABLING

The standard built-in peripherals, cartridge disk drives, floppy disk drives, and trend pen recorders, are installed and cabled into the Universal Station^X at the factory. Removal and replacement procedures are provided in the applicable service manual and installation drawings. The matrix printer is packaged separately for shipping.

After unpacking, position the printer on the table top. Route the power cord and data cables down the back of the console and up through the cable cutouts. Connect the power cord into any unused receptacle on the power entry box. The data cable connections, as applicable to the Universal Station^X, are shown in Figures A-1 and A-2. See subsection A.7 for cabling information for the Universal Work Station.

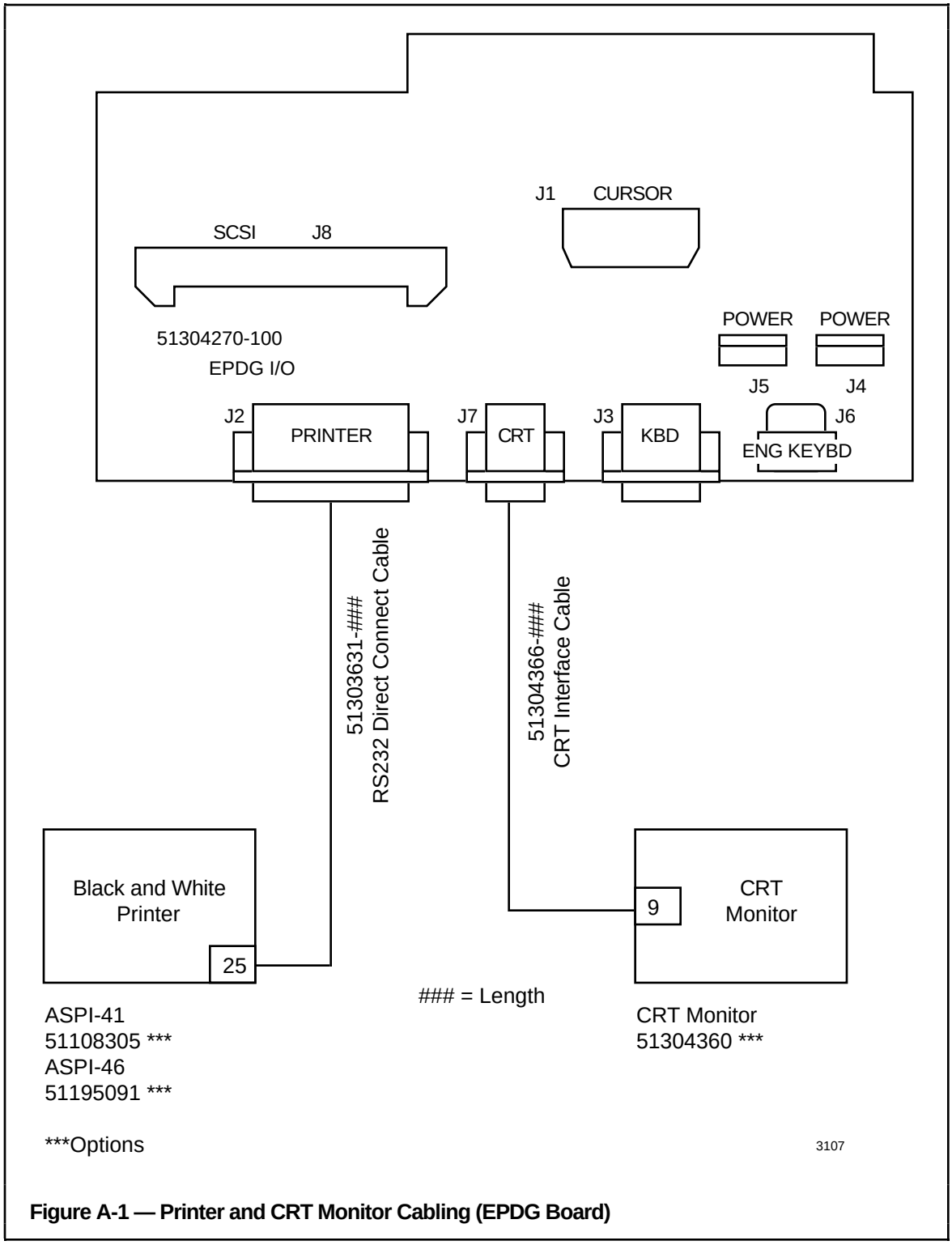


Figure A-1 — Printer and CRT Monitor Cabling (EPDG Board)

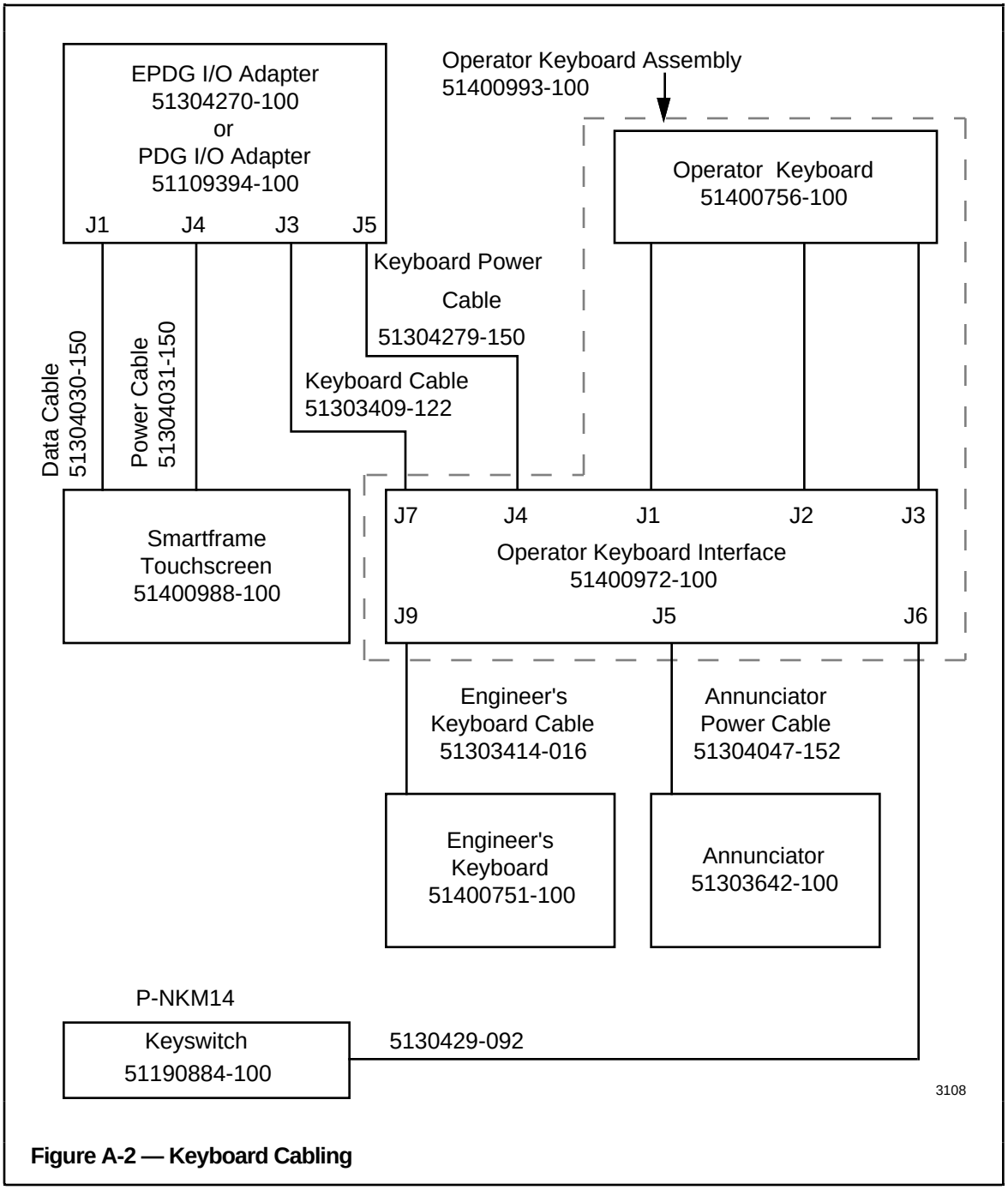


Figure A-2 — Keyboard Cabling

A.4 TREND PEN ASSEMBLY REMOVAL AND REPLACEMENT

The trend pen recorders, up to three, and the power/interface chassis are mounted in a separate assembly, above the CRT shroud. Mounting brackets and M5 hex-head screws are used to secure it in place. To remove and replace the recorders, refer to the *Universal Station Service* in the *LCN Service-1* binder or *Universal Station^X Service* in the *Universal Station^X* binder. The standard trend-pen cable connections are shown in Figure A-3.

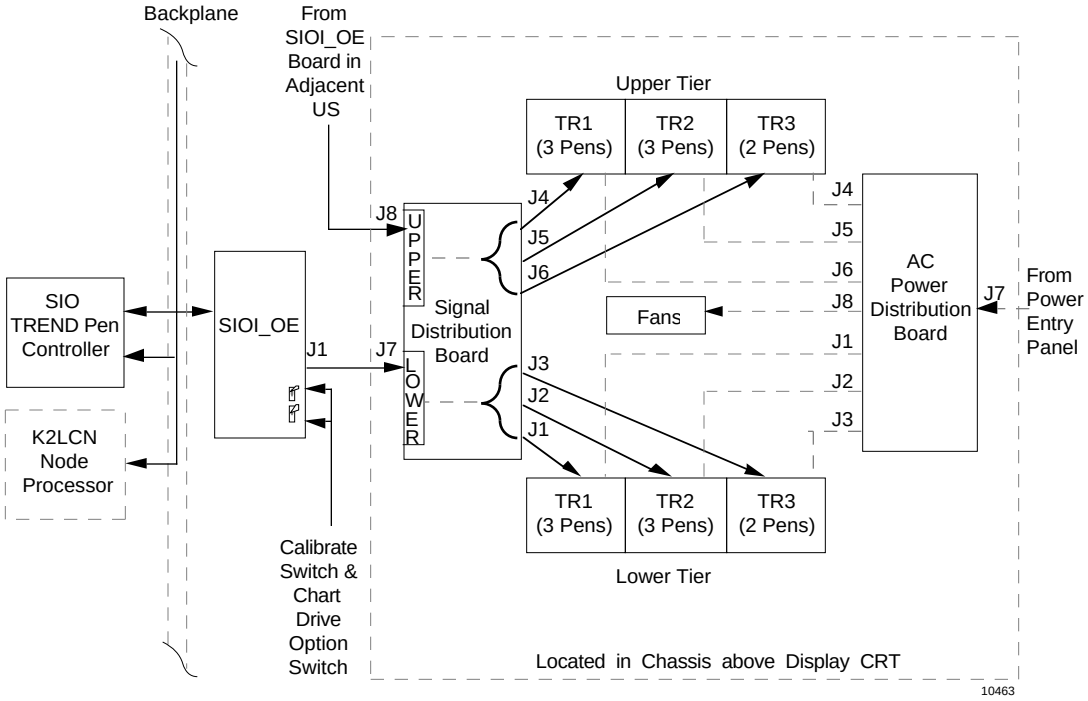


Figure A-3 — Trend Pen Recorder Cabling

A.5 HIWAY GATEWAY CABLING

For an overview of Hiway Gateway preferred access cabling with or without a Hiway Traffic Director (HTD), see Figure A-4. For hiway cable specifications and address priority assignments, refer to the *Data Hiway Subsystem Site Planning* manual in the *Basic System Summary* binder.

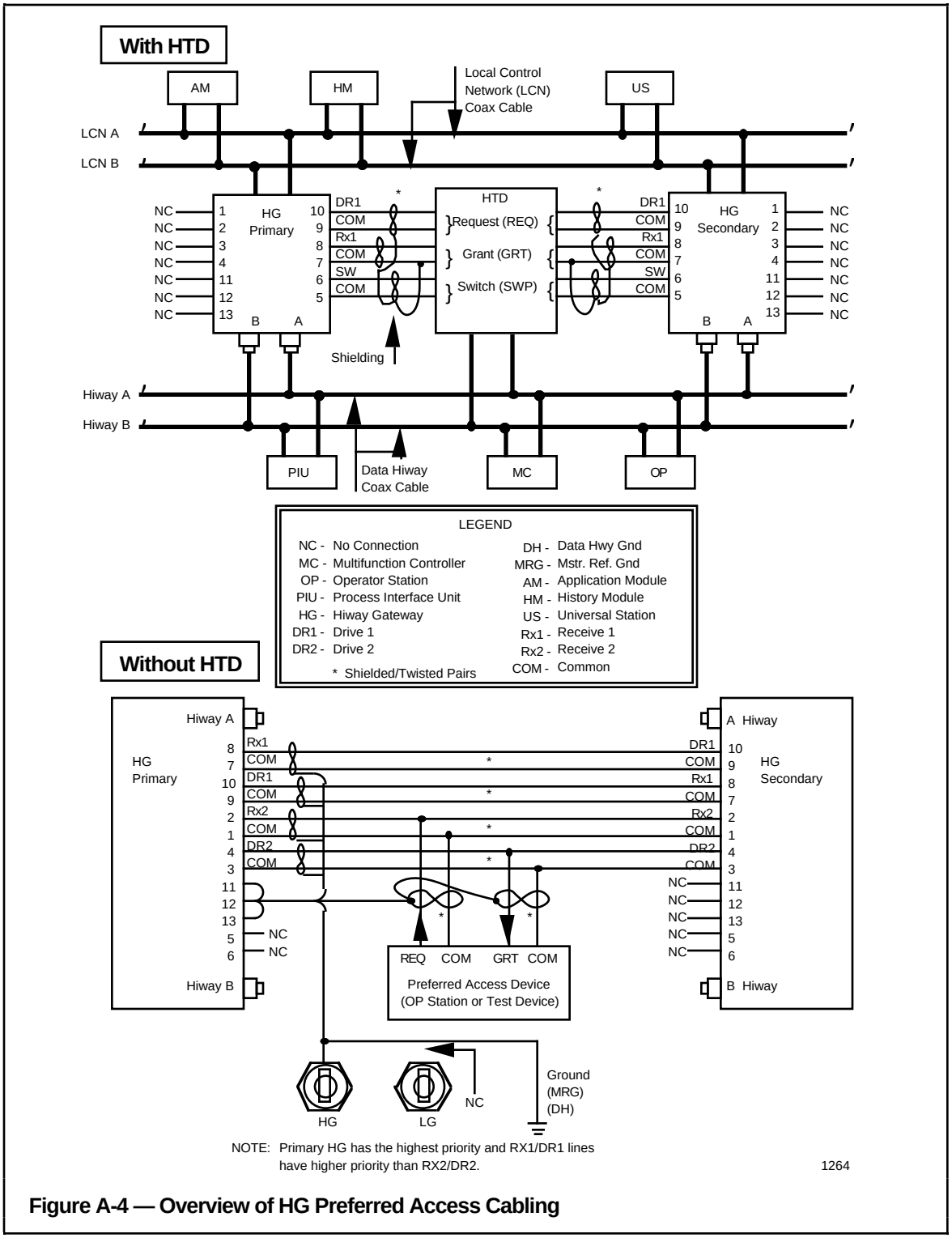


Figure A-4 — Overview of HG Preferred Access Cabling

A.6 ENHANCED UNIVERSAL WORK STATION (EUWS) INSTALLATION

The EUWS consists of a 5-slot LCN module with optional media storage devices (either dual floppy-disk drives or dual high-capacity cartridge drives), all of which are mounted in a free-standing enclosure, see Figure A-6 and A-7. Peripherals supplied are a 14" CRT color monitor, either an engineering keyboard or a supervisory keyboard, or both, a mouse for cursor control and an optional printer.

The power cable, peripheral cables, and LCN cables enter and exit through the rear panel. Access to the 5-slot module cards is through the front cover and access to the I/O cards is through the rear. Some details of I/O cabling are shown in Figures A-5, A-6, and A-7. See Section 8 for address pinning.

For complete installation and operating details, see the *Enhanced Universal Work Station Installation, Operation, and Service* manual packed with the equipment.

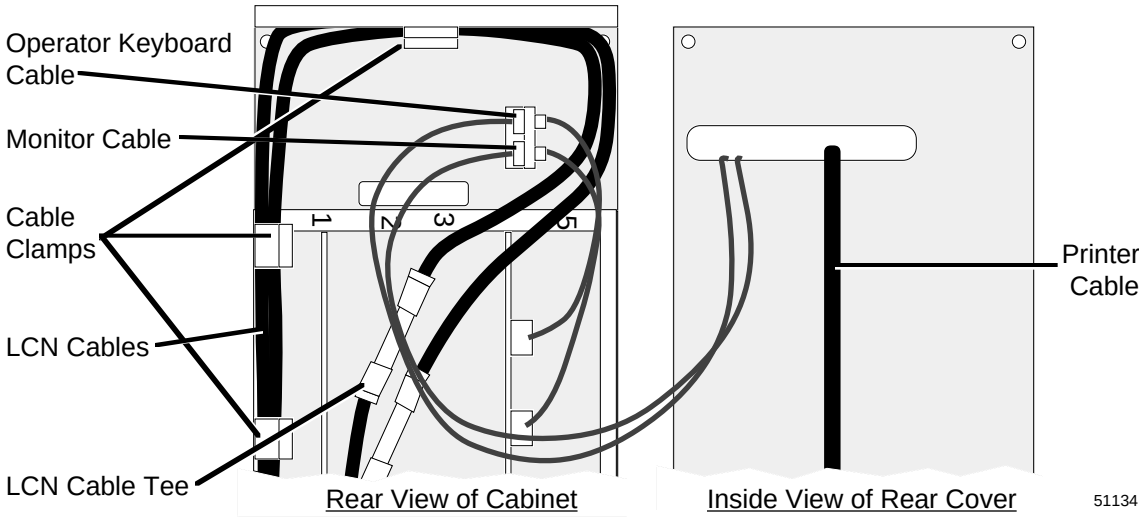


Figure A-5 — Cable Routing at Rear of Enhanced Universal Work Station

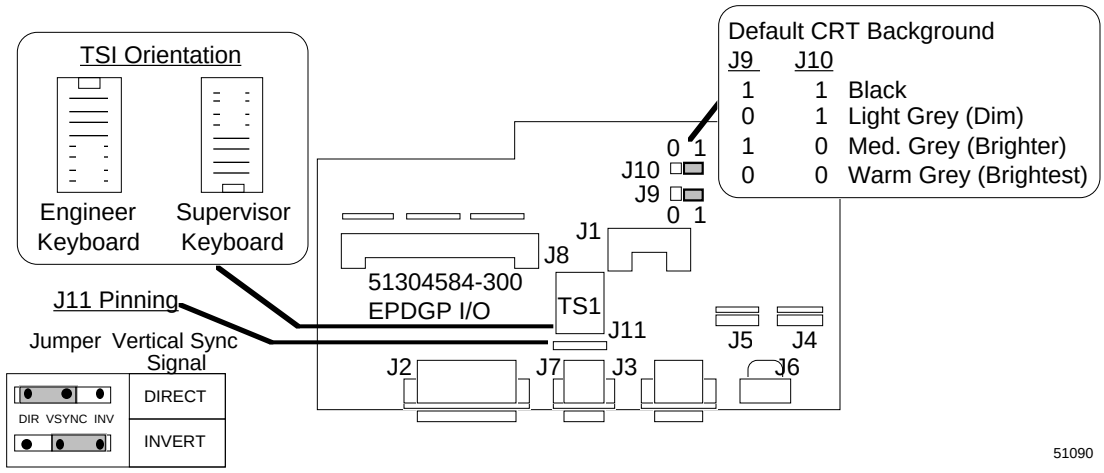


Figure A-6 — EPDGP I/O Pinning

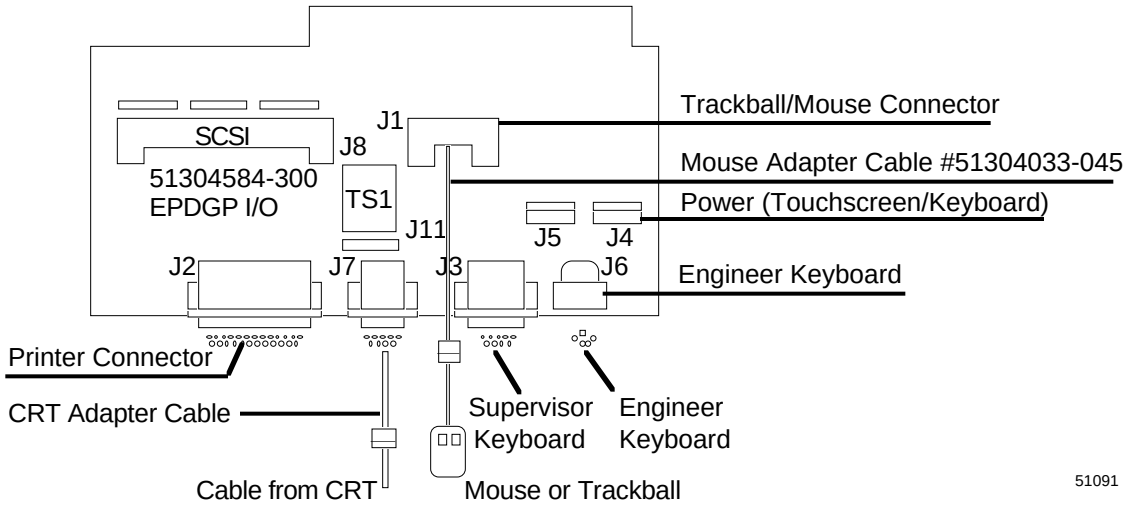


Figure A-7 — EPDGP I/O Cabling for Universal Work Station

A.7 REDUNDANT APPLICATION MODULE CABLING

The cabling for Redundant Application Modules is shown in Figure A-8.

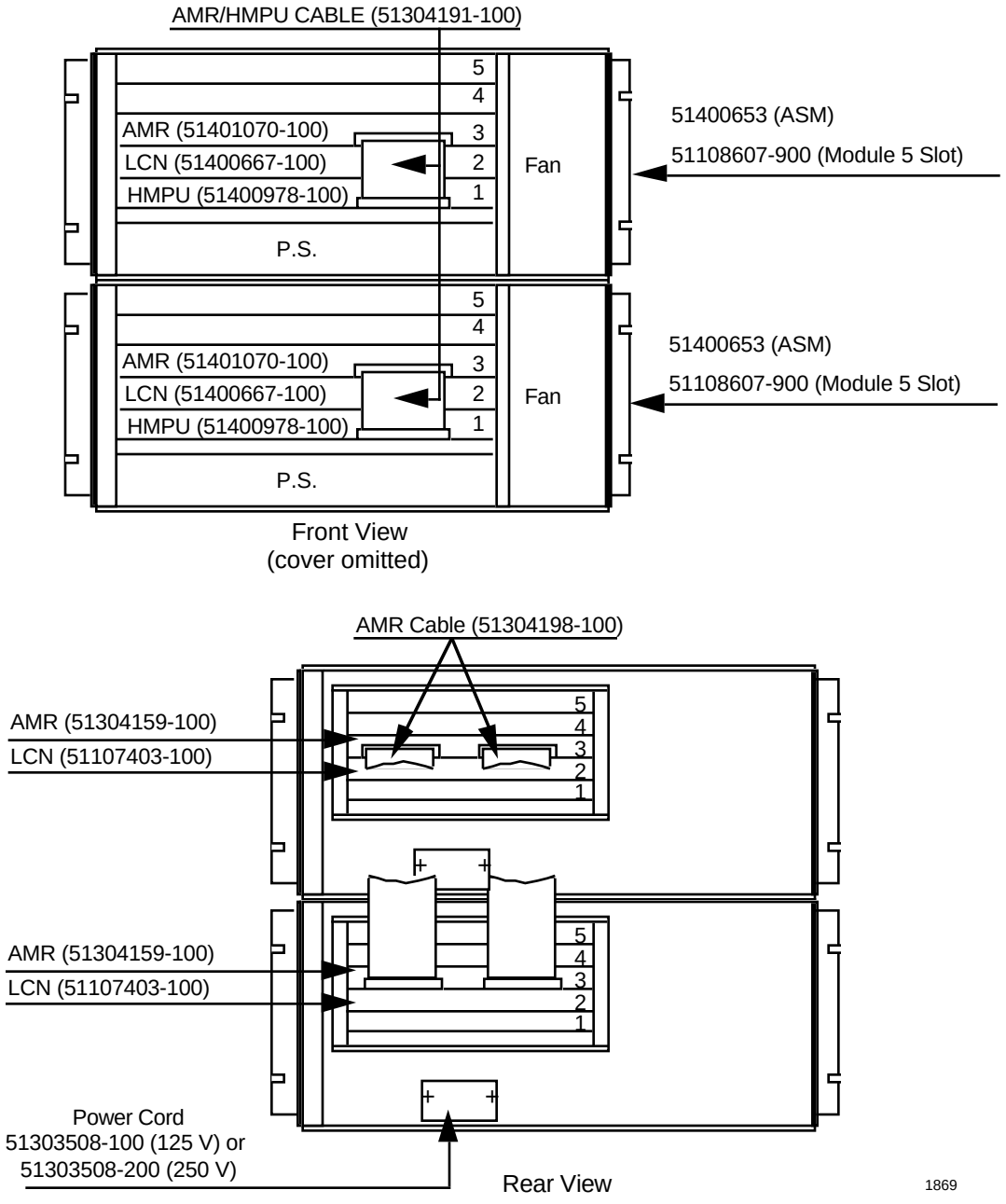


Figure A-8 — Redundant Application Module Cabling

This is an example of cabling for Enhanced Redundant Application Modules using K4LCN/EAMR boards as shown in Figures A-9 through A-16. The boards can be installed in either node position of the Dual Node Module. There are four combinations of upper/lower node positions.

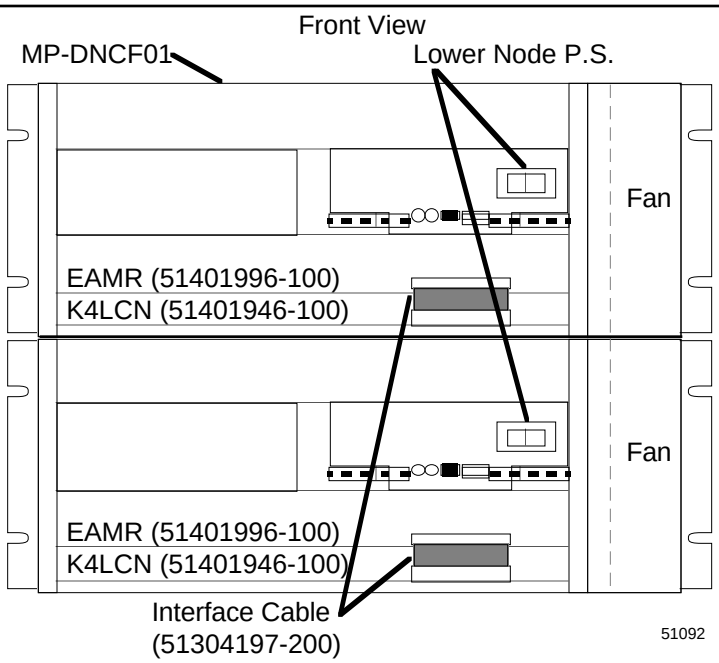


Figure A-9 — Redundant Application Module Cabling (K4LCN/EAMR)

Figure A-9 and A-10 show front and back views of the same application.

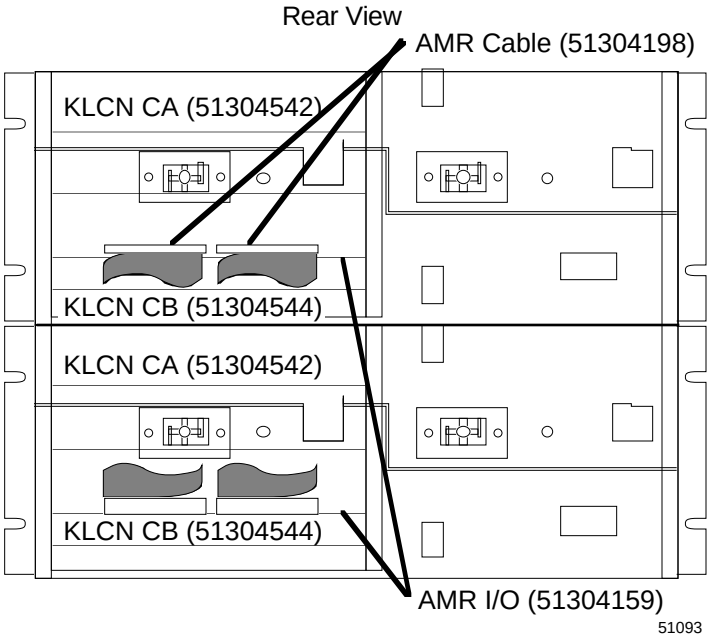


Figure A-10 — Redundant Application Module Cabling (K4LCN/EAMR)

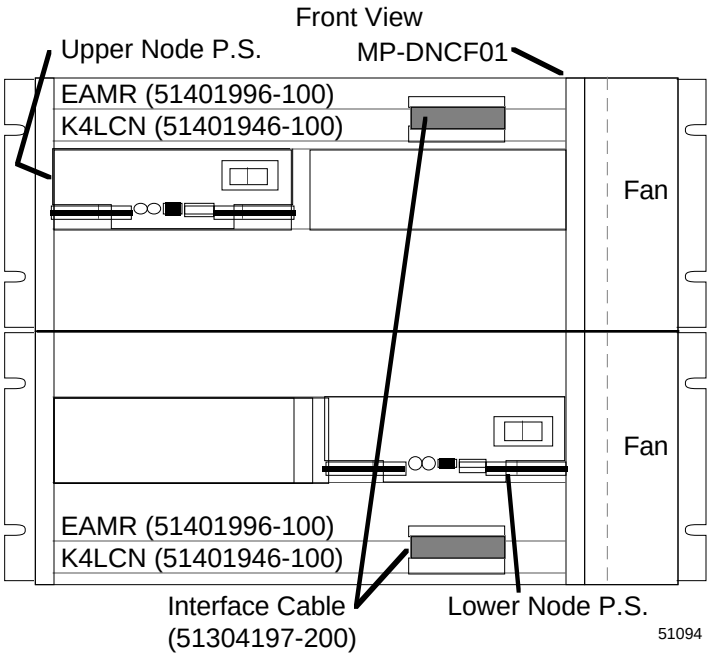


Figure A-11 — Redundant Application Module Cabling (K4LCN/EAMR)

Figure A-11 and A-12 show front and back views of the same application.

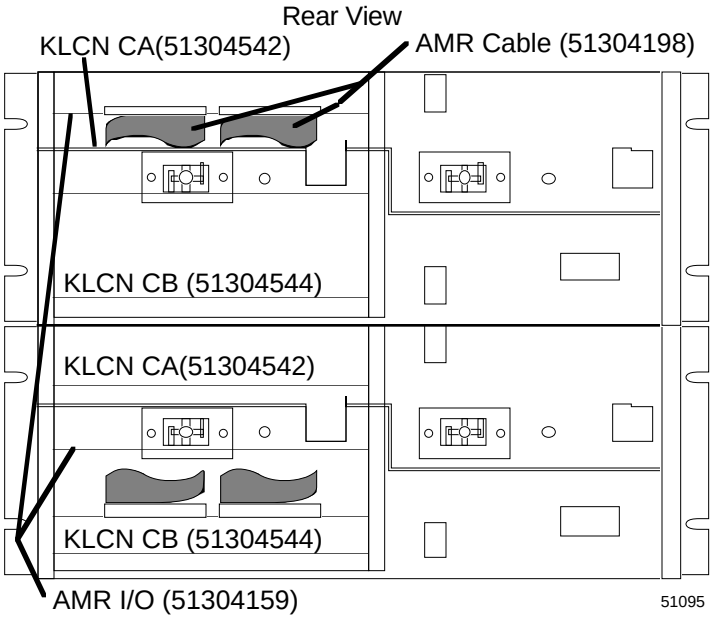


Figure A-12 — Redundant Application Module Cabling (K4LCN/EAMR)

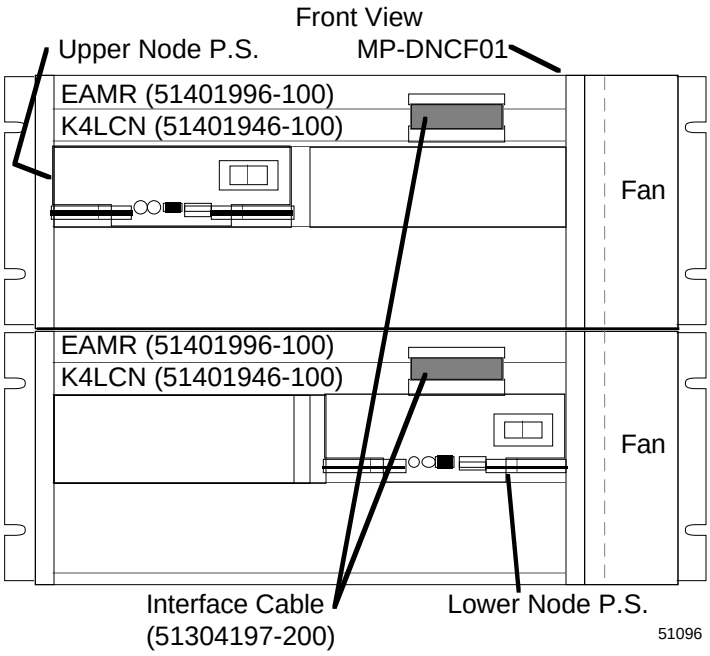


Figure A-13 — Redundant Application Module Cabling (K4LCN/EAMR)

Figure A-13 and A-14 show front and back views of the same application.

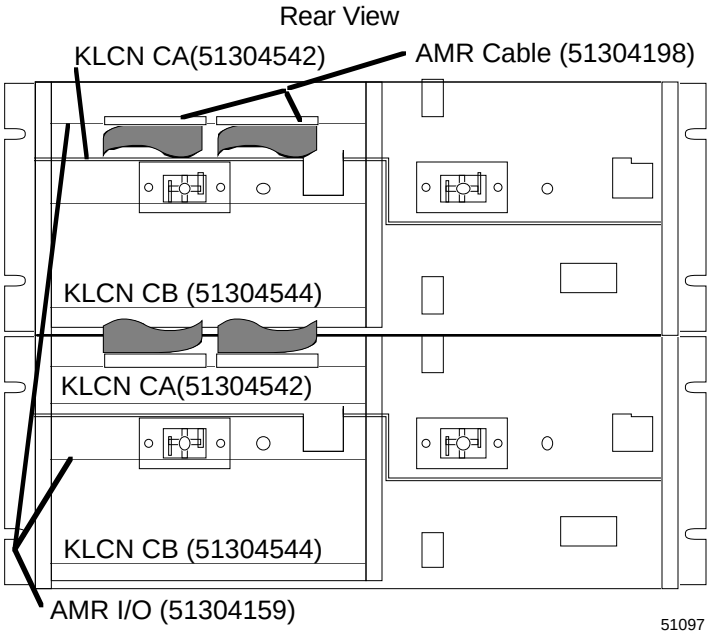


Figure A-14 — Redundant Application Module Cabling (K4LCN/EAMR)

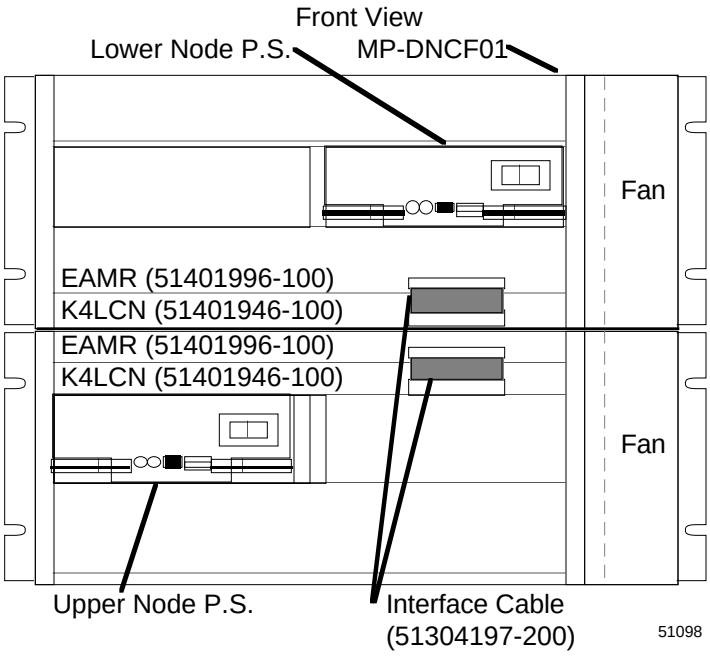


Figure A-15 — Redundant Application Module Cabling (K4LCN/EAMR)

Figure A-15 and A-16 show front and back views of the same application.

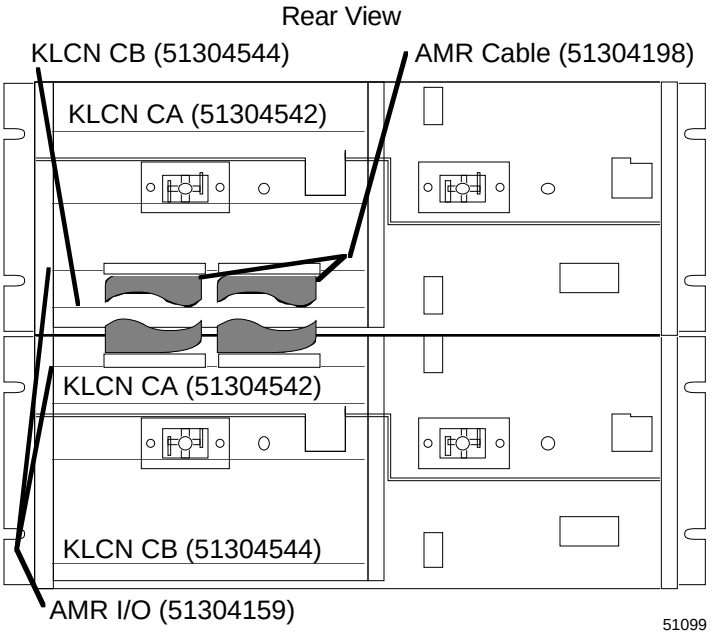


Figure A-16 — Redundant Application Module Cabling (K4LCN/EAMR)

A.8 UNIVERSAL STATION^X CABLING (UNIVERSAL STATION FURNITURE)

The Universal Station cabling shown in Figures A-17, A-18, and A-19, when all combined, shows the complete cabling for a Universal Station^X.

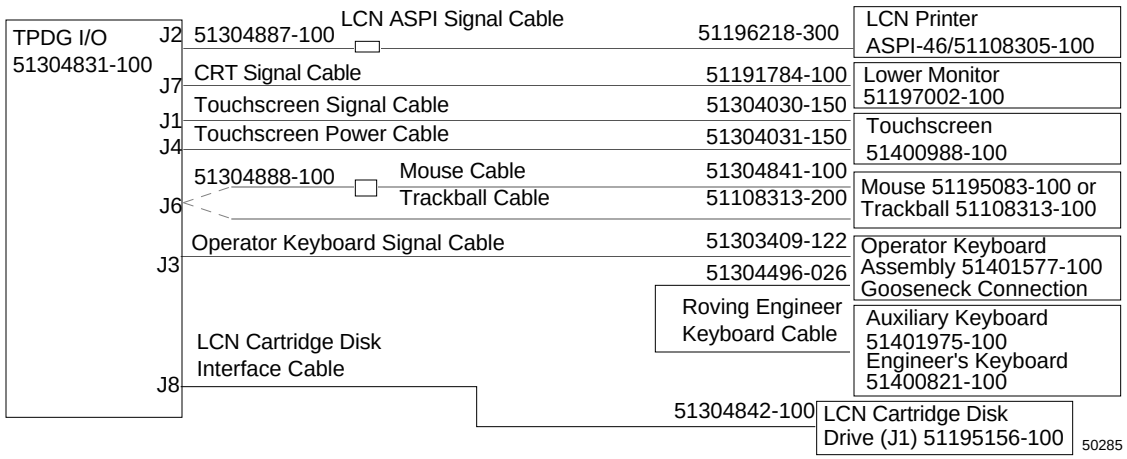


Figure A-17 — Universal Station^X Internal Cabling—Left Half

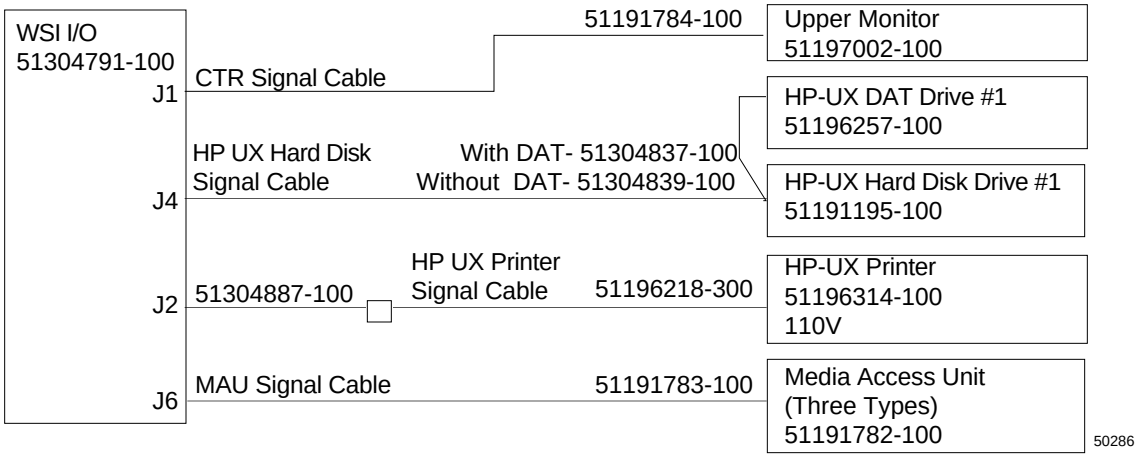


Figure A-18 — Universal Station^X Cabling

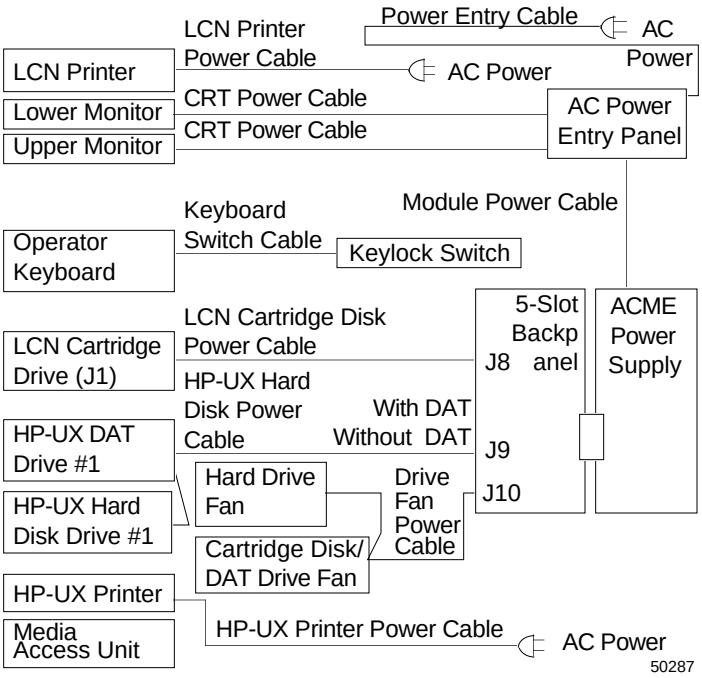


Figure A-19 — Universal Station^{X} Internal Cabling—Right Half

A.9 UNIVERSAL STATION CABLING (ERGONOMIC FURNITURE)

The Universal Station (Ergonomic) internal cabling is shown in Figure A-20. Figure A-20 is supported by Table A-1, which gives the part numbers for the items referred to by the number in the bubble.

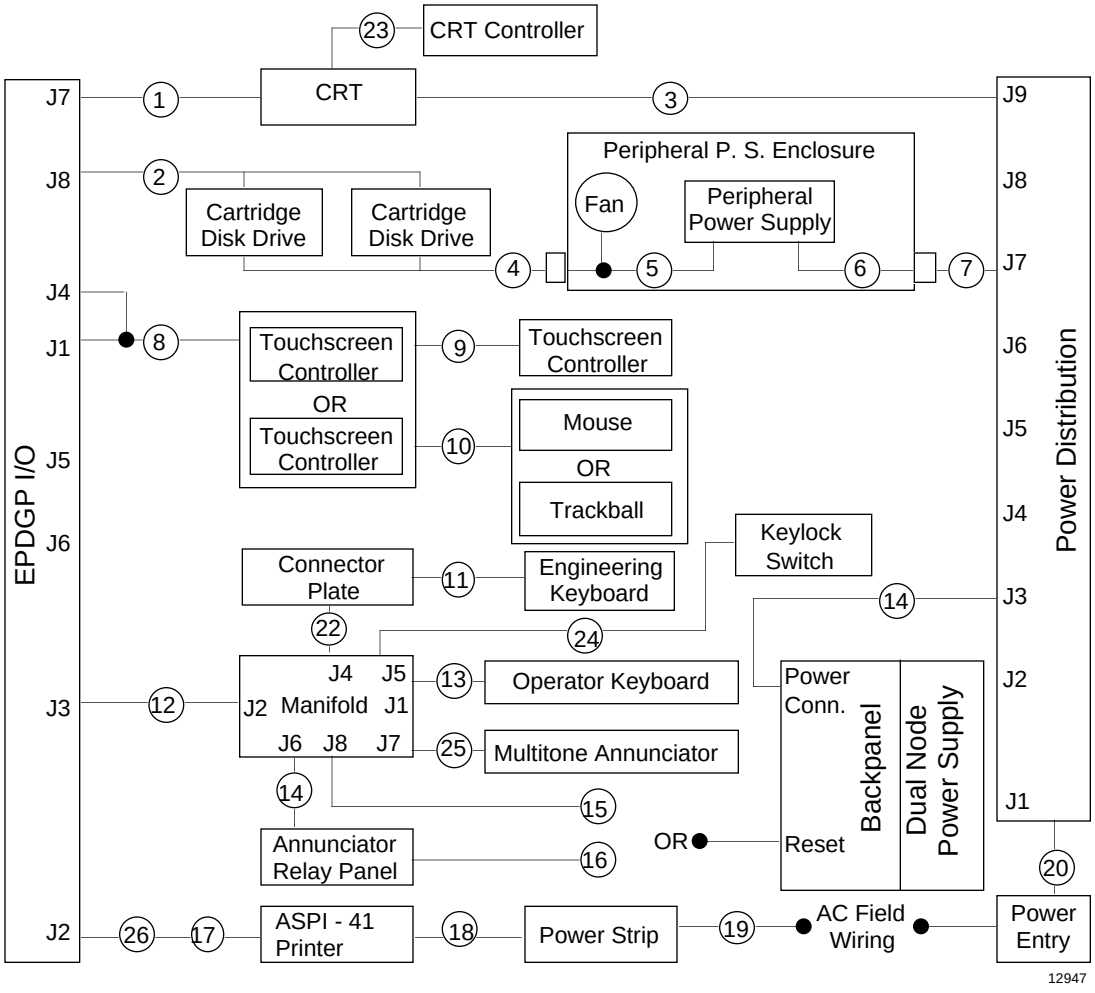


Figure A-20 — Universal Station (Ergonomic) Internal Cabling

Table A-1 — Cabling Schematic Key List

Item	Part Number	Identification
1	51191784-100	CRT Signal Cable
2	51304842-200	Cartridge Disk Interface Cable (Single Drive)
	51304199-300	Cartridge Disk Interface Cable (Dual Drive)
3	51308020-100	Monitor/P.S. AC Power Cable
4	51308055-100	Drive Cable, DC Power
5	51308051-100	P.S. Enclosure DC Cable (51197004-100) P.S.)
	51308051-200	P.S. Enclosure DC Cable (51197004-200) P.S.)
6	51308052-100	P.S. Enclosure AC Cable (51197004-100) P.S.)
	51308052-200	P.S. Enclosure AC Cable (51197004-200) P.S.)
7	51308020-200	Monitor/Ps AC Power Cable
8	51308047-100	Touchscreen Interface Cable
	51308082-100	Mouse I/C Cable (EPDG)
	51308073-100	Trackball I/C Cable (EPDG)
9	—	Touchscreen I/C Cable (part of Touchscreen)
10	—	Mouse /Trackball Cable (part of subassembly)
11	—	Keyboard Cable (part of subassembly)
12	51308059-100	Manifold/Keyboard Interconnect Cable
13	51308058-100	Keyboard I/F Cable
14	51308019-100	Module AC Power Cable (120 Vac) Right or Close Power Supply
	51308019-100	Module AC Power Cable (120 Vac) Left or Far Power Supply
	51308066-100	Module AC Power Cable (240 Vac) Right or Close Power Supply
	51308066-200	Module AC Power Cable (240 Vac) Left or Far Power Supply
15	51303420-081	Module Status Cable
16	51303420-086	Module Status Cable
17	51303631-003	ASPI-41 Printer Signal Cable (3 Meter)
	51303631-008	ASPI-41 Printer Signal Cable (8 Meter)
	51303631-015	ASPI-41 Printer Signal Cable (15 Meter)
18	51191839-100	Cable, Power, Shielded, PVC Jacket
19	51191840-203	Cable, Power, Shielded, PVC Jacket
20	51308054-100	AC Power Entry Cable (120 Vac)
	51308067-100	AC Power Entry Cable (240 Vac)
21	51304047-152	Annunciator Power Cable
22	51308060-100	Eng. Keyboard I/F Cable
23	—	Monitor Remote Harness (supplied with monitor)
24	—	Keylock Switch Cable (part of subassembly)
25	—	Multitone Annunciator cable (part of subassembly)
26	51304506-300	Printer Adapter Cable

A.10 UNIVERSAL STATION^X CABLING (ERGONOMIC FURNITURE)

The Universal Station^X (Ergonomic) internal cabling is shown in Figures A-21 and A-22. Figures A-21 and A-22 is supported by Table A-2, which gives the part numbers for the items referred to by the number in the bubble.

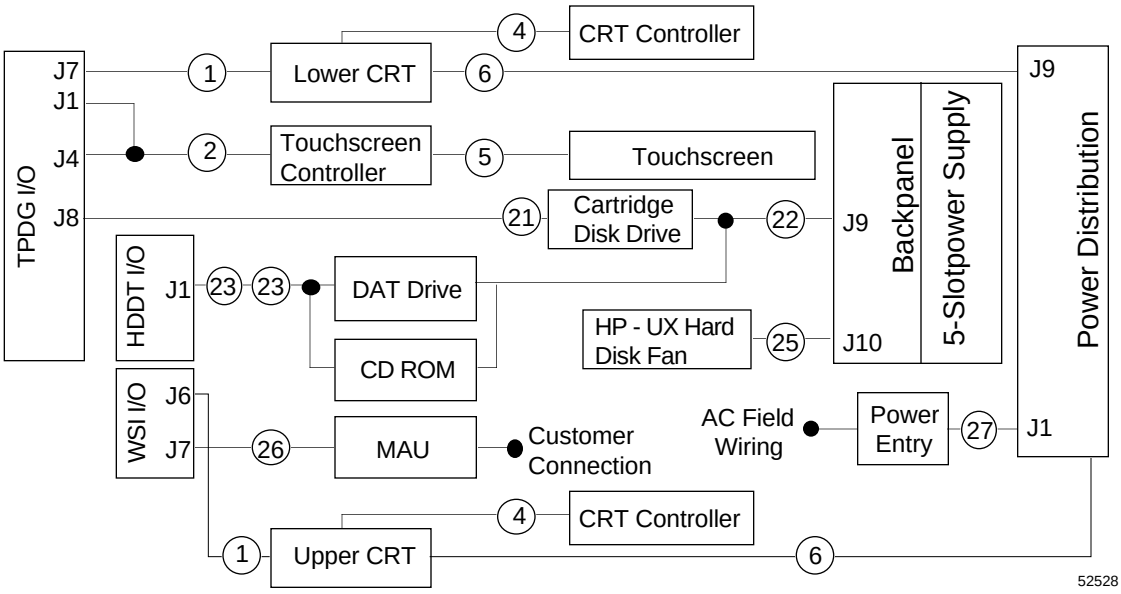


Figure A-21 — Universal Station^X Internal Cabling

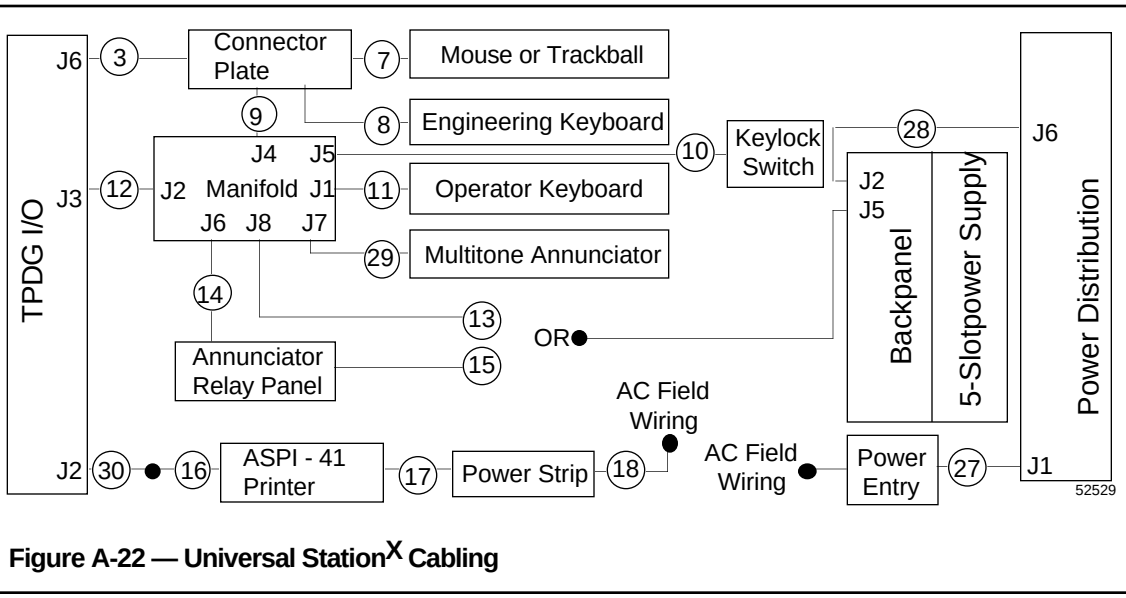


Figure A-22 — Universal Station^X Cabling

Table A-2 — Cabling Schematic Key List

Item	Part Number	Identification
1	51191784-100	CRT Signal Cable
2	51308047-100	Touchscreen Interface Cable
3	51308057-100	Mouse/Trackball Interconnect Cable
4	—	Monitor Remote Harness (supplied with monitor)
5	—	Touchscreen I/C Cable (part of touchscreen)
6	51308020-100	Monitor/P.S. AC Power Cable
7	—	Mouse Trackball Cable (part of subassembly)
8	—	Keyboard Cable (part of subassembly)
9	51308060-100	Eng. Keyboard I/F Cable
10	—	Keylock Switch Cable (part of subassembly)
11	51308058-100	Keyboard I/F Cable
12	51308059-100	Manifold/Keyboard I/C Cable
13	51303420-081	Module Status Cable
14	51304047-152	Annunciator Power Cable
15	51303420-086	Module Status Cable
16	51196218-300	Printer Signal Cable (3 meter)
17	51191839-100	Cable, Power, Shielded, PVC Jacket
18	51191840-203	Cable, Power, Shielded, PVC Jacket
19	51196218-300	Printer Signal Cable (3 Meter)
20	51191839-100	Cable, Power, Shielded, PVC Jacket
21	51304842-200	Cartridge Disk Interface Cable (Single Drive)
	51304199-300	Cartridge Disk Interface Cable (Dual Drive)
22	51308080-200	Cartridge/DAT Drive Cable DC Power
23	51308083-200	Hard Disk Signal Cable w/o DAT (drive)
	51308084-200	Hard Disk Signal Cable with DAT (drive)
24	51304838-100	WDD Power Cable
25	51304585-200	DC Fan Power Cable
26	51191783-100	MAU Signal Cable
27	51308054-100	AC Power Entry Cable (120 Vac)
	51308067-100	AC Power Entry Cable (240 Vac)
28	51308019-200	Module AC Power Cable (120 Vac)
	51308066-200	Module AC Power Cable (240 Vac)
29	—	Multitone Annunciator Cable (part of subassembly)
30	51304880-100	Printer Ferrite Cable

OPTIONS INSTALLATION US/ERGONOMIC FURNITURE Appendix B

This section provides brief installation procedures for adding an option or feature to an existing Universal Station^X node in the new ergonomic furniture. These procedures, together with the information contained in the various service manuals, provide the necessary information to modify or expand your system.

B.1 CONSOLE COMPLEXING (PHYSICAL)

Refer to Section 3 for instructions about complexing Operator Interface Stations (OIS's) into physical consoles.

B.2 MODULE INSTALLATION

Refer to the Section 2 in Universal Station (Ergonomic) Service for detailed instructions for adding an upper monitor and adding an additional card file.

B.3 PERIPHERAL INSTALLATION AND CABLING

The standard built-in peripherals, cartridge disk drives, and trend-pen recorders, are installed and cabled into the Universal Station at the factory. Removal and replacement procedures are provided in the applicable service manual and installation drawings. Upgrade kits contain an individual upgrade kit installation instruction that provide step-by-step instructions for adding or expanding options.

The matrix printer is packaged separately for shipping.

After unpacking, position the printer on the table top. Route the power cord and data cables down the back of the console and up through the cable cutouts. Connect the power cord into any unused receptacle on the power entry box. The data cable connections, as applicable to the Universal Station, are shown in Figures B-1, Figure B-2, and Figure B-3.

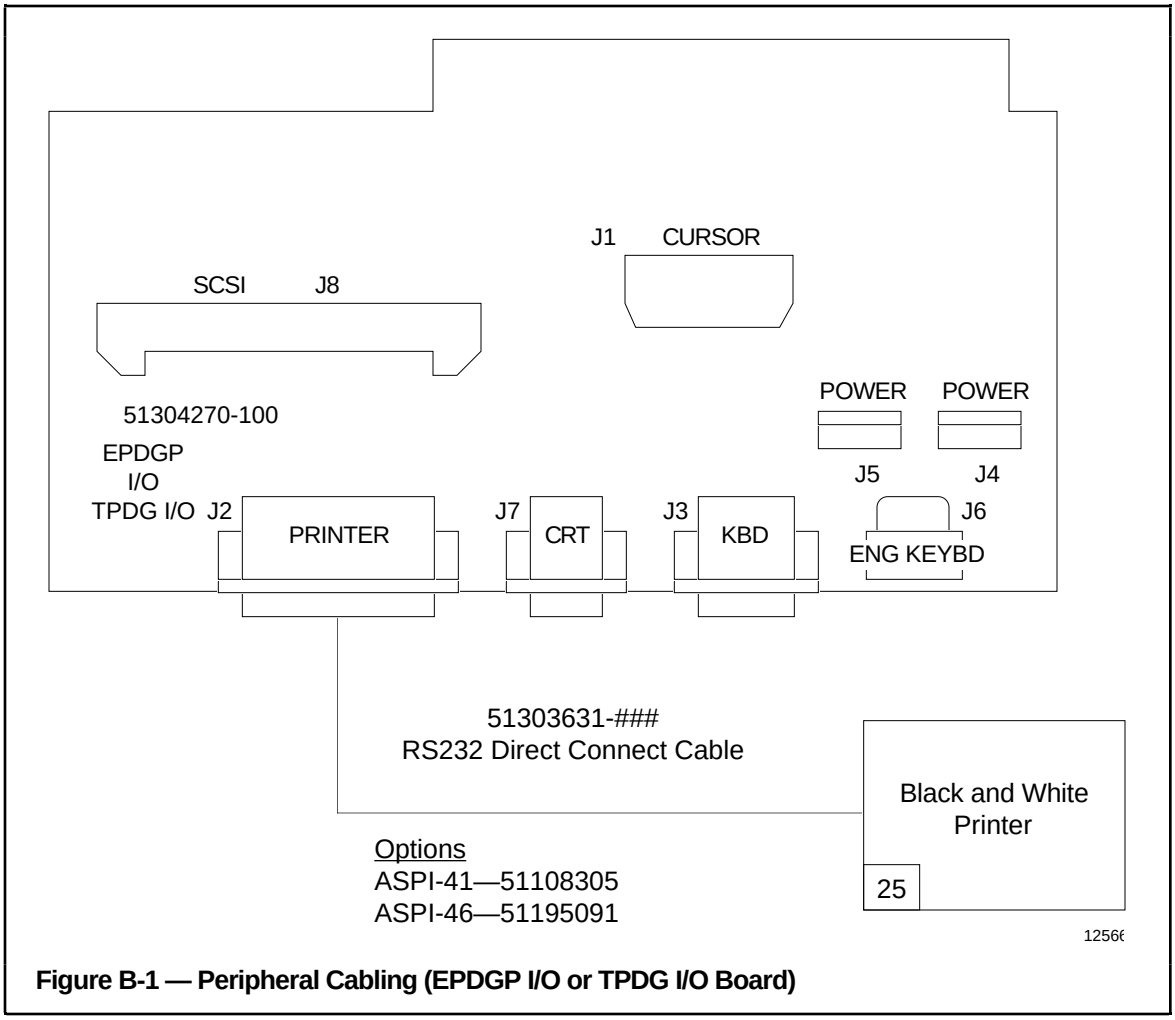


Figure B-1 — Peripheral Cabling (EPDGP I/O or TPDG I/O Board)

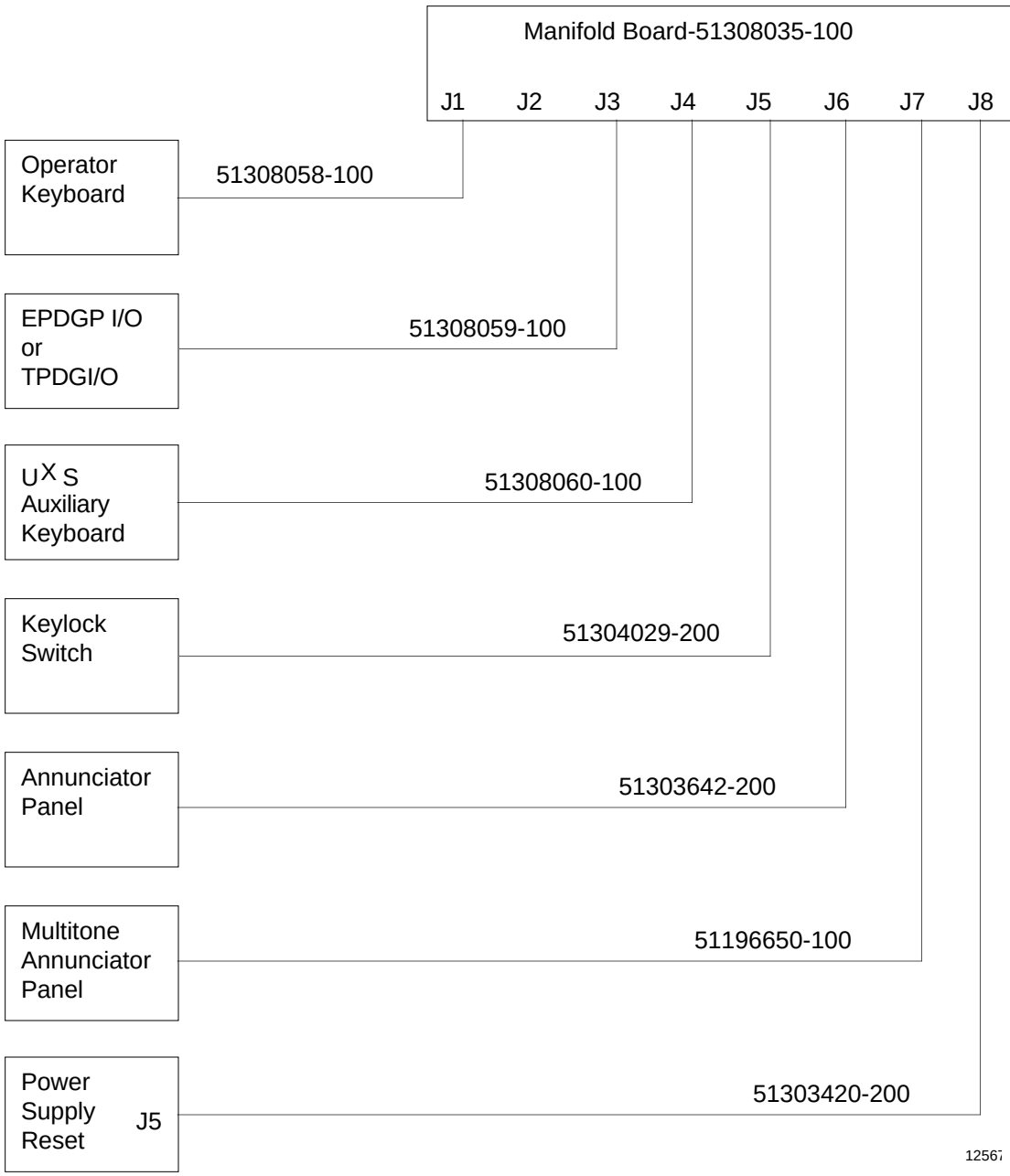


Figure B-2 — Manifold Cabling

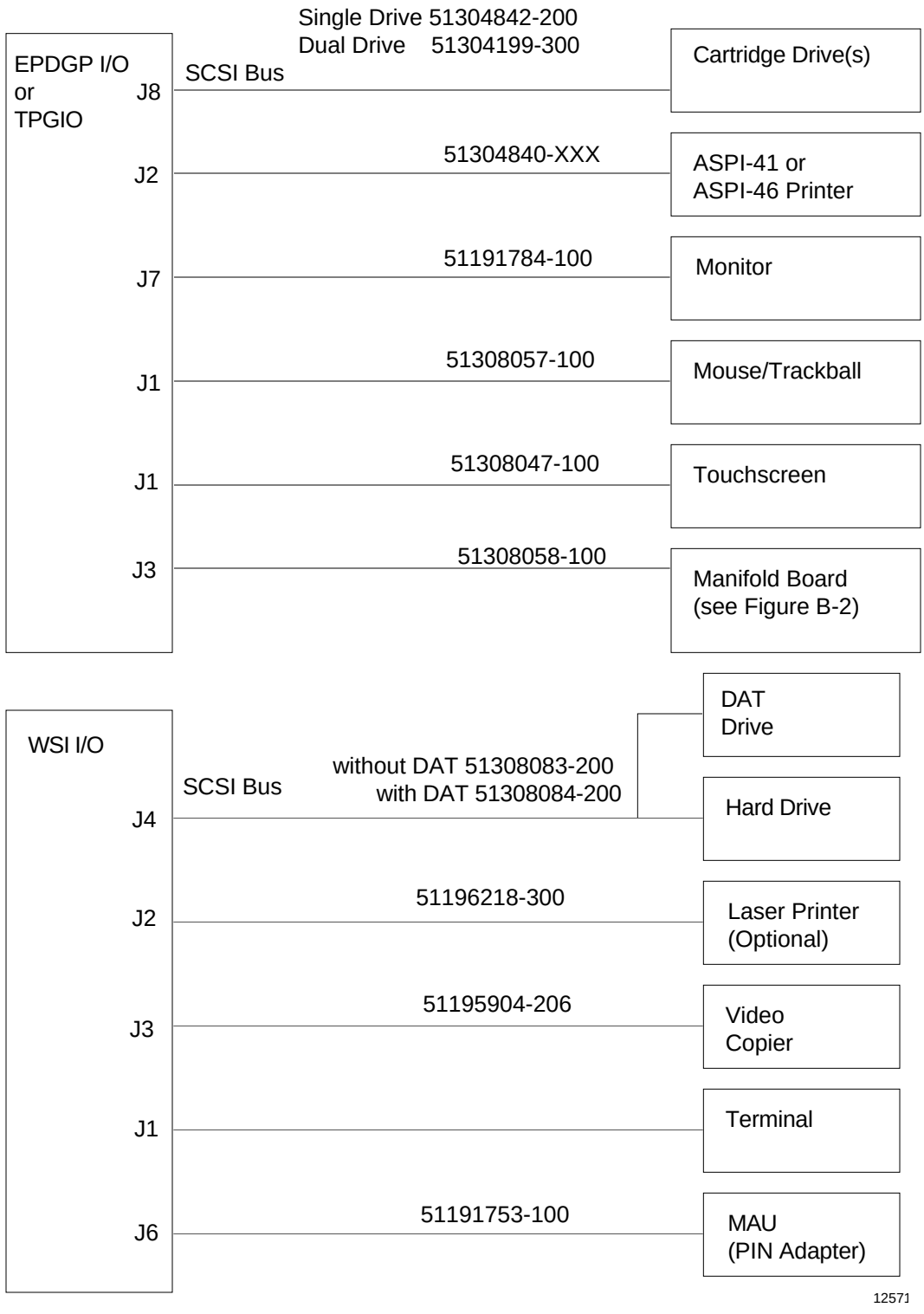


Figure B-3 — Universal Station^X Interface Cabling

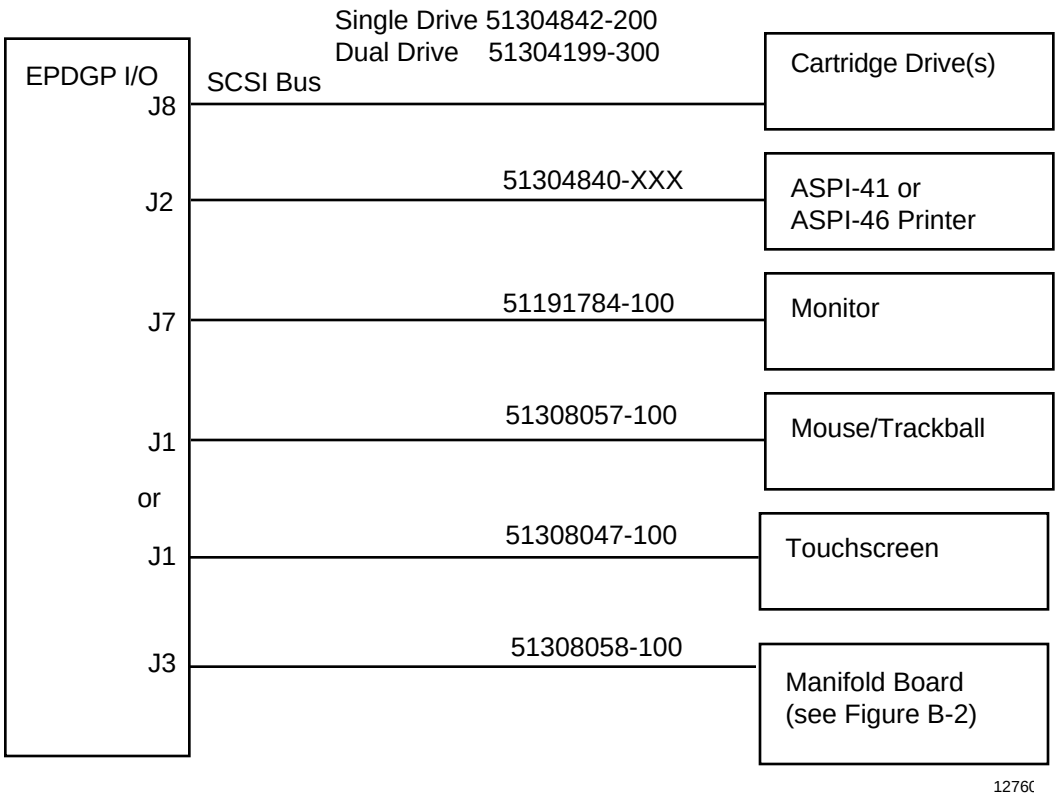


Figure B-4 — US Node Cabling

Appendix C – Installations of CE Compliant Options

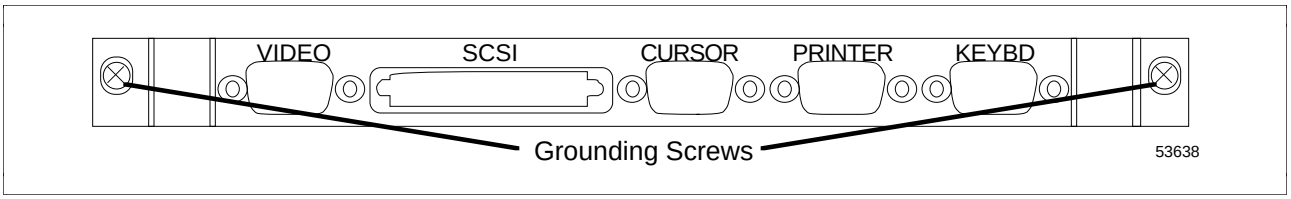
C.1 Overview

Scope

CE Compliant hardware consists of a special set of I/O boards, for each control board type, that have a metal faceplate mounted to the edge of the board that provides grounding for the shielded cables connected to the I/O board. These boards are connected to the module chassis by a retaining screw, located on the right and left ends of the faceplate.

Figure C-1 shows an EPDGC I/O board as an example of an I/O board and the grounding screw locations.

Figure C-1 EDPGC I/O Faceplate



ATTENTION

These screws must always be firmly into the I/O card file to provide the required grounding.

Cables

Classic and ergonomic Universal Stations, Universal Station^{X}s, Micro TDC 3000s, and Universal Work Stations have a complete new set of cables that connect the components in each application.

Cabling diagrams and tables

Each cabling application is shown in this appendix with each different cable numbered for identification. Each number is listed in the table following the diagram. Each entry in the table lists the part number and part identification title. The part identification title is assigned for the first application of the cable. A second usage of the same part may have a title not associated with the application.

C.2 Universal Station Cabling—Classic Furniture

Scope

Cabling for Universal Station in classic furniture is shown below.

Figure C-2 US Cabling—Classic Furniture with Touchscreen

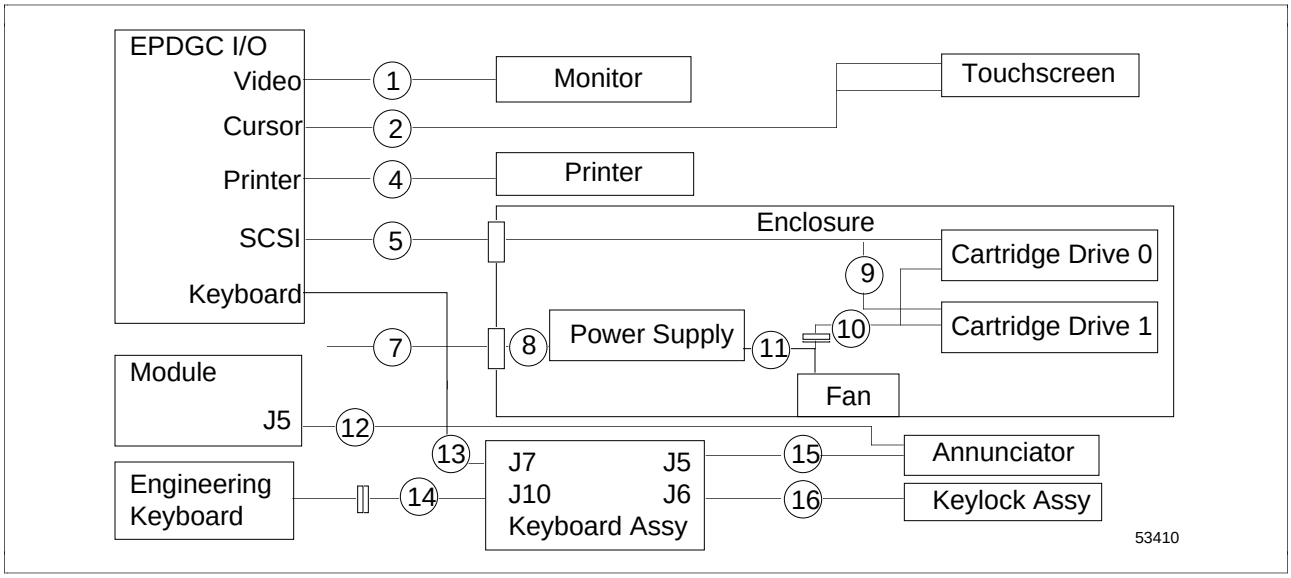


Table C-1 US Cabling—Classic Furniture with Touchscreen

Ref. #	Part Number	Application Notes
1	51308120-100	Classic Console EC Video Cable
2	51308123-200	EC Smartscreen Cable
3		Not Applicable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable — 15 meters/49.2 ft.
5	51192054-102	Cable, SCSI Shielded, 50 position
6		Not Applicable
7	51308094-600	Classic Module AC Power Cable
8	51308052-200	P.S.Enclosure AC Cable
9	51305070-100	Cable, SCSI (1 Drive)
	51305070-200	Cable, SCSI (2 Drives)
10	51308055-100	Drive Cable DC Power
11	51308051-200	DC Power Cable, Fan
12	51303420-586	Module Status Cable
13	51308126-100	Keyboard Cable
14	51304496-026	Engineer's Keybd Cable
15	51304047-652	Annunciator Power Cable
16	51304029-500	Keylock Switch Cable

Continued on next page

Illustration

Figure C-3 US Cabling—Classic Furniture with Mouse/Trackball

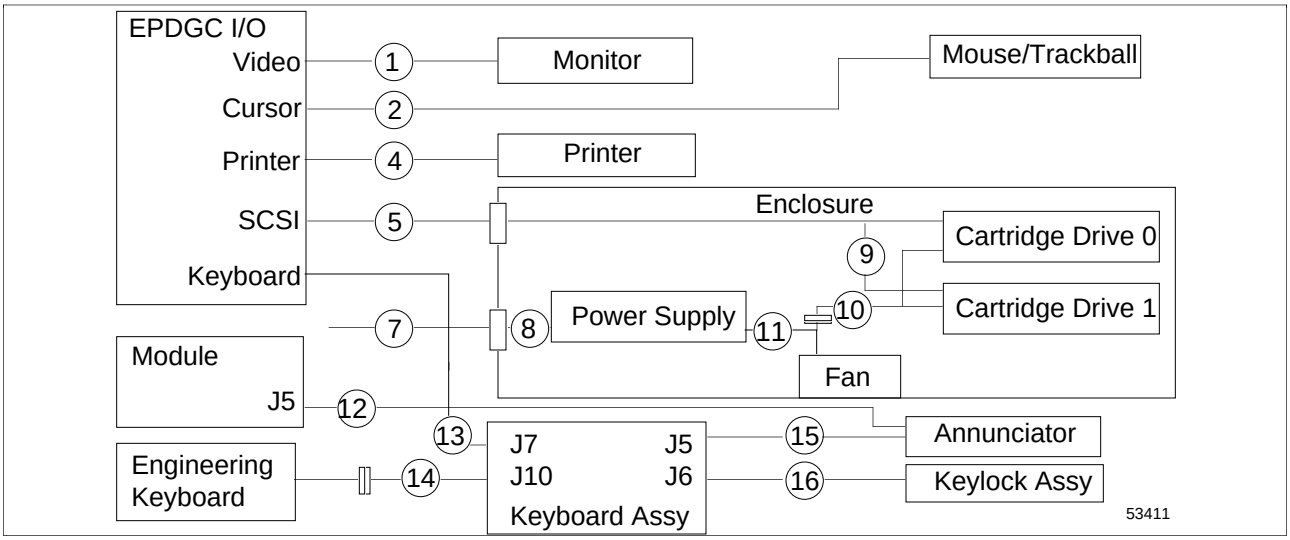


Table C-2 US Cabling—Classic Furniture with Mouse/Trackball

Ref. #	Part Number	Application Notes
1	51308120-100	Classic Console EC Video Cable
2	51308099-100	EPDGC Mouse/Trackball I/F Cable
3		Not Applicable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-102	Cable, SCSI Shielded, 50 position
6	51305070-100	Cable, SCSI (1 Drive)
	51305070-200	Cable, SCSI (2 Drives)
7	51308129-100	Skynet-Cart Drive Power Cable
8	51308125-100	Cartridge Drive Encl Power Harness
9	51308051-200	DC Power Cable, Fan
10	51308055-100	Drive Cable, DC Power
11	51308051-200	DC Power cable, Fan
12	51303420-586	Module Status Cable
13	51308126-100	Keyboard Cable
14	51304496-026	Engineer's Keybd Cable
15	51304047-652	Annunciator Power Cable
16	51304029-500	Keylock Switch Cable

C.3 Universal Station Cabling—Ergonomic Furniture

Scope

Cabling for the Universal Station in ergonomic furniture is shown in the following figure and table. The number in the circles refers to the line item in the table below.

Figure C-4 US Cabling—Ergonomic Furniture with Mouse/Trackball

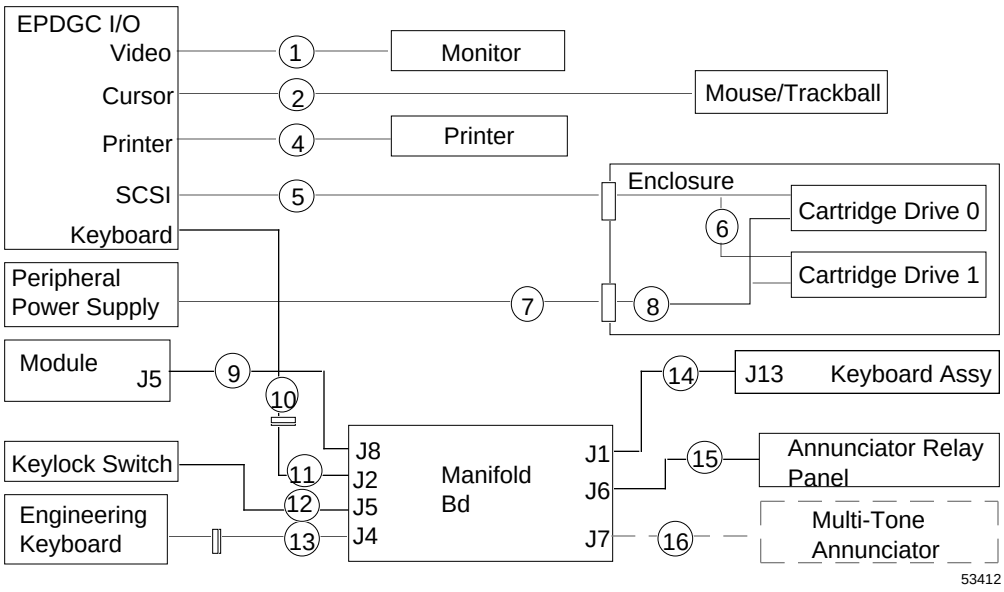


Table C-3 Universal Station Cabling—Ergonomic Furniture with Trackball

Ref. #	Part Number	Application Notes
1	51301784-200	Cable, CRT Signal
2	51308099-100	Mouse/Trackball Interface Cable
3		Not Applicable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-101	Cable, SCSI Shielded, 50 position
6	51305070-100	Cable, SCSI (Single Drive)
	51305070-100	Cable, SCSI (Dual Drive)
7	51308129-100	Skynet-Cart Drive Power Cable
8	51308125-100	Cartridge Drive Enclosure Power Harness
9	51308051-200	Module Status Cable
10	51308105-100	EPDGC/TPDGC Keyboard I/C Cable
11	51303420-622	Annunciator Cable
12	51304029-200	Keylock Switch Cable
13	51308060-100	Eng Keyboard I/F Cable
14	51308058-100	Keyboard I/F Cable
15	51304047-552	Annunciator Power Cable
16	51196650-100	Keyboard Alarm Assy (Multitone Annunciator)

Continued on next page

Illustration

Cabling for the Universal Station in ergonomic furniture is shown in the following figure and table. The number in the circles refers to the line item in the table below.

Figure C-5 US Cabling—Ergonomic Furniture with Touchscreen

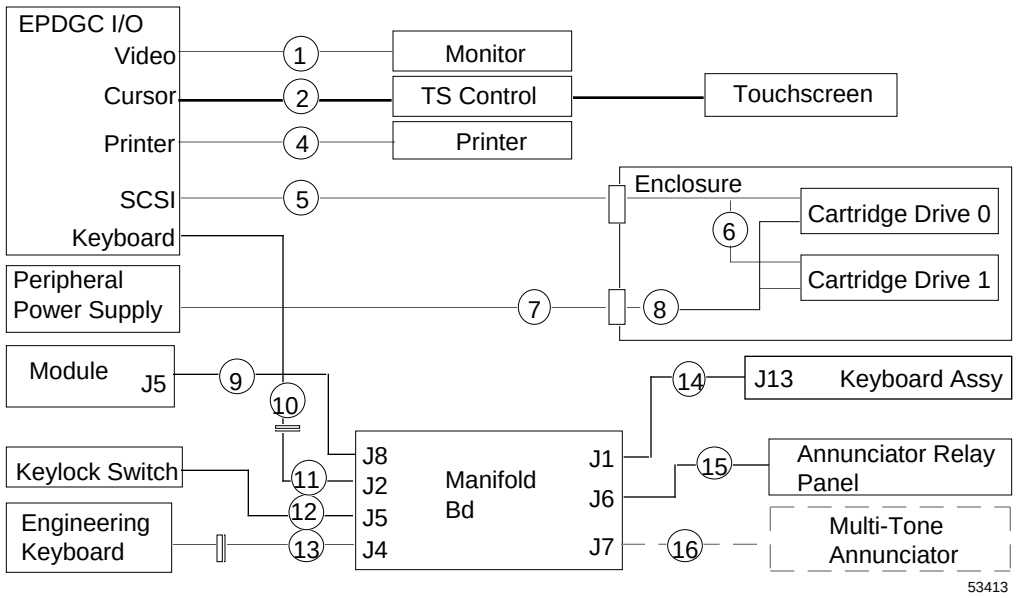


Table C-4 US in Ergonomic Furniture Cabling—Touchscreen

Ref. #	Part Number	Application Notes
1	51301784-200	Classic Console EC Video Cable
2	51308099-100	Mouse/Trackball Interface Cable
3	51308097-200	Touchscreen Interface Cable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-102	Cable, SCSI Shielded, 50 position
6	51305070-100	Cable, SCSI (Single Drive)
	51305070-200	Cable, SCSI (Dual Drive)
7	51308129-100	Skynet-Cart Drive Power Cable
8	51308125-100	Cartridge Drive Enclosure Power Harness
9	51308051-200	Module Status Cable
10	51308105-100	EPDGC/TPDGC Keyboard I/C Cable
11	51303420-622	Annunciator Cable
12	51304029-200	Keylock Switch Cable
13	51308060-100	Eng Keyboard I/F Cable
14	51308058-100	Keyboard I/F Cable
15	51304047-552	Annunciator Power Cable
16	51196650-100	Keyboard Alarm Assy (Multitone Annunciator)

C.4 Universal Station^{X} Cabling—Classic Furniture

Scope

Cabling for Universal Station^{X} in classic furniture is shown in the following figure and table.

Figure C-6 U^{X}S Cabling—Classic Furniture with Touchscreen and Mouse/Trackball

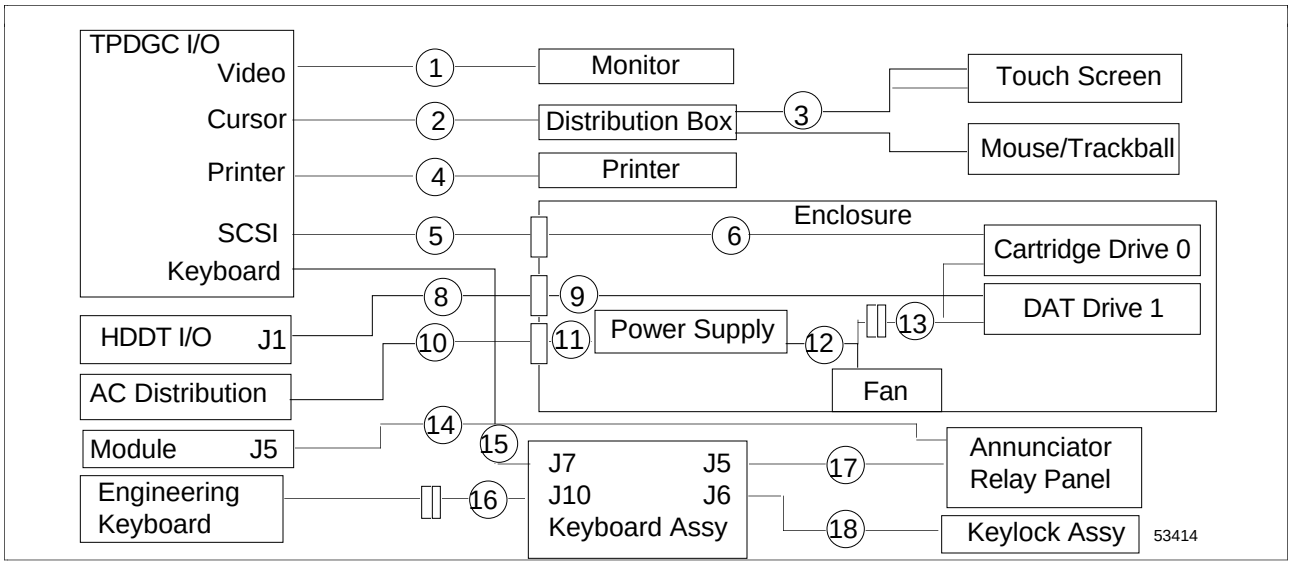


Table C-5 Universal Station^{X} Cabling—Classic Furniture

Ref. #	Part Number	Application Notes
1	51191784-100	Cable, CRT Signal
2	51308119-100	TPDGC I/O Distribution Box Cable
3	51308123-100	EC Smartscreen Cable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-102	Cable, SCSI Shielded, 50 position
6	51305070-100	Cable, SCSI
7		Not Applicable
8	51192054-102	Cable, SCSI, Shielded, 50 Pos
9	51305070-200	Cable, SCSI
10	51308094-600	Classic Module AC Power Cable
11	51308051-200	P.S. Enclosure DC Cable
12	51308052-200	P.S. Enclosure AC Cable
13	51308055-100	Drive Cable DC Power
14	51303420-586	Module Status Cable
15	51308126-100	Keyboard Cable
16	51304496--026	Engineering Keyboard Interface Cable
17	51304047-652	Annunciator Power Cable
18	51304029-500	Keylock Switch Cable

C.5 Universal Station^{X} Cabling—Ergonomic Furniture

Scope

Cabling for Universal Station^{X} in ergonomic furniture is shown in the following figure and table. The number in the circles refers to the line item in the table below.

Figure C-7 U^{X}S Cabling—Ergonomic Furniture with DAT Drive

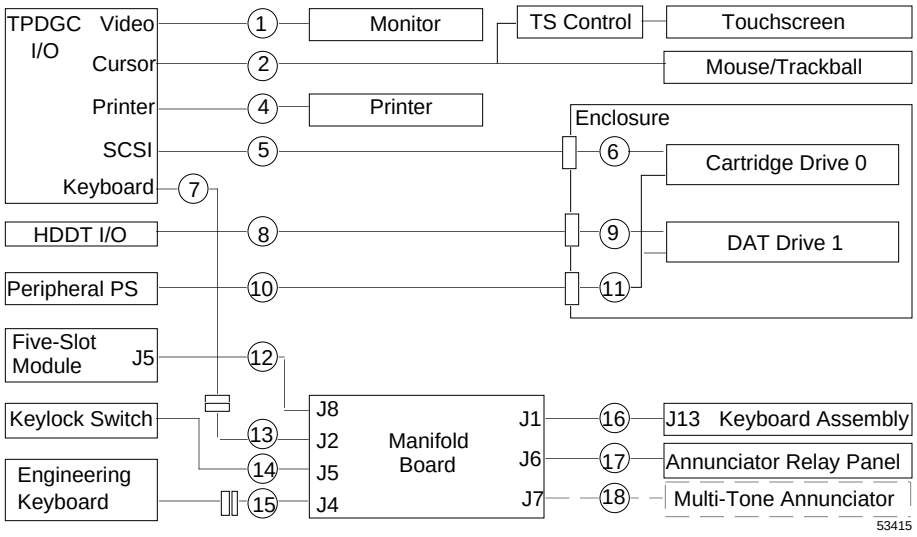


Table C-6 U^{X}S Cabling—Ergonomic Furniture with DAT Drive

Ref. #	Part Number	Application Notes
1	51191784-200	Monitor Interface Cable
2	513408102-100	Touchscreen/Mouse/Trackball Interface Cable
3		Not Applicable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-101	Cable, SCSI Shielded, 50 position
6	51308128-200	EC SCSI Cable
7	5130105-100	EPDGC/TPDGC Keyboard I/C Cable
8	51192054-101	Cable, SCSI Shielded, 50 position
9	51308128-100	EC SCSI Cable
10	51308130-100	Cartridge Drive Power Cable
11	51308125-100	Cartridge Drive Encl Power Harness
12	51198051-200	Module Status Cable
13	51303420-622	Annunciator Cable
14	51304029-200	Keylock Switch Cable
15	51308060-100	Eng Keyboard I/F Cable
16	51308058-100	Keyboard I/F Cable
17	51304047-552	Annunciator Power Cable
18	51196650-100	Keyboard Alarm Assy (Multitone Annunciator)

C.6 Micro TDC 3000 Cabling

Scope

Cabling for a Micro TDC 3000 is shown in the following figure and table. The number in the circles refers to the line item in the table below.

Figure C-8 Micro TDC 3000 Cabling—Standard

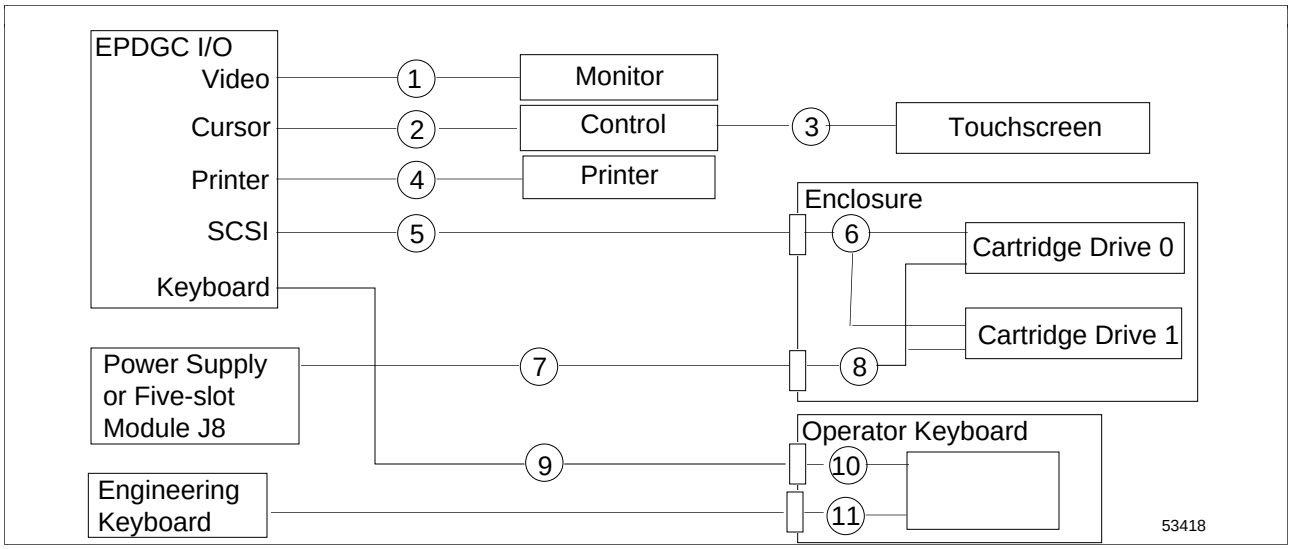


Table C-7 Micro TDC 3000 Cabling—Standard (Trackball)

Ref. #	Part Number	Application Notes
1	51192126-200	Video Cable
2	51308099-100	Mouse/Trackball Interface Cable
3		Not Applicable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-101	Cable, SCSI Shielded, 50 position
6	51305070-200	Cable, SCSI
7	51308110-100	Cartridge DC Power Cable
8	51308109-100	Cartridge DC Power Cable (in enclosure)
9	51308105-200	Keyboard Interface Cable
10	51308104-100	Keyboard Interface Cable (in keyboard tray)
11	51304496-046	Engineer's Keyboard Cable (in keyboard tray)

Continued on next page

Touchscreen option

Cabling for a Micro TDC 3000 is shown in the following figure and table. If the touchscreen special has been installed, the following figure and table represents the cabling. The number in the circles refers to the line item in the table below.

Figure C-9 Micro TDC 3000 Cabling—Touchscreen

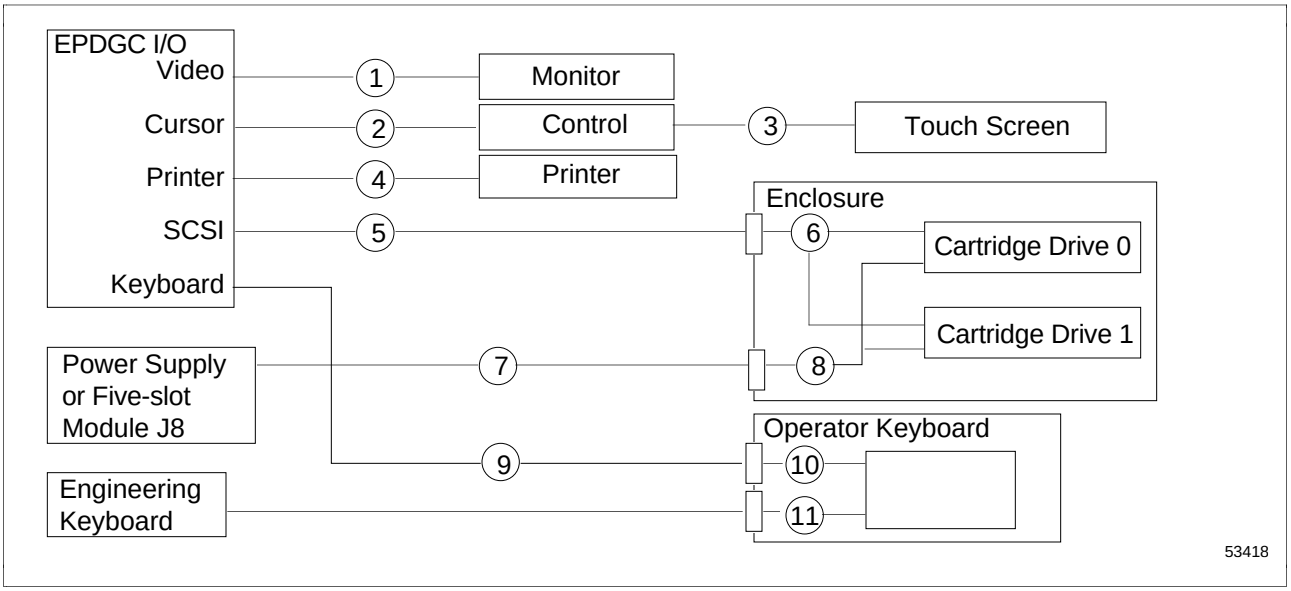


Table C-8 Micro TDC 3000 Cabling—Touchscreen

Ref. #	Part Number	Application Notes
1	51192126-200	Video Cable
2	51308097-100	Touchscreen Interface Cable
3	51308114-100	Touchscreen Interface Cable
4	51308103-003	Printer Cable – 3 meters/9.8 ft.
	51308103-008	Printer Cable – 8 meters/26.3 ft.
	51308103-015	Printer Cable – 15 meters/49.2 ft.
5	51192054-101	Cable, SCSI Shielded, 50 position
6	51305070-200	Cable, SCSI
7	51308110-100	Cartridge Drive Power Cable
8	51308109-100	Cartridge Drive Power Cable (in enclosure)
9	51308105-200	Keyboard Interconnecting Cable
10	51308104-100	Keyboard Interface Cable (in keyboard tray)
11	51304496-046	Engineer's Keyboard Cable (in keyboard tray)

C.7 Applications Module^{X} (A^{X}M) Cabling

Scope

Cabling for Applications Module^{X} (A^{X}M) mounted in classic furniture is shown in the following figure and table. The number in the circles refers to a line item in the table below.

Figure C-10 A^{X}M Cabling in Classic Furniture

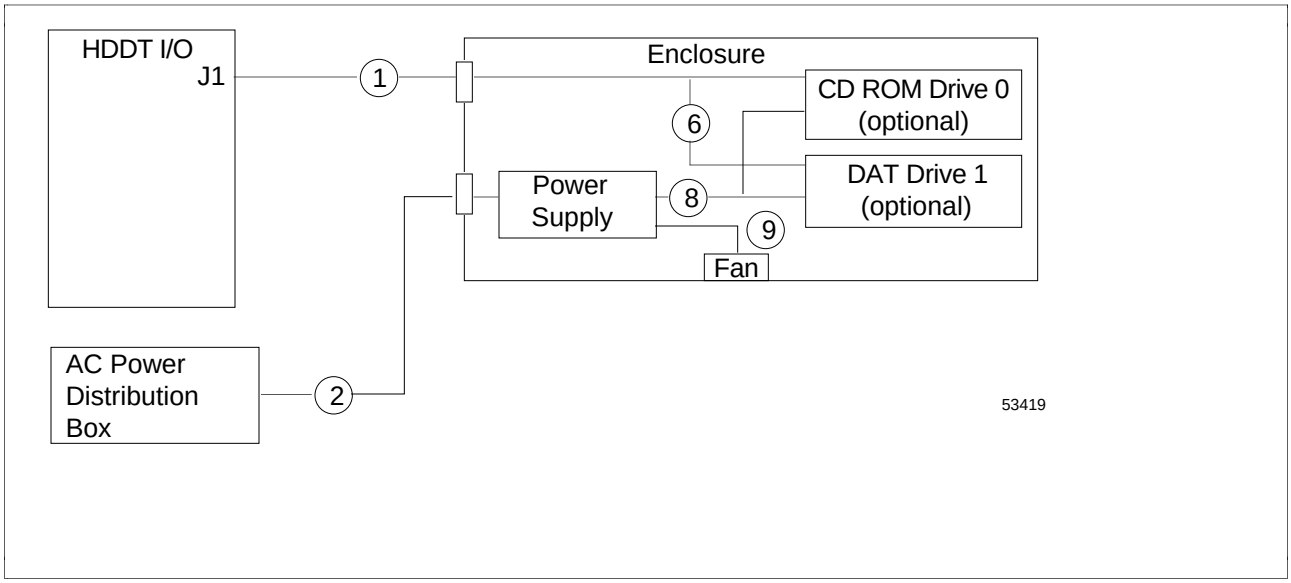


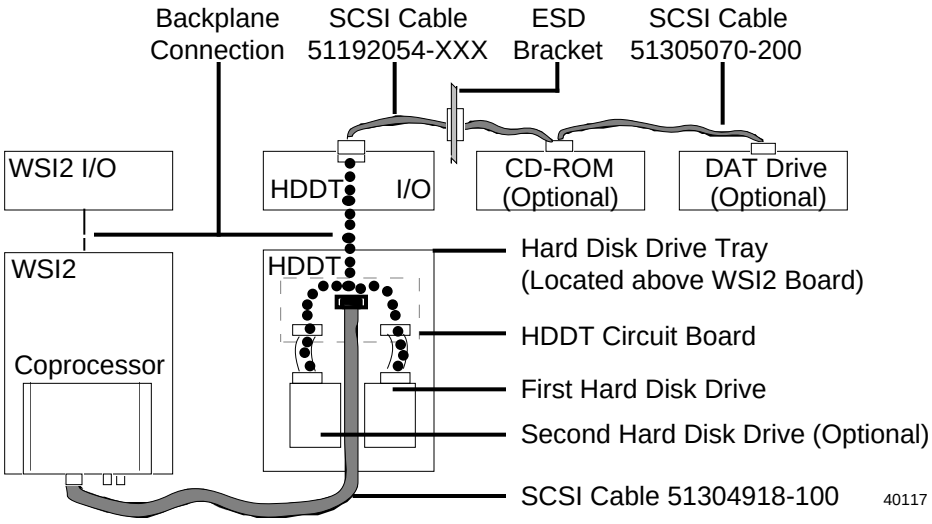
Table C-9 A^{X}M Cabling in Classic Furniture

Ref. #	Part Number	Application Notes
1	51192054-102	Cable, SCSI Shielded, 50 position
2	51305070-100	Cable, SCSI
3	51308094-600	Classic Module AC Power Cable
4	51308052-200	DC Power Cable, Power Supply End
	51308055-100	DC Power Cable, Cartridge End
5	51308051-200	DC Power Cable, Fan

Illustration

The cable connections for an Applications Module^{X} (A^{X}M) in both classic and ergonomic furniture are shown below.

Figure C-11 HDDT/DAT Drive/CD ROM Drive Cabling



Drive location

When an Application Module^{X} is located in a station.

Continued on next page

C.7 Applications Module^{X} (A^{X}M) Cabling, Continued

Scope

Cabling for Applications Module^{X} (A^{X}M) mounted in classic furniture is shown in the following figure and table. The number in the circles refers to a line item in the table below.

Figure C-12 A^{X}M Cabling in Ergonomic Furniture

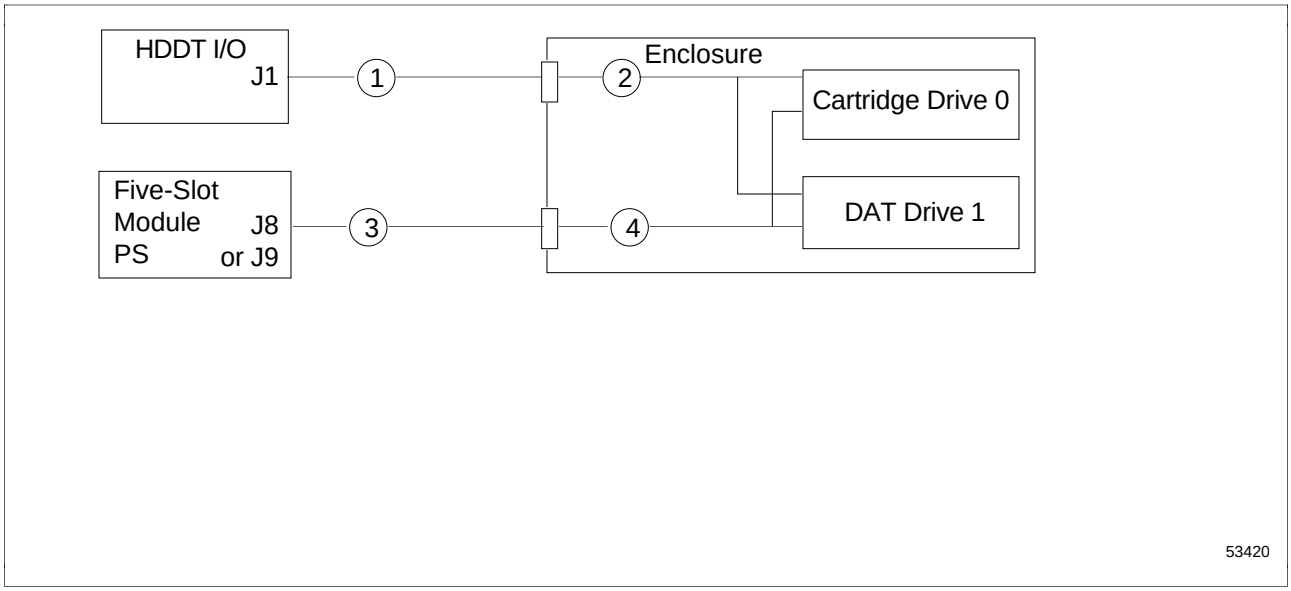


Table C-10 A^{X}M Cabling in Ergonomic Furniture

Ref. #	Part Number	Application Notes
1	51192054-101	Cable, SCSI Shielded, 50 position
2	51308128-100	HDDT-DAT SCSI Interface Cable—Enclosure
3	51308130-100	DC Power Cable
4	51308125-100	DC Power Cable—Enclosure

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