HARDWARE/ACCESSORIES CATALOG

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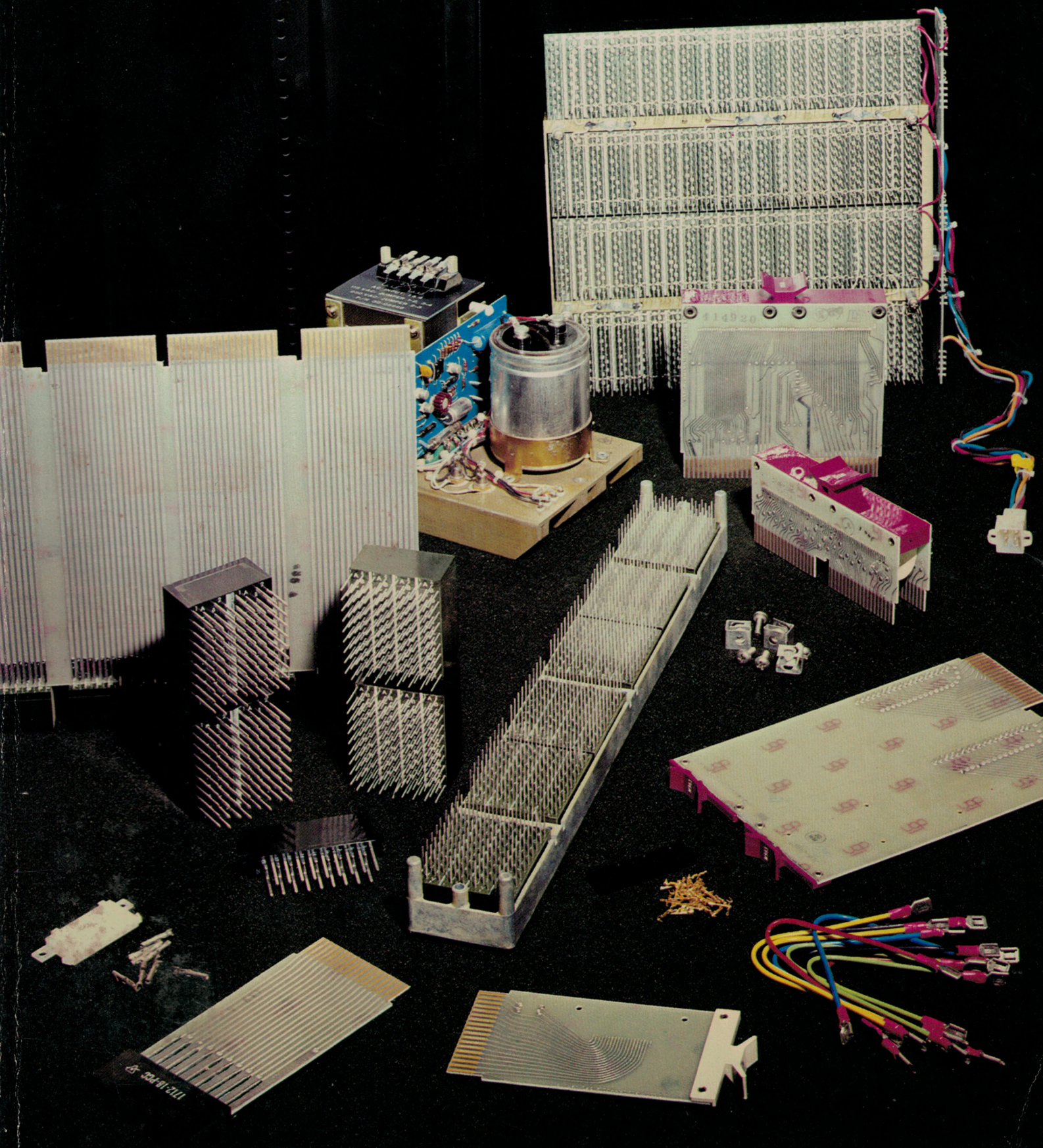

HARDWARE/ACCESSORIES CATALOG

Prepared by
LOGIC PRODUCTS GROUP

DIGITAL EQUIPMENT CORPORATION
ONE IRON WAY
MARLBOROUGH, MASS. 01752

digital

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Foreword

This catalog describes Digital Equipment Corporation's full line of mounting hardware, cabinets, connectors, power supplies, wire wrapping accessories, and other accessory-type interface products. These items are the unique and low-volume, yet essential, products that provide efficient and orderly system construction. This catalog is especially useful for logic and system designers faced with the problems of translating a paper design into working hardware. The products described will aid the logic designer immeasurably in choosing suitable hardware and accessories.

DIGITAL is perhaps best known for its complete range of computers – from the popular PDP-8 and PDP-11 minicomputers to the large-scale DECsystem-10 timesharing and batch processing systems to the latest state-of-the-art microprocessor; equally well known is DIGITAL's full line of peripherals, services, and computer interfacing modules. By offering the aforementioned hardware and accessories, DIGITAL solidifies its position as the *complete* single-source supplier of computers and computer-related products.

Extensive noncatalog products and services are also available from DIGITAL. If you require unique functions that are not described in this catalog, contact your local DIGITAL office; the product you need may be available as a noncatalog item. In addition, DIGITAL's Logic Products Group has complete capabilities for designing, manufacturing, and testing support hardware and accessories, including cables, custom wire wrapping, and cabinets. From a background of custom logic system design experience, DIGITAL may have a detailed solution to your application or interface requirements.

Please address any comments relative to this catalog, or inquiries concerning special services, to your nearest DIGITAL sales office or to:

Digital Equipment Corporation
Components Group
One Iron Way
Marlborough, Massachusetts 01752

Attn: Logic Products
Sales Support Manager

Introduction

ORGANIZATION

This edition of the *Hardware/Accessories Catalog* is organized into seven functional sections for maximum ease of reference; some sections are further organized into subsections.

To locate a specific item when you know the part number, consult the Product List at the back of the catalog. To locate a specific item when you do not know the part number, consult the Table of Contents at the front of the catalog. If the description of an item reveals that the item will not fulfill your requirement, a cursory examination of the photographs and illustrations in the same section will often enable you to "zero in" on an item that exactly meets your needs.

When another hardware part number is mentioned in an item description, reference is made to the section of this catalog where it is described. For example, in the description of a system unit with connector blocks installed, reference is made to the part number of the system unit casting that the complete system unit is built on; and, in the description of the system unit casting, reference is made to the part numbers of the connector blocks that are used on the casting to make up a complete system unit.

Cabinets

This section includes descriptions of cabinet assemblies built on standard 19-in. (48.26-cm) frame electronics racks. The enclosure area of these attractive cabinets provides stable mounting facilities for drawers and panels, logic module mounting frames, power supplies, and peripherals, as well as for customer-designed and supplied equipment. These cabinets offer complete flexibility and expandability and provide security for your logic system.

Descriptions of cabinet accessories such as free-standing tables and touchup paint are also included in this section.

System Units, 19-In. Rack Mounting Panels, and Module System Enclosures

This section includes descriptions of the items used to mount the modules of a logic system or to expand an existing system. The items described in this section include system units with connector blocks installed and bused for power and ground, blank system unit castings, 19-in. rack mounting panels with connector blocks installed and wired for power and ground, blank 19-in. rack mounting panel frames, module system enclosures for housing system units, and associated hardware. The items described in this section provide the means to select system mounting hardware to suit nearly any size system mounting requirement.

Module Connector Blocks

This section includes descriptions of the connector blocks that are mounted on system units and mounting panel frames to provide physical mounting and electrical connection of the logic modules. Connector blocks that accommodate single-sided (i.e., contact fingers on one side only) logic modules and connector blocks that accommodate double-sided logic modules are available, and are described in this section. A summary table is included to aid in identifying the connector blocks appropriate to your system.

Connectors, Bulk Cables, and Cable Accessories

This section includes descriptions of the connectors, cables, and accessories that are required for user-fabrication of special purpose or special length cable assemblies; fabrication of cable assemblies with these items requires a minimum of custom design and planning. Summary tables, according to the type of cable generally used, are included to aid in identifying the specific connector that will fulfill your requirements. This section also includes descriptions of bus (Unibus and Omnibus) interconnection and termination connectors.

Power Supplies

This section includes descriptions of a variety of power supplies for small or large systems. Summary tables are included to aid the system designer in selecting the power supply appropriate to the system.

Wire Wrapping Tools and Wire, Bus Strips, and Patch Cords

This section includes descriptions of a variety of wire wrap wire and tools used when wire wrapping the backplanes of system units and mounting panels. It also includes descriptions of bus strips used to bus power, ground, and common signals to identically numbered pins on the backplanes of system units and mounting panels.

Blank Module Boards, Extender Boards, and Integrated Circuits

This section includes descriptions of a wide variety of blank module boards [i.e., copper-clad boards, fiberglass boards, wire wrappable boards with and without integrated circuit (IC) sockets, and collage boards], ICs and IC sockets for use on the blank boards, and extender boards. These items provide a low-cost method of producing limited-production runs; they also provide a convenient method of working with discrete components or ICs during breadboarding and/or prototyping before production, and they are ideal for designing and using unique, specially designed circuitry in a logic system. Each subsection devoted to modules contains a summary table to aid in identifying the type of module that will be appropriate to your system.

GENERAL INFORMATION

Module Contact Finger and Module Connector Block Contact Identification

DIGITAL plug-in (FLIP CHIP) modules have contact fingers either on one side (single-sided modules) or on both sides (double-sided modules). Modules with contact fingers on only one side always have them on side 2 (the solder side) (Figures 1, 2, and 3). DIGITAL module connector blocks have module slots with contacts either on one or on both sides. Modules with contact fingers on only one side can be plugged into connector blocks with contacts on both sides of the module slots; then electrical contact between the module and the connector block is only via module slot side 2 contacts. The module contact fingers and connector block contacts are identified by alphanumeric codes. These alphanumeric codes are used throughout this catalog, the *DIGITAL Logic Handbook*, the *Peripherals Handbook*, individual module data sheets, engineering drawings, and other DIGITAL publications. This coded numbering scheme must be understood to ensure proper system interconnections (Figures 1, 2, and 3). Letters G, I, O, and Q are not used in this numbering scheme.

DIGITAL modules are *single-height*, *double-height*, or *quad-height; standard length* or *extended length;* and *single-width* or *double-width* (Figures 1, 2, and 3). Each DIGITAL module is a specific, fixed size; the size of each module is stated in the module description in the previously mentioned DIGITAL publications. DIGITAL *single-height* and *double-height* modules are *standard length* or *extended length*. DIGITAL *quad-height* modules are always *extended length*. Any DIGITAL module can be *single-width* or *double-width*; most, however, are *single-width*.

The height and length requirement is determined by the quantity and size of discrete components and integrated circuits located on side 1 of the module, and, to some extent, by the amount of etched printed circuitry on sides 1 and 2. The width requirement is determined by the distance the largest component extends from its mounting surface on the module.

All DIGITAL module connector blocks accommodate any length (standard or double) module. The length of the modules to be used in a logic system must, however, be considered when connector block mounting drawers, system unit mounting drawers, or cabinets are being selected; enough space must be provided to accommodate the longest module. DIGITAL's *standard-length* modules are 5.40/5.60 in. (13.72/14.22 cm) long and *extended -length* modules are 8.84/9.04 in. (22.58/22.96 cm) long from the bottom of the contact fingers to the top of the attached handle(s).

All DIGITAL module connector blocks accommodate any width (single or double) module. The width of the module must be considered, however, when any connector block module slot is occupied by a *double-width* module; this is because no module can be inserted into the module slot on the immediate right on the same connector block unless that connector block provides sufficient space between module slots for the mounted components, i.e., an H808 Module Connector Block. DIGITAL's *single-width* modules require 0.338/0.348 in. (0.859/0.884 cm) for conductive components and 0.370/0.380 in. (0.940/0.965 cm) for non-conductive components. *Double-width* modules require 0.829/0.839 in. (2.106/2.131 cm) for conductive components and 0.870/0.880 in. (2.210/2.235 cm) for non-conductive components. These space requirements are the distance from the module's side 1 surface to the side 2 surface of the module mounted on the immediate right.

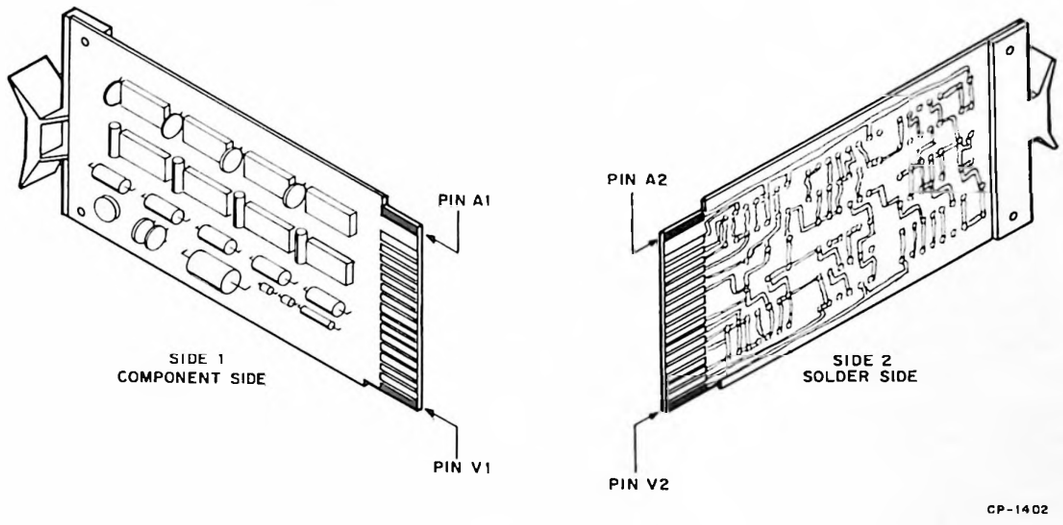


Figure 1 Single-Height Module Contact Finger Identification

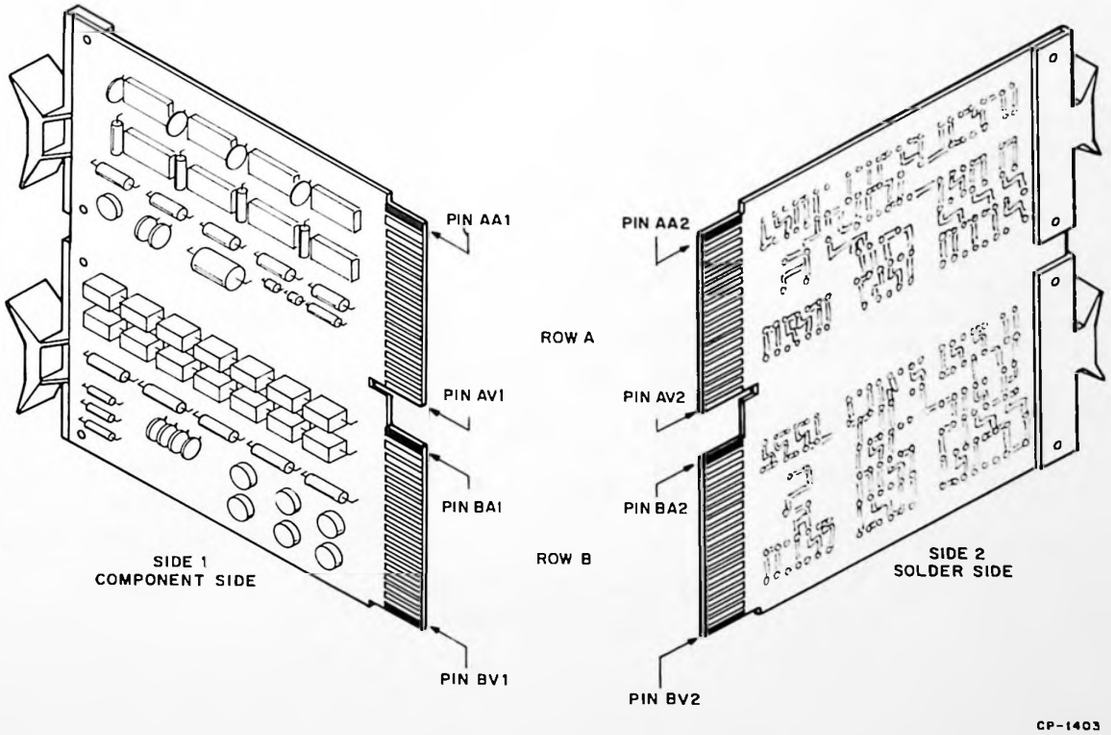


Figure 2 Double-Height Module Contact Finger Identification

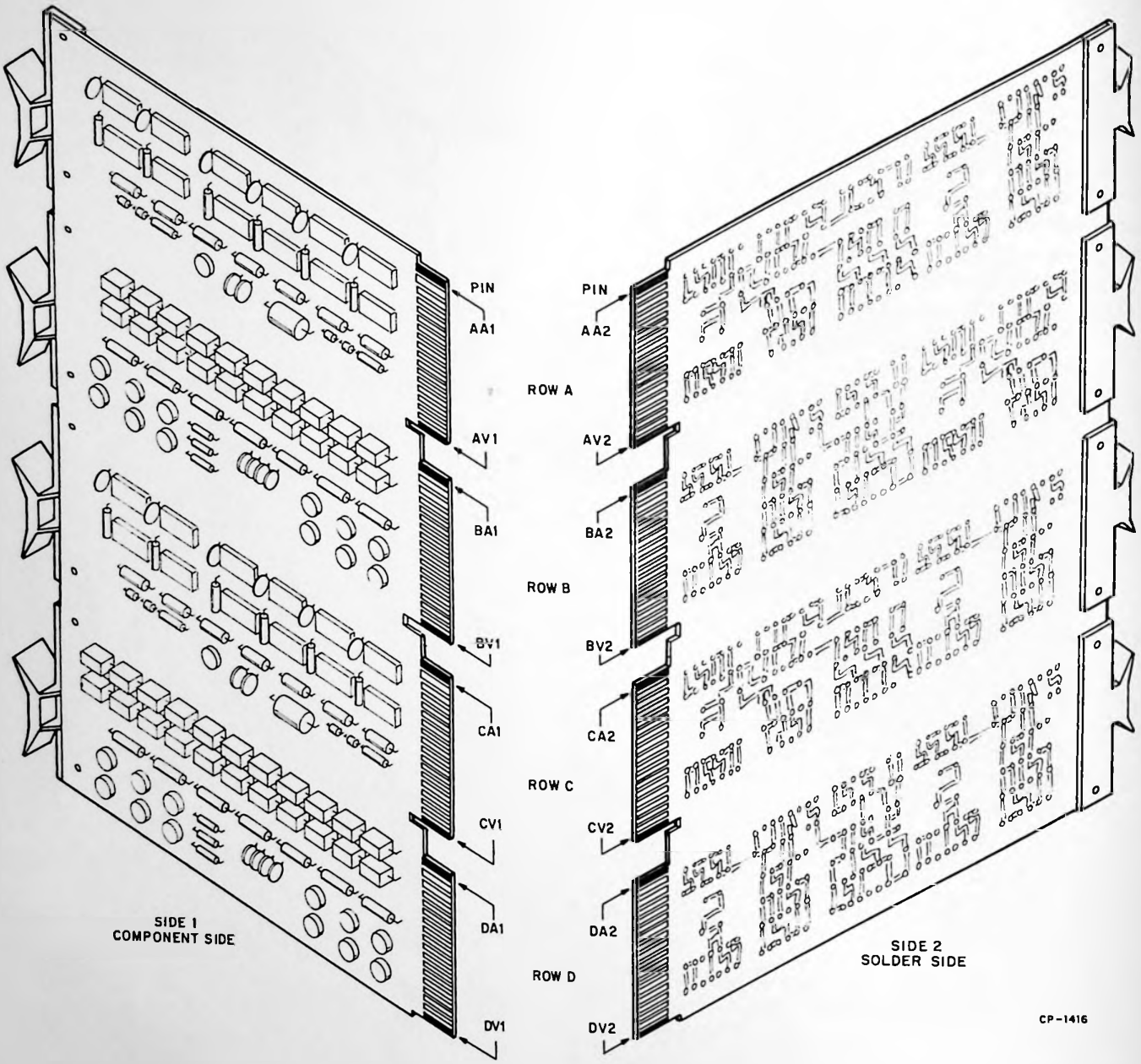


Figure 3 Quad-Height Module Contact Finger Identification

Some DIGITAL module connector blocks accommodate only *single-height* modules and others accept either *single-height* or *double-height* modules. No single connector block can accommodate *quad-height* modules; *quad-height* modules must be mounted in mounting frames, system units, or module drawers comprising module connector blocks with slotted ends so that four module slots are arranged end to end (i.e., at least two H863 or H8030 Module Connector Blocks mounted end to end). *Single-height* modules are 2.417/2.452 in. (6.139/6.228 cm) high, *double-height* modules are 5.167/5.202 in. (13.124/13.213 cm) high, and *quad-height* modules are 10.437/10.472 in. (26.510/26.599 cm) high (Figure 4).

Single-height modules (standard length and extended length) may be plugged into the upper (row A, C, or E) or lower (row B, D, or F) module slot of a connector block (Figure 4). Contact fingers A1 through V1 are on side 1 (component side) of the module, and contact fingers A2 through V2 are on side 2 (solder side) of the module (Figure 1).

Double-height modules (standard length and extended length) have two plug-in sections of contact fingers and occupy two module slots (rows A and B, C and D, or E and F) of a connector block (Figure 4). The two plug-in sections are identified by the designations A and B. Contact fingers A1 through V1 and A2 through V2 of the A section are designated AA1 through AV1 and AA2 through AV2, respectively; contact fingers A1 through V1 and A2 through V2 of the B section are designated BA1 through BV1 and BA2 through BV2, respectively (Figure 2). Note that the positioning notch in the module base must mate with the protrusion on the connector block for correct positioning.

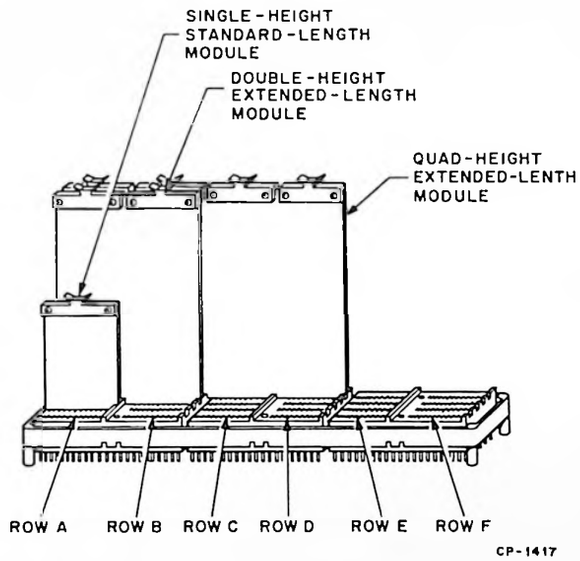


Figure 4 Typical Modules Installed in an H033 Four-Slot System Unit Equipped with Three H863 Module Connector Blocks

Quad-height modules (always extended length) have four plug-in sections of contact fingers and occupy four module slots (rows A through D or C through F) of two connector blocks (Figure 4). The four plug-in sections are identified by the designations A, B, C, and D. The four sections of contact fingers are designated AA1 through AV1 and AA2 through AV2; BA1 through BV1 and BA2 through BV2; CA1 through CV1 and CA2 through CV2; and DA1 through DV1 and DA2 through DV2 (Figure 3).

Related Literature

Listed below are DIGITAL documents that supplement the material provided in this catalog. These documents are available from the nearest DEC Sales Office.

- Logic Handbook
- PDP-11 Peripherals Handbook
- PDP-8/E, 8/F, 8/M Small Computer Handbook

Section 1
Cabinets And Cabinet Accessories

Digital Equipment Corporation offers two basic cabinet frames, standard size and short size, and a complete line of cabinet accessories and hardware. Both sizes accept panels or equipment designed to mount in standard 19-in. (48.26-cm) electronics cabinets or racks. The standard size cabinet frame provides 63.0 in. (160.0 cm) of vertical mounting space at the front and rear, and the short cabinet frame provides 42.0 in. (106.7 cm). The cabinet frames are rigidly constructed of 12 and 13 gauge steel, either riveted or welded together.

The cabinets can be placed individually or attached to form a multibay configuration. The accessories and hardware available include front and rear doors, panel mounting door frames and door skins, end panels, bezel and logo panels, blower fans, and power controllers.

This section, describing cabinets, cabinet accessories, and hardware, is divided into three subsections: standard size cabinets and accessories, short size cabinets and accessories, and cabinet hardware.

The floor space required to allow proper access for operation and servicing of the equipment in either the standard or short size cabinet is illustrated in Figure 1, which also gives the overall dimensions of the standard and short cabinets.

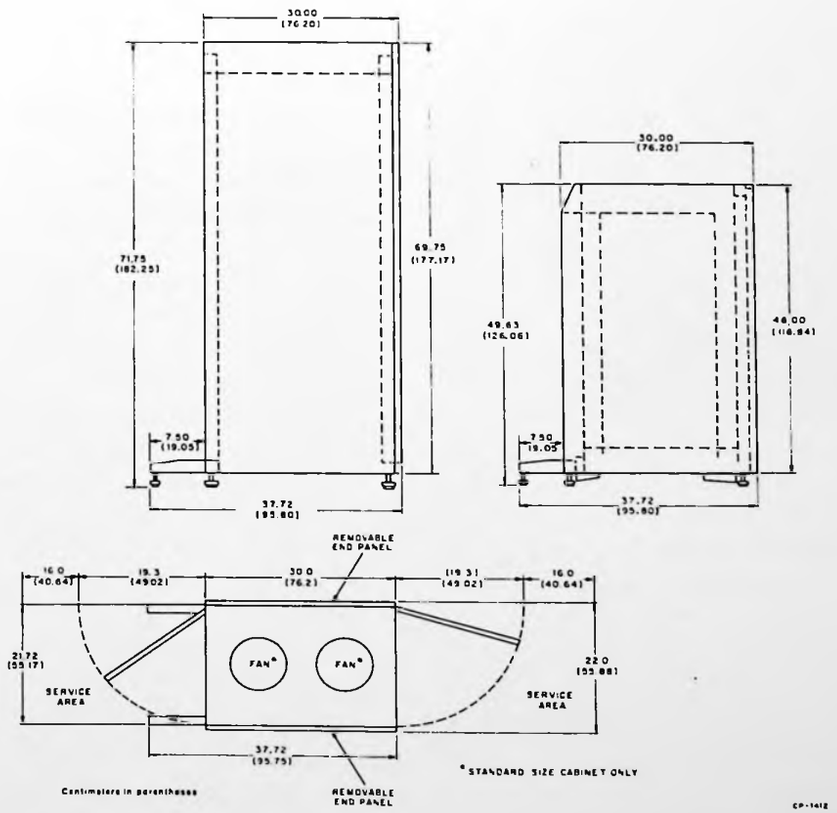


Figure 1 Standard and Short Cabinet Clearance Dimensions

STANDARD SIZE CABINETS AND ACCESSORIES

Seven basic cabinet configurations (H960-BC, H960-BD, H960-CA, H960-CB, H961-A, H961-AA, and H961-AB) are available in the standard size cabinet series. The H961-A, -AA, and -AB are intended primarily for add-on configurations. The standard size cabinet is 71.5 in. (181.61 cm) high and provides 63.0 in. (160.0 cm) of vertical mounting space at the front; an additional 63.0 in. of mounting space is available at the rear of the cabinet. These cabinets are configured to meet the requirements of most customer applications.

All standard size cabinets are configured around the basic H950-AA Cabinet Frame (Figures 3 and 6). These cabinet frames are drilled with 0.25-in. (0.64-cm) diameter holes at standard EIA spacings to accommodate equipment, panels, or devices which are designed to mount in standard 19-in. (48.26-cm) electronics cabinets or racks. Some of the cabinets contain an 861-A, 861-B, or 861-C Power Controller for distribution and control of the main power to the equipment installed. (The 861-A, 861-B, and 861-C are described in Section 5 of this catalog.) Six of the cabinet configurations include a rear mounting panel door frame, which is also drilled with 0.25-in. (0.64-cm) diameter holes at standard EIA spacings; this mounting panel door frame allows the equipment and devices mounted on it to be swung out for maintenance or adjustment. Optional accessories as specified by the customer can be added to any of the available configurations. Equipment mounting drawers and mounting drawer slides are described in Section 2. The parts and accessories included with each of the seven standard size cabinet configurations are listed in Table 1, which also lists the optional accessories that are available for use with these cabinets. All cabinets are completely assembled before shipment.

Figure 2 illustrates a typically configured standard size cabinet front. Figure 3 illustrates the installation of typical accessories on a standard size cabinet frame, and Table 2 identifies and describes these accessories. Complete descriptions of the accessories for standard size cabinet frames are contained in the following accessory descriptions, which are in alphanumeric order.

Table 1
Standard Cabinets
H960-BC, H960-BD, H960-CA, H960-CB,
H961-A, H961-AA, and H961-AB

Cabinet Assembly								
	H960-BC	H960-BD	H960-CA	H960-CB	H961-A	H961-AA	H961-AB	Catalog No.	Description
1	1	1	1	1	1	1	H950-AA	Cabinet Frame, 19 in. wide, 69 in. high, 25 in. deep
		1	1				H950-BA	Full Door (RH) (front or rear mounting)
							H950-CA	Full Door (LH) (front or rear mounting)
1	1	1	1		1	1	H950-DA	Mounting Panel Door Frame (RH) (rear mounting)
				1			H950-EA	Mounting Panel Door Frame (LH) (rear mounting)
1	1			1	1	1	H950-FA	Mounting Panel Door Skin
							H950-HA	Short Door (covers 21 in. mounting space)
							H950-HB	Short Door (covers 22-3/4 in. mounting space)
							H950-HC	Short Door (covers 26-1/4 in. mounting space)
							H950-HD	Short Door (covers 31-1/2 in. mounting space)
							H950-HE	Short Door (covers 36-3/4 in. mounting space)
							H950-HF	Short Door (covers 42 in. mounting space)
							H950-HG	Short Door (covers 47-1/4 in. mounting space)
							H950-HH	Short Door (covers 52-1/2 in. mounting space)
							H950-HJ	Short Door (covers 57-3/4 in. mounting space)
							H950-HK	Short Door (covers 63 in. mounting space)
							H950-JA	Short Door (covers 21 in. mounting space) (used with H952-BA installed)
							H950-JE	Short Door (covers 63 in. mounting space) (used with H952-BA installed)
							H950-LA	Logo Frame Panel (aluminum)
1	1	1	1	1	1	1	H950-LB	Logo Frame Panel (plastic)
							H950-PA	5-1/4 in. Bezel Cover Panel
5	5	5	6	6			H950-QA	10-1/2 in. Bezel Cover Panel
1	1	1	1	1	1	1	H950-SA	Filter (for H952-BA or H952-CA)
2	2	2	2				H952-AA	End Panel (require 2 per cabinet)
1	1	1	1				H952-BA	Stabilizer Feet (pair)
1	1	1	1	1	1	1	H952-CA	Fan Assembly (top mounted) (115 Vac)
							H952-CB	Fan Assembly (top mounted) (230 Vac)
1	1	1	1	1	1	1	H952-EA	Caster Set (4 per set, included with H950-AA frame)
1	1	1	1	1	1	1	H952-FA	Leveler Set (4 per set, included with H950-AA frame)
				1	1	1	H952-GA	Filler Strip Set (front and rear) (joining two cabinets)
							H950-G	Cabinet Table
							H952-HA	Free-Standing Table
							H970-BA	Free-Standing Table
							H970-CA	Free-Standing Table
1	1	1	1				74-06782	Kickplate (use with H952-BA)
				1	1	1	74-06793	Kickplate
							12-09154	Drawer Mounting Slides
							12-09703	Drawer Mounting Slides (tilt)
							861-A	Power Controller (90–130 Vac, two phase)
	1		1			1	861-B	Power Controller (180–270 Vac, single phase)
1		1			1		861-C	Power Controller (90–135 Vac, single phase)

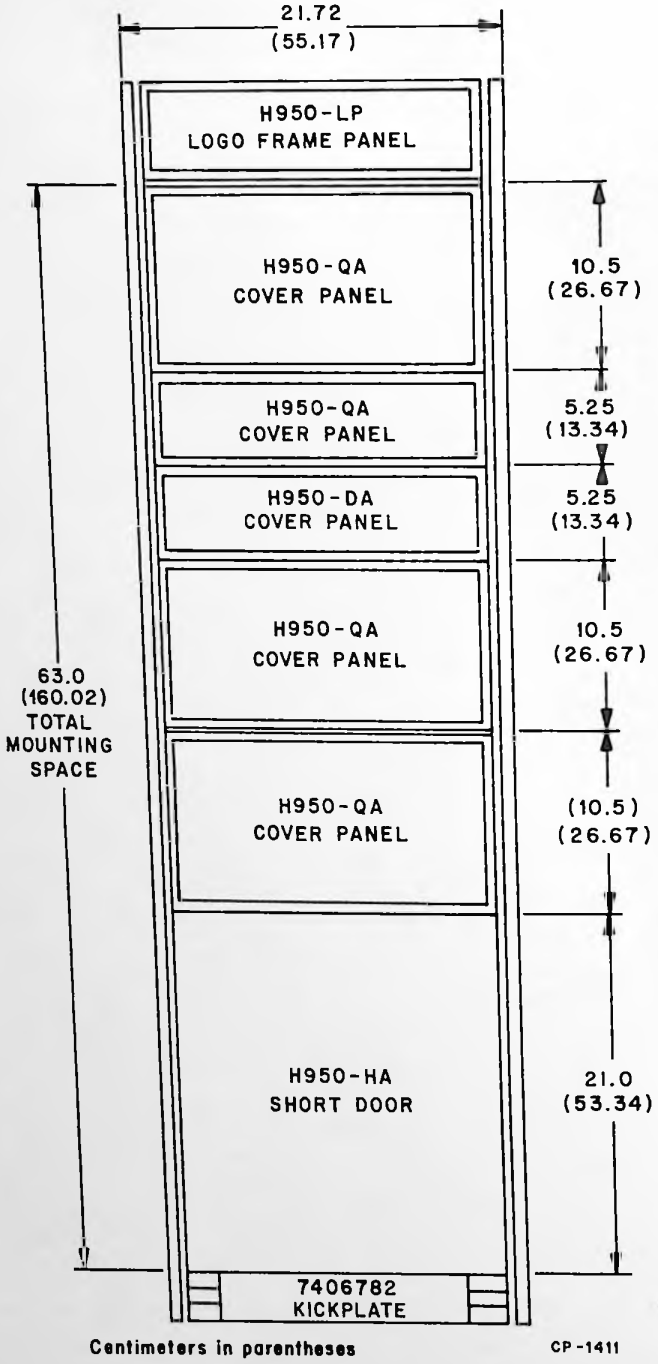


Figure 2 Typical Standard Cabinet Front Cover Panel and Short Door Configuration

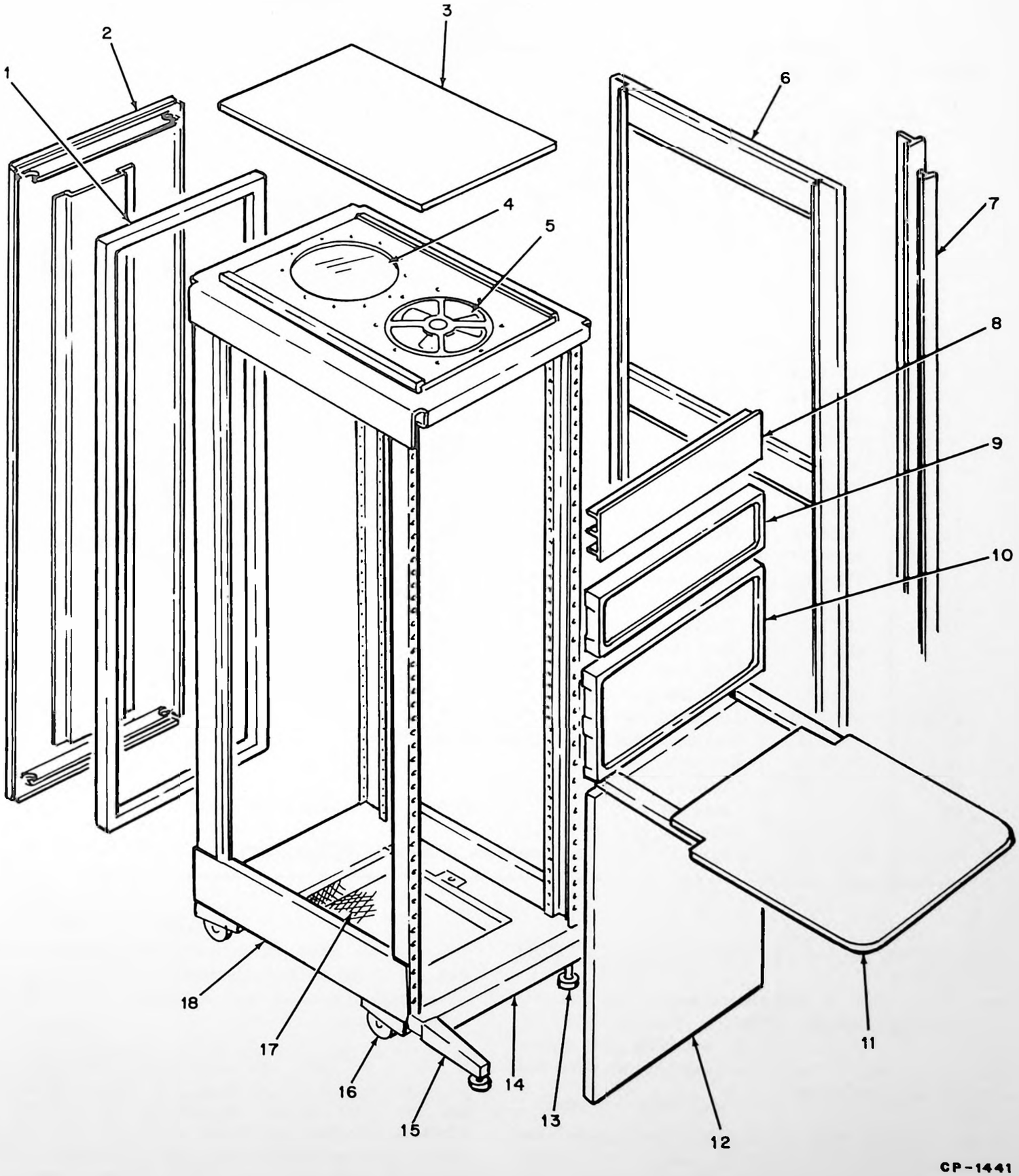


Figure 3 H950-AA Standard Cabinet Frame and Accessories

Table 2
Standard Cabinet Frame H950-AA and Accessories

Figure 3 Item	Part No.	Description
1	H950-DA	Mounting Panel Door Frame (right hanging)
1	H950-EA	Mounting Panel Door Frame (right hanging)
2	H950-BA	Door, Front or Rear Mounting (right hanging)
2	H950-CA	Door, Front or Rear Mounting (left hanging)
3	H950-SA	Air Filter
4	74-06706	Fan, Cover Plate
5	H952-CA	Fan Assembly (115 Vac)
5	H952-CB	Fan Assembly (230 Vac)
6	H952-AA	End Panel (left or right side)
7	H952-GA	Filler Strip Set (front or rear)
8	H950-LB	Frame Panel (plastic)
8	H950-LA	Frame Panel (aluminum)
9	H950-PA	Bezel Cover Panel, 5.25 in. (13.34 cm)
10	H950-QA	Bezel Cover Panel, 10.50 in. (26.67 cm)
11	H950-G	Tabletop Assembly
12	H950-HA	Short Door, covers 21.00 in. (53.34 cm) mounting space
12	H950-HB	Short Door, covers 22.75 in. (57.79 cm) mounting space
12	H950-HC	Short Door, covers 26.25 in. (66.68 cm) mounting space
12	H950-HD	Short Door, covers 31.50 in. (80.01 cm) mounting space
12	H950-HE	Short Door, covers 36.75 in. (93.35 cm) mounting space
12	H950-HF	Short Door, covers 42.00 in. (106.68 cm) mounting space
12	H950-HG	Short Door, covers 47.25 in. (102.02 cm) mounting space
12	H950-HH	Short Door, covers 52.50 in. (133.35 cm) mounting space
12	H950-HJ	Short Door, covers 57.75 in. (146.68 cm) mounting space
12	H950-HK	Short Door, covers 63.00 in. (160.02 cm) mounting space
13	H952-FA	Leveler Set (4)
14	74-06782	Kickplate (used with H952-BA stabilizer feet)
14	74-06793	Kickplate
15	H952-BA	Stabilizer Feet (pair)
16	H952-EA	Caster Set (4)
17	74-11606	Bottom Screen
18	H950-AA	Frame, 19.00 in. (48.46 cm) wide, 69.00 in. (175.26 cm) high, 25.00 in. (63.50 cm) deep

HOW TO ORDER A STANDARD SIZE CABINET ASSEMBLY

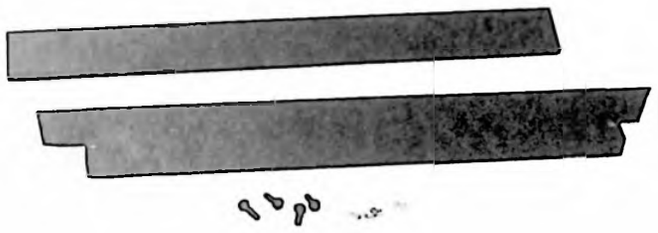
Determine if one of the seven basic cabinet assembly configurations (H960-BC, H960-BD, H960-CA, H960-CB, H961-A, H961-AA, or H961-AB) will fulfill your requirements by referring to Table 1 and comparing the items that comprise each configuration.

If one of these basic configurations will satisfy your requirements, you can order the completely assembled cabinet by specifying that cabinet assembly number, e.g., H960-BC, H960-BD, H960-CA, H960-CB, H961-A, H961-AA, or H961-AB. In addition to the accessories included in the seven configurations, optional accessories are available, e.g., short doors, a cabinet table, and drawer mounting slides.

If one of the basic configurations will not fulfill your requirements, you can "build up" and order a cabinet that will suit your specific requirements by ordering an H950-AA standard size frame and the accessories (by specific part numbers) that you require. The frame and the accessories that you select will be shipped completely assembled.

STANDARD SIZE CABINET ACCESSORIES

Kickplate – 74-06782, 74-06793



Kickplates are available for mounting on the front of either the standard size H950-AA Cabinet Frame or the short size H957-AA Cabinet Frame. Kickplate 74-06782 is used when H952-BA Stabilizer Feet are installed on either cabinet; Kickplate 74-06793 is used when stabilizer feet are not required. Each kickplate contains mounting holes and is supplied with the necessary hardware for installation. Only H950-JA and H950-JE Short Doors can be mounted on the front of the cabinet when either kickplate is installed.

Specifications

Dimensions

See Figure 4 for overall dimensions of the 74-06782 and 74-06793 kickplates.

Weight

74-06782: 2.0 lb (0.9 kg)
74-06793: 2.0 lb (0.9 kg)

Mounting

The kickplate mounts on the front of either the standard size H950-AA Cabinet Frame or the short size H957-AA Cabinet Frame as shown on Figure 4.

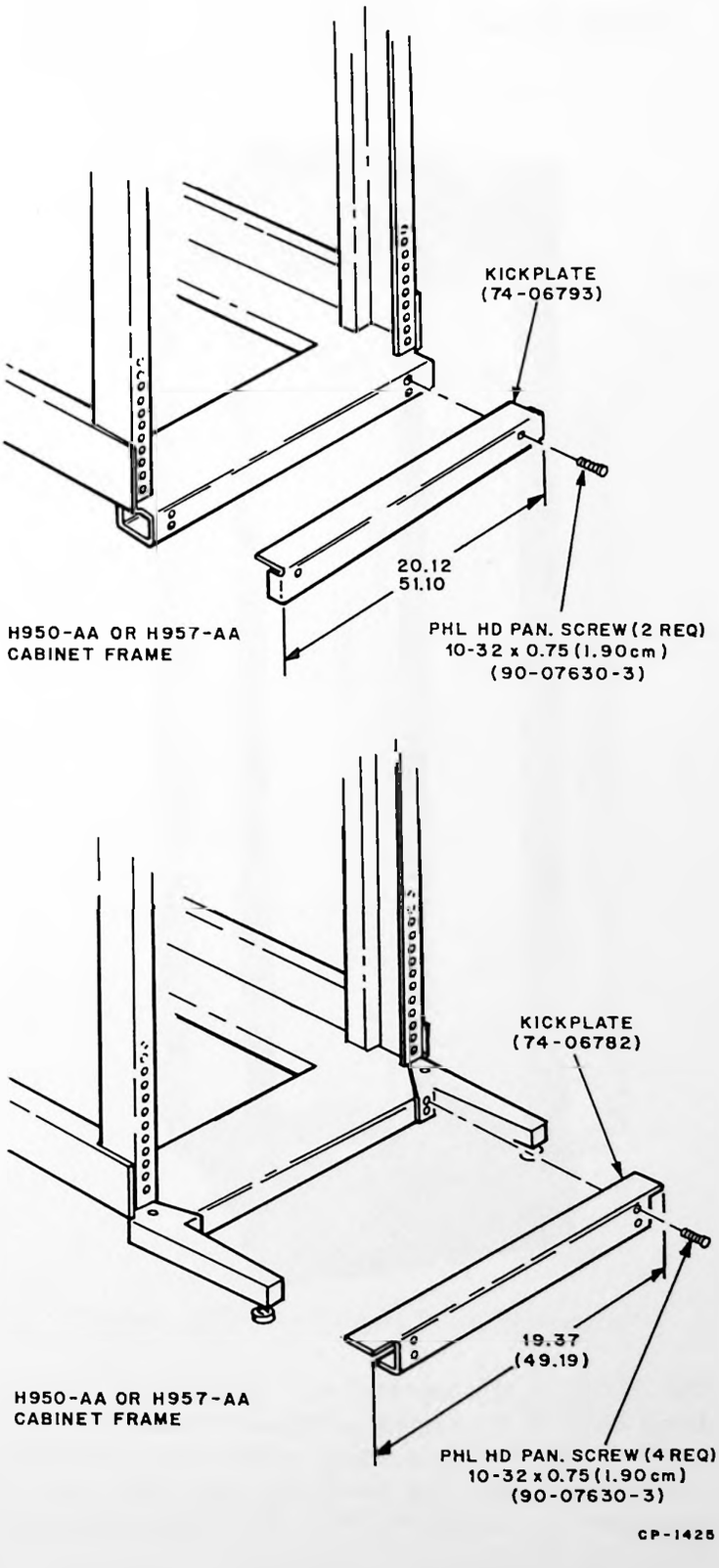
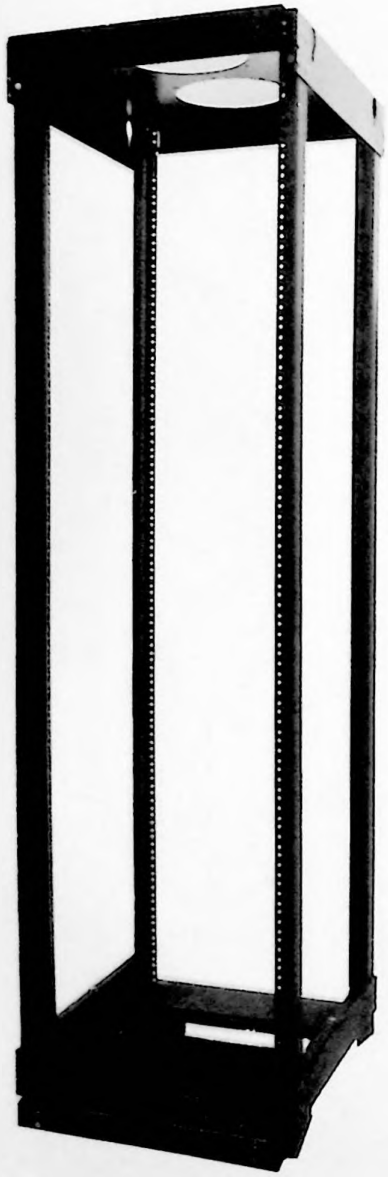


Figure 4 74-06782 and 74-06793 Kickplate Installation

Cabinet Frame – H950-AA



The H950-AA is a standard size cabinet frame, painted Lamp Black. It is a sturdily constructed frame designed to accept, on the two front vertical rails and on the two rear vertical rails, mounting panels or equipment that are mountable on standard 19-in. (48.26-cm) electronics cabinets or racks. The cabinet frame provides 63.0 in. (160.0 cm) of vertical mounting space on the front vertical rails and the same amount on the rear vertical rails.

The H950-AA Cabinet Frame is equipped with a top pan that has two 8.75-in. (22.23-cm) diameter holes that can accept cooling fans. To provide mounting facilities for a fan and guard, each cooling fan hole has four 0.1875-in. (0.4763-cm) diameter holes spaced 90 degrees and four 0.3750-in. (0.9525-cm) diameter holes spaced 90 degrees around the perimeter. These eight holes form a 9.688-in. (24.608-cm) diameter circle with the two sets of holes spaced at 45 degrees. The cabinet frame is equipped with a bottom pan and screen. The screen allows the cooling fan(s) to circulate the air when the front, back, and sides are enclosed.

The H950-AA Cabinet Frame is equipped with four casters to facilitate relocation of the cabinet. It is also equipped with four leveling screws to provide leveling capabilities and stability to the cabinet.

The H950-AA Cabinet Frame is designed to accept the cabinet accessories (front and rear full doors, end panels, short doors, power controllers, etc.) described in this section.

The two front and two rear vertical mounting rails are equipped with 0.25-in. (0.64-cm) diameter equipment mounting holes as shown on Figure 5.

Specifications

Dimensions

See Figure 6 for the overall dimensions of the H950-AA Cabinet Frame.

Weight

42 lb (19 kg)

Mounting

Equipment can be mounted on the front and rear vertical rails by using the mounting holes provided. These mounting holes are spaced at standard EIA spacings [5/8, 5/8, 1/2 in. (1.588, 1.588, 1.270 cm)] as shown on Figure 5.

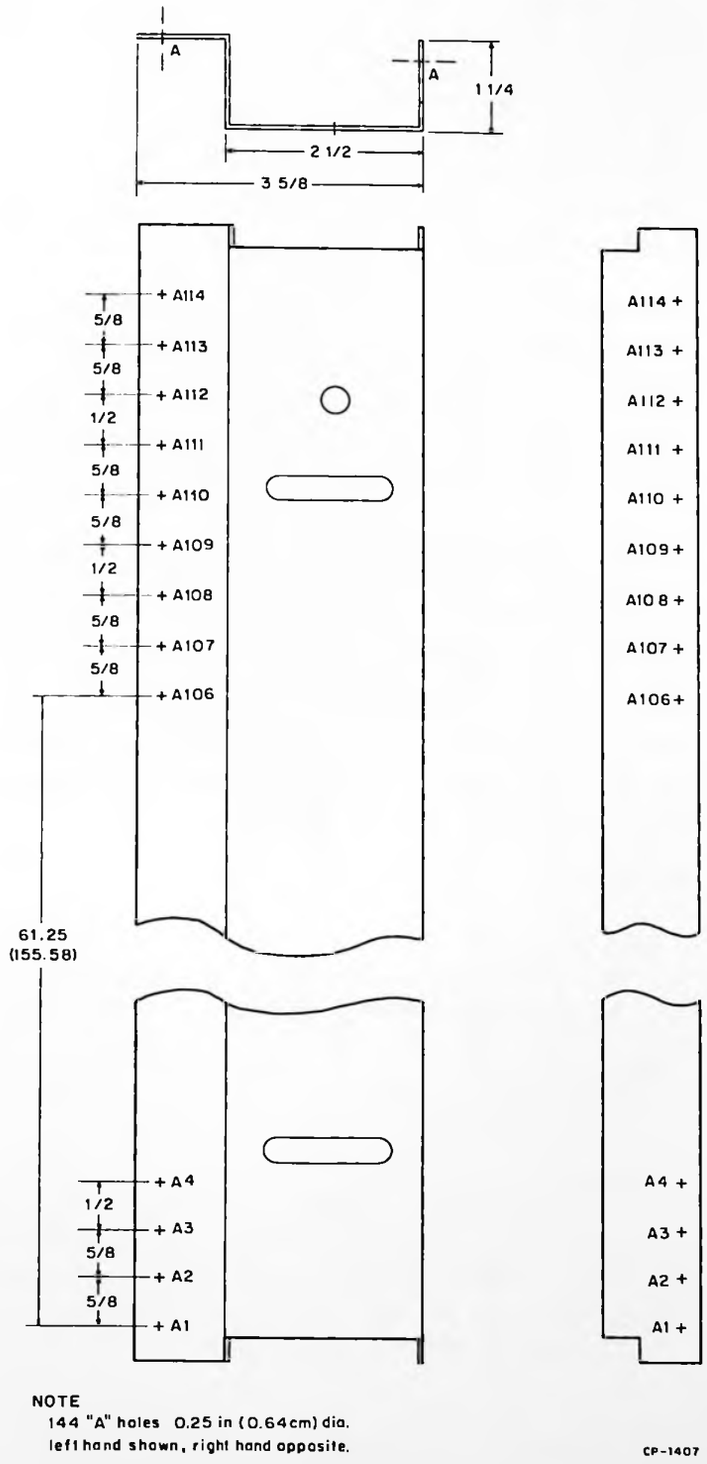


Figure 5 H950-AA Cabinet Frame Front and Rear Vertical Rail Mounting Hole Locations

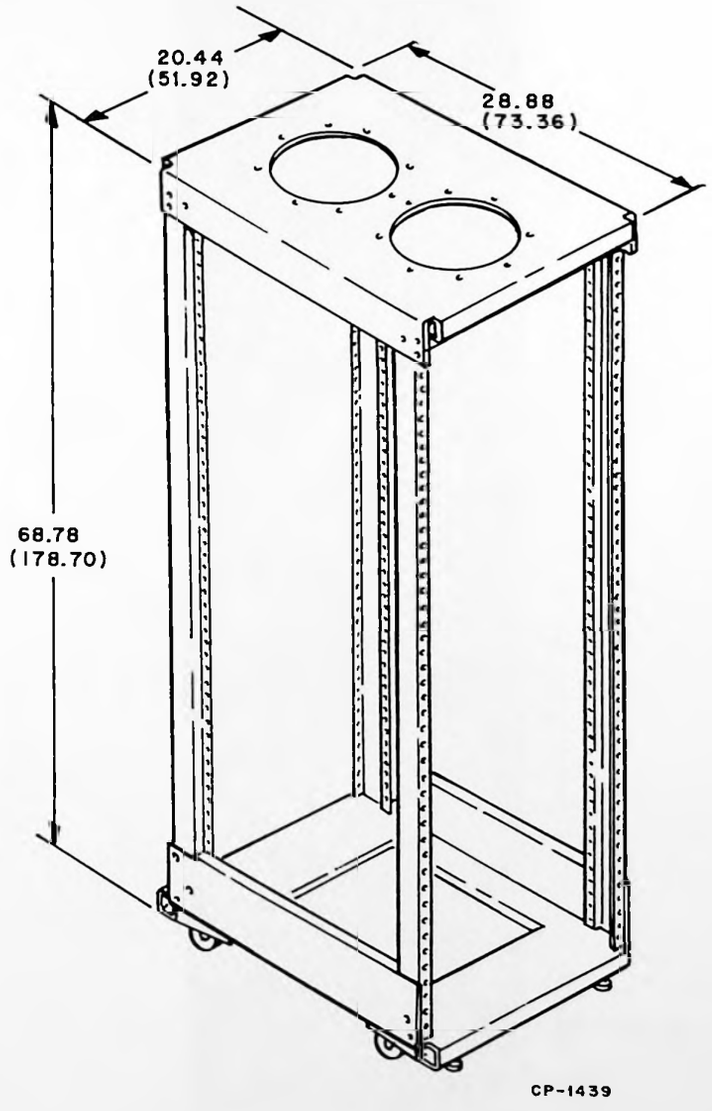
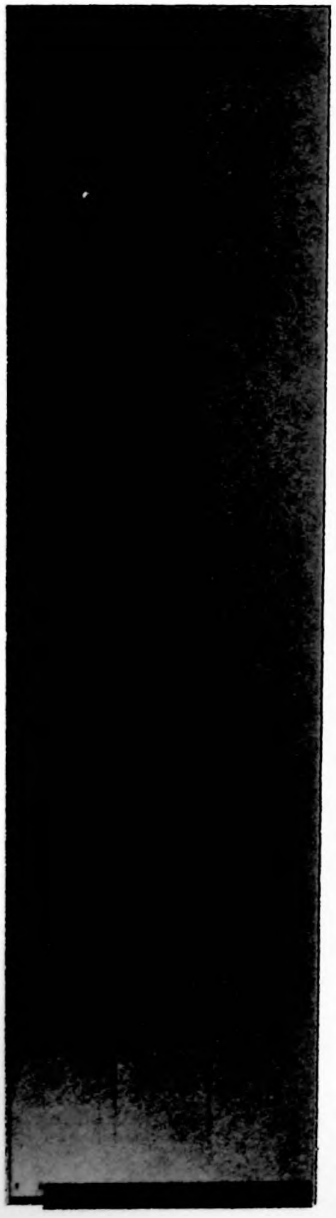


Figure 6 H950-AA Cabinet Frame Dimensions

Full Door – H950-BA, H950-CA



The H950-BA and the H950-CA are right-hanging and left-hanging full-size steel doors, respectively. All exposed surfaces of these doors are painted an attractive, texturized Lamp Black. The H950-BA or H950-CA can be mounted on the front or rear of the standard size H950-AA Cabinet Frame. These doors enhance the appearance of the system and tend to protect the system against tampering and/or accidental damage.

The H950-BA attaches to the cabinet frame so that the door pivots on the right side, facing the cabinet. The H950-CA pivots on the left side. Either door can be mounted on the front or on the rear of the cabinet; however, when mounted on the front, the H950-LA or H950-LB Logo Frame Panel cannot be installed.

The door can be installed in conjunction with the H950-DA or H950-EA Mounting Panel Door Frame using the mounting panel door frame hardware. When both are installed, the door and mounting panel frame pivot on the same side of the cabinet frame, but independently of each other. The door is held in the closed position by magnetic latches located near the top and bottom. For convenience, the door can be easily removed. All the required mounting hardware is supplied with the H950-BA or H950-CA door.

Specifications

Dimensions

See Figure 7 for the overall dimensions of the H950-BA and H950-CA Full Door.

Weight

30.0 lb (13.6 kg)

Mounting

The H950-BA mounts on the front or rear of the standard size H950-AA Cabinet Frame as shown on Figure 8. The H950-CA mounts on the opposite side of the front or rear cabinet frame using the same hardware specified for the H950-BA.

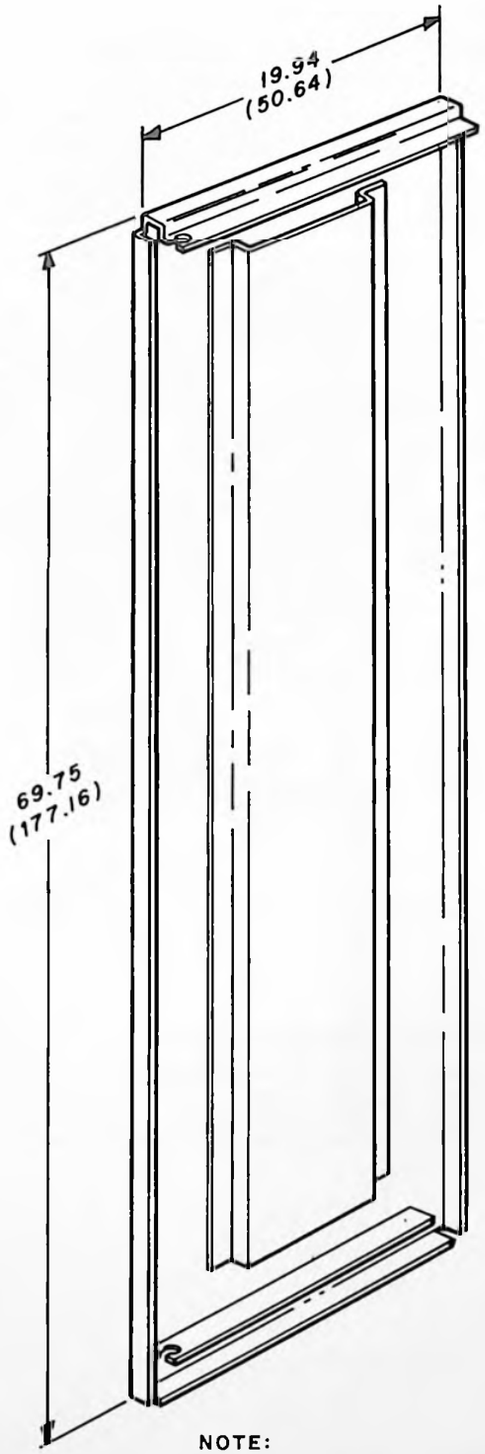
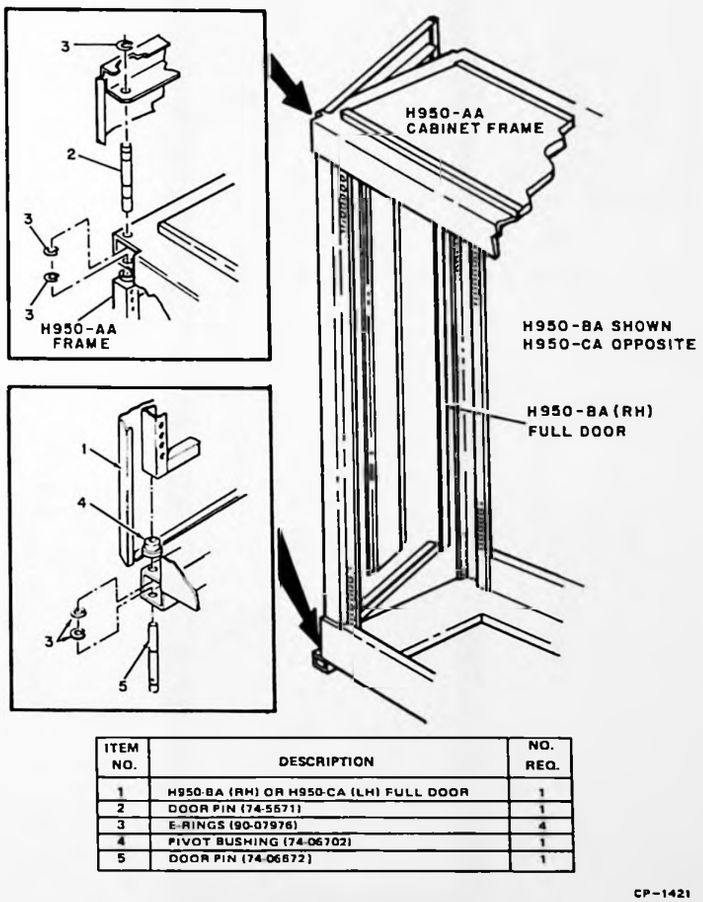


Figure 7 H950-BA and H950-CA Full Door Dimensions



ITEM NO.	DESCRIPTION	NO. REQ.
1	H950-BA (RH) OR H950-CA (LH) FULL DOOR	1
2	DOOR PIN (74-5571)	1
3	E-RINGS (90-07976)	4
4	PIVOT BUSHING (74-06702)	1
5	DOOR PIN (74-06872)	1

Figure 8 H950-BA and H950-CA Full Door Installation

Mounting Panel Door Frame – H950-DA, H950-EA

The H950-DA and the H950-EA are right-hanging and left-hanging mounting door frames, respectively, which are usually mounted on the rear of the standard size H950-AA Cabinet Frame. Panels or equipment designed to mount in standard 19-in. (48.26-cm) electronics cabinets or racks can be mounted on this door frame. The door frame uprights have predrilled, 0.25-in. (0.64-cm) diameter holes at standard EIA spacings.

A spring-loaded pin at the top of the cabinet releases the door frame when access to the interior of the cabinet is required. An H950-FA Mounting Panel Door Skin can be attached to either door frame when an H950-BA or H950-CA Full Door is not installed. All the required mounting hardware is supplied with the H950-DA or H950-EA door frame.

Specifications

Dimensions

See Figure 9 for the overall dimensions of the H950-DA and H950-EA Mounting Panel Door Frame.

Weight

12.0 lb (5.44 kg)

Mounting

The H950-DA mounts on the rear of the standard size H950-AA Cabinet Frame as shown on Figure 10. The H950-EA mounts on the opposite side of the rear of the cabinet frame using the same hardware specified for the H950-DA.

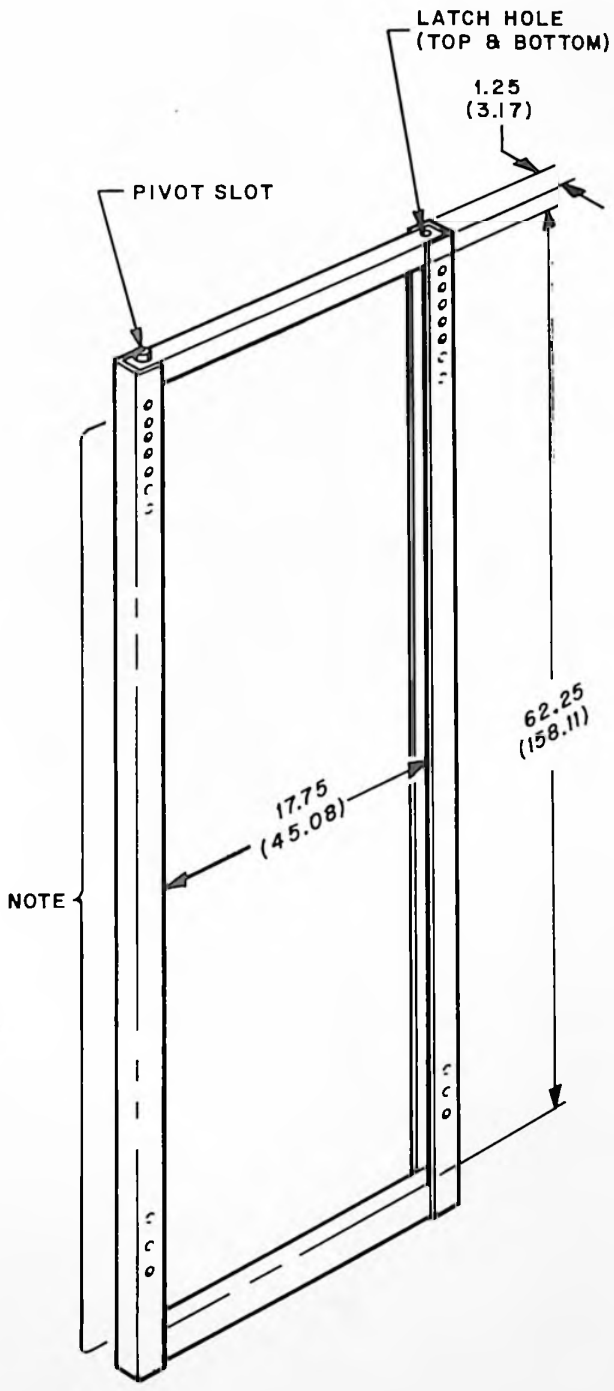
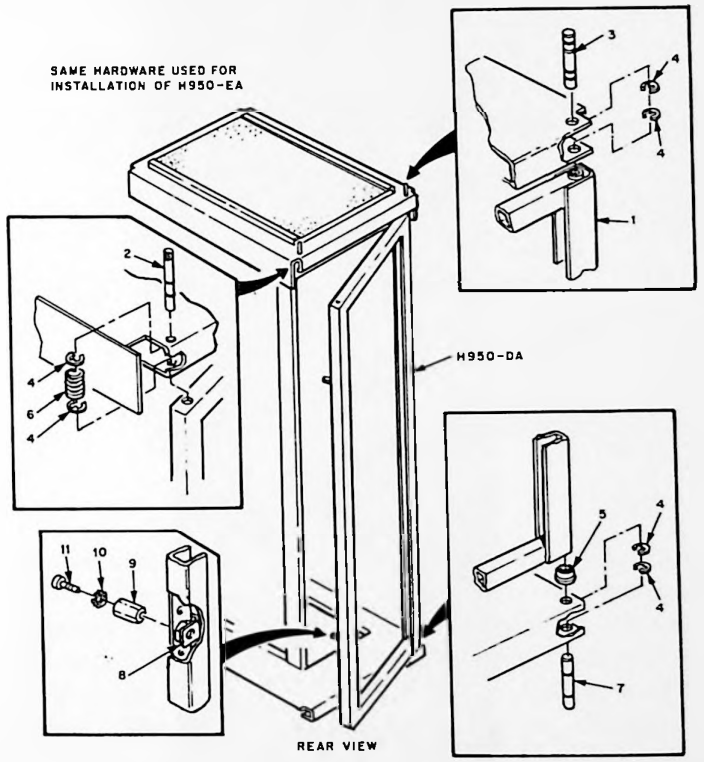


Figure 9 H950-DA and H950-EA Mounting Panel Door Frame Dimensions



ITEM NO.	DESCRIPTION	NO. REQ.
1	H950-DA OR H950-EA MOUNTING PANEL DOOR	1
2	DOOR PIN (74006710)	1
3	DOOR PIN (74 006711)	1
4	E RING (90 071841	6
5	PIVOT BUSHING (74 06702)	1
6	SPRING (90 01077)	1
7	DOOR PIN (74 006721	1
8	SPEEDNUT, 10-32 (24 (90 07786)	2
9	ALUM. SPACER (90 06833)	2
10	LOCK WASHER (90 07651)	2
11	PAN HD. SCREW 10-32 X 1.0 (2.54 CM) (90 06077-031	2

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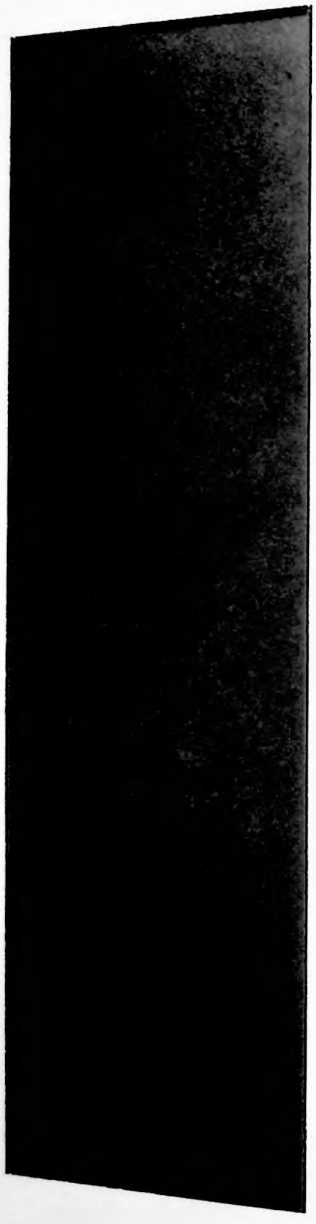
Figure 10 H950-DA and H950-EA Mounting Panel Door Frame Installation

Mounting Frame Door Skin – H950-FA



The H950-FA Mounting Frame Door Skin is a steel panel that can be attached to either the H950-DA (right mounting) or H950-EA (left mounting) Mounting Panel Door Frame. All exposed surfaces of these door skins are painted an attractive, texturized Lamp Black. The door skin can be used when access to equipment installed on the H950-DA or H950-EA is not required on a routine basis. The door skin is, however, easily and quickly removable when access to the panel mounted side of the equipment is necessary. The door skin is held in the closed position by a magnet located at the bottom of the door skin. All the required mounting hardware and the magnet are supplied with the H950-FA.

Specifications

Dimensions

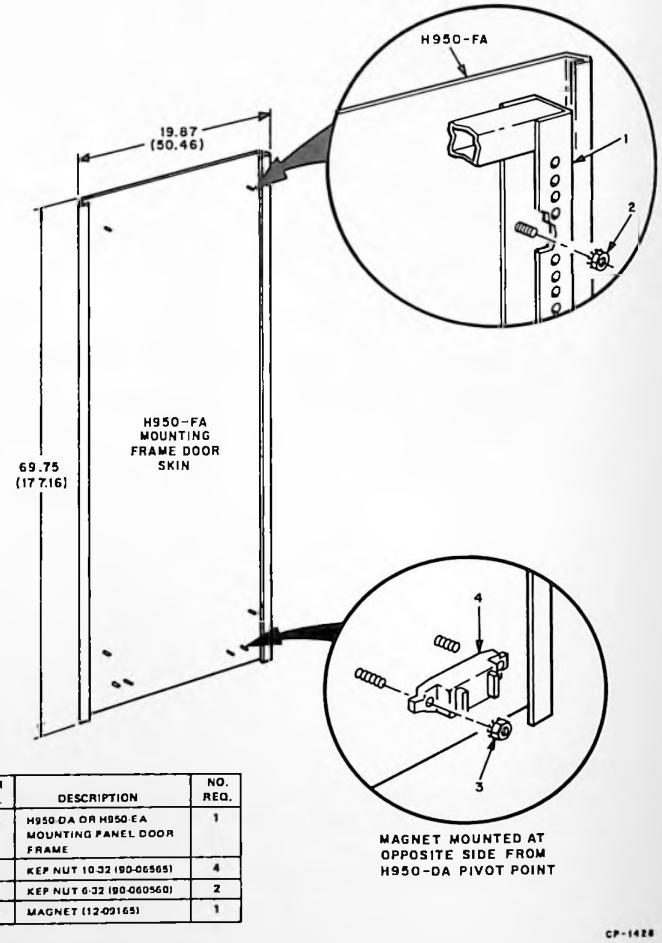
See Figure 11 for the overall dimensions of the H950-FA Mounting Frame Door Skin.

Weight

20.0 lb (9.1 kg)

Mounting

The H950-FA mounts on the H950-DA or H950-EA Mounting Panel Frame as shown on Figure 11.



ITEM NO.	DESCRIPTION	NO. REQ.
1	H950-DA OR H950-EA MOUNTING PANEL DOOR FRAME	1
2	KEP NUT 10-32 (90-06565)	4
3	KEP NUT 6-32 (90-060560)	2
4	MAGNET (12-09165)	1

Figure 11 H950-FA Mounting Frame Door Skin Installation

Cabinet Table – H950-G

The H950-G Cabinet Table is designed for installation at the front of the standard size H950-AA or short size H957-AA Cabinet Frame. The table provides a convenient working surface at the front of the unit and consists of a scratch-resistant top, a support bracket, and two mounting brackets. The support bracket and the mounting brackets have predrilled holes and are bolted to the vertical frames on the left and right side of a cabinet.

The H950-G Cabinet Table is shipped unassembled; however, it is easily assembled and all of the necessary assembly and mounting hardware are supplied with the table. The table should be mounted so that the tabletop surface is approximately 27 in. (68.58 cm) above the floor (Figure 12).

Specifications

Dimensions

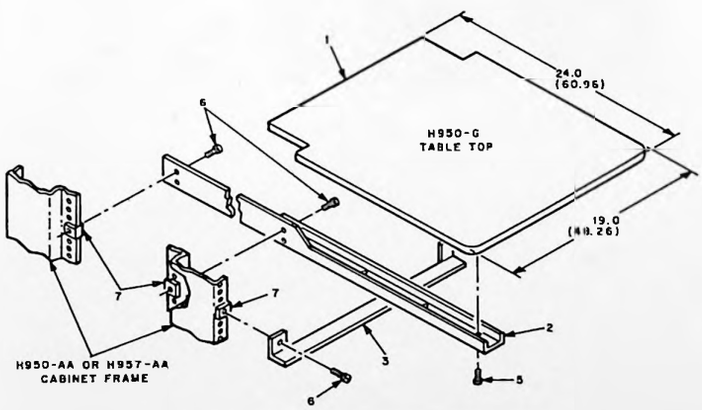
See Figure 12 for overall dimensions of the H950-G Cabinet Table.

Weight

27.0 lb (12.05 kg)

Mounting

The H950-G mounts at the front of the standard size H950-AA or short size H957-AA Cabinet Frame. The two mounting brackets are secured to the cabinet front and rear vertical frames, and the support bracket is secured to the front vertical frames as shown on Figure 12.



ITEM NO.	DESCRIPTION	QTY
1	H950-G TABLE TOP	1
2	H950-G MOUNTING BRACKET	2
3	H950-G SUPPORT BRACKET	1
4	SCREW, FLAT HEAD 1/2-20 x 1 IN. (90-06060-21)	2
5	SCREW, PAN HEAD 1/2-20 x 1 IN. (90-06060-1)	6
6	SCREW, TRUSS HEAD 10-32 x 1/2 IN. (90-06072-3)	8
7	NUT, SPEED (90-07706)	8

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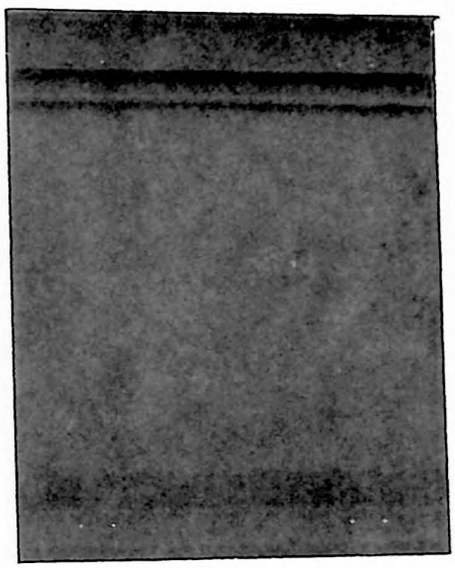
Figure 12 H950-G Cabinet Table Dimensions

Short Doors – H950-HA Through H950-HH, H950-HJ, H950-HK



Several short steel doors are available for mounting on the front of the standard size and short size cabinet frames. All exposed surfaces of these doors are painted an attractive, texturized Lamp Black. These doors provide protection and easy access to equipment and wiring in the front of the cabinet. The hinge side can be positioned on either the left or right of the cabinet front. Spring-loaded pins are included to facilitate door removal and installation. The doors are held in the closed position by two magnets on each door that make contact with the cabinet frame. The door heights vary from 23.37 in. (59.36 cm) to 65.37 in. (166.04 cm) and cover panel heights from 21.00 in. (53.34 cm) to 63.00 in. (160.02 cm) in ten discrete increments as listed in the table on Figure 13.

The selection of door size depends on the amount and size of the bezel cover panels on the front of the cabinet. Bezel cover panels may be used to cover some of the equipment in a cabinet and short doors may be used to cover the remainder. Refer to the H950-PA and H950-QA Bezel Cover Panel descriptions for the cover panel dimensions, and refer to the standard size and short size cabinet configuration and dimensions diagrams (Figures 2 and 26, respectively) for equipment mounting space dimensions. Kickplate 74-06793 can be used with H950-H series Short Doors if H952-BA Stabilizer Feet are not installed. H952-BA Stabilizer Feet and the 74-06782 Kickplate cannot be installed when an H950-H series Short Door is used; however, if an H950-J series Short Door is used, the stabilizer feet and kickplate can be installed.

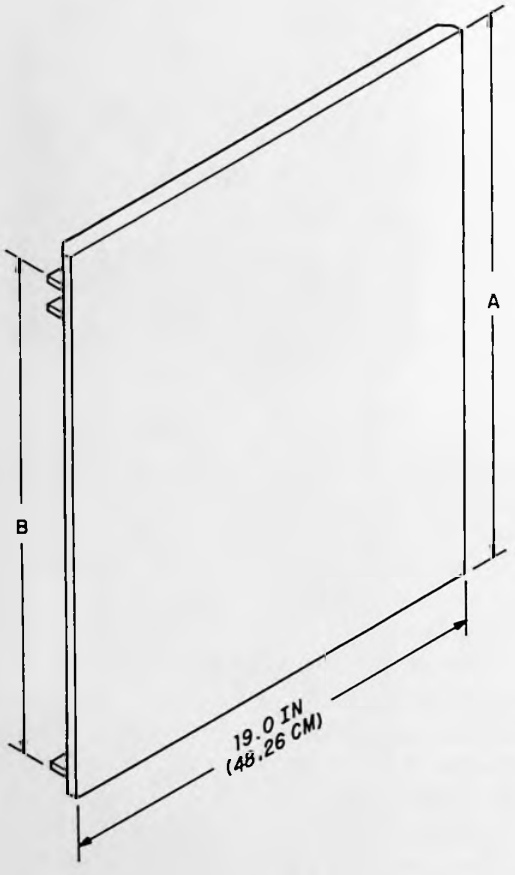
Specifications

Dimensions

See Figure 13 for the dimensions and panel cover height of the available short doors.

Weight

Refer to the table on Figure 13.



DEC PART NO.	DIM. A DOOR HEIGHT		DIM. B PANEL HEIGHT		WEIGHT	
	INCH	CM	IN	CM	LB	KG
H950-HA	21.37	59.36	21.0	53.34	10.0	4.5
H950-HB	25.12	63.80	22.75	57.79	10.0	4.5
H950-HC	28.62	72.69	26.25	66.68	11.0	5.0
H950-HD	33.87	86.03	31.50	80.01	15.0	6.8
H950-HE	39.12	99.36	36.75	93.35	19.0	8.6
H950-HF	44.37	112.70	42.00	106.68	20.0	9.9
H950-HG	49.62	126.03	47.25	120.03	21.0	9.5
H950-HH	54.87	139.87	52.50	133.35	23.0	10.4
H950-HJ	60.12	152.70	57.75	146.69	25.0	11.4
H950-HK	65.37	166.04	63.00	160.02	27.0	12.3

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Figure 13 Short Door Dimensions

Mounting

The H950-H series cabinet doors mount on the front of the standard size H950-AA Cabinet Frame or the short size H957-AA Cabinet Frame as shown on Figure 14.

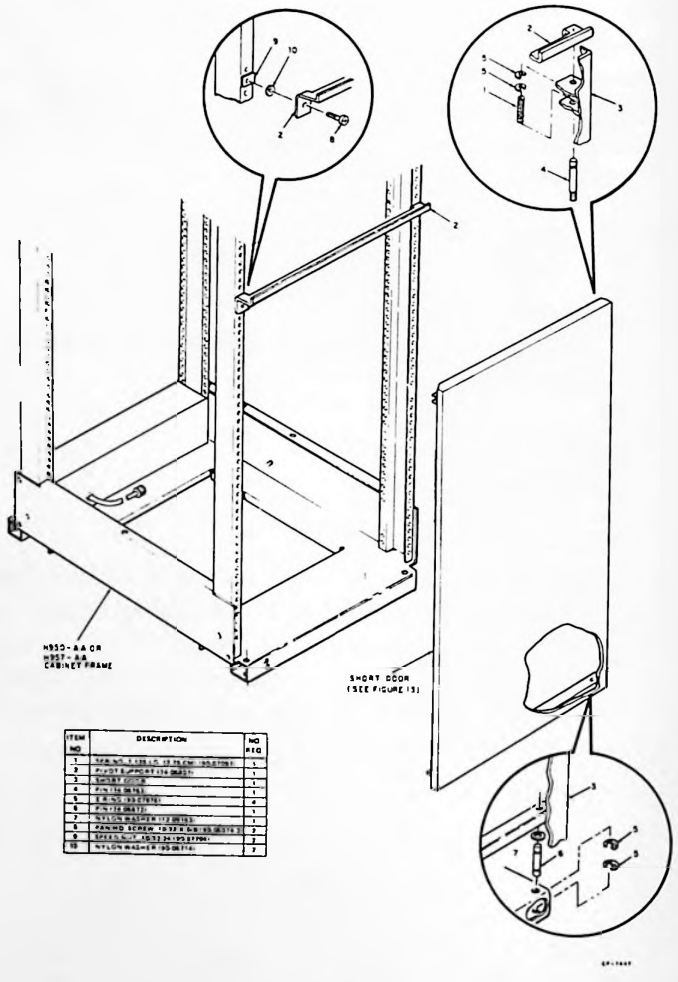
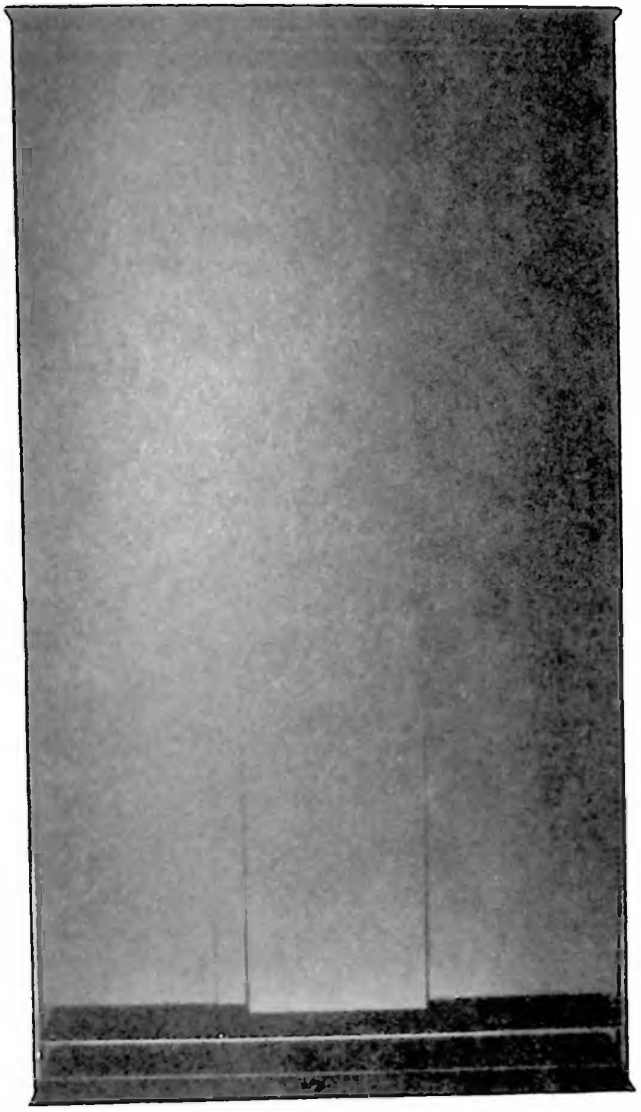


Figure 14 Short Door Installation

Short Door – H950-JA, H950-JE



The H950-JA and H950-JE are short doors which can be mounted on the front of the standard size H950-AA Cabinet Frame when H952-BA Stabilizer Feet or a 74-06782 or 74-06793 Kickplate is installed on the cabinet frame. The H950-JA Short Door can also be mounted on the front of the short size H957-AA Cabinet Frame when the stabilizer feet or a kickplate is installed.

A short door provides protection to the equipment and wiring in the cabinet that is not protected by H950-PA or H950-QA Bezel Cover Panels. The short doors are painted an attractive, texturized Lamp Black.

The door mounting hardware, supplied with the door, attaches to the predrilled holes in the cabinet frame, and the hinge side can be positioned on either the left or right of the cabinet front. Spring-loaded pins on the door facilitate door removal and installation. The door is held in the closed position by magnetic latches.

Specifications

Dimensions

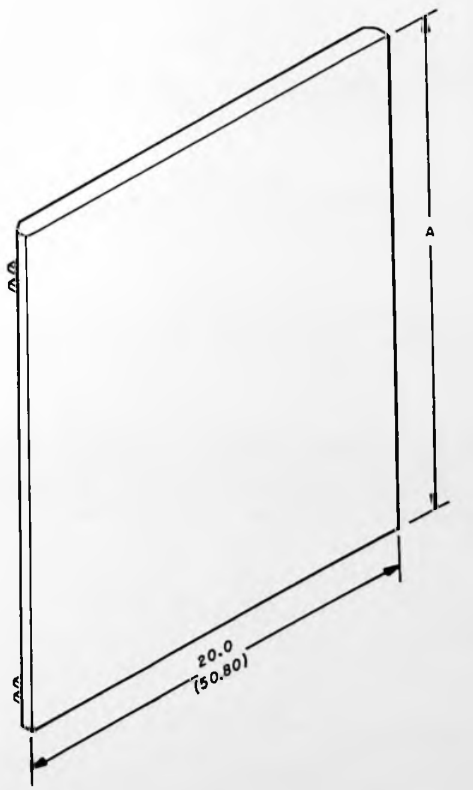
See Figure 15 for the overall short door dimensions.

Weight

Refer to the table on Figure 15.

Mounting

The H950-JA and H950-JE Short Doors mount on the front of the standard size H950-AA Cabinet Frame or the short size H957-AA Cabinet Frame as shown on Figure 16.



PART NO.	DIM A		WEIGHT	
	INCH	CM	LB	KG
H950-JA	20.90	53.09	8.0	3.6
H950-JE	62.78	159.46	25.0	11.4

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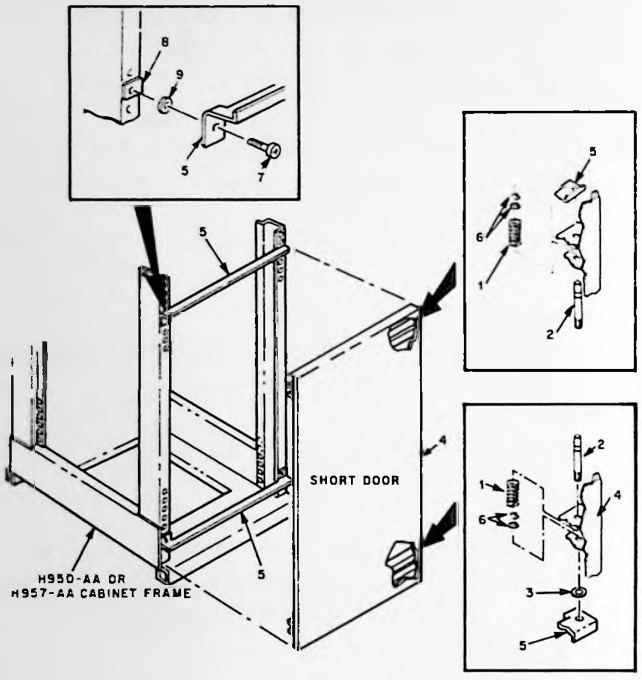
Figure 15 H950-JA and H950-JE Short Door Weight and Dimensions



ITEM NO	DESCRIPTION	NO. REQ
1	SPRING 1 12 LG (2.75 CM) (90 07037)	2
2	DOOR PIN (90 06763)	2
3	NYLON WASHER (90 03193)	1
4	SHORT DOOR	1
5	PIVOT SUPPORT (74 06807)	2
6	E RINGS (90 07104)	4
7	PAN HD SCREW 10 32 X 5/8 (1 59 CM) (90 06074 1)	4
8	SPEED NUT 10 32 (90 07765)	4
9	NYLON WASHER (90 06714)	4

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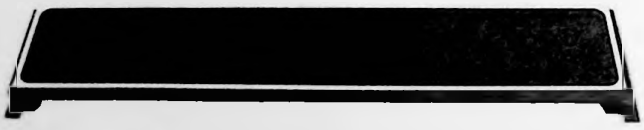
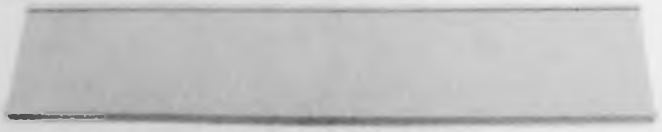
Figure 16 H950-JA and H950-JE Short Door Installation

Logo Frame Panels – H950-LA, H950-LB



H950-LA



H950-LB

Two logo frame panels, H950-LA and H950-LB, are available for mounting at the top front of the standard size H950-AA Cabinet Frame. The H950-LA is an aluminum panel and the H950-LB is a plastic panel. Each of the logo panels accepts adhesive inlay strips designed to match the system colors. The H950-LB plastic panel and one inlay strip are supplied as part of each cabinet assembly listed in Table 1. Your order must specify the color of the inlay strip desired; otherwise, 74-07926-1 (Magenta/Bright Rose) will be supplied.

Specifications

Dimensions

H950-LA: See Figure 17 for overall dimensions.
H950-LB: See Figure 18 for overall dimensions.

Weight

H950-LA: 1.5 lb (0.68 kg)
H950-LB: 0.25 lb (0.11 kg)

Mounting

H950-LA: See Figure 17 for panel mounting information. All mounting hardware is supplied.

H950-LB: See Figure 18 for panel mounting information. All mounting hardware is supplied.

Inlay Strips

H950-LA:

DEC Part No.	Color
74-07348-1	Copen Blue/Bright Navy (PDP-15)
74-07128	Marigold/Russet Orange (PDP-8/I) (with Digital logo)
74-07348-2	Marigold/Russet Orange (PDP-8/L)
74-07348-4	Chartreuse/Lime Peel (PDP-12)
74-07348-6	Magenta/Bright Rose (PDP-11)
12-09395	Light Grey (ideal for customized silk screening by the user)

H950-LB:

74-07926-1	Magenta/Bright Rose (PDP-11)
74-07926-2	Terra Cotta/Amber (PDP-8/E)
12-09774	Light Grey (ideal for customized silk screening by the user)

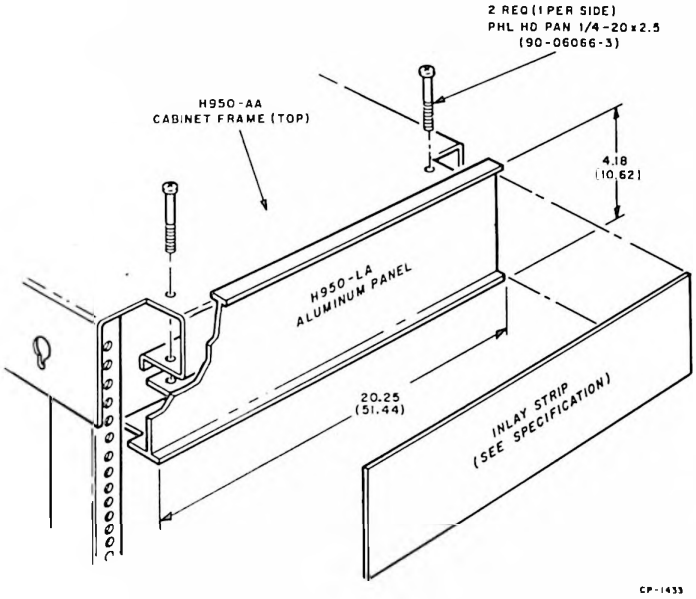


Figure 17 H950-LA Logo Frame Panel Mounting and Dimensions

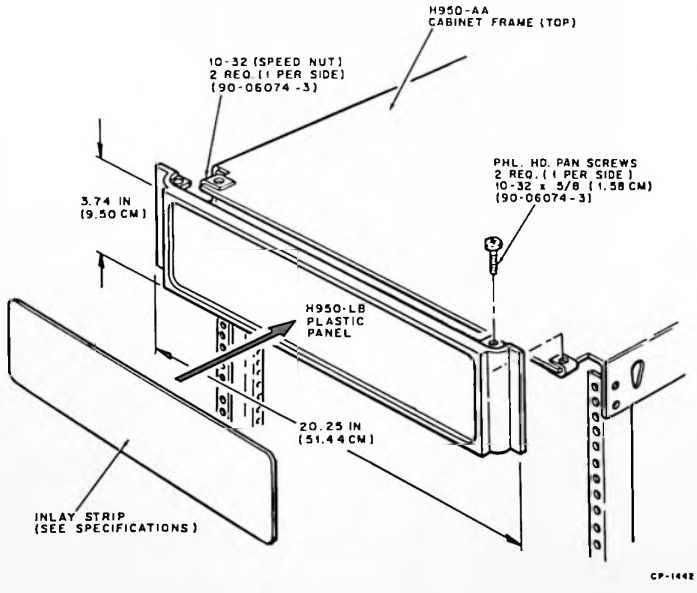
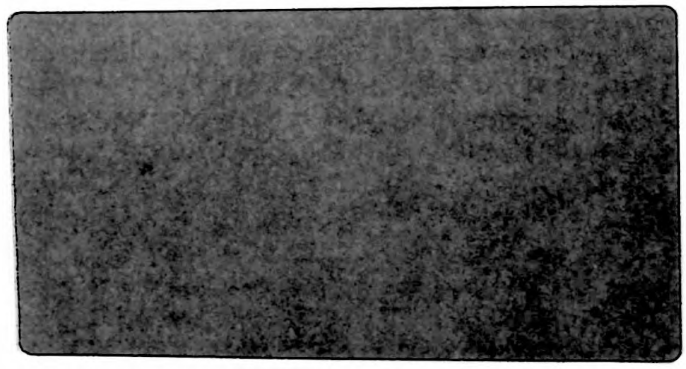


Figure 18 H950-LB Logo Frame Panel Mounting and Dimensions

Bezel Cover Panels – H950-PA, H950-QA

H950-PA



H950-QA

The H950-PA and H950-QA Bezel Cover Panels are removable plastic panels available for mounting on the front of either the standard size or short size cabinet frame (H950-AA or H957-AA). The panels are 19 in. (48.26 cm) wide and are used to protect exposed wiring and to improve the appearance of the cabinet. The H950-PA panel is 5.12 in. (13.00 cm) high, and the H950-QA is 10.37 in. (26.34 cm) high. The panels are attached to the cabinet frame with plastic latches that allow the covers to be easily attached or removed. The H950-PA panel requires two latches, one on each side; the H950-QA panel requires four latches, two on each side. Each cover panel is supplied with the necessary latches and hardware.

The panel bezel is beige and the panel is black.

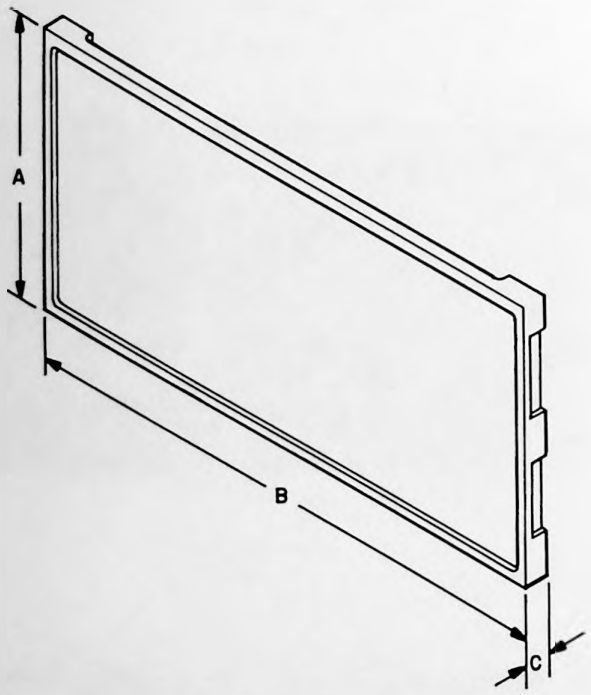
Specifications

Dimensions

See Figure 19 for the dimensions of the H950-PA and H950-QA Cover Panels.

Weight

H950-PA: 0.5 lb (0.23 kg)
H950-QA: 1.0 lb (0.45 kg)



PANEL	DIM.	INCH	CM
H950-PA	A	5.12	13.01
	B	19.00	48.26
	C	1.25	3.18
H950-QA	A	10.43	26.49
	B	19.00	48.26
	C	1.25	3.18

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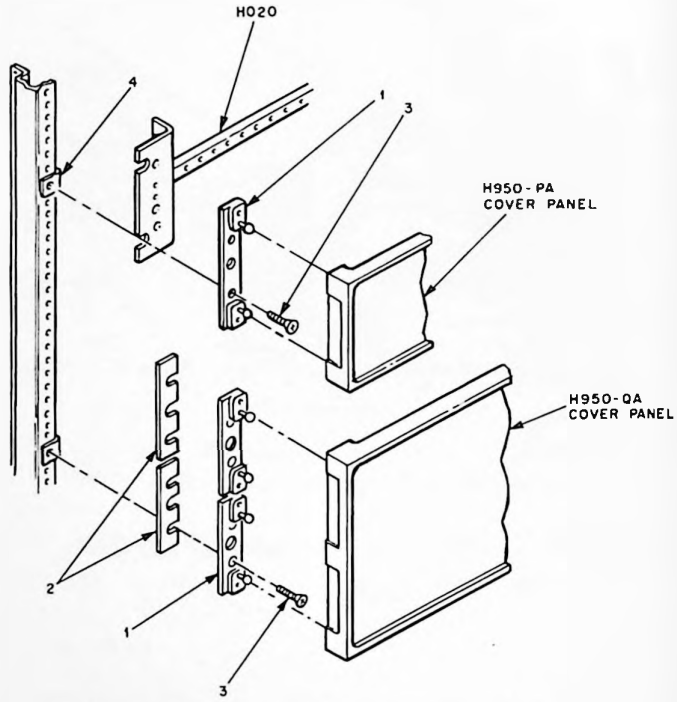
Figure 19 H950-PA and H950-QA Cover Panel Dimensions

Mounting

The H950-PA and H950-QA mount on the front of the standard size H950-AA or short size H957-AA Cabinet Frame as shown on Figure 20.



ITEM	DESCRIPTION
1	LATCH (12-09224) OR THICK LATCH (12-11386)
2	SPACER (74-07789)
3	FLT. HD. SCREW (90-06073-2) 10-32 X 5/8" (1.58 CM)
4	SPEED NUTS 10-32 (90-07786)

Note:
To maintain alignment of cover panels on the front of the cabinet, use the following procedures when installing the H950-PA or H950-QA.
When installing an H950-PA or H950-QA over an H020 or other mounting frame attached to the front of the cabinet frame, use latch 12-09224 as item 1 and do not use item 2.
When installing an H950-PA or H950-QA directly on the cabinet frame (i.e., over unoccupied space or over equipment not attached to the front of the cabinet frame), use thick latch 12-11386 as item 1 or use latch 12-09224 as item 1 and use item 2.

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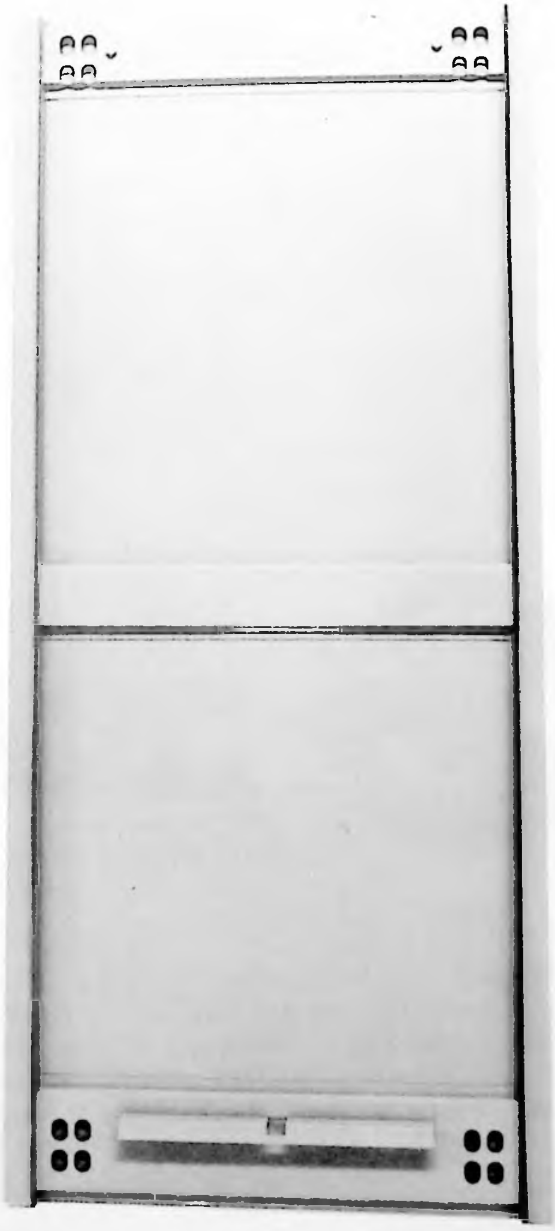
Figure 20 H950-PA and H950-QA Installation

Filter – H950-SA

The H950-SA Filter is used when an H952-CA or H952-CB Fan Assembly is mounted in a standard size cabinet with the air-flow direction into the cabinet. When the air-flow direction is out of the cabinet, the filter is not required.

The filter is mounted on top of the cabinet by inserting it into the two slots that are provided. To remove the filter, pull the filter out of the two retaining slots.

End Panel – H952-AA



The H952-AA is a steel-reinforced end panel, painted Light Grey, which can be mounted on either the left or right of the standard size H950-AA Cabinet Frame. The panel is easily attached or removed from the frame and requires no additional hardware for installation. When two cabinets are joined to form a double-bay unit, the end panels cannot be used at the joining sides; then the H952-GA Filler Strip Set is installed between cabinets.

Specifications

Dimensions

See Figure 21 for overall dimensions of the H952-AA End Panel.

Weight

32.0 lb (14.5 kg)

Mounting

The H952-AA mounts on either the left or right side of the standard size H950-AA Cabinet Frame. Holding tabs on the H952-AA insert into slotted holes at the top of the cabinet frame, and a holding plate inserts over the lower cabinet frame channel.

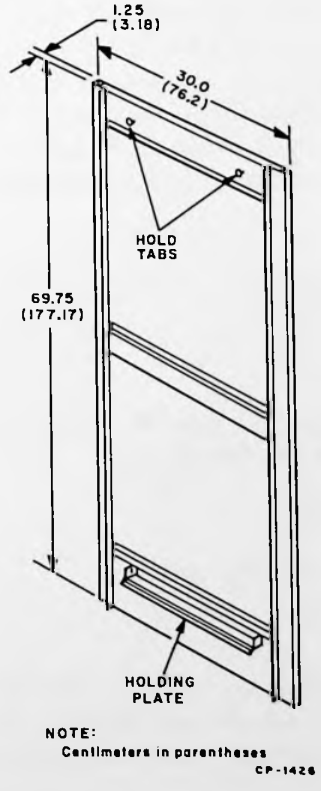


Figure 21 H952-AA End Panel Dimensions

Stabilizer Feet – H952-BA

The H952-BA Stabilizer Feet (pair) can be attached to each side of the front channel on either the standard size or short size cabinet frame (H950-AA or H957-AA). Each stabilizer foot has an adjustable leveler screw and pad. When installed, the H952-BA prevents the cabinet from tipping forward as a unit or drawer is extended from the front. The H950-JA and H950-JE Short Doors are the only doors which can be installed on the front of the cabinet frame when the stabilizer feet are attached. The 74-06782 Kickplate is designed for mounting to the channel frame when the stabilizer feet are installed. All the required mounting hardware is supplied with the H952-BA Stabilizer Feet.

Specifications

Dimensions

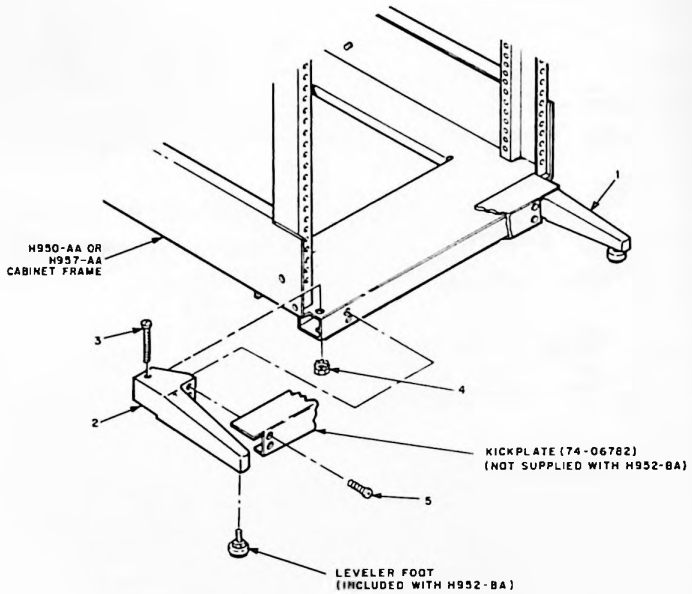
See Figure 22 for the overall dimensions of the H952-BA Stabilizer Feet.

Weight

5.0 lb (2.3 kg) per pair

Mounting

The stabilizer feet mount on the front of the standard size H950-AA Cabinet Frame or short size H957-AA Cabinet Frame as shown in Figure 22.



ITEM NO.	DESCRIPTION	NO REQ
1	STABILIZER FOOT (RIGHT MOUNTING)	1
2	STABILIZER FOOT (LEFT MOUNTING)	1
3	FLT. HD. SCREW 1/4-20 X 2 5/8 10 63 20X6 35 CM) 90 003701	2
4	KEP NUT, 1/4-20 (0 63 CM 20) 90-052001	2
5	PHL. HD. PAN SCREW 10-32 X 0.75 (1 90 CM) 90 076301	4

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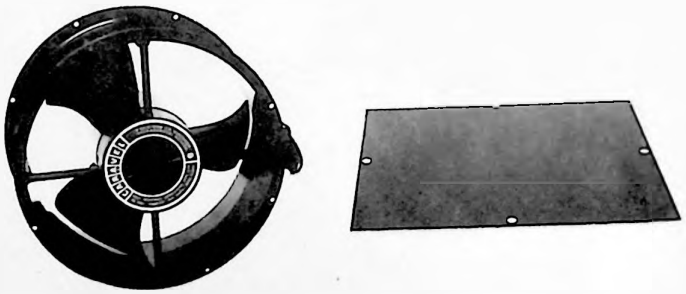
Figure 22 H952-BA Stabilizer Feet Installation

Fan Assembly – H952-CA, H952-CB



The H952-CA (115 Vac) or the H952-CB (230 Vac) Fan Assembly mounts to the top plate of the standard size H950-AA Cabinet Frame. Two ports are provided on the top plate to allow two H952-CA or H952-CB fans to be mounted. If only one fan is required, the remaining port must be covered by a cover plate, DEC No. 74-06706.

The fan assembly can be installed so the air-flow direction is either into or out of the cabinet enclosure. The H950-SA Filter is required only when the air flow is into the cabinet. In all preassembled cabinets, unless otherwise requested by the customer, the fan is mounted at the rear port with the air-flow direction into the cabinet. The circular fan guard attaches to the fan assembly opposite the mounting side. The fan motor connects to the voltage source by two stripped and tinned leads. Suitable terminals and a terminal block are required for the power connection.

Specifications

Input Voltage
H952-CA: 115 Vac, 50/60 Hz
H952-CB: 230 Vac, 50/60 Hz

Air Flow
Rated at 550 ft^3/min (15.57 m^3/min)

Weight
5.0 lb (2.3 kg), including guard and cover plate

Mounting
The H952-CA and H952-CB mount inside on the top plate of the H950-AA Cabinet Frame as shown on Figure 23. Figure 23 also illustrates how the fan guard and 74-06706 Cover Plate are mounted.

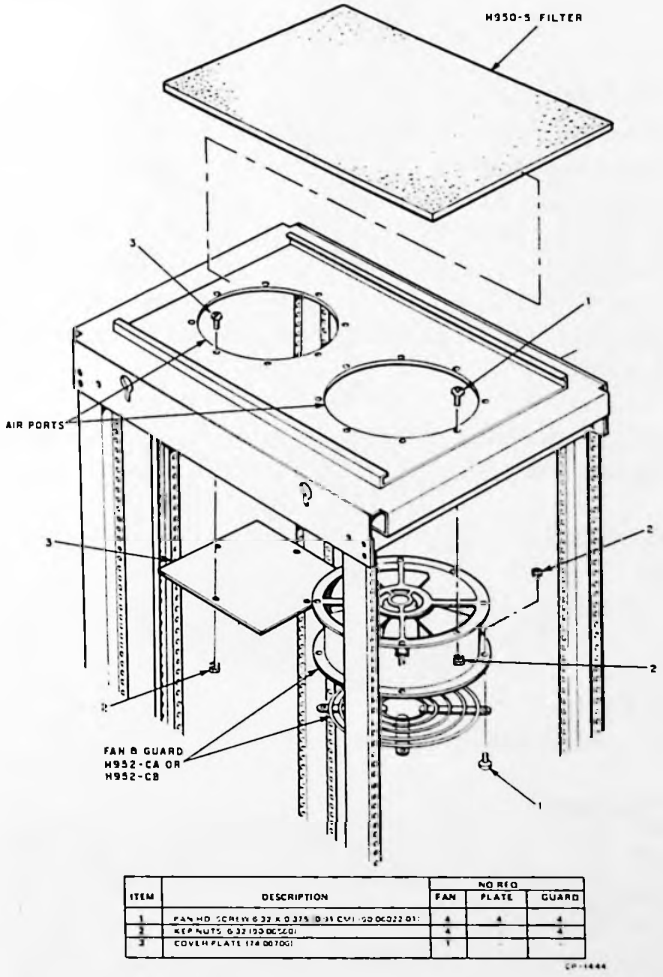
Caster Set – H952-EA

The H952-EA is a set of four swivel-frame casters that are welded to the bottom of the standard size H950-AA or short size H957-AA Cabinet Frame.

The plastic caster wheel diameter is 3.0 in. (7.62 cm), and the outer perimeter is 1.31 in. (3.33 cm) wide. Each caster load capacity is 225 lb (102 kg).

Leveler Set – H952-FA

The H952-FA is a set of four cushioned leveler feet that are mounted into threaded (1/2-13) plates on the bottom of the standard size H950-AA or short size H957-AA Cabinet Frame.



ITEM	DESCRIPTION	NO REQ		
		FAN	PLATE	GUARD
1	[illegible]	4	4	4
2	[illegible]	4		4
3	COVER PLATE 174 06706	1		

Figure 23 H952-CA and H952-CB Fan and Cover Plate Installation

Filler Strip Set – H952-GA

The H952-GA Filler Strip Set consists of a front and a rear mounting filler strip. The H952-GA is installed between two standard size H950-AA Cabinet Frames when the two cabinets are joined to form a double-bay unit. Mounting holes are provided in the filler strips and in the cabinet frame top and bottom channels. The filler strips are held in place by the hardware that is used to join the cabinets. The H952-AA End Panels cannot be used on the joining sides of cabinets.

All the hardware required to mount the filler strips and to join the cabinets is supplied with the H952-GA.

Specifications

Dimensions
68.75 in. (174.63 cm) long

Weight
6.0 lb (2.7 kg) per set

Mounting
The H952-GA front and rear filler strips mount between two standard size H950-AA Cabinet Frames as shown on Figure 24.

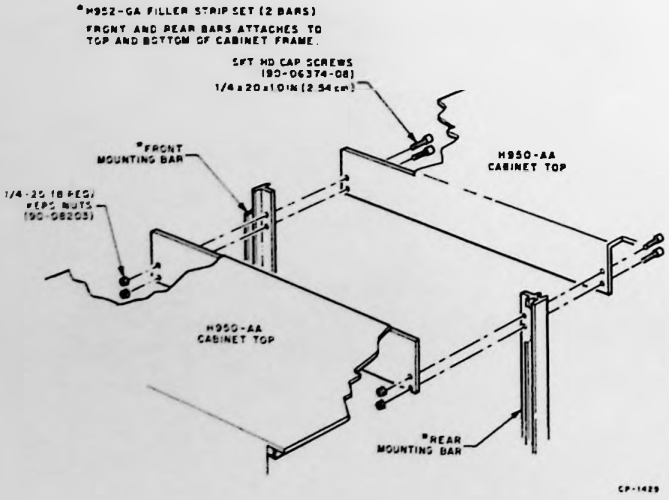


Figure 24 H952-GA Filler Strip Set Installation

Free-Standing Table – H952-HA, H970-BA, H970-CA

Three free-standing tables are available as support for peripheral devices or as a convenient working surface near the equipment cabinets. Each table consists of a removable top and steel supporting frame. The top is constructed of a durable, scratch-resistant, Off-White surface. Four non-skid, adjustable leveling feet on the support frame allow the table to be firmly positioned. The H952-HA (shown in photo) is 19.00 in. (48.26 cm) wide and 20.88 in. (53.04 cm) deep; the H970-BA is 30.00 in. (76.20 cm) wide and 20.00 in. (50.80 cm) deep; and the H950-CA is 30.00 in. (76.20 cm) wide and 30.00 in. (76.20 cm) deep.

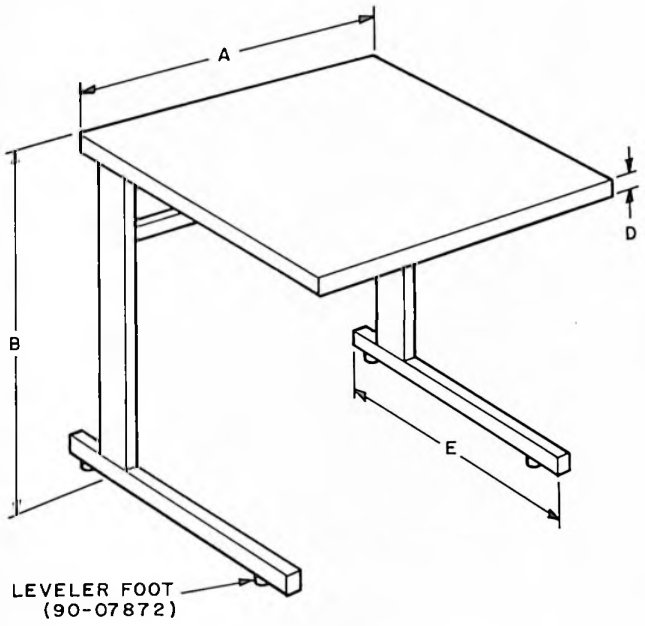
Specifications

Dimensions
See Figure 25 for overall dimensions of the H952-HA, H970-BA, and H970-CA Free-Standing Tables.

Weight
H952-HA: 30.0 lb (13.6 kg)
H970-BA: 45.0 lb (20.4 kg)
H970-CA: 47.0 lb (21.4 kg)

Mounting

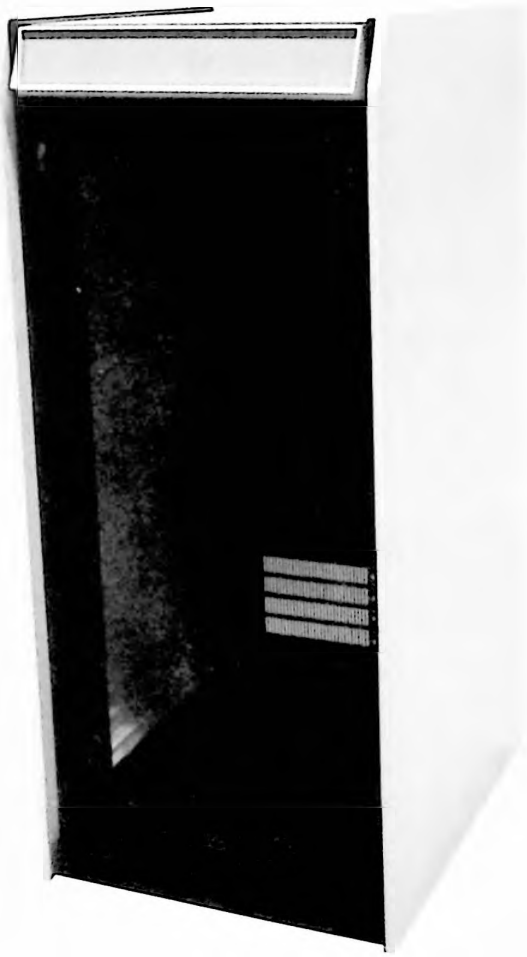
Tables are free-standing and no mounting hardware is required.



DIM	H952-HA		H970-BA		H970-CA	
	IN.	CM	IN.	CM	IN.	CM
A	19.00	48.26	30.00	76.20	30.00	76.20
B	26.75	67.95	26.63	67.64	26.63	67.64
C	20.88	53.04	20.00	50.80	30.00	76.20
D	1.12	2.84	1.62	4.11	1.62	4.11
E	20.00	50.80	20.00	50.80	20.00	50.80

CP-1453

Figure 25 Free-Standing Table Dimensions



SHORT SIZE CABINETS AND ACCESSORIES

Five basic cabinet configurations (H967-BA, H967-BB, CAB-I, CAB-J, and CAB-K) are available in the short size cabinet series. CAB-K is intended primarily for add-on configurations. The short size cabinet is 50.0 in. (127.0 cm) tall and provides 42.0 in. (106.7 cm) of vertical mounting space at the front; an additional 42.0 in. (106.7 cm) of mounting space is available at the rear of the cabinet. These cabinets are configured to meet the requirements of most customer applications.

Figure 1, at the front of this section, illustrates the floor space required for proper access to operate and service the equipment in short size cabinets. Figure 1 also illustrates overall dimensions of the short cabinets.

All short size cabinets are configured around the basic H957-AA Cabinet Frame (Figures 27 and 29). These cabinet frames are drilled with 0.25-in. (0.64-cm) diameter holes at standard EIA spacings to accommodate equipment, panels, or devices that are designed to mount in standard 19-in. (48.26-cm) electronics cabinets or racks. Two of the cabinets contain power controllers for distribution and control of the main power to the equipment installed. (The 861-A, 861-B, and 861-C Power Controllers are described in Section 5 of this catalog.) Three of the cabinet configurations include a rear mounting panel door frame, which is also drilled with 0.25-in (0.64-cm) diameter holes at standard EIA spacings; this mounting panel door frame allows the equipment and devices mounted on it to be swung out for maintenance or adjustment. Optional accessories as specified by the customer can be added to any of the available configurations. Table 3 lists the parts and accessories included in each of the five short size cabinet configurations; Table 3 also lists the optional accessories that are available for use with these cabinets. All cabinets are completely assembled before shipment.

Table 3
Short Cabinets
H967-BA, H967-BB, CAB-I, CAB-J, and CAB-K

Cabinet Assembly						
H967-BA	H967-BB	CAB-I	CAB-J	CAB-K	Catalog No.	Description
1	1	1	1	1	H957-AA	Cabinet Frame, 19 in. wide, 47-8/16 in. high, 25 in. deep
1	1	1	1		H957-BA	Full Door (RH) (rear mounting)
				1	H957-CA	Full Door (LH) (rear mounting)
1	1	1			H957-DA	Mounting Panel Door Frame (RH)
					H957-EA	Mounting Panel Door Frame (LH)
					H952-HA	Free-Standing Table
					H970-BA	Free-Standing Table
					H970-CA	Free-Standing Table
					H950-HA	Short Door (covers 21 in. mounting space)
					H950-HB	Short Door (covers 22-3/4 in. mounting space)
					H950-HC	Short Door (covers 26-1/4 in. mounting space)
					H950-HD	Short Door (covers 31-1/2 in. mounting space)
					H950-HE	Short Door (covers 36-3/4 in. mounting space)
					H950-HF	Short Door (covers 42 in. mounting space)
					H950-JA	Short Door (covers 21 in. mounting space) (used with H952-BA installed)
					H950-PA	Bezel Cover Panel, 5-1/4 in.
					H950-QA	Bezel Cover Panel, 10-1/2 in.
1	1	1			H952-BA	Stabilizer Feet (pair)
1	1	1	1	1	H952-EA	Caster Set (4 per set, included with H957-AA Frame)
1	1	1	1	1	H952-FA	Leveler Set (4 per set, included with H957-AA Frame)
					H950-G	Cabinet Table
1	1	1	1		H957-FA	End Panel (R end)
1	1	1	1		H957-FB	End Panel (L end)
				1	H957-GA	Filler Strip Set (top, front, and rear) (joining two cabinets)
1	1	1	1	1	H957-HA	Fan Assembly (front or rear mounting)
					H957-JA	Bottom Cover Plate
1	1	1	1	1	H957-LA	Logo Frame Panel
1	1	1	1	1	H957-SA	Filter (for H957-HA)
1	1	1			74-06782	Kickplate (use with H952-BA)
			1	1	74-06793	Kickplate
					12-09154	Drawer Mounting Slides
					12-09703	Drawer Mounting Slides (tilt)
					861-A	Power Controller (90–130 Vac, two phase)
	1				861-B	Power Controller (180–270 Vac, single phase)
1					861-C	Power Controller (90–135 Vac, single phase)

Figure 26 illustrates a typically configured short size cabinet front. Figure 27 illustrates the installation of typical accessories on a short size cabinet frame, and Table 4 identifies and describes these accessories. Complete descriptions of the accessories for short size cabinet frames are contained in the following accessory descriptions; complete descriptions of accessories that are usable on both standard size and short size cabinet frames are contained in the preceding subsection, Standard Size Cabinets and Accessories. The accessory descriptions are in alphanumeric order.

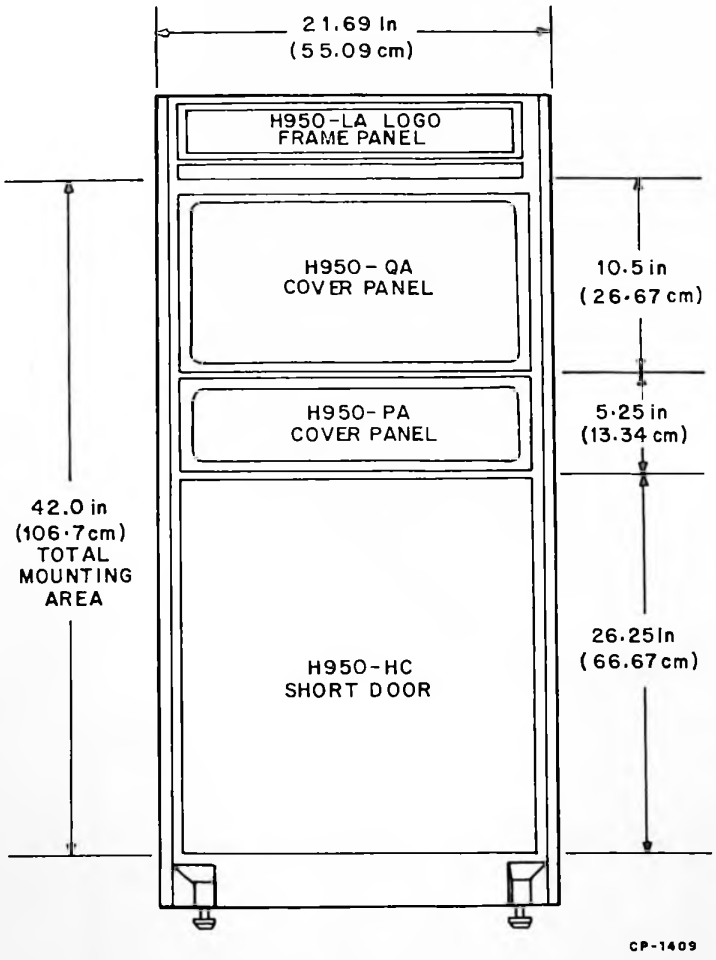


Figure 26 Typical Short Cabinet Front Cover Panel and Short Door Configuration

HOW TO ORDER A SHORT SIZE CABINET ASSEMBLY

Determine if one of the five basic cabinet assembly configurations (H967-BA, H967-BB, CAB-I, CAB-J, or CAB-K) will fulfill your requirements by referring to Table 3 and comparing the items that comprise each configuration.

If one of the basic configurations will satisfy your requirements, you can order the completely assembled cabinet by specifying that cabinet assembly number, e.g., H967-BA, H967-BB, CAB-I, CAB-J, or CAB-K. In addition to the accessories included in the five configurations, optional accessories are available, e.g., short doors, a cabinet table, drawer mounting slides, etc.

If one of the basic configurations will not fulfill your requirements, you can "build up" and order a completely assembled cabinet that will suit your specific requirements by ordering an H957-AA short size frame and the accessories (by specific part numbers) that you require. The frame and the accessories that you select will be shipped completely assembled.

SHORT SIZE CABINET ACCESSORIES

Kickplate – 74-06782, 74-06793

Refer to description in Standard Size Cabinets and Accessories subsection.

Cabinet Table – H950-G

Refer to description in Standard Size Cabinets and Accessories subsection.

Short Door – H950-HA through H950-HF

Refer to description in Standard Size Cabinets and Accessories subsection.

Short Door – H950-JA, H950-JE

Refer to description in Standard Size Cabinets and Accessories subsection.

Bezel Cover Panel – H950-PA, H950-QA

Refer to description in Standard Size Cabinets and Accessories subsection.

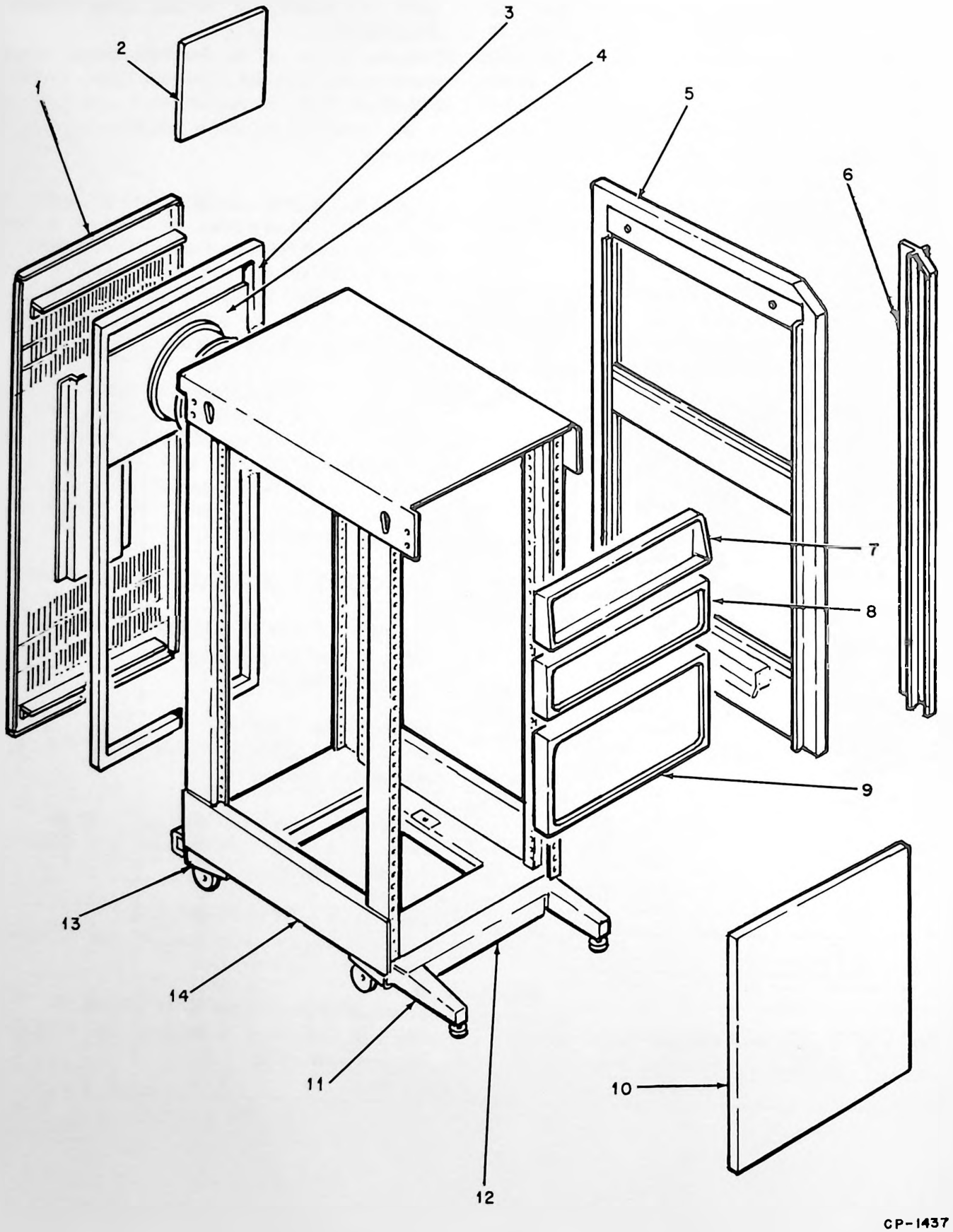


Figure 27 H957-AA Short Cabinet Frame and Accessories

Table 4
Short Size Cabinet Frame H957-AA and Accessories

Item	Part No.	Description
1	H957-BA	Full Rear Door (right hanging)
1	H957-CA	Full Rear Door (left hanging)
2	H957-SA	Air Filter
3	H957-DA	Mounting Panel Door Frame (right hanging)
3	H957-EA	Mounting Panel Door Frame (left hanging)
4	H957-HA	Fan Assembly
5	H957-FA	End Panel (right hanging)
5	H957-FB	End Panel (left hanging)
6	H957-GA	Filler Strip Set (top, front, and rear)
7	H957-LA	Logo Frame Panel (plastic)
8	H950-PA	Bezel Cover Panel, 5.25 in. (13.34 cm)
9	H950-QA	Bezel Cover Panel, 10.50 in. (26.67 cm)
10	H950-HA	Short Door, covers 21.00 in. (53.34 cm) mounting space
10	H950-HB	Short Door, covers 22.75 in. (57.79 cm) mounting space
10	H950-HC	Short Door, covers 26.25 in. (66.68 cm) mounting space
10	H950-HD	Short Door, covers 31.50 in. (80.01 cm) mounting space
11	H952-BA	Stabilizer Feet (pair)
12	74-06782	Kickplate (used with H952-BA Stabilizer Feet)
12	74-06793	Kickplate
13	H952-EA	Caster Set (4)
14	H957-AA	Frame, 19.00 in. (48.26 cm) wide, 47.50 in. (120.65 cm) high, 25.00 in. (63.50 cm) deep

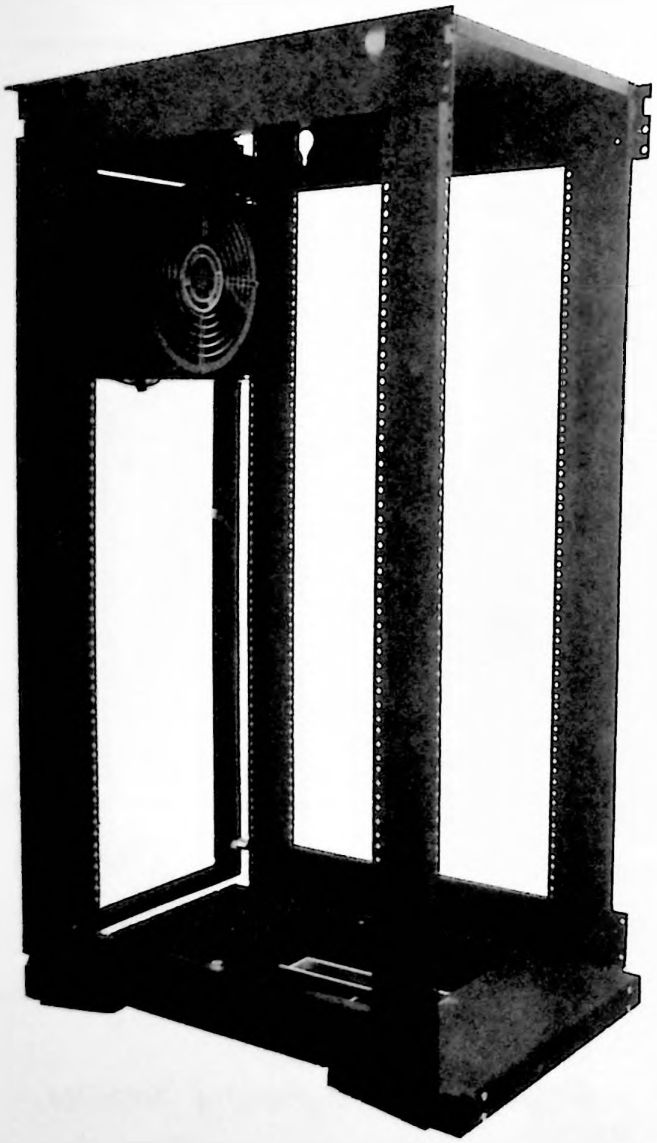
Stabilizer Feet – H952-BA
Refer to description in Standard Size Cabinets and Accessories subsection.

Caster Set – H952-EA
Refer to description in Standard Size Cabinets and Accessories subsection.

Leveler Set – H952-FA
Refer to description in Standard Size Cabinets and Accessories subsection.

Free-Standing Table – H952-HA, H970-BA, H970-CA
Refer to description in Standard Size Cabinets and Accessories subsection.

Cabinet Frame – H957-AA



The H957-AA short size Cabinet Frame, painted Lamp Black, is a sturdily constructed frame designed to accept, on the two front vertical rails and on the two rear vertical rails, mounting panels or equipment that is mountable on standard 19-in. (48.26-cm) electronics cabinets or racks. The cabinet frame provides 42.0 in. (106.7 cm) of vertical mounting space on the front vertical rails and the same amount on the rear vertical rails.

The H957-AA Cabinet Frame is equipped with a top pan that has a durable Off-White finish. The cabinet frame is equipped with a bottom pan and screen. The screen allows a cooling fan to circulate the air.

The H957-AA is also equipped with four casters to facilitate relocation of the cabinet and four leveling screws to provide leveling capabilities and stability to the cabinet.

The H957-AA Cabinet Frame is designed to accept the cabinet accessories (front and rear full doors, end panels, short doors, power controllers, etc.) described in this section.

The two front vertical rails and the two rear vertical mounting rails are equipped with 0.25-in. (0.64-cm) diameter equipment mounting holes as shown on Figure 28.

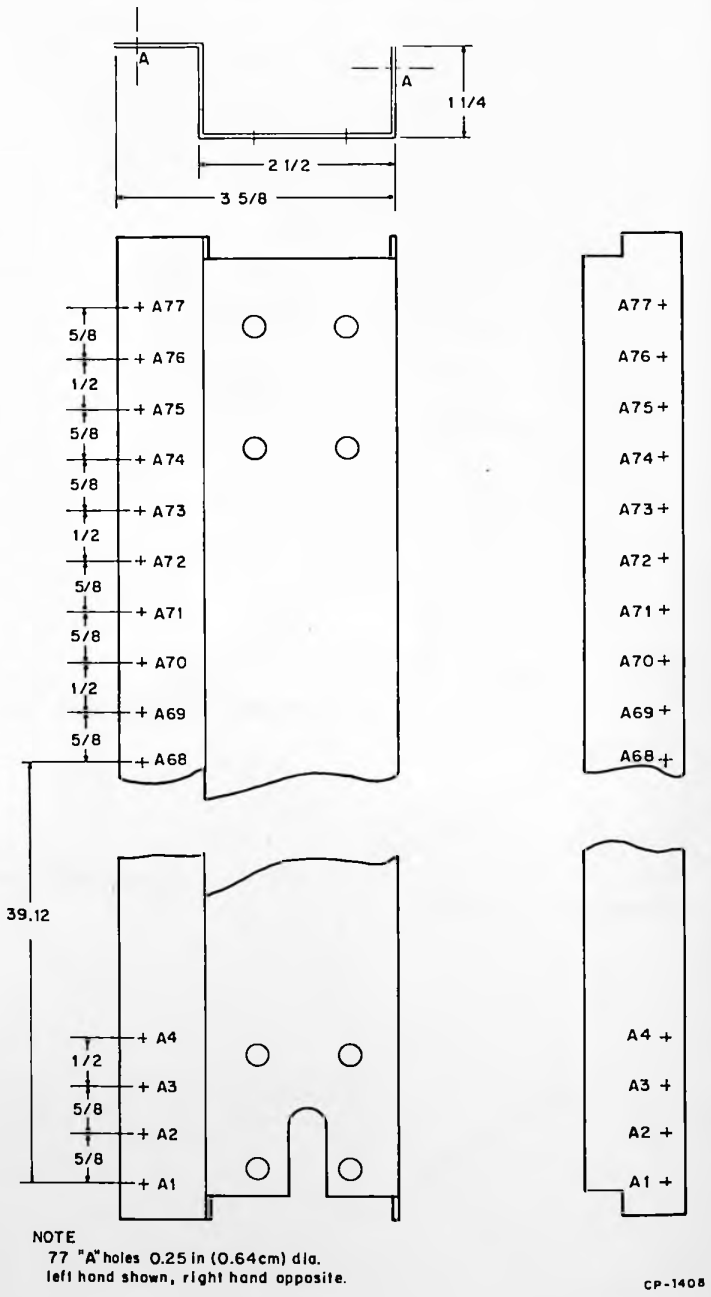


Figure 28 H957-AA Cabinet Frame Front and Rear Vertical Rail Mounting Hole Locations

Dimensions

See Figure 29 for the overall dimensions of the H957-AA Cabinet Frame.

Weight

37 lb (16.6 kg)

Mounting

Equipment can be mounted on the front and rear vertical rails by using the mounting holes provided. These mounting holes are spaced at standard EIA spacings [5/8, 5/8, 1/2 in. (1.588, 1.588, 1.270 cm)] as shown on Figure 28.

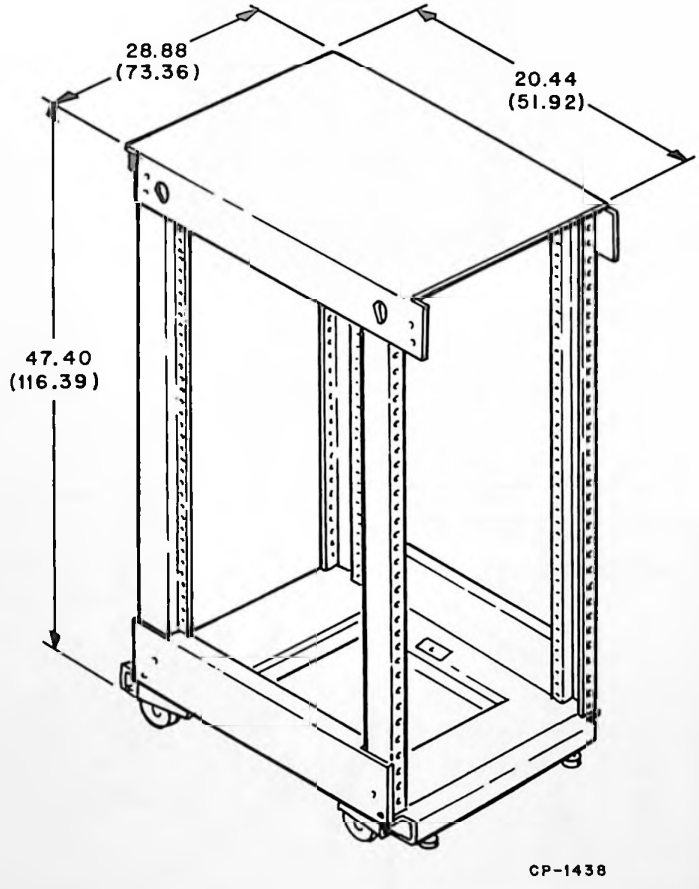


Figure 29 H957-AA Cabinet Frame Dimensions

Full Door – H957-BA, H957-CA

The H957-BA and the H957-CA are right-hanging and left-hanging full-size doors, respectively, with steel skins attached. All exposed surfaces of these doors are painted an attractive, texturized Lamp Black. The H957-BA or H957-CA can be mounted on the rear of the short size H957-AA Cabinet Frame. These doors enhance the appearance of the system and tend to protect it against tampering and/or accidental damage.

The H957-BA attaches to the cabinet frame so that the door pivots on the right side, facing the cabinet. The H957-CA pivots on the left side.

The door can be installed in conjunction with the H957-DA or H957-EA Mounting Panel Door Frame using the mounting panel door frame hardware. When both are installed, the door and mounting panel frame pivot on the same side of the cabinet frame. The door is held in the closed position by magnetic latches located on the top and bottom. In addition, the door is equipped with a locking latch and key. For convenience, the door can be easily removed. All the required mounting hardware is supplied with the H957-BA or H957-CA door.

Specifications

Dimensions

See Figure 30 for the overall dimensions of the H957-BA and H957-CA Full Door.

Weight

16.0 lb (7.3 kg)

Mounting

The H957-BA mounts on the front or rear of the short size H957-AA Cabinet Frame as shown on Figure 31. The H957-CA mounts on the opposite side of the front or rear cabinet frame using the same hardware specified for the H957-BA.

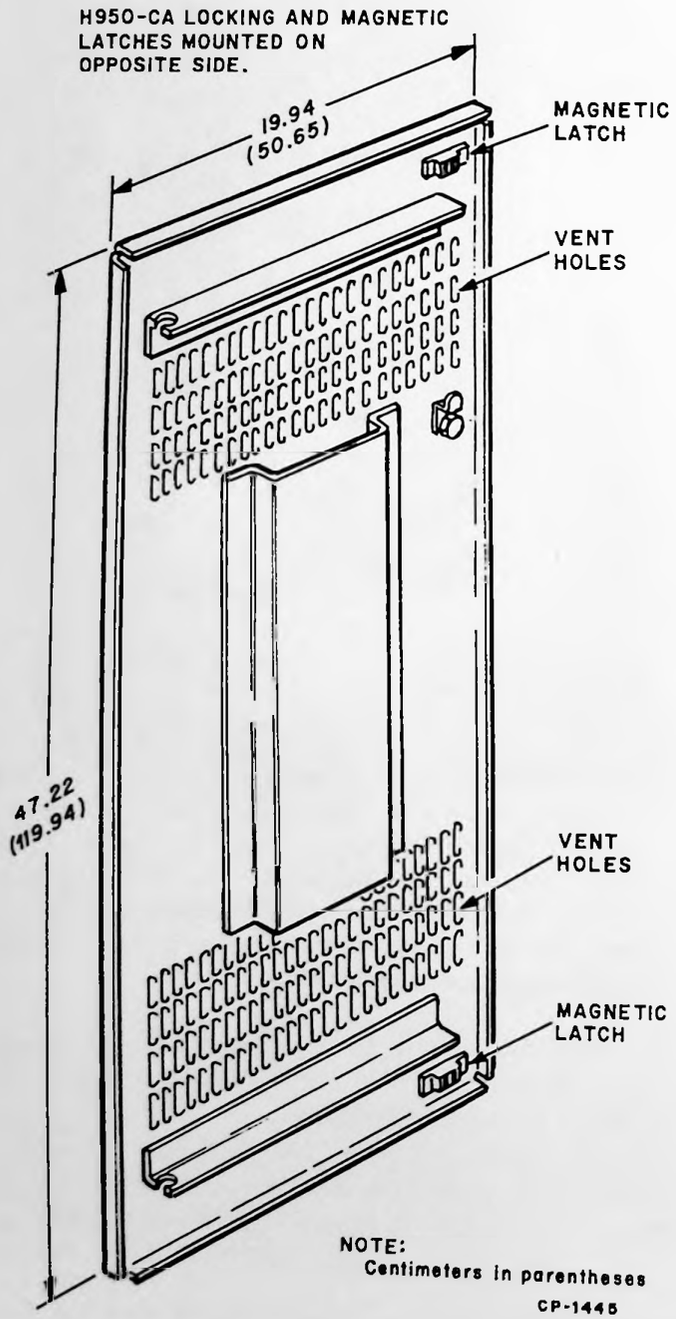
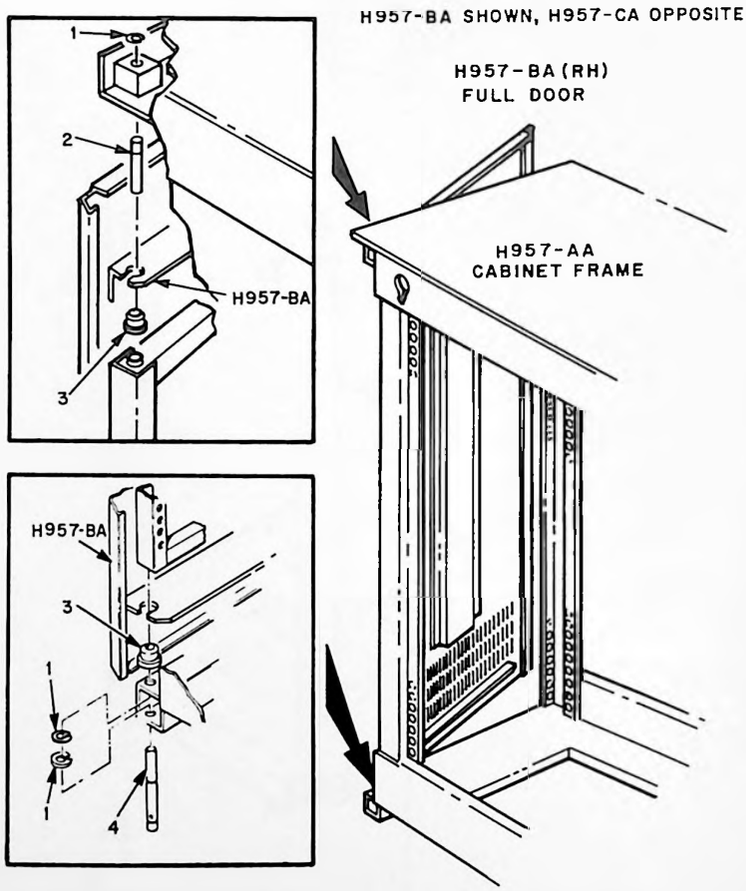


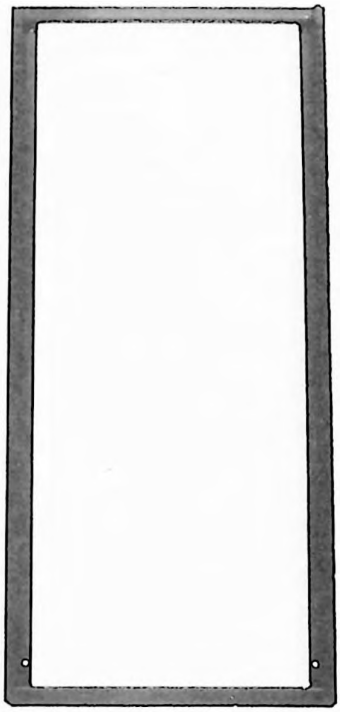
Figure 30 H957-BA and H950-CA Full Door Dimensions



ITEM NO.	DESCRIPTION	NO. REQ
1	E-RING (90-07184)	3
2	DOOR PIN (74-06816)	1
3	PIVOT BUSHING (74-06702)	2
4	DOOR PIN (74-06672)	1

Figure 31 H957-BA and H957-CA Full Door Installation

Mounting Panel Door Frame – H957-DA, H957-EA



The H957-DA and the H957-EA are right-hanging and left-hanging mounting door frames, respectively, which are usually mounted on the rear of the short size H957-AA Cabinet Frame. Panels or equipment designed to mount in standard 19-in. (48.26-cm) electronics cabinets or racks can be mounted on this door frame. The door frame uprights have predrilled, 0.25-in. (0.64-cm) diameter holes at standard EIA spacings.

A pin at the top of the cabinet releases the door frame when access to the interior of the cabinet is required. All the required mounting hardware is supplied with the H957-DA or H957-EA door frame.

Specifications

Dimensions

See Figure 32 for the overall dimensions of the H957-DA and H957-EA Mounting Panel Door Frame.

Weight

10.0 lb (4.54 kg)

Mounting

The H957-DA mounts on the rear of the short size H957-AA Cabinet Frame as shown on Figure 33. The H957-EA mounts on the opposite side of the rear of the cabinet frame using the same hardware specified for the H957-DA.

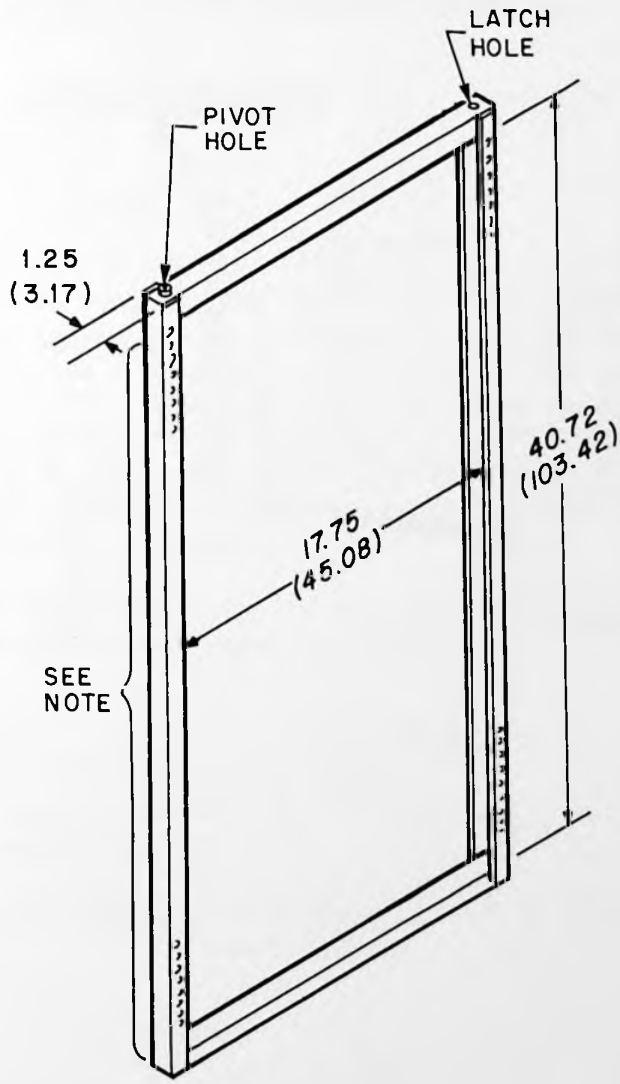
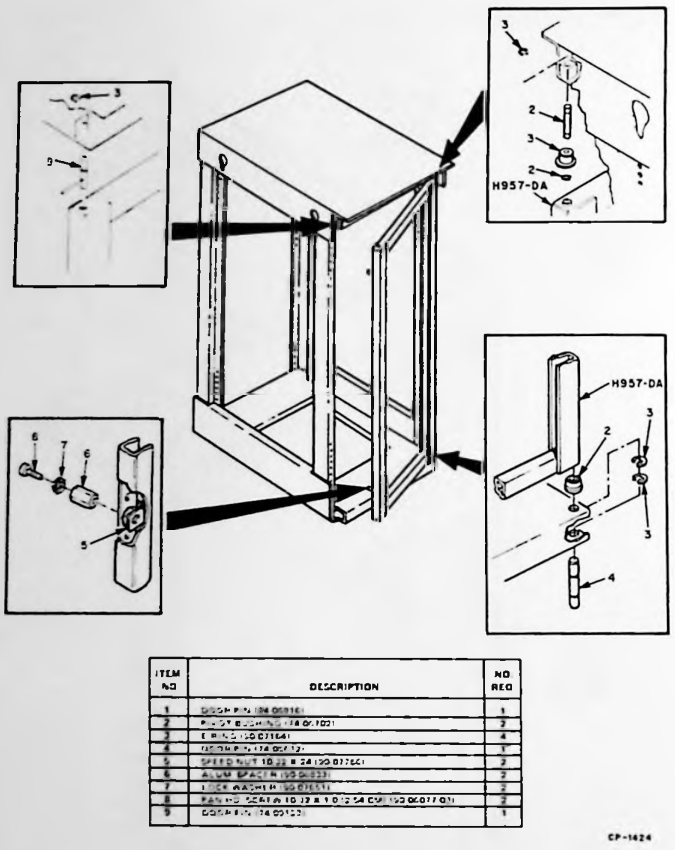


Figure 32 H957-DA and H957-EA Mounting Panel Door Frame Dimensions



ITEM NO	DESCRIPTION	NO. REQ
1		1
2		2
3		4
4		1
5		2
6		2
7		2
8		2
9		1

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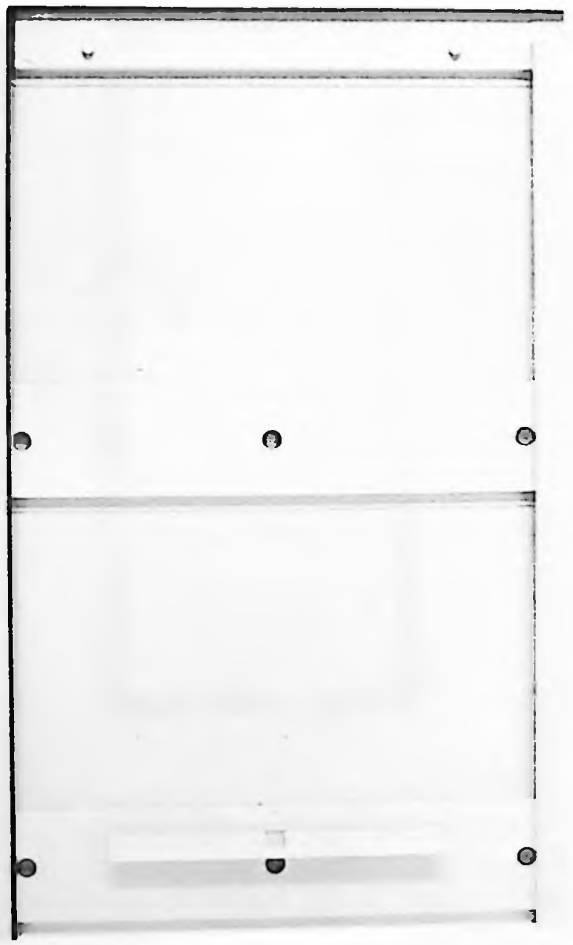
Figure 33 H957-DA and H957-EA Mounting Panel Door Frame Installation

End Panel – H957-FA, H957-FB



The H957-FA and the H957-FB are right and left steel reinforced end panels, painted Light Grey, which can be mounted on right or left sides of the short size H957-AA Cabinet Frame. The panels are easily attached or removed from the frame and require no additional hardware for installation. When two cabinets are joined to form a double-bay unit, the end panels cannot be used at the joining sides; then the H957-GA Filler Strip Set is installed between cabinets.

Specifications

Dimensions

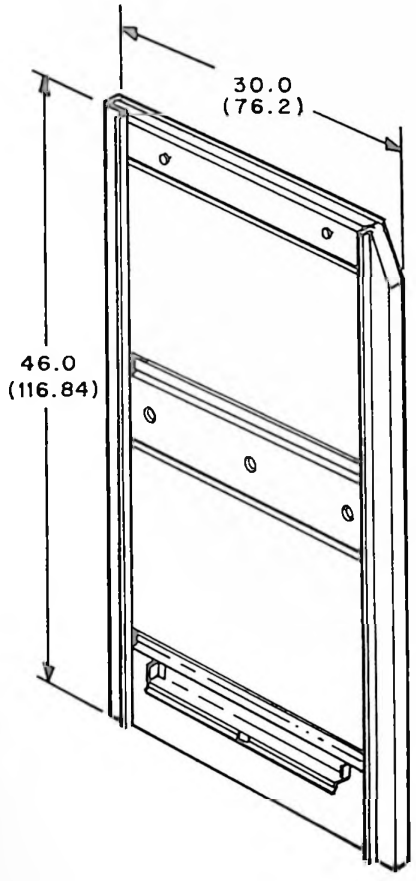
See Figure 34 for overall dimensions of the H957-FA and H957-FB End Panel.

Weight

32.0 lb (14.5 kg)

Mounting

The H957-FA mounts on the right side and the H957-FB mounts on the left side of the short size H957-AA Cabinet Frame. Holding tabs on the H957-FA and H957-FB insert into slotted holes at top of cabinet frame, and a holding plate inserts over the lower cabinet frame channel.



NOTES:
H957-FA shown, H957-FB opposite.
Same dimensions for H957-FB.
Centimeters in parentheses.
CP-1432

Figure 34 H957-FA and H957-FB End Panel Dimensions

Filler Strip Set – H957-GA

The H957-GA Filler Strip Set consists of a front, top, and rear filler strip. The H957-GA is installed between two short size H957-AA Cabinet Frames when the two cabinets are joined to form a multibay unit. Mounting holes are provided in the filler strips and in the top and bottom channels of the cabinet frames. The filler strips are held in place by the hardware used to join the cabinets. The H957-FA and H957-FB End Panels cannot be used on the joining sides of the cabinets.

All the hardware required to mount the filler strips and to join the cabinets is supplied with the H957-GA.

Specifications

Dimensions
Front filler strip: 47.50 in. (120.65 cm)
Rear filler strip: 47.20 in. (119.89 cm)
Top filler strip: 28.20 in. (71.63 cm)

Weight
4.0 lb (1.8 kg)

Mounting
The H957-GA Filler Strips mount between two short size H957-AA Cabinet Frames as shown on Figure 35.

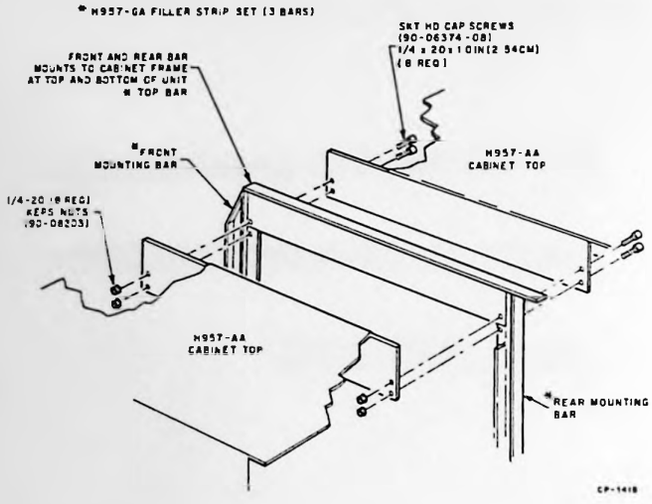
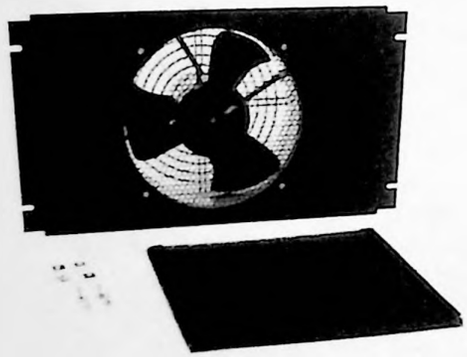


Figure 35 H957-GA Filler Strip Installation

Fan Assembly – H957-HA



The H957-HA Fan Assembly consists of a 19.0-in. (48.26-cm) panel-mounted fan and attached filter (H957-SA). The panel mounts on the mounting panel door frame (H957-DA or H957-EA), or it can be mounted on the front or rear of the cabinet frame (H957-AA). The normal direction of air flow is into the cabinet enclosure; however, the fan can be reversed and remounted to change the air-flow direction.

Two plastic retaining pads, connected to the panel front, are used to mount the H957-SA Filter. When the air-flow direction is out of the cabinet enclosure, the filter is not required.

The fan motor operates from a 115 Vac, 60 Hz power source. When 230 Vac is supplied, the H722 Step-Down Transformer (Section 5) can be used to reduce the input voltage to the required 115 Vac. The fan motor connects to the voltage source by two stripped and tinned leads. A terminal block and associated terminals are required for proper power connection.

Specifications

Input Voltage

115 Vac, 50/60 Hz at 0.82 A. Requires H722 Step-Down Transformer when used with 230 Vac.

Air Flow

Rated at 500 ft^3/min (14.15 m^3/min)

Weight

7.0 lb (3.2 kg), including panel

Dimensions

19.00 in. (48.26 cm) long, 10.50 in. (26.67 cm) high, 3.75 in. (9.53 cm) deep

Mounting

The H957-HA Fan Assembly mounts on a mounting panel door frame (H957-DA or H957-EA) or on the front or rear of a cabinet frame (H957-AA) as shown on Figure 36.

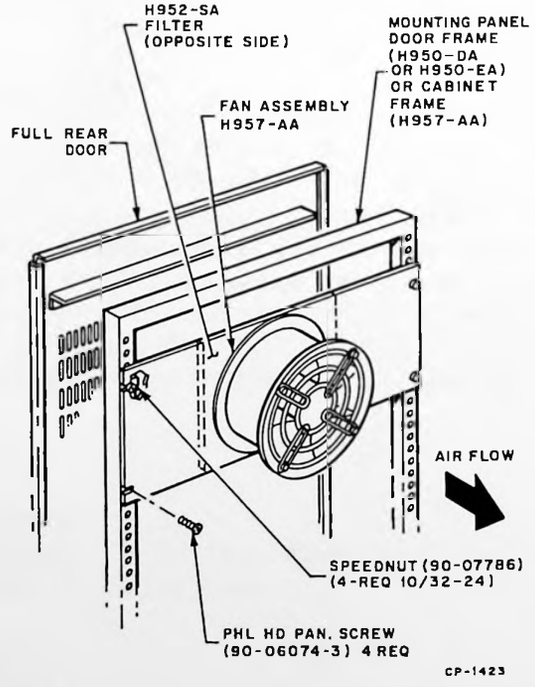


Figure 36 H957-HA Fan Assembly Installation

Bottom Cover Plate – H957-JA

The H957-JA Bottom Cover Plate is used to cover the screen in the bottom pan of the short size H957-AA Cabinet Frame when a fan assembly is not mounted on the bottom of the frame. Two 10-32 X 0.38-in. (0.97-cm) pan head screws are supplied with the plate to secure the plate to the cabinet frame.

Logo Frame Panel – H957-LA

The H957-LA Logo Frame Panel mounts at the top front of the short size H957-AA Cabinet Frame. The H957-LA is an aluminum panel that provides the surface for mounting a decorative adhesive inlay strip. One inlay strip is supplied as part of each cabinet assembly listed in Table 3. Your order must specify the color of the inlay strip desired; otherwise, 74-09583-2 (Bright Rose) will be supplied.

Specifications

Dimensions
See Figure 37 for overall dimensions.

Weight
3.0 lb (1.4 kg) approximate

Mounting
See Figure 37 for the panel mounting information. All mounting hardware is supplied.

Inlay Strips

DEC Part No.	Color
74-09583-1	Terra Cotta
74-09583-2	Bright Rose

Filter – H957-SA

The H957-SA Filter is used when an H957-AA Fan Assembly is mounted in a short size cabinet with the air-flow direction into the cabinet. When the air-flow direction is out of the cabinet, the filter is not required.

The filter is mounted on the fan assembly panel by pressing the filter onto the two plastic retaining pads that are on the panel. To remove the filter, gently pull the filter away from the two plastic retaining pads.

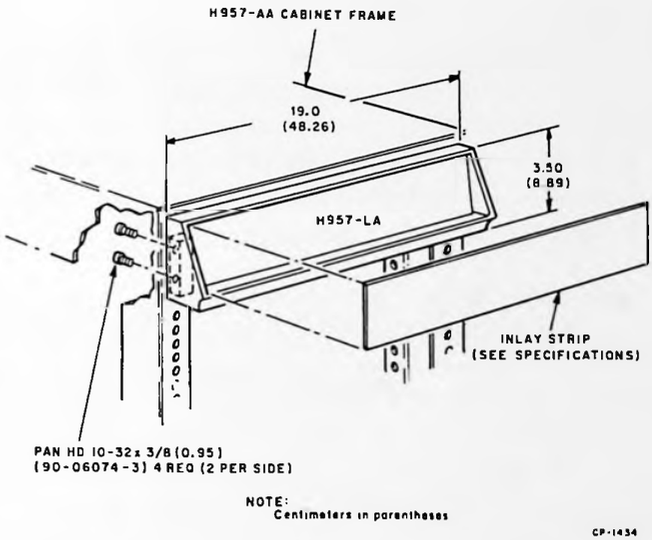


Figure 37 H957-LA Panel Mounting and Dimensions

CABINET HARDWARE

This subsection describes a variety of cabinet hardware which can be used on existing system cabinets or installed on the basic standard size or short size cabinet configurations. This hardware can also be purchased as replacement parts.

Paint (Touchup) – 29-15201, 29-15202, 29-15205

Paint is available in aerosol cans for touching up Digital Equipment Corporation manufactured cabinets. This paint is available in three colors: black, grey (bezel/68), and grey (end panel/101).

Tinnerman Clip Nut and Phillips Pan Head Screw Collection – 90-07786

This is a bagged collection of fifty 10-32 Tinnerman clip nuts, fifty 10-32 X 5/8-in. (1.5875-cm) Phillips pan head screws, and fifty size 10 lock washers.

Latch – 12-09224

The 12-09224 Latch is used to secure H950-PA or H950-QA Bezel Cover Panels to the front of either the standard size or short size cabinet frame (H950-AA or H957-AA). Refer to the description and illustration of the H950-PA (or H950-QA) Bezel Cover Panel.

Thick Latch – 12-11386

The 12-11386 Thick Latch is used to secure H950-PA or H950-QA Bezel Cover Panels to the front of either the standard size or short size cabinet frame (H950-AA or H957-AA). Refer to the description and illustration of the H950-PA (or H950-QA) Bezel Cover Panel.

Spacer – 74-07789

The 74-07789 Spacer is used to maintain alignment of H950-PA or H950-QA Bezel Cover Panels on the front of either the standard size or short size cabinet frame (H950-AA or H957-AA). Refer to the description and illustration of the H950-PA (or H950-QA) Bezel Cover Panel.

Key-Lock Strike Plate – 74-09819

The 74-09819 Key-Lock Strike Plate is used on a short size H957-AA Cabinet Frame as a strike plate for the key lock on the H957-BA or H957-CA Full Door when an H957-DA or H957-EA Mounting Panel Door Frame is not installed. The 74-09819 can be mounted on the left vertical cabinet frame rail to accommodate a right-hanging full door, or it can be mounted on the right vertical rail to accommodate a left-hanging full door. All the required mounting hardware is supplied with the 74-09819 Key-Lock Strike Plate.

Cabinet Door Ground Strap – 90-06990

The 90-06990 Cabinet Door Ground Strap is used to electrically connect the cabinet door to the cabinet frame to ensure that the cabinet door is not isolated from earth ground. The cabinet door should be connected to earth ground to prevent operating personnel from electrical shock if a short circuit should occur in the logic system.

The 90-06990 Cabinet Door Ground Strap is a braided-copper bonding jumper; it is 4.875 in. (12.383 cm) long and has a terminal on each end. Each terminal is equipped with a hole sized to accept a No. 10 screw.

One ground strap terminal should be secured to the cabinet frame, at the door hinge side, with a No. 10 screw and nut, and the other terminal should be secured to the cabinet door with a No. 10 screw and nut.

Cabinet Frame Ground Strap – 90-08887

The 90-08887 Cabinet Frame Ground Strap is used to electrically connect one cabinet frame to another cabinet frame to continue the common earth ground for the logic system cabinets.

The 90-08887 Cabinet Frame Ground Strap is a braided-copper bonding jumper; it is 11.00 in. (27.94 cm) long and has a terminal on each end. Each terminal is equipped with a hole sized to fit over an 0.313-in. (0.794-cm) diameter stud.

Each H950-AA and H957-AA Cabinet Frame is equipped with two threaded (5/16-18) copper studs, one on each side, inside the cabinet near the bottom panel. The ground strap should be installed on the threaded copper studs of two adjacent cabinet frames and a 5/16-18 nut should be used to secure each ground strap terminal. Each cabinet in a logic system should be connected to its adjacent cabinets to form a continuous path to an earth ground.

Section 2
Electronics Rack Mounting Panels, Four-Slot System Units, Nine-Slot System Units, Module System Enclosures and Hardware, and PDP-8/e Expansion Hardware

Digital Equipment Corporation offers a variety of 19-in. (48.26-cm) electronics rack mounting panels, four-slot system units, nine-slot (double) system units, system enclosures, and PDP-8/e expansion hardware to suit the requirements of almost any logic system. This section, which is divided into five parts, describes these items.

NINETEEN-INCH (48.26-CM) ELECTRONICS RACK MOUNTING PANELS

Mounting panels are designed to provide mounting space for module connector blocks and are usually used to expand a logic system. They are designed to mount in standard 19-in. (48.26-cm) electronics racks or cabinets.

One (H020) of these mounting panels is a bare frame for mounting module connector blocks, some (H911-J, H911-K, H911-R, H911-S, K943-R, and K943-S) are equipped with connector blocks and are prebused for power and ground, others (H913, H916, and H917) are equipped with connector blocks and a power supply and are prebused for power and ground, and one (H914) is a frame that is equipped with connector blocks but is not bused or wired for power or ground.

The following table summarizes the mounting panels described in this subsection; individual detailed descriptions follow the table. The hardware associated with mounting panels is also described in this subsection.

19-in. Rack Mounting Panels

Part Number	Description
H020	Blank mounting panel that accommodates eight connector blocks; mounts in a standard 19-in. (48.26-cm) electronics rack.

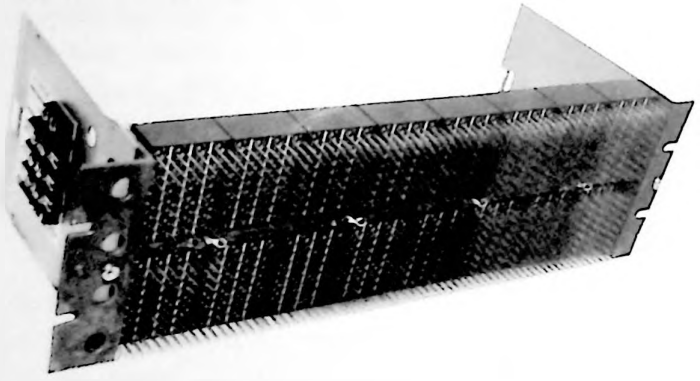
19-in. Rack Mounting Panels (Cont)

Part Number	Description
H911-J	H020 equipped with eight H803 Connector Blocks to accommodate 64 single-height or 32 double-height, standard length modules; bused for power and ground.
H911-K	Same as H911-J except wired and bused for power and ground.
H911-R	Same as H911-J except accommodates extended length modules.
H911-S	Same as H911-K except accommodates extended length modules.
H913	H020 equipped with an H710 Power Supply and four H808 Connector Blocks to accommodate 16 single-height or 8 double-height, standard length modules; bused for power and ground.
H914	H020 equipped with eight H808 Connector Blocks to accommodate 32 single-height or 16 double-height, standard length modules.
H916	H020 equipped with an H716 Power Supply and six H803 Connector Blocks to accommodate 48 single-height or 24 double-height, standard length modules; bused for power and ground.
H917	H020 equipped with an H716 Power Supply and four H808 Connector Blocks to accommodate 24 single-height or 12 double-height, standard length modules; bused for power and ground.

19-in. Rack Mounting Panels (Cont)

Part Number	Description
K943-R	H020 equipped with eight H800-W Connector Blocks to accommodate 64 single-height or 32 double-height modules with contact fingers on only one side; bused for power and ground. Connector blocks equipped with solder-fork pins for 24 AWG wire.
K943-S	Same as K943-R except equipped with eight H800-F Connector Blocks that have wire wrap pins for 24 AWG wire.

Mounting Panel – H911-J, H911-K, H911-R, H911-S



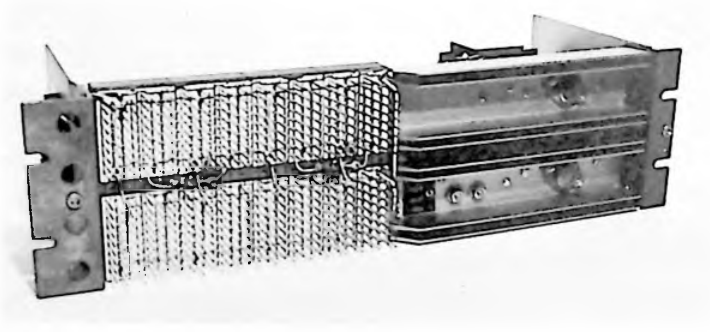
The H911 series Mounting Panels are 19-in. (48.26-cm) H020 Connector Block Mounting Frames equipped with eight 288-pin connector blocks (H803), which provide sixty-four 36-pin connector sockets that can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire.

Each of these mounting panels occupies 5.1875 in. (13.1763 cm) of vertical space. There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting bolt slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center. H911-J and H911-K are equipped with 6-in. (15.24-cm) standoff end plates (H021 and H022), i.e., they accommodate standard length modules. H911-R and H911-S are equipped with 9.4375-in. (23.9712-cm) standoff end plates (H023 and H024), i.e., they accommodate extended length modules.

All H911 Mounting Panels are bused for +5 Vdc power and ground. All A2 pins are bused for +5 Vdc power and all C2 and T1 pins are bused for ground. All H911 left end panels are equipped with a terminal block for connecting +5 Vdc power, ground, and -15 Vdc power. H911-K and H911-S are wired and bused for power and ground; that is, the +5 Vdc bus and the ground bus are wired to the terminal board. H911-J and H911-R are not wired for power or ground; however, H911-J and H911-R are bused for +5 Vdc and ground and the terminal block is installed.

A 1945-19 Hold-down Bar can be used with all H911 Mounting Panels to protect the system against vibration and prevent the modules from loosening. H001 or H002 Standoff Brackets and a 1907 or H950-PA Cover Panel can be used with all H911 Mounting Panels to enhance the appearance of the pin side of the mounting panel and to protect the system against tampering and/or accidental damage. Bus Strip 933 can be used with all H911 Mounting Panels to facilitate the busing of signals to identical pins. (Refer to Section 6 for a description of Bus Strip 933.)

Mounting Panel – H913



The H913 Mounting Panel is a 19-in. (48.26-cm) H020 Connector Block Mounting Frame equipped with an H710 Power Supply and four 144-pin connector blocks (H808) which provide sixteen 36-pin connector sockets that can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 24 AWG wire

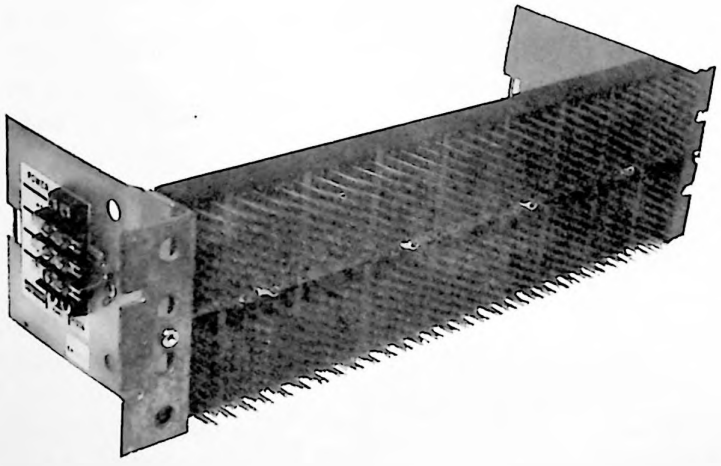
The H710 Power Supply provides +5 Vdc at up to 5 A. Primary power may be 105–125 or 210–250 Vac, 47–63 Hz. (Power Supply H710 is described in Section 5.) The H913 Mounting Panel is bused for +5 Vdc power and ground. All A2 pins are bused for +5 Vdc power and all C2 and T1 pins are bused for ground.

The H913 Mounting Panel occupies 5.1875 in. (13.1763 cm) of vertical space. There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting bolt slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center.

The H913 Mounting Panel is equipped with 6-in. (15.24-cm) standoff end plates (H021 and H022), i.e., it accommodates standard length modules.

The 1945-19 Hold-down Bar can be used with the H913 Mounting Panel to protect the system against vibration and prevent the modules from loosening. H001 and H002 Standoff Brackets and a 1907 or H950-PA Cover Panel can be used with the H913 Mounting Panel to enhance the appearance of the pin side of the mounting panel and to protect the system against tampering and/or accidental damage. Bus Strip 933 can be used with the H913 Mounting Panel to facilitate the busing of signals to identical pins. (Refer to Section 6 for a description of Bus Strip 933.)

Mounting Panel – H914



The H914 Mounting Panel is a 19-in (48.26-cm) H020 Connector Block Mounting Frame equipped with eight 144-pin connector blocks (H808), which provide thirty-two 36-pin connector sockets that can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 24 AWG wire.

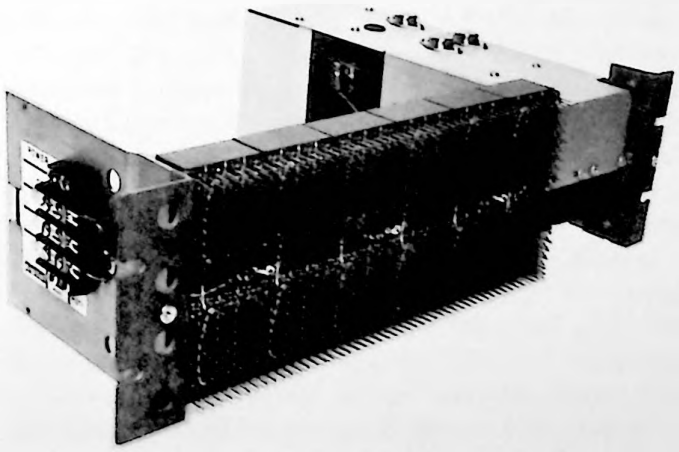
The H914 Mounting Panel is not prebused. The left end panel is equipped with a terminal block for connecting +5 Vdc power, ground, and -15 Vdc power. The H914 Mounting Panel occupies 5.1875 in. (13.1763 cm) of vertical space.

There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting bolt slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center.

The H914 Mounting Panel is equipped with 6-in. (15.24-cm) standoff end plates (H021 and H022), i.e., it accommodates standard length modules.

A 1945-19 Hold-down Bar can be used with the H914 Mounting Panel to protect the system against vibration and prevent the modules from loosening. H001 and H002 Standoff Brackets and a 1907 or H950-PA Cover Panel can be used with the H914 Mounting Panel to enhance the appearance of the pin side of the mounting panel and to protect the system against tampering and/or accidental damage. Bus Strip 933 can be used with the H914 Mounting Panel to facilitate the busing of power and signals to identical pins. (Refer to Section 6 for a description of Bus Strip 933.)

Mounting Panel – H916



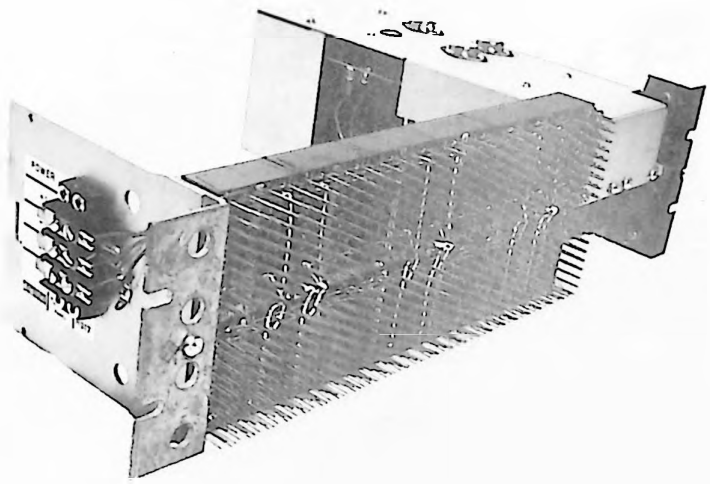
The H916 Mounting Panel is a 19-in. (48.26-cm) H020 Connector Block Mounting Frame equipped with an H716 Power Supply and six 288-pin connector blocks (H803), which provide forty-eight 36-pin connector sockets that can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire.

The H716 Power Supply provides +5 Vdc at up to 5.5 A and -15 Vdc at 1.5 A. Primary power may be 105–130 or 210–260 Vac, 47–63 Hz. (Power Supply H716 is described in Section 5.) The H916 Mounting Panel is bused for +5 Vdc power, -15 Vdc, and common (ground). All A2 pins are bused for +5 Vdc power, all B2 pins are bused for -15 Vdc power, and all C2 and T1 pins are bused for ground. The power and ground buses are connected to the H716 Power Supply via an installed wiring harness, which is equipped with solderless connectors at the power supply end.

The H916 Mounting Panel occupies 5.1875-in. (13.1763 cm) of vertical space. There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting bolt slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center.

Mounting Panel H916 is equipped with a 6-in. (15.24-cm) standoff end plate (H021) on the left end. The H716 Power Supply is on the right end of the H916; the H716 extends 13.13 in. (33.35 cm) back from the H916 mounting brackets. H001 or H002 Standoff Brackets and a 1907 or H950-PA Cover Panel can be used with the H916 Mounting Panel to enhance the appearance of the pin side of the mounting panel and to protect the system against tampering and/or accidental damage. Bus Strip 933 can be used with the H916 Mounting Panel to facilitate the busing of signals to identical pins. (Refer to Section 6 for a description of Bus Strip 933).

Mounting Panel – H917



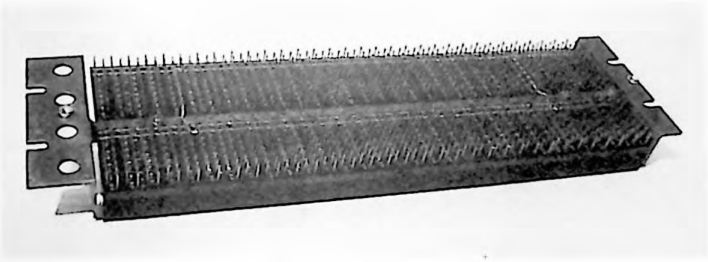
The H917 Mounting Panel is a 19-in. (48.26-cm) H020 Connector Block Mounting Frame equipped with an H716 Power Supply and six 144-pin connector blocks (H808), which provide twenty-four 36-pin connector sockets that can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 24 AWG wire.

The H716 Power Supply provides +5 Vdc at up to 4 A and -15 Vdc at 1.5 A. Primary power may be 108–132 or 216–264 Vac, 47–63 Hz. The H917 Mounting Panel is bused for +5 Vdc power, -15 Vdc, and common (ground). All A2 pins are bused for +5 Vdc power, all B2 pins are bused for -15 Vdc power, and all C2 and T2 pins are bused for ground. The power and ground buses are connected to the H716 Power Supply via an installed wiring harness equipped with solderless connectors at the power supply end.

The H917 Mounting Panel occupies 5.1875 in. (13.1763 cm) of vertical space. There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting bolt slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center.

Mounting Panel H917 is equipped with a 6-in. (15.24-cm) standoff end plate on the left end. The H716 Power Supply is on the right end of the H917; the H716 extends 12.56 in. (31.90 cm) back from the H917 mounting brackets. H001 or H002 Standoff Brackets and a 1907 or H950-PA Cover Panel can be used with the H917 Mounting Panel to enhance the appearance of the pin side of the mounting panel and to protect the system against tampering and/or accidental damage. Bus Strip 939 can be used with the H917 Mounting Panel to facilitate the busing of signals to identical pins. (Refer to Section 6 for a description of Bus Strip 939.)

Mounting Panel – K943-R, K943-S



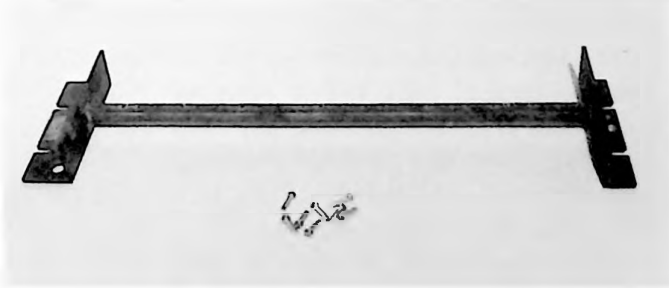
The K943 Mounting Panels are 19-in. (48.26-cm) H020 Connector Block Mounting Frames equipped with eight 144-pin connector blocks (H800), which provide sixty-four 18-pin connector sockets that can accommodate any of the FLIP CHIP modules with contacts on only one side (side 2). K943-S is equipped with wire wrap pins, which are designed to be wrapped with 24 AWG wire; K943-R is equipped with solder-fork pins.

Each of these mounting panels occupies 5.1875 in. (13.1763 cm) of vertical space. There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting bolt slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center.

All A pins are bused for +5 Vdc power and all C pins are bused for ground.

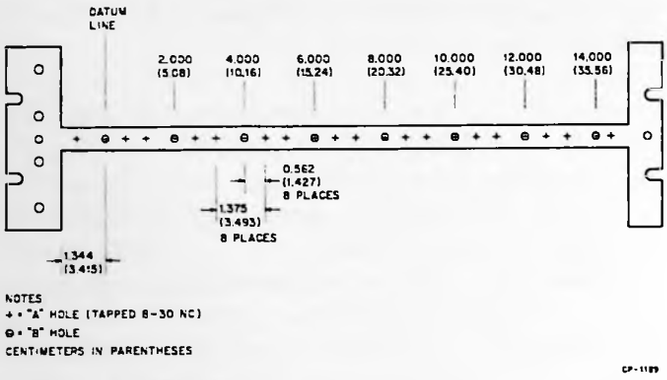
K980 or K981 Standoff End Plates and a 1907 Cover Panel can be used with Mounting Panels K943-R and K943-S to enhance the appearance of the module side of the mounting panel and to protect the system against vibration and tampering. H021 and H022 or H023 and H024 Standoff End Plates and a 1945-19 Hold-down Bar can also be used with Mounting Panels K943-R and K943-S to protect the system against vibration and to add stability to the system; or H001 or H002 Standoff Brackets and a 1907 or H950-PA Cover Panel can be used with Mounting Panels K943-R and K943-S to enhance the appearance of the pin side of the mounting panel and to protect the system against tampering and/or accidental damage.

Connector Block Mounting Frame – H020



The H020 Connector Block Mounting Frame is designed to accommodate a variety of Digital Equipment Corporation module connector blocks, power supplies, and other components. It is designed to fit in a standard 19-in. (48.26-cm) electronics rack or cabinet.

The horizontal mounting bar is drilled and tapped (8-32 NC) through 16 "A" places and drilled [0.125 in. (0.318 cm) diameter] through 8 "B" places as shown in the following illustration. The 16 tapped "A" holes provide mounting facilities for up to eight H800, H803, or H808 Module Connector Blocks; ground lugs can be mounted on the opposite side of the horizontal mounting bar by using any of the "A" holes for the mounting screws. Care should be exercised in selecting screw lengths when mounting ground lugs to prevent the two screws (one securing a module connector block and the other securing the ground lug) from bottoming out against each other. The eight "B" holes can be used for inserting 0.125-in. (0.318-cm) roll pins to position (key) the module connector blocks, thus precluding inverted installation of the connector blocks.

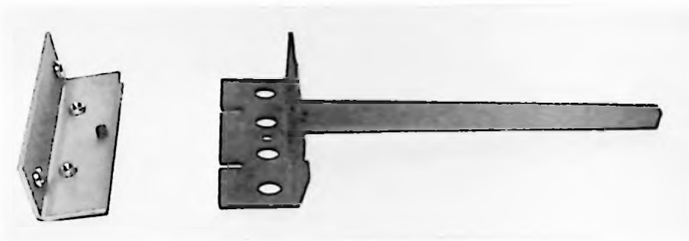


H020 Mounting Bar Connector Block Mounting Holes

The front surface of the left end of the H020 has four 0.500-in. (1.270-cm) diameter holes equally spaced 1.312 in. (3.332 cm) center-to-center; these can be used to mount user-supplied switches or other components. The front surface of each end is equipped with a 10-32 Perma-Nut (TM) centered vertically with the horizontal mounting bar and spaced horizontally 17.5938 in. (44.4488 cm) center-to-center. These Perma-Nuts can connect two or more H020 connector block frames, to permit mounting quad-height modules, by using two 55-08153 mounting panel stacking bars and 10-32 screws. The side of each end of the H020 is drilled with four 0.128-in. (0.325-cm) holes that align with the bolt holes in standoff end plates H021 and H022 or H024 and H025.

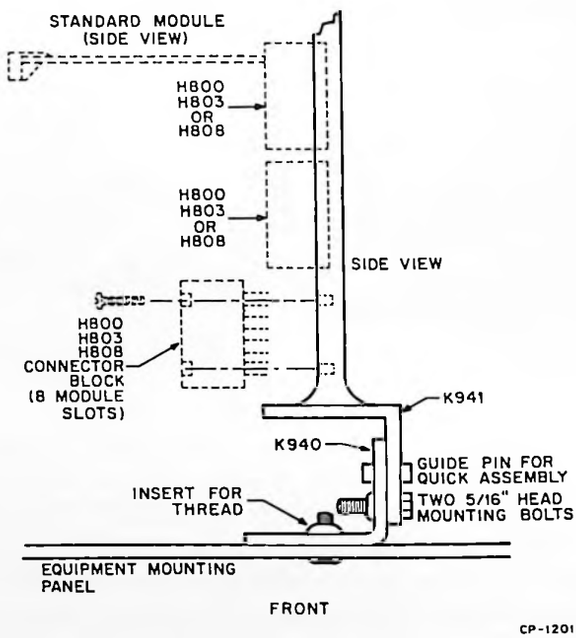
Each end of the H020 casting occupies 5.1875 in. (13.1763 cm) of vertical space. There are two 0.250-in. (0.635-cm) wide by 0.4375-in. (1.1113-cm) deep mounting slots on each end of the casting. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.125 in. (46.038 cm) center-to-center and are used to mount the H020 in an electronics rack or cabinet.

Mounting Support and Bracket – K940, K941



This convenient mounting hardware permits up to four connector blocks to be mounted on any convenient surface.

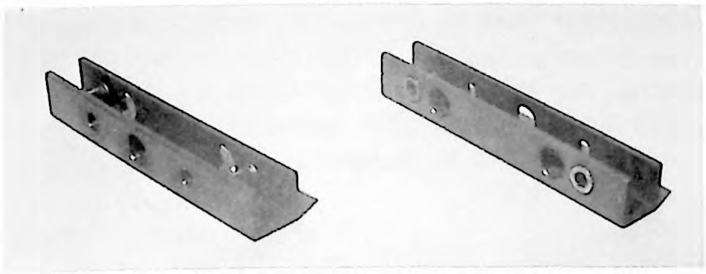
The K940 is a mounting support that attaches to the enclosure. (See the following diagram.) The K941 is a removable bracket that mounts up to four H800, H803, or H808 Connector Blocks.



K940 and K941 Mounting Support and Bracket

(TM) Perma-Nut is a trademark of Townsend Company.

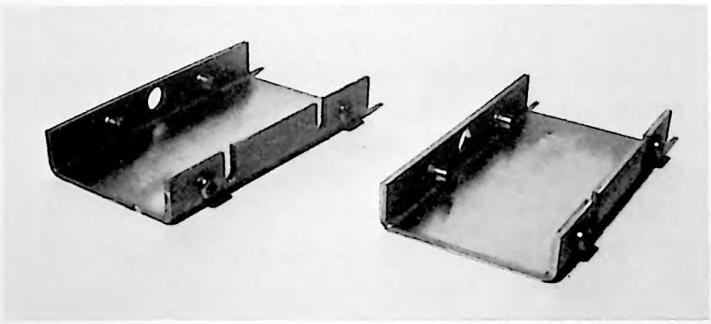
Standoff Bracket – H001



A pair of H001 Standoff Brackets provides a 0.75-in. (1.91-cm) standoff so a 1907 Cover Panel can be mounted over the pins and wiring of an H911, H913, H914, H916, or H917 Mounting Panel. A 1907 Cover Panel enhances the appearance of the system and protects the system against tampering and/or accidental damage.

The H001 Standoff Bracket's channel is drilled on one side with two 0.25-in. (0.635-cm) diameter holes spaced 2.25 in. (5.72 cm) center-to-center for attaching the bracket to the cabinet mounting rails. The other side of the channel is equipped with two inserts (tapped 10-32) spaced 3.375 in. (8.573 cm) center-to-center for attaching a 1907 Cover Panel.

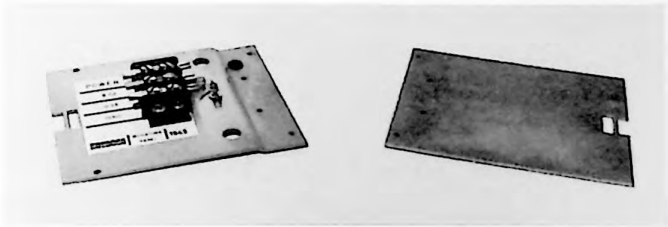
Standoff Bracket – H002



A pair of H002 Standoff Brackets provides a 2.75-in. (6.99-cm) standoff so a 1907 Cover Panel, user-equipped with switches, lamps, or other controls/indicators, or a user-supplied control panel, can be mounted over the pins and wiring of an H911, H913, H914, H916, or H917 mounting panel.

The H002 Standoff Bracket's channel is equipped on one side with two inserts (tapped 10-32), spaced 2.25 in. (5.715 cm) center-to-center, for attaching the bracket to cabinet mounting rails. The other side of the channel is equipped with two inserts (tapped 10-32), spaced 3.375 in. (8.573 cm) center-to-center, for attaching a 1907 Cover Panel; this side also has two 0.4375-in. (1.1113-cm) deep slots, with a 0.125-in. (0.318-cm) radius, spaced 2.25 in. (5.72 cm) center-to-center for attaching a user-supplied control panel that is equipped for mounting on frames drilled at standard EIA spaces.

Standoff End Plates – H021, H022



The H021 and H022 Standoff End Plates are designed to be attached to the sides of an H020 Connector Block Mounting Frame to provide strength to the mounting frame, protection for the system module, and a terminal block for dc power connections. H021, the right end plate, and H022, the left end plate, should be used when the system comprises standard length modules.

These end plates are notched to provide mounting facilities for a 1945-19 Hold-down Bar. H021 and H022 are drilled with four 0.141-in. (0.358-cm) diameter holes that align with the bolt holes in right and left sides, respectively, of an H020 Connector Block Mounting Frame. Each end plate occupies 5.1875 in. (13.1763 cm) of vertical space, the same as the H020.

The H022 is equipped with a three-section terminal block for +5 Vdc and −15 Vdc power distribution. The terminal block accepts both spade and quick-disconnect type terminals. Filtering capacitors (6.8 μF) are supplied and installed on the H022 End Plate. The H022 is equipped with a rubber grommet to prevent chaffing of user-supplied and connected power distribution wiring where it passes through the end plate.

Standoff End Plates – H024, H025

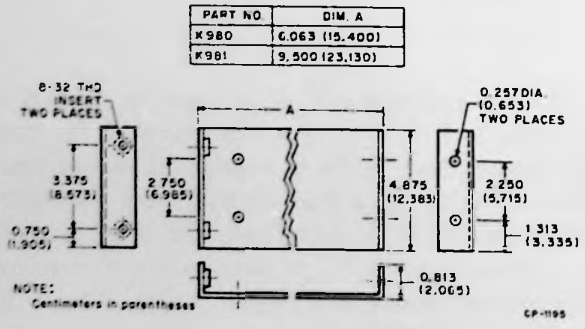
The H024 and H025 Standoff End Plates are the same as H021 and H022, respectively, except that they are used when the system comprises extended length modules. The H024 is the right end plate and H025 is the left end plate.

Standoff End Plates – K980, K981

The K980 and K981 Standoff End Plates are designed to attach to cabinet rails at the module side of a K943 Mounting Panel Frame and provide mounting facilities for a 1907 Cover Panel. When a pair of K980 or K981 Standoff End Plates are so configured with a K943 and a 1907, the modules are prevented from backing out of their mounting slots due to vibration; this configuration provides additional security to the system because the 1907 Cover Panel must be removed before the system modules can be physically accessed. The 1907 panel, however, is easily removed for maintenance and other authorized access. (The K943 and 1907 are more completely described elsewhere in this section.)

The K980 Standoff End Plates are designed to be used with systems that comprise standard length modules. (See the following illustration.)

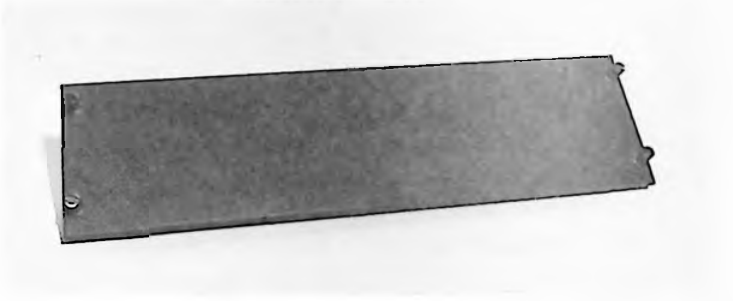
The K981 Standoff End Plates are designed to be used with systems that comprise extended length modules. (See the following illustration.)



K980 and K981 Standoff End Plates

The K980 and K981 have two 0.257-in. (0.653-cm) diameter holes spaced 2.250 in. (5.715 cm) center-to-center on one flange, and two 10-32 threaded inserts spaced 3.375 in. (8.573 cm) center-to-center. The 2.250-in. (5.715-cm) holes are used to secure the end plates to the cabinet rails using the hardware (bolts and screws) that secures the K943 Mounting Panel to the rails. The 10-32 threaded inserts are used to secure the 1907 Cover Panel via the captive screws in the 1907. (See the following illustration.)

Cover Panel – 1907 (Blue or Brown)



The 1907 19-in (48.26-cm) Cover Panel enhances the appearance of rack- or cabinet-mounted systems and also protects the system against tampering and/or accidental damage. It occupies 5.1875 in. (13.1763 cm) of vertical space; therefore, it is ideal for mounting over an H911, H913, H914, H916, or H917 Mounting Panel, since it will cover and protect the pins and wiring of the complete panel. It is equipped with four 10-32 captive screws spaced vertically 3.375 in. (8.573 cm) center-to-center and horizontally 18.25 in. (46.36 cm) center-to-center; this permits mounting on a standard 19-in. electronics rack or cabinet that is drilled at standard EIA spacings.

The 1907 Cover Panel is fabricated from 0.063-in. (0.160-cm) thick aluminum alloy and is painted either blue tweed or brown tweed. When a choice of color is not specified on an order, blue will be supplied.

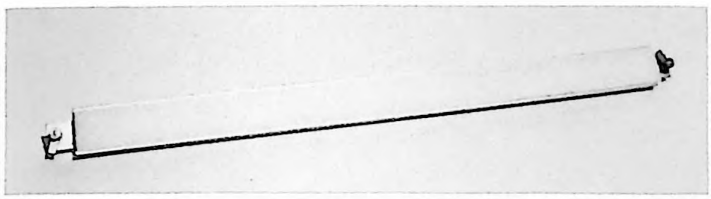
NOTE

Standoff brackets (H001 or H002) should also be ordered to provide standoff from the pins and wiring of a mounting panel and to provide ease of mounting the 1907 Cover Panel.

Cover Panel – H950-PA, H950-QA

The H950-PA and H950-QA are plastic cover panels that are designed to mount on the front of either a standard size or short size 19-in. (48.26-cm) cabinet to protect the equipment mounted within the cabinet. The H950-PA covers 5.12 in. (13.00 cm) of vertical space and the H950-QA covers 10.37 in. (26.34 cm) of vertical space. More complete descriptions of the H950-PA and H950-QA Cover Panels are included in Section 1.

Hold-Down Bar – 1945-19



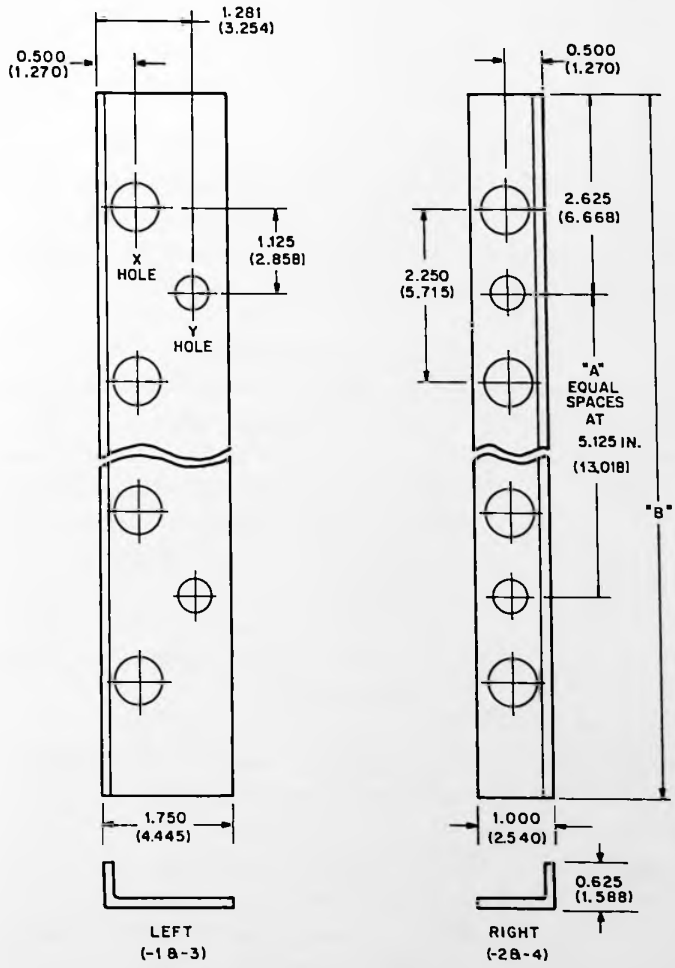
The 1945-19 Hold-down Bar is used to provide stability to a system and to protect the system modules against vibration damage. The 1945-19 is 18.065 in. (45.8788 cm) long and is fabricated to fit into notches on H021 and H022 (accommodating standard length modules) or H024 and H025 (accommodating extended length modules) Standoff End Plates. It has an adjustable pawl fastener on each end to secure it to the standoff end plates. A polyethylene foam strip on the 1945-19 protects the interfacing surfaces of the modules from scratches and abrasion.

Mounting Panel (H020) Stacking Bars – 55-08153-1, 55-08153-2, 55-08153-3, 55-08153-4

The 55-08153 Mounting Panel Stacking Bars are designed to provide stacking capabilities for two or three mounting panels. These stacking bars are particularly useful when two or three mounting panels are interconnected by backplane wiring; with the mounting panels held rigid, they can be installed in or removed from a cabinet as one physical unit without disturbing the interconnected backplane wiring. This permits wiring the backplanes in a shop and then installing the mounting panels in the system cabinet without danger of breaking the wiring or connections.

The 55-08153 Stacking Bars are designed to fit any of the mounting panels described in this catalog that are built on an H020 Connector Block Mounting Frame (H911, H913, H914, H916, H917, or K943). (The H020 Connector Block Mounting Frame is also described in this catalog.) The 55-08153 Stacking Bars are attached to a mounting panel with 10-32 screws by using the Perma-Nuts in each side of the mounting panel frames. The 55-08153 Stacking Bars are drilled with 0.625-in. (1.588-cm) diameter holes spaced 2.250 in. (5.715 cm) center-to-center to provide clearance for the bolts that secure the mounting panels to the cabinet frame. (See the following illustration.)

The 55-08153 Stacking Bars are available in two lengths: one length accommodates two mounting panels and the other length accommodates three mounting panels. Stacking Bars 55-08153-1 (for the left side) and 55-08153-2 (for the right side) accommodate two mounting panels. Stacking Bars 55-08153-3 (for the left side) and 55-08153-4 (for the right side) accommodate three mounting panels.



PART NO.	"A" SPACES	"B" DIM.
55-08153-1B-2	1	10.500 (26.670)
55-08153-2B-4	2	15.750 (40.005)

NOTE: Centimeters in parentheses.
"X" hole dia. 0.625 (1.588)
"Y" hole dia. 0.438 (1.111)

CP-1198

55-08153 Mounting Panel Stacking Bars

FOUR-SLOT SYSTEM UNITS

Four-slot units provide mounting sockets (slots) for logic system modules. They are designed to mount in the various module system enclosures also offered by Digital Equipment Corporation. Module system enclosures are described elsewhere in this section. Four-slot system units accept up to three four-slot module connector blocks mounted end to end. Since each of the module connector blocks used with these system units has two rows of slots, a fully complemented four-slot system unit provides mounting facilities for 24 single-height, 12 double-height, or four quad-height and eight single- (or four double-) height modules. Module connector blocks are described in Section 3.

One (H033) of the four-slot system units is a bare frame for mounting connector blocks, some (H933-A, H933-B, H933-CA, H933-CB, and H933-D) are equipped with connector blocks, and others (BB11, BB11-A, DD11-A, and DD11-B) are equipped with connector blocks, are prebused for power and ground, and are prewired for Unibus interfacing.

The following table summarizes the four-slot system units described in this subsection; individual detailed descriptions follow the table. The hardware associated with four-slot system units is also described in this subsection.

Four-Slot System Units

Part Number	Description
BB11	H033 equipped with one H803 and two H863 Connector Blocks to accommodate 24 single-height, 12 double-height, or 4 quad-height and 4 double- (or 8 single-) height modules; prewired for Unibus, power, and ground; used for general Unibus interfacing.
BB11-A	Same as BB11 except equipped with three H803 Connector Blocks.
DD11-A	H033 equipped with three H803 Connector Blocks to accommodate four SPCs, a Unibus input connector module, a Unibus terminator/extender module, and a power connector module, or four Unibus interface modules, four address selector modules (M105), four Unibus interrupt control modules, a Unibus input connector, a Unibus terminator/extender module, and a power connector module; prewired for Unibus, power, and ground.

Four-Slot System Units (Cont)

Part Number	Description
DD11-B	H033 equipped with three H803 Connector Blocks to accommodate four SPCs, two serial line interface signal conditioning modules (DF11), a Unibus input connector, and a Unibus terminator/extender module; prewired for Unibus, power, and ground.
H033	Blank four-slot system unit that accommodates three connector blocks; mounts in various module system enclosures.
H933-A	H033 equipped with three H800-W Connector Blocks to accommodate 24 single-height or 12 double-height modules with contact fingers on only one side.
H933-B	Same as H933-A except equipped with three H800-F Connector Blocks.
H933-C	Same as H933-A except equipped with H803 Connector Blocks.
H933-CA	Same as H933-A except equipped with one H803 and two H863 Connector Blocks.
H933-CB	Same as H933-A except equipped with three H863 Connector Blocks.
H933-D	H033 equipped with three H808 Connector Blocks to accommodate 12 single-height or 6 double-height modules.

System Unit – H933-A, H933-B, H933-C, H933-CA, H933-CB, and H933-D

The H933 series System Units are unwired units used for general system mounting. Six configurations are available: H933-A, H933-B, H933-C, H933-CA, H933-CB, and H933-D.

The H933-A System Unit is an H033 System Unit Mounting Frame equipped with three H800-W Module Connector Blocks. The H933-A provides mounting facilities for up to twenty-four 18-pin modules. The H800-W is equipped with wire wrap pins, which are designed to be wrapped with 24 AWG wire. A more complete description of the H800-W Module Connector Block is given in Section 3.

The H933-B System Unit is the same as the H933-A except that it is equipped with three H800-F Module Connector Blocks to provide mounting facilities for up to twenty-four 18-pin modules. The H800-F is equipped with solder-fork pins, which are designed to be used with 24 AWG wire. A more complete description of the H800-F Module Connector Block is given in Section 3.

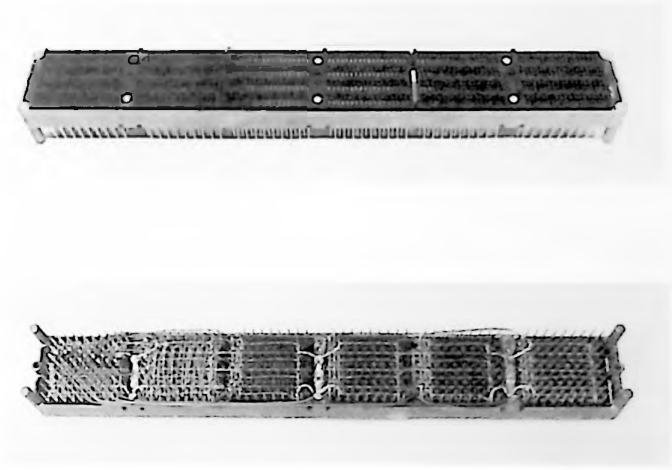
The H933-C System Unit is the same as the H933-A except that it is equipped with three H803 Module Connector Blocks to provide mounting facilities for up to twenty-four 36-pin modules. The H803 is equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire. A more complete description of the H803 Module Connector Block is given in Section 3.

The H933-CA System Unit is the same as the H933-A except that it is equipped with one H803 and two H863 Module Connector Blocks to provide mounting facilities for up to twenty-four 36-pin modules. The H803 and H863 are equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire. A more complete description of the H803 and H863 Module Connector Blocks is given in Section 3.

The H933-CB System Unit is the same as the H933-A except that it is equipped with three H863 Module Connector Blocks to provide mounting facilities for up to twenty-four 36-pin modules. The H863 is equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire. A more complete description of the H863 Module Connector Block is given in Section 3.

The H933-D System Unit is the same as the H933-A except that it is equipped with three H808 Module Connector Blocks to provide mounting facilities for up to twelve 36-pin modules. The H808 is equipped with wire wrap pins, which are designed to be wrapped with 24 AWG wire. A more complete description of the H808 Module Connector Block is given in Section 3.

System Interfacing Unit – BB11

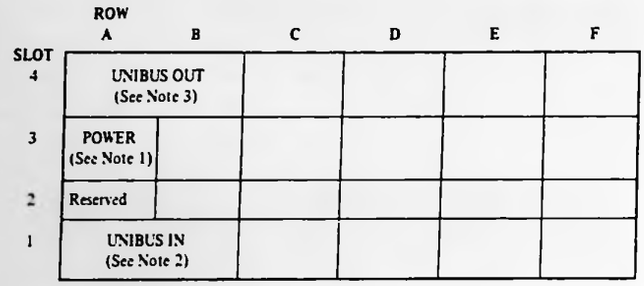


The BB11 System Interfacing Unit, which is used for general PDP-11 interfacing, is prewired for Unibus and power only. It is an H033 System Unit Mounting Frame equipped with one H803 and two H863 Module Connector Blocks. H803 and H863 Module Connector Blocks have eight 36-pin module slots. The BB11, therefore, provides twenty-four 36-pin connector sockets. (The H803 and H863 Module Connector Blocks are described more completely in Section 3.) Five of these sockets are used for bus and power connectors, and one is reserved because of power cable overhang. These six sockets are:

A1 and B1	UNIBUS IN
A2	Reserved
A3	POWER
A4 and B4	UNIBUS OUT

The remaining 18 sockets can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The 24 connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire. The following illustration shows the BB11 socket configuration.

The BB11 System Interfacing Unit is bused for +5 Vdc power, -15 Vdc power, and common (ground). All A2 pins are bused for +5 Vdc power; all B2 pins, except sockets A1, B1, A4, and B4, are bused for -15 Vdc power; and all C2 and T1 pins are bused for ground.



NOTES:

1. A G772 power connector is required at socket A3. The power supply cable (or 18 AWG wire) from a power supply can be soldered to the G772 terminals.

2. Unibus connector M920 is required at sockets A1 and B1 unless the BB11 is the first unit in an expander box; then a Unibus cable assembly (BC11-A-XX) is required at sockets A1 and B1.

3. Unibus connector M920 is required at sockets A4 and B4 unless the BB11 is the last unit on the Unibus; then an M930 Unibus terminator is required at sockets A4 and B4.

BB11 System Interfacing Unit
(Shown Pin Side Up)

POWER socket A3's pin assignments are listed in the table that follows. Power cable assemblies, described in the *DIGITAL Logic Handbook*, are available for supplying power to the BB11.

The pin assignments for UNIBUS IN sockets A1 and B1 and UNIBUS OUT sockets A4 and B4 are listed in the table below. An M920 Unibus connector is required at sockets A1 and B1 unless the BB11 is the first unit in an expander box; then a Unibus cable assembly (BC11A-XX) is required. An M920 Unibus connector is required at sockets A4 and B4, unless the BB11 is the last unit on the Unibus; then an M930 Unibus terminator is required.

The BB11 System Interfacing Unit is usually mounted in a PDP-11 Processor cabinet or in a BA11 Expansion Box. The BB11 is 16.50 in. (41.91 cm) long, 2.230 in. (5.664 cm) wide, and 1.590 in. (4.039 cm) high. The BB11 is equipped with two 8-32 captive mounting screws spaced 16.100 in. (40.894 cm) center-to-center and located 1.115 in. (2.832 cm) from either side.

BB11 Power Pin Assignments
(Socket A3)

Pin	Power	Pin	Power
A1	-15 V	L1	-15 V
A2	+5 V	L2	+5 V
B1	-15 V	M1	-15 V
B2	-15 V	M2	+5 V
C1	-15 V	N1	GND
C2	GND	N2	-25 V
D1	-15 V	P1	GND
D2	GND	P2	LTC L
E1	-15 V	R1	GND
E2	GND	R2	AC LO L
F1	-15 V	S1	GND
F2	GND	S2	DC LO L
H1	-15 V	T1	GND
H2	+5 V	T2	+8 V
J1	-15 V	U1	GND
J2	+5 V	U2	+8 V
K1	-15 V	V1	GND
K2	+5 V	V2	+8 V

BB11 Unibus Pin Assignments
(Sockets A1, B1 and A4, B4)

Pin	Signal	Pin	Signal
AA1	INIT L	BA1	BG 6 H
AA2	POWER (+5 V)	BA2	POWER (+5 V)
AB1	INTR L	BB1	BG 5 H
AB2	GND	BB2	GND
AC1	D00 L	BC1	BR 5 L

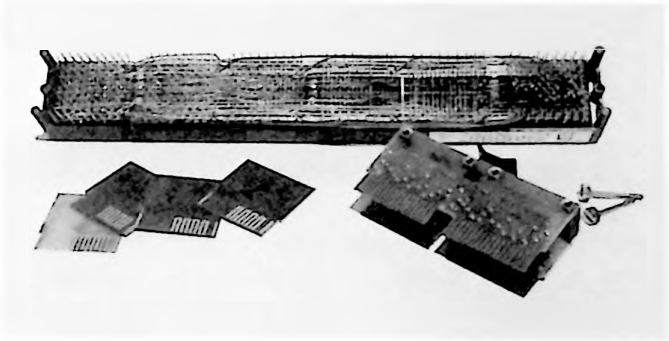
BB11 Unibus Pin Assignments (Cont)
(Sockets A1, B1 and A4, B4)

Pin	Signal	Pin	Signal
AC2	GND	BC2	GND
AD1	D02 L	BD1	GND
AD2	D01 L	BD2	BR 4 L
AE1	D04 L	BE1	GND
AE2	D03 L	BE2	BG 4 H
AF1	D06 L	BF1	AC LO L
AF2	D05 L	BF2	DC LO L
AH1	D08 L	BH1	A01 L
AH2	D07 L	BH2	A00 L
AJ1	D10 L	BJ1	A03 L
AJ2	D09 L	BJ2	A02 L
AK1	D12 L	BK1	A05 L
AK2	D11 L	BK2	A04 L
AL1	D14 L	BL1	A07 L
AL2	D13 L	BL2	A06 L
AM1	PA L	BM1	A09 L
AM2	D15 L	BM2	A08 L
AN1	GND	BN1	A11 L
AN2	PB L	BN2	A10 L
AP1	GND	BP1	A13 L
AP2	BBSY L	BP2	A12 L
AR1	GND	BR1	A15 L
AR2	SACK L	BR2	A14 L
AS1	GND	BS1	A17 L
AS2	NPR L	BS2	A16 L
AT1	GND	BT1	GND
AT2	BR 7 L	BT2	C1 L
AU1	NPG H	BU1	SSYN L
AU2	BR 6 L	BU2	C0 L
AV1	BG 7 H	BV1	MSYN L
AV2	GND	BV2	GND

System Interfacing Unit – BB11-A

The BB11-A System Interfacing Unit is the same as the BB11, except it is equipped with three H803 Module Connector Blocks, which are more fully described in Section 3.

System Interfacing Unit – DD11-A, DD11-B



The DD11 System Interfacing Unit, which is used for mounting up to four small peripheral controller (SPC) interfaces, is prewired for logic and Unibus signals and for power. It is an H033 System Unit Mounting Frame equipped with three 288-pin module connector blocks (H803), which provide twenty-four 36-pin connector sockets.

The DD11 System Interfacing Units are bused for +5 Vdc power, -15 Vdc power, and common (ground). All A2 pins are bused for +5 Vdc power; all B2 pins except sockets A1, B1, A4, and B4 are bused for -15 Vdc power; and all C2 and T1 pins are bused for ground.

Pin assignments for UNIBUS IN sockets A1 and B1 and UNIBUS OUT sockets A4 and B4 are listed in the table below. An M920 connector is required at sockets A1 and B1 unless the DD11 is the first unit in an expander box; then a Unibus cable assembly (BC11A-XX) is required. An M920 Unibus connector is required at sockets A4 and B4 unless the DD11 is the last unit on the Unibus; then an M930 Unibus terminator is required. An M920 connector is supplied with the DD11.

The DD11 requires specialized logic modules for the actual interface, since the pin assignments of all module slots are fixed for the various control and data signals. Examples of

such interfaces are the DR11-C General Purposes Interface (M7860), LP11 Printer Control (M7930), CR11 Card Reader Control (M8290), and KL11 Teletype® Control (M7800). Users may design interfaces to go into a DD11 by using M1710 modules that allow wire wrapping of the integrated circuit interconnections on the module; the control and data signals are SPC compatible.

DD11-A and DD11-B Unibus Pin Assignments (Sockets A1, B1 and A4, B4)

Pin	Signal	Pin	Signal
AA1	INIT L	BA1	BG 6 H
AA2	POWER (+5 V)	BA2	POWER (+5 V)
AB1	INTR L	BB1	BG 5 H
AB2	GND	BB2	GND
AC1	D00 L	BC1	BR 5 L
AC2	GND	BC2	GND
AD1	D02 L	BD1	GND
AD2	D01 L	BD2	BR 4 L
AE1	D04 L	BE1	GND
AE2	D03 L	BE2	BG 4 H
AF1	D06 L	BF1	AC LO L
AF2	D05 L	BF2	DC LO L
AH1	D08 L	BH1	A01 L
AH2	D07 L	BH2	A00 L
AJ1	D10 L	BJ1	A03 L
AJ2	D09 L	BJ2	A02 L
AK1	D12 L	BK1	A05 L
AK2	D11 L	BK2	A04 L
AL1	D14 L	BL1	A07 L
AL2	D13 L	BL2	A06 L
AM1	PA L	BM1	A09 L
AM2	D15 L	BM2	A08 L
AN1	GND	BN1	A11 L
AN2	PB L	BN2	A10 L
AP1	GND	BP1	A13 L
AP2	BBSY L	BP2	A12 L
AR1	GND	BR1	A15 L
AR2	SACK L	BR2	A14 L
AS1	GND	BS1	A17 L
AS2	NPR L	BS2	A16 L
AT1	GND	BT1	GND
AT2	BR 7 L	BT2	C1 L
AU1	NPG H	BU1	SSYN L
AU2	BR 6 L	BU2	C0 L
AV1	BG 7 H	BV1	MSYN L
AV2	GND	BV2	GND

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If any slots do not contain SPC modules, a G727 Grant Continuity module must be installed in the respective slot D. Four G727 modules are supplied with the DD11.

There are two versions of the DD11; the differences are:

Prewired area

DD11-A	4 SPC slots
DD11-B	4 SPC slots plus 2 DF11 slots*

Mounting

DD11-A	BA11-ES can be used
DD11-B	BA11-ES cannot be used (for power connection reasons)

Power connections

DD11-A	Module for power plugs into slot A3
DD11-B	Tabs on wire wrap pin side

Pin assignments for DD11-A POWER socket A3 are listed in the following table. Power cable assemblies are available for supplying power to the DD11-A. Power to the DD11-B must be connected at the tabs on the wire wrap pin side. Power cable assemblies are available for supplying power to the DD11-B. Power cable assemblies are described in the *DIGITAL Logic Handbook*. Power connector G772 must *not* be plugged into any slots on DD11-B.

The DD11-A System Interfacing Unit is usually mounted in a PDP-11 Processor cabinet or a BA11 Expansion Box. The DD11-B System Interfacing Unit cannot be mounted in a BA11 Expansion Box (for power connection reasons); it is usually mounted in a PDP-11 Processor cabinet. DD11-A and DD11-B are 16.50 in. (41.91 cm) long, 2.230 in. (5.664 cm) wide, and 1.590 in. (4.039 cm) high. The DD11-A and DD11-B are each equipped with two 8-32 captive mounting screws spaced 16.100 in. (40.894 cm) center-to-center and located 1.115 in. (2.832 cm) from either side.

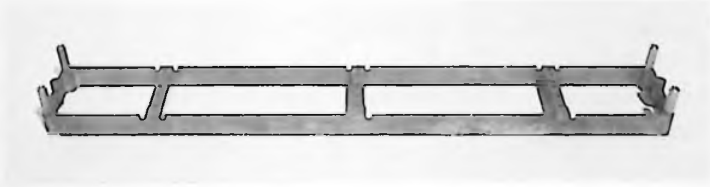
*DF11 serial line interface signal conditioning modules furnish flexible electrical and physical signal conditioning between most Digital Equipment Corporation interface equipment and terminals, and commonly used serial communications channels. Details relative to the DF11 module are contained in the DEC's *Peripherals Handbook*.

DD11-A* Power Pin Assignments
(Socket A3)

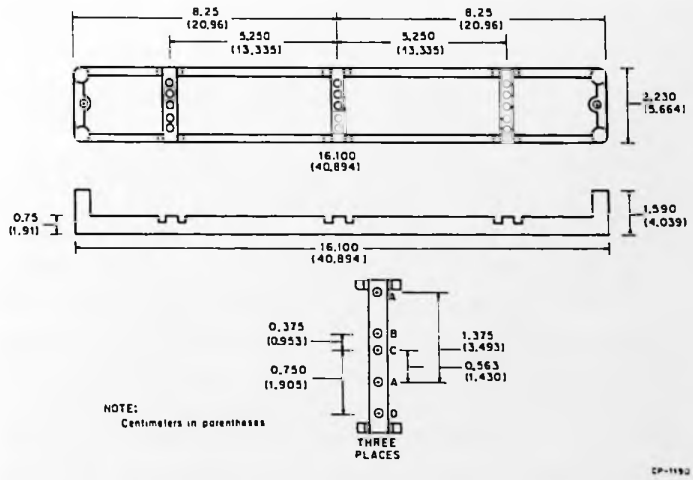
Pin	Power	Pin	Power
A1	-15 V	L1	-15 V
A2	+5 V	L2	+5 V
B1	-15 V	M1	-15 V
B2	-15 V	M2	+5 V
C1	-15 V	N1	GND
C2	GND	N2	-25 V
D1	-15 V	P1	GND
D2	GND	P2	LTC L
E1	-15 V	R1	GND
E2	GND	R2	AC LO L
F1	-15 V	S1	GND
F2	GND	S2	DC LO L
H1	-15 V	T1	GND
H2	+5 V	T2	+8 V
J1	-15 V	U1	GND
J2	+5 V	U2	+8 V
K1	-15 V	V1	GND
K2	+5 V	V2	+8 V

*On the DD11-B, power is input at tabs on the wire wrap pin side.

System Unit Mounting Frame – H033



The H033 System Unit Mounting Frame is a blank system unit casting that is not equipped with connector blocks; it is, however, drilled at locations that permit mounting up to three module connector blocks of Digital Equipment Corporation types H800-F, H800-W, H803, H808, or H863. (Module connector blocks are described in Section 3.) The H033 is drilled [0.149/0.156 in. (0.378/0.396 cm) diameter] through six "A" places and three "B" places. (See the following illustration.) It is equipped with an 0.125-in. (0.318-cm) diameter roll pin that protrudes 0.12 in. (0.30 cm) on one side and 0.255 in. (0.648 cm) on the other side (three "C" places) and an 0.125-in. (0.318-cm) diameter roll pin that protrudes 0.12 in. (0.304 cm) on one side only (three "D" places). Each pair of holes "A" can be used to secure one of the above mentioned module connector blocks. The protruding roll pins at the associated "C" and "D" places preclude inverted and/or rotated installation of the connector block. Two 8-32 self-tapping panhead screws, 0.625 in. (1.588 cm) long, should be used to secure each module connector block. The H033 is 16.50 in. (41.91 cm) long, 2.230 in. (5.664 cm) wide, and 1.590 in. (4.039 cm) high. Two 0.187-in. (0.475-cm) diameter holes spaced 16.100 in. (40.894 cm) center-to-center and located 1.115 in. (2.832 cm) from either side can be used to mount the H033. The H033 can be easily mounted on an H014 Mounting Panel. System unit mounting frame stops, 74-07512 or 74-07513, can be used to connect two or three H033 System Unit Mounting Frames to permit interconnection backplane wiring; the frames can then be moved for installation or maintenance as a single unit.



H033 System Unit Mounting Frame

Mounting Panel – H014

The H014 Mounting Panel is designed for mounting in a standard 19-in. (48.26-cm) electronics rack or cabinet that is drilled at standard EIA spacings. It provides mounting space for an H726 Power Supply or an H933 System Unit.

When an H933 System Unit on the H014 is mounted in an electronics rack or cabinet, the H933's backplane pins are easily accessible for soldering, wire wrapping, and/or maintenance test probing.

The H014 occupies 5.19 in. (13.18 cm) of vertical space. There are two 0.24-in. (0.61-cm) wide by 0.44-in. (1.12-cm) deep bolt mounting slots on each side of the mounting panel. The mounting slots are spaced vertically 2.25 in. (5.72 cm) center-to-center and horizontally 18.12 in. (46.02 cm) center-to-center.

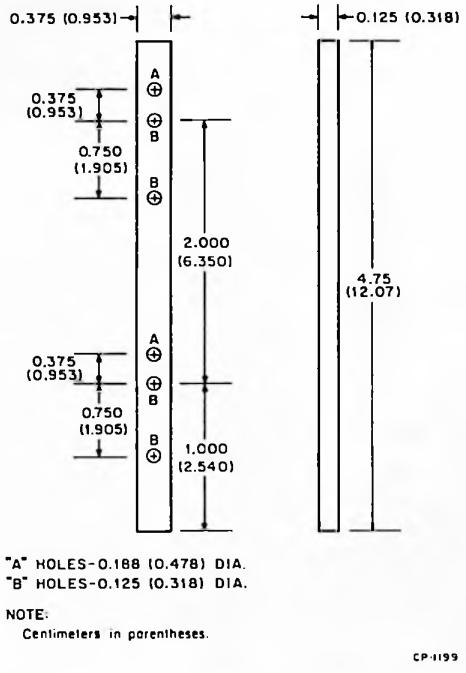
The H014 has two 8-32 threaded inserts spaced vertically 16.125 in. (40.958 cm) center-to-center with the centers located 2.59 in. (6.58 cm) from either end. These threaded inserts provide mounting locations for an H726 Power Supply or an H933 System Unit.

System Unit (H033) Mounting Frame Straps – 74-07512, 74-07513

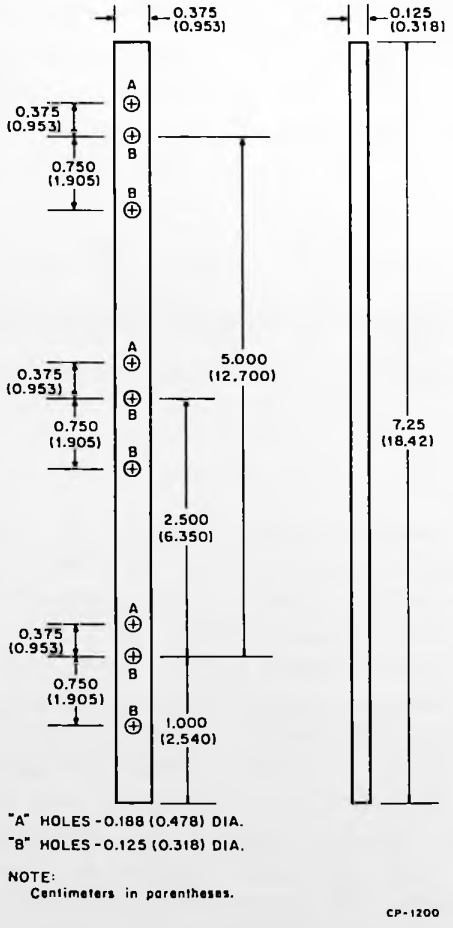
The 74-07512 and 74-07513 System Unit Mounting Frame Straps are used to connect system units built on H033 System Unit Mounting Frames. These mounting frame straps are particularly useful when two or three system units are interconnected by backplane wiring; with the system units held rigid, they can be installed in or removed from a cabinet as one unit without disturbing the interconnected backplane wiring. This permits wiring the backplanes in a shop and then installing the system units in the system cabinet without danger of breaking the wiring or interconnections.

The 74-07512 and 74-07513 Mounting Frame Straps are designed to fit any of the system units described in this catalog that are built on an H033 System Unit Mounting Frame (BB11, DD11, or H933 series). (The H033 System Unit Mounting Frame is also described in this catalog.) A pair of 74-07512 or 74-07513 Mounting Straps is attached to the pin side of system units with the screws that are used to attach the two outer ground lugs on each mounting frame. The "A" holes shown on the following illustrations are to be used with the screws attaching the ground lugs; the "B" holes are to provide clearance for the roll pins in the H033 frame.

The 74-07512 Mounting Straps accommodate two system units, and 74-07513 Mounting Straps accommodate three system units. The 74-07512 and 74-07513 Mounting Frame Straps are drilled as shown on the following illustrations.



74-07512 System Unit Mounting Frame Straps



74-07513 System Unit Mounting Frame Straps

NINE-SLOT SYSTEM UNITS

Nine-slot system units, like four-slot system units, provide mounting sockets (slots) for logic system modules. They, too, are designed to mount in the various module system enclosures offered by Digital Equipment Corporation. Nine-slot system units accept up to six four-slot and three one-slot module connector blocks mounted in three groups (one four-slot, one one-slot, and one four-slot module) mounted end to end. Since each of the module connector blocks used with these system units has two rows of slots, a fully complemented nine-slot system unit provides mounting facilities for 54 single-height, 27 double-height, or 9 quad-height and 16 single- (or 8 double-) height modules. Module connector blocks are described in Section 3.

One of the nine-slot system units (H034) is a bare frame for mounting connector blocks, one (H934-CB) is equipped with connector blocks, and one (BB11-B) is equipped with connector blocks, is prebused for power and ground, and is prewired for Unibus interfacing.

The following table summarizes the nine-slot system units described in this subsection; individual descriptions follow the table.

Nine-Slot System Units

Part Number	Description
BB11-B	H034 equipped with six H863 and three H8030 Connector Blocks to accommodate 54 single-height modules, 27 double-height modules, or 9 quad-height and 8 double- (or 16 single-) height modules; prewired for Unibus, power, and ground. Used for general Unibus interfacing.
H034	Blank nine-slot system unit that can accommodate six H863 and three H8030 Connector Blocks; mounts in various module system enclosures.
H934-CB	Same as BB11-B except not prewired for Unibus, power, or ground.

Double System Unit – H934-CB

The H934-CB Double System Unit is an unwired unit used for general system mounting. The H934-CB System Unit is an H034 Double System Unit Mounting Frame equipped with six H863 Module Connector Blocks and three H8030 Module Connector Blocks. The H934-CB provides mounting facilities for up to fifty-four 36-pin modules. The H863 and H8030 are equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire. A more complete description of the H863 and H8030 Module Connector Blocks is included in Section 3.

Double System Interfacing Unit – BB11-B

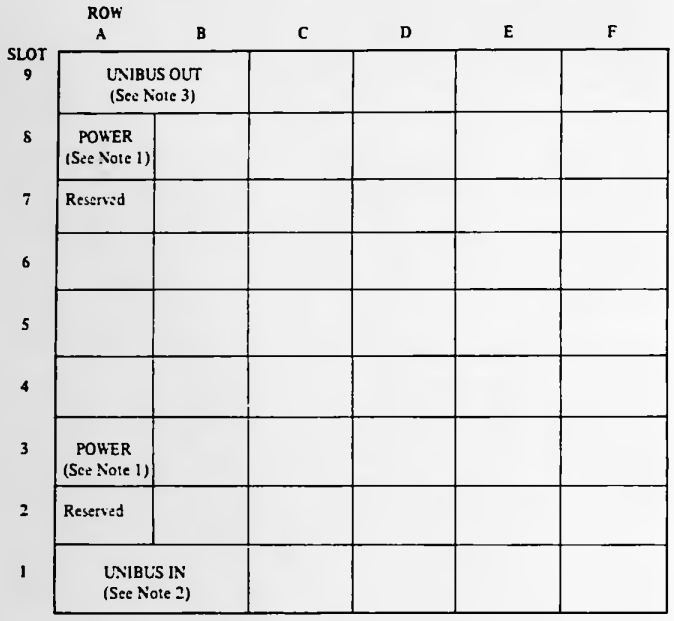
The BB11-B Double System Interfacing Unit, which is used for general PDP-11 interfacing, is prewired for Unibus and power only. It is an H034 Double System Unit Mounting Frame equipped with six H863 and three H8030 Module Connector Blocks. H863 Module Connector Blocks have eight 36-pin module slots; the H8030 Module Connector Blocks have two 36-pin module slots. The BB11-B, therefore, provides fifty-four 36-pin connector sockets. (The H863 and H8030 Module Connector Blocks are more completely described in Section 3.) Eight of these sockets are used for bus and power connections and two are reserved because of power cable overhang. These eight sockets are as follows:

A1 and B1	UNIBUS IN
A2 and A7	Reserved
A3 and A8	POWER (socket A8 is common with socket A3)
A9 and B9	UNIBUS OUT

The remaining 46 sockets can accommodate any of the FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The 54 connector sockets are equipped with wire wrap pins which are designed to be wrapped with 30 AWG wire. The following illustration shows the BB11-B socket configuration.

The BB11-B System Interfacing Unit is bused for +5 Vdc power, -15 Vdc power, and common (ground). All A2 pins are bused for +5 Vdc power; all B2 pins, except sockets A1, B1, A9, and B9, are bused for -15 Vdc power; and all C2 and T1 pins are bused for ground.

POWER sockets A3 and A8's pin assignments are listed in the following table. Power cable assemblies, described in the *DIGITAL Logic Handbook*, are available for supplying power to the BB11-B.



NOTES:

1. A G772 power connector is required at sockets A3 and A8. The power supply cable (or 18 AWG wire) from a power supply can be soldered to the G772 terminals.

2. Unibus connector M920 is required at sockets A1 and B1 unless the BB11-B is the first unit in an expander box; then a Unibus cable assembly (BC11A-XX) is required at sockets A1 and B1.

3. Unibus connector M920 is required at sockets A9 and B9 unless the BB11-B is the last unit on the Unibus; then an M930 Unibus terminator is required at sockets A9 and B9.

BB11-B Double System Interfacing Unit
(Shown Pin Side Up)

Pin assignments for UNIBUS IN sockets A1 and B1 and UNIBUS OUT sockets A9 and B9 are listed in the following table. An M920 Unibus connector is required at sockets A1 and B1 unless the BB11-B is the first unit in an expander box; then a Unibus cable assembly (BC11A-XX) is required.

BB11-B Unibus Pin Assignments
(Sockets A1, B1 and A9, B9)

Pin	Signal	Pin	Signal
AA1	INIT L	BA1	BG 6 H
AA2	POWER (+5 V)	BA2	POWER (+5 V)
AB1	INTR L	BB1	BG 5 H
AB2	GND	BB2	GND
AC1	D00 L	BC1	BR 5 L
AC2	GND	BC2	GND
AD1	D02 L	BD1	GND
AD2	D01 L	BD2	BR 4 L
AE1	D04 L	BE1	GND
AE2	D03 L	BE2	BG 4 H
AF1	D06 L	BF1	AC LO L
AF2	D05 L	BF2	DC LO L
AH1	D08 L	BH1	A01 L
AH2	D07 L	BH2	A00 L
AJ1	D10 L	BJ1	A03 L
AJ2	D09 L	BJ2	A02 L
AK1	D12 L	BK1	A05 L
AK2	D11 L	BK2	A04 L
AL1	D14 L	BL1	A07 L
AL2	D13 L	BL2	A06 L
AM1	PA L	BM1	A09 L
AM2	D15 L	BM2	A08 L
AN1	GND	BN1	A11 L
AN2	PB L	BN2	A10 L
AP1	GND	BP1	A13 L
AP2	BBSY L	BP2	A12 L
AR1	GND	BR1	A15 L
AR2	SACK L	BR2	A14 L
AS1	GND	BS1	A17 L
AS2	NPR L	BS2	A16 L
AT1	GND	BT1	GND
AT2	BR 7 L	BT2	C1 L
AU1	NPG H	BU1	SSYN L
AU2	BR 6 L	BU2	C0 L
AV1	BG 7 H	BV1	MSYN L
AV2	GND	BV2	GND

An M920 Unibus connector is required at sockets A9 and B9 unless the BB11-B is the last unit on the Unibus; then an M930 Unibus terminator is required.

BB11-B Power Pin Assignments
(Sockets A3 and A8)

Pin	Power	Pin	Power
A1	-15 V	L1	-15 V
A2	+5 V	L2	+5 V
B1	-15 V	M1	-15 V
B2	-15 V	M2	+5 V
C1	-15 V	N1	GND
C2	GND	N2	-25 V
D1	-15 V	P1	GND
D2	GND	P2	LTC L
E1	-15 V	R1	GND
E2	GND	R2	AC LO L
F1	-15 V	S1	GND
F2	GND	S2	DC LO L
H1	-15 V	T1	GND
H2	+5 V	T2	+8 V
J1	-15 V	U1	GND
J2	+5 V	U2	+8 V
K1	-15 V	V1	GND
K2	+5 V	V2	+8 V

The BB11-B System Interfacing Unit is usually mounted in a PDP-11 Processor cabinet or in a BA11 Expansion Box. The BB11-B is 16.524 in. (41.971 cm) long and 4.770 in. (12.116 cm) wide. It is equipped with threaded mounting holes as described and illustrated in the H034 Double System Unit Mounting Frame description.

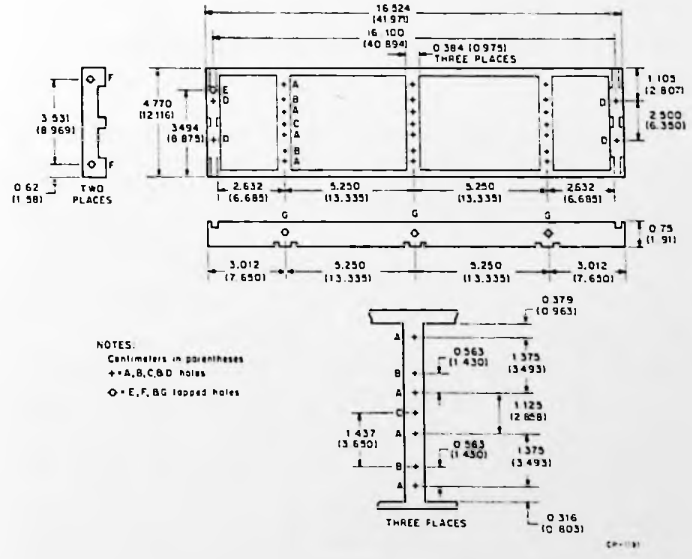
Double System Unit Mounting Frame – H034

The H034 Double System Unit Mounting Frame is designed to accommodate a variety of Digital Equipment Corporation module connector blocks. It is designed to fit in a PDP-11 Processor cabinet or in a BA11 Expansion Box; it provides the space for mounting the modules that would otherwise require two system units (i.e., two BB11s or two DD11s).

The three vertical mounting bars are drilled [0.149/0.156 in. (0.378/0.396 cm) diameter] through twelve "A" and three "C" places and drilled [0.125/0.128 in. (0.318/0.325 cm) diameter] through six "B" places as shown in the following illustration. The twelve "A" holes provide mounting facilities for up to six H800, H803, H808, or H863 (288-pin) Module Connector Blocks; the three "C" holes provide mounting facilities for up to three H8030 (72-pin) Module Connector Blocks. (Module connector blocks are described in Section 3.)

Ground lugs can be mounted on the opposite side of the vertical mounting bars by using any of the "A" or "C" holes for the mounting screws. Care should be exercised in selecting screw lengths when mounting ground lugs to prevent the two screws (one securing a module connector block and the other securing the ground lug) from bottoming out against each other. The six "B" holes can be used for inserting 0.125-in. (0.318-cm) diameter, 0.750-in. (1.905-cm) long roll pins to position (key) the module connector blocks, thus precluding inverted and/or rotated installation of the connector blocks.

The H034 Double System Unit Mounting Frame is 16.524 in. (41.971 cm) X 4.770 in. (12.116 cm). There are four 0.218-in. (0.554-cm) diameter mounting holes, "D" spaced as shown in the illustration. The four "D" mounting holes align with threaded (8-32-UNC-2B) mounting holes in a BA11 Expansion Box or logic mounting frame 74-08379. One "E" and four "F" places are tapped 8-32 through and three "C" places are tapped 8-32 X 0.25 in. (0.64 cm) deep. The "E," "F," and "C" tapped places align with mounting holes in various PDP-11 chassis, including 11/05, 11/30, 11/40, and 11/45.

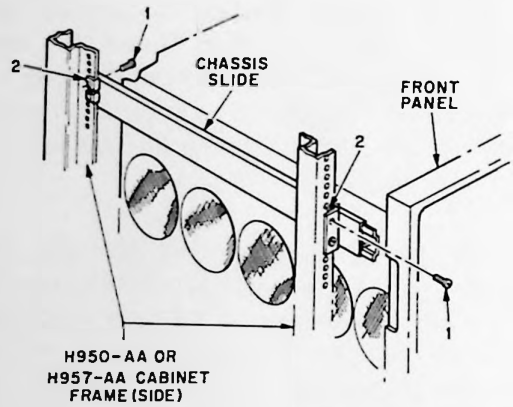


H034 Double System Unit Mounting Frame

MODULE SYSTEM ENCLOSURES

Module system enclosures are designed to provide mounting space for system units, 19-in. (48.26-cm) rack mounting enclosures, module connector blocks, and power supplies. They provide enough space to accommodate medium-sized systems and offer the convenience of easy access to the

system for maintenance and testing. The following illustration shows typical drawer-type module system enclosure installation in an electronics rack.



ITEM NO.	DESCRIPTION	QTY
1	PHL.HD. PAN SCREW 10-32 x 0.62 (1.57cm) (90-06074-3)	8
2	SPEEDNUT 10/32-24 (90-07786)	8

NOTE:
Items 1 and 2 are part of Tinnerman clip nut and screw collection (90-07786) described in section 1 of this publication.

CP-1349

Typical Module Drawer Installation

The following table summarizes the enclosures and associated hardware described in this subsection; individual detailed descriptions follow the table.

Module System Enclosures

Part Number	Description
BA11-ES	Drawer-type enclosure that accommodates up to six four-slot system units and an H720 Power Supply. Equipped with four muffin-type cooling fans, tilting chassis slides, and front panel. Accepts extended length modules; fits 19-in. (48.26-cm) electronics rack.
H035	Vertical system unit mounting frame that accommodates up to six four-slot or three nine-slot system units. Accepts extended length modules; mounts in 19-in. (48.26-cm) electronics rack.

Module System Enclosures (Cont)

Part Number	Description
H904-A	Horizontal system unit mounting enclosure that accommodates up to two four-slot or one nine-slot system unit. A cooling fan assembly and a rear cover are available. Accepts extended length modules; mounts in 19-in. (48.26-cm) electronics rack.
H905-A	Similar to H904-A except accommodates up to four four-slot or two nine-slot system units.
H906	Vertical system unit mounting enclosure that accommodates up to five four-slot or three nine-slot system units. A cooling fan assembly and a rear cover are available. Accepts extended length modules; mounts in 19-in. (48.26-cm) electronics rack.
H907-A	Similar to H904-A except accommodates up to eight four-slot or four nine-slot system units.
H909-A	Drawer-type or tabletop enclosure that accommodates one nine-slot system unit and an H755 Power Supply. Equipped with side and top cover plates and a front panel. Equipped with rubber-padded feet for tabletop use. Chassis slides are available for mounting the H909-A in a 19-in. (48.26-cm) electronics rack.
H909-BA	Same as H909-A except equipped with an H755 Power Supply.
H920	Drawer-type frame that accommodates up to 24 H800, H803, H808, or H863 Module Connector Blocks or up to 20 module connector blocks and an H710 Power Supply. Equipped with a rear-mounted power distribution panel. Fits in 19-in (48.26-cm) electronics rack when equipped with H923 Chassis Slides.

Module System Enclosures (Cont)

Part Number	Description
H921	Front panel designed to fit the H920 Module Drawer Frame. Occupies 6.9375 in. (17.6213 cm) of vertical space and covers the horizontal space of a 19-in. (48.26-cm) electronics rack.
H923	Chassis slides designed for H920 Module Drawer Frame. Designed to tilt both up and down from the horizontal position. Fits 19-in. (48.26-cm) electronics rack.
H925	Drawer-type enclosure that accommodates up to 18 H800, H803, H808, or H863 Module Connector Blocks or up to 14 connector blocks and an H710 Power Supply. Equipped with front panel and non-tilting chassis slides. Accepts extended length modules; fits 19-in. (48.26-cm) electronics rack.
H930	Drawer-type enclosure that accommodates up to five four-slot system units and an H750 Power Supply. Equipped with front panel and tilting chassis slides. Accepts extended length modules; fits 19-in. (48.26-cm) electronics rack.
H941-AA	Mounting panel frame that accommodates up to four 19-in. (48.26-cm) rack mounting panels (H911, H913, H914, H916, H917, or K943). Can be mounted on wall or other convenient surface; has mounting holes on 12 X 22.50 in. (30.48 X 51.15 cm) centers. Two covers, H941-BA and H941-BB, are available.
H941-BA	Cover for H941-AA Mounting Panel Frame. The H941-BA Cover accommodates extended length modules.
H941-BB	Same as H941-BA except accepts standard length modules.
12-09154	Chassis slides that provide a 22-in. (55.88-cm) extension for a chassis mounted in an electronics rack. Non-tilting.

Module System Enclosures (Cont)

Part Number	Description
12-09703	Chassis slides that provide a 22-in. (55.88-cm) extension for a chassis mounted in an electronics rack. Tilts 90 degrees either up or down.
12-10945	Chassis slides that provide a 19-in. (48.26-cm) extension for a chassis mounted in an electronics rack. The left side of these slides is comprised of two members, one of which can be removed (with the chassis remaining in the rack) to gain access to modules mounted in an H909 enclosure. Non-tilting.

System Unit Drawer – H909-A

The H909-A System Unit Drawer provides mounting space for one nine-slot system unit and an H755 Power Supply. The system unit mounts with the module handles toward the left side of the drawer for easy access via the removable left panel. The H909-A fits a standard 19-in. (48.26-cm) electronics rack or cabinet.

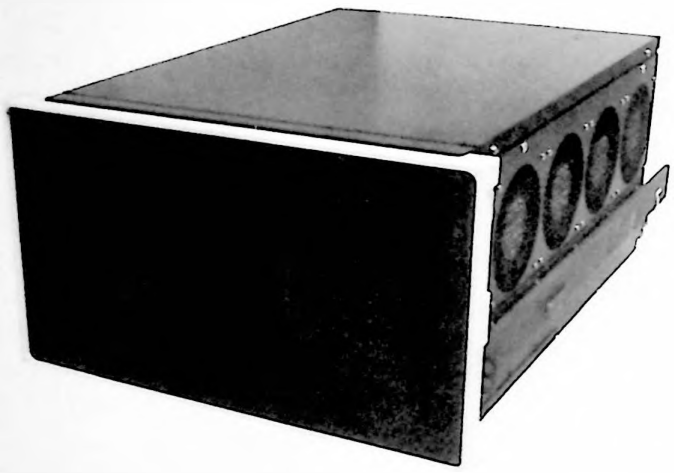
The H909-A is 19 in. (48.26 cm) wide, 21.25 in. (53.98 cm) long, and 5.25 in. (13.34 cm) high, including the bezel cover.

The H909-A is equipped with rubber feet and can be used as a tabletop logic box. The 909-A can also be equipped with a pair of 12-10945 Chassis Slides to provide ease of mounting in an electronics rack or cabinet. The H909-A includes top and side cover plates, along with an attractive bezel and front subpanel. The bezel occupies 10.50 in. (26.67 cm) of vertical space and is designed for installing a customer-supplied dress panel. The dress panel should be 0.125 in. (0.318 cm) thick.

System Unit Drawer – H909-BA

The H909-BA is the same as the H909-A except that it is equipped with an H755 Power Supply. The H755 Power Supply provides +15 Vdc at 2 A, -15 Vdc at 2 A, and +5 Vdc at 17 A.

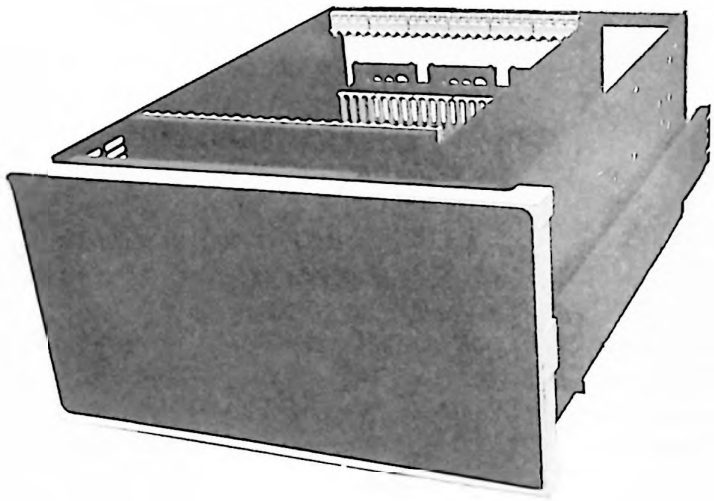
Expansion Mounting Box – BA11-ES



The BA11-ES Expansion Mounting Box is a steel enclosure that is designed to house up to six four-slot or three nine-slot system units and an H720 Power Supply. The BA11-ES enclosure consists of a chassis with brackets for mounting the system units and power supply; four side-mounted fans for forced-air cooling; a removable top cover; two 12-09703 Tilting Chassis Slides; and an H950-QA Cover Panel. Included with the mounting box is an 8.5-ft (2.59-m) external I/O Unibus flat cable (BC11A-8F) used with PDP-11 Systems. An internal power cable is contained within the box; the power cable distributes dc power and power signals from the power supply to each of the BB11 System Units installed. The four-slot and nine-slot system units are described elsewhere in this section and the H720 Power Supply is described in Section 5. An access hole at the rear of the box provides clearance for the receptacles and controls on the H720 Power Supply. The BA11-ES is 16.75 in. (41.54 cm) wide, 23.25 in. (59.05 cm) deep, and 10.50 in. (26.67 cm) high, excluding the cover panel and slides.

The BA11-ES can be installed in any electronics cabinet or rack equipped with 19-in. (48.26-cm) mounting rails (front and rear) drilled at standard EIA spacings. The BA11-ES attaches to the cabinet frame by the two tilt slides mounted on each side of the unit. The tilt slides enable the unit to be pulled from the cabinet and tilted to facilitate servicing the system units or power supply.

System Unit Drawer – H930

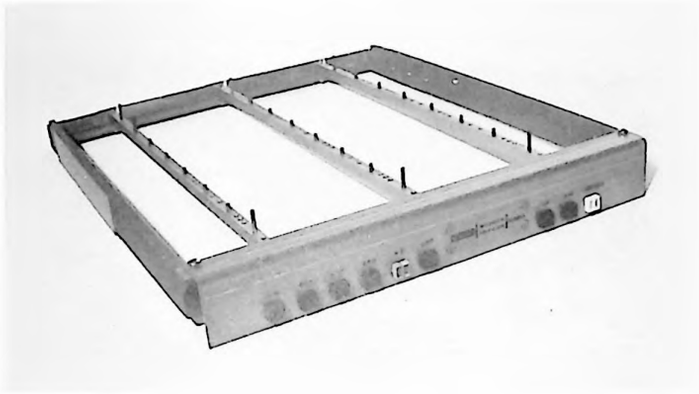


The H930 System Unit Drawer provides mounting space for five four-slot system units and an H750 Power Supply. The system units mount with the modules upward for easy access during system checkout. The H930 fits a standard 19-in. (48.26-cm) electronics rack or cabinet.

For ease of mounting, the H930 is provided with two tilting slides. The H930 should be mounted with enough height to allow bottom access during servicing. The H930 is 18.06 in. (45.87 cm) wide, 23.50 in. (59.69 cm) long, and 10.25 in. (26.04 cm) high, excluding the bezel and front cover or slides.

The H930 includes top and bottom cover plates, along with an attractive bezel and front subpanel. The bezel occupies 10.50 in. (26.67 cm) of vertical space and is designed for installing a customer-supplied dress panel. The dress panel should be 0.125 in. (0.318 cm) thick.

Module Drawer – H920



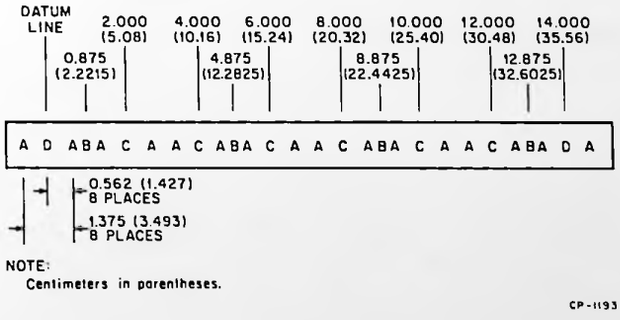
The H920 Module Drawer provides a convenient mounting facility for a logic system. It has space for 24 module connector blocks of Digital Equipment Corporation types H800, H803, H808, and H863, or 20 module connector blocks and an H710 Power Supply. The H920 fits a standard 19-in. (48.26-cm) electronics rack or cabinet. It is equipped with a power distribution panel for distributing power within the drawer, or to other drawers or mounting panels.

The H920 is 16.81 in. (42.70 cm) wide, 18.44 in. (46.83 cm) long, and 2.22 in. (5.64 cm) high, including the rear-mounted power distribution panel. The H920 casting is drilled to accept an H921 Front Panel and H923 Chassis Slides.

The three connector block mounting bars are each drilled [0.150/0.154 in. (0.381/0.391 cm) diameter] through 16 "A" places and 4 "B" places. The three connector block mounting bars are each equipped with 0.125-in. (0.318-cm) diameter roll pins, 0.750-in. (1.905-cm) long, at eight "C" places, and 1.125-in. (2.858-cm) long at two "D" places as shown in the following illustration. Each pair of "A" holes can be used to secure one of the above-mentioned module connector blocks. The roll pins at the "C" and "D" places preclude inverted installation of the module connector blocks. Forty-eight 8-32 self-tapping panhead screws, 0.750-in. (1.905-cm) long, are included with the H920; two of these self-tapping screws should be used to secure each module connector block. The four "B" holes are not used when the above-mentioned module connector blocks or power supplies are installed.

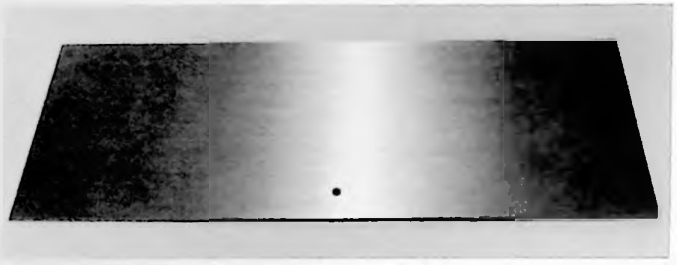
The front of the H920 casting is drilled and tapped (10-32 NF) in three places, 0.3438-in. (0.8733-cm) deep, with the centers of the holes located on a horizontal line. The vertical centers of two of the tapped holes are spaced 7.813 in. (19.845 cm) and 16.00 in. (40.64 cm) from the third (furthest right) tapped hole. These tapped holes align with the mounting holes in the H921 Front Panel.

Each side of the H920 casting is drilled and tapped (10-32 NF) through three places and drilled and tapped (5/16-24 NF) through one place to align with the mounting holes in H923 Tilting Chassis Slides.



H920 Module Drawer Mounting Bars Connector Block Mounting Holes (Typical Three Bars)

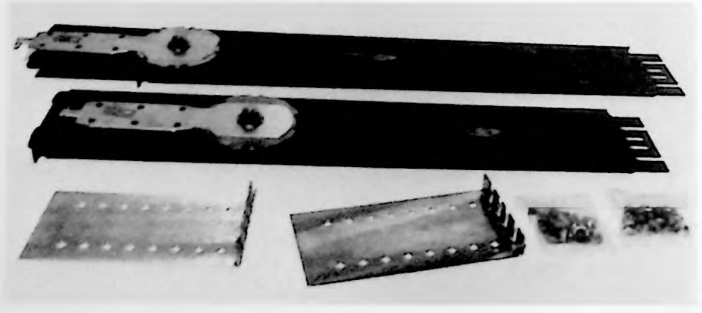
Front Panel – H921



The H921 Front Panel is designed for use primarily with the H920 Module Drawer. It occupies 6.9375 in. (17.6213 cm) of vertical space and fits a standard 19-in. electronics rack or cabinet. It is drilled to align with the tapped (10-32 NF) front panel mounting holes in the H920 casting.

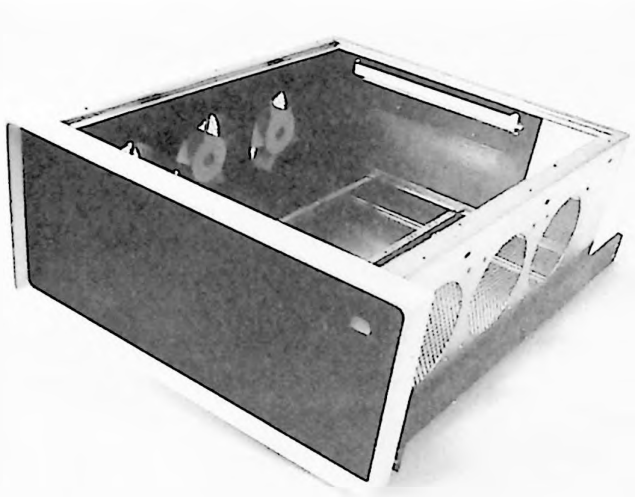
The H921 is fabricated from 0.125-in. thick aluminum alloy to provide durability and strength. It can be easily drilled to mount user-supplied switches, meters, or indicators.

Chassis Slides – H923



The H923 Chassis Slides are intended for use with the H920 Module Drawer. The H923 Chassis Slides allow the user to slide the drawer out of the rack and tilt the drawer for easy access to either the pin or module side.

Module Drawer – H925



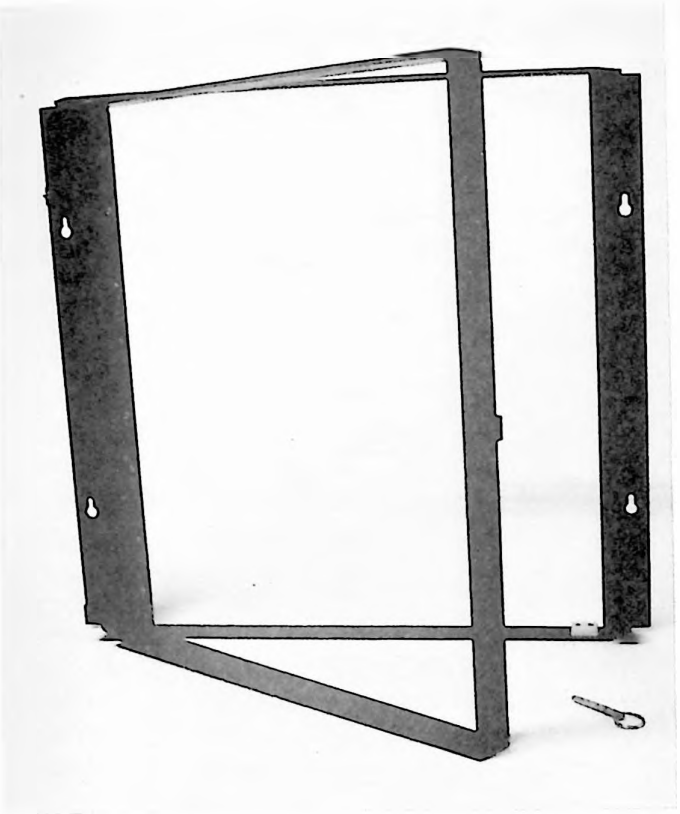
The H925 Module Drawer provides mounting space for 18 connector blocks of Digital Equipment Corporation types H800, H803, H808, or H863, or 14 connector blocks and an H710 Power Supply. The connector blocks mount pins upward on the H925 for easy access during system checkout. The H925 fits a standard 19-in. (48.26-cm) electronics rack or cabinet.

The right side of the H925 is equipped with three, internally mounted, axial flow fans (300 cubic feet/minute, 8.5 cubic meters/minute) to provide cooling air flow across the mounted modules.

For ease of mounting, the H925 is provided with two non-tilting slides, 12-09154. The H925 should be mounted with enough height to allow bottom access during servicing. The H925 is 16.75 in. (42.55 cm) wide, 19.50 in. (49.53 cm) deep, and 8.50 in. (21.59 cm) high, excluding the front cover and slides.

The H925 includes top and bottom cover plates, along with an attractive bezel and front subpanel. The subpanel is made of sturdy 16-gauge metal for mounting front panel controls and accessories. The bezel is designed for installing a customer-supplied dress panel. The dress panel should have a thickness of 0.125 in. (0.318 cm).

19-Inch Mounting Panel Frame – H941-AA
8-Inch Deep Cover – H941-BA
11.44-Inch Deep Cover – H941-BB



The H941-AA Mounting Panel Frame holds four 19-in. (48.26-cm) X 5.25-in. (13.34-cm) mounting panels (K943, H911, H913, H914, H916, or H917). These panels attach to the pretapped H941-AA frame with 10-32 X 1/2-in. (1.27-cm) long machine screws. A quick-release pin snaps out to allow the two-piece frame to swing open for easy access to the backpanel wiring and connections. The construction of this steel frame provides sufficient rigidity for vertical or horizontal mounting.

Black-finished aluminum covers, H941-BA and H941-BB, are available to provide mechanical protection for the circuitry as well as a neatly finished appearance for your logic system. Cover H941-BA is 8 in. (20.32 cm) deep and accommodates standard length modules; cover H941-BB is 11.44 in. (29.06 cm) deep and accommodates extended length modules. Either cover attaches to the frame with two serrated knobs that screw onto studs in the frame.

The physical specifications for this frame are:

Frame Height
22.63 in. (57.48 cm)

Frame Width
24 in. (60.96 cm)

Overall Depth
H941-AA – 2.13 in. (5.41 cm)
H941-BA – 8 in. (20.32 cm)
H941-BB – 11.44 in. (29.06 cm)

Frame Mounting Hole Centers
12 X 22.50 in. (30.48 X 57.15 cm)

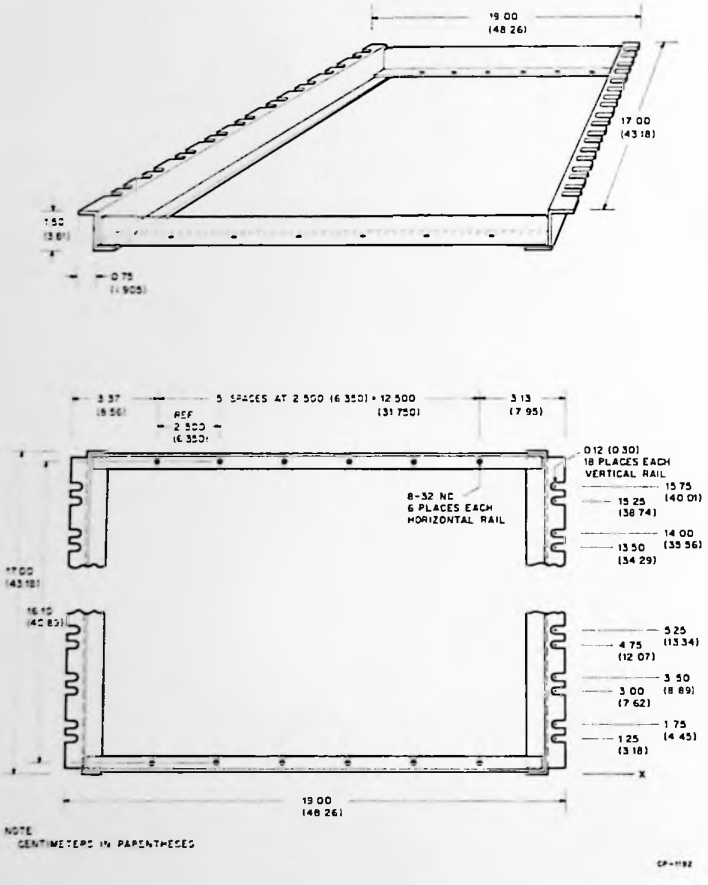
Frame Mounting Bolt
1/4 in. (0.635 cm)

Cover Material
0.094-in. (0.239-cm) sheet aluminum

Vertical System Unit Mounting Frame – H035

The H035 Vertical System Unit Mounting Frame is designed to accommodate a variety of system unit mounting frames and system units and to fit in a standard 19-in. (48.26-cm) electronics cabinet. It provides the space and facilities to mount up to three H034, H934-CB, or BB11-B Double System Units, or up to six H033, H933 series, BB11, BB11-A, DD11-A, or DD11-B System Units. These system units are more completely described elsewhere in this section.

The H035 horizontal frame members are drilled and tapped (8-32 NC) in twelve places, as shown in the following illustration, to facilitate mounting the above mentioned system units. The vertical frame members have mounting slots spaced, as shown in the illustration, for mounting the frame in a 19-in. electronics cabinet that has mounting rails punched or drilled at standard EIA spacings.



H035 Logic Mounting Frame

Horizontal System Unit Mounting Enclosure — H904-A

The H904-A Horizontal System Unit Mounting Enclosure can be installed in a 19-in. (48.26-cm) cabinet or rack. The enclosure provides space for mounting two four-slot or one nine-slot system unit. These system units are described elsewhere in this section. The H904-A is deep enough to accommodate extended length modules.

A 115 Vac fan (12-09403-1) or 230 Vac fan (12-10930-1) can be mounted on the side of the enclosure. A filter retainer (12-12059) and filter (12-12106) can be attached to the fan. A rear cover (74-11694-1) can be ordered to protect the module connector block pins.

The H904-A occupies 5.20 in. (13.20 cm) of vertical mounting space at the front or rear of a standard or short cabinet frame (H950-AA or H957-AA). The module boards are installed horizontally within the enclosure.

Horizontal System Unit Mounting Enclosure — H905-A

The H905-A Horizontal System Unit Mounting Enclosure is similar to the H904-A Horizontal System Unit Mounting Enclosure except that it can accommodate a maximum of four four-slot or two nine-slot system units. The H905-A is deep enough to accommodate extended length modules.

Two 115 Vac fans (12-09403-1) or two 230 Vac fans (12-10930-1) can be mounted on the side of the enclosure. A rear cover (74-11694-2) can be installed on the H905-A to protect the module connector block pins. The H905-A occupies 10.50 in. (26.67 cm) of vertical mounting space at the front or rear of a standard or short cabinet frame (H950-AA or H957-AA).

Vertical System Unit Mounting Enclosure — H906

The H906 Vertical System Unit Mounting Enclosure can be installed in a 19-in. (48.26-cm) cabinet or rack. The enclosure provides space for mounting a maximum of five four-slot or three nine-slot system units. These system units are described elsewhere in this section. The H906 is deep enough to accommodate extended length modules.

A three-blower fan assembly (70-09066) can be installed within the enclosure. A rear cover (74-11863) can be mounted to protect the module connector block pins. The mounting enclosure occupies 21.00 in. (53.34 cm) of vertical mounting space at the front or rear of a standard or short cabinet frame (H950-AA or H957-AA). The module boards are installed vertically within the enclosure.

Horizontal System Unit Mounting Enclosure — H907-A

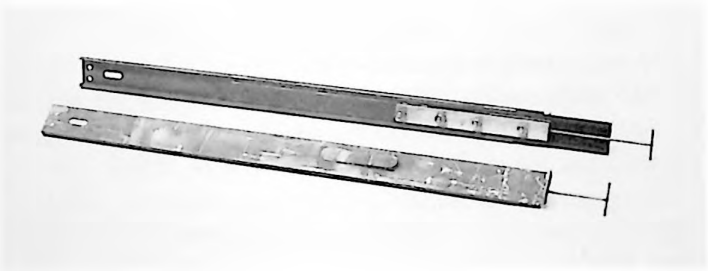
The H907-A Horizontal System Unit Mounting Enclosure is similar to the H904-A Horizontal System Unit Mounting Enclosure except that it can accommodate a maximum of eight four-slot or four nine-slot system units. The H907-A is deep enough to accommodate extended length modules.

Four 115 Vac fans (12-09403-1) or four 230 Vac fans (12-10930-1) can be mounted on the side of the enclosure. A rear cover (74-11694-3) can be installed on the H907-A to protect the module connector block pins. The H907-A occupies 21.00 in. (53.34 cm) of vertical mounting space at the front or rear of a standard or short cabinet frame (H950-AA or H957-AA).

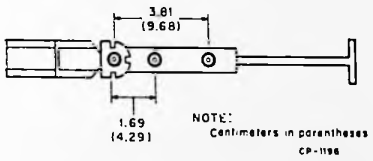
Chassis Slides – 12-09154

The 12-09154 Chassis Slides provide a 22-in. (55.88-cm) extension for a chassis mounted in a cabinet. These slides are designed to mount in cabinets with front and rear mounting rails drilled or punched at standard EIA spacings, i.e., holes on 0.625-in. (1.588-cm) centers. The chassis mounting sections of these slides are drilled with six 0.203-in. (0.516-cm) diameter holes spaced 3.63 in. (9.22 cm) center-to-center to provide chassis mounting capabilities. The slides are designed to mount in cabinets with front and rear mounting rails punched at standard EIA spacings. Maximum load is 50 lb (22.7 kg) per pair.

Chassis Slides (Tilting) – 12-09703



The 12-09703 Tilting Chassis Slides provide a 22.88-in. (58.12-cm) extension capability, i.e., a chassis mounted on a pair of these slides can be extended out of a cabinet 22.88 in. (58.12 cm) and tilted 90 degrees either up or down. This provides easy access to the bottom, top, or rear of the chassis. The pivot point is 10.50 in. (26.67 cm) from the rear of a 21.63-in. (54.94-cm) long chassis. A chassis can be secured to the slide by three 10-24 shoulder screws in each slide; these shoulder screws are located as shown on the following illustration. The slides are designed to mount in cabinets with front and rear mounting rails drilled or punched at standard EIA spacings.

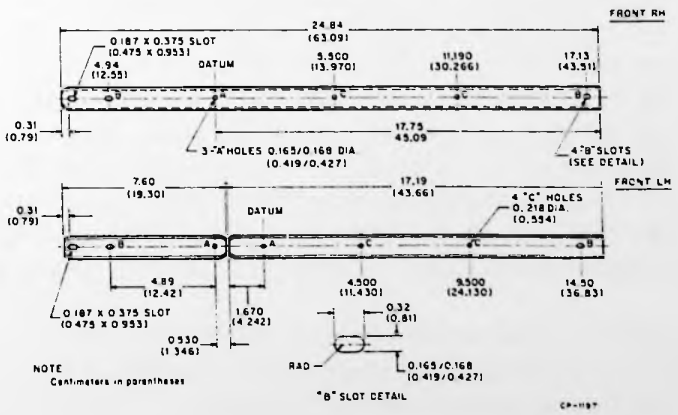


12-09703 Slides – Chassis Mounting Details

Chassis Slides – 12-10945

The 12-10945 Chassis Slides provide a 19-in. (48.26-cm) extension for a chassis mounted in a cabinet. These slides are designed to mount in cabinets with front and rear mounting rails drilled or punched at standard EIA spacings. The chassis mounting sections of these slides are drilled as shown on the following illustration to provide chassis mounting capabilities.

The 12-10945 Chassis Slides provide a desirable feature in that the left slide is comprised of two members; the front member can be removed, with the drawer installed in a cabinet, to allow access to modules within the drawer when the drawer has a removable left side, e.g., an H909-A or H909-BA.

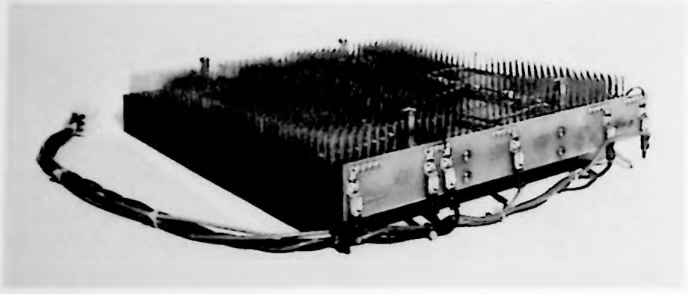


12-10945 Slides – Chassis Mounting Details

PDP-8/e EXPANSION HARDWARE

Expansion hardware specifically designed to expand a PDP-8/e System is described in this subsection.

Expander Panel – H9190



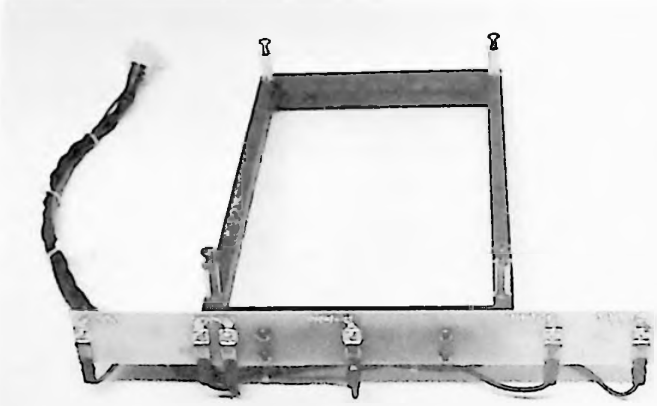
The H9190 Expander Panel is designed for mounting in a PDP-8/e chassis to provide mounting space for interface or system expansion modules.

The H9190 is the same as the H019 Expander Frame except that it is equipped with ten 288-pin connector blocks (H803) and is prebused for +5 Vdc power and ground.

The connector blocks provide eighty 36-pin connector sockets that can accommodate any single-height FLIP CHIP modules; modules with contacts on only one side will make contact only with the side 2 pins (A2, B2, etc.). The connector sockets are equipped with wire wrap pins, which are designed to be wrapped with 30 AWG wire. All A2 pins, except the four slots in the first column (i.e., slots A01, B01, C01, and D01), are bused for +5 Vdc power; all C2 and T1 pins are bused for ground. The power and ground buses are connected to the power distribution board. The H9190 can be connected to the PDP-8/e Omnibus by using two M935 Bus Connector Modules. (Refer to Section 4 for a detailed description of the M935 Bus Connector Module.)

Bus Strip 933 can be used with the H9190 to facilitate busing of signals to identical pins. (Refer to Section 4 for a detailed description of the 933 Bus Strip.)

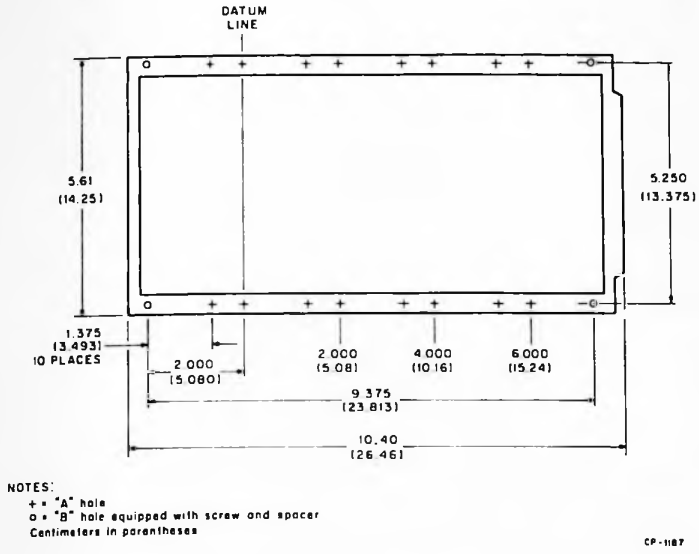
Expander Frame – H019



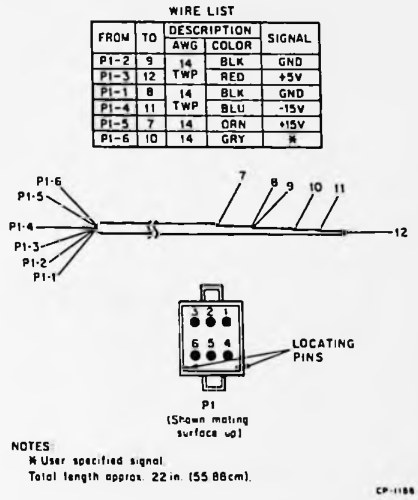
The H019 Expander Frame is designed for mounting in a PDP-8/e chassis to provide mounting space for interface or system expansion modules.

The H019 is drilled [0.149/0.156 in. (0.378/0.396 cm) diameter] through 16 "A" places and is equipped with 4 "B" places with threaded spacers and 8-32 X 1 in. (2.54 cm) screws as shown in the following illustration. The 16 "A" holes and 4 "B" screws provide mounting facilities for up to 10 module connector blocks of Digital Equipment Corporation types H800, H803, H808, or H863. The four 8-32 screws also provide the means to mount the H019 in a PDP-8/e chassis; the PDP-8/e chassis is predrilled to accept these screws.

The H019 is equipped with a power distribution board and is supplied with a power wiring harness. The wiring harness has a Mate-N-Lok connector on one end and quick-disconnect connectors on the other end; the Mate-N-Lok connector mates with a connector on the PDP-8/e's power distribution panel and the quick-disconnect connectors mate with tabs on the H019's power distribution board. The power distribution board is equipped with split-lug terminals to facilitate power distribution to the interface or



H019 Expander Frame Connector Block Mounting Holes (Power Distribution Board Not Shown)



H019 Expander Frame Power Wiring Harness

system expansion modules. The following table and illustration are provided to aid in connecting the wiring harness. The H019 can be connected to the PDP-8/e Omnibus by using two M935 Bus Connector Modules. (Refer to Section 4 of this catalog for a detailed description of the M935.)

More complete descriptions of module connector blocks H800, H803, H808, and H863 are contained in Section 3.

Section 3
Module Connector Blocks

Digital Equipment Corporation offers a variety of module connector blocks to suit the requirements of almost any logic system. Most M-series systems use H803, 30 AWG, wire wrap blocks for modules with contact fingers on both sides. However, a system requiring 24 AWG interconnections, or using a large number of type 913 Patch Cords, might use H808 Connector Blocks because of the wider spacing of the connector pins. A system using K-series and certain A-series modules (i.e., contact fingers on only one side) can use H800 Connector Blocks. Connector blocks with slotted ends should generally be used in systems where the modules are quad height or larger. The following table summarizes the module connector blocks described in this section; individual detailed descriptions follow the table.

Module Connector Block Summary

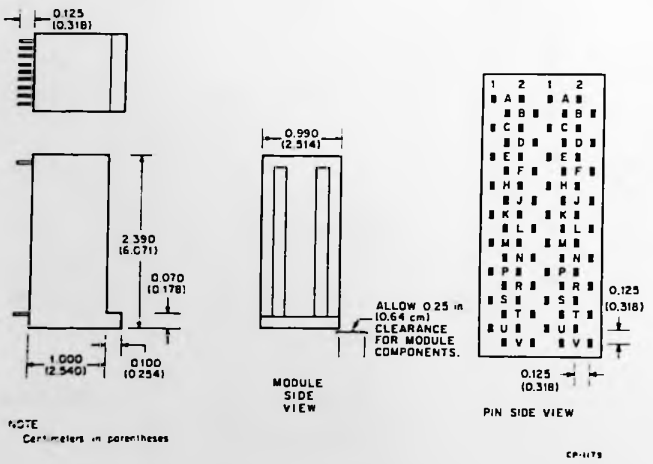
Block Part No.	No. of Slots	Contacts Per Slot	No. of Contact Sides	Wire Wrap Pin Size	Bus Strip No.	Module Type	End
12-10152-1	2	36	2	None*	None	All single-height	Unslotted
H800	8	18	1	24 AWG	932	All single- and double height; single-sided	Unslotted
H802	1	18	1	24 AWG	932	All single-height single-sided	Unslotted
H803	8	36	2	30 AWG	933	All single- and double-height	Unslotted
H8030	2	36	2	30 AWG	933	All single- and double-height	Slotted
H807	1	36	2	30 AWG	933	All single-height	Unslotted
H808	4	36	2	24 AWG	939	All single- and double-height	Unslotted
H863	8	36	2	30 AWG	933	All single- and double-height	Slotted

*12-10152-1 is used on a motherboard and the pins are soldered to the printed circuit tracks.

Connector Block – 12-10152-1

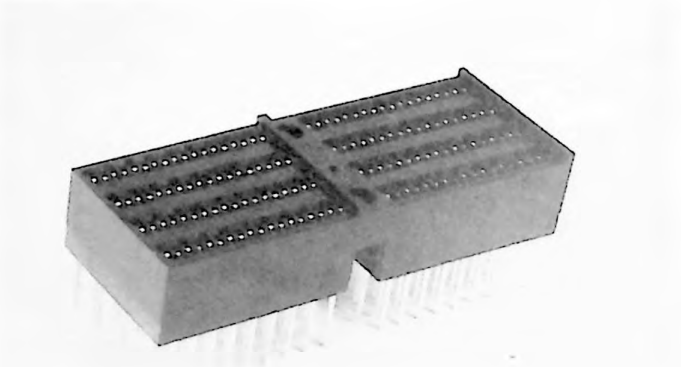
The 12-10152-1 Connector Block is a 72-pin connector block designed to be soldered to a motherboard. It is used to terminate modules with contacts on both sides of the module board, i.e., all single-height M-series modules. It can also be used with all other series modules listed in the *DIGITAL Logic Handbook.* Eighteen-pin modules (i.e., all K-series and some A- and W-series modules) will make contact only with side 2 pins (A2, B2, etc.). The 12-10152-1 accommodates two single-height, 36-pin modules and is particularly useful in prototype work and user-designed, custom systems.

The 12-10152-1 is 2.390 in. (6.071 cm) long, 0.990 in. (2.514 cm) wide, and 1.350 in. (3.429 cm) thick overall. The 12-10152-1 accepts 0.068-in. (0.173-cm) thick by 2.245-in. (5.702-cm) long circuit boards with 36 contact fingers, i.e., eighteen 0.080-in. (0.203-cm) wide contact fingers on each side, spaced 0.125 in. (0.318 cm) center-to-center. The 0.125-in. (0.318-cm) long pins are 0.025/0.026 in. (0.064/0.066 cm) square and are usually soldered to a motherboard. See the illustration for pertinent dimensions and pin layout diagram.



12-10152-1 Connector Block

Connector Blocks – H800-F, H800-W

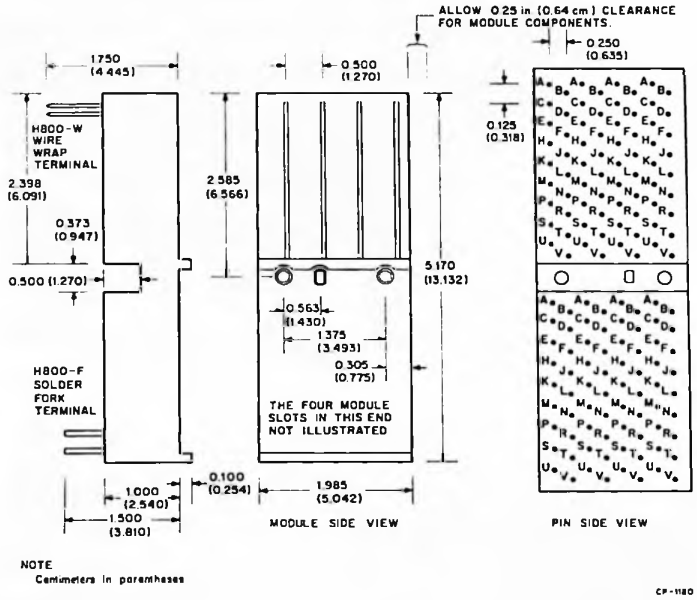


The H800 Connector Block is a 144-pin connector block designed to be used in systems that utilize modules with contacts on only one side of the module board, i.e., all K-series and some A- and W-series modules listed in the DIGITAL Logic Handbook. The H800 accommodates eight single-height, 18-pin modules or four double-height, 36-pin modules. The H800-F is equipped with solder-fork pins and the H800-W is equipped with wire wrap pins.

The H800 Connector Block can be mounted on H033 and H034 System Units; H020 and K941 Mounting Frames; H019, H9190, and H941 Expander Frames; and in H920 and H925 Drawers. Number 8 panhead screws and associated hardware should be used to mount this connector block.

The H800 is 5.170 in. (13.132 cm) long, 1.985 in. (5.042 cm) wide, and 1.850 in. (4.699 cm) thick with wire wrap type pins and 1.650 in. (4.191 cm) thick with solder-fork type pins. The two 0.1875-in. (0.4763-cm) diameter mounting holes are spaced 1.375 in. (3.493 cm) center-to-center and are counter-sunk – 0.3125 in. (0.7938 cm) in diameter by 0.1875 in. (0.4763 cm) deep – to allow recessed mounting screw heads. An

0.125-in. (0.318-cm) by 0.1875-in. (0.4763-cm), oval-shaped hole, located between the two mounting holes, precludes inverted and/or rotated installation of the connector block when the mounting frame is equipped with roll pins. The H800 accepts, in each of the eight circuit board slots, an 0.058-in. (1.473-cm) thick by 2.245-in. (5.702-cm) long circuit board with eighteen 0.080-in. (0.203-cm) wide contact fingers on one side, spaced 0.125 in. (0.318 cm) center-to-center; the H800 also accepts double-height circuit boards, i.e., two 2.245-in. (5.702-cm) long contact finger surfaces, spaced 0.510 in. (1.295 cm) center-to-center, each with 18 contacts on one side. The solder-fork and the wire wrap pins are 0.031 in. (0.079 cm) by 0.062 in. (0.158 cm). See the illustration for pertinent dimensions and pin layout diagram.



H800-F and H800-W Connector Block

The pin sides of the H800-F and H800-W Connector Blocks are marked with pin designations to facilitate soldering or wire wrapping and signal tracing. Use 24 AWG wire with these connector blocks. Bus Strip 932 can be used. (Refer to Section 6 for a description of the 932 Bus Strip.)

Contacts – H801-F, H801-W

H801-F and H801-W Contacts comprise a package of 18 replacement contacts for H800 Connector Blocks. Each package contains nine straight (fit contact spaces A, C, E, etc.) and nine offset (fit contact spaces B, D, F, etc.) contacts, enough to replace all contacts in one module socket. H801-F is for solder connections; H801-W is for wire wrap connections.

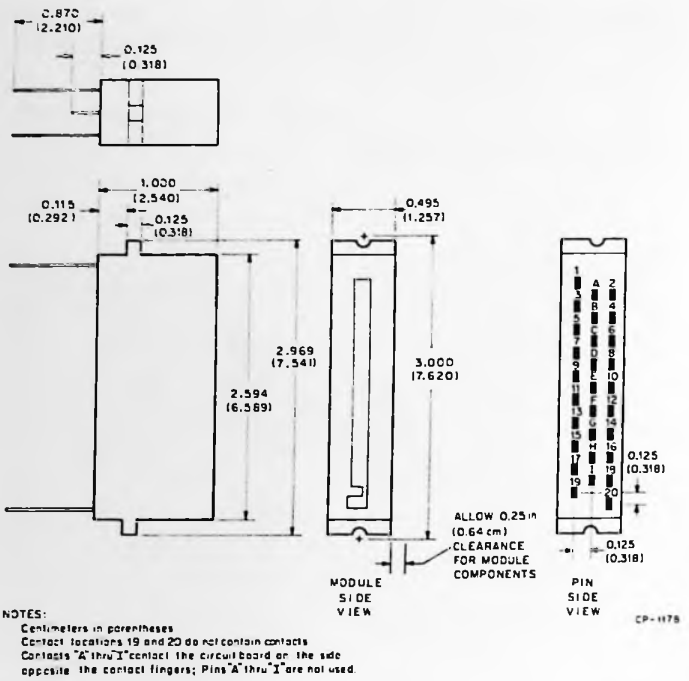
Connector Block – H802

The H802 Connector Block is an 18-pin connector block designed to terminate modules with contacts on only one side of the module board, i.e., all K-series and some A- and W-series modules listed in the DIGITAL Logic Handbook. The H802 accommodates one single-height, 18-pin module. It is available only with wire wrap pins.

The H802 Connector Block is usually used in a confined or irregular space or to terminate a module at a remote location.

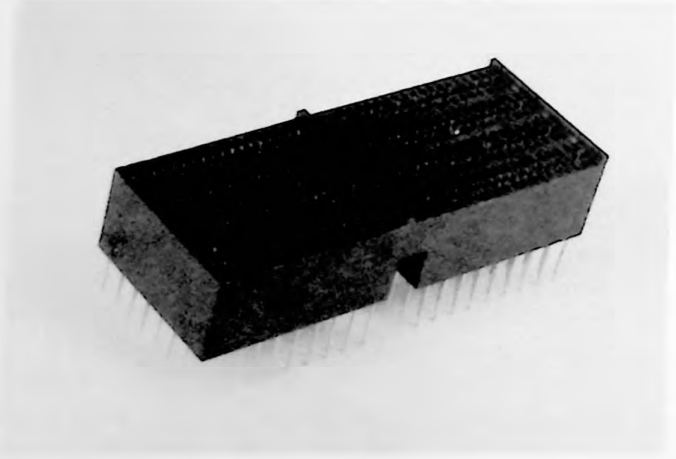
The H802 is 2.969 in. (7.541 cm) long, 0.495 in. (1.258 cm) wide, and 1.870 in. (4.750 cm) thick, including the pins. Mounting ears with 0.113-in. (0.287-cm) radius mounting slots, spaced 3.00 in. (7.620 cm) center-to-center, are on each end as shown on the following illustration. The H802 accepts one 0.068-in. (0.173-cm) thick by 2.245-in. (5.702-cm) long circuit board with eighteen 0.080-in. (0.203-cm) wide contact fingers on one side, spaced 0.125 in. (0.318 cm) center-to-center. The wire wrap pins are 0.031 in. (0.079 cm) by 0.062 in. (0.158 cm). See the illustration for pertinent dimensions and pin layout diagram.

The pin side of the H802 Connector Block is marked with pin designations to facilitate wire wrapping and signal tracing. Use 24 AWG wire with this connector block.



H802 Connector Block

Connector Block – H803

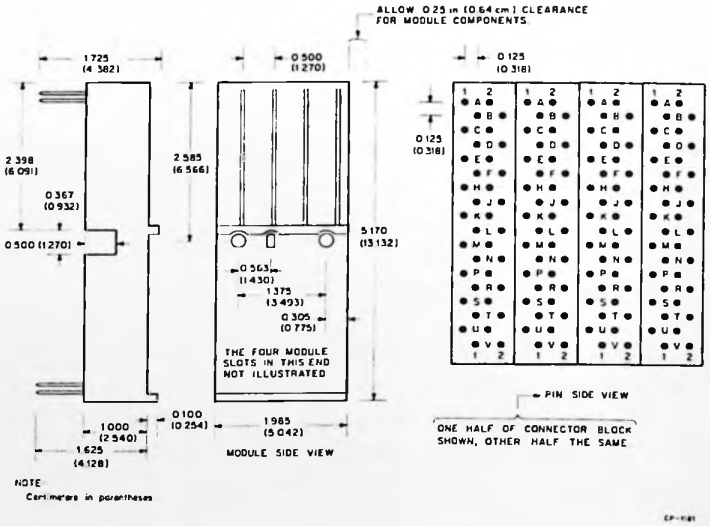


The H803 Connector Block is a 288-pin connector block designed to be used in systems that utilize M-series modules; however, it can also be used with all other series modules listed in the DIGITAL Logic Handbook. The H803 accommodates eight single-height, 36-pin modules or four double-height, 72-pin modules. Eighteen-pin modules (i.e., all K-series and some A- and W-series modules) will make contact only with side 2 pins (A2, B2, etc.). The H803 is available only with wire wrap type pins.

The H803 Connector Block can be mounted on H033 and H034 System Units; H020 and K941 Mounting Frames; H019, H9190, and H941 Expander Frames; and in H920 and H925 Drawers. Number 8 panhead screws and associated hardware should be used to mount this connector block.

The H803 is 5.170 in. (13.132 cm) long, 1.985 in. (5.042 cm) wide, and 1.725 in. (4.382 cm) thick, including the pins. The two 0.1875-in. (0.4763-cm) diameter mounting holes are spaced 1.375 in. (3.493 cm) center-to-center and are counter-sunk – 0.3125 in. (0.7938 cm) in diameter by 0.1875 in. (0.4763 cm) deep – to allow recessed mounting screw heads. An 0.125-in. (0.318-cm) by 0.1875-in. (0.4763-cm), oval-shaped hole, located between the two mounting holes, precludes inverted and/or rotated installation of the connector block when the mounting frame is equipped with roll pins. The H803 accepts, in each of the eight circuit board slots, an 0.058-in. (1.473-cm) thick by 2.245-in. (5.702-cm) long circuit board with thirty-six 0.080-in. (0.203-cm) wide contact fingers spaced 0.125 in. (0.318 cm) center-to-center (i.e., 18 contact fingers on each side); the H803 also accepts double-height circuit boards, i.e., two 2.245 in. (5.702 cm) long contact finger surfaces, spaced 0.510 in. (1.295 cm) center-to-center, each with 36 contacts. The wire wrap pins are 0.025/0.026 in. (0.064/0.066 cm) square. See the illustration for pertinent dimensions and pin layout diagram.

The pin side of the H803 Connector Block is marked with pin designations to facilitate wire wrapping and signal tracing. Use 30 AWG wire with this connector block. Bus Strip 933 can be used. (Refer to Section 6 for a description of the 933 Bus Strip.)



H803 Connector Block

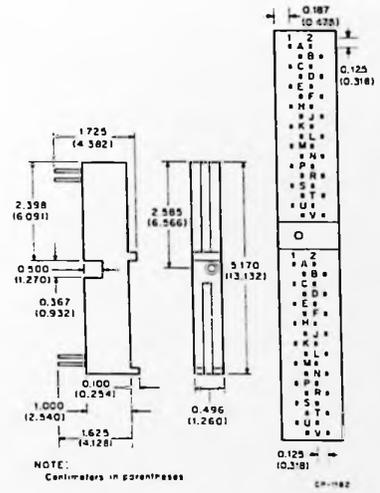
Connector Block – H8030

The H8030 Connector Block is a 72-pin connector block designed to be used in systems that utilize M-series modules; however, it can also be used with all other series modules listed in the DIGITAL Logic Handbook. The H8030 accommodates two single-height, 36-pin modules or one double-height, 72-pin module. Eighteen-pin modules (i.e., all K-series and some A- and W-series modules) will make contact only with side 2 pins (A2, B2, etc.). The M8030, which has slotted ends, is available only with wire wrap type pins.

The H8030 Connector Block can be mounted on H033 and H034 System Units; H020 and K941 Mounting Frames; H019, H9190, and H941 Expander Frames; and in H920 and H925 Drawers. It is usually used with H803 or H863 Connector Blocks and mounted on an H034 System Unit. Number 8 panhead screws and associated hardware should be used to mount this connector block.

The H8030 is 5.170 in. (13.132 cm) long, 0.496 in. (1.260 cm) wide, and 1.725 in. (4.382 cm) thick, including the pins. The 0.188 in. (0.478 cm) diameter mounting hole is 0.187 in. (0.475 cm) from the left side (when viewed from the pin side) and is counter-sunk – 0.312 in. (0.792 cm) in diameter by 0.188 in. (0.478 cm) deep – to allow recessed mounting screw heads. The H8030 accepts, in each of the two circuit board slots, an 0.058-in. (1.473-cm) thick by 2.245-in. (5.702-cm) long circuit board with thirty-six 0.080-in. (0.203-cm) wide contact fingers, spaced 0.125 in. (0.318 cm) center-to-center (i.e., 18 contact fingers on each side); the H8030 also accepts double-height circuit boards, i.e., two 2.245-in. (5.702-cm) long contact finger surfaces, spaced 0.510 in. (1.295 cm) center-to-center, each with 36 contacts. The wire wrap pins are 0.025/0.026 in. (0.064/0.066 cm) square. See the illustration for pertinent dimensions and pin layout diagram.

The pin side of the H8030 Connector Block is marked with pin designations to facilitate wire wrapping and signal tracing. Use 30 AWG wire with this connector block. Bus Strip 933 can be used. (Refer to Section 6 for a description of the 933 Bus Strip.)



H8030 Connector Block

Contacts – H805

H805 Contacts comprise a package of 36 wire wrap type replacement contacts for H803 and H863 Connector Blocks. Each package contains 18 outside (fit contact spaces A1, B2, C1, D2, etc.) and 18 inside (fit contact spaces A2, B1, C2, D1, etc.) contacts, enough to replace all contacts in one module socket. Replacement contacts are available only with wire wrap type pins.

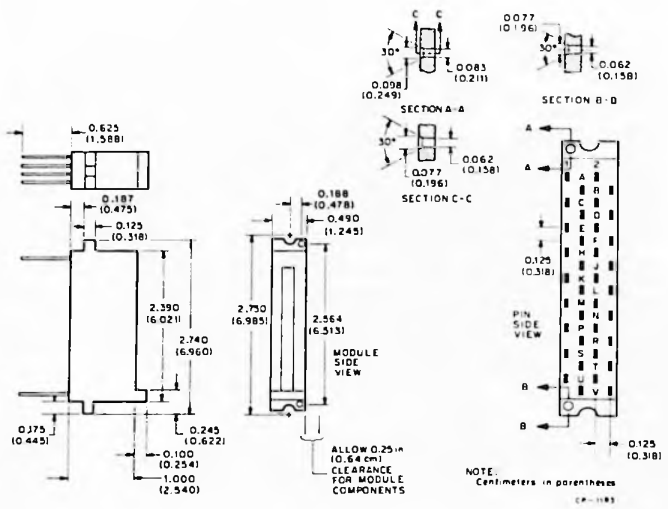
Connector Block – H807

The H807 Connector Block is a 36-pin connector block designed to terminate modules with contacts on both sides of the module board, i.e., all M-series modules. It can also be used with all other series modules listed in the DIGITAL Logic Handbook. Eighteen-pin modules (i.e., all K-series and some A- and W-series modules) will make contact only with side 2 pins (A2, B2, etc.). The H807 accommodates one single-height, 36-pin module. It is available only with wire wrap pins.

The H807 Connector Block is usually used in a confined or irregular space; it can be used with cable clamp 12-09925 and a round cable to terminate a module at a remote location. (Refer to Section 4 for a description of cable clamp 12-09925. Cables are described in Section 6.)

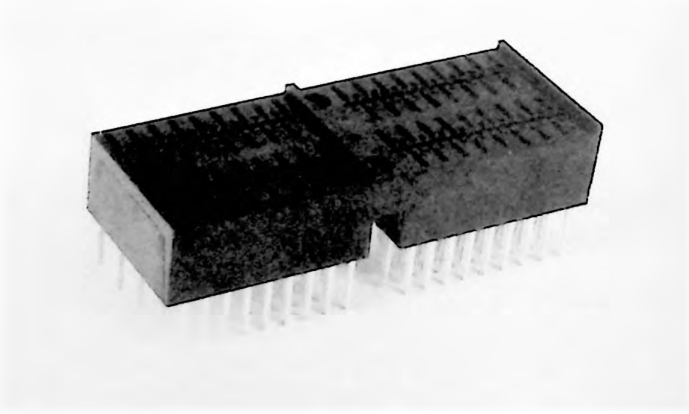
The H807 is 2.740 in. (6.960 cm) long, 0.490 in. (1.245 cm) wide, and 1.725 in. (4.382 cm) thick overall. Mounting ears with 0.078-in. (0.198-cm) radius mounting slots, spaced 2.750 in. (6.985 cm) center-to-center, and locating (keying) holes are on each end as shown in the illustration. The locating holes are spaced 2.564 in. (6.513 cm) center-to-center. One locating hole is 0.062 in. (0.158 cm) in diameter and counter-sunk 0.077 in. (0.196 cm) in diameter, sloping 30 degrees; the other locating hole is 0.062 in. (0.158 cm) by 0.083 in. (0.211 cm) and counter-sunk, sloping 30 degrees as shown on the illustration. The H807 accepts 0.068-in. (0.173-cm) thick by 2.245-in. (5.702-cm) long circuit boards with 36 contact fingers, i.e., eighteen 0.080-in. (0.203-cm) wide contact fingers on each side, spaced 0.125 in. (0.318 cm) center-to-center. The wire wrap pins are 0.025/0.026 in. (0.064/0.066 cm) square. See the illustration for pertinent dimensions and pin layout diagram.

The pin side of the H807 Connector Block is marked with pin designations to facilitate wire wrapping and signal tracing. Use 30 AWG wire with this connector block.



H807 Connector Block

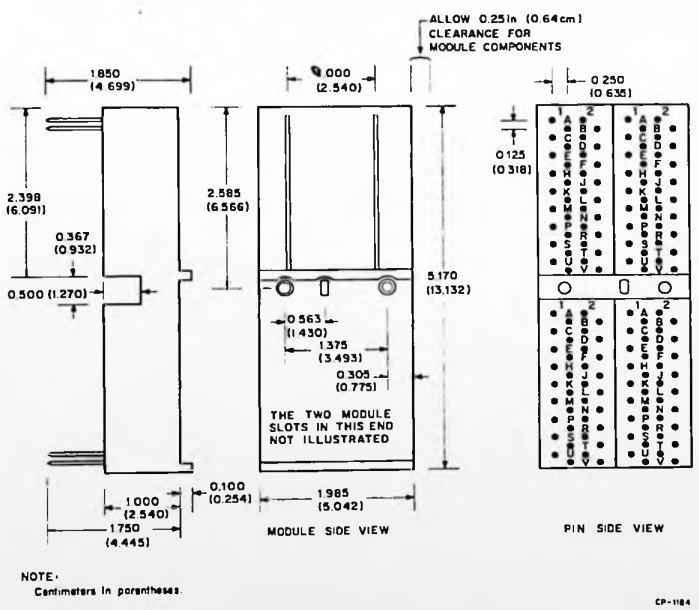
Connector Block – H808



The H808 Connector Block is a 144-pin connector block designed for systems that utilize M-series modules; however, it can also be used with all other series modules listed in the DIGITAL Logic Handbook. The H808 accommodates four single-height, 36-pin modules or two double-height, 72-pin modules. Eighteen-pin modules (i.e., all K-series and some A- and W-series modules) will make contact only with side 2 pins (A2, B2, etc.). It is available only with wire wrap pins.

The H808 Connector Block can be mounted on H033 and H034 System Units; H020 and K941 Mounting Frames; H019, H9190, and H941 Expander Frames; and in H920 and H925 Drawers. Number 8 panhead screws and associated hardware should be used to mount this connector block.

The H808 is 5.170 in. (13.132 cm) long, 1.985 in. (5.042 cm) wide, and 1.850 in. (4.699 cm) thick, including the pins. The two 0.1875-in. (0.4763-cm) diameter mounting holes are spaced 1.375 in. (3.493 cm) center-to-center and are counter-sunk – 0.3125 in. (0.7938 cm) in diameter by 0.1875 in. (0.4763 cm) deep – to allow recessed mounting screw heads. An 0.125-in. (0.318-cm) by 0.1875-in. (0.4763-cm), oval-shaped hole, located between the two mounting holes, precludes inverted and/or rotated installation of the connector block when the mounting frame is equipped with roll pins. The H808 accepts, in each of the four circuit board slots, an 0.058-in. (1.473-cm) thick by 2.245-in. (5.702-cm) long circuit board with eighteen 0.080-in. (0.203-cm) wide contact fingers spaced 0.125 in. (0.318 cm) center-to-center; the H808 also accepts double-height circuit boards, i.e., two 2.245-in. (5.702-cm) long contact finger surfaces spaced 0.510 in. (1.295 cm) center-to-center, each with 18 contacts. The wire wrap pins are 0.031 in. (0.079 cm) by 0.062 in. (0.158 cm). See the illustration for pertinent dimensions and pin layout diagram.



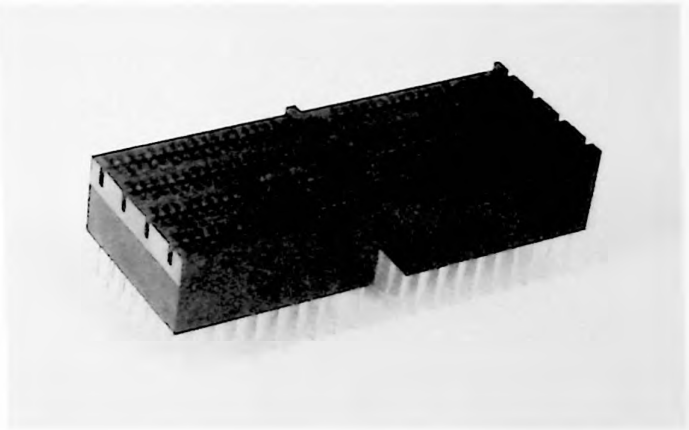
H808 Connector Block

The pin side of the H808 Connector Block is marked with pin designations to facilitate wire wrapping and signal tracing. Use 24 AWG wire with this connector block. Bus Strip 939 can be used. (Refer to Section 6 for a description of the 939 Bus Strip.)

Contacts – H809

H809 Contacts comprise a package of 36 wire wrap type replacement contacts for H808 Connector Blocks. Each package contains 18 outside (fit contact spaces A1, B2, C1, D2, etc.) and 18 inside (fit contact spaces A2, B1, C2, D1, etc.) contacts, enough to replace all contacts in one module socket. Replacement contacts are available only with wire wrap type pins.

Connector Block – H863

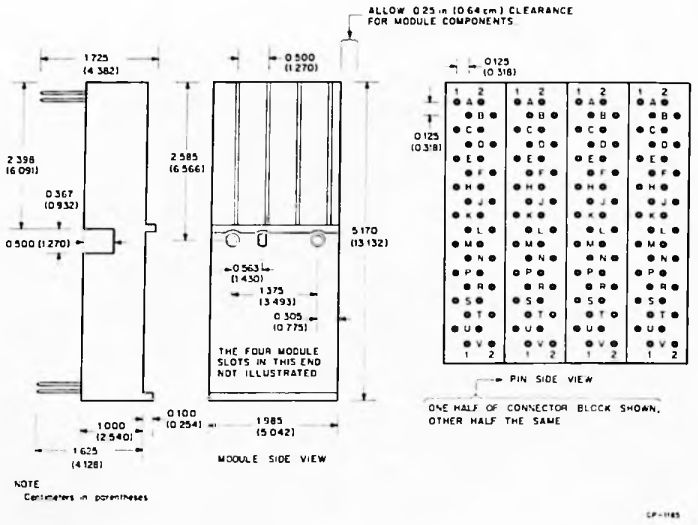


The H863 Connector Block is a 288-pin connector block designed for systems that utilize M-series modules; however, it can also be used with all other series modules listed in the DIGITAL Logic Handbook. The H863 accommodates eight single-height, 36-pin modules or four double-height, 72-pin modules. Eighteen-pin modules (i.e., all K-series and some A- and W-series modules) will make contact only with side 2 pins (A2, B2, etc.). The H863 is available only with wire wrap pins. The H863 is the same as the H803 Connector Block except that the H863 has slotted ends.

The H863 Connector Block can be mounted on H033 and H034 System Units; H020 and K941 Mounting Frames; H019, H9190, and H941 Expander Frames; and in H920 and H925 Drawers. Number 8 panhead screws and associated hardware should be used to mount this connector block.

The H863 is 5.170 in. (13.132 cm) long, 1.985 in. (5.042 cm) wide, and 1.725 in. (4.382 cm) thick, including the pins. The two 0.1875-in. (0.4763-cm) diameter mounting holes are spaced 1.375 in. (3.493 cm) center-to-center and are counter-sunk – 0.3125 in. (0.7938 cm) diameter by 0.1875 in. (0.4763 cm) deep – to allow recessed mounting screw heads. An 0.125-in. (0.381-cm) by 0.1875-in. (0.4763-cm), oval-shaped hole, located between the two mounting holes, precludes inverted and/or rotated installation of the connector block when the mounting frame is equipped with roll pins. The H863 accepts, in each of the eight circuit board slots, an 0.058-in. (1.473-cm) thick by 2.245-in. (5.702-cm) long circuit board with thirty-six 0.080-in. (0.203-cm) wide contact fingers, spaced 0.125 in. (0.318 cm) center-to-center (i.e., 18 contact fingers on each side); the H863 also accepts double-height circuit boards, i.e., two 2.245-in. (5.702-cm) long contact finger surfaces, spaced 0.510 in. (1.295 cm) center-to-center, each with 36 contacts. The wire wrap pins are 0.025/0.026 in. (0.064/0.066 cm) square. See the illustration for pertinent dimensions and pin layout diagram.

The pin side of the H863 Connector Block is marked with pin designations to facilitate wire wrapping and signal tracing. Use 30 AWG wire with this connector block. Bus Strip 933 can be used. (Refer to Section 6 for a description of the 933 Bus Strip.)



H863 Connector Block

Section 4
Connectors (Bus, Cable, Edge), Bulk Cables, and Cable Clamps

Digital Equipment Corporation offers a variety of connectors, bulk cables, and cable clamps to suit the requirements for user-fabrication of unique, special-purpose cables. The connectors, bulk cable, and cable clamps are described in this section.

CONNECTORS

Connectors are grouped into eight general classifications according to the type cable they accommodate and their use: flat ribbon cable, flat mylar cable, flat coaxial cable, round coaxial cable, flat shielded cable, round cable, bus interconnection and termination, and miscellaneous connectors. Most of the connectors described in this section are general-purpose connectors; some, however, are specific-use connectors. These connectors are described relative to the specific use. The descriptions of some of the general-purpose connectors cite application examples; the cited examples are popular, widely used applications and are not intended to imply that a particular connector cannot be used with other equipment. Additionally, some of the descriptions reference preassembled cable assemblies; frequently, Digital Equipment Corporation preassembled cable assemblies are available to fulfill your cabling requirements and eliminate the need for you to fabricate a cable assembly.

Preassembled cable assemblies are listed and described in the *DIGITAL Logic Handbook* and the *Cable Price List and Cross-Reference Guide*, both published by Digital Equipment Corporation. Digital Equipment Corporation also fabricates unique, special-purpose cables according to the customer's specifications to suit almost any requirement. These specially built cable assemblies are completely assembled and tested. Details on special-purpose cables are available from your local DIGITAL sales office or from Digital Equipment Corporation, Components Group, One Iron Way, Marlborough, Ma. 01752.

A cable clamp and two eyelets are supplied with each cable connector. The cable clamp desired should be specified in each order for cable connectors; if cable clamps are not specified, the cable clamp that is usually used with the cable connector will be supplied. (The cable clamp usually used is listed in each cable connector description.) Cable clamps are described in detail at the end of this section.

The following tables summarize the cable connectors described in this section.

Flat Ribbon Cable Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M908	36	2	Single-height, standard length	No contact fingers dedicated to ground; 10-ohm resistors in series with four contact fingers. Split-lug terminals. Similar to M901.
M933	20	1	Single-height, standard length	Twenty signal contact fingers, two ground contact fingers, three power contact fingers. Resistors, capacitors, and jumpers may be installed by user at all signal contact fingers to provide pull-up capabilities to any one of three jumper-selectable voltage fingers, or resistors may be installed by user to provide shunt-to-ground (termination) capabilities at all signal contact fingers. Split-lug terminals for cable conductors and voltage jumpers.
M957	36	2	Single-height, extended length	No contact fingers are dedicated to ground; 32 signal contact fingers; 10-ohm resistors in series with four contact fingers. Split-lug terminals.
M960	14	1	Single height, standard length	Provides line drivers and pull-up resistors necessary to connect command signals from a TD8-E to a TU56. Requires user installation of jumpers. Sixteen signal contact fingers, one ground contact finger, one +5 V power contact finger. Split-lug terminals. Alternate signal/ground cable conductors. Usually used on cable with an M961 and a 12-10090.
M961	20	1	Double-height, standard length	Provides line drivers and pull-up resistors necessary to connect the data, and "daisy-chained" signals from a TD8-E to a TU56. Fourteen data signal contact fingers, 20 daisy-chained signal contact fingers, eight ground contact fingers, two +5 V power contact fingers. Split-lug terminals. Alternate signal/ground cable conductors. Usually used with an M960 and a 12-10090.
M976	120	2	Double-height, short length	Unibus cable connector. Fifty-six signal contact fingers, 14 ground contact fingers. Alternate signal/ground cable conductors. PC solder. Usually used to connect the Unibus to a system unit in an external drawer or cabinet or to a peripheral device. Similar to M919.
M983	36	2†	Double-height, extended length	Thirty-six contact fingers on one side; all can be assigned to signals. Usually used with an RK05. Split-lug terminals.
W011	18	1	Single-height, short length	Nine contact pins dedicated to ground; nine contact pins for signal use. Can be wired for alternate signal/ground configuration. Nineteen split-lug terminals.
W018	18	1	Single-height, short length	All 18 contact pins can be assigned to signals; none are dedicated to ground. A D664 diode is in series with each contact. Eighteen split-lug terminals.

*Cable conductor connections
†Cables enter at right angles to the board.

Flat Ribbon Cable Connectors (Cont)

Module	No. of Pins*	No. of Cables	Size	Description
W020	18	1	Single-height, single length	All 18 contact pins can be assigned to signals; none are dedicated to ground. A 1500-ohm resistor is in series with each contact. Eighteen split-lug terminals.
W021	18	1	Single-height, single length	Nine contact pins dedicated to ground; nine contact pins for signal use. Can be wired for alternate signal/ground configuration. Nineteen split-lug terminals.
W022	18	1	Single-height, single length	Nine contact pins dedicated to ground; nine contact pins for signal use. Can be wired for alternate signal/ground configuration. Nine 100-ohm resistors are included to provide a current-limiting capability. Nineteen split-lug terminals.
W023	18	1	Single-height, single length	All 18 contact pins can be assigned to signals; none are dedicated to ground. Eighteen split-lug terminals. Two jumpers or resistors must be user-installed in series with contact pins A and B.
W027	18	1	Single-height, single length	All 18 contact pins can be assigned to signals; none are dedicated to ground. A 3000-ohm resistor is in series with each pin. Eighteen split-lug terminals.

Flat Mylar Cable Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M901	36	2	Single-height, standard length	No contact fingers dedicated to ground; 32 signal contact fingers; 10-ohm resistors in series with four contact fingers. PC solder. Similar to M908 and M922.
M903	36	2	Single-height, standard length	Eighteen signal contact fingers, 14 ground contact fingers. Alternate signal/ground cable conductors. PC solder. Similar to M904 and M943.
M915	36	2	Single-height, standard length	Thirty-three signal contact fingers (24 equipped with 390-ohm resistors), two ground contact fingers, one +5 V power contact finger. PC solder.
M918	36	2†	Single-height, standard length	No contact fingers dedicated to ground. Jumpers in series with contact fingers U1 and V1; installation of jumpers or resistors required at contact fingers A2 and B2. PC solder.

*Cable conductor connections.
†Cables enter at right angles to the board.

Flat Mylar Cable Connectors (Cont)

Module	No. of Pins*	No. of Cables	Size	Description
M919	120	2	Double-height, standard length	Unibus cable connector. Fifty-six signal contact fingers, 14 ground contact fingers. Alternate signal/ground cable conductors. PC solder. Usually used on a cable with an M929 on the other end. Similar to M976.
M922	36	2	Single-height, standard length	No contact fingers dedicated to ground. Jumpers in series with four contact fingers. PC solder. Similar to M901.
M925	38	2†	Single-height, standard length	Eighteen signal contact fingers, 14 ground contact fingers. Alternate signal/ground cable conductors. PC solder. Similar to M927.
M926	36	2	Single-height, standard length	No contact fingers dedicated to ground. 100-ohm resistors in series with eight contact fingers, 10-ohm resistors in series with four contact fingers. PC solder.
M929	120	2	Double-height, standard length	Mirror image of M919 and usually used on other end of cable. PC solder.
M936	120	2	Double-height, short length	Omnibus cable connector. Forty-eight signal contact fingers, 16 ground contact fingers. Alternate signal/ground cable conductors. PC solder. Two M936s required for Omnibus extension.
M937	120	2	Double-height, short length	Mirror image of M936 and usually used on other end of cable. PC solder.
M943	32	2†	Single-height, standard length	Eighteen signal contact fingers, 14 ground contact fingers. Alternate signal/ground cable conductors. PC solder. Similar to M903.
M945	120	2	Double-height, short length	UDC system unit to expansion system unit bus cable connector. Fifty-four signal contact fingers, four ground contact fingers. Alternate signal/ground cable conductors. PC solder.
M946	120	2	Double-height, short length	Mirror image of M945 and usually used on other end of cable. PC solder.
M972	36	2	Single-height, extended length	No contact fingers dedicated to ground; 34 signal contact fingers, 10-ohm resistors in series with two contact fingers. PC solder.
W031	16	1	Single-height, short length	Nine contact fingers can be assigned to signals; seven contact fingers are dedicated to ground. Can be wired for alternate signal/ground configuration.
W033	18	1	Single-height, single length	All 18 contact fingers can be assigned to signals; none are dedicated to ground.

*Cable conductor connections.
†Cables enter at right angles to the board.

Flat Coaxial Cable Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M904	26	2	Single-height, standard length	Eighteen signal contact fingers, 14 ground contact fingers. Twenty-six split-lug terminals, eight dedicated to ground. Similar to an M903; similar to 1/2 of an M912.
M917	30	2†	Single-height, standard length	Eighteen signal contact fingers, 14 ground contact fingers. Thirty split-lug terminals, 12 dedicated to ground.

Round Coaxial (TWP) Cable Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M912	72	2	Double-height, standard length	Thirty-six signal contact fingers, 28 ground contact fingers. Split-lug terminals. Alternate signal/ground cable conductors. Each slot similar to M904.
M927	27	1†	Single-height, standard length	Sixteen signal contact fingers, 16 ground contact fingers. Split-lug terminals. Similar to M925.
W024	18	1	Single-height, short length	Sixteen signal contact fingers, two ground contact fingers. Thirty-three split-lug terminals. Can be wired for alternate signal/ground configuration.
W028	18	1	Single-height, single length	Same as W021 except with split-lug terminals for series or shunt resistors/capacitors in signal leads.

*Cable conductor connections (includes shields).
†Cables enter at right angles to the board.

Flat Shielded Cable Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M953	40	1	Single-height, standard length	Eighteen signal contact fingers, 14 ground contact fingers. Alternate signal/ground cable conductors. Equipped with a connector for solderless connection of the cable.
M954	80	2	Single-height, standard length	None of the contact fingers are dedicated to ground; 32 signal contact fingers; 10-ohm resistors in series with four contact fingers: U1, V1, A2, and B2. Alternate signal/ground cable conductors possible. Equipped with two connectors for solderless connection of the cables.
M955	40	1	Single-height, standard length	None of the contact fingers are dedicated to ground; 16 signal contact fingers; 10-ohm resistors in series with two contact fingers. Alternate signal/ground cable conductors possible. Equipped with a connector for solderless connection of the cable.

Round Cable Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M959	24	1†	Single-height, short length	No contact fingers are dedicated to ground; 24 signal contact fingers. Split-lug terminals.

Bus Interconnection and Termination Connectors

Module	No. of Pins*	No. of Cables	Size	Description
M920	N/A	N/A	Double-height, short length, dual circuit board	Unibus jumper module.
M935	N/A	N/A	Double-height, short length, dual circuit board	Omnibus jumper module.
M981	N/A	N/A	Double-height, standard length, dual circuit board	Unibus terminator module. Terminates all Unibus signals except AC LO L, DC LO L, BG7 H, BG6 H, BG5 H, BG4 H, and NPG H.

*Cable conductor connections.
†Cable enters at right angle to the board.

Miscellaneous Connectors

Module	No. of Pins*	No. of Cables	Size	Description
12-09340-00	8	See Description column	2.3 X 0.85 X 0.3 in. (5.8 X 2.2 X 0.8 cm) nominal	Female connector with up to eight female pins to provide termination for up to eight 20–14 AWG conductors. Equipped with two mounting holes and is usually mounted on a connector board or on the equipment. Requires 12-09379-01 pins. Mates with 12-09340-01 connector. Usually used with TTY and other serial devices.
12-09340-01	8	See Description column	2.2 X 1.5 X 0.3 in. (5.5 X 3.7 X 0.8 cm) nominal	Male connector that mates with 12-09340-00 connector and is usually used to terminate a cable with up to eight 20–14 AWG conductors. Requires 12-09378-01 pins. Usually used with TTY and other serial devices.
12-09350-03, -04, -06, -09, -12, -15	3, 4, 6, 9, 12, or 15	Refer to 12-09350 description in this section	Refer to 12-09350 description in this section	Female connectors that accommodate 3, 4, 6, 9, 12, or 15 female pins to provide termination for 26–14 AWG conductors. Usually bulkhead mounted. Requires 12-09879-01 pins. Mates with 12-09351-03, -04, -06, -09, -12, or -15 connectors. Usually used with TTY and other serial devices.
12-09351-03 -04, -06, -09, -12, -15	3, 4, 6, 9, 12, or 15	Refer to 12-09351 description in this section	Refer to 12-09351 description in this section	Male connectors that mate with 12-09350-03, 04, 06, 09, 12, or -15 connectors and are usually used to terminate a cable with 26–14 AWG conductors. Usually used with TTY and other serial devices.
H851	N/A	1	Two adjacent slots accommodate 36 single-height contact fingers	Edge connector providing busing of 36 signals of two adjacent modules equipped with top (handle end) contact fingers.
H854	40	1	2.5 X 0.75 X 0.3 in. (4.6 X 1.89 X 0.8 cm) nominal	A 40-pin connector designed to be mounted on a printed circuit board. The pins form right angles to intersect the printed circuit tracks. Mates with H856 connector.
H856	40	1	2.205 X 0.545 X 0.200 in. (5.600 X 1.384 X 0.508 cm) nominal	Designed to terminate a cable and mate with H854 connector.

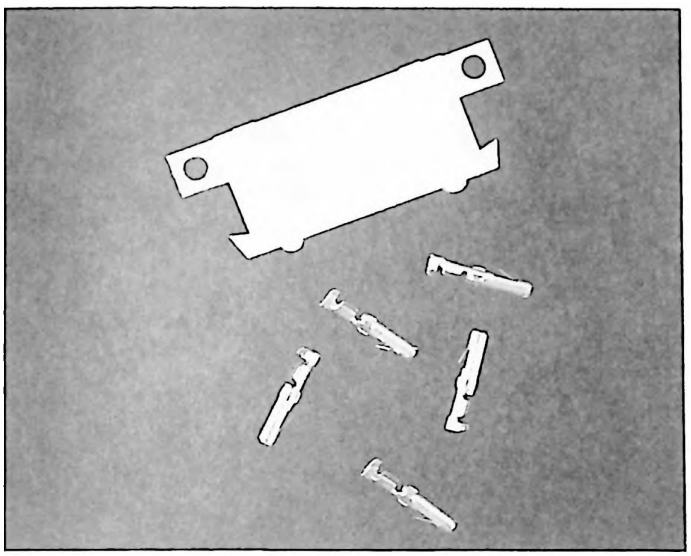
*Cable conductor connections.

Miscellaneous Connectors (Cont)

Module	No. of Pins*	No. of Cables	Size	Description
H9100	80 at H854s	2	Single-height, extended length	Printed circuit cable connector with two 40-pin H854 connectors that mate with cables equipped with H856 connectors. The two H854 connectors and the board contact fingers form a "T" type connector. Thirty-two independent lines available at contact fingers with the remaining contact fingers, usually associated with ground, connected in common.
M971	40 at one H854	1	Single-height, standard length	Printed circuit cable connector with a 40-pin H854 connector that mates with a cable equipped with an H856 connector. Forty pins of the H854 in series with 36 board contact fingers; i.e., 32 pins of the H854 in series with 32 contact fingers (four with 10-ohm resistors in series) and eight pins of the H854 in series with four contact fingers. No contact fingers dedicated to ground.
M973	4	1	Single-height, standard length	Printed circuit cable connector with a 12-09340-00 connector equipped with four pins. The connector mates with a cable equipped with a 12-09340-01 connector. Normally used as a TTY cable connector.
M975	80 at two H854s	2	Double-height, short length	Printed circuit cable connector with two 40-pin H854 connectors that mate with cables equipped with H856 connectors. Eighteen pins of each H854 in series with 18 board contact fingers; the two H854 connectors are not electrically connected. Six contact fingers and 44 H854 pins dedicated to ground. Alternate signal/ground cable conductors.

*Cable conductor connections

Eight-Pin Connector (Female) Housing — 12-09340-00

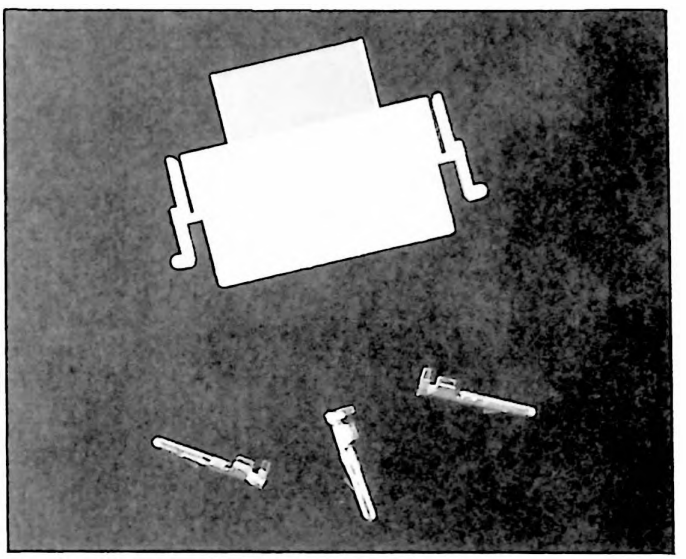


The 12-09340-00 is a cable connector housing that accommodates up to eight 12-09379-01 female connector pins, thereby providing termination for up to eight 20 to 14 AWG conductors.

The 12-09340-00 is 2.300 in. (5.842 cm) wide, 0.850 in. (2.159 cm) high, and 0.300 in. (0.762 cm) thick overall. It is equipped with two 0.170-in. (0.432-cm) diameter mounting holes spaced 2.000 in. (5.080 cm) center-to-center.

This nylon-fabricated female cable connector housing mates with male cable connector housing 12-09340-01, and has two protrusions that engage slots on the mating male cable connector housing to connect the two. These connectors are commonly used on cables for teletypewriter and other serial devices.

Eight-Pin Cable Connector (Male) Housing — 12-09340-01



The 12-09340-01 is a cable connector housing that accommodates up to eight 12-09378-01 male contact pins, thereby providing termination for a cable with up to eight 20 to 14 AWG conductors.

The 12-09340-01 is 2.172 in. (5.517 cm) wide, 1.450 in. (3.683 cm) high, and 0.310 in. (0.787 cm) thick overall.

This nylon-fabricated male cable connector housing mates with female cable connector housing 12-09340-00, and has two slots that engage protrusions on the mating female cable connector housing to connect the two. These connectors are commonly used with teletypewriter and other serial devices.

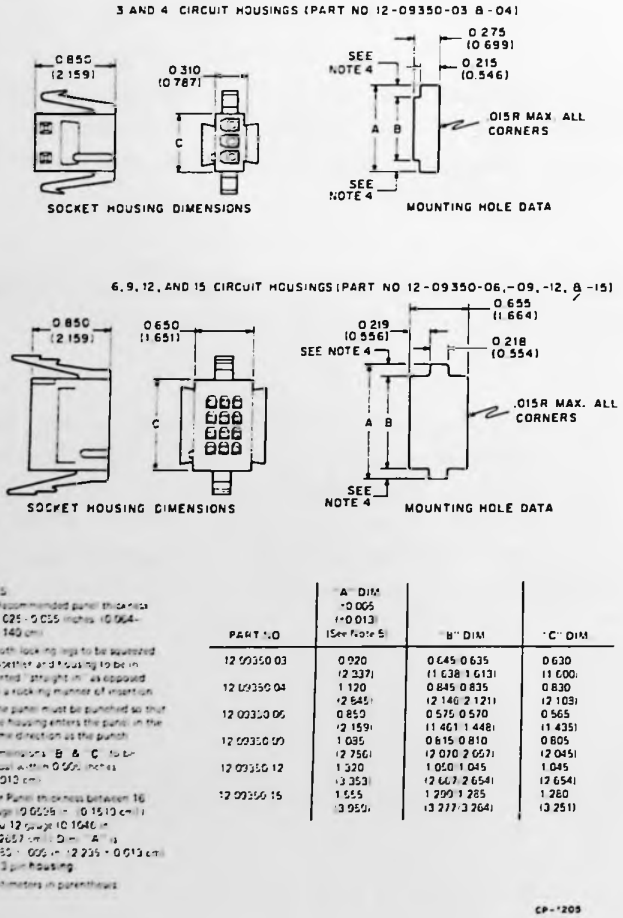
Cable Connector (Female) Housing – 12-09350

The 12-09350 cable connector accommodates 12-09379-01 female connector pins according to the following chart:

Part Number	No. of Circuits	Qty. Sold/Pkg.
12-09350-03	3	5
12-09350-04	4	5
12-09350-06	6	5
12-09350-09	9	3
12-09350-12	12	3
12-09350-15	15	2

The connector pins each accept one 26 to 14 AWG conductor, two 18 AWG conductors, or one 16 AWG conductor and one 18 AWG conductor.

The overall dimensions of this series of female cable connector housings are shown on the following illustration, which also contains connector mounting information.



12-09350 Connector Dimensions and Mounting Data Diagram

These nylon-fabricated female cable connector housings mate with male cable connector housings 12-09351-03, -04, -06, -09, -12, and -15, and each has two protrusions that engage slots on the mating male cable connector housing to connect the two. These connectors are commonly used as panel-mounted receptacles for teletypewriter and other serial device cables.

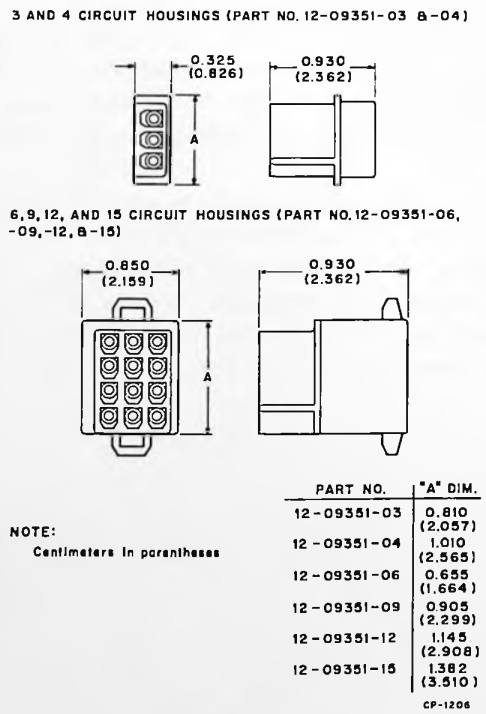
Cable Connector (Male) Housing – 12-09351

The 12-09351 cable connector accommodates 12-09378-01 male connector pins according to the following chart:

Part Number	No. of Circuits	Qty. Sold/Pkg.
12-09351-03	3	5
12-09351-04	4	5
12-09351-06	6	5
12-09351-09	9	5
12-09351-12	12	3
12-09351-15	15	3

The connector pins each accept one 26 to 14 AWG conductor, two 18 AWG conductors, or one 16 AWG conductor and one 18 AWG conductor.

The overall dimensions of this series of male cable connector housings are shown on the following illustration.



12-09351 Connector Dimensions Diagram

These nylon-fabricated male cable connector housings mate with female cable connector housings 12-09350-03, -04, -06, -09, -12, and -15, and each has two slots that engage protrusions on the mating female cable connector housing to connect the two. These connectors are commonly used as plugs on cables for teletypewriter and other serial devices.

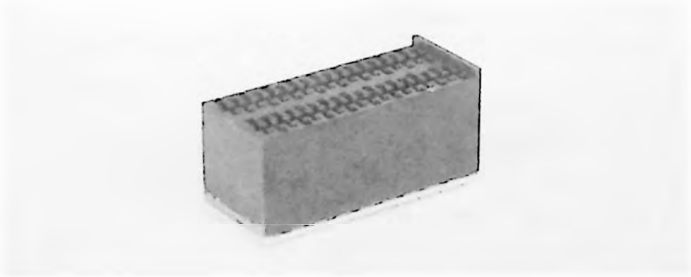
Male Connector Pins – 12-09378-01

The 12-09378-01 is a package of eight male connector pins. Up to eight of these male connector pins are used with eight-pin cable connector (male) housing 12-09340-01. These pins accommodate 20 to 14 AWG wire and are secured by crimping. They are phosphorus bronze and are tin plated.

Female Connector Pins – 12-09379-01

The 12-09379-01 is a package of eight female connector pins. Up to eight of these female connector pins are used with eight-pin cable connector (female) housing 12-09340-00. These pins accommodate 20 to 14 AWG wire and are secured by crimping. They are phosphorus bronze and are tin plated.

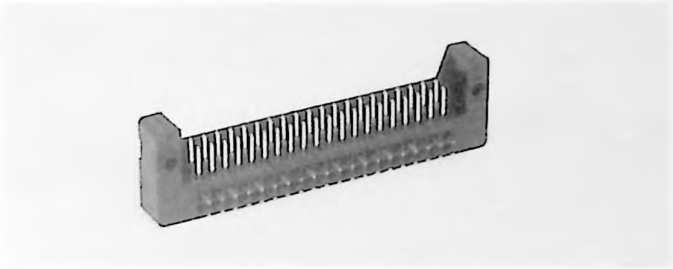
Edge Connector – H851



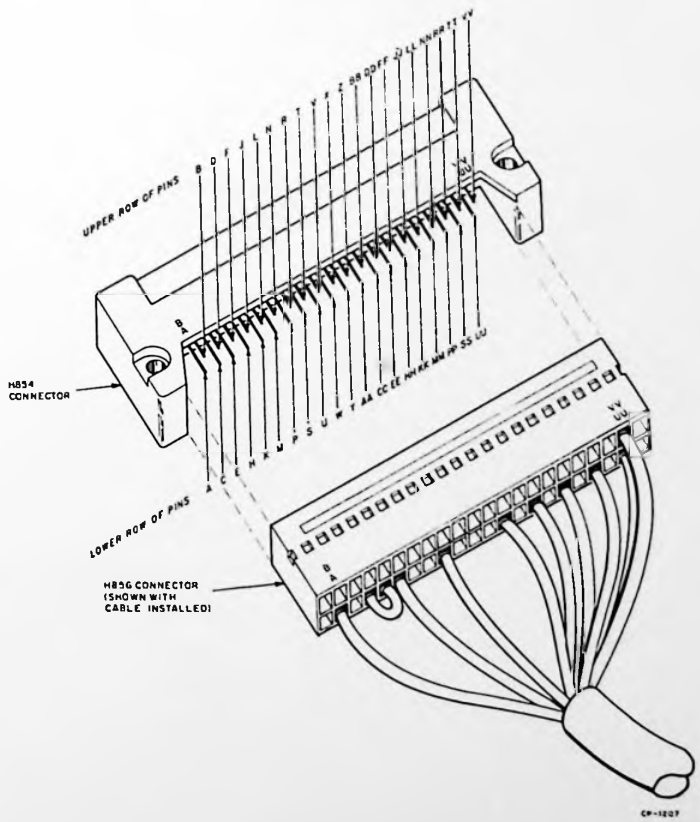
The H851 edge connector is a 72-pin connector designed to be used to interconnect 36 top (handle end) terminal fingers of a DEC FLIP CHIP module* with 36 top terminal fingers of an adjacent module, thereby providing additional signal paths between the two modules. Pins A1, A2, B1, etc., of slot 1 of the H851 are connected to pins A1, A2, B1, etc., respectively, of slot 2 by a printed circuit board soldered in place.

*Modules with top (handle end) terminal fingers include the M7300, M7301, M8340, M8341, G227, W966, and W967. W966 and W967 are described in Section 7, and M7301, M8340, M8341, and G227 are described in the DIGITAL Logic Handbook.

I/O Connector – H854



The H854 I/O connector is a 40-pin male connector designed to be mounted on a printed circuit module board and soldered in place; it is usually used on a circuit board that contains custom-designed circuitry. The H854 mates with the 40-socket female connector H856. The mating ends of the H854 pins are at right angles to the soldered ends to permit space-saving cable entry to the system, i.e., the cable is parallel to the surface of the circuit board. The mating surface of the H854 is marked with pin designations to facilitate pin identification. The H854 pin layout diagram illustrates pin locations.

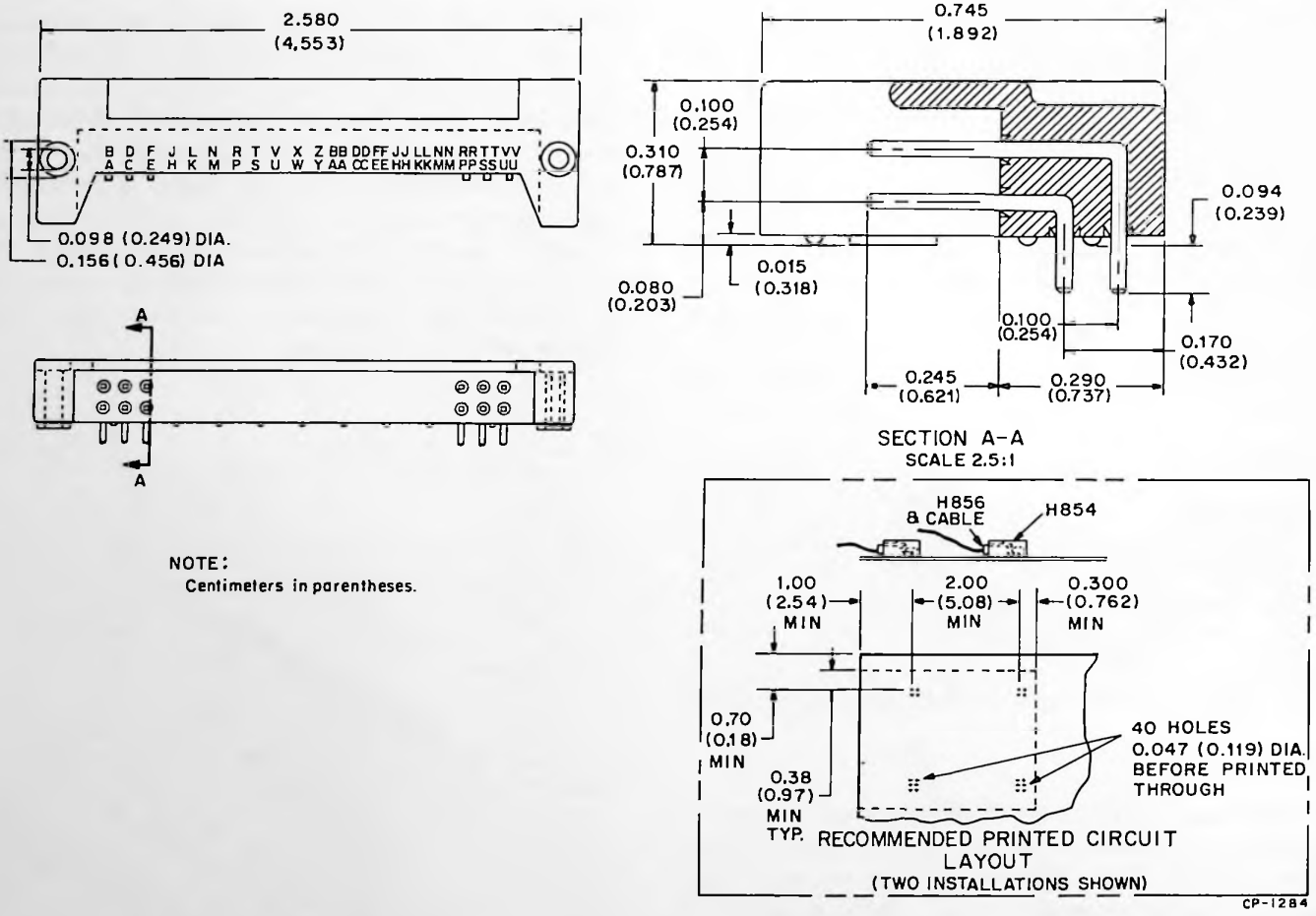


H854 Connector Pin Layout Diagram

The H854 is 2.580 in. (4.553 cm) long, 0.745 in. (1.892 cm) wide, and 0.310 in. (0.787 cm) thick when mounted on a circuit board. The soldered ends of the pins extend 0.094 in. (0.239 cm); therefore, the pins will extend 0.048 in. (0.122 cm) through an 0.056-in. (0.142-cm) thick circuit board to permit easy soldering to the etched tracks.

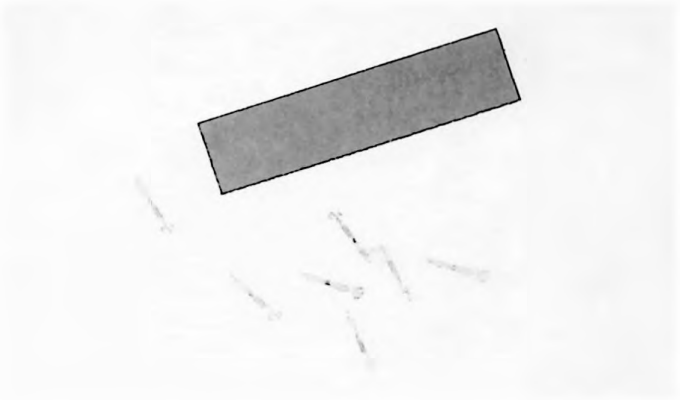
The H854 has two rows of 20 male pins; the pins are 0.025 in. (0.064 cm) square and are spaced 0.100 in. (0.254 cm) center-to-center in each direction, as shown in the H854 I/O connector dimensions illustration. This illustration also shows the recommended printed circuit board layout.

Blank module boards W970–W975, W990–W999, and W9720–W9722, described in Section 7, are well adapted to mounting the H854 and custom-designed circuitry.



H854 I/O Connector Dimensions

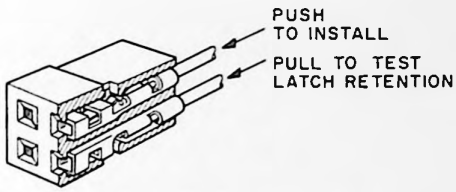
I/O Connector – H856



The H856 I/O connector is a 40-socket female connector designed to terminate flat ribbon cable. Forty female sockets are supplied with the H856, which mates with the 40-pin male connector H854. Refer to the pin layout diagram in the H854 I/O connector description for H856 socket identification.

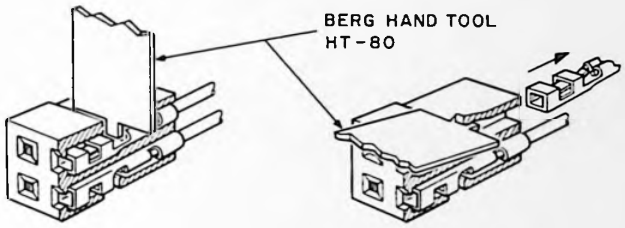
The H856 is 2.205 in. (5.600 cm) long, 0.545 in. (1.384 cm) wide, and 0.200 in. (0.508 cm) thick.

The H856 has two rows of 20 female sockets; the sockets are sized and spaced to accept the 0.025-in. (0.064-cm) H854 male pins spaced 0.100 in. (0.254 cm) center-to-center in each direction. The sockets (contacts) are rated at 3 A continuous (dry circuit); they accommodate one 22, 24, or 26 AWG wire, or two 26 or 28 AWG wires, with up to 0.069-in. (0.175-cm) diameter insulation. The conductors should be crimped using Berg crimping tool model number HT95, available from Berg Electronics, New Cumberland, PA 17070. The following illustrations show socket removal, installation, and crimping procedures.



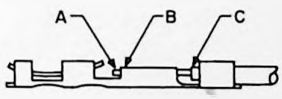
INSTALL AND LATCH SOCKET AS SHOWN IN THE ABOVE FIGURE. BE SURE THAT LATCH SNAPS. MINIMUM PULL-OUT FORCE IS 6.5 LB.

Socket Insertion Procedures



TO REMOVE SOCKET: PUSH SOCKET FORWARD, LIFT LATCH WITH HAND TOOL AS SHOWN IN THE ABOVE FIGURES.

Socket Removal Procedures



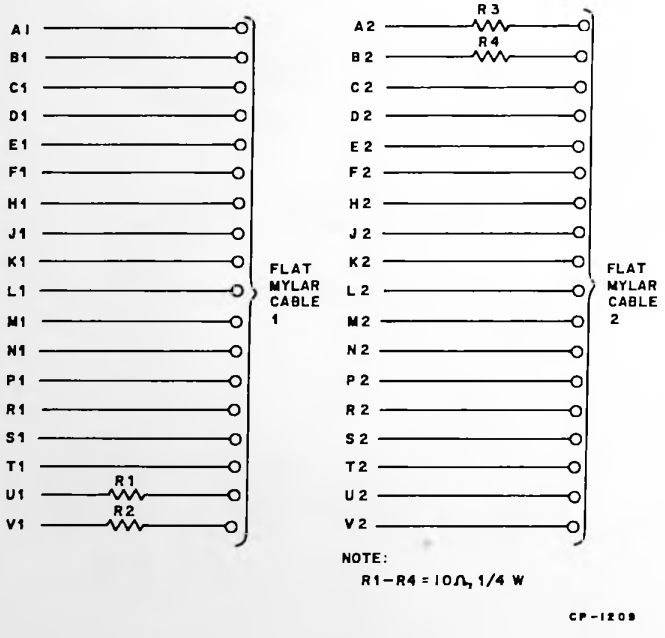
A. STRIPPED WIRE TO BE VISIBLE AT THIS POINT.
B. CRIMP TO HAVE SLIGHT UPTURN AT THIS POINT.
C. INSULATION TO BE VISIBLE AT THIS POINT.

CP-1208

Conductor-to-Socket Crimping Procedures

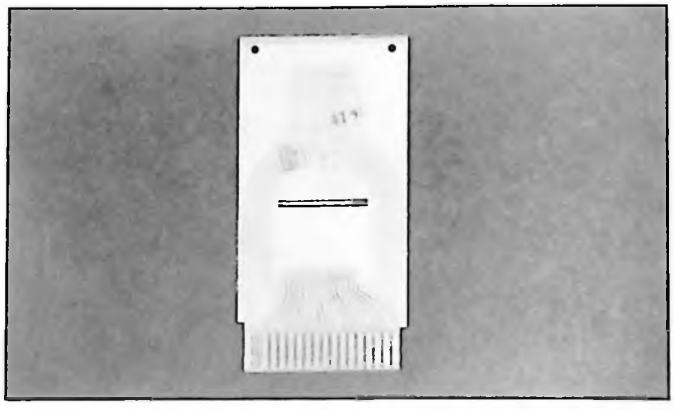
Cable Connector – M901

The M901 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 17-00002-0, nineteen-conductor, flat mylar cables. None of the contact fingers are dedicated to ground. Four 10-ohm, current-limiting resistors are in series with contact fingers U1, V1, A2, and B2. (See the following schematic diagram.) This is a general-use cable connector. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamps 940 can be used with this connector for strain relief. The M901 is similar to an M908 and an M922 with these exceptions: the M908 is used with flat ribbon cable, and the M922 has removable jumpers installed in series with contact fingers U1, V1, A2, and B2.

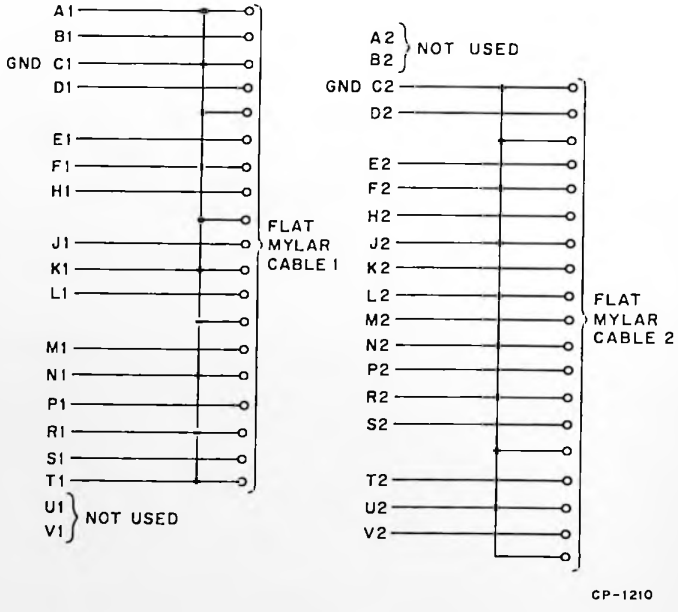


M901

Cable Connector – M903

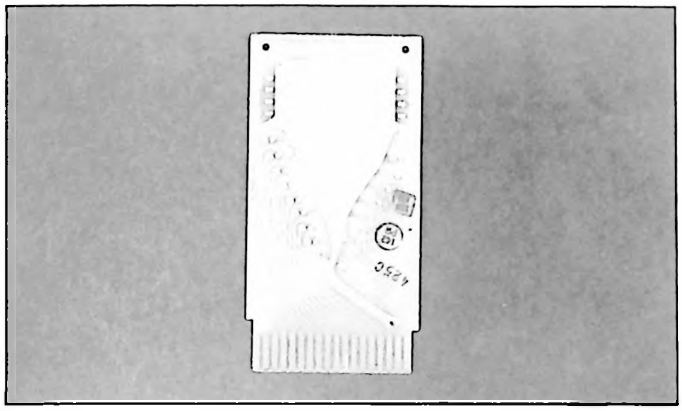


The M903 is a single-height, standard length cable connector with 17 contact fingers on each side; it can accommodate two 17-00002-0, nineteen-conductor, flat mylar cables. Eighteen contact fingers can be assigned to signals; 14 are dedicated to ground and 2 are not used. (See the following schematic diagram.) This is a general-use cable connector. The cable conductors must be soldered to the board etch using printed circuit solder techniques; two 19-conductor cables provide alternate signal/ground cable conductors. Cable clamp 940 can be used with this connector for strain relief. The M903 is similar to an M904 except the M904 is used with coaxial type cables. The M903 is also similar to an M943 except the cables enter the M943 at right angles (one from each side) to the board.

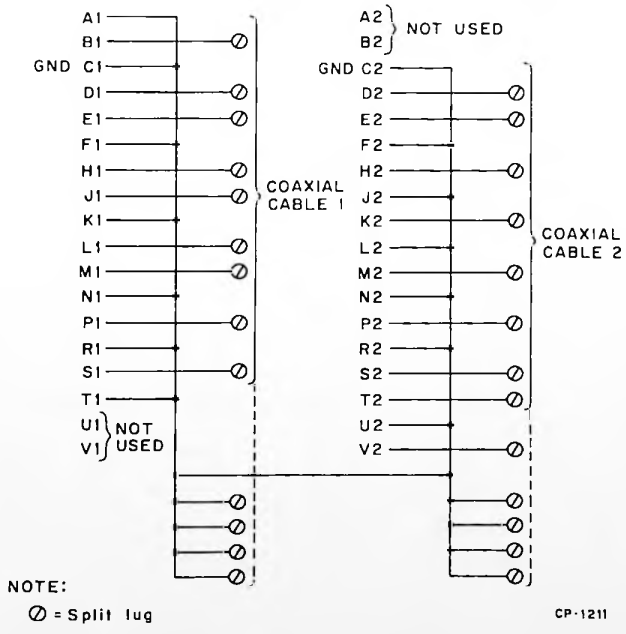


M903

Cable Connector – M904

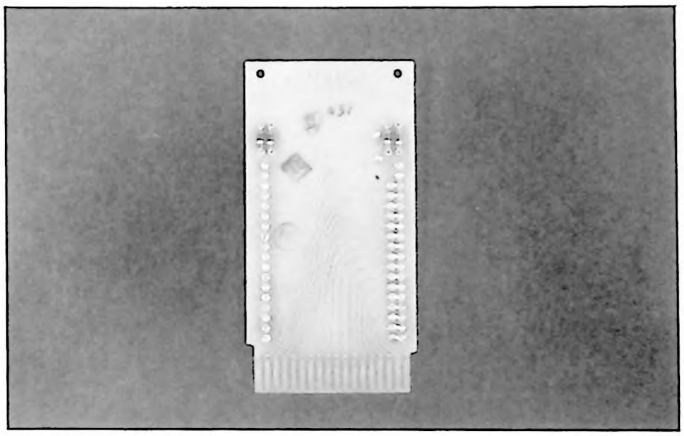


The M904 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 17-00001-00 or 17-00001-01, nine-conductor, flat coaxial cables. Eighteen contact fingers can be assigned to signals; 14 are dedicated to ground and 4 are not used. (See the following schematic diagram.) This is a general-use I/O cable connector. The board is equipped with 26 split-lug terminals for solder connection of cable conductors; 18 split-lug terminals are associated with signals and 8 are dedicated to ground, as shown on the schematic diagram. Cable clamp 944 can be used with this connector for strain relief. Round, 9-conductor coaxial cables 17-00003, or round, 38-conductor (19 TWP) cable 91-07541 and cable clamp 941 can also be used with this connector. The M904 is similar to an M903 except the M903 is used with flat mylar cables. The M904 provides the same electrical configuration as one-half (one slot segment) of an M912 cable connector.

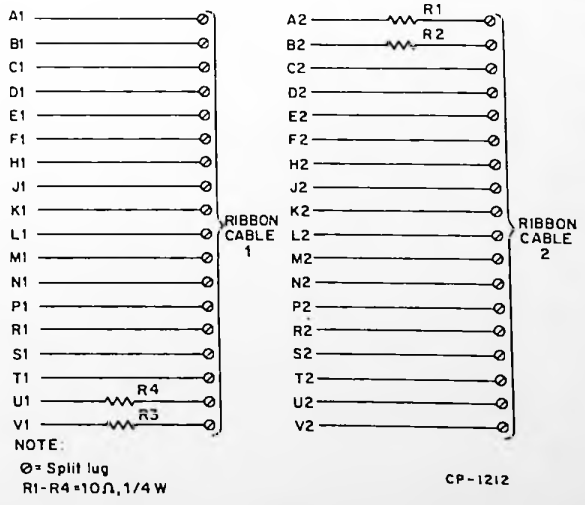


M904

Cable Connector – M908

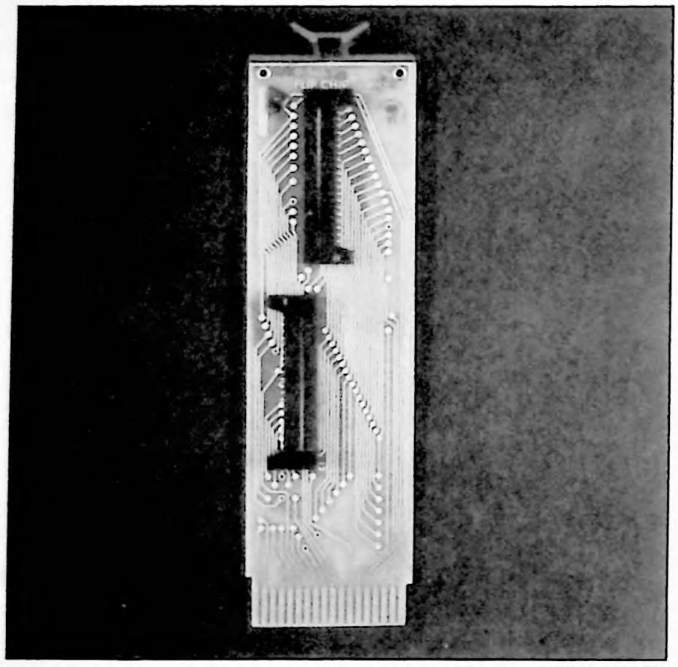


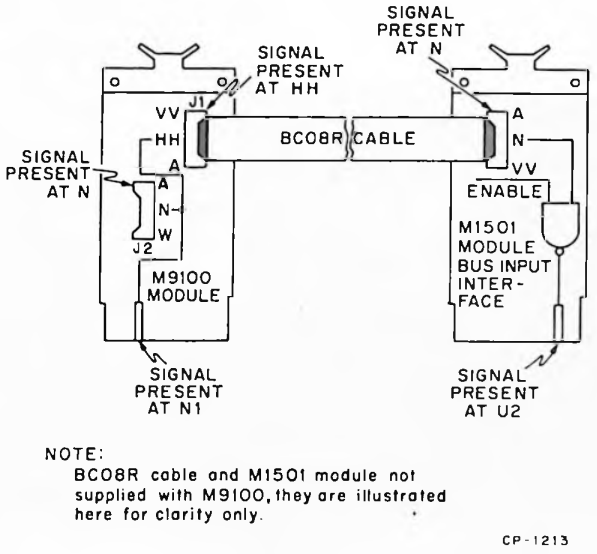
The M908 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 91-07575, twenty-conductor, flat ribbon cables. None of the contact fingers are dedicated to ground. Four 10-ohm, current-limiting resistors are in series with contact fingers U1, V1, A2, and B2. (See the following schematic diagram.) This is a general-use cable connector. The board is equipped with 36 split-lug terminals for solder connections of the cable conductors. Cable clamp 943 can be used with this connector. Round, 38-conductor (19 TWP) cable 91-07541 and cable clamp 941 can also be used with this connector. The M908 is similar to an M901 except the M901 is used with flat mylar cables.



M908

Adapter (H854 to H854) Connector – M9100





NOTE:
BC08R cable and M1501 module not supplied with M9100, they are illustrated here for clarity only.

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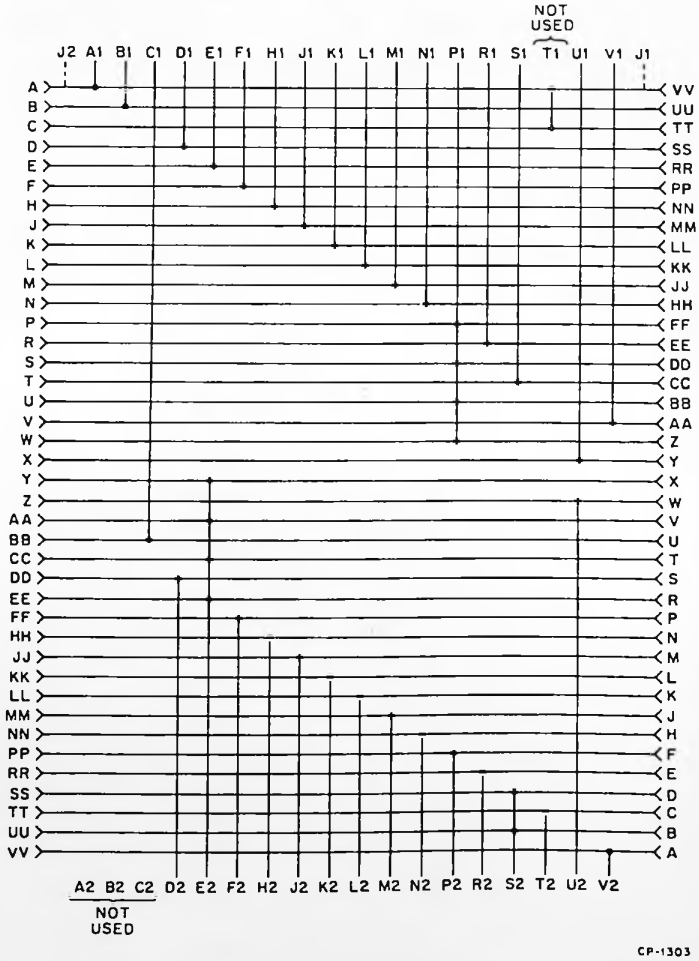
M9100 Functional Diagram

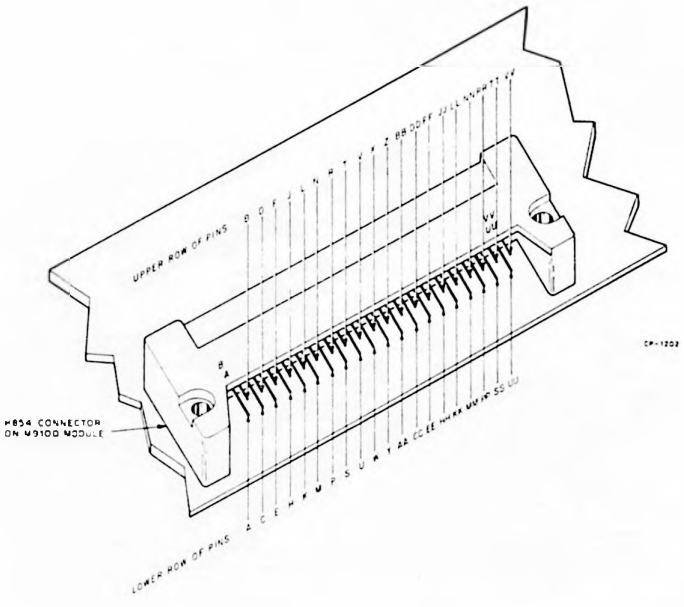
The M9100 is a single-height, extended length adapter connector with 18 contact fingers on each side; it accommodates two of any cable that has an H856 connector, such as the BC08J, BC08K, BC08R, or BC04Z series. The M9100 is equipped with two 40-pin H854 I/O cable connectors (J1 and J2). Signals coming from or going to an interfacing module, such as an M1501 or M1502,* will usually be plugged into J1, and signals going to or coming from an external device will usually be plugged into J2, as shown on the functional diagram. This configuration provides 26 dedicated signal paths from (or to) an external device to (or from) an interfacing module. The 26 signals are also available at the M9100 contact fingers: a simple "T" adapter offering many uses. This could, for example, permit easy, semipermanent monitoring of the signals and/or access to the signals for performance of operations, and, at the same time, placing the signals on the bus or receiving the signals from the bus, as shown on the schematic diagram. The other 12 pins at I/O connectors J1 and J2 are interconnected as shown on the schematic diagram and are usually used for ground connections. H854 (J1 and J2) connector pins are identified in the H854 connector pin identification diagram. To provide the greatest flexibility, none of the I/O lines are connected to the M9100 ground or power contact fingers (T1, A2, B2, and C2).

*M1501, M1502, and other logic modules are fully described in the DIGITAL Logic Handbook and in individual date sheets published by Digital Equipment Corporation.



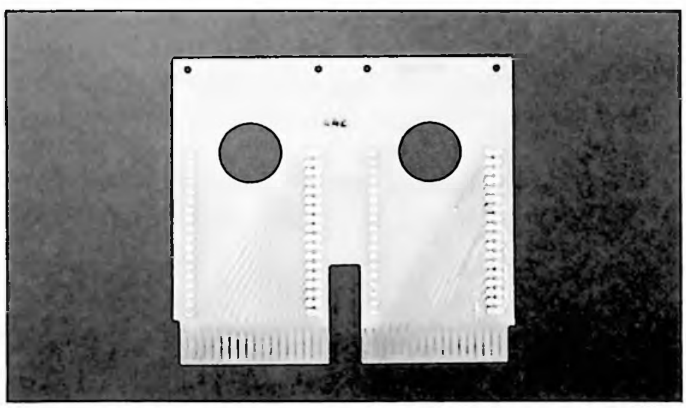
CP-1303

M9100

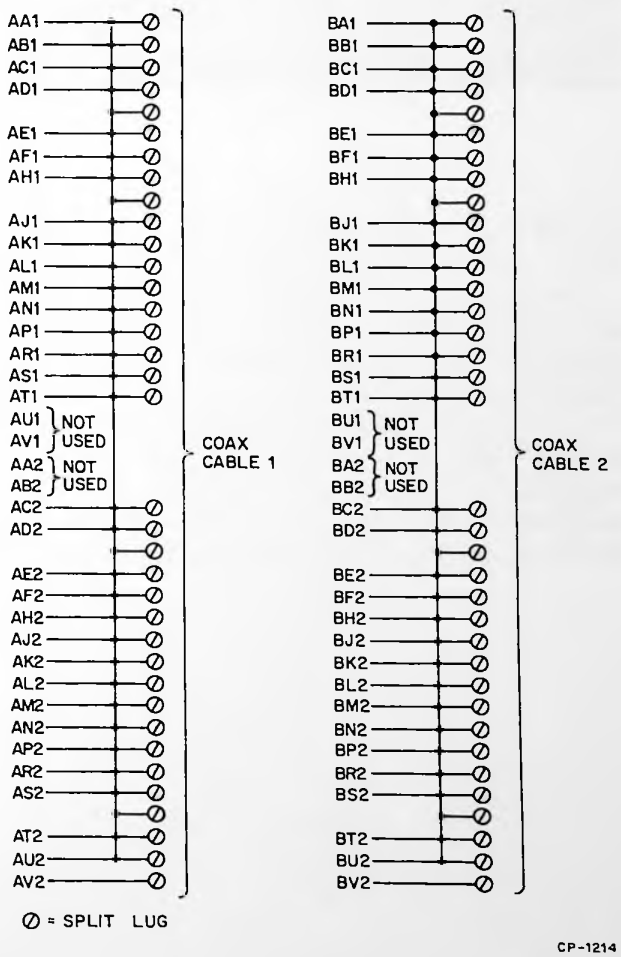


H854 Connector Pin Identification Diagram

I/O Bus Cable Connector – M912

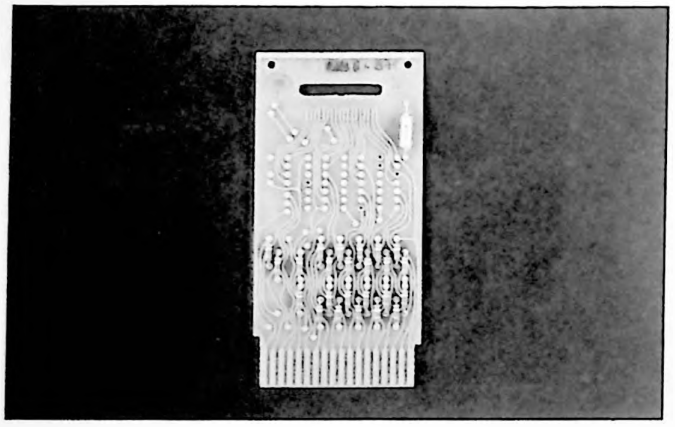


The M912 is a double-height, standard length cable connector with 36 contact fingers on each side; it can accommodate two 17-07599, thirty-six-conductor (18 twisted pairs), round cables. Thirty-six contact fingers can be assigned to signals; 28 are dedicated to ground and 8 are not used. (See the following schematic diagram.) The board is equipped with 72 split-lug terminals for solder connection of the cable conductors and for an alternate signal/ground cable conductor configuration. (See the schematic diagram.) This is a general-use I/O bus cable connector. Cable clamp 941 can be used with this connector for strain relief. Each slot segment of the M912 provides the same electrical configuration as an M904 cable connector.

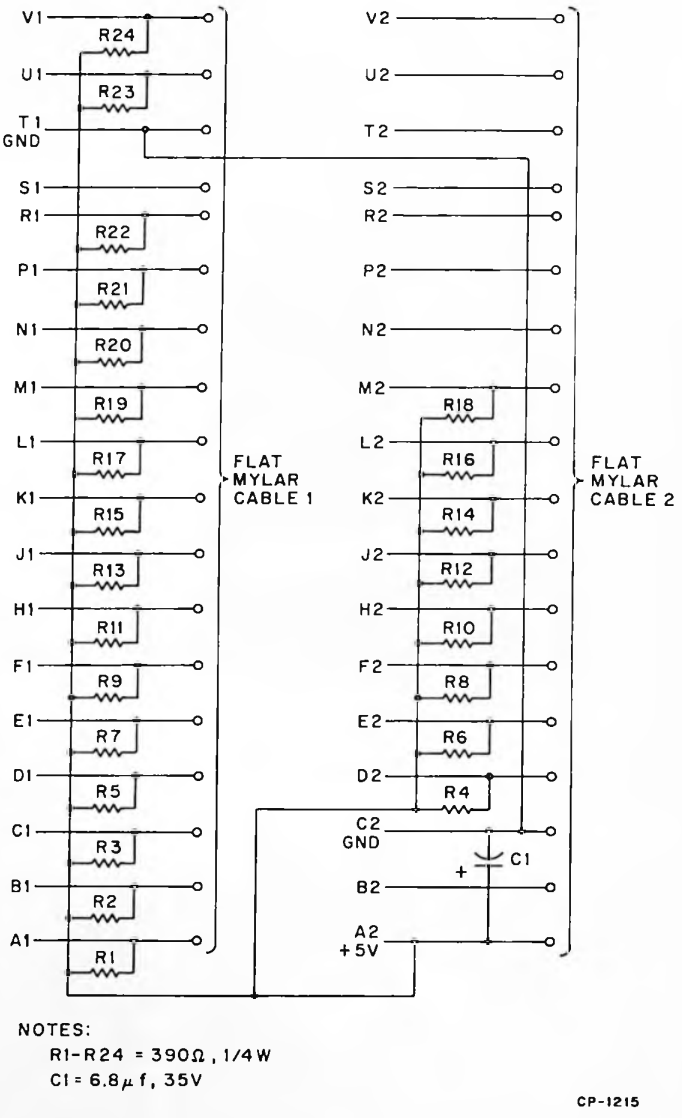


M912

Cable Connector – M915

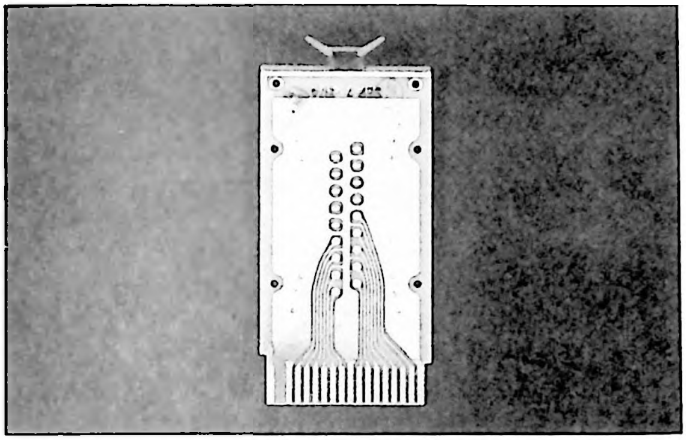


The M915 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 17-00002-00, nineteen-conductor, flat mylar cables. Thirty-three contact fingers can be assigned to signals (24 are equipped with pull-up resistors), two are dedicated to ground, and one is dedicated to +5 V power, as shown on the following schematic diagram. This is a general-use I/O cable connector, where pull-up resistors are required. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 940 can be used with this connector for strain relief.

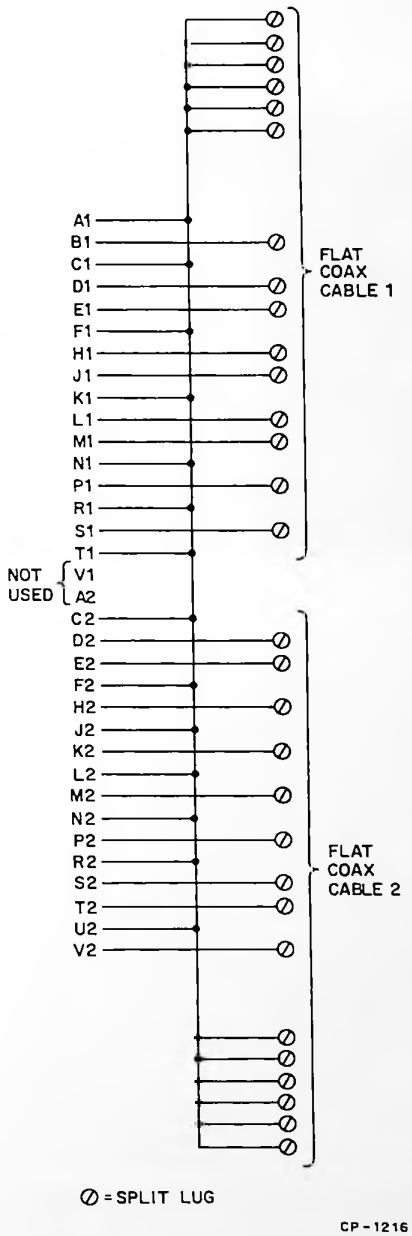


M915

Cable Connector – M917



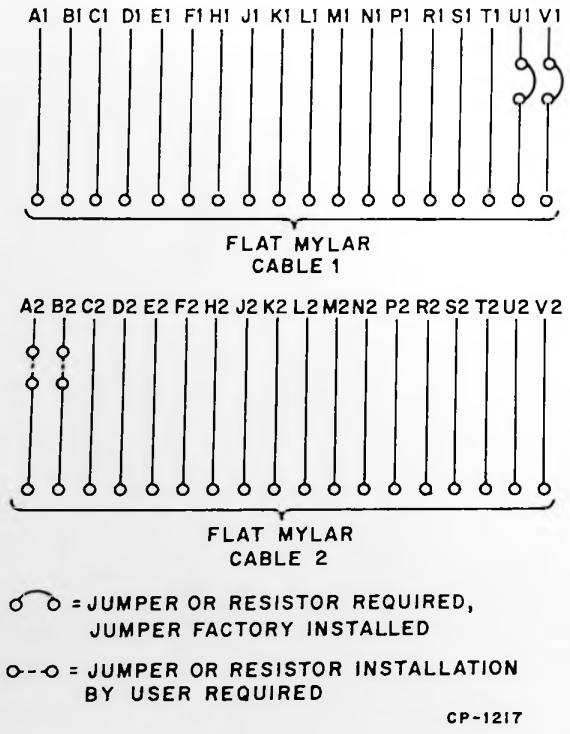
The M917 is a single-height, standard length cable connector with 17 contact fingers on each side; it can accommodate two 17-0000, nine-conductor, flat coaxial cables. The cables enter the board at right angles, one from each side. Eighteen contact fingers can be assigned to signals, 14 are dedicated to ground, and 2 are not used, as shown on the following schematic diagram. This is a general-use cable connector. The board is equipped with 30 split-lug terminals for solder connection of the cable conductors; 18 split-lug terminals are associated with signals and 12 are dedicated to ground. (See the schematic diagram.) Cable clamp 940 can be used with this connector for strain relief.



M917

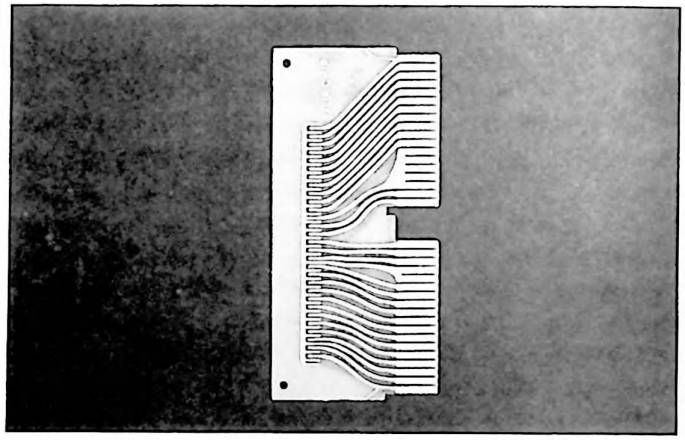
Cable Connector – M918

The M918 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 17-00002-0, nineteen-conductor, flat mylar cables. The cables enter the board at right angles; one cable enters from one side and the other cable enters from the other side (i.e., at 180 degrees). None of the contact fingers are dedicated to ground; two contact fingers (U1 and V1) are equipped with removable jumpers and two (A2 and B2) must have jumpers or resistors installed by the user. (See the following schematic diagram.) This is a general-use I/O cable connector. Current-limiting resistors are usually installed at contact fingers A2 and B2; if the jumpers are removed from contact fingers U1 and V1, resistors must be installed at those locations. Printed circuit solder techniques must be used to install jumpers or resistors. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 940 can be used with this connector for strain relief.

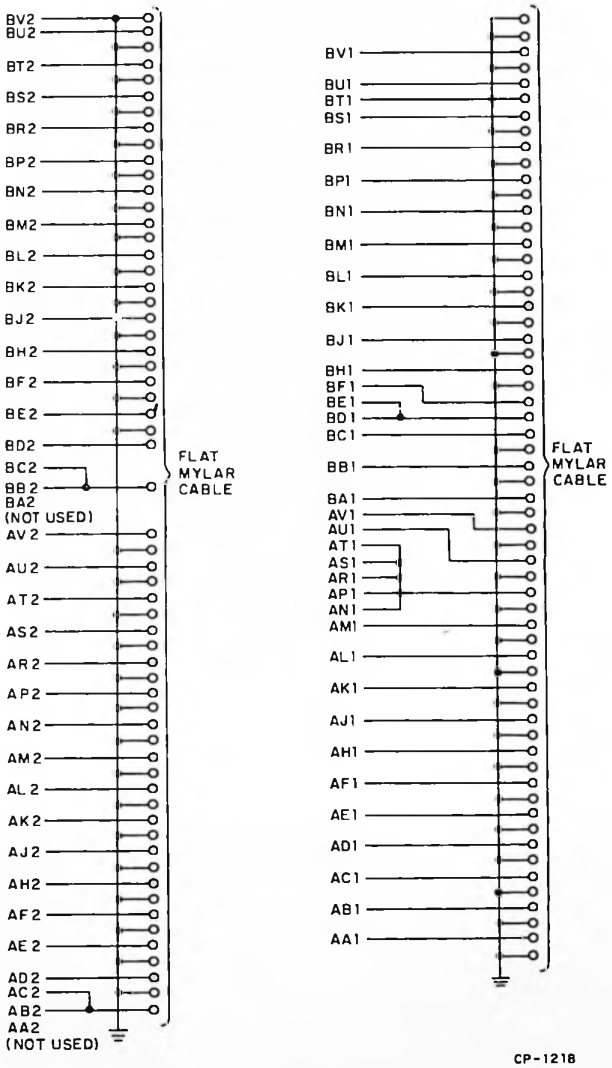


M918

Unibus Cable Connector – M919



The M919 is a double-height, short length cable connector with 36 contact fingers on each side; it can accommodate two 17-00002-1, sixty-conductor, flat mylar cables. This connector and an M929 are used on a cable to connect the Unibus to a system unit in an external mounting drawer or cabinet, or to connect a peripheral device not located within the drawer; preassembled cable assembly BC11A-XX can also be used for this purpose. Fifty-six contact fingers can be assigned to Unibus signals, 14 are dedicated to ground, and 2 are not used. (See the following schematic diagram.) This is a general-use Unibus cable connector, which provides an alternate signal/ground cable conductor configuration. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 12-09764 can be used with this connector for strain relief. The M919 is similar to an M976 cable connector except the M976 is used with flat ribbon cables.



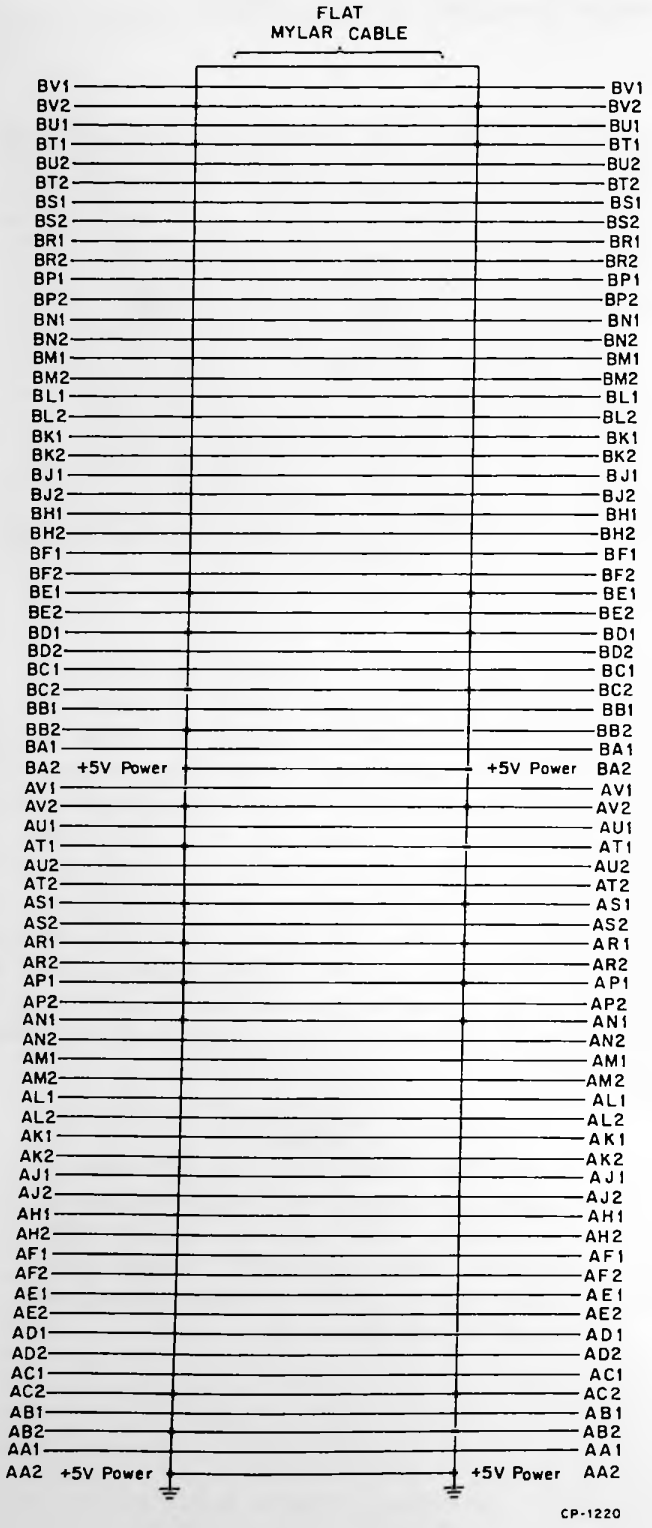
M919

Unibus Connector Module – M920

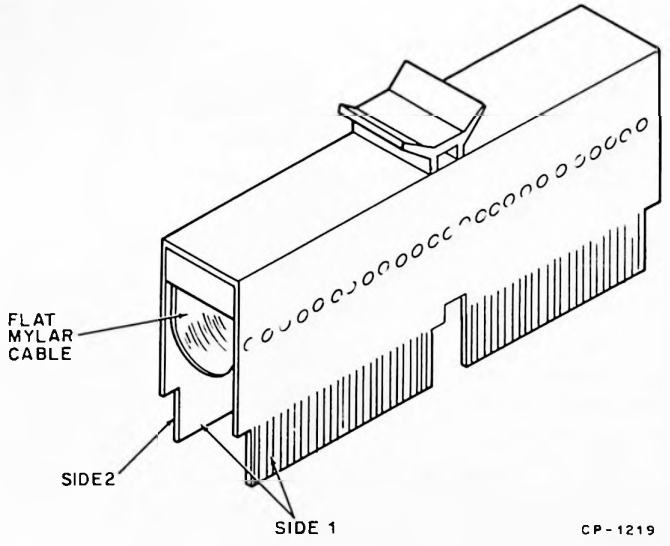
The M920 Unibus connector module is a dual printed circuit board, double-height, short length module that electrically connects the Unibus from one system unit to the next system unit when the two system units are adjacent. On each printed circuit board, 56 contact fingers are assigned to Unibus signals, 14 are dedicated to ground, and 2 are used for +5 V power. (See the following schematic diagram.) The two printed circuit boards are on 1.000-in. (2.540-cm) centers and are connected by a 73-conductor, flat mylar cable as shown on the following illustration.

NOTE

If the two system units are not adjacent, Unibus cable assembly BC11A-XX can be used, or a similar cable assembly can be user-assembled with two 17-00002-1 cables of the proper length, one M919 cable connector, and one M929 cable connector.

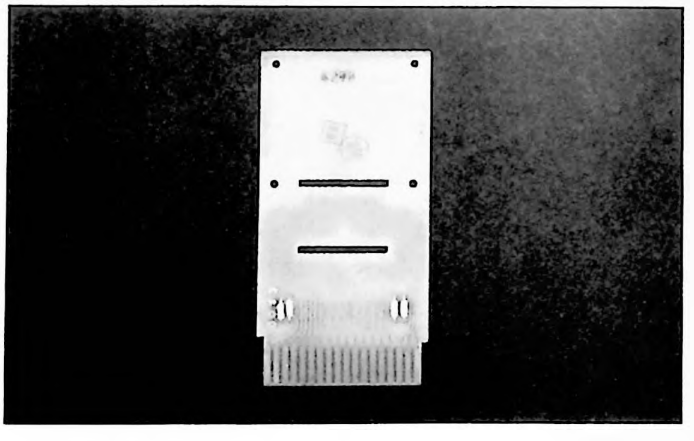


M920

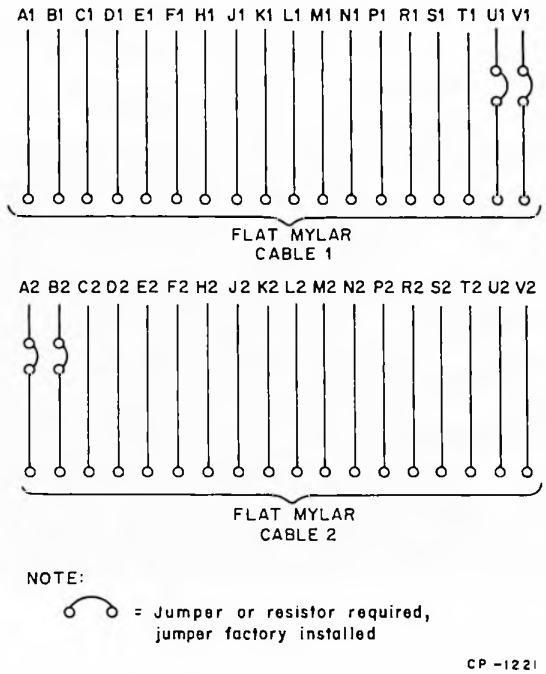


M920

Cable Connector – M922

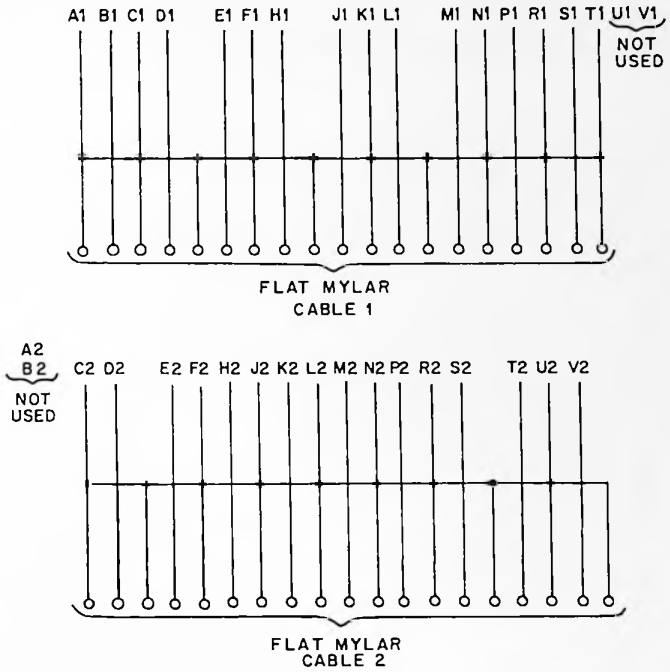


The M922 cable connector is the same as the M901 except the M922 has removable jumpers installed in series with contact fingers U1, V1, A2, and B2, as shown on the following schematic diagram. The jumpers can be removed and current-limiting resistors to suit the requirements of the user can be installed at these locations; printed circuit solder techniques must be used to connect these user-supplied resistors.



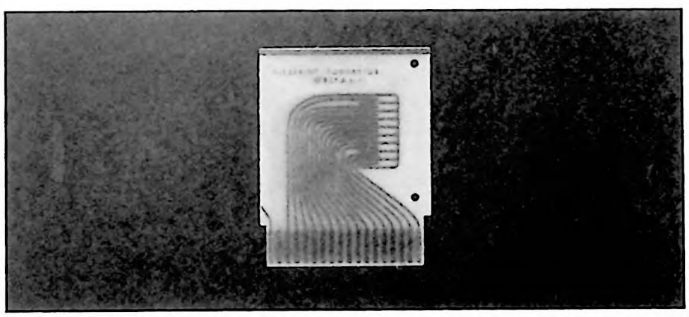
M922

Cable clamp 940 can be used with this connector for strain relief. The M925 is similar to an M927 except the M927 is used with round coaxial cables.



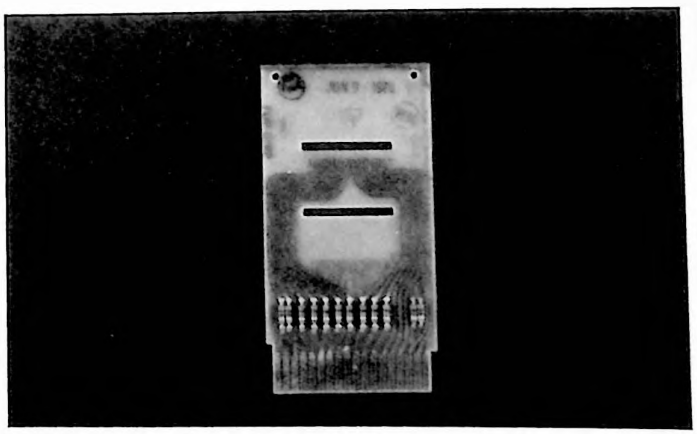
M925

Cable Connector – M925



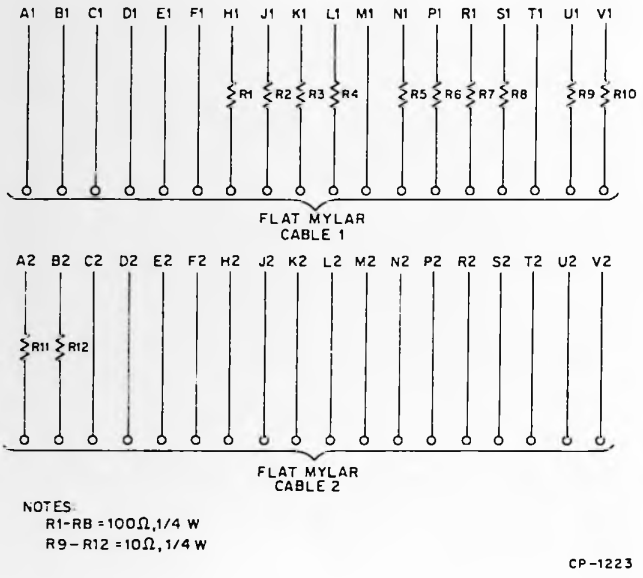
The M925 is a single-height, short length cable connector with 18 contact fingers on each side; it can accommodate two 17-00002-0, nineteen-conductor, flat mylar cables, which enter the board at right angles. The M925 is used in a DD11-A System Unit with the internal device control module. The M925 and an M903 cable connector are used on an I/O cable with a PC11 High-Speed Paper Tape Reader/Punch; preassembled cable assembly BC08F-06 can also be used for this purpose. Eighteen contact fingers can be assigned to signals, 14 are dedicated to ground, and 4 are not used. (See the following schematic diagram.) The cable conductors must be soldered to the board etch using printed circuit solder techniques. This connector provides an alternate signal/ground cable conductor configuration.

Cable Connector – M926



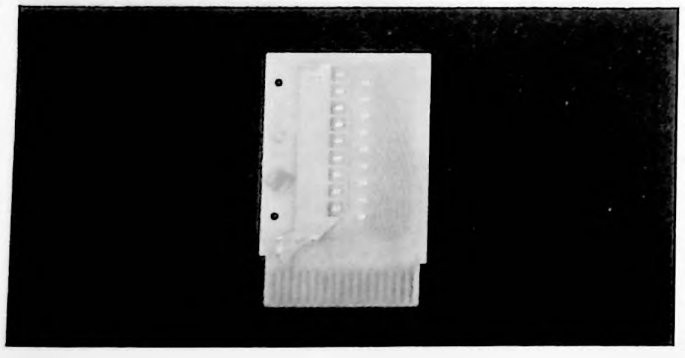
The M926 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 17-00002-0, nineteen-conductor, flat mylar cables. None of the contact fingers are dedicated to ground. Eight 100-ohm resistors are in series with contact

fingers H1, J1, K1, L1, N1, P1, R1, and S1, and four 10-ohm resistors are in series with contact fingers U1, V1, A2, and B2, as shown on the following schematic diagram. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 940 can be used with this connector for strain relief.

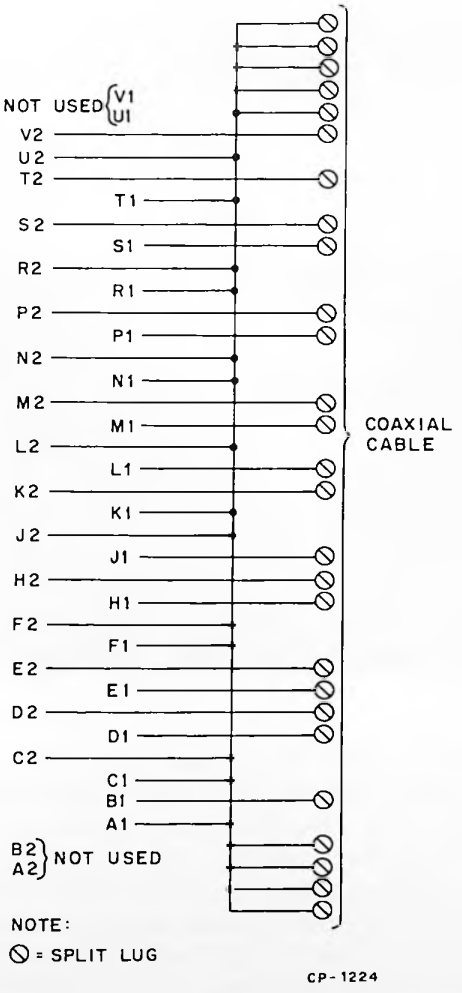


M926

Cable Connector – M927

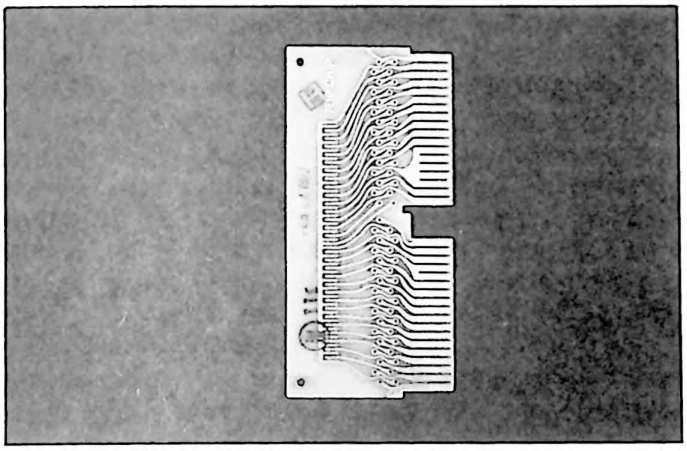


The M927 is a single-height, short length cable connector with 18 contact fingers on each side; it can accommodate one 91-07687, eighteen-conductor (9 individually shielded, twisted pairs), round coaxial cable. The cable enters the board at a right angle to the board. The M927 is usually used in a DD11-A System Unit with the external device control module. Sixteen contact fingers can be assigned to signals, 16 are dedicated to ground, and 4 are not used, as shown on the following schematic diagram. The board is equipped with 27 split-lug terminals for solder connection of the cable conductors; 18 split-lug terminals are associated with signals and 9 are dedicated to ground. (See the schematic diagram.) Cable clamp 941 can be used with this connector for strain relief. The M927 is similar to an M925 except the M925 is used with flat mylar cables.

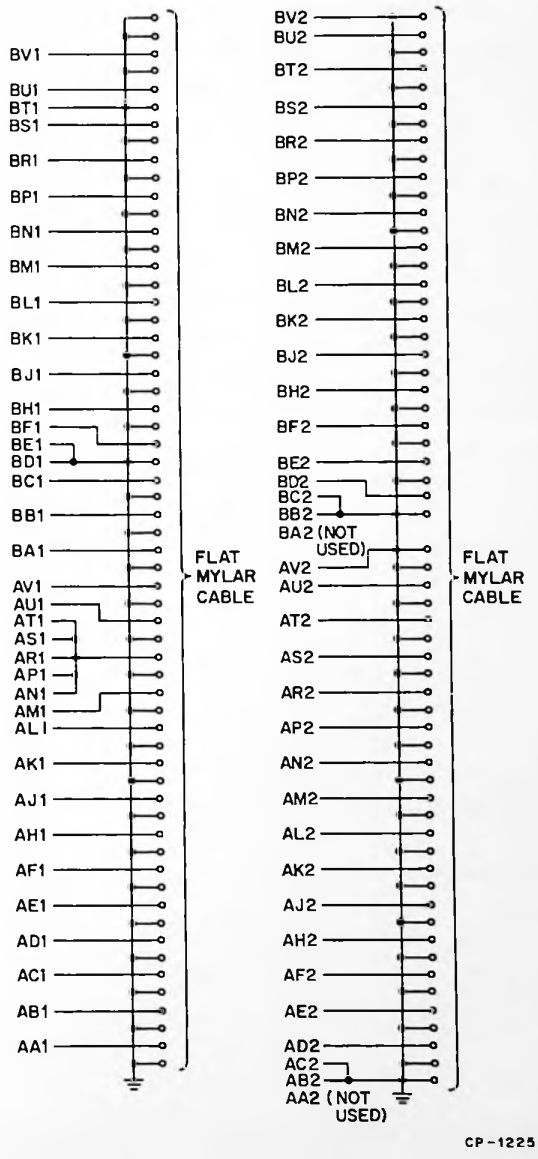


M927

Unibus Cable Connector – M929



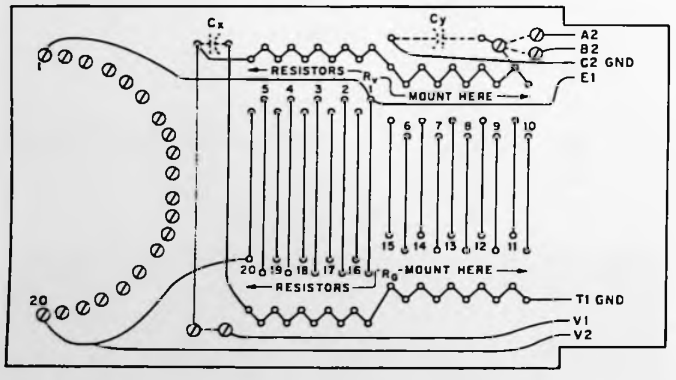
The M929 is a double-height, short length cable connector with 36 contact fingers on each side; it can accommodate two 17-00002-1, sixty-conductor, flat mylar cables. This connector is usually used on one end of a cable that is equipped on the other end with an M919 cable connector. The M929 is a mirror image of an M919 as shown on the following schematic diagram. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 12-09764 can be used with this connector for strain relief.

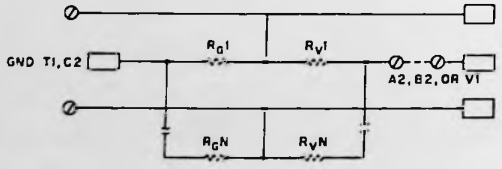


M929

Cable Connector – M933

The M933 is a single-height, standard length cable connector with 8 contact fingers on side 1 and 18 contact fingers on side 2; it can accommodate one 91-07575, twenty-conductor, flat ribbon cable. Twenty contact fingers can be assigned to signals, two are dedicated to ground, three are dedicated to power, and one is not used, as shown on the following schematic diagram. Twenty signal contact fingers are directly in series with 20 split-lug cable connections; however, user-installed resistors R_V1 and R_g1 through R_V20 and R_g20 and jumpers can provide pull-up/termination capabilities. (See the following component layout diagram.) The user-selected and installed resistors and the user-installed power jumpers provide a variety of termination or voltage source circuits to terminate lines, provide current sources for open-collector devices, or provide special output voltages. The voltage at only one contact finger (V1, A2, or B2) may be jumpered at any one time. User-installed capacitors C_x and C_y provide a dc power filter network. The board is equipped with 25 split-lug terminals for solder connection of the 20 cable conductors and the 3 selectable voltage jumpers. The resistors and capacitors must be connected using printed circuit board solder techniques. Cable clamp 943 can be used with this connector for strain relief.





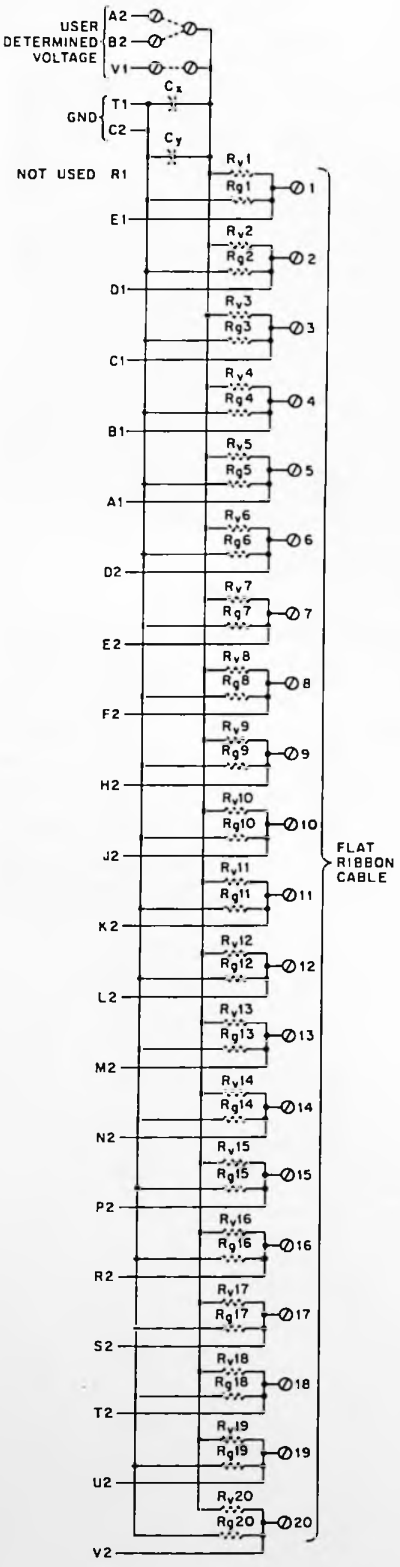
NOTES:
- ⌀ = Split lug
- □ = Contact finger
- o = Feed through eyelet

Dashed lines = User installed pull-up/terminator circuit components and jumpers

Partial PC tracks shown only for clarity

CP-1227

M933 Component Layout Diagram and Pull-up/Terminator Circuit

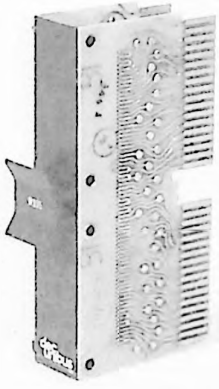


NOTES:
- Resistors and capacitors to be inserted by user.
- ⌀ indicates split lug.
- ---Indicates jumper to be inserted by user.
- V1, A2, B2 are voltage pins, voltage to be determined by user. (Only one may be used at a time)

CP-1226

M933

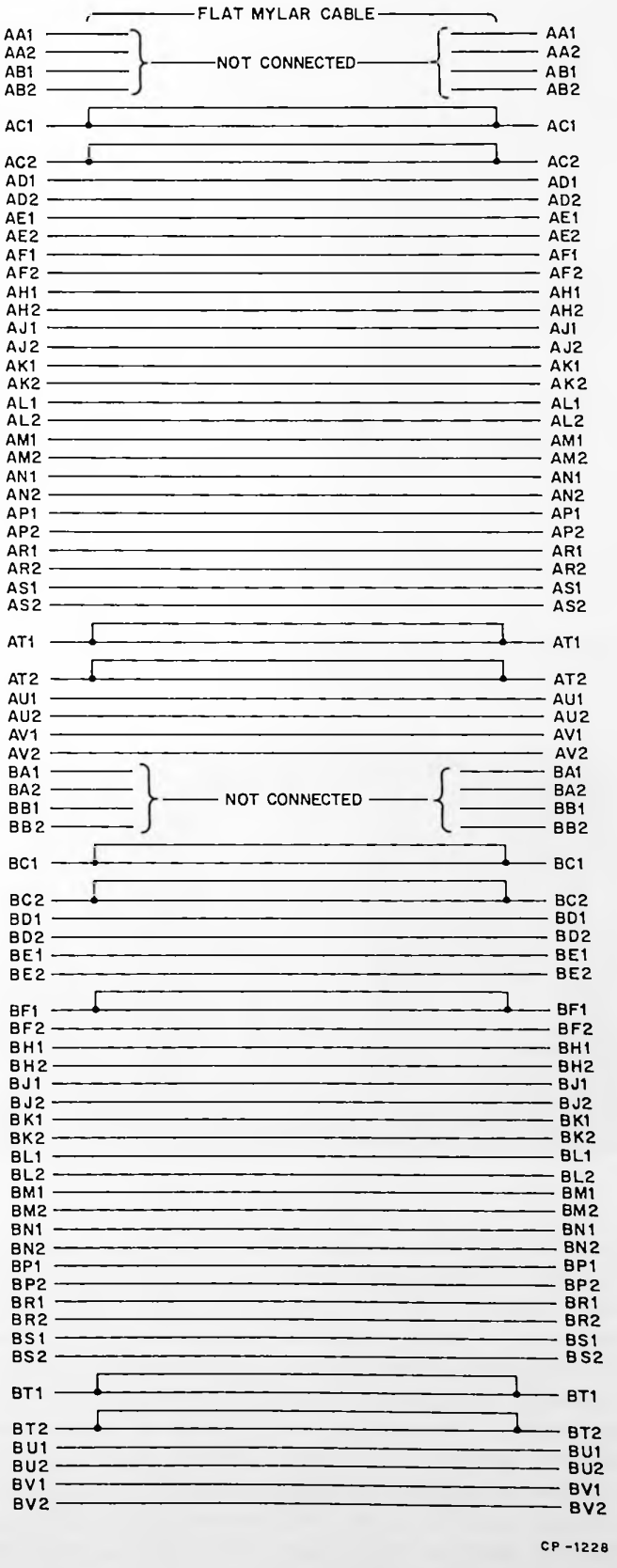
Omnibus Connector Module – M935



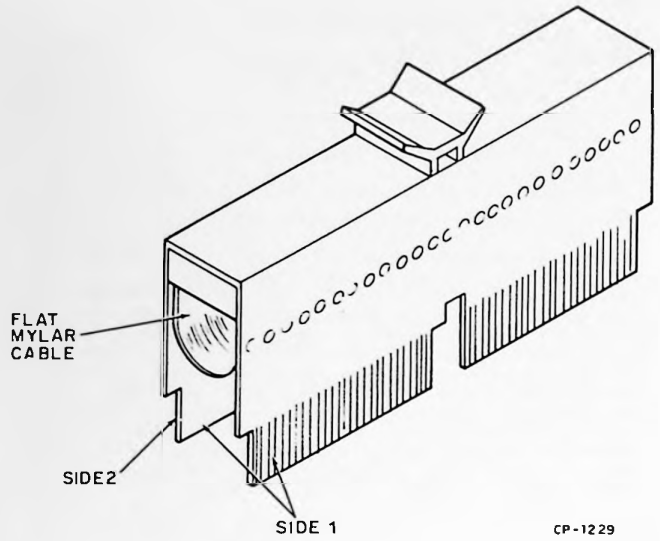
The M935 Omnibus connector module is a dual printed circuit board, double-height, short length module that electrically connects the PDP-8/e Omnibus from one system unit to the next system unit when the two system units are adjacent. Two M935s are required. Each M935 has 48 contact fingers assigned to Omnibus signals and 16 contact fingers dedicated to ground; and remaining eight contact fingers (power and test poine dedicated) are not connected from one printed circuit board to the other. (See the following schematic diagram.) The H019 Mounting Bar and H9190 Mounting Panel (Section 2), usually used to add a system unit in the PDP-8/e chassis, are supplied power via a power wiring harness. The M935 printed circuit boards are on 1.000-in. (2.540-cm) centers and are connected via a 73-conductor, flat mylar cable as shown on the following illustration.

NOTE

If the two system units are not adjacent, two BC08H-04F Internal Bus Expander Cable Assemblies can be used or a similar cable assembly can be user-assembled using four 17-00002-1 cables of the proper length, two M936 cable connectors, and two M937 cable connectors.

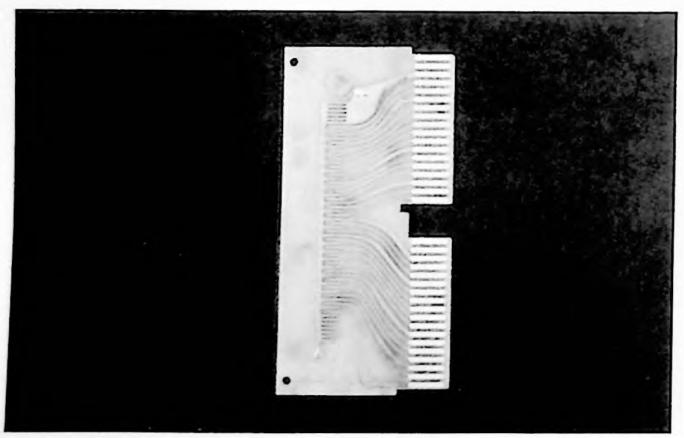


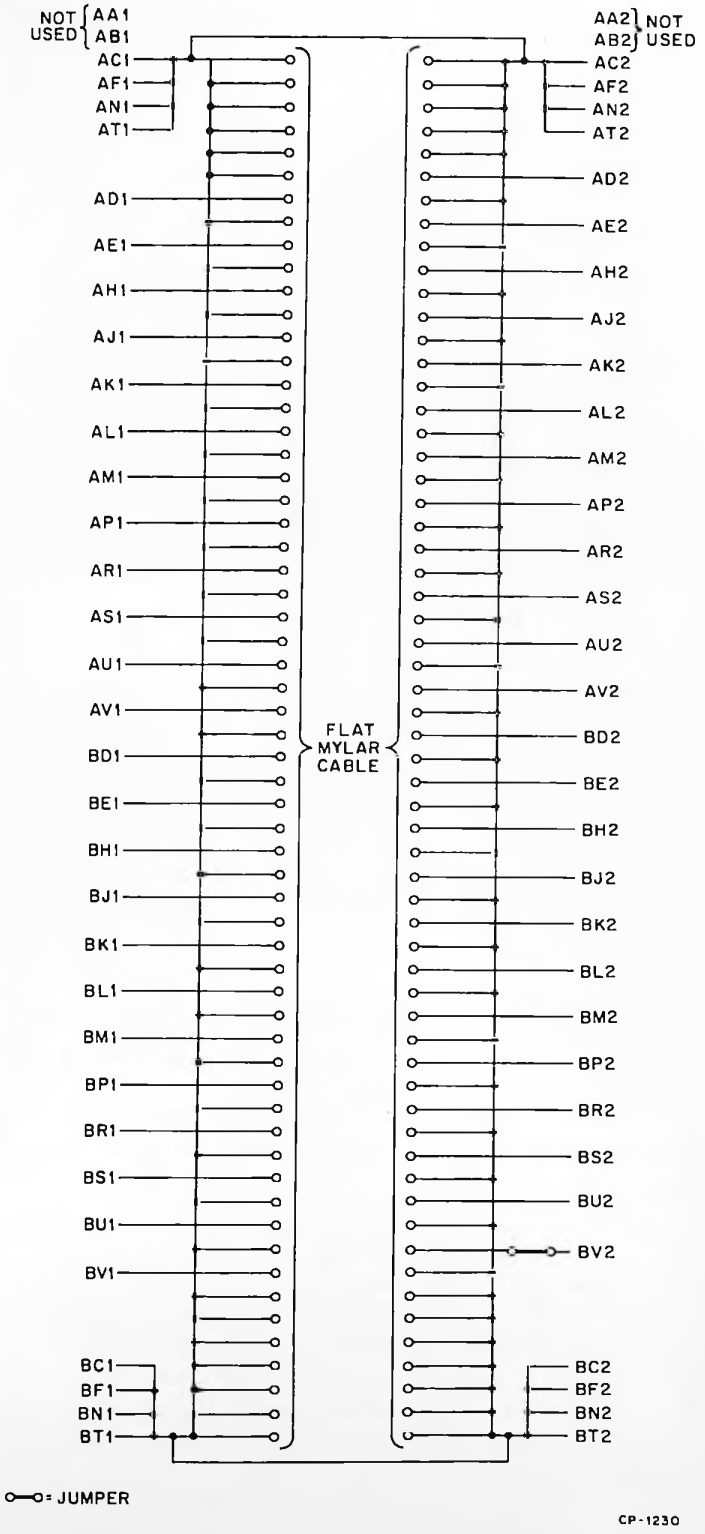
M935



M935

Cable Connector – M936





M936

The M936 is a double-height, short length cable connector with 36 contact fingers on each side; it can accommodate two 17-00002-1, sixty-conductor, flat mylar cables. This connector is usually used to connect one-half of the Omnibus to the system unit in an external mounting drawer or cabinet, or to connect a peripheral device not located in the drawer. Two M936s are required to extend the complete Omnibus. Forty-eight contact fingers on each M936 can be assigned to Omnibus signals, 16 are dedicated to ground, and four are not used, as shown on the following schematic diagram. One contact finger, BV2, is equipped

with a removable jumper in series. This jumper must remain installed except under circumstances that meet the following criteria:

1. A positive I/O bus interface (KA8-A) option is utilized as an external bus for a peripheral device, and

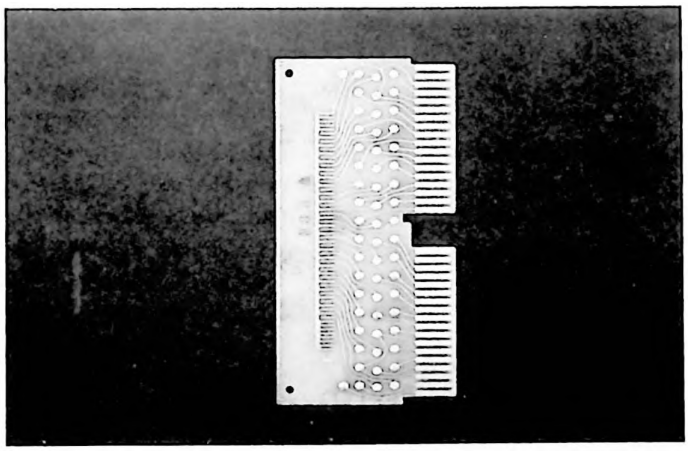
2. It is not desired to utilize the B INITIALIZE 1 pulse at the peripheral device [at power turn-on and by the Clear All Flags (CAF) IOT, 6007_8].

Under these circumstances, the jumper in series with contact finger BV2 on the M936 in slots A and B must be removed. The cable conductors must be soldered to the board etch using printed circuit solder techniques. This connector provides an alternate signal/ground cable conductor configuration. Cable clamp 12-09764 can be used with this connector for strain relief.

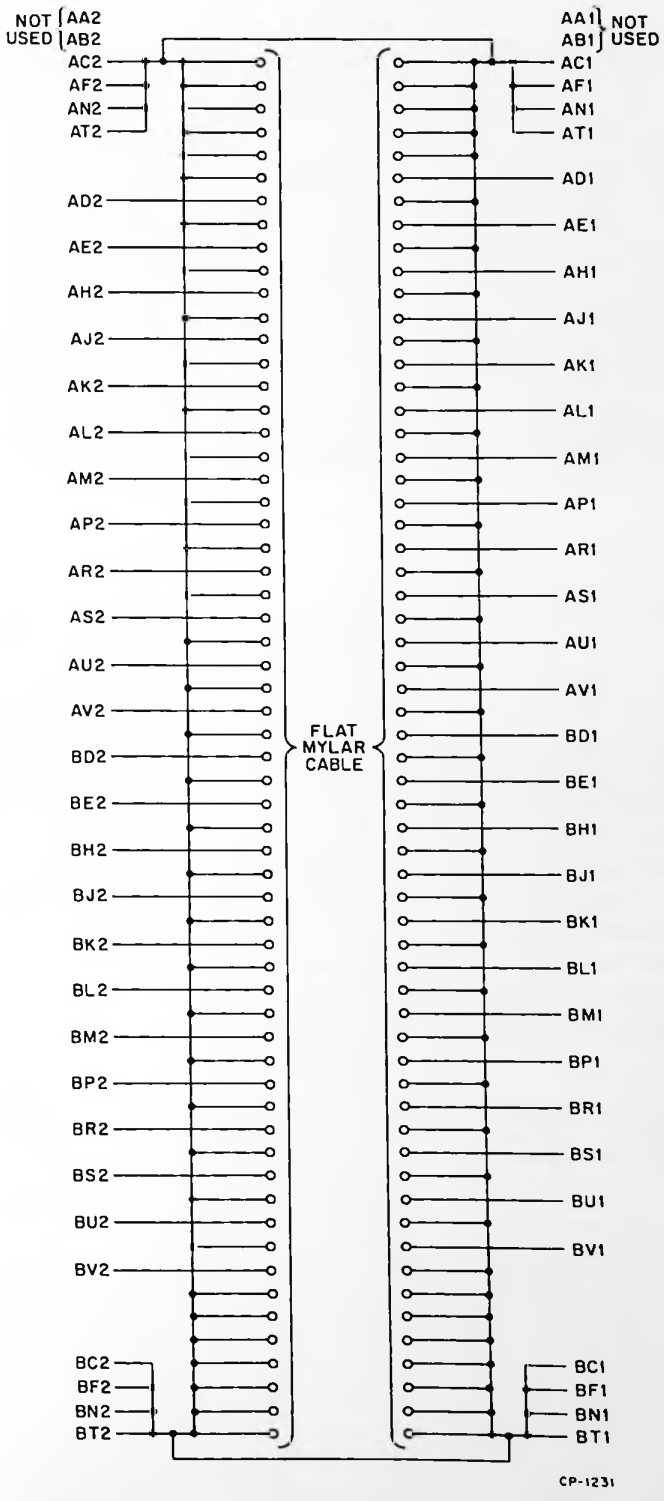
NOTE

An M937 cable connector is usually used on the other end of the cable.

Cable Connector – M937

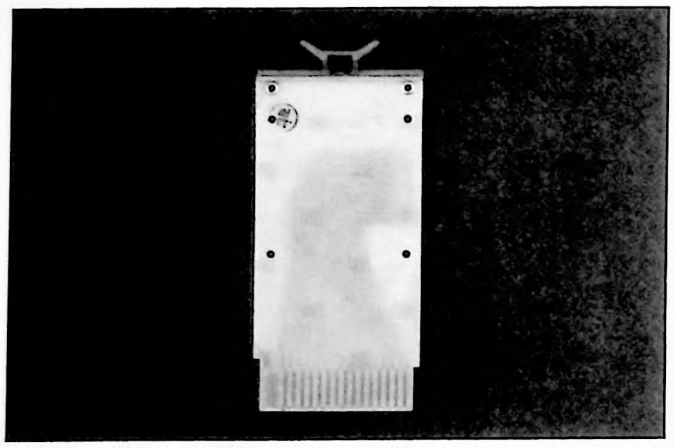


The M937 is a double-height, short length cable connector with 36 contact fingers on each side; it can accommodate two 17-00002-1, sixty-conductor, flat mylar cables. This connector is usually used on a cable that is equipped with an M936 cable connector. The M937 is a mirror image of an M936. (See the following schematic diagram.) The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 12-09764 can be used with this connector to provide strain relief.

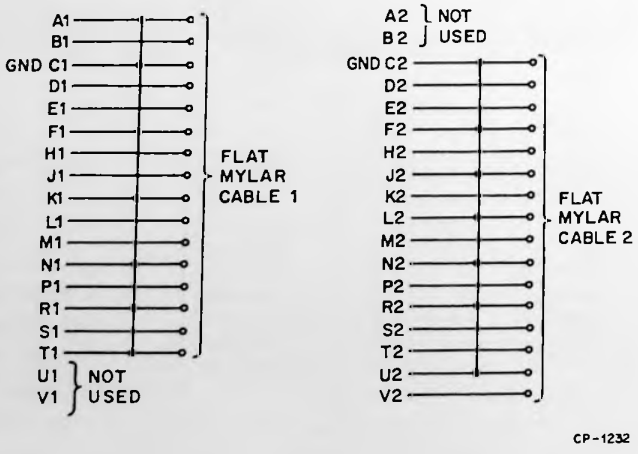


M937

Cable Connector – M943



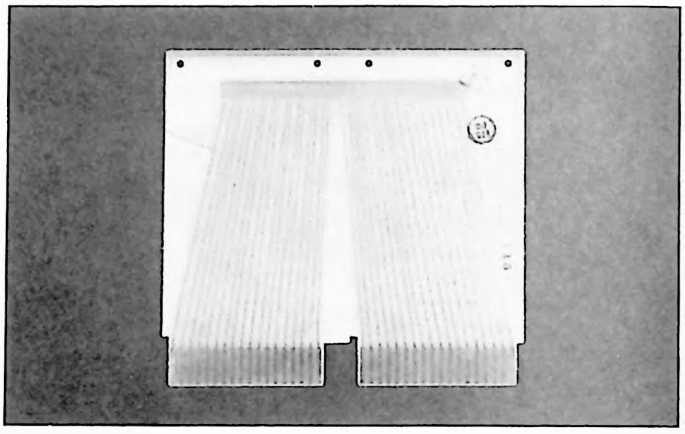
The M943 is a single-height, standard length cable connector with 17 contact fingers on each side; it can accommodate two 17-00002-0, nineteen-conductor, flat mylar cables. This connector is a multi-use connector and is similar to an M903, except the M943 is equipped with a handle and the cables enter onto the board at right angles to the board; one cable enters from one side and the other enters from the other side (i.e., at 180 degrees). A cable with an M943 on each end is often used when expanding the memory of a PDP-15 with an MM15 option. Preassembled cable assembly 70-06907-05 or -06 can also be used for this purpose. Eighteen contact fingers can be assigned to signals, 14 are dedicated to ground, and 2 are not used, as shown on the following schematic diagram.



M943

The cable conductors must be soldered to the board etch using printed circuit solder techniques. This connector provides an alternate signal/ground cable conductor configuration. Cable clamp 940 can be used with this connector to provide strain relief.

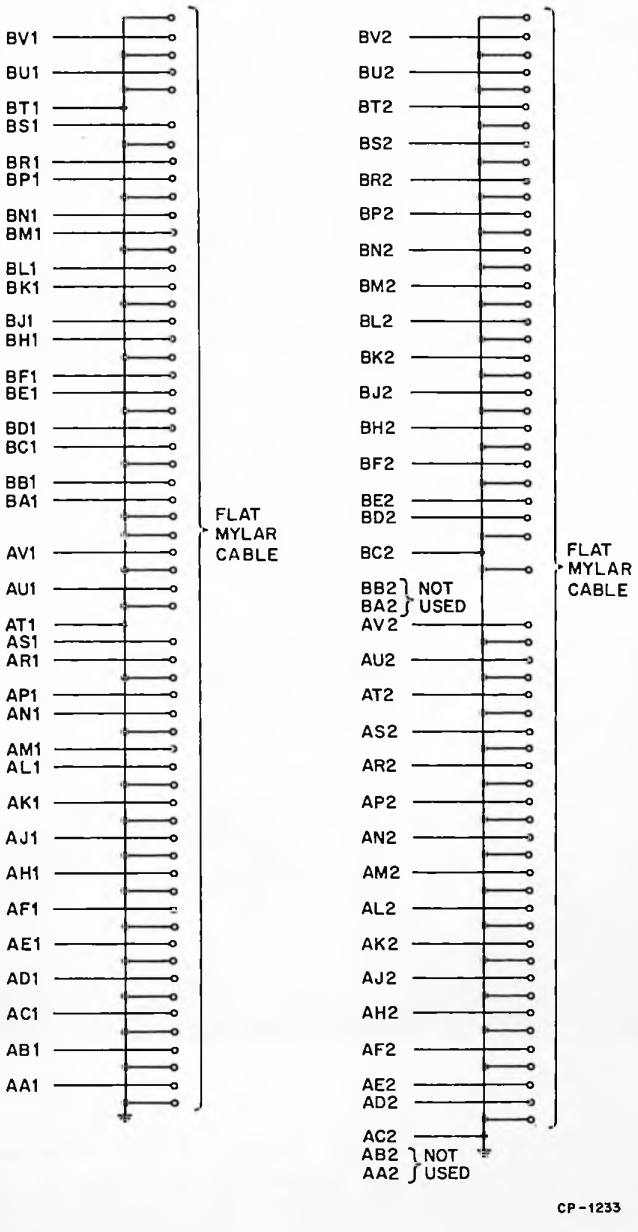
Cable Connector – M945



The M945 is a double-height, short length cable connector with 36 contact fingers on each side; it can accommodate two 17-00002-1, sixty-conductor, flat mylar cables. This connector and an M946 are usually used on a cable to connect the bus of a Universal Digital Controller (UDC-8) system unit to the bus of an expansion system unit. One such cable is required to expand four UDC channels. Preassembled cable assembly BC41A-05, -06, or -10 can also be used for this purpose. Fifty-four contact fingers can be assigned to signals, four are dedicated to ground, and four are not used, as shown on the following schematic diagram. The cable conductors must be soldered to the board etch using printed circuit solder techniques. This connector provides an alternate signal/ground cable conductor configuration. Cable clamp 12-09764 can be used with this connector for strain relief. Round, 72-conductor (36 twisted pair) cable 91-07599 and cable clamp 941 can also be used with this connector.

NOTE

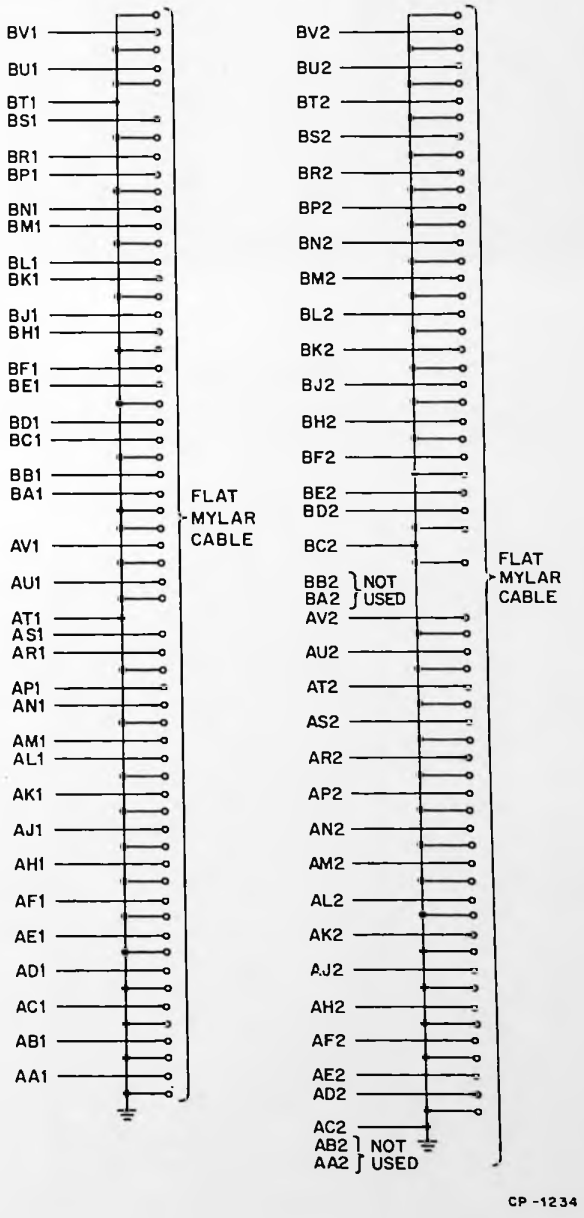
An M946 cable connector is usually used on the other end of the cable.



M945

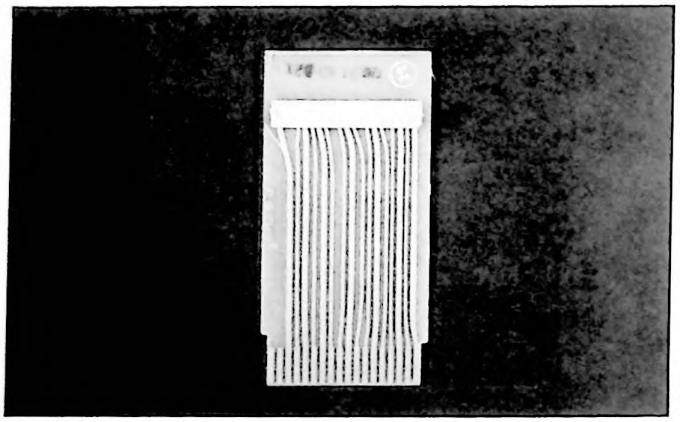
Cable Connector – M946

The M946 is a double-height, short length cable connector with 36 contact fingers on each side; it can accommodate two 17-00002-1, sixty-conductor, flat mylar cables. This connector is usually used on a cable that is equipped with an M945 cable connector. The M946 is a mirror image of an M945. (See the following schematic diagram.) The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 12-09764 can be used with this connector for strain relief.

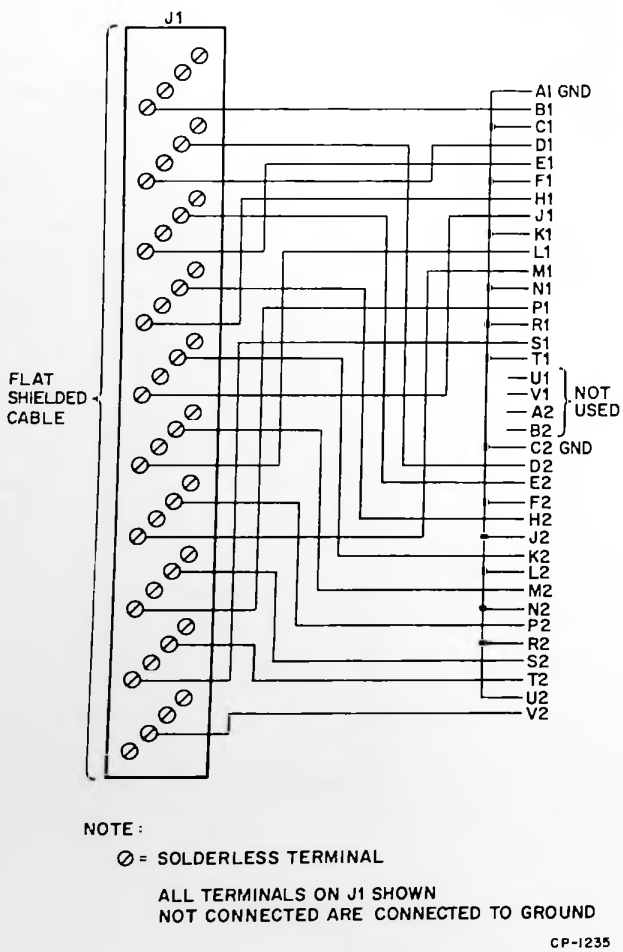


M946

Cable Connector – M953

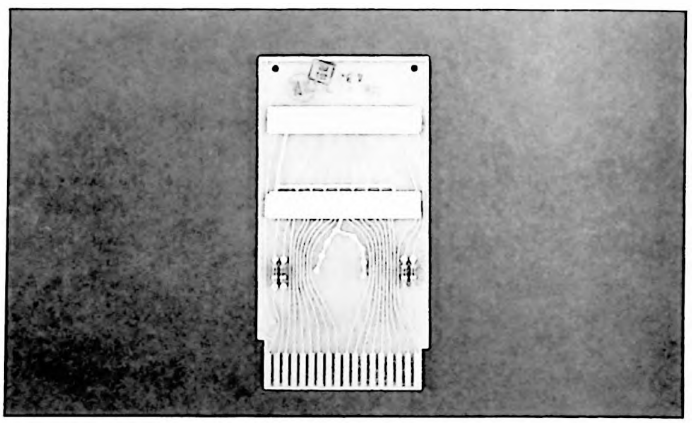


The M953 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate one 17-00004-00, forty-conductor, flat shielded cable. This connector and an H856 connector are usually used on a cable as a PDP-8/e general-purpose I/O cable when up to 18 signal paths are required. Preassembled cable assembly BC08-J-06, -10, -15, -25, or -50 can also be used for this purpose. Eighteen contact fingers can be assigned to signals, 14 are dedicated to ground, and 4 are not used, as shown on the schematic diagram. A connector, J1, equipped with 40 solderless terminals for attaching the cable conductors, is mounted on the M953. All terminals on J1 that cannot be assigned to signals are dedicated to ground; this provides an alternate signal/ground cable conductor configuration. This cable connector is supplied with a cable clamp that fits over the terminals of connector J1 to provide strain relief and protection to the terminals.

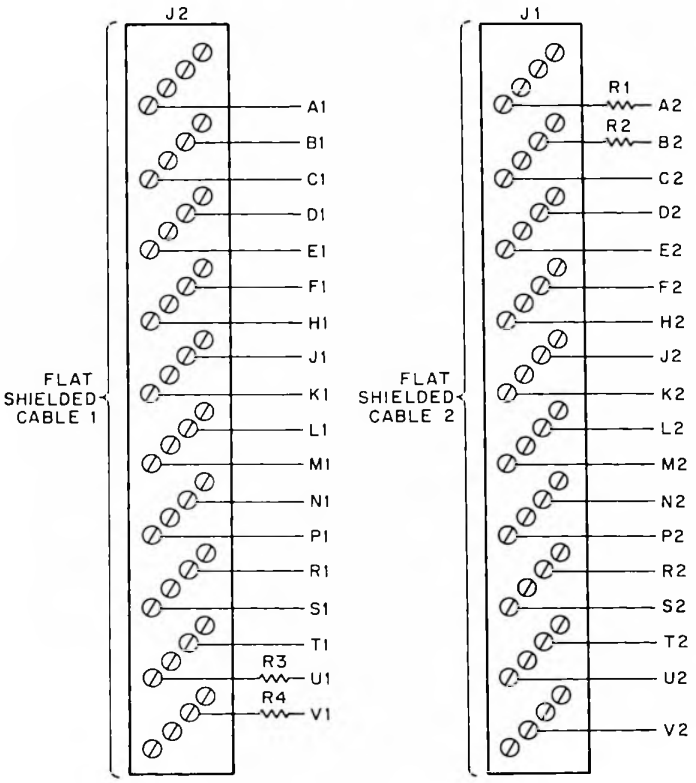


M953

Cable Connector – M954



The M954 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate two 17-00004-00, forty-conductor, flat shielded cables. This connector and an H856 connector are usually used on a cable as a general-purpose I/O cable when up to 32 signal paths are required. Preassembled cable assembly BC08L-06, -10, -15, -25, or -50 can also be used for this purpose. None of the contact fingers are dedicated to ground. Four 10-ohm current-limiting resistors are in series with contact fingers U1, V1, A2, and B2, as shown on the following schematic diagram. Two connectors, J1 and J2, each equipped with 40 solderless terminals for attaching the cable conductors, are mounted on the M954. All terminals on J1 and J2 that cannot be assigned to signals are connected in common; this can provide an alternate signal/ground cable conductor configuration. This cable connector is supplied with cable clamps that fit over the terminals of connectors J1 and J2 to provide strain relief and protection to the terminals.

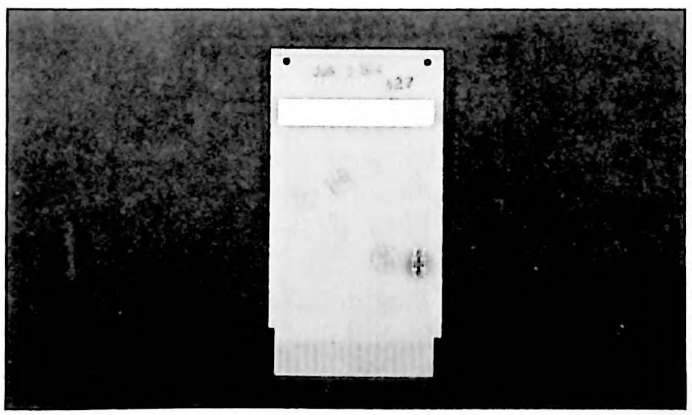


NOTE:
1. ⌀ = Solderless terminal
2. All terminals on J1 and J2 shown not connected are connected in common
3. R1 - R4 = 10Ω, 1/4 W

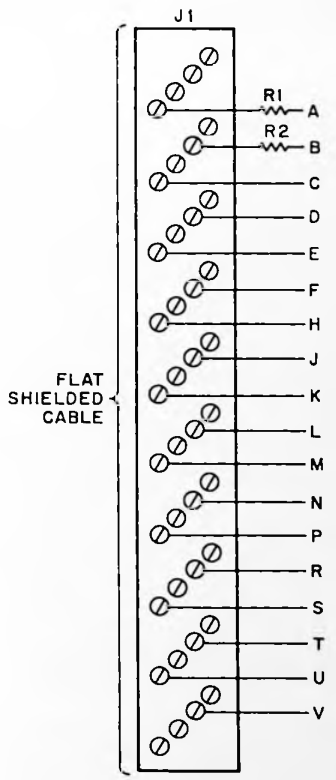
CP-1236

M954

Cable Connector — M955



The M955 is a single-height, standard length cable connector with 18 contact fingers on one side; it can accommodate one 17-00004-00, forty-conductor, flat shielded cable. This connector and an H856 connector are used on a cable to connect a PC8-E Paper Tape Reader/ Punch unit or a PR8-E Paper Tape Reader unit to the control unit; two such cables are required to connect the PC8-E and one is required to connect the PR8-E. Preassembled cable assembly BC08K-06, -15, -25, or -50 can also be used for this purpose. Sixteen contact fingers can be assigned to signals; none of the contact fingers are dedicated to ground. Two 10-ohm, current-limiting resistors are in series with contact fingers A and B, as shown on the following schematic diagram. A connector, J1, equipped with 40 solderless terminals for attaching the cable conductors, is mounted on the M955. All terminals on J1 that cannot be assigned to signals are dedicated to ground; this can provide an alternate signal/ground cable conductor configuration. This cable connector is supplied with a cable clamp that fits over the terminals of connector J1 to provide strain relief and protection to the terminals.

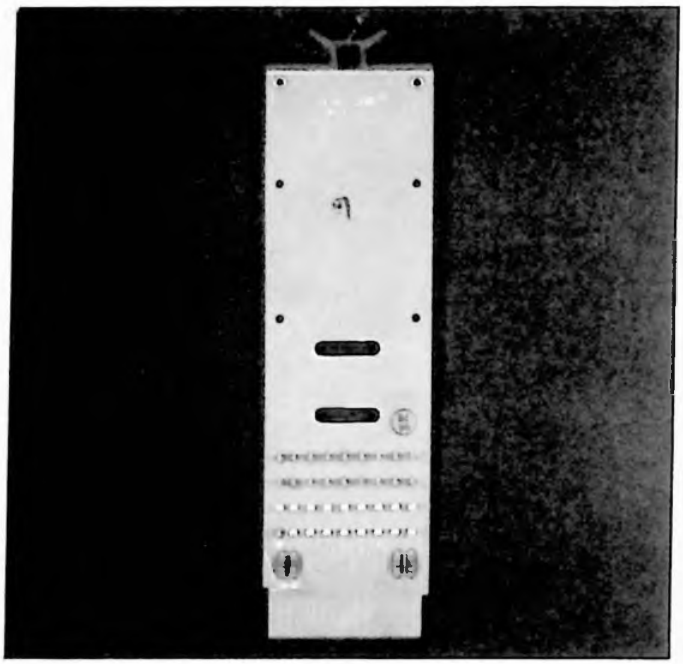


NOTE:
1. ⌀ = Solderless terminal
2. All terminals on J1 shown not connected are connected in common
3. R1, R2 = 10Ω, 1/4 W

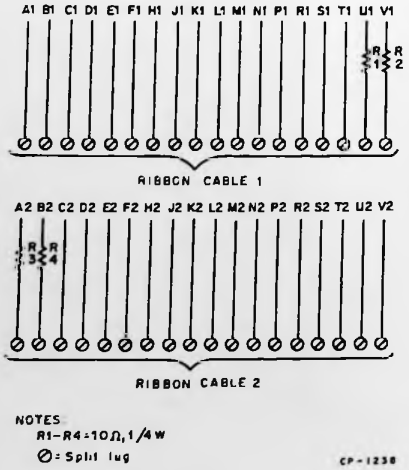
CP-1237

M955

Cable Connector – M957

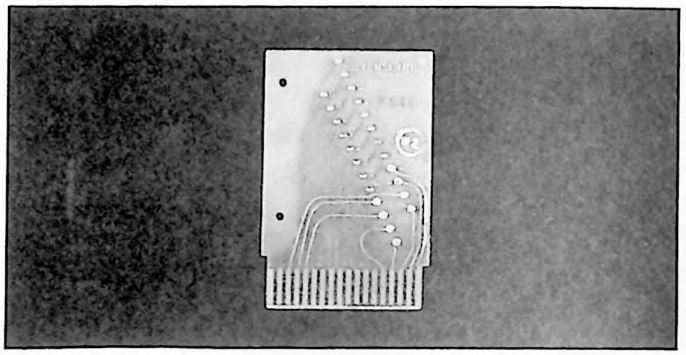


The M957 is a single-height, extended length cable connector with 18 contact fingers on each side; it can accommodate two 91-07575, twenty-conductor, flat ribbon cables. Two cables, each with an M957 on one end, are sometimes used to connect user devices to a direct memory access interface (DR11-B). None of the contact fingers are dedicated to ground. Four 10-ohm, current-limiting resistors are in series with contact fingers U1, V1, A2, and B2, as shown on the following schematic diagram. The board is equipped with 36 split-lug terminals for solder connection of the cable conductors. Cable clamp 943 can be used with this connector to provide strain relief.

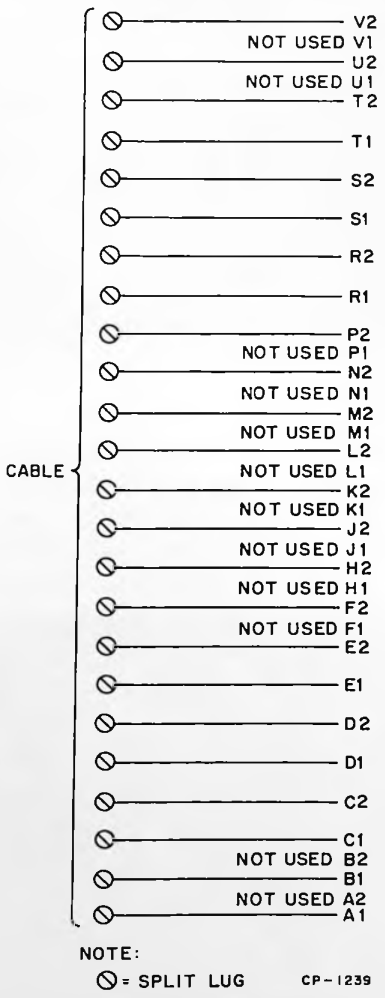


M957

Cable Connector – M959



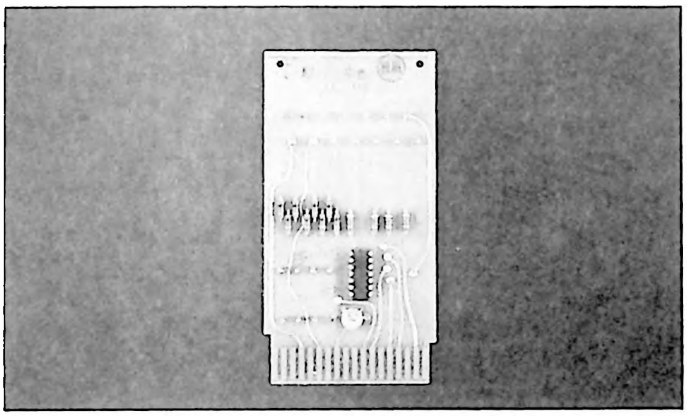
The M959 is a single-height, short length cable connector with 18 contact fingers on each side; it can accommodate one 24-conductor cable. The cable enters onto the board at a right angle to the board. Twenty-four contact fingers can be assigned to signals and 12 are not used, as shown on the following schematic diagram; contact fingers A1 and C2,



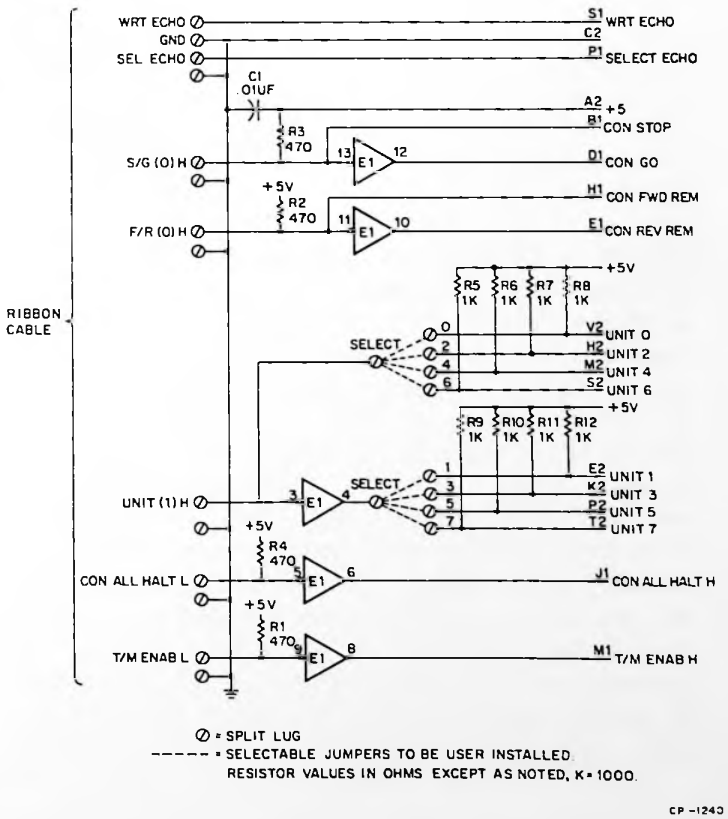
M959

however, are usually associated with ground. The board is equipped with 24 split-lug terminals for solder connection of the 24 to 20 AWG cable conductors. The split-lug terminal locations are marked with their associated contact finger to aid identification. Cable clamp 941 can be used with this connector when round cable is used.

TU56/TD8-E Command Cable Connector – M960

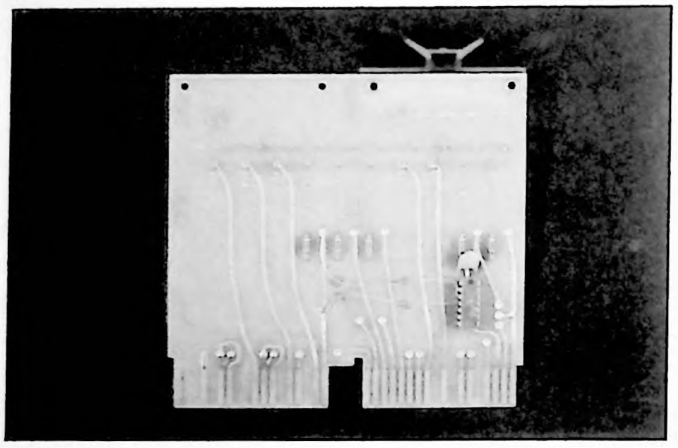


The M960 is a single-height, standard length cable connector with 18 contact fingers on each side; it can accommodate one 91-07575, twenty-conductor, flat ribbon cable. This connector, an M961 connector, and a 34-pin, 12-10090 (Berg 20383) connector are used on two 91-07575 cables to connect a TU56M or TU56MH DECtape Drive Unit to a TD8-E DECtape Control Unit. Preassembled command/data cable assembly 70-08447-10 or -15 can also be used for this purpose. The M960 provides the inverters/line drivers, pull-up resistors, and split-lug terminals required to connect the command signals from the TD8-E to the TU56. It is possible to control up to four Dual Drive TU56s (eight drive units) with a PDP-8/e through four TD8-Es; the first TD8-E will control units 0 and 1, the second will control units 2 and 3, the third will control units 4 and 5, and the fourth will control units 6 and 7. Jumpers must be installed on the M960 to provide the required control configuration; the M960 associated with TU56 units 1 and 2 must have jumpers installed between split-lug terminals **SEL** and **0** and terminals **SEL** and **1**. (See the following schematic diagram.) Likewise, the M960 associated with TU56 units 3 and 4 must have jumpers installed between split-lug terminals **SEL** and **2** and terminals **SEL** and **3**, etc. for the M960 associated with units 4 and 5 and units 6 and 7. One of the M960 contact fingers is dedicated to ground, one is dedicated to +5 Vdc, 16 are dedicated to signals, and all others (18) are not used, as shown on the following schematic diagram. The board is equipped with 14 split-lug terminals (7 for signals and 7 for ground) for solder connection of the cable conductors; the split-lug terminals are arranged to provide an alternate signal/ground cable conductor configuration. These split-lug terminals, as well as the 10 associated with the jumpers, are labeled to facilitate identification. Cable clamp 940 can be used with this connector to provide strain relief.

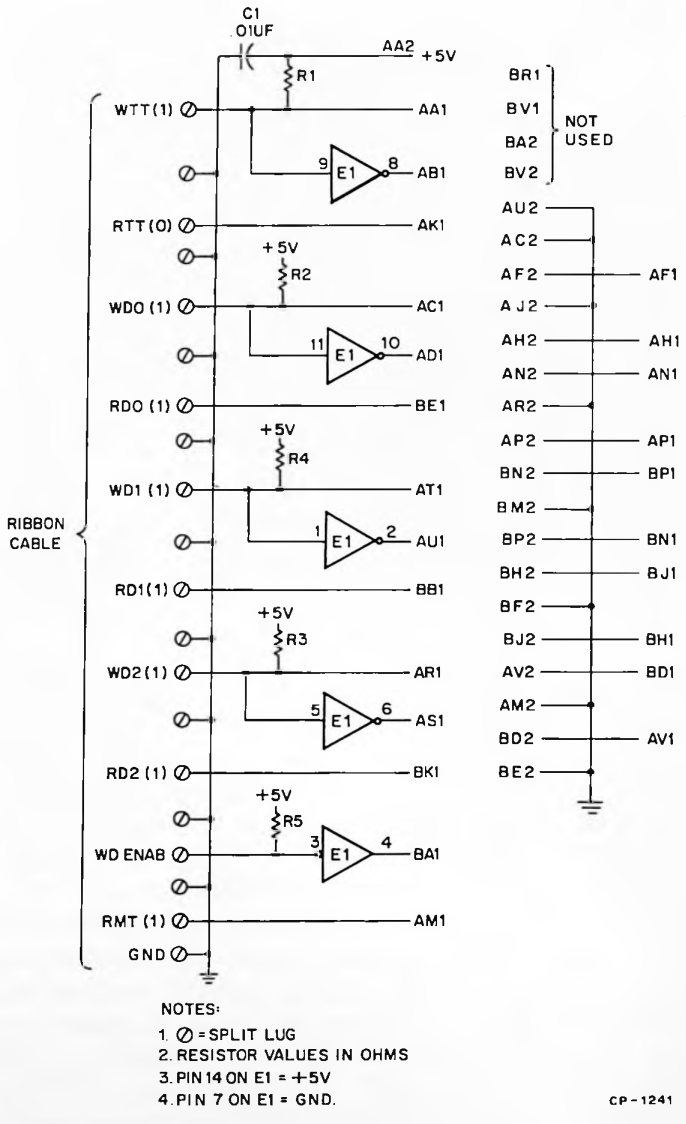


M960

TU56/TD8-E Data Cable Connector – M961

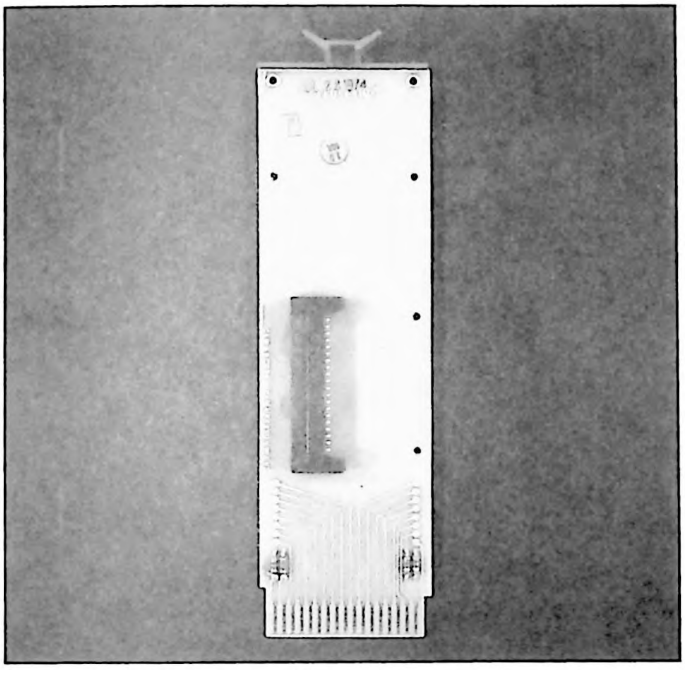


The M961 is a double-height, standard length cable connector with 26 contact fingers on side 1 and 21 contact fingers on side 2; it can accommodate one 91-07575, twenty-conductor, flat ribbon cable. This connector, an M960 connector, and a 34-pin, 12-10090 (Berg 20383) connector are used on two 91-07575 cables to connect a TU56M or TU56MH DECtape Drive Unit to a TD8-E DECtape Control Unit. Preassembled command/data cable assembly 70-08447-10 or -15 can also be used for this purpose. The M961 provides the inverter/line drivers, pull-up resistors, and split-lug terminals required to connect the data signals from the TD8-E to the TU56. The M961 also provides I/O paths for 10 "daisy-chained" TU56 signals (contact fingers AF2–AF1, AH2–AH1, AN2–AN1, AP2–AP1, BN2–BP1, BP2–BN1, BH2–BJ1, BJ2–BH1, AV2–BD1, and BD2–AV1). Fourteen contact fingers are dedicated to data signals, one is dedicated to +5 Vdc, eight are dedicated to ground, 20 are dedicated to the daisy-chained signals, and four are not used, as shown on the following schematic diagram. The board is equipped with 20 split-lug terminals (10 for signals and 10 for ground) for solder connection of the cable conductors; the split-lug terminals are arranged to provide an alternate signal/ground cable conductor configuration. These split-lug terminals are labeled to facilitate identification. Cable clamp 940 can be used with this connector to provide strain relief.

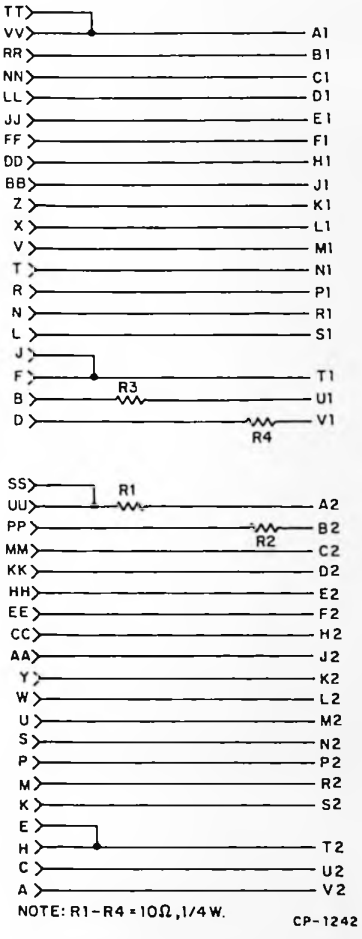


M961

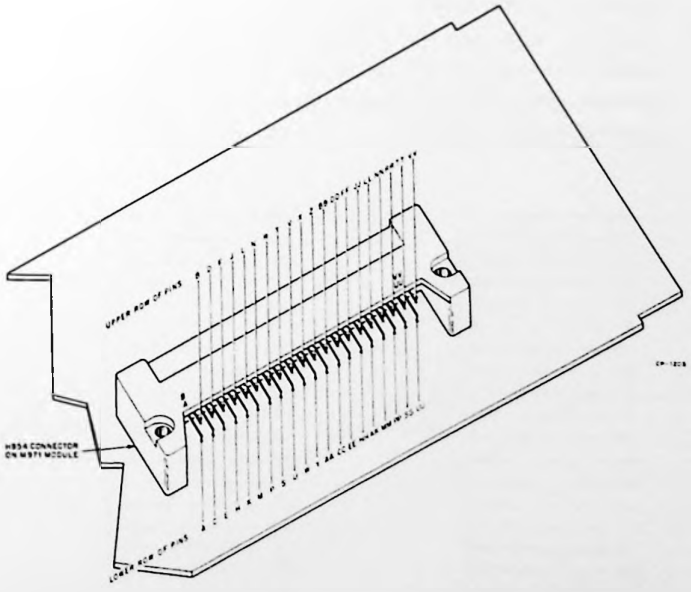
Cable Connector – M971



The M971 is a single-height, extended length cable connector with 18 contact fingers on each side; it can accommodate any cable that has an H856 connector on one end. The M971 is equipped with a 40-pin H854 I/O connector (J1) that provides mirror image signal paths to the contact fingers, i.e., J1-A to V2, J1-C to U2, etc., through J1-RR to B1, and J1-VV to A1. (See the following schematic diagram.) H854 (J1) connector pins are identified in the H854 connector pin identification diagram. Two M971 cable connectors and two 20-conductor BC08R-XX cables are often used with a DR11-C General Device Interface to bring all user I/O signals to a backplane. None of the contact fingers are dedicated to ground. Four 10-ohm, current-limiting resistors are in series with contact fingers U1, V1, A2, and B2, as shown on the schematic diagram. Cable clamp 12-09764 can be used with this connector to provide strain relief.

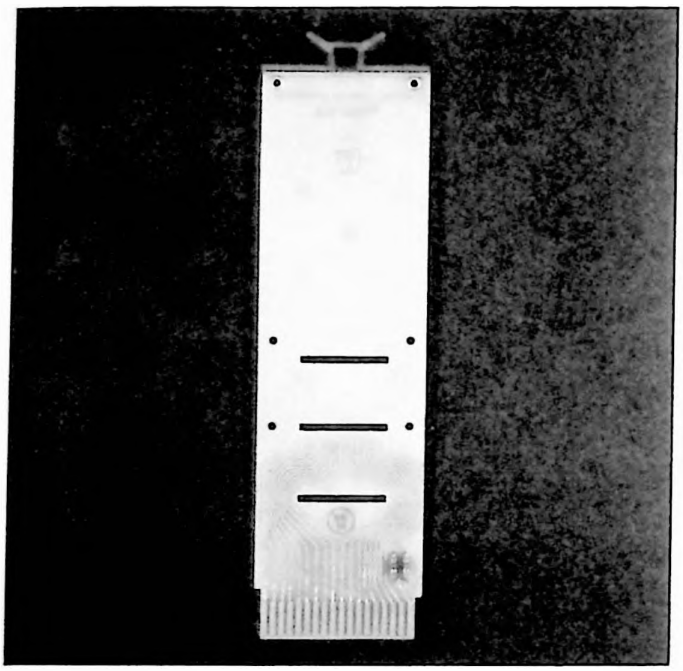


M971

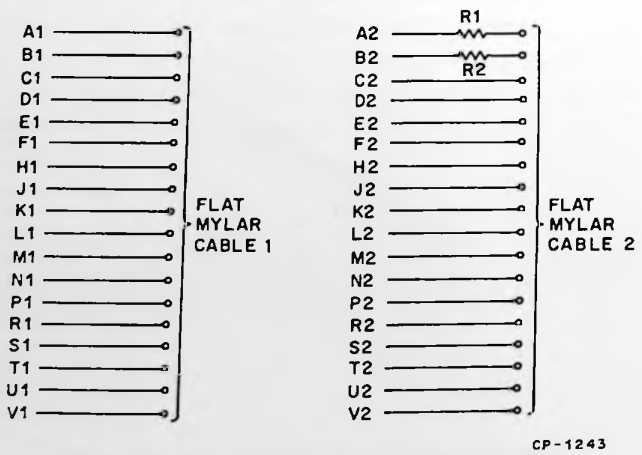


H854 Connector Pin Identification Diagram

Cable Connector – M972

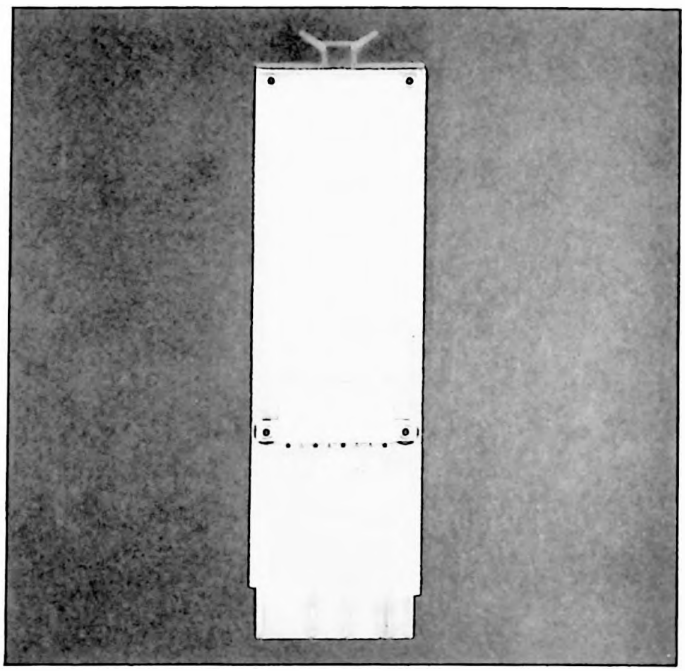


The M972 is a single-height, extended length cable connector with 18 contact fingers on each side; it can accept two 17-00002-0, nineteen-conductor, flat mylar cables. None of the contact fingers are dedicated to ground. Two 10-ohm current-limiting resistors are in series with contact fingers A2 and B2, as shown on the following schematic diagram. This is a general-use cable connector. The cable conductors must be soldered to the board etch using printed circuit solder techniques. Cable clamp 940 can be used with this connector to provide strain relief.



M972

TTY Cable Connector – M973



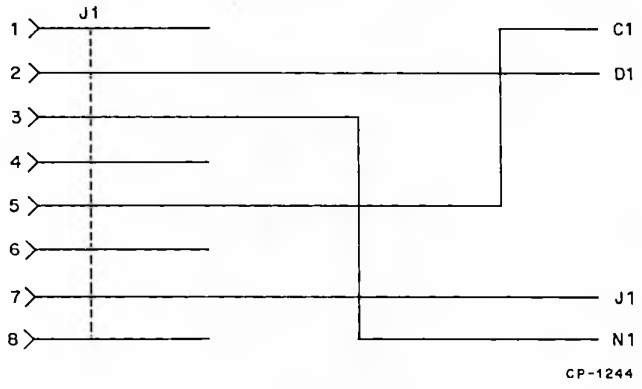
The M973 is a single-height, extended length cable connector with four contact fingers on one side (side 1); it can accommodate any cable with a 12-09340-01 connector (male Mate-N-Lok with male pins) that has contact pins 2, 3, 5, and 7 installed. Preassembled cable assemblies available from Digital Equipment Corporation that mate with the M973 and their usual uses are:

Cable	Used With
BC04R-XX	LT33, RT01
BC05F-XX	LA30, PDM70
70-08519-XX	RT02, VT05

The M973 is equipped with a 12-09340-00 connector (female Mate-N-Lok with female pins) with contact pins 2, 3, 5, and 7 installed. (See the following schematic diagram.) The J1 contact pins are dedicated to the M973 connector board contact fingers as follows:

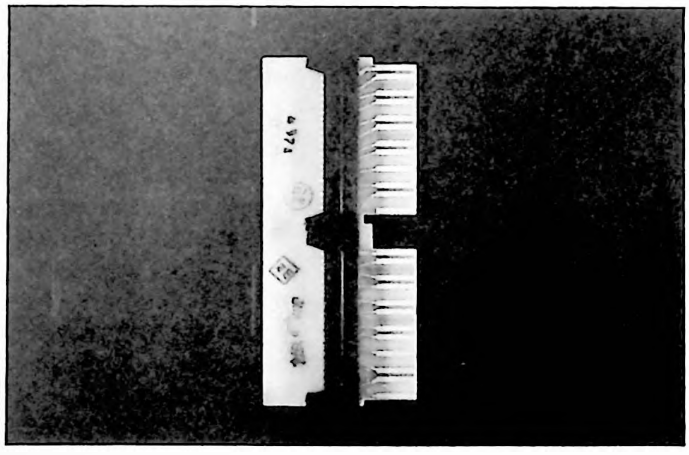
J1 Pin	M973 Contact Finger
2	D1
3	N1
5	C1
7	J1

The M973 contact fingers and signal dedications are compatible with the DF11-F and -K Serial Line Interface Signal Conditioning option.

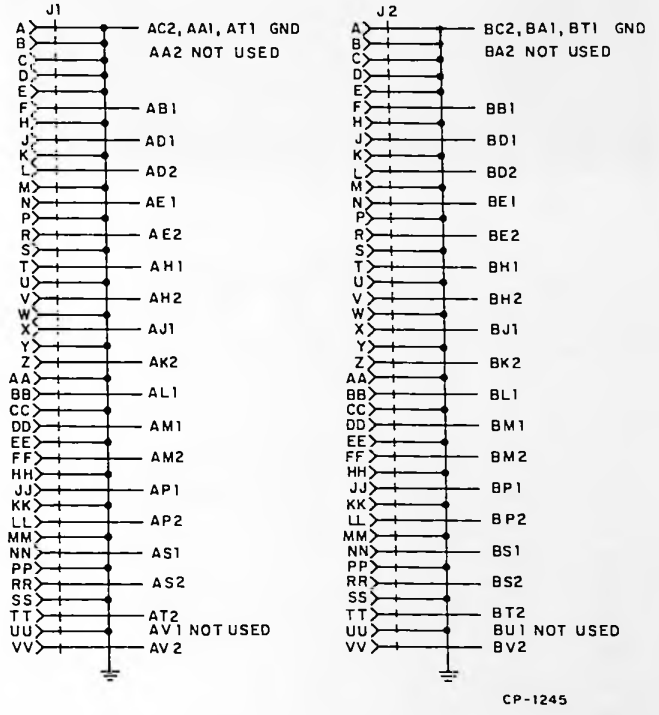


M973

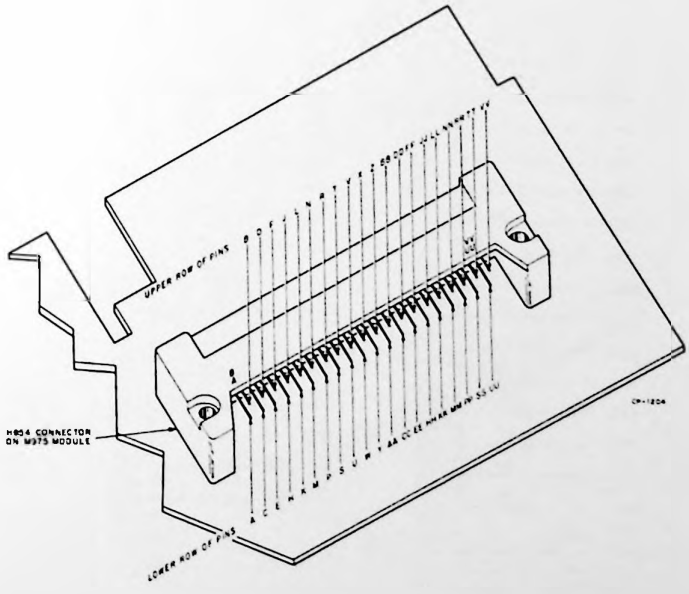
FLIP CHIP to H854 Adapter – M975



The M975 is a double-height, special length (short) cable connector; it is used to input or output logic panel wiring to H854 connectors (male) and can accommodate two of any cable that has an H856 connector, such as the BC08J, BC08K, BC08R, or BC04Z series. The M975 is equipped with two 40-pin H854 connectors (J1 and J2). Thirty-six contact fingers are dedicated to signals input/output at J1 and J2 (18 at J1 and 18 at J2), six are dedicated to ground, and four are not used, as shown on the following schematic diagram. Connectors J1 and J2 provide alternate signal/ground cable conductor configurations. H854 (J1 and J2) connector pins are identified in the H854 connector pin identification diagram. When the M973 is installed in a logic panel, it protrudes only 1.50 in. (3.81 cm).

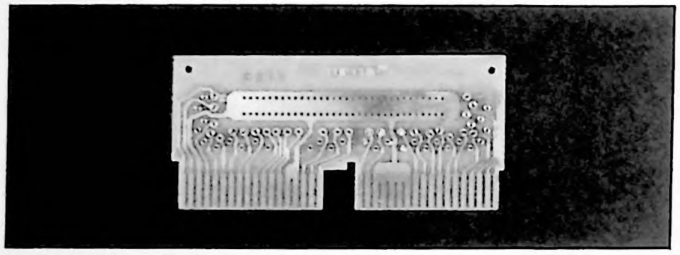


M975

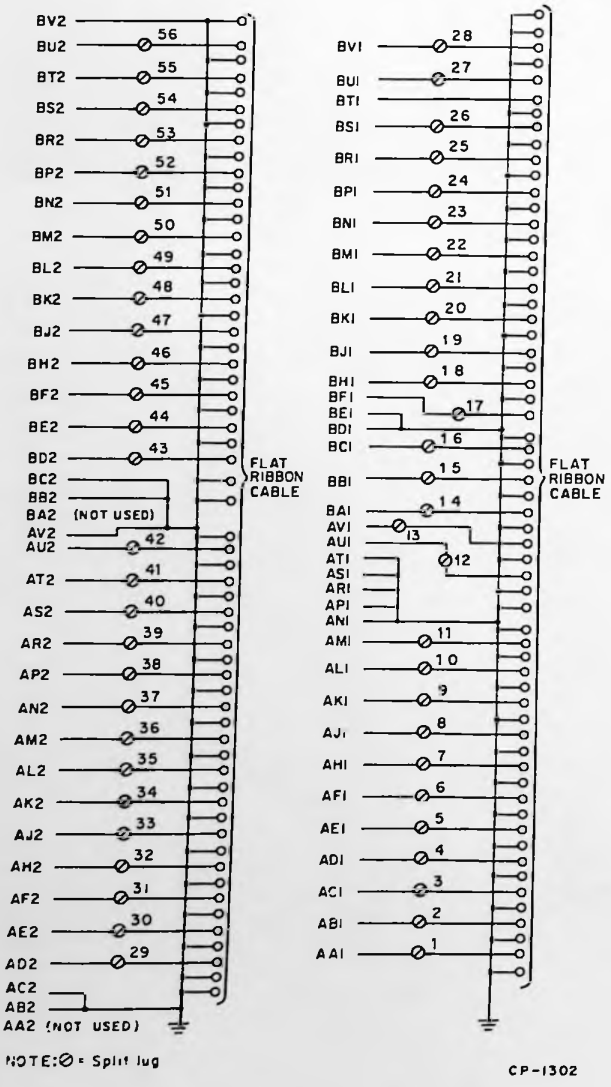


H854 Connector Pin Identification Diagram

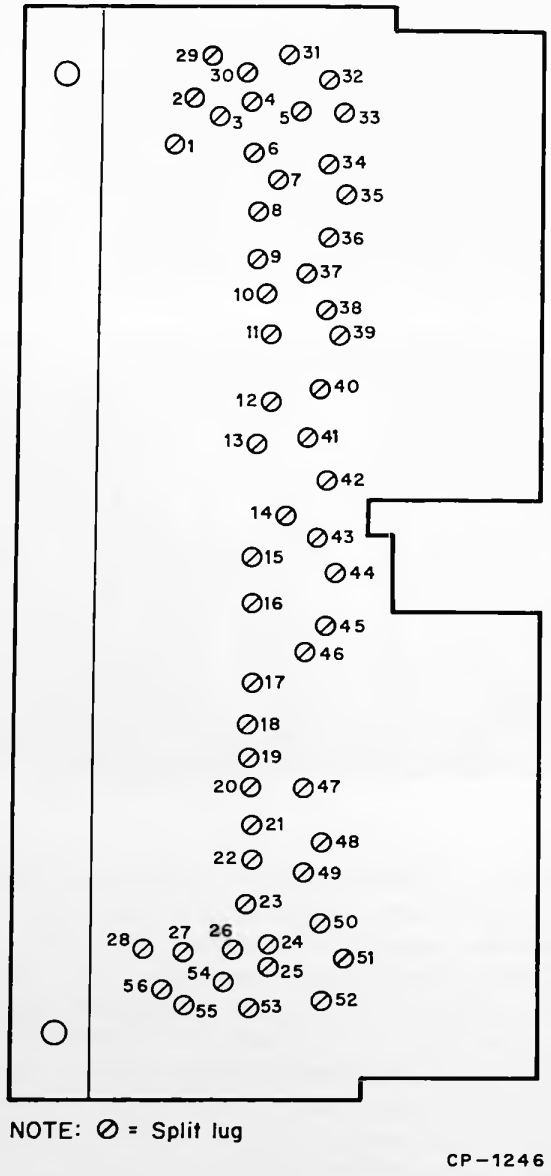
Unibus Cable Connector – M976



The M976 is a double-height, short length cable connector with 36 contact fingers on each side. Fifty-six contact fingers can be assigned to Unibus signals, 14 are dedicated to ground, and two are not used, as shown on the following schematic diagram. This is a general-use Unibus cable connector; it can be used with four 91-07731, thirty-conductor, flat ribbon cables to connect the Unibus to a system unit in an external mounting drawer or cabinet or to connect a peripheral device not located within the drawer. Cable clamp 12-09764 can be used with this connector. The M976 is similar to the M919 cable connector except the M976 is equipped with 56 split-lug terminals for connecting the cable conductors dedicated to signals, and plated-through holes (64) are provided for the cable conductors dedicated to ground; this provides an alternate signal/ground cable conductor configuration.

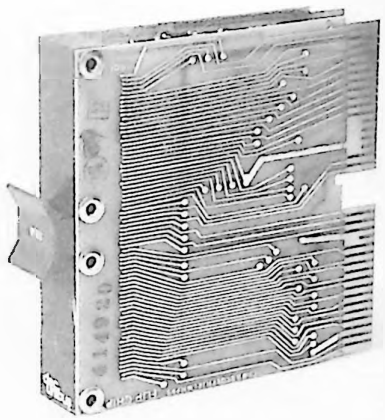


M976



M976 Split Lug Layout Diagram (Side 1)

Internal Unibus Terminator Module – M981



The M981 Internal Unibus Terminator module is a dual printed circuit board, double-height, standard length module that is used to terminate the internal KD11-A Unibus and electrically connect a KD11-A processor to the next Unibus device. On each printed circuit board, 56 contact fingers are assigned to Unibus signals, 14 are dedicated to ground, and two are used for +5 V power, as shown on the following schematic diagram. The M981 contains the pull-up/terminator resistor networks (178 ohms to +5 V and 383 ohms to ground) necessary to terminate the 56 Unibus signals except AC LO L, DC LO L, BG7 H, BG6 H, BG5 H, BG4 H, and NPG H.

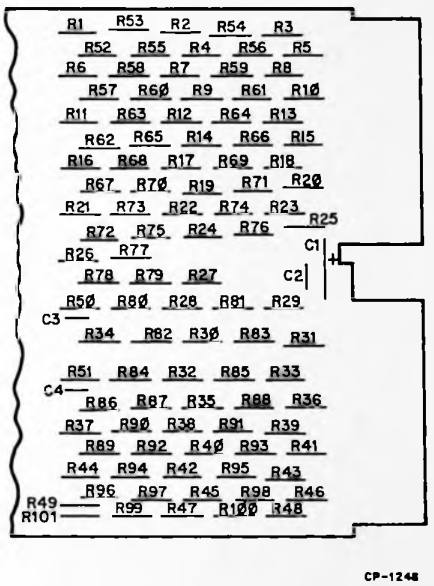
NOTE

AC LO L and DC LO L have 389 ohms in parallel with 0.001 μF to +5 V. NPG H has 178 ohms to +5 V.

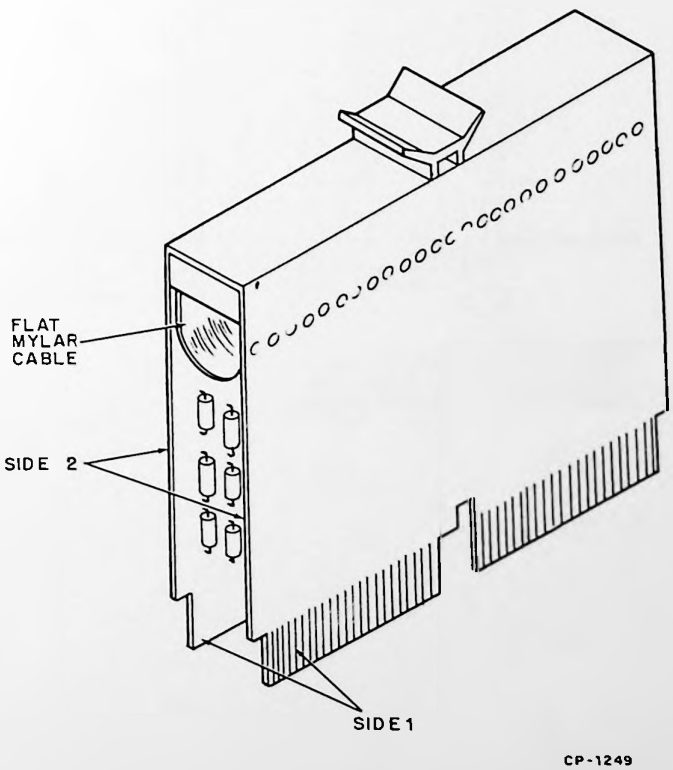
The two printed circuit boards are on 1.000-in. (2.540-cm) centers and are connected by a 73-conductor, flat mylar cable as shown on the following illustration. The resistors and capacitors are located as shown on the component layout diagram.

NOTE

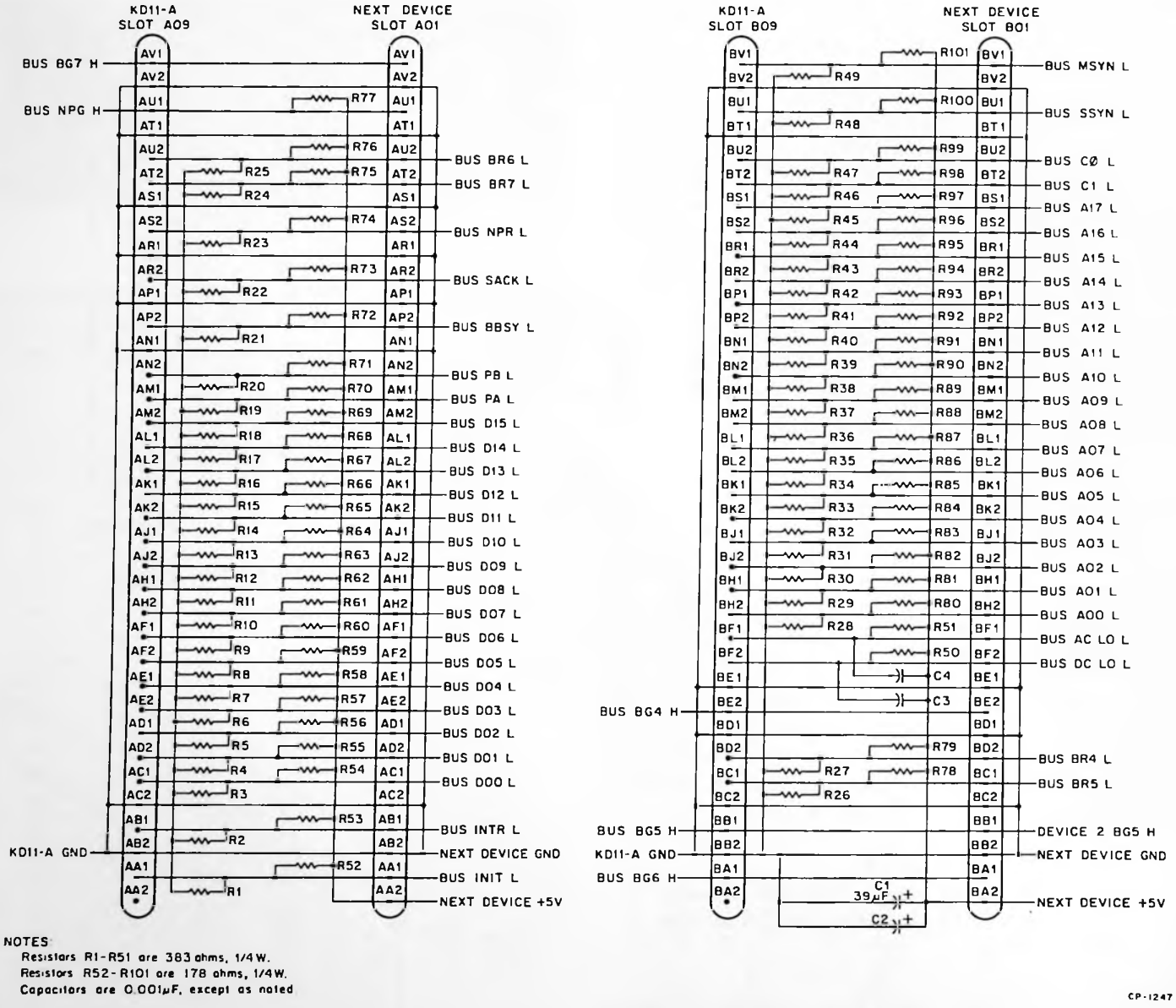
The M981 is used only to connect the processor to the first Unibus device. An M920 Unibus connector module or a BC11A-XX Unibus cable assembly (or one each M919, one M929, and two 17-00002-1 cables of the correct length) is used to electrically connect all other Unibus devices. An M930 Unibus terminator module is used to terminate the last device on the Unibus.



M981 Component Layout Diagram



M981

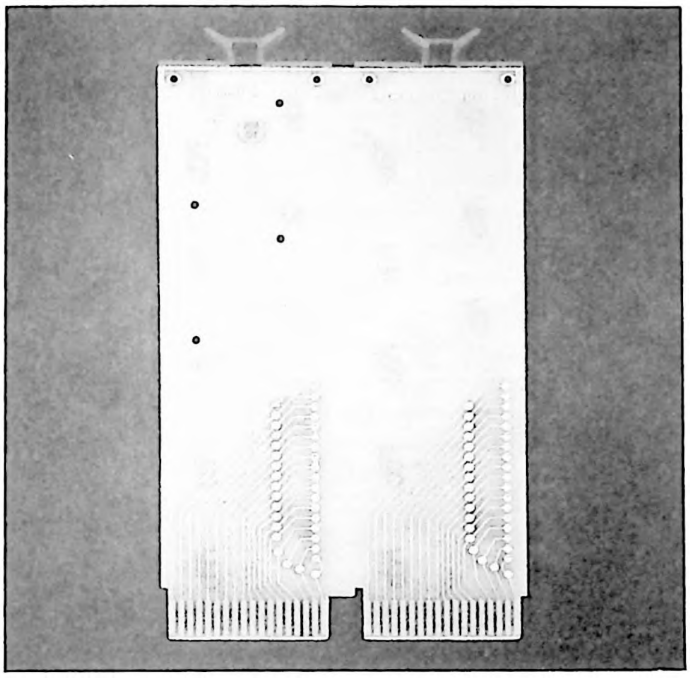


NOTES:
Resistors R1-R51 are 383 ohms, 1/4 W.
Resistors R52-R101 are 178 ohms, 1/4 W.
Capacitors are 0.001µF, except as noted.

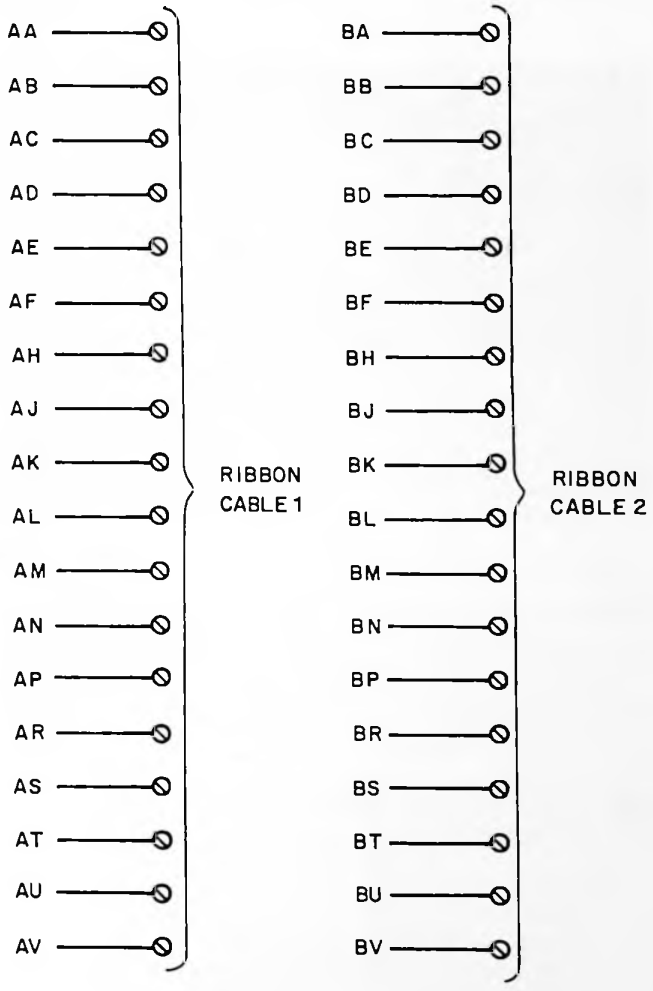
CP-1247

M981

RK05 DECpack Disk Drive Cable Connector – M983



The M983 is a double-height, extended length cable connector with 36 contact fingers on one side; it can accommodate two 91-07575, twenty-conductor, flat ribbon cables. All 36 contact fingers can be assigned to signals (i.e., none are dedicated to ground or power), as shown on the following schematic diagram. The cables enter the board on one side at right angles to the board. This cable connector is usually used with an RK05 DECpack Disk Drive. The board is equipped with 36 split-lug terminals for solder connection of the cable conductors. Cable clamp 943 can be used with this connector for strain relief. Round, 18-conductor (nine twisted pairs) cables and cable clamp 941 can also be used with this connector.

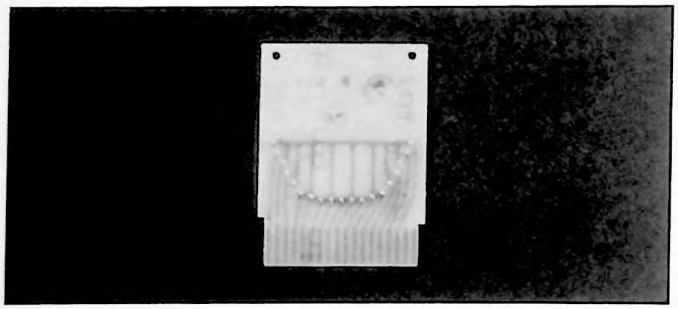


NOTE:
⊘ = SPLIT LUG

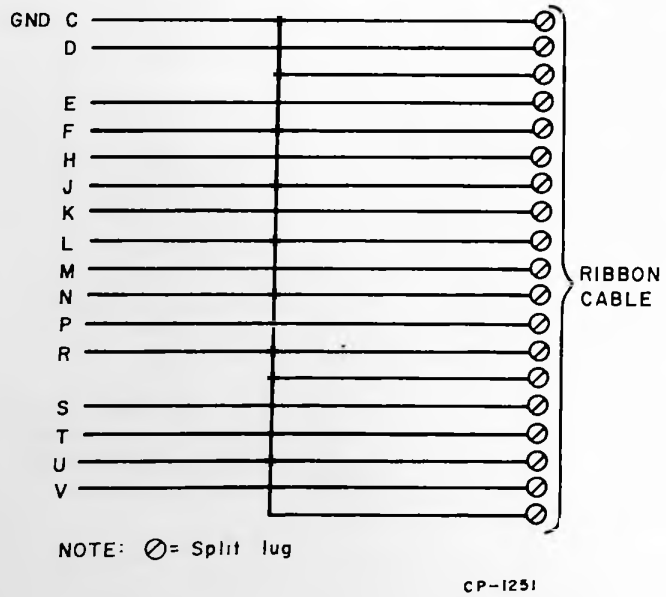
CP-1250

M983

Cable Connector – W011



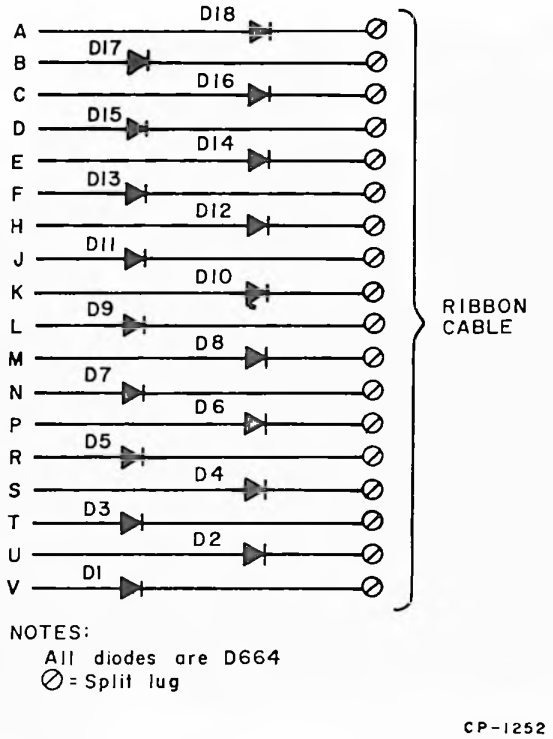
The W011 is a single-height, short length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Nine contact fingers can be assigned to signals and nine contact fingers are dedicated to ground, as shown on the following schematic diagram. The board is equipped with 19 split-lug terminals for solder connection of the cable conductors; an alternate signal/ground cable conductor configuration is provided.



W011

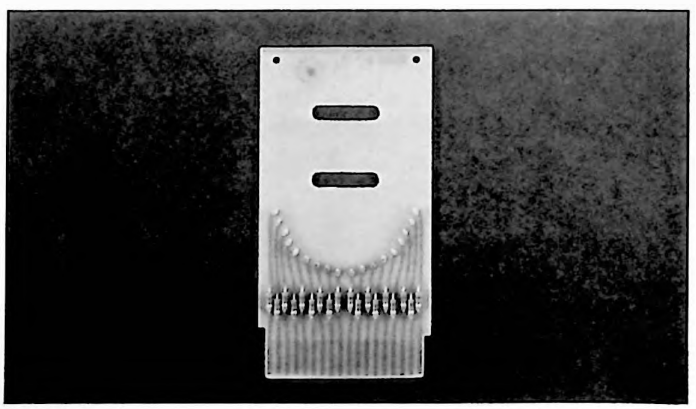
Cable Connector – W018

The W018 is a single-height, short length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Eighteen contact fingers can be assigned to signals, as shown on the following schematic diagram. A D664 diode is in series with each contact finger. None of the contact fingers are dedicated to ground. The board is equipped with 18 split-lug terminals for solder connection of the cable conductors.



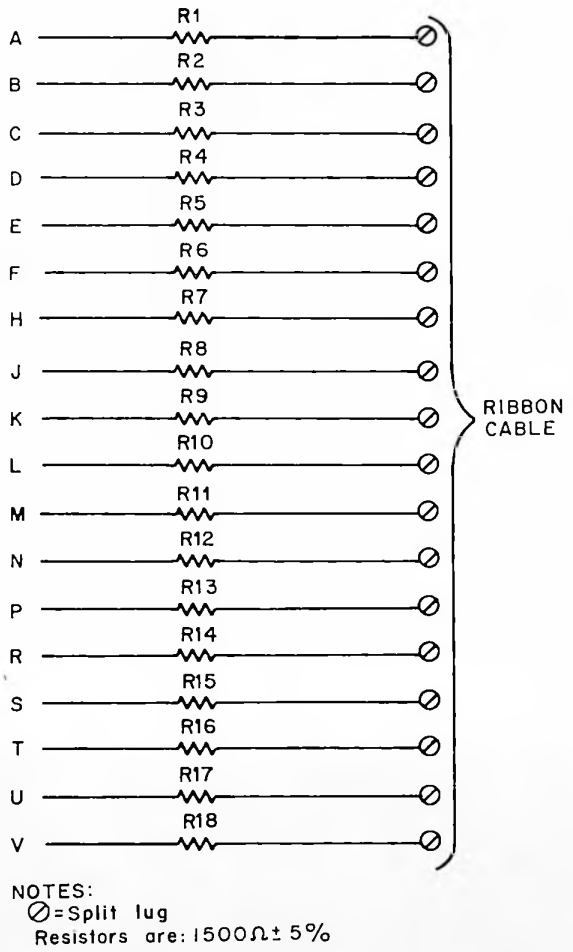
W018

Cable Connector – W020



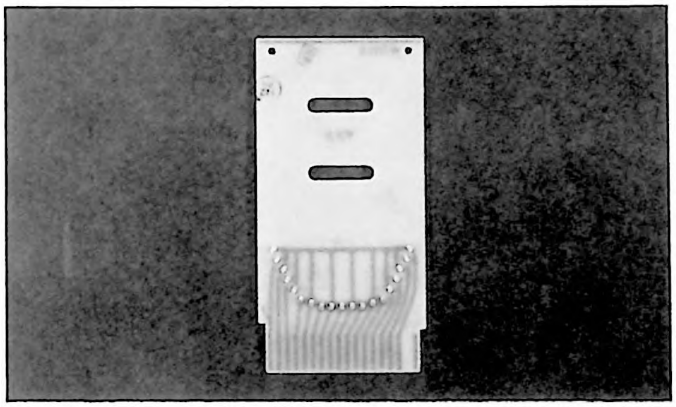
The W020 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Eighteen contact fingers can be

assigned to signals, as shown on the following schematic diagram. A 1500-ohm resistor is in series with each contact finger. None of the contact fingers are dedicated to ground. The board is equipped with 18 split-lug terminals for solder connection of the cable conductors.

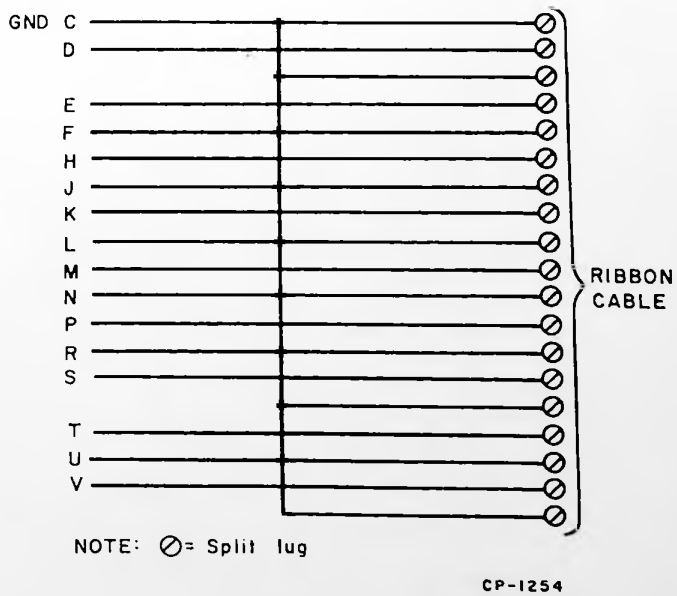


W020

Cable Connector – W021

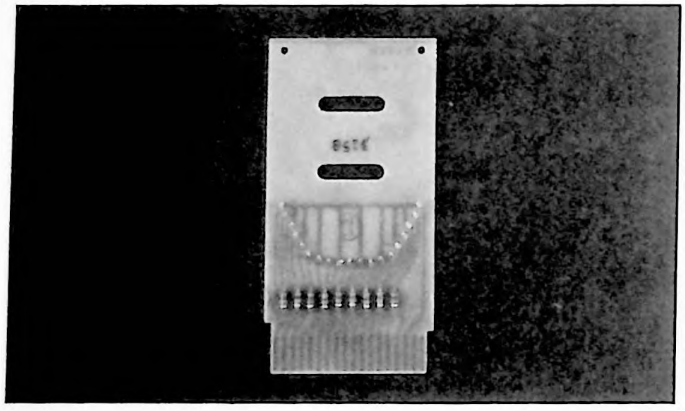


The W021 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Nine contact fingers can be assigned to signals and nine contact fingers are dedicated to ground, as shown on the following schematic diagram. The board is equipped with 19 split-lug terminals for solder connection of the cable conductors; an alternate signal/ground cable conductor configuration is provided.

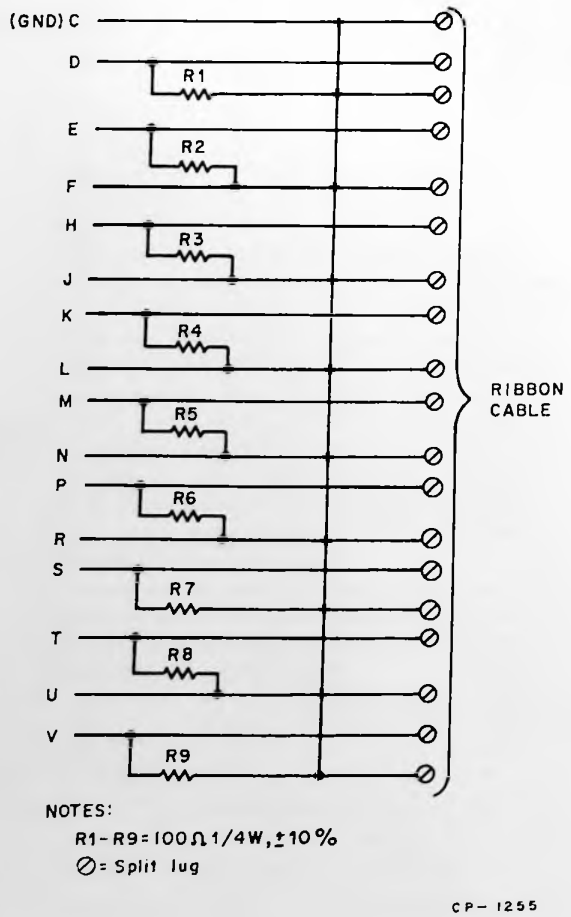


W021

Cable Connector – W022

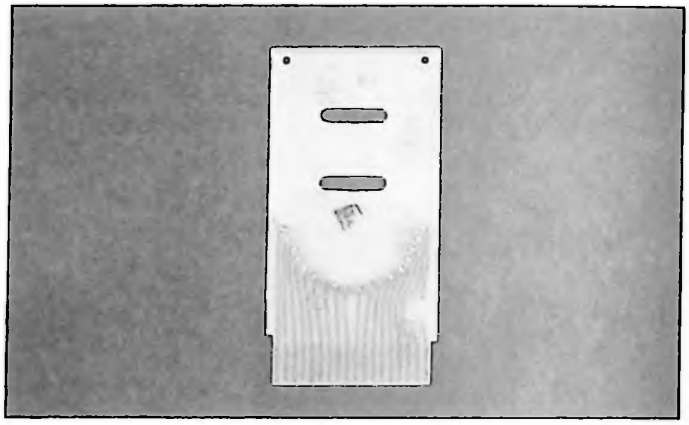


The W022 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Nine contact fingers can be assigned to signals and nine contact fingers are dedicated to ground, as shown on the following schematic diagram. The board is equipped with nine 100-ohm load resistors and 19 split-lug terminals for solder connection of the cable conductors; an alternate signal/ground cable conductor configuration is provided.

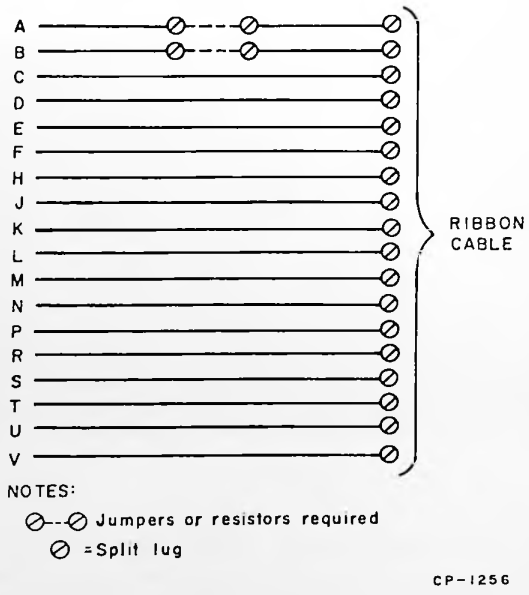


W022

Cable Connector – W023

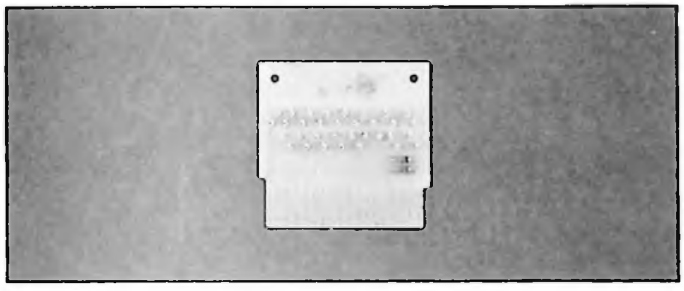


The W023 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Eighteen contact fingers can be assigned to signals, as shown on the following schematic diagram. None of the contact fingers are dedicated to ground. Two jumpers or resistors must be user-installed in series with contact fingers A and B. The board is equipped with 18 split-lug terminals for solder connection of the cable conductors.



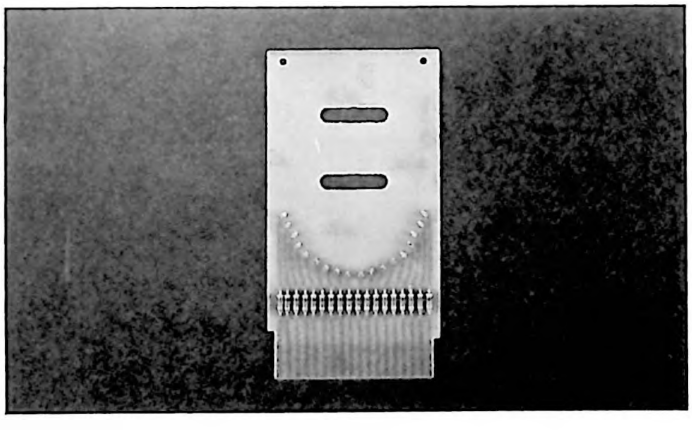
W023

Cable Connector – W024

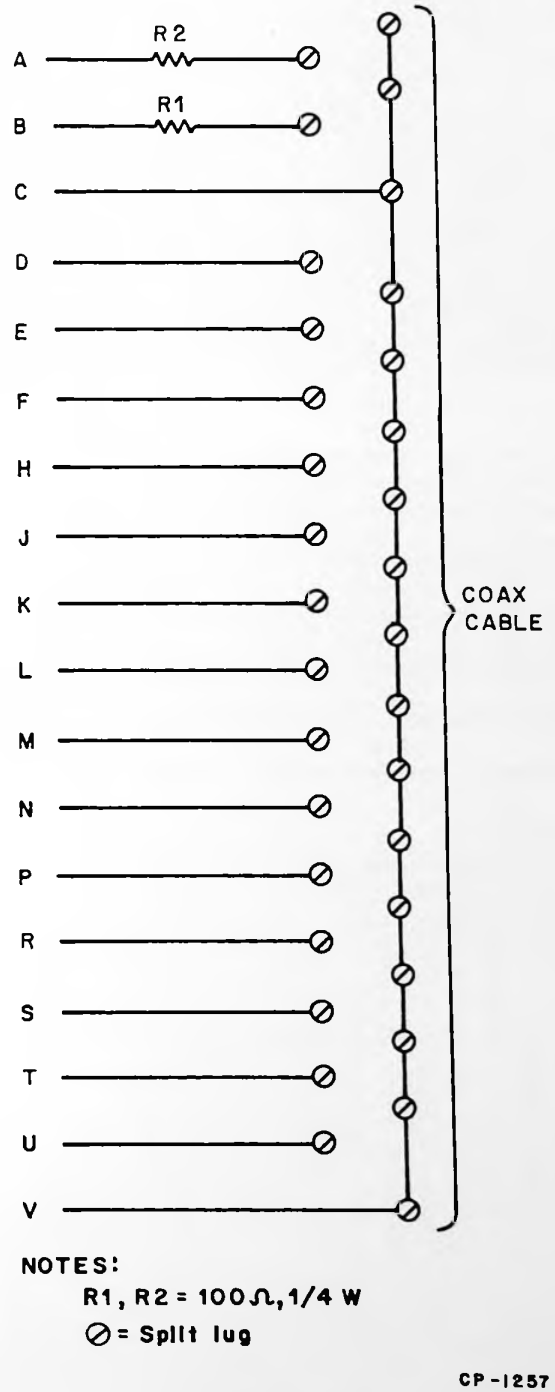


The W024 is a single-height, short length cable connector with contact fingers on one side; it can accommodate one 36-conductor coaxial (18 twisted pairs) cable. Sixteen contact fingers can be assigned to signals and two contact fingers are dedicated to ground, as shown on the following schematic diagram. In series with contact fingers A and B are 10-ohm resistors. The board is equipped with 33 split-lug terminals for solder connection of the cable conductors; an alternate signal/ground cable conductor configuration is provided.

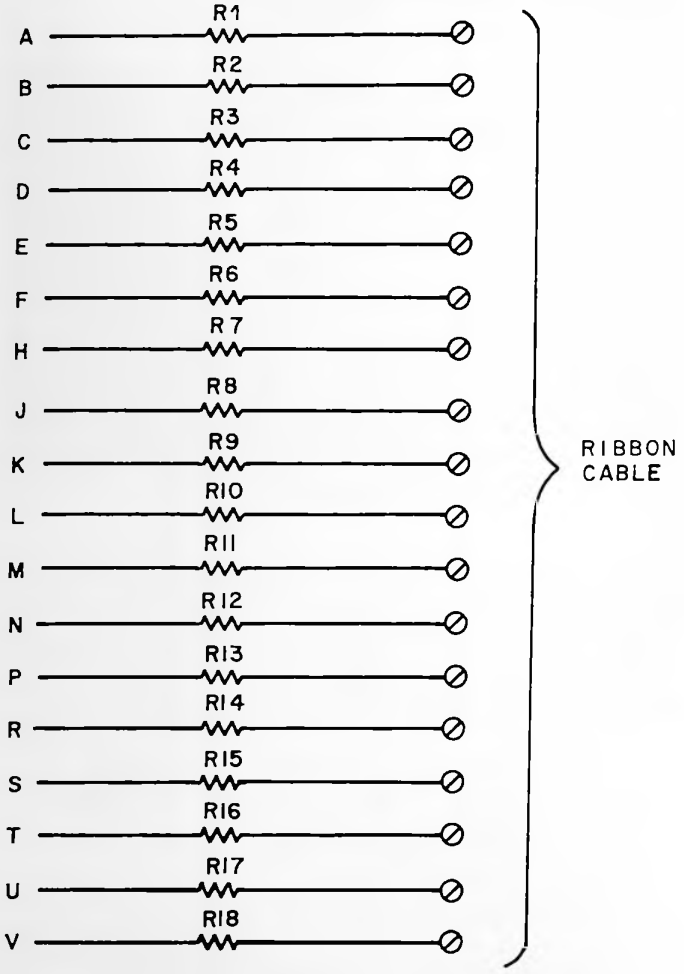
Cable Connector – W027



The W027 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 20-conductor ribbon cable. Eighteen contact fingers can be assigned to signals, as shown on the following schematic diagram. A 3000-ohm resistor is in series with each contact finger. None of the contact fingers are dedicated to ground. The board is equipped with 18 split-lug terminals for solder connection of the cable conductors.



W024



NOTES:

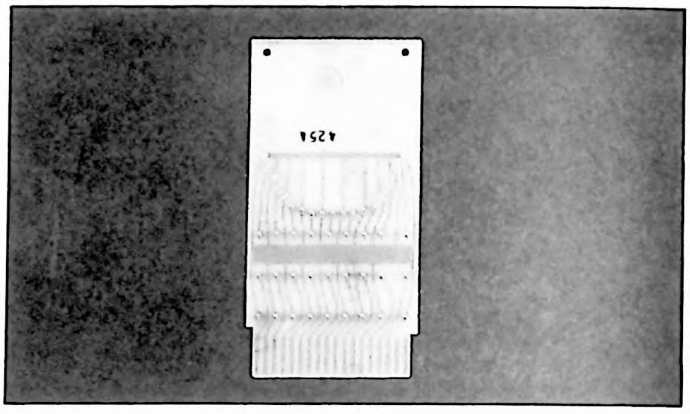
All resistors are 3000 OHMS, 1/4 W, ± 5 %

⊘ = Split lug

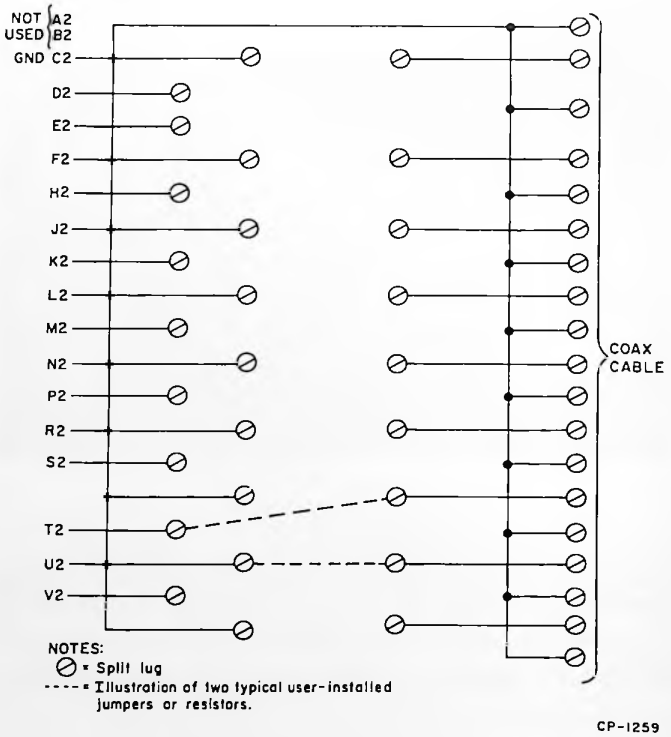
CP-1258

W027

Cable Connector – W028



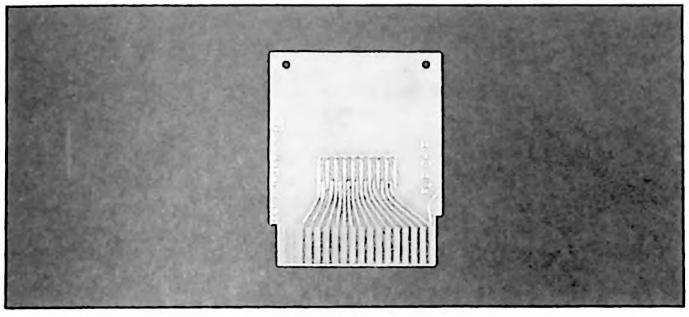
The W028 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 9-conductor coaxial cable. Nine contact fingers can be assigned to signals and ten contact fingers are dedicated to ground, as shown on the following schematic diagram. This cable connector requires user-installed jumpers or resistors. The board is equipped with split-lug terminals for solder connection of the cable conductors and the jumpers or resistors.



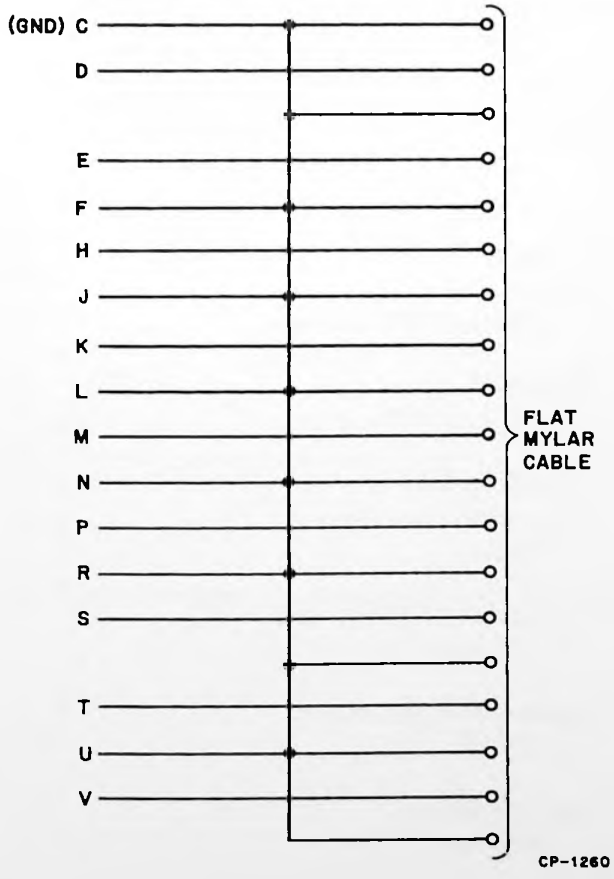
CP-1259

W028

Cable Connector – W031

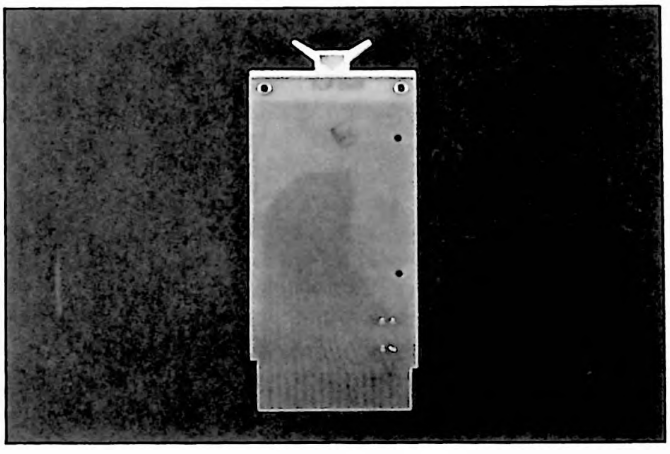


The W031 is a single-height, short length cable connector with contact fingers on one side; it can accommodate one 19-conductor, flat mylar cable. Nine contact fingers can be assigned to signals and seven contact fingers are dedicated to ground, as shown on the following schematic diagram. An alternate signal/ground cable conductor configuration is provided. The cable conductor must be soldered to the board etch using printed circuit solder techniques.

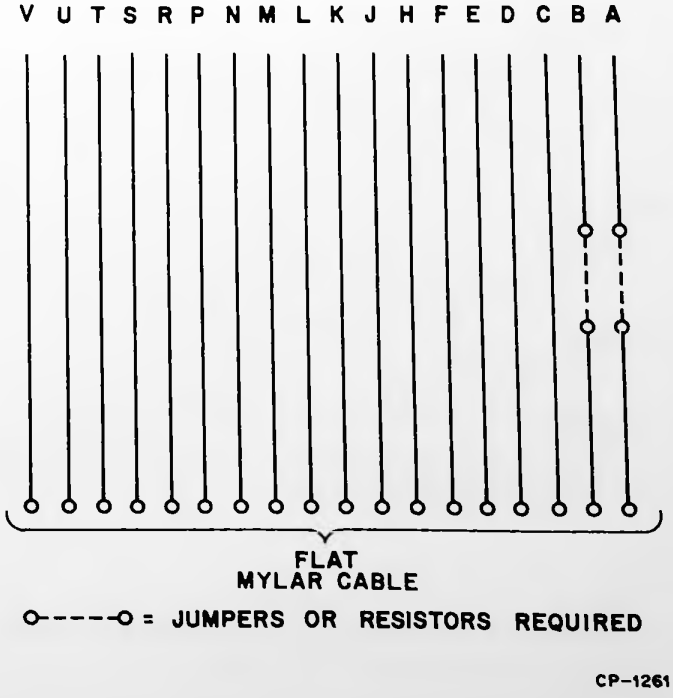


W031

Cable Connector – W033



The W033 is a single-height, single-length cable connector with contact fingers on one side; it can accommodate one 19-conductor, flat mylar cable. Eighteen contact fingers can be assigned to signals, as shown on the following schematic diagram. None of the contact fingers are dedicated to ground. Two jumpers or resistors must be user-installed in series with contact fingers A and B. The cable conductors must be soldered to the board etch using printed circuit solder techniques.



W033

BULK CABLES

Bulk cables are grouped into six general classifications according to the cable type: flat ribbon cable, flat mylar cable, flat coaxial cable, round coaxial cable, flat shielded cable, and round twisted-pair cable. These cables are excellent for fabricating cable assemblies using cable connectors described in this publication. Wire wrap wire, hook-up wire, bus strips, and patch cords are described in Section 6.

Nine-Conductor, Flat Coaxial Cable – 17-00001-00

Nine-conductor, flat coaxial cable is available for user-fabrication of cable assemblies. It is unterminated on both ends, and the nine conductors are bonded together in a flat configuration as shown in the following illustration. Cable clamp 940 is recommended for use with this cable for strain relief where the cable enters the cable connector board.

Cable 17-00001-00 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors

Quantity
9

Gauge
29 AWG solid

Material
Tinned copper-clad steel or tin-plated copper weld

Dielectric
Extruded rulan, 0.077-in. (0.196-cm) diameter tube over 0.015-in. (0.038-cm) diameter rulan beading with 0.50-in. (1.27-cm) lay.

Drain Wires

Quantity
9

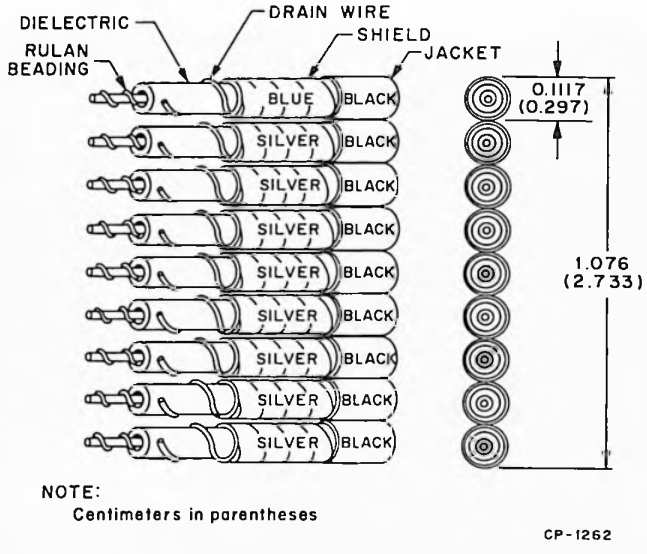
Gauge
29 AWG solid

Material
Tinned copper-clad steel or tin-plated copper weld with 0.50-in. (1.27-cm) lay.

Shields

Material
Aluminum/mylar tape, 0.375 by 0.00135 in. (0.953 by 0.00343 cm) with 25% overlap.

Color
Per illustration



17-00001-00 Nine-Conductor Flat Coaxial Cable

Jackets

Material
Polyvinyl chloride (PVC)

Diameter
0.117 in. (0.297 cm) nominal

Color
Per illustration

Cable Size

Width
1.076 in. (2.783 cm) nom

Thickness
0.117 in. (0.297 cm) nom

Electrical Properties

Characteristic impedance
95 ohms

DC resistance/ft (30.48 cm)
0.2 ohm max

Capacitance/ft (30.48 cm)
13.75 pF

Operating voltage
300 V rms

19-Conductor, Flat Mylar Cable – 17-00002-00

Nineteen-conductor, flat mylar cable is available for user-fabrication of cable assemblies. It is unterminated on both ends, and the 19 conductors form a flat configuration as shown in the following illustration. Cable clamp 940 is recommended for use with this cable for strain relief where the cable enters the cable connector board.

Cable 17-00002-00 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors

Quantity
19

Size
0.003 X 0.026 in. (0.008 X 0.066 cm)

Material
Copper

Insulation

Polyester, self-extinguishing

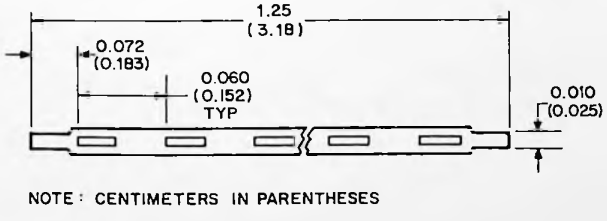
Cable Width

1.25 in. (3.18 cm) nom

Electrical Characteristics

Characteristic impedance
100 to 131 ohms

Voltage rating
300 V rms (conductor-to-conductor)



17-00002-00 Nineteen-Conductor, Flat Mylar Cable

60-Conductor, Flat Mylar Cable – 17-00002-01

Sixty-conductor, flat mylar cable is available for user-fabrication of cable assemblies. It is unterminated on both ends, and the 60 conductors form a flat configuration as shown in the following illustration. Cable clamp 12-09764 is recommended for use with this cable for strain relief where the cable enters the cable connector board.

Cable 17-00002-01 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors

Quantity
60

Size
0.003 X 0.026 in. (0.008 X 0.066 cm)

Material
Copper

Insulation

Polyester, self-extinguishing

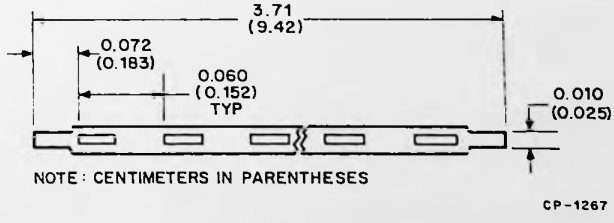
Cable Width

3.71 in. (9.42 cm) nom

Electrical Characteristics

Characteristic impedance
100 to 131 ohms

Voltage rating
300 V rms (conductor-to-conductor)



17-00002-01 Sixty-Conductor, Flat Mylar Cable

40-Conductor, Flat Mylar Cable – 17-00004-00

Forty-conductor, flat mylar cable is available for user-fabrication of cable assemblies. It is unterminated on both ends, and the 40 conductors form a flat configuration as shown in the following illustration. Cable clamp 12-09764 is recommended for use with this cable to provide strain relief where the cable enters the cable connector board.

Cable 17-00004-00 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors
Quantity
40

Gauge
30 AWG solid

Material
Copper

Shield Material
Copper

Insulation
Polyvinyl chloride (PVC)

Cable Size
Width
2.250 in. (5.715 cm) nom

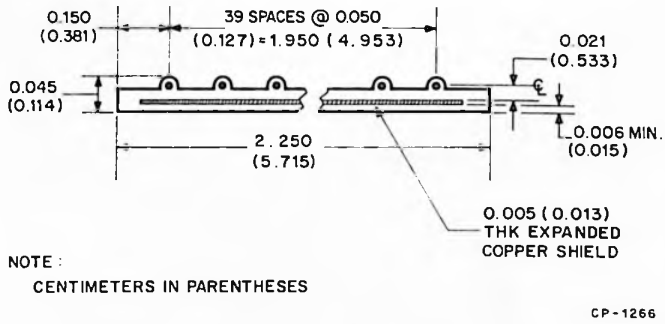
Thickness
0.045 in. (0.114 cm) nom

Electrical Properties
Characteristic impedance
75 ohms

DC resistance/ft (30.48 cm)
0.11 ohm max

Capacitance/ft (30.48 cm)
21 pF typ

U.L. Style No.
2466



17-00004-00 Forty-Conductor, Flat Mylar Cable

Six-Conductor Round Cable – 17-00012

Six-conductor, round cable is available for user-fabrication of cable assemblies. It is unterminated on both ends; the six conductors and a center-filler wrapped with clear mylar form a round configuration as shown in the following illustration.

Cable 17-00012 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors
Quantity
6

Gauge
20 AWG, 10/30 stranded

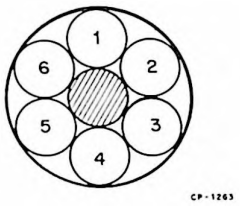
Material
Tinned copper

Insulation
Polyvinyl chloride (PVC), 0.012-in. (0.030-cm) thick wall

Insulation colors
Black, red, orange, green, blue, white

Jacket
Material
PVC, 0.040-in. (0.102-cm) thick wall

Color
Gray



17-00012 Six-Conductor, Round Cable

20-Twisted-Pair, Round Cable – 17-00018

Twenty-twisted-pair, round cable is available for user-fabrication of cable assemblies. It is unterminated on both ends. The 20-twisted-pair conductors and a ground wire form a round configuration as shown in the following illustration. Cable clamp 941 is recommended for use with this cable for strain relief where the cable enters the cable connector board.

Cable 17-00018 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors

Quantity
40

Gauge
24 AWG, 7/32 stranded

Material
Tinned copper

Insulation
Polyvinyl chloride (PVC), 0.010-in. (0.0254-cm) thick wall

Insulation color
Per table and illustration

U.L. Style No.
1061 or 1429

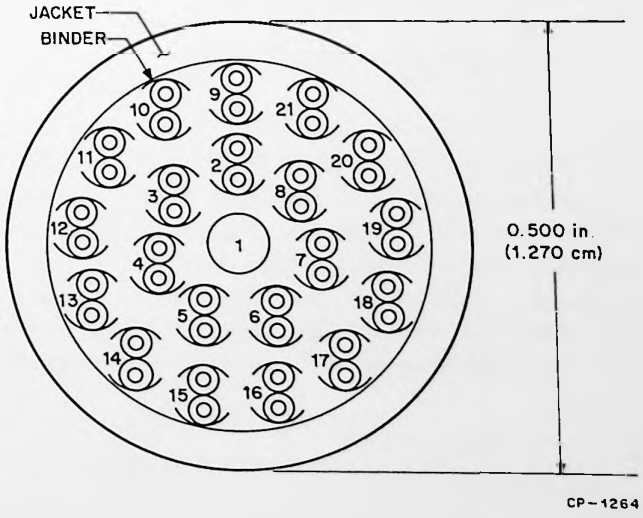
Ground Wire

Quantity
1

Gauge
16 AWG, 26/30 or 19/0.0117-in. (0.0297-cm) stranded

17-00018 Cable Conductor Insulation Color Code

Item No.	Color
1	Green/Yellow (Ground)
2	Red Paired with White
3	Blue Paired with Black
4	Yellow Paired with Black
5	Violet Paired with Brown
6	Red Paired with Black
7	Orange Paired with Brown
8	Green Paired with Black
9	White/Red Paired with Black
10	White/Orange Paired with Black
11	White/Blue Paired with Black
12	Orange Paired with Black
13	Violet Paired with Black
14	Green Paired with Brown
15	White/Violet Paired with Black
16	White/Yellow Paired with Black
17	White/Green Paired with Black
18	Red Paired with Brown
19	White Paired with Black
20	Yellow Paired with Brown
21	Blue Paired with Brown



17-00018 Twenty-Twisted-Pair, Round Cable

Material
Tinned copper

Insulation
PVC, 0.016-in. (0.041-cm) thick wall

Insulation color
Per table and illustration

U.L. Style No.
1007 or 1430

Cable

Jacket
PVC, 0.035-in. (0.089-cm) thick wall

Binder
0.001-in. (0.003-cm) thick mylar tape, 6.0-in. (15.2-cm), left-hand lay with 10% min overlap

Diameter
0.500 in. (1.270 cm) nom

U.L. Style No.
2464

Electrical Properties

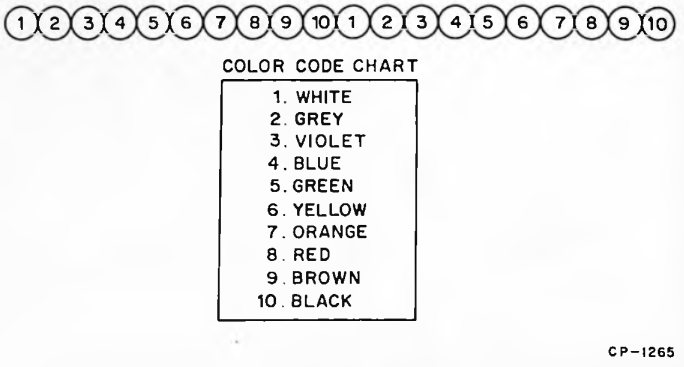
Characteristic impedance
80 ohms nom

DC resistance/ft (30.48 cm)
0.26 ohm max

Capacitance/ft (30.48 cm)
25.0 pF

20-Conductor, Flat Ribbon Cable – 91-07575

Twenty-conductor, flat ribbon cable is available for user-fabrication of cable assemblies. It is unterminated on both ends, and the 20 conductors are bonded together in a flat configuration as shown in the following illustration. Cable clamp 943 is recommended for use with this cable for strain relief where the cable enters the cable connector board.



91-07575 Twenty-Conductor, Ribbon Cable

Cable 91-07575 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors

Quantity
20

Gauge
22 AWG, 7/30 stranded

Material
Tinned copper

Insulation

Material
Polyvinyl chloride (PVC)

Color
Per illustration and color code chart

Cable Size

Width
1.02 in. (2.59 cm) nom

Thickness
0.051 in. (0.130 cm) nom

Four-Conductor Round Cable – 91-07706

Four-conductor, round cable is available for user-fabrication of cable assemblies. It is unterminated on both ends, and the four conductors form a round configuration.

Cable 91-07706 is available in any length in increments of 1 foot (30.48 cm). Other specifications are listed below.

Conductors

Quantity
4

Gauge
22 AWG, 7/30 stranded

Insulation
Theroplastic, 0.010-in. (0.025-cm) thick wall

Insulation colors
Black, red, green, white

CABLE CLAMPS

Cable clamps provide strain relief where a cable enters a cable connector. Cable clamps are available for both flat and round cables.

Cable Clamp – 12-09764

The 12-09764 cable clamp can be used with flat cable up to 4.562 in. (11.587 cm) wide. Two 0.128-in. (0.325-cm) diameter mounting holes are spaced 4.750 in. (12.065 cm) center-to-center to align with holes on the cable connector; nylon mounting hardware (No. 4 screw and nut) is recommended.

Cable Clamp – 12-09925

The 12-09925 cable clamp can be used with module connector block H807 and a round cable. An H807 connector block and a round cable provide a convenient method of terminating a single-height module at a remote location. The 12-09925 cable clamp protects the solder connections of the cable and the connector pins; it also prevents excessive strain on the cable when the module is inserted into or removed from the module connector. The 12-09925 will accommodate cables from 0.290 in. (0.737 cm) to 0.390 in. (0.813 cm) in diameter.

The body of the 12-09925 is equipped with two 6-32 threaded inserts so that the cover of the 12-09925 can be secured to the body.

Cable Clamp – 940

The 940 cable clamp can be used with flat cable up to 1.75 in. (4.45 cm) wide. The cable slot is 0.080 in. (0.203 cm) deep. Two 0.128-in. (0.325-cm) diameter mounting holes are spaced 2.000 in. (5.080 cm) center-to-center to align with holes on the cable connector; nylon mounting hardware (No. 4 screw and nut) is recommended.

Cable Clamp – 941

The 941 cable clamp can be used with round cable that is 0.281 to 0.438 in. (0.714 to 1.113 cm) in diameter. The 941 cable clamp can also be used where cables require strain relief at the entry point to panels and cabinets. Two 0.136-in. (0.345-cm) diameter mounting holes are spaced 2.000 in. (5.080 cm) center-to-center to align with holes on the cable connector, panel, or cabinet; nylon mounting hardware (No. 4 screw and nut) is recommended.

Cable Clamp – 943

The 943 cable clamp can be used with a ribbon cable up to 1.00 in. (2.54 cm) wide. The cable slot is 0.109 in. (0.277 cm) deep. Two 0.128-in. (0.325-cm) diameter mounting holes are spaced 2.000 in. (5.080 cm) center-to-center to align with holes on the cable connector; nylon mounting hardware (No. 4 screw and nut) is recommended.

Cable Clamp – 944

The 944 cable clamp can be used with ribbon cables up to 1.00 in. (2.54 cm) wide when two cables require connection to the same side of the connector. The cable slot is 0.219 in. (0.556 cm) deep and can accommodate two ribbon cables. Two 0.128-in. (0.325-cm) diameter mounting holes are spaced 2.000 in. (5.080 cm) center-to-center to align with holes on the cable connector; nylon mounting hardware (No. 4 screw and nut) is recommended.

Section 5
Power Supplies, Power Controllers, and Step-Down Transformers

This section describes the electrical and mechanical features of a complete line of power supplies, a power controller, a panel-mounted, step-down transformer, and power supply accessories. These units can be easily incorporated into an existing system when additional power or reference voltages are required.

The power supply group consists of single-voltage, regulated and unregulated output units and multiple-voltage output units, which are adaptable to a variety of system requirements. Many of the power supplies contain overcurrent and overvoltage protection to prevent damage to the system logic or power supply circuits in the event of excessive current conditions. Remote sensing outputs, which enable a constant voltage to be maintained at the load, are also included on some power supplies.

The power controller unit is available to distribute and control the ac voltage to system power supplies and other devices. The controller contains unswitched ac outlets and switched ac outlets that can be controlled by switches or signals from remote locations.

The step-down transformer contains both tapped input and output windings and permits a wide range of input and output ac voltages to be selected for the proper operation of the system power supplies and other ac units.

The power supply accessories include receptacles and line sets for use with the power supplies and power controller.

This section is divided into five subsections, according to the usual use of each product:

+5 Vdc Positive Logic Power Supplies

Analog Power Supplies

System Power Supplies

Power Controller and Step-Down Transformer

Power Supply Accessories

The descriptions of the products within a subsection are arranged in alphanumeric order by part number. At the beginning of each of the subsections is a quick-reference summary table listing the products described in that subsection.

+5 Vdc POSITIVE LOGIC POWER SUPPLIES

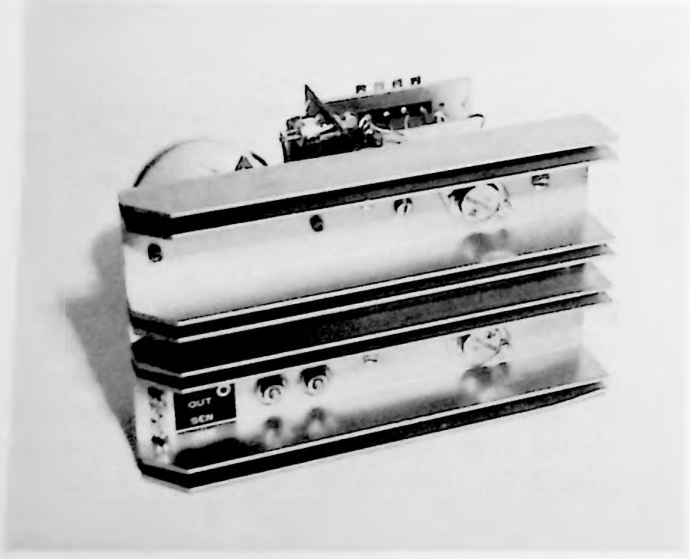
These +5 Vdc positive logic power supplies are designed to provide V_{CC} (+5 Vdc) to the integrated circuits mounted on modules used in logic systems and interfaces. Many small systems and most interfaces comprise M-series gating, multiplexing, bus receivers, and bus transmitter modules that require only a V_{CC} power supply. The power supplies described in this subsection are ideal for these applications because of such features as overvoltage and short circuit protection, remote sensing, and input voltage ranges.

The following table summarizes the +5 Vdc positive logic power supplies described in this subsection; individual descriptions follow the table.

+5 Vdc Positive Logic Power Supplies

Part No.	Input Specs	Output Specs	Dimensions	Features
H710	105–125 Vac 210–250 Vac (47–63 Hz)	+5 Vdc @ 5 A, 1% regulation	8 in. long X 6 in. high X 5.25 in. deep (20.32 X 15.24 X 13.34 cm)	Short circuit proof Floating output Remote sensing Overvoltage protection
H716	120 Vac 240 Vac (47–63 Hz)	+5 Vdc @ 4.0 A, 3% regulation -15 Vdc @ 1.5 A, 5% regulation	5.25 in. long X 4.125 in. high X 12.00 in. deep (13.34 X 10.48 X 30.48 cm)	Floating output Short circuit proof Overvoltage protection for +5 Vdc output
H726-B	120/240 Vac (47–500 Hz)	+5 Vdc @ 7.0 A, 1% regulation	16.50 in. long X 2.23 in. high X 6.25 in. deep (41.91 X 5.66 X 15.88 cm)	Floating output Short circuit proof Parallel operation Overvoltage protection

Power Supply – H710



The H710 is a single-voltage, +5 Vdc output power supply that provides up to 5.0 A of regulated current. The output terminals of the supply are isolated from chassis ground to allow the +5 Vdc to be used as either a positive or negative voltage source. The supply output includes both positive and negative remote sensing to monitor the voltage at critical load circuits. The +5 Vdc is not manually adjustable.

The remote sensing circuit within the supply varies the output voltage to compensate for the voltage loss caused by the output leads. An internal series regulator circuit protects the supply circuits from damage caused by an overload or short circuit condition. An overvoltage circuit also prevents the +5 Vdc output from exceeding a predetermined value during short durations. These circuits reduce the output voltage of the supply during the excessive voltage or current condition.

The H710 can be operated from either 115 Vac (nominal), single phase or 230 Vac (nominal), single phase. Unless otherwise specified, the unit is shipped with the input transformer wired for 115 Vac. Refer to the mechanical specifications for the wiring changes necessary to adapt the unit to 230 Vac operation. No input ac or output dc cable is provided on the unit. The rectifier circuit output contains a fuse.

The H710 can be mounted to an H020 Mounting Rack, to the frame within an H920 Module Drawer, or to a chassis when required. All input and output leads are soldered to terminals.

Electrical Specifications

Input Voltage
105 to 125 Vac (rms) or 210 to 250 Vac (rms) at a frequency of 47 to 63 Hz. Unless otherwise requested, the H710 is prewired for 110 Vac.

Output Voltage
5.0 Vdc (load condition) with 5 mV

Output Current
0 to 5 A (max)

Line Regulation
±5 mV for 9% change in input voltage (105 to 125 Vac and 210 to 250 Vac)

Load Regulation
±12.5 mV (max) from no load to full load

Ripple
15 mV (rms) max from no load to full load

Temperature Deviation
±50 mV over temperature range from 0 to 70° C

Overcurrent Protection
Activates at 6 A (max)

Overvoltage Protection
Output protected from transient voltages exceeding 6.9 V for 10 μs (min). No protection provided against transients exceeding 6.9 V for long duration.

Dissipation
80 W (max)

Load and Sense
The possible wiring configurations using the load and sense output terminals are shown on the following illustration. Sense input adjusts the output voltage to compensate for up to 0.5 V (max) drop from output leads. The dc outputs of two H710 Power Supplies can be connected in parallel. The total output current rating for parallel operation is less than twice the rated output of each supply.

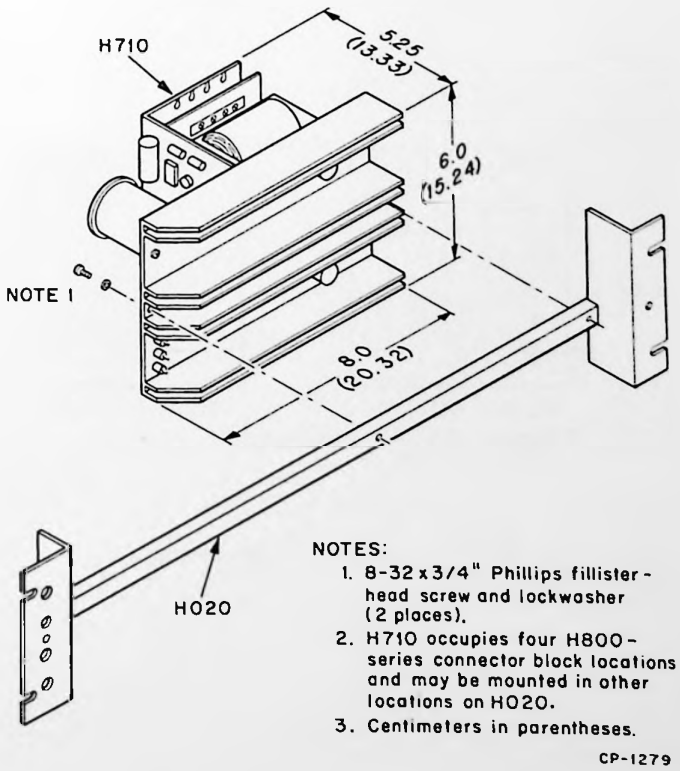
Mechanical Specifications

Dimensions
Mounting and clearance dimensions of the H710 are shown on the illustration below.

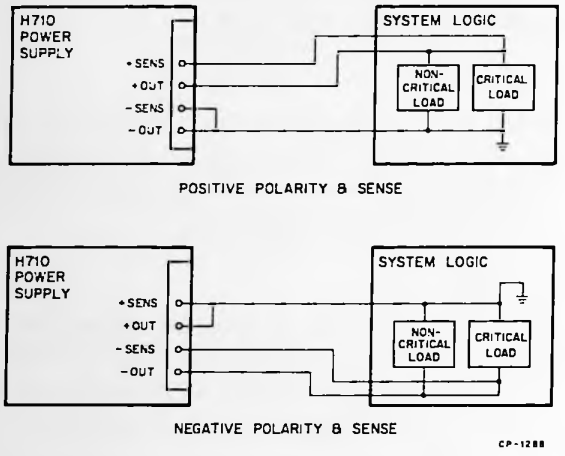
Mounting
Installation procedures for the H710 to an H020 Mounting Frame casting are shown on the illustration below. The H710 can also be mounted to a chassis using the existing mounting holes.

Power Connections
AC Input: Connects to terminal board TB1 with spade lugs. Unit is supplied wired for 115 Vac with jumpers installed. (See the H710 wiring diagrams for input wiring configurations and terminal locations.)

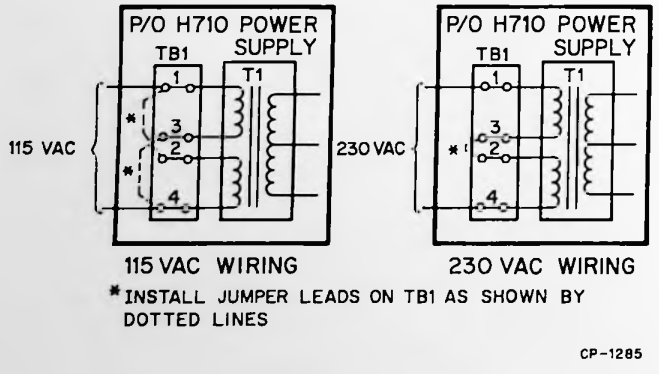
DC Output: Output load and sense leads require soldering to standoff output terminals. The sense leads +SENS and -SENS are prewired to associated +OUT and -OUT.



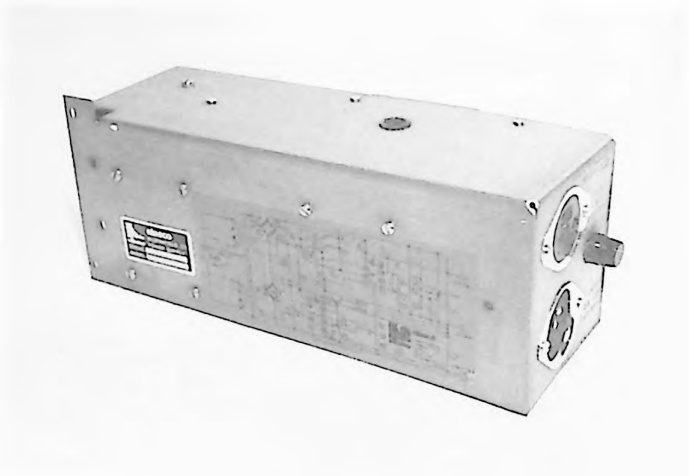
H710 Mounting and Clearance Dimensions



H710 Load and Sense Wiring Configurations



H710 115 Vac/230 Vac Input Wiring



The H716 is a dual-voltage, regulated power supply that provides +5 Vdc at 4.0 A and −15 Vdc at 1.5 A for both analog and digital logic applications. The H716 Power Supply operates from a 115 Vac, 60 Hz line source; however, it may be easily modified for use with 230 Vac, 50 Hz. The +5 Vdc and −15 Vdc outputs and common terminals are isolated from chassis ground to permit use as either a positive or negative voltage source. Because the common terminal of each supply is internally connected, one supply will always operate at the opposite polarity to the other. A series regulator is incorporated in each supply to reduce the output voltage in the event of an external overload or short circuit condition within the system. In addition, the +5 Vdc circuit contains an overvoltage circuit which prevents the output voltage from exceeding a preset value. Each output voltage can be varied within minor limits by adjusting a potentiometer. A fuse is also incorporated in the input ac line to the power transformer to protect the supply against damage from internal shorts or excessive output load currents. The H716 is designed for installation on the right side of an H020 Mounting Bracket; however, it can also be attached to a suitable chassis or front panel. When required, the input and output voltages must be switched by an external control panel.

Electrical Specifications

Input Voltage

105 to 130 Vac (rms) or 210 to 260 Vac (rms) at a frequency of 47 to 63 Hz

Output Voltage

+4.5 to +5.5 Vdc (adjustable) and −14.25 to −15.75 Vdc (adjustable)

Output Current

4.0 A (max) for +5 Vdc output and 1.5 Vdc (max) for −15 Vdc output

Line/Load/Ripple Regulation

Total regulation for +5 Vdc output is ±3%. Total regulation for −15 Vdc output is ±5%.

Temperature Range

0–55° C

Overvoltage Protection

Activates at +6.0 to +6.5 Vdc with a response time of 10–50 μs. Maximum voltage will not exceed +7 Vdc.

Mechanical Specifications

Overall Dimensions

5.25 in. long X 4.125 in. high X 12.00 in. deep (13.34 X 10.48 X 30.48 cm)

Weight

8.0 lb (3.63 kg)

Mounting

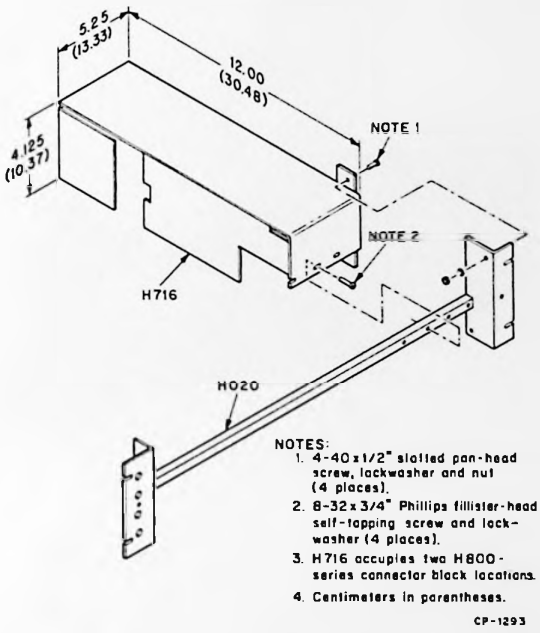
Procedures for mounting the H716 to the H020 Mounting Bracket are shown in the following illustration.

Power Connections

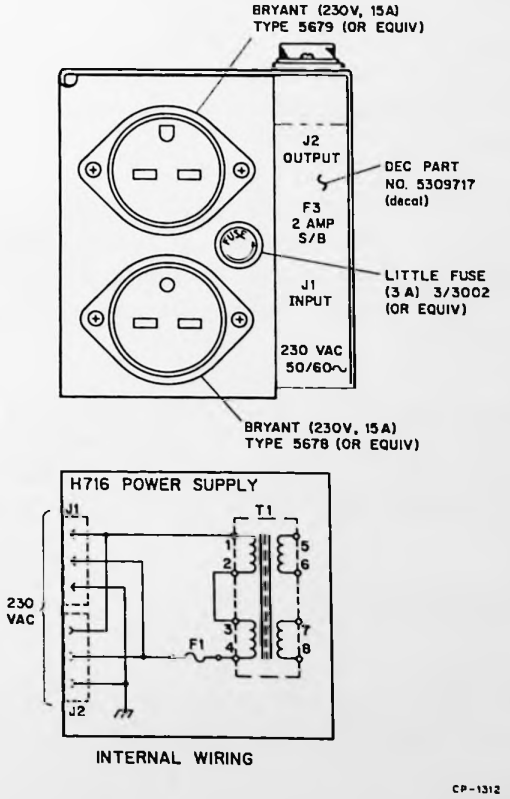
Input ac power is supplied to connector J1. Connector J2 provides ac power to external devices when required. Output dc connections are made with slip-on terminals.

120 Vac to 220 Vac Modification

The H716 supply can be modified for operation with 230 Vac, 50/60 Hz by replacing the input receptacle J1, output receptacle J2, and fuse F3. Refer to the H716 modification drawing for components required and transformer wiring.

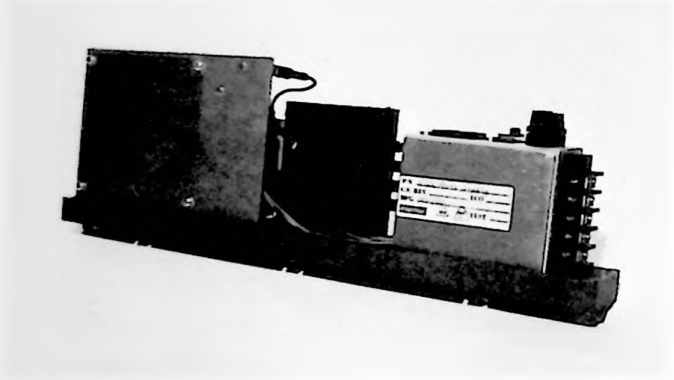


H716 Mounting and Clearance Dimensions



220 Vac Modification to H716

Power Supply – H726-B



The H726-B is a +5 Vdc regulated power supply which provides up to 7.0 A of output current. The supply is constructed on an H933 system unit casting to facilitate mounting with an H014 19-in. (48.26-cm) mounting panel or to any suitable chassis or cabinet. The input and output terminals are isolated from the chassis ground to permit use as either a positive or negative voltage source. A series regulator is incorporated within the H726-B to limit the output current in the event of a short circuit or overload condition at the output. An overvoltage circuit is also included to prevent the output voltage from exceeding a preset limit.

The dc outputs of two type H726-B supplies can be connected in parallel to increase the current capability of the supply. The supply can be operated from either 120 Vac or 240 Vac by changing the connections on the input transformer.

A mounting box on the H933 casting provides a power switch in the ac line, a nonswitched ac convenience outlet, a 10 A fuse, and a terminal strip. The terminal strip provides the connection for both the ac input and dc output.

Electrical Specifications

Input Voltage
95 to 125 Vac or 190 to 250 Vac at a frequency of 47 to 500 Hz (supplied wired for 120 Vac)

Output Voltage
5.15 Vdc ±0.025 at 3.5 A

Output Current
0 to 7 A (max) continuous

Line/Load Regulation
±0.5% total output regulation

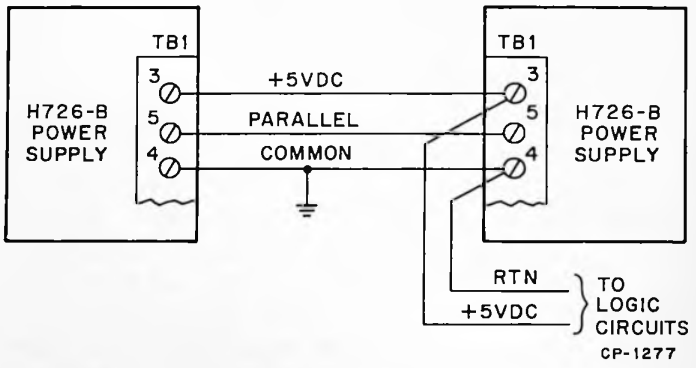
Ripple
20.0 mV (max) peak-to-peak

Overload Protection
Activates at 8.4 to 8.8 A. Output voltage is restored to within specifications when overload condition is removed.

Overvoltage Protection
Activates at 6.5 Vdc ±0.5 V within 1.5 μs after overvoltage condition exists. Output voltage is restored to within specifications when overvoltage condition is removed.

Parallel Capability
Two H726-B units in parallel provide 14.0 A (max); three H726-B units in parallel provide 21.0 A (max). (Refer to the H726-B wiring configuration diagram.)

Operating Temperature
-21° C to +71° C



H726-B Parallel Load Wiring Configuration

Mechanical Specifications

Dimensions
Mounting and clearance dimensions of the H726-B are shown in the following figure.

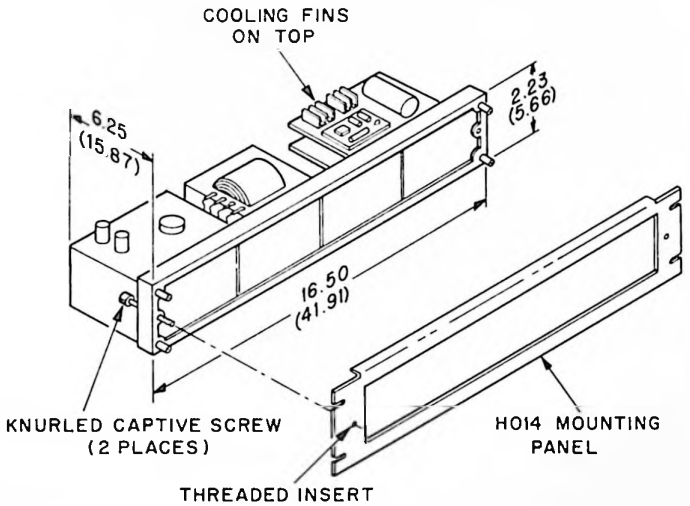
Weight
10.0 lb (4.54 kg)

Mounting
The procedure for installing the H726-B to an H014 Mounting Panel is shown in the H726-B dimensions drawing. The supply can also be mounted within a BA11 Mounting Box.

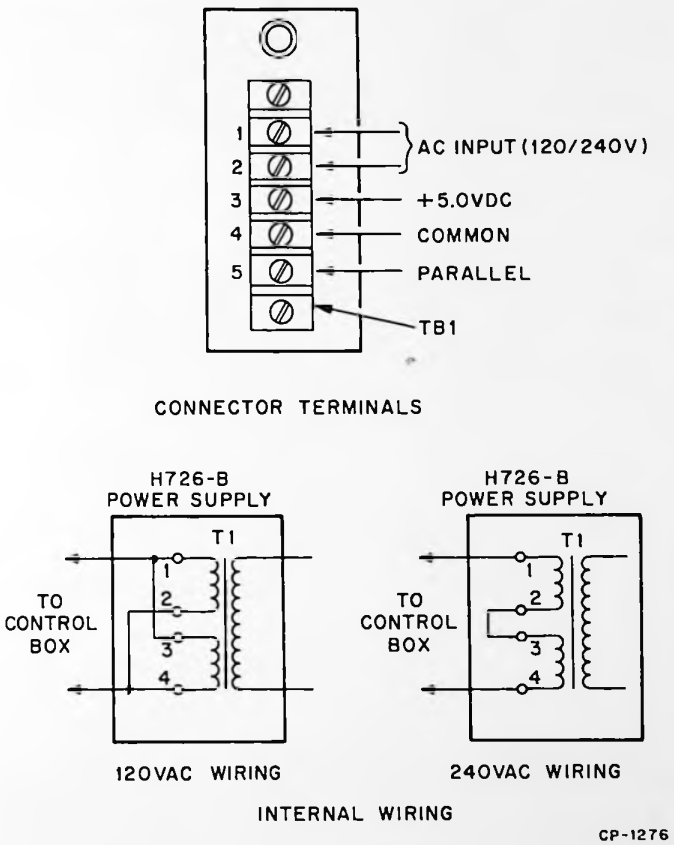
Power Connections

AC/DC Terminals: Both the ac input and dc output leads are connected to terminal board TB1 with spade lugs, as shown in the wiring diagram.

AC Wiring: The H726-B is supplied with internal connections for 115 Vac. The wiring and terminal identification diagram depicts the 240 Vac wiring configuration.



H726-B Mounting and Clearance Dimensions



H726-B 120 Vac/240 Vac Wiring and Terminal Identification

ANALOG POWER SUPPLIES

Analog power supplies are designed to provide ±15 Vdc for operational amplifiers and D/A and A/D converters used in analog systems. The power supplies described in this subsection are ideal for these applications because of their accuracy and regulation.

The following table summarizes the analog power supplies described in this subsection; individual descriptions follow the table.

Analog Power Supplies

Part No.	Input Specs	Output Specs	Dimensions	Features
H704-A	105–125 Vdc (47–420 Hz)	±15 Vdc outputs @ 400 mA, 0.1% regulation	7.75 X 4.0 X 3.81 in. (19.68 X 10.16 X 9.67 cm)	Two 15 V floating outputs Overload protection Remote sensing
H707	Same as H704-A	±15 Vdc outputs @ 1.5 A, 0.1% regulation	5.5 in. X 5.0 in. X 4.0 in. (13.97 X 12.70 X 10.16 cm)	Same as H704 plus fuse holder

Power Supply – H704-A

The H704-A Power Supply has two independent 15 Vdc outputs, both of which are isolated from each other and from the power supply chassis. The unit is primarily designed as an analog voltage source and is operated from 115 Vac, 60 Hz line input. Each 15 Vdc output supplies a maximum of 400 mA regulated load current. The separate common terminal provided at each supply output enables the 15 Vdc voltages to be connected in series as a 30 Vdc source. Each 15 Vdc output contains a series regulator circuit to reduce the output voltage in the event of an external overload or short circuit condition. A remote sensing circuit is incorporated in each output circuit and compensates for the voltage loss caused by the output leads.

The output voltages of the supply are also variable within ±1 Vdc by the adjustment of potentiometers. The input ac and output dc and sense connections are made by soldering the leads to an 11-pin socket attached to the right angle mounting bracket.

Electrical Specifications

Input Voltage
105 to 125 Vac (rms) at a frequency of 47–420 Hz

Output Voltage
Each output supplies 15 Vdc and is variable by ±1.0 Vdc.

Output Current
Each output provides a maximum of 1.5 A of current continuously.

Line/Load Regulation
0.05% at either output for complete range of input voltage, 0.1% at either output from no load to full load.

Ripple
1 mV (rms) at each output

Overload Protection
Activated by excessive current at either output. Outputs are restored to within specifications when excessive current condition is removed.

Remote Sensing
Compensates for up to 0.5 Vdc of load loss at either output

Operating Temperature
-20° to +71° C (ambient)

Power Connections

Input, output, and sense lead designations at 11-pin receptacle are shown in the following illustration.

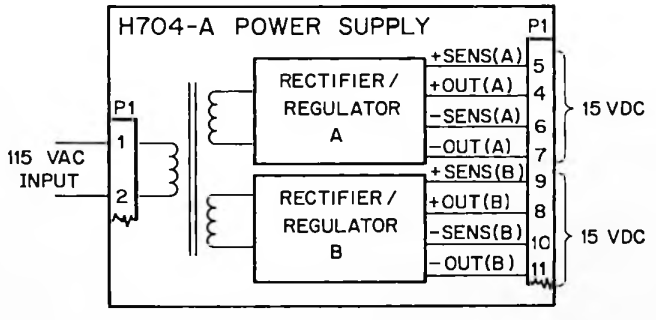
Output Applications

+15 Vdc and −15 Vdc: Typically used as supply for A/D or D/A conversion. The −SENS (A) and −OUT (A) connect at supply and terminate at load return. The +SENS (B) and +OUT (B) connect at supply and terminate at load return.

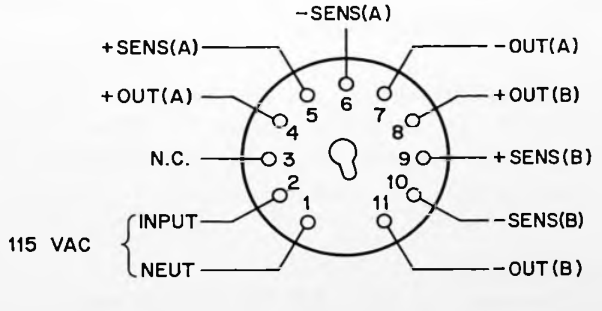
+30 Vdc: Typically used for special circuit application. The −SENS (A), −OUT (A), +SENS (B) and +OUT (B) connect at supply, resulting in series connected rectifier/regulator A and B. Polarity is changed (−30 Vdc) by reversing +OUT (A) and −OUT (B) and associated sense leads at load.

+15 Vdc Split Load: Typically used for level converters requiring extended load current capability. Connect rectifier/regulator A to load 1 and rectifier/regulator B to load 2 as shown on the applications diagram. The returns (RTN) connect at load.

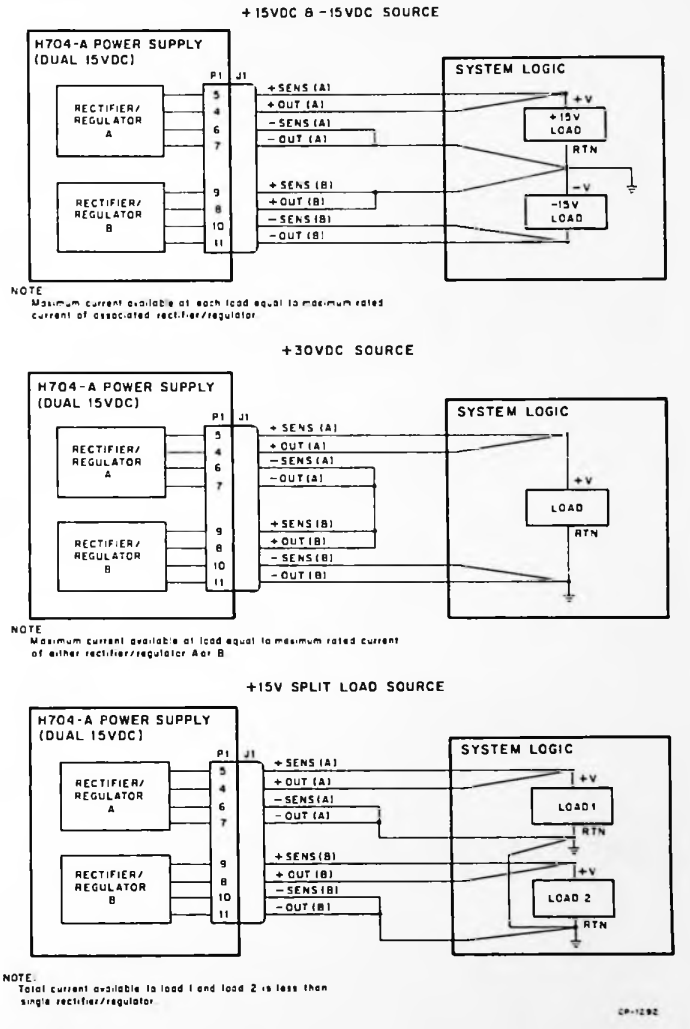
Sense Not Required: The remote sense function for any application can be disabled by connecting the OUT and associated SENS terminals at the supply.



CONNECTOR P1 TERMINALS DIAGRAM



H704-A Input/Output Connections



Typical H704-A Output Applications

Mechanical Specifications

Dimensions

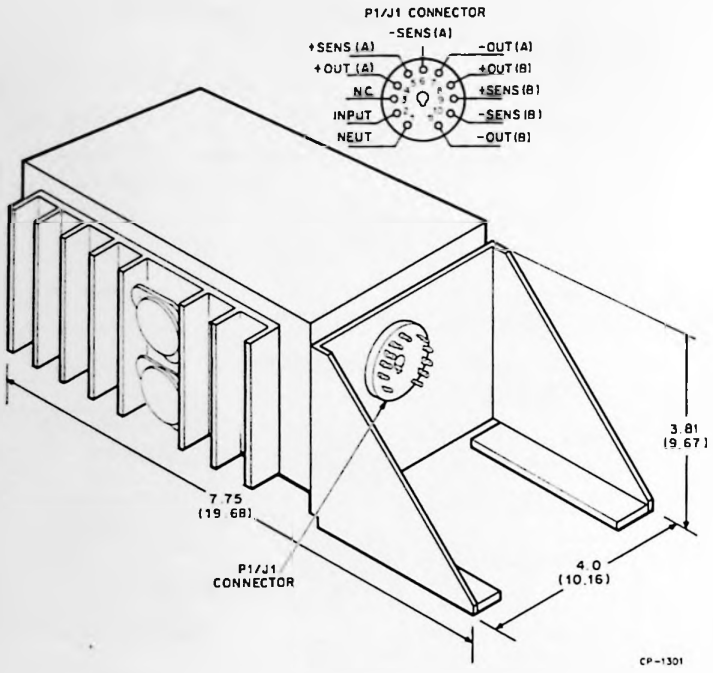
7.75 X 4.0 X 3.81 in. (19.68 X 10.16 X 9.67 cm)

Weight

5.0 lb (2.27 kg)

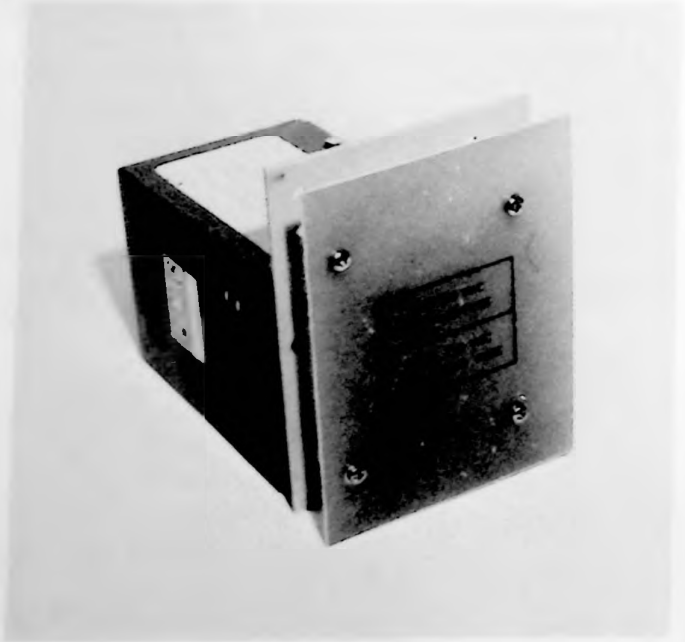
Mounting

Mounting information is given in the following illustration. All mounting hardware is supplied with the unit.



H704-A Mounting and Clearance Dimensions

Dual 15 Vdc Power Supply – H707



The H707 is a dual power supply that provides two independent 15 Vdc outputs, both of which are electrically isolated from each other and from chassis ground. The supply requires 115 Vac, 60 Hz (nominal) input and provides 1.5 A of regulated current from each output. Each output contains a series regulator circuit to decrease the voltage in the event of an external short circuit or excessive current condition. A remote sense circuit also adjusts the output voltage to compensate for the voltage loss at the load caused by the output leads.

The supply outputs can be connected separately as either positive or negative voltage sources or in series to form a 30 Vdc source. Each output voltage can be varied ±1.0 Vdc by setting an internal potentiometer. All input or output connections to the supply are made by soldering leads to an 11-pin receptacle mounted on a base plate. The main assembly of the supply plugs into the 11-pin receptacle and is mechanically attached to the base plate.

The H707 is designed for mounting on an H020 mounting bracket and occupies the space normally required by two connector blocks.

Electrical Specifications

Input Voltage
105 to 125 Vac (rms) at a frequency of 47–420 Hz

Output Voltage
Each output supplies 15 Vdc and is variable by ±1.0 Vdc.

Output Current
Each output provides a maximum of 1.5 A of current continuously.

Line/Load Regulation
0.05% at either output for complete range of input voltage, 0.1% at either output from no load to full load

Ripple
1 mV (rms) at each output

Overload Protection
Activates by excessive current at either output. Outputs are restored to within specifications when excessive current condition is removed.

Remote Sensing
Compensates for up to 0.5 Vdc of load loss at either output.

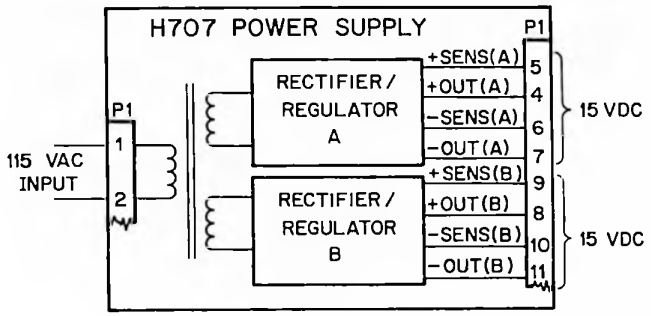
Operating Temperature
-20° to +71° C (ambient)

Power Connections

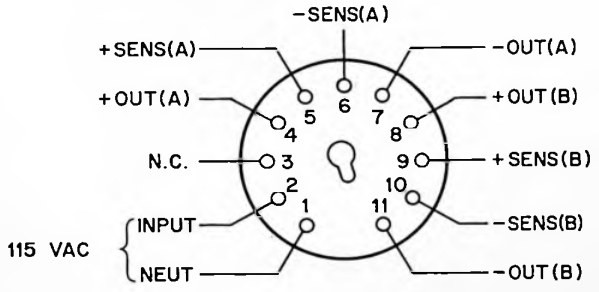
Input, output, and sense lead designations on the 11-pin receptacle are shown on the following diagram.

Output Applications

Same as for H704-A Dual Power Supply.



CONNECTOR P1 TERMINALS DIAGRAM



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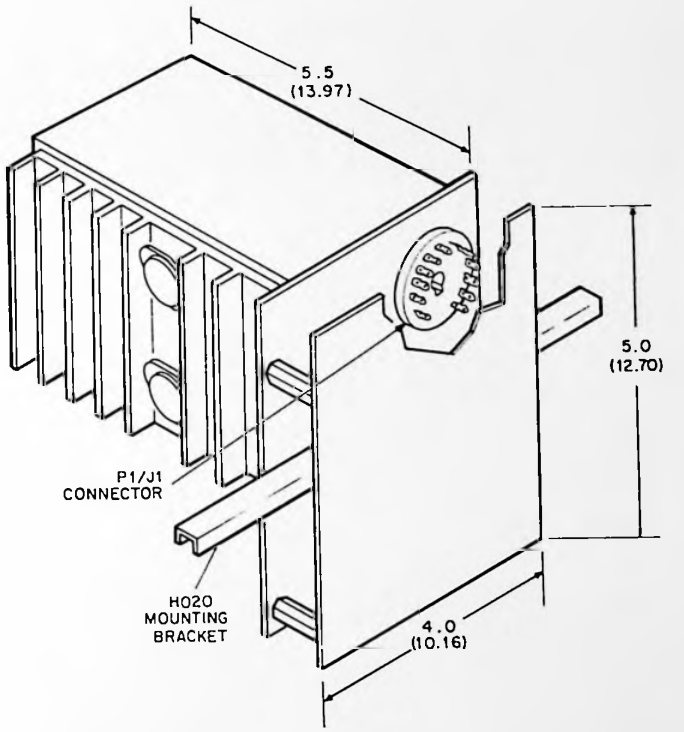
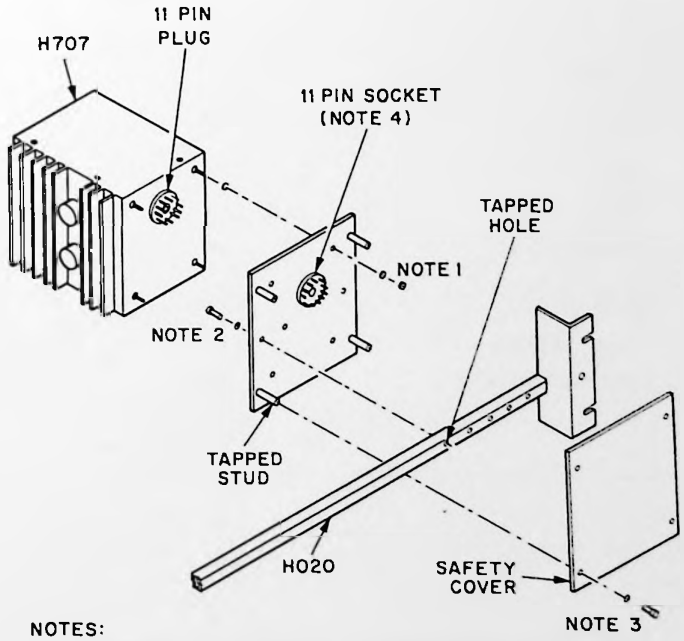
H707 Input/Output Connections



CP-1299

H707 Overall Dimensions



NOTES:

1. 6-32 nut and 2 ext. tooth lockwashers (4 places)
2. 8-32 x 3/4" Phillips fillister-head screw and lockwasher (3 places).
3. 6-32 x 3/8" slotted pan-head screw and lockwasher (4 places)
4. Unit may be mounted with socket above or below bar.
5. H707 occupies two H800-series connector block locations and may be mounted in other locations on H020.

CP-1280

H707 Mounting to H020 Bracket

Mechanical Specifications

Dimensions

Overall dimensions are shown in the following figure.

Weight

5 lb (2.27 kg)

Mounting

Mounting information is given in an illustration that follows. All mounting hardware is supplied with the unit.

SYSTEM POWER SUPPLIES

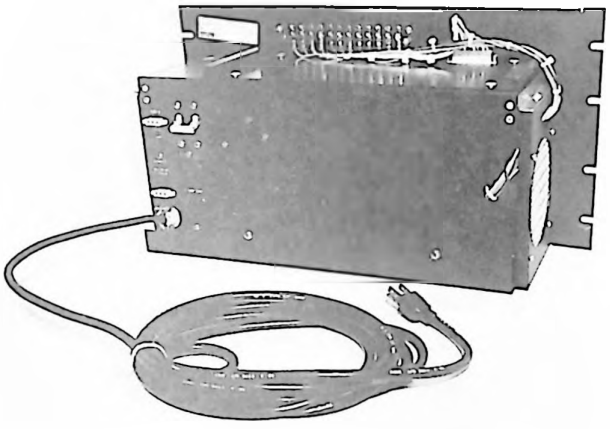
System power supplies are designed to provide V_{CC} (+5 Vdc) and reference voltages to an entire system or to a large interface when spare power is not available from the system supply. The power supplies described in this subsection are ideal for these applications because of their high current output capabilities and voltage output ranges.

The following table summarizes the system power supplies described in this subsection; individual descriptions follow the table.

System Power Supplies

Part No.	Input Specs	Output Specs	Features
H720-C 19-in. (48.26-cm) panel-mounted	120 Vac, 47–63 Hz	+5 V @ 22 A -15 V @ 10 A +8 V (avg) @ 1.5 A -25 V @ 1.5 A	AC frequency monitor AC or dc low voltage detection Overvoltage and overcurrent protection
H720-D (Same as H720-C)	240 Vac, 47–63 Hz	Same as H720-C	Same as H720-C
H720-E (BA11-C or BA11-E Mounting Box)	120 Vac, 47–63 Hz	+5 V @ 22 A -15 V @ 10 A +8 V (avg) @ 1.5 A -22 V @ 1.5 A	Input frequency monitor AC and dc low power detection Overvoltage and overcurrent protection
H720-F (Same as H720-E)	240 Vac 47–63 Hz	Same as H720-E	Same as H720-E
H721 19-in. (48.26-cm) panel-mounted	88–132 Vac/ 176–264 Vac, 47–63 Hz	+5 V @ 20 A -15.5 V @ 3.5 A +10.5 V @ 2.5 A	20 μs hold-up on dc outputs
H740-D 19-in. (48.26-cm) panel-mounted	115 Vac/230 Vac, 47–63 Hz	+5 V @ 17 A -15 V @ 5 A +15 V @ 1.0 A	AC frequency monitor AC and dc low voltage detection

System Power Supply – H720-C and H720-D



The H720-C and H720-D are 19-in. (48.26-cm) panel-mounted power supplies that provide +5 Vdc, -15 Vdc, +8 V (avg), and -25 Vdc outputs. These supplies can be mounted on the front or rear of a standard cabinet when additional power is required for peripheral logic. The H720-C is operated from 120 Vac, 60 Hz input, and the H720-D from 240 Vac, 60 Hz input. Each power supply has a regulated output of +5 Vdc at 22 A, -15 Vdc at 10 A, and -25 Vdc at 1.5 A. In addition, a full wave, unfiltered output of +8 V (avg) at 1.5 A is also available. The H720-C and H720-D contain a power control assembly to allow the ac input to the supplies to be controlled by a switch on the supply or by a switch mounted at a remote location. The power control also permits the ac power to be applied and removed by remote interlock switches.

The supplies generate three output signals to enable the input ac and output dc to be monitored: a Line Time Clock (LTC) square wave signal, which indicates the ac frequency, an AC LO level to specify when the input ac voltage is below a critical value, and a DC LO level, which is produced when the regulated output voltage is below a required value. In the PDP-11 systems, these signals are applied to the Unibus to prevent the loss of data in the event of a power malfunction.

A blower assembly is incorporated on each side of the supply to prevent overheating. The power control assembly panel consists of a dual 115 Vac or 230 Vac receptacle, a REMOTE/LOCAL switch, and a circuit breaker.

Two 3-pin connectors (J1 and J2) are mounted on the power supply to enable the interlock function to control the supply operation. Each of the supplies includes associated plugs (P2 and P3) for the 3-pin connectors; an ac line cord is attached.

Electrical Specifications

Input Voltage/Current

H720-C: 120 Vac ±10%, 6 A, at a frequency of 47–63 Hz.

H720-D: 240 Vac ±10%, 3 A, at a frequency of 47–63 Hz.

Output Voltage/Current

+5 Vdc at 22 A, -15 Vdc at 10.0 A, +8 V (avg) at 1.5 A, and -25 Vdc at 1.5 A. All listed voltages are nominal. No internal voltage adjustments are included. +8 V (avg) at 1.5 A is full wave rectified and unfiltered.

Output Voltage

+5 Vdc, -15 Vdc, +8 V (avg), -25 Vdc (nominal). No internal output voltage adjustments are provided. The +5 Vdc and -15 Vdc outputs are interlocked so that the +5 Vdc output is available prior to the -15 Vdc after ac power is applied. The -15 Vdc output will become 0 V if the +5 Vdc fails.

Line/Load Regulation

+5 Vdc ± 5%, -15 Vdc ± 3%, -22 V ± 20%, for complete range of input voltage and output current combined.

Overload Protection

-15 Vdc actuates from 12 to 16 A. Short circuit current 25 A at 0 V.

Overvoltage Protection

+5 Vdc limited to 6.3 Vdc; -15 Vdc limited to unregulated -22 Vdc.

Monitor Signals

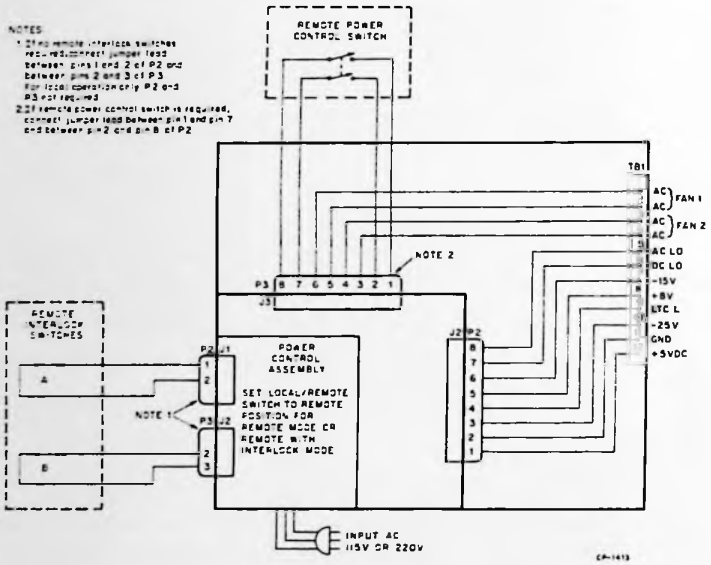
LTC: line frequency sine-wave signal clipped at +5 Vdc and ground.

AC LO: low logic level indicates low ac input voltage.

DC LO: low logic level indicates less positive +5 Vdc output voltage or more positive -15 Vdc output.

Mode Control Selection

The H720-C and H720-D can be operated in local mode, remote mode, and remote mode with interlock switch connections. The units are supplied with the connector plugs wired for local mode operation. Interconnection data for remote mode is given in the following figure.



H720-C and H720-D Mode Selection Wiring

Mechanical Specifications

Dimensions

Clearance and mounting dimensions are given in the following figure.

Weight

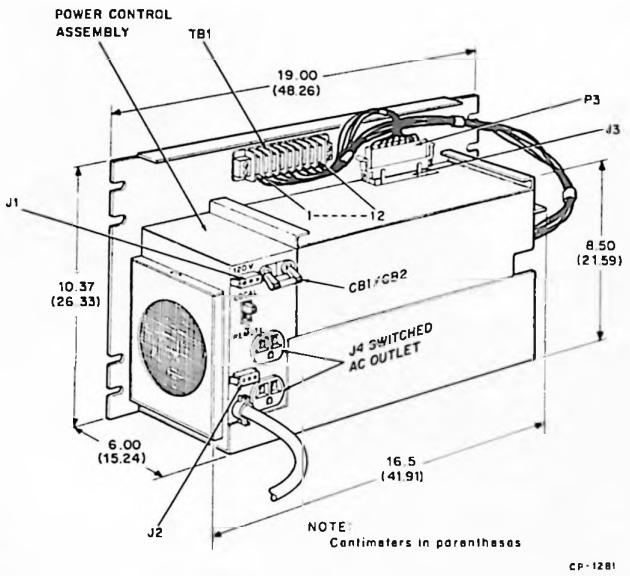
30 lb (13.62 kg)

Mounting

The H720-C and H720-D can be mounted at the front or rear of any cabinet which accepts 19-in. (48.26-cm) panels.

Power Connections

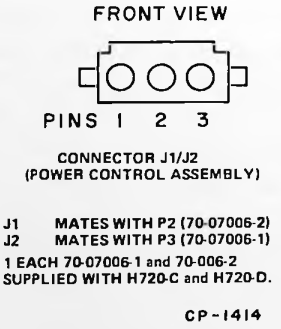
Input ac is supplied to the H720-C and H720-D by an integral cord and connector. A switched ac receptacle on the power control assembly provides up to 5 A of output current on the H720-C and 2 A on the H720-D.



H720-C and H720-D Dimensions and Connector Designations

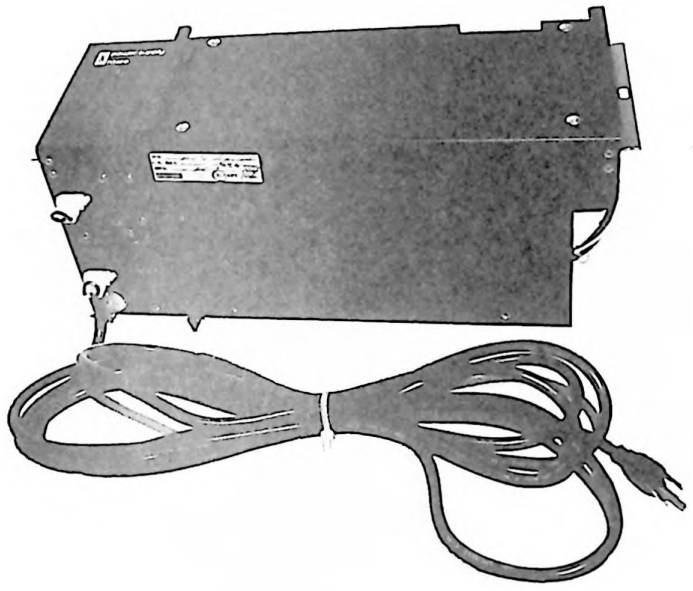
Mode Select Connections

The H720-C and H720-D can be operated in local mode, remote switch mode, and remote switch mode with interlock. (Refer to the connector pin assignment diagram.)



H720-C and H720-D Connector Pin Assignments

System Power Supply – H720-E and H720-F



The H720-E and H720-F Power Supplies are designed for installation in a BA11-ES Expander Box of a PDP-11 system. The supplies provide regulated output voltages of +5 Vdc and -15 Vdc, and unregulated output voltage of -22 Vdc. A full wave, unregulated, and unfiltered output of +8 V (avg) is also available. The H720-E is operated from 120 Vac, 60 Hz (nominal) line power, and the H720-F is operated from 240 Vac, 60 Hz (nominal) line power. Each contains a power control assembly to allow the ac input to the supply to be switched by the circuit breaker on the supply or by a power switch mounted at a remote location. The power control also enables the ac power to be applied or removed by remote interlock switches.

The -5 Vdc output provides an output current of 22 A and the -15 Vdc output supplies a current of 10 A. Both the +8 V (avg) and the -22 Vdc outputs are rated at 1.5 A.

Three output signals are available to monitor the frequency and voltage of the input ac and the +5 Vdc and -15 Vdc regulated outputs: the Line Time Clock (LTC) signal is a square wave output at a frequency equal to the input ac frequency. The AC LO output becomes a low level when the input ac voltage is below a critical value. The DC LO output becomes a low level when either the +5 Vdc or -15 Vdc are below the required levels. These signals are used in the PDP-11 system to prevent the loss of data in the event of a power malfunction.

When mounted in the BA11-ES Expander Box, the H720-E or H720-F is cooled by fans in the BA11-ES unit. A panel on the power control assembly of the supply contains a REMOTE/LOCAL switch to select the operating mode, two 3-pin connectors for the interlock function, and a circuit breaker. A switched, dual 115 Vac receptacle is also mounted on the panel for use with test equipment or other ac requirements. The ac power to the supply is provided by an attached cord and plug. All connections to the dc output power and voltage monitor signals are made through an eight-pin connector.

Electrical Specifications

Input Voltage

H720-E: 120 Vac ± 10%, 6 A, at a frequency of 47–63 Hz.

H720-F: 240 Vac ± 10%, 3 A, at a frequency of 47–63 Hz.

Input Current

6.0 A for power supply and 5.0 A additional for ac receptacle on the power control assembly

Output Voltage/Current

Regulated: +5 Vdc at 22 A and -15 Vdc at 10 A

Unregulated: -22 Vdc at 1 A and +8 V at 1.5 A full wave regulated, unfiltered.

The +5 Vdc output is adjustable from +4.7 Vdc to +5.4 Vdc by an internal potentiometer. The remaining output voltages are non-adjustable.

Line/Load Regulation

+5 Vdc ± 5%, -15 Vdc ± 3%, -22 Vdc ± 20%, for specified range of input voltages and output currents

Interlocked Voltages

The +5 Vdc and the -15 Vdc outputs are interlocked so that when ac power is initially applied, the +5 Vdc is available prior to the -15 Vdc. The -15 Vdc output becomes 0 V in the event of a +5 Vdc failure.

Overload Protection

-15 Vdc actuates at 12 to 16 A. Short circuit current is 25 A at 0 V. +5 Vdc actuates at 18 to 22 A. Short circuit current is 30 A at 0 Vdc.

Overvoltage Protection

+5 Vdc limited to 6.3 Vdc; -15 Vdc limited to -22 Vdc of unregulated voltage

Monitor Signals

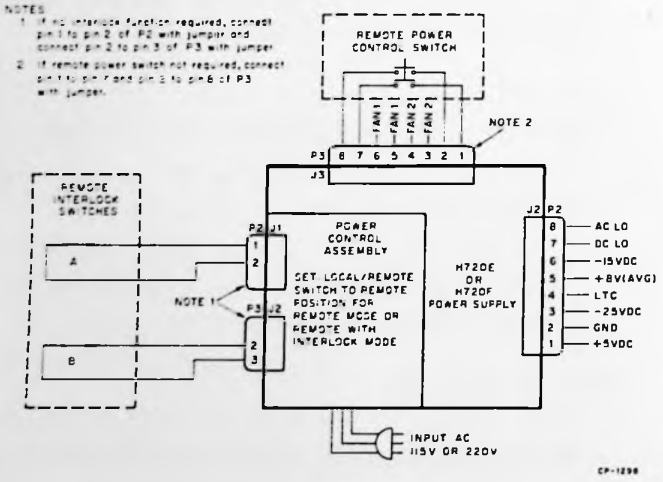
LTC: Line frequency signal, sine wave clipped at +5 V and ground.

AC LO: Low dc voltage signal indicates ac below preset minimum value.

DC LO: Low dc voltage signal indicates +5 Vdc or -15 Vdc is below preset minimum value. DC LO level becomes high before the AC LO level becomes high on power up. DC LO level remains high for 7 ms after AC LO becomes low when power is removed.

Mode Control Selection

The H720-E and H720-F can be operated in local mode, remote mode, or remote mode with interlock switch connections. The units are supplied with two connector plugs (P2 and P3) on the power control assembly wired for local mode operation. Refer to the wiring diagram for the external connections required for the various selectable operating modes.



H720-E and H720-F Mode Select Wiring

Mechanical Specifications

Dimensions

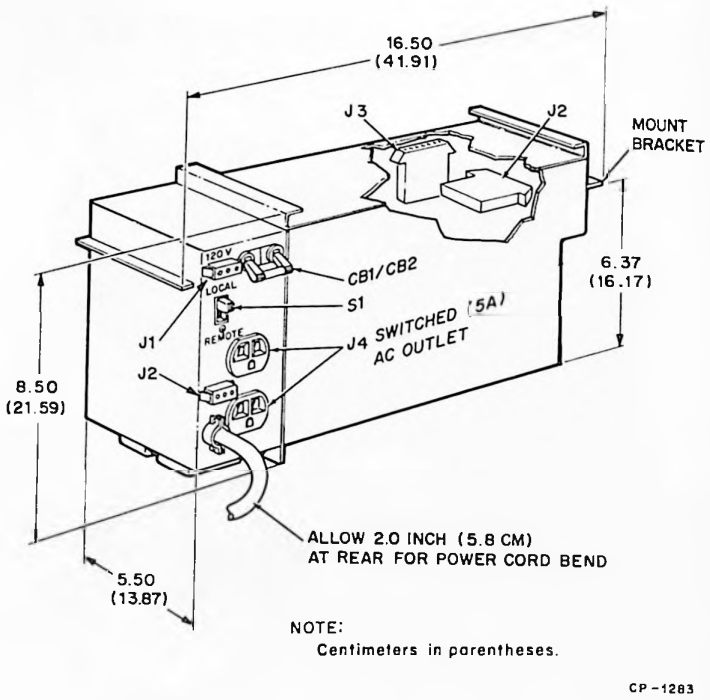
Clearance and mounting dimensions are given in the following figure.

Weight

30 lb (13.62 kg)

Mounting

The H720-E and H720-F are designed for mounting in the BA11-ES Expander Box.



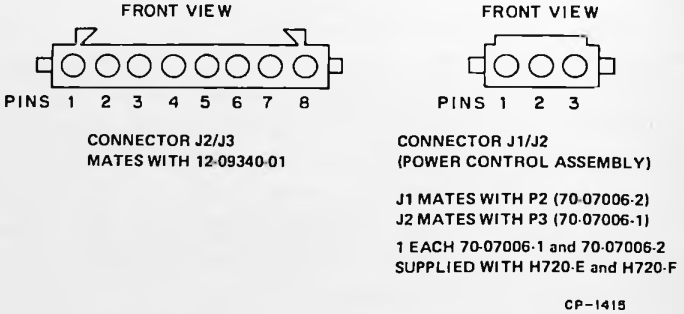
H720-E and H720-F Dimensions and Connector Designations

Power Connections

The input ac voltage is supplied to the H720-E and H720-F by an attached cord and ac connector. The switched, dual ac receptacle on the power control assembly provides 5 A of output current on the H720-E and 2 A on the H720-F supply.

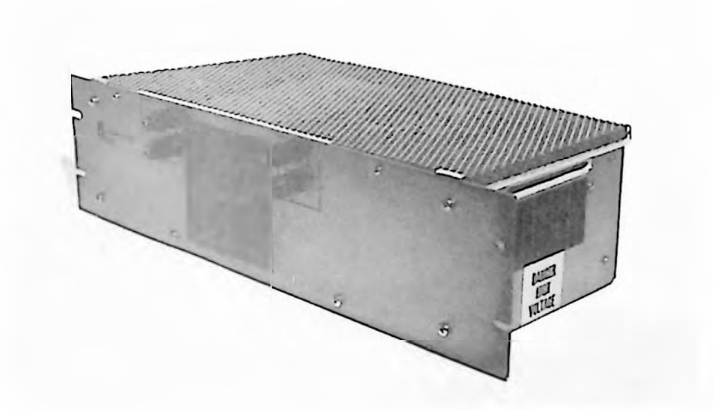
Mode Select Connections

The H720-E and H720-F can be operated in local mode, remote mode, or remote mode with interlock. Refer to the wiring diagram and connector pin assignment diagram.



Connector Pin Assignments

System Supply – H721



The H721 Power Supply is mounted on a 19-in. (48.26-cm) panel and provides three separate regulated voltages for the expansion of system logic. The supply operates from either 110 Vac or 220 Vac line voltage and provides +10.5 Vdc at 2.5 A, −15.5 Vdc at 3.5 A, and +5 Vdc at 20 A. An unregulated 11.5 Vdc (+5 BULK) output is also provided. The regulated +5 Vdc contains an overvoltage circuit to prevent the output from exceeding a preset value. Each output voltage, except the +5 V BULK output, can be varied by adjusting potentiometers internal to the supply.

The H721 contains a fuse for the input ac line and a fuse for each of the three regulated outputs to prevent damage to the supply caused by an overload condition. A terminal board supplies ac voltage to external devices when required, and also provides contacts to a thermo-switch, which can be connected to the input ac to prevent overheating of the supply. The unit is cooled by a blower fan, mounted at the rear, which connects directly to the ac input.

No internal switching of the ac or dc voltages is provided and the dc outputs are available from a 12-pin female connector at the rear of the unit. The associated male connector is not provided with the unit.

All connections to the terminal board are made using Faston receptacles, series 250 or equivalent.

Electrical Specifications

Input AC Voltage

88–132 Vac or 176–264 Vac, at a frequency of 47 to 63 Hz. Input is fused for 12 A at 110 Vac and 6 A at 220 Vac. Unless otherwise specified by the user, the unit is shipped wired for 110 Vac operation.

Output AC Voltage

Two sets of output ac terminals are available, each rated for 2 A at 110 Vac and 1 A at 220 Vac.

Output DC Voltages

+5 Vdc (variable 4.7 to 5.3 Vdc) at 0–20 A; +10.5 Vdc (fixed) at 0–2.5 A; −15.5 V (fixed) at 0–3.5 A. The +5 Vdc BULK output is 11.5 Vdc (min) from 0 to 50 mA.

Output Regulation

±2% at nominal setting of +5.1 Vdc; ±10% of nominal setting of +10.5 Vdc and −15 Vdc. Regulation maintained for specified range of input voltage, output current, ripple and noise, and temperature range.

Ripple and Noise

20 mV peak-to-peak (max) on +5 Vdc, and 500 mV (max) peak-to-peak on +10.5 Vdc and −15.5 Vdc outputs.

Load Protection

Overvoltage circuit activates on the +5.1 Vdc output when voltage exceeds 6.5 Vdc for more than 5 μs, and overload circuit is normally set to activate when the output current exceeds 25 A.

Hold-Up Time

The +5.1 Vdc output level is sustained for 20 ms after power failure. The +10.5 Vdc and −15 Vdc output levels each decrease no more then +1 Vdc for 20 ms after power failure.

Transient Current

Output current transient of 8 A at 5.1 Vdc output will appear as 0.5 V (max) pulse with 50 μs (max) width.

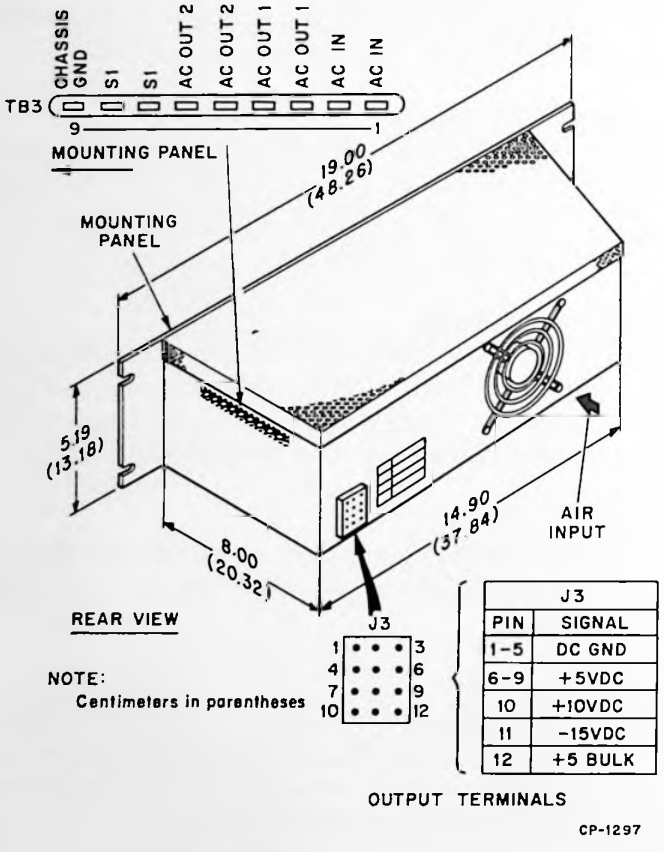
Ambient Temperature

0° to 70° C.

Mechanical Specifications

Dimensions

Clearance and mounting dimensions are given in the following figure.



J3	
PIN	SIGNAL
1-5	DC GND
6-9	+5VDC
10	+10VDC
11	-15VDC
12	+5 BULK

H721 Input/Output Terminals and Dimensions

Weight

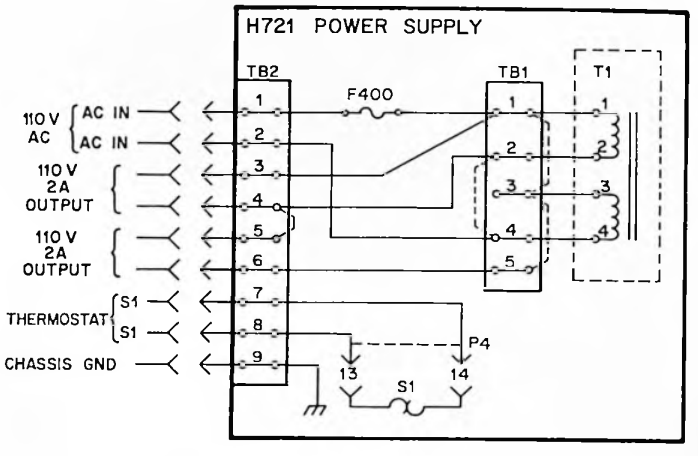
39 lb (17.76 kg)

Mounting

The H721 can be mounted in any standard rack or cabinet that accepts 19-in. (48.26-cm) mounting panels.

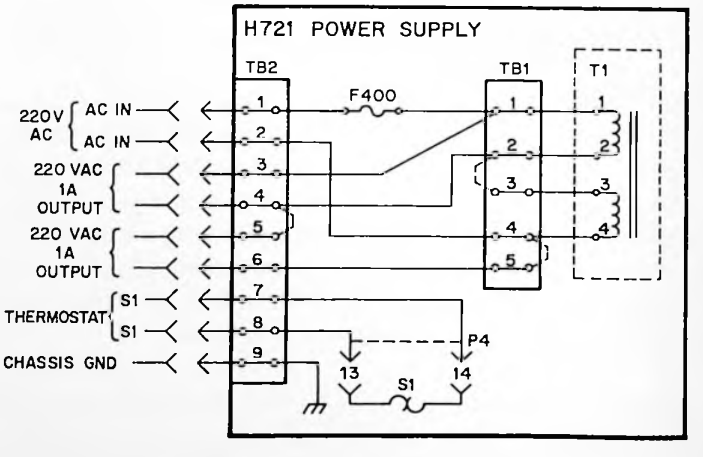
Power Connections

Terminal board TB3 (ac power) requires Faston receptacles, series 250 or equivalent. Connector J3 (dc power) mates with male plug DEC No. 12-09351-12. Plug 12-09351-12 is not supplied with the H721; it must be ordered separately. This plug is described in Section 4. Refer to the wiring configuration diagram for either 110 Vac or 220 Vac operation.



NOTE:
Install jumpers shown by dotted lines.

110 VAC INPUT CONNECTION



NOTE:
Install jumpers shown by dotted lines.

220 VAC INPUT CONNECTION

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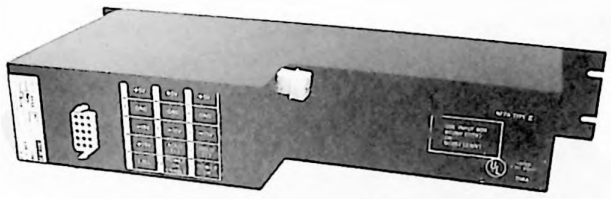
H721 AC Input Wiring

System Power Supply – H740-D



The H740-D Power Supply has +5 Vdc, −15 Vdc, and +15 Vdc outputs and can be used to provide additional power for system expansion logic. The supply consists of a 19-in. (48.26-cm) mounting panel and attached chassis to facilitate installation in a standard rack or cabinet. A fan is also included to cool the unit during operation.

The H740-D operates from either 115 Vac or 230 Vac and has regulated outputs of +5 Vdc at 17 A, −15 Vdc at 5 A, and +15 Vdc at 1.0 A. An AC LO and DC LO logic level output is available at the output to inform the system that a low voltage condition exists. A Line Time Clock (LTC) signal is also provided as an output to indicate the frequency of the ac input.

The +5 Vdc, −15 Vdc, and +15 Vdc outputs are protected against excessive load current conditions by a series regulator circuit. The +5 Vdc and −15 Vdc outputs are also protected from excessive output voltage by an overvoltage circuit.

The power supply is equipped with an ac line cord and plug and an output connector for distributing the dc voltages and sense signals. The input ac is protected by a circuit breaker with a reset pushbutton. A fuse on the regulator board also protects the supply from damage caused by excessive circuit drain at any of the three dc outputs. No internal power switching is provided. When ordering the H740-D, the input ac voltage requirements must be specified.

Electrical Specifications

Input Voltage
115 Vac ± 10% or 230 Vac ± 10% at a frequency of 47 to 63 Hz

Output Voltage/Current
+5 Vdc at 0–17 A, +15 Vdc at 0–1 A, and −15 Vdc at 5 A

Output Voltage Adjust
Potentiometer adjustable +5 Vdc from +4.75 to +5.25 Vdc; +15.1 Vdc from +14.25 to +15.1 Vdc; −15 Vdc from −14.25 to −15.75 Vdc.

Line/Load Regulation
+5.1 Vdc output from +5.0 to +5.3 Vdc; +15.1 Vdc output from +14.85 to +15.15 Vdc; −15.0 Vdc output from −14.85 to −15.15 Vdc. Combined regulation for specified range of input voltage and output load.

Ripple
For +5.1 Vdc, less than 200 mV peak-to-peak; for +15.1 Vdc, less than 450 mV peak-to-peak; and for −15.1 Vdc, less than 450 mV peak-to-peak. Ripple measured at specified range of specified load current.

Overload Protection
+5 Vdc activates at 22 to 30 A, +15 Vdc activates at 1.1 to 1.7 A, and −15 Vdc activates at 5.5 to 8.0 A.

Overvoltage Protection
+5 Vdc activates at +5.7 Vdc and −15 Vdc activates at −18 Vdc.

Voltage Sense
AC LO: Logic level output of 0 to 0.5 Vdc for low ac input voltage and 3.5 to 5.5 Vdc for acceptable ac input voltage.

DC LO: Logic level output of 0 to 0.5 Vdc for low dc output voltages and 3.5 to 5.5 Vdc for acceptable dc output voltages.

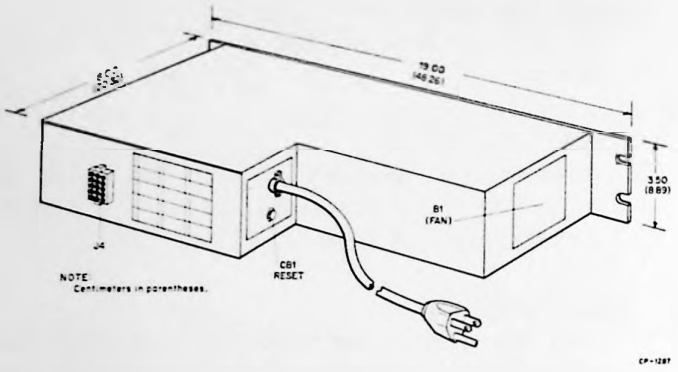
Line Frequency Sense
LTC: Square wave output varying between 0 to 1 Vdc and 3.5 to 5.5 Vdc at line frequency.

Operating Temperature
0° to 70° C (ambient)

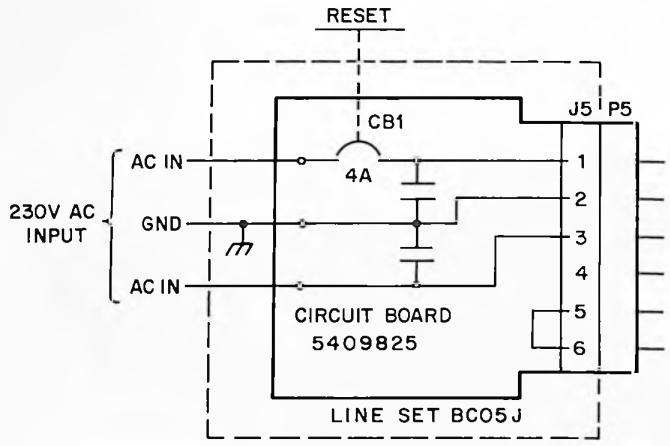
Mechanical Specifications

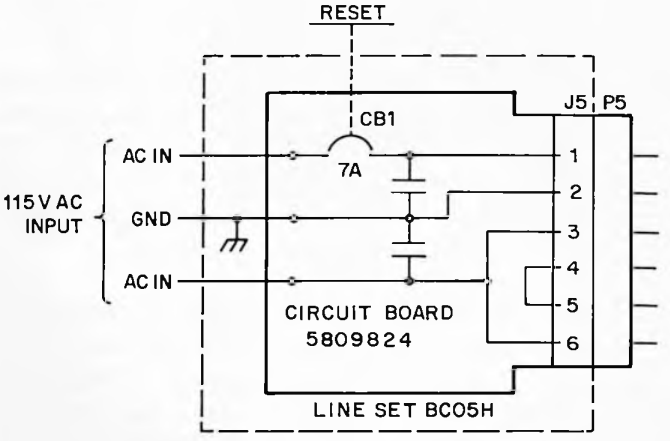
Dimensions
Mounting and clearance dimensions are given in the following illustration.

Weight
38 lb (17.3 kg)



H740-D Connectors, Controls, and Dimensions





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AC Input Wiring

Mounting

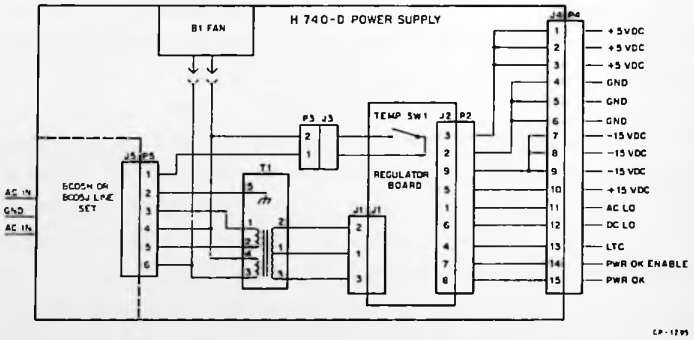
Allow adequate space for air circulation to fan. The H740-D can be mounted in any standard 19-in. (48.26-cm) rack or cabinet.

AC Wiring

Refer to the ac input wiring diagram for the type of line set required. Line sets BC05J and BC05H are described in this section under "Power Supply Accessories."

DC Wiring

The dc outputs and voltage sense signals are supplied from 15-pin receptacle J4. J4 mates with male plug DEC No. 12-09351-15. Plug 12-09351-15 is not supplied with the H740-D; it must be ordered separately. This plug is described in Section 4. Refer to the wiring terminal diagram for the output connector wiring.



H740-D Input/Output Wiring Terminals

POWER CONTROLLER AND STEP-DOWN TRANSFORMER

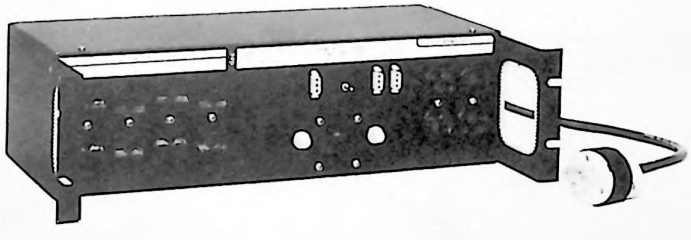
A power controller and a power transformer are described in this subsection. The power controller is ideal for distributing ac power within a system; the power transformer is ideal for stepping down commercial power to 115 Vac for use within a system.

The following table summarizes the items described in this subsection; individual descriptions follow the table.

Power Controllers and Step-Down Transformer

Part No.	Input Specs	Output Specs	Features
861-A	90–130 Vac, 2 phase, 16 A/pole	90–130 Vac at 12 A (each ac outlet)	Local or remote control Four switched, dual receptacles
861-B	180–270 Vac, single phase, 16 A/pole	180–270 Vac at 12 A (each ac outlet)	Two unswitched, dual receptacles
861-C	90–130 Vac, single phase, 24 A/pole	90–130 Vac at 12 A (each ac outlet)	19-in. (48.26-cm) mounting-rail mounted
H722	115, 189, 200, 217, 230, 245 Vac	115 Vac at 4.0 A	19-in. (48.26-cm) panel-mounted

Power Controller – 861-A, 861-B, 861-C



The 861-A, -B, and -C Power Controllers are used to control and distribute ac voltage to power supplies, fans, and other electrical devices that require ac inputs within a system. The power controllers permit the ac voltages to the devices to be controlled by local or remote switches. The 861-A operates from a 4-wire, 16 A, 125/250 V, two phase input; the 861-B operates from a 3-wire, 16 A, 250 V single phase input; and the 861-C operates from a 3-wire, 24 A, 115 V single phase input. The controller connects to an ac source through an attached plug and cable. The controller distributes the ac voltage to the devices from switched and unswitched ac receptacles on the controller.

Power to the switched outlets is controlled by the contacts of an internal relay, which is activated and deactivated by switches and control signals. A switch on the controller permits selection of either local or remote control. In the local or remote mode, a thermal-sensitive switch on the controller or an emergency shutdown signal will disconnect the ac from the switched ac receptacles.

The power controllers can be installed in any electronics cabinet or rack equipped with 19-in. (48.26-cm) mounting rails drilled at standard EIA spacings. The 861-A, -B, and -C Power Controllers meet all provisions of Underwriters Laboratories' Specification UL-478.

Electrical Specifications

Input Power

861-A: 90–130/180–270 Vac, two phase displaced either 120 or 180 degrees at a current rating of 16 A/pole

861-B: 180–270 Vac, single phase at a current rating of 16 A/pole

861-C: 90–135 Vac, single phase at a current rating of 24 A/pole.

Power Requirements

861-A, -B: 3830 VA full load, 10 VA no load

861-C: 2870 VA full load, 10 VA no load

Input Current Capability

240 A peak, 1 cycle

Input Overvoltage Transient

180/360 V, 1 second (power controller alone)

Activate to Deactivate Time

20 ms (from switch closing to power out)

10 ms (from switch opening to power out)

Input Breaker

20 A delayed action, manual reset, magnetic

Thermo-switch

Opens at 160° F (71° C) automatically resets at 120° F (49° C) (exposed to ambient air external to controller)

Input Signal Current Levels

0.5 mA (min), 10 mA (max) load worst case to each bus signal line when connected to pin 3

Input Signal Voltage Levels

Open circuit = high; +3.0 V max = low; +35 V min = high. Worst case to each bus signal line in relation to pin 3.

Bus Signal Line Overload Capability

125 Vac rms at 60 Hz, 13K ohms impedance in relation to pin 3 for 2 seconds with no damage

Power Control Impedance

Inductive (diode suppressed)

Capacitance

200 pF (max)

Hipot

2.1 kVdc for 60 seconds (input and output to chassis)

Outlet Current Ratings

861-A: 12 A per outlet, 16 A per branch circuit, 32 A total

861-B: 12 A per outlet, 16 A total

861-C: 12 A per outlet, 16 A per branch circuit, 24 A total

Outlet Inrush Current

861-A: 240 A peak per branch circuit (1 cycle), 480 A peak total (1 cycle)

861-B: 240 A peak total (1 cycle)

861-C: 240 A peak per branch circuit (1 cycle), 360 A peak total (1 cycle)

Mechanical Specifications

Dimensions

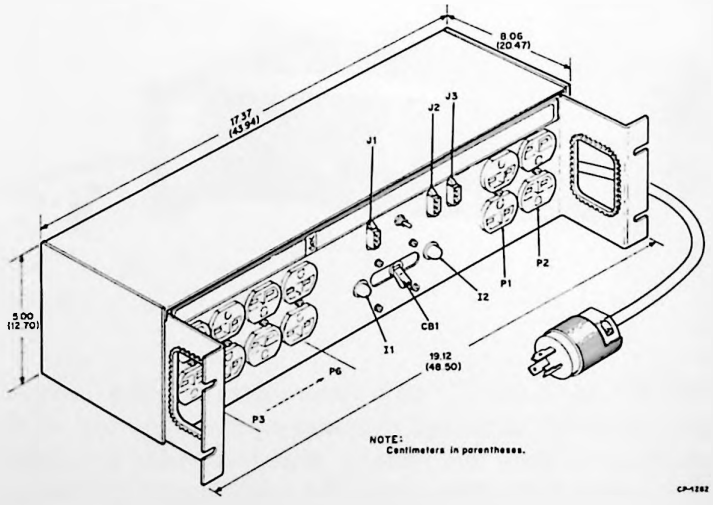
Mounting and clearance dimensions are given in the following illustration.

Weight

10 lb (4.54 kg)

Mounting

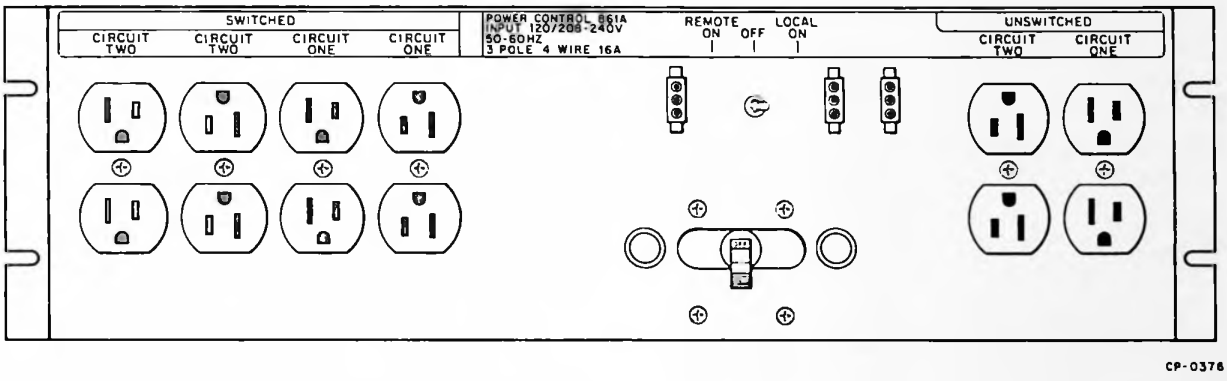
Attaches to standard 19-in. (48.26-cm) rack or cabinet.



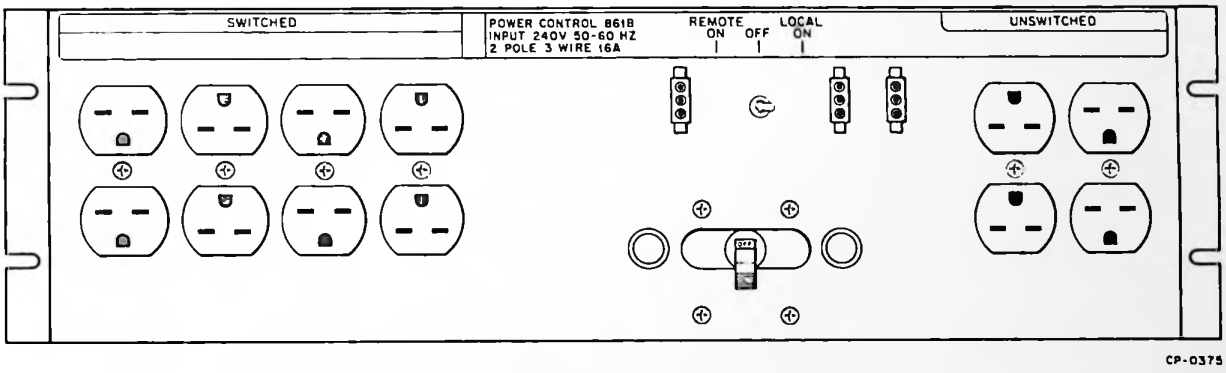
861-A Typical Mounting and Clearance Dimensions

Panel Configuration

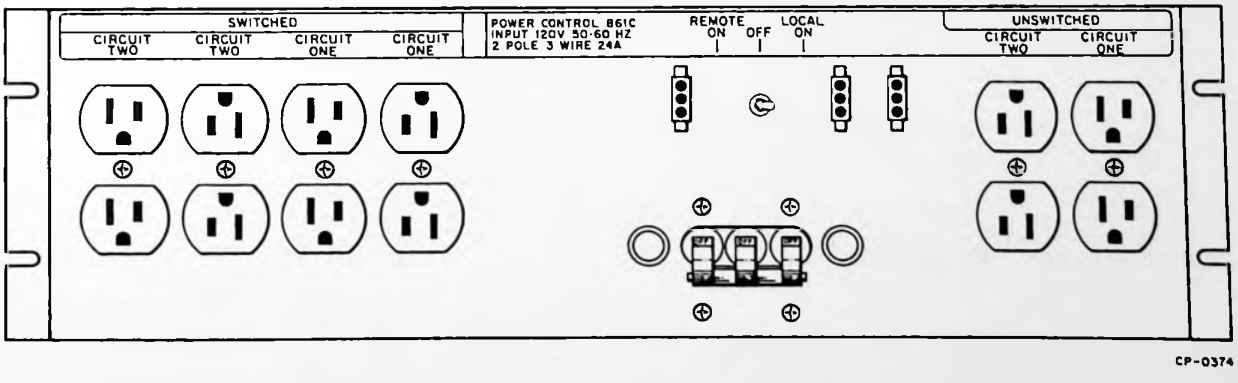
The type 861 Power Controller panels are shown in the figure below



861-A



861-B



861-C

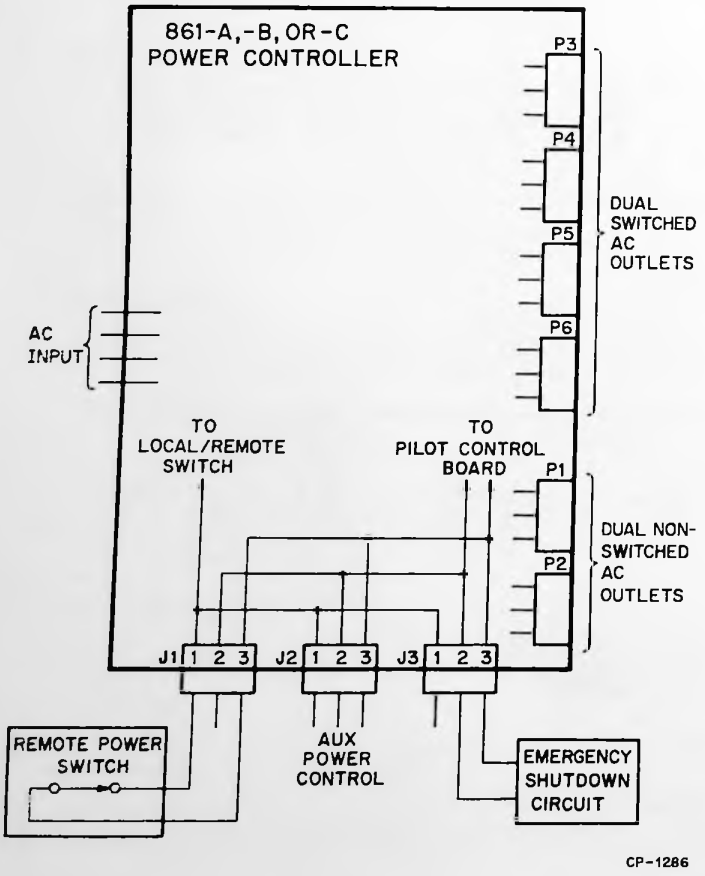
Type 861 Power Controller Panels

Power/Control Connections

Input AC: Plug and receptacle wiring configurations are shown in the power control connections diagram. The following chart lists the plug and receptacle part numbers. The appropriate receptacle is not supplied with the controller; it must be ordered separately. These receptacles are described in this section under "Power Supply Accessories."

Input Power Cable Connectors

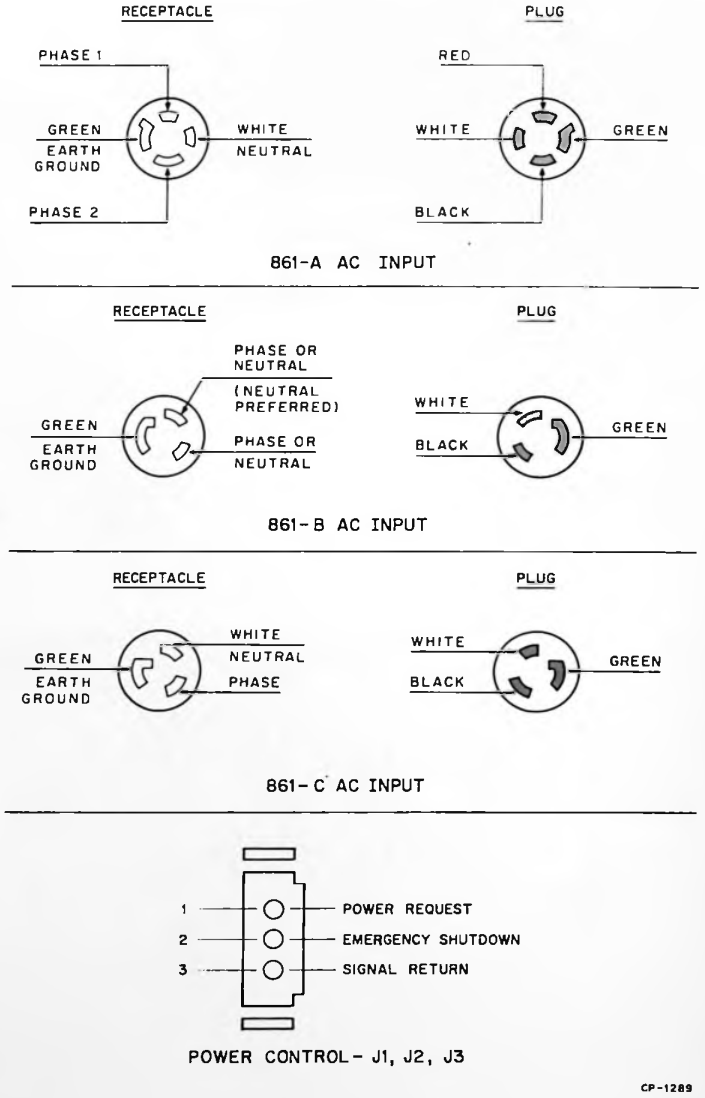
Controller	Description	NEMA Type	DEC Part No.
861-A	Four-Prong Twist Plug	L14-20P	12-11045
	Four-Prong Twist Receptacle	L14-20R	12-11046
861-B	Three-Prong Twist Plug	L6-20P	12-11192
	Three-Prong Twist Receptacle	L6-20R	12-11191
861-C	Three-Prong Twist Plug	L5-30P	12-11193
	Three-Prong Twist Receptacle	L5-30R	12-11194



Typical Power Control Connections

Output AC: Refer to the panel diagram and connector diagram for the type of ac output receptacle used on each type 861 Power Controller.

Remote Control: Refer to the connector diagrams for connector pin configurations of receptacles J1, J2, and J3. J1, J2, and J3 mate with male plugs DEC No. 12-09351-03. Plug 12-09351-03 is not supplied with the controller; it must be ordered separately. This plug is described in Section 4.



Type 861 Power and Control Connections

Step-Down Transformer – H722

The H722 consists of a step-down power transformer mounted on a 19-in. (48.26-cm) panel. The H722 is used to step down or isolate the input ac voltage of the line from the system equipment. The transformer has two separate windings at the input, one of which contains a tapped connection. The output is a single winding with two tapped connections. All input and output connections to the transformer are facilitated by a terminal board mounted to the panel.

The panel can be installed in any electronics rack or cabinet that is equipped with 19-in. (48.26-cm) mounting rails drilled at standard EIA spacings. It occupies 5.19 in. (13.18 cm) of vertical space.

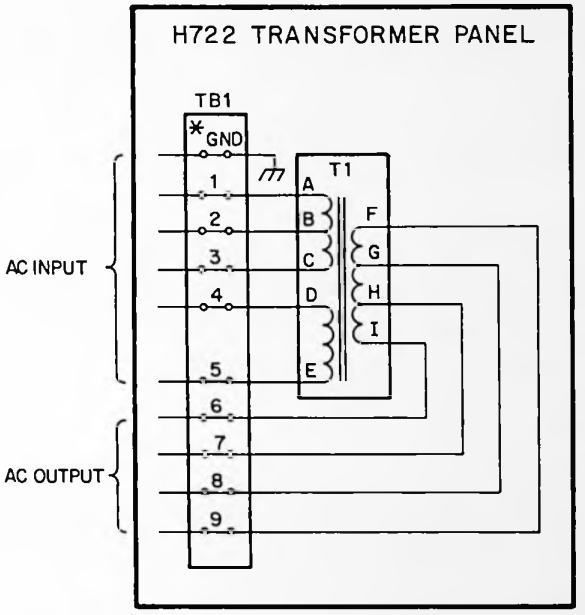
Electrical Specifications

Input/Output Voltage

Refer to the following table and wiring diagram for input/output ac voltage selections. Input frequency rating is 50 or 60 Hz.

Output Current

4.0 A (max)



H722 Internal Wiring

H722 Transformer Connections

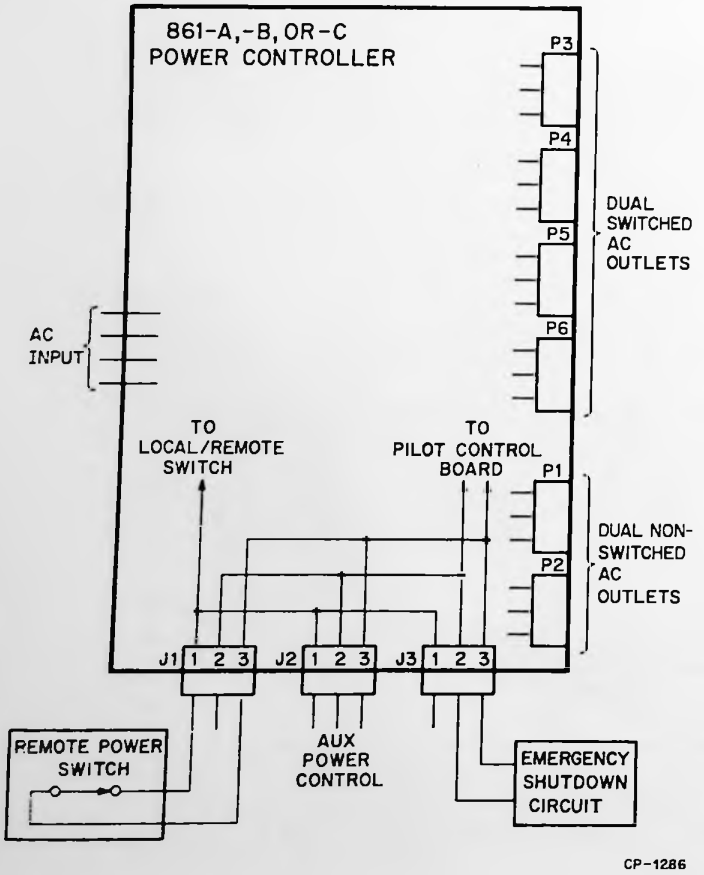
Input		Jumper	Output	
AC (Single Phase)	TB1 Terminal	TB1 Terminal	TB1 Terminal	AC (Single Phase)
245 V	AC IN (1) AC IN (5)	(3) to (4)	AC OUT (8) AC OUT (9)	
230 V	AC IN (1) AC IN (5)	(3) to (4)	AC OUT (7) AC OUT (9)	
217 V	AC IN (1) AC IN (5)	(3) to (4)	AC OUT (6) AC OUT (9)	115 V at 4.0 A
200 V	AC IN (2) AC IN (5)	(3) to (4)	AC OUT (7) AC OUT (9)	
189 V	AC IN (2) AC IN (5)	(3) to (4)	AC OUT (6) AC OUT (9)	
115 V (isolation)	AC IN (1) AC IN (5)	(1) to (4) (5) to (3)	AC OUT (7) AC OUT (9)	

Power/Control Connections

Input AC: Plug and receptacle wiring configurations are shown in the power control connections diagram. The following chart lists the plug and receptacle part numbers. The appropriate receptacle is not supplied with the controller; it must be ordered separately. These receptacles are described in this section under "Power Supply Accessories."

Input Power Cable Connectors

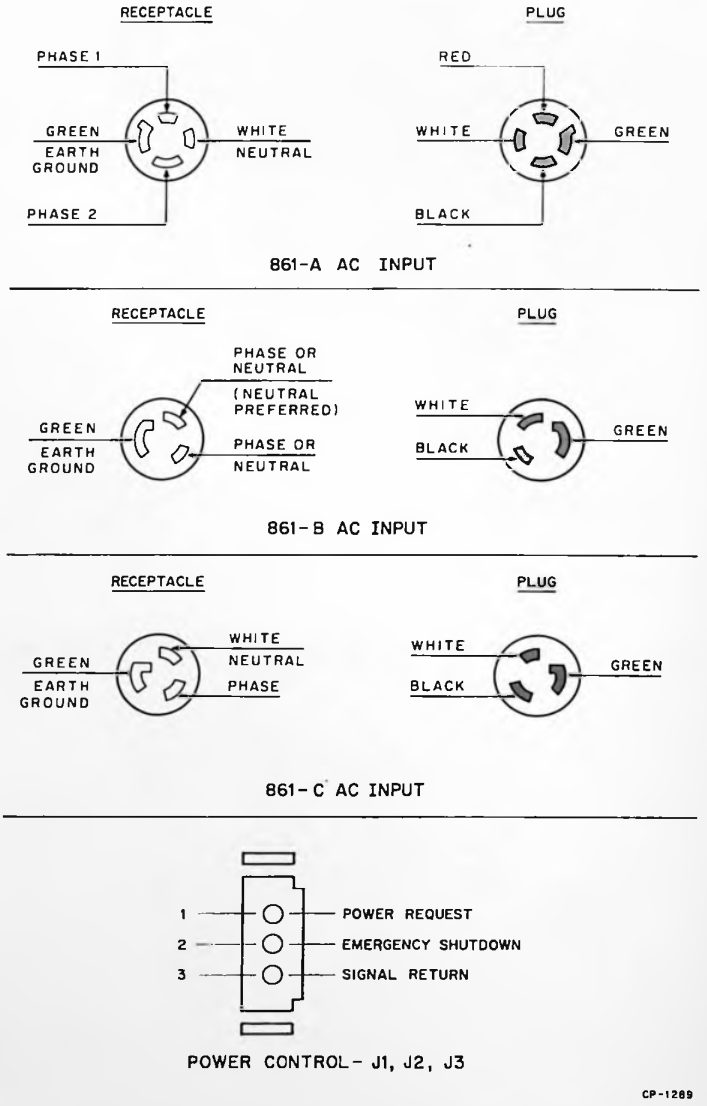
Controller	Description	NEMA Type	DEC Part No.
861-A	Four-Prong Twist Plug	L14-20P	12-11045
	Four-Prong Twist Receptacle	L14-20R	12-11046
861-B	Three-Prong Twist Plug	L6-20P	12-11192
	Three-Prong Twist Receptacle	L6-20R	12-11191
861-C	Three-Prong Twist Plug	L5-30P	12-11193
	Three-Prong Twist Receptacle	L5-30R	12-11194



Typical Power Control Connections

Output AC: Refer to the panel diagram and connector diagram for the type of ac output receptacle used on each type 861 Power Controller.

Remote Control: Refer to the connector diagrams for connector pin configurations of receptacles J1, J2, and J3. J1, J2, and J3 mate with male plugs DEC No. 12-09351-03. Plug 12-09351-03 is not supplied with the controller; it must be ordered separately. This plug is described in Section 4.



Type 861 Power and Control Connections

Step-Down Transformer – H722

The H722 consists of a step-down power transformer mounted on a 19-in. (48.26-cm) panel. The H722 is used to step down or isolate the input ac voltage of the line from the system equipment. The transformer has two separate windings at the input, one of which contains a tapped connection. The output is a single winding with two tapped connections. All input and output connections to the transformer are facilitated by a terminal board mounted to the panel.

The panel can be installed in any electronics rack or cabinet that is equipped with 19-in. (48.26-cm) mounting rails drilled at standard EIA spacings. It occupies 5.19 in. (13.18 cm) of vertical space.

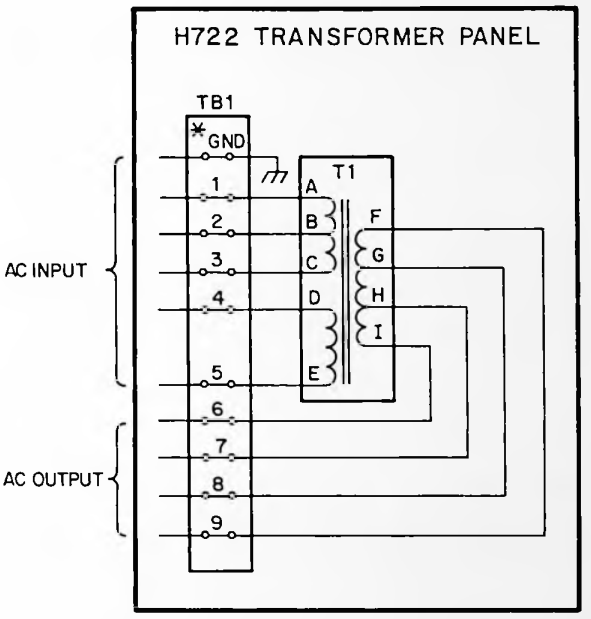
Electrical Specifications

Input/Output Voltage

Refer to the following table and wiring diagram for input/output ac voltage selections. Input frequency rating is 50 or 60 Hz.

Output Current

4.0 A (max)



H722 Internal Wiring

H722 Transformer Connections

Input		Jumper	Output	
AC (Single Phase)	TB1 Terminal	TB1 Terminal	TB1 Terminal	AC (Single Phase)
245 V	AC IN (1) AC IN (5)	(3) to (4)	AC OUT (8) AC OUT (9)	
230 V	AC IN (1) AC IN (5)	(3) to (4)	AC OUT (7) AC OUT (9)	
217 V	AC IN (1) AC IN (5)	(3) to (4)	AC OUT (6) AC OUT (9)	115 V at 4.0 A
200 V	AC IN (2) AC IN (5)	(3) to (4)	AC OUT (7) AC OUT (9)	
189 V	AC IN (2) AC IN (5)	(3) to (4)	AC OUT (6) AC OUT (9)	
115 V (isolation)	AC IN (1) AC IN (5)	(1) to (4) (5) to (3)	AC OUT (7) AC OUT (9)	

Breakdown Voltage

2000 V at 60 Hz for 1.0 minute between any two windings.

Regulation

5% (max) for 460 VA load

Heat Rise

Acceptable within specifications for MIL-T-27-B, Class R (65° C ambient), 40° C max temperature rise.

Mechanical Specifications

Dimensions

Mounting and clearance dimensions are given in the following illustration.

Weight

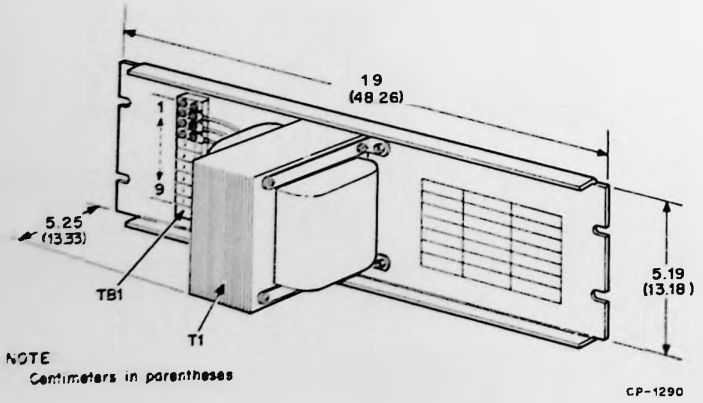
20 lb (9.08 kg)

Mounting

The H722 panel mounts into a standard 19-in. (48.26-cm) rack or cabinet using four, 8-32 X 1/2 in. (1.27 cm) screws and associated nuts and washers.

Power Connections

The input and output wires connect to the H722 terminal board using standard 1/4 inch spade lugs. Connect ground leads to terminal board mounting screws.



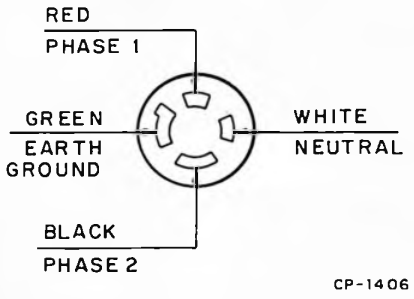
H722 Mounting and Clearance Dimensions

POWER SUPPLY ACCESSORIES

Line sets and ac receptacles are described in this subsection. The ac receptacles are wall-mounted and are designed to mate with the plug on the ac input cords of some power supplies. These receptacles are offered in this catalog because they may not be available in local supply stores. The line sets are ac input power cords terminated with an ac input box on one end; the line sets are specifically designed for use with H740-D Power Supplies. Also available is the H322 Distribution Panel, which can be mounted in a cabinet to distribute signals, power, and ground to one or more devices.

Receptacle (Four-Prong) – 12-11046

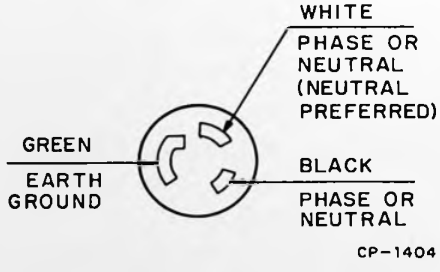
The 12-11046 four-prong receptacle is designed to be wall-mounted. It mates with the ac input plug on Power Controller 861-A. The 12-11046 is rated at 125/250 V, 20 A; it should be wired as shown in the following illustration.



12-11046
(Mating Surface Shown)

Receptacle (Three-Prong) – 12-11191

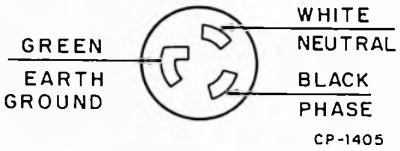
The 12-11191 three-prong receptacle is designed to be wall-mounted. It mates with the ac input plug on Power Controller 861-B. The 12-11191 is rated at 250 V, 20 A; it should be wired as shown in the following illustration.



12-11191
(Mating Surface Shown)

Receptacle (Three-Prong) – 12-11194

The 12-11194 three-prong receptacle is designed to be wall-mounted. It mates with the ac input plug on Power Controller 861-C. The 12-11194 is rated at 125 V, 20 A; it should be wired as shown in the following illustration.



12-11194
(Mating Surface Shown)

Line Set (115 V) – BC05H-6

The BC05H-6 line set is designed to provide the 115 Vac input to an H740-D Power Supply. The BC05H-6 comprises a 6-ft (1.8-m) power cord and an ac input box. The schematic diagram of the BC05H-6 is contained in the description of the H740-D Power Supply.

Line Set (230 V) – BC05J-6

The BC05J-6 line set is designed to provide the 230 Vac input to an H740-D Power Supply. The BC05J-6 comprises a 6-ft (1.8-m) power cord and an ac input box. The schematic diagram of the BC05J-6 is contained in the description of the H740-D Power Supply.

Distribution Panel – H322

The H322 Distribution Panel is a 19-in. (48.26-cm), general purpose signal distribution panel. It provides a convenient means of distributing signals from one or more devices to one or more other devices. Power and ground can also be distributed to any device.

The H322 Distribution Panel is supplied with two mounting brackets that permit it to be offset mounted in a 19-in. (48.26-cm) electronics rack or cabinet that has mounting rails with holes drilled at standard EIA spacings.

The H322 Distribution Panel has two 40-pin H854 connectors, two 9-pin 12-09350-09 connectors, and nine 10-screw terminal strips to provide maximum I/O signal distribution capabilities. The H854 connectors mate with 40-pin H856 connectors and the 12-09350-09 connectors mate with 9-pin 12-09351-09 connectors. Connectors H856 and 12-09351-09 are used to terminate I/O cables.

Section 6
Wire Wrapping Tools and Accessories, Bus Strips, Patch Cords and Accessories, and Wire Wrap Wire

Digital Equipment Corporation offers a variety of wire wrapping tools and accessories, bus strips, patch cords and accessories, and wire wrap wire. These items are described in this section.

WIRE WRAPPING TOOLS AND ACCESSORIES

Wire wrapping provides positive, uniform electrical connections faster and more economically than solder connections. Digital Equipment Corporation has a complete line of tools and accessories for wire wrapping all of the wire wrappable module connector blocks described in Section 3 and all of the wire wrappable module boards described in Section 7.

Pistol-Grip Wire Wrapping Tool Kit – H810(24), H810-A, H810-B

The H810(24) Pistol-Grip Wire Wrapping Tool Kit provides a pistol-grip mechanical wire wrapping tool and a sleeve and bit of the proper size to wrap 24 AWG wire wrap wire.

The H810-A is the same as the H810(24) except the sleeve and bit are the proper size for wrapping 30 AWG wire wrap wire. The H810-B is a combination of H810(24) and H810-A. H810-B provides a pistol-grip mechanical wire wrapping tool and the bits and sleeves of the proper sizes for wrapping 24 AWG or 30 AWG wire wrap wire.

H810

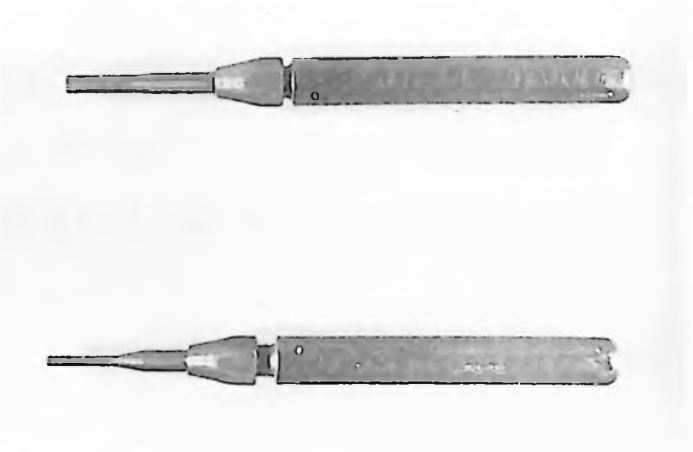
Battery-Powered Wire Wrap Gun – H810-C, H810-D, H810-E

H810-E

The H810-C, H810-D, and H810-E battery-powered wire wrap guns are equipped with rechargeable, nickel-cadmium batteries. They do not require ac connection while in use. Their ease of operation reduces user-fatigue and provides uniform wire wrap connections.

The H810-C battery-powered wire wrap gun is supplied with a bit and sleeve for wrapping 24 AWG wire wrap wire. The H810-D is supplied with a bit and sleeve for wrapping 30 AWG wire wrap wire. The H810-E is supplied without bits or sleeves. H813 bits and H814 sleeves can be used with any of these battery-powered wire wrap guns.

Hand Wire Wrapping Tool – H811(24), H811-A

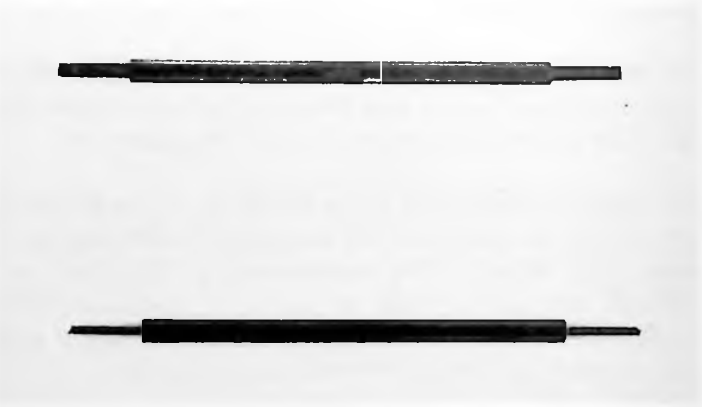


H811(24), H811-A

The H811(24) and H811-A hand wire wrapping tools are especially useful for service and repair applications. They can also be used for producing limited numbers of prototype modules.

H811(24) is designed for 24 AWG wire wrap wire, and the H811-A is designed for 30 AWG wire wrap wire.

Hand Wire Unwrapping Tool – H812(24), H812-A



H812(24), H812-A

The H812(24) and H812-A hand unwrapping tools are ideal for unwrapping wire wrapped terminals.

The H812(24) is designed for unwrapping 24 AWG wire, and the H812-A is designed for unwrapping 30 AWG wire.

Bit for Battery-Powered Wire Wrap Gun – H813(24), H813-A

The H813(24) and H813-A bits are replacement bits for battery-powered wire wrap guns H810-C, H810-D, or H810-E.

The H813(24) is designed for 24 AWG wire, and the H813-A is designed for 30 AWG wire.

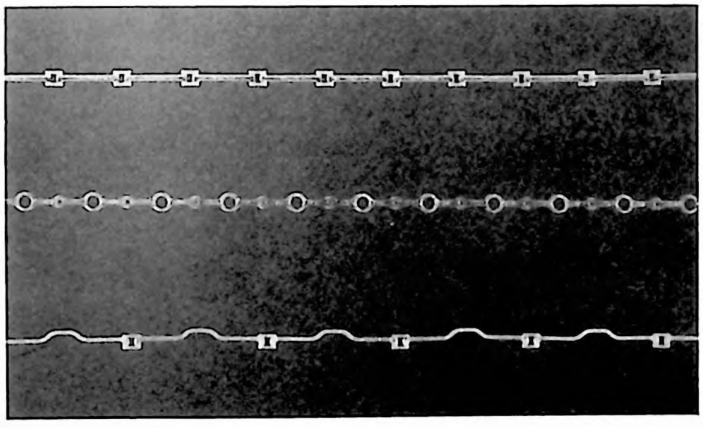
Sleeve for Battery-Powered Wire Wrap Gun – H814(24), H814-A

The H814(24) and H814-A sleeves are replacement sleeves for battery-powered wire wrap guns H810-C, H810-D, or H810-E.

The H814(24) is designed for 24 AWG wire, and the H814-A is designed for 30 AWG wire.

BUS STRIPS

Bus Strips – 932, 933, 939



932, 933, 939

Bus strips 932, 933, and 939 provide a convenient method of interconnecting all wire wrap pins in a system that are assigned identical control signals, power, or ground. These bus strips are flat, narrow conductors with holes that correspond to the connector block pin size and spacing. When a bus strip is placed over the pins and soldered to each, it will interconnect all of the pins with the same pin number for as many module slots as desired. After the modules have been selected and the slots of the mounting panel have been assigned to the modules, identical control signal, power, and ground pins can be bused with the bus strips.

Bus strip 932 can be used to bus systems using H800 Module Connector Blocks. Bus strip 933 can be used to bus systems using H803, H8030, and H863 Module Connector Blocks. Bus strip 939 can be used to bus systems using H808 Module Connector Blocks.

Length: 932 – 13.5 in. (39.4 cm)
933 – 21.5 in. (54.6 cm)
939 – 21.5 in. (54.6 cm)

NOTE

Module connector blocks are described in Section 3.

PATCH CORDS AND ACCESSORIES

Grip-Clip Connectors for Slip-on Patch Cords – H820, H821

The H820 and H821 grip-clip connectors are identical to the connectors used on each end of 913 and 915 patch cords, respectively. These grip clips permit the fabrication of patch cords of any length.

H820 grip-chip connectors accept 24 to 20 AWG wire; they slip on wire wrap terminals that are sized for 24 AWG wire wrap wire, 0.031 by 0.062 in. (0.079 by 0.158 cm). H821 grip-clip connectors accept 30 to 24 AWG wire; they slip on wire wrap terminals that are sized for 30 AWG wire wrap wire, 0.025 in. (0.064 cm) square.

H820 and H821 grip-clip connectors are shipped in quantities of 1000 of one size.

NOTE

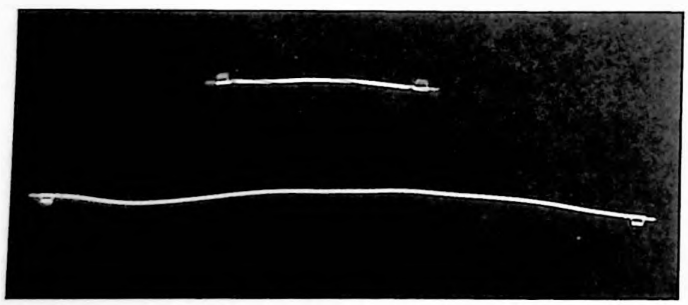
H825 and H826 hand crimping tools can be used with connectors H820 and H821, respectively, to ensure good electrical connections.

Hand Crimping Tool – H825, H826

The H825 and H826 hand crimping tools can be used to secure H820 and H821 grip-clip connectors to the wire. These tools ensure good electrical connections quickly and easily.

The H825 hand crimping tool should be used to crimp H820 connectors to 24 to 20 AWG wire. The H826 hand crimping tool should be used to crimp H821 connectors to 30 to 24 AWG wire.

Patch Cords – 913, 915



The 913 and 915 patch cords provide slip-on connections at the wire wrap pins of FLIP-CHIP modules and module connector blocks. They are ideal for breadboarding prototype modules and making temporary or semipermanent jumpers at a system backplane. They are available in 11 color-coded lengths from 2 to 64 inches (5.04 to 162.56 cm).

Patch cord 913 is 24 AWG stranded wire with IPVC insulation, and is equipped on each end with an H820 grip-clip connector; H820 connectors fit on wire wrap pins that are sized for 24 AWG wire wrap wire, 0.031 by 0.062 in. (0.079 by 0.158 cm).

Patch cord 915 is 26 AWG stranded (7/34) with IPVC insulation, and is equipped on each end with an H821 grip-clip connector; H821 connectors fit on wire wrap pins that are sized for 30 AWG wire wrap wire, 0.025 in. (0.064 cm) square.

Patch cords 913 and 915 are available in quantities of 100 of the same length and same gauge, and in quantities of 100 of assorted lengths and the same gauge. The following chart lists the part number, length, and color code for 913 and 915 patch cords.

Part Number		Length in Inches (Centimeters)	Color
24 AWG	26 AWG		
913-2	915-2	2 (5.08)	BRN
913-3	915-3	3 (7.62)	BRN/WHT
913-4	915-4	4 (10.16)	RED
913-6	915-6	6 (15.24)	RED/WHT
913-8	915-8	8 (20.32)	ORN
913-12	915-12	12 (30.48)	ORN/WHT
913-16	915-16	16 (40.64)	YEL
913-24	915-24	24 (60.96)	YEL/WHT
913-32	915-32	32 (81.28)	GRN
913-48	915-48	48 (121.92)	GRN/WHT
913-64	915-64	64 (162.56)	BLU
913-AF	915-AF	Assorted*	Assorted

*913-AF and 915-AF comprise the following assorted patch cords: 30 BRN/WHT (-3); 25 RED/WHT (-6); 25 ORN (-8); 10 YEL/WHT (-24); 5 GRN (-32); and 5 BLU (-64).

When ordering, please specify part number 913 or 915 and the appropriate *dash* number.

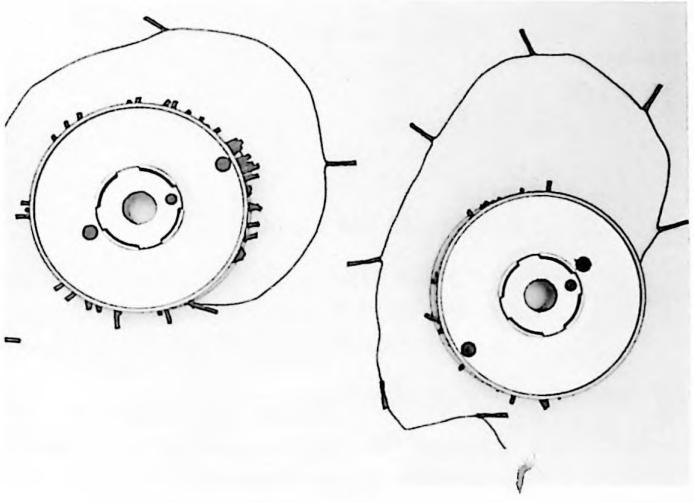
Power Patch Cord – 914-7, 914-19

The 914 power patch cords provide interconnections between power supplies and mounting panels that are equipped with Faston (TM) terminals, series 250. The 914

(TM) Faston is a trademark of AMP, Inc.

power patch cord is stranded wire with IPVC insulation and is equipped on each end with Faston receptacles, series 250. Power patch cord 914 is available in two lengths – 7 inches and 19 inches (18 cm and 48 cm) – and is available in packages of ten of the same length. The 914-7 is a package of ten 7-inch (18-cm) patch cords. The 914-19 is a package of ten 19-inch (48-cm) patch cords.

Daisy Chain – 917-2.5, 917-5



The 917 daisy chain is a continuous length of stranded insulated wire on a reel with 250 gold-plated and insulated terminals crimped at 2.5-in. (6.4-cm) or 5.0-in. (12.7-cm) intervals. A prototype system is easily and quickly hand patched when the 917 daisy chain is used.

The terminals are designed to fit on module connector blocks that have wire wrap pins sized for wrapping with 30 AWG wire [0.025/0.026 in. (0.064/0.066 cm) square] e.g., module connector blocks H803, H8030, H807, and H863, described in Section 3.

The dependable 917 daisy chain push-on terminals are easily removed from the connector block wire wrap terminals; this provides an ideal wiring technique in systems where unwiring and rewiring for changing system requirements are essential. If an additional lead is ever required on a wire wrap terminal, a 915 patch cord can be used; a 915 patch cord can be placed on the terminal after the wire wrap connection and before the 917 termination.

The 917-2.5 daisy chain has 250 terminals at 2.5-in. (6.4-cm) intervals. The 917-5 daisy chain has 250 terminals at 5-in. (12.7-cm) intervals.

WIRE

30 AWG Wire Wrapping Wire – 91-05740

Thirty AWG solid conductor wire is available on 1000-ft (304.8-m) spools for wire wrapping logic system backplane pins. This wire is excellent for wire wrapping H803, H8030, H807, and H863 module connector blocks described in Section 3.

Specifications for the 91-05740 wire wrapping wire follow.

Conductor

Gauge
30 AWG solid

Material
Silver-coated copper

Diameter
0.0101 + 0.0003 in. or - 0.0001 in. (0.0257 + 0.0008 cm or - 0.0003 cm)

Insulation

Material
Vinylindene flouride

Outside Diameter
0.019 ± 0.001 in. (0.048 ± 0.003 cm)

U.L. Style No.
1423

DC Resistance/1000 ft (304.8 m)
113.6 ohms

NOTE

This wire should not be used for solder applications. 91-07470-44 wire, 24 AWG, also described in this publication, should be used for solder applications.

24 AWG Hookup (Solder) Wire – 91-07470-44

Twenty-four AWG solid conductor wire is available on 1000-ft (304.8-m) spools for soldering logic system backplane pins. This wire is excellent for soldering the H800-F Module Connector Blocks described in Section 3.

Specifications for 91-07470-44 solder wire follow.

Conductor

Gauge
24 AWG solid

Diameter
0.0202/0.0210 in. (0.0513/0.0533 cm)

Material
Silver-coated copper

Insulation

Material
Teflon® Type "E"

Outside Diameter
0.0405/0.0425 in. (0.1029/0.1080 cm)

24 AWG Wire Wrapping Wire – 91-07688

Twenty-four AWG solid conductor wire is available on 1000-ft (304.8-m) spools for wire wrapping logic system backplane pins. This wire is excellent for wire wrapping the H800, H802, and H808 Module Connector Blocks described in Section 3.

Specifications for 91-07688 wire wrapping wire follow.

Conductor

Gauge
24 AWG solid

Material
Silver-coated copper

Diameter
0.0201 + 0.0006 in. or - 0.0002 in. (0.0510 + 0.0015 cm or - 0.0005 cm)

Insulation

Material
Vinylindene flouride

Outside Diameter
0.041 ± 0.001 in. (0.104 ± 0.003 cm)

U.L. Style No.
1327

DC Resistance/1000 ft (304.8 m)
26.8 ohms

NOTE

This wire should not be used for solder applications. 91-07470-44 wire, also described in this publication, should be used for solder applications.

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Section 7
Wire Wrappable Module Boards, Blank Module Boards, Collage Module Boards, Module Extender Boards, Integrated Circuits, Integrated Circuit Sockets, And Module Handles

Digital Equipment Corporation offers a variety of wire wrappable, blank, collage, and module extender boards, integrated circuits (ICs), and IC sockets.

The wire wrappable, blank, and collage module boards provide a convenient means of working with discrete components or integrated circuit packages. They are ideal for experimenting; breadboarding and/or ptototyping before production; and designing and using unique, specially designed circuitry. Additionally, these module boards provide a convenient and low-cost method of producing limited-production runs.

The ICs available are Unibus and Omnibus compatible. These selected ICs, along with user-designed and built circuitry or commercially available ICs, provide the logic circuitry necessary to implement breadboard, prototype, and/or limited-production runs of unique, specially designed circuitry on wire wrappable, blank, or collage module boards.

The extender boards provide a convenient means of extending printed circuit modules to provide access to the module circuitry for test and maintenance purposes without breaking connections between the module and the mounting panel wiring.

WIRE WRAPPABLE MODULE BOARDS

Wire wrappable modules provide a convenient, low-cost method of producing prototype or limited runs of production modules with special circuitry that utilizes, mainly, dual-in-line package (DIP) integrated circuits (ICs). They are completely compatible with the standard module mounting blocks described in Section 2. These glass epoxy, wire wrappable modules have +5 Vdc power and ground bused (printed circuit etch tracks) to wire wrap pins at each IC location to facilitate connection of V_{cc} and ground to the appropriate IC wire wrap pin. The wire wrap pins each accommodate two 30 AWG wire wraps. Board contact fingers are dedicated to +5 Vdc power and ground in accordance with the following charts:

Double-Height Modules
W941, W943, W951, W953

+5 Vdc	AA2, BA2
GND	AC2, AT1, BC2, BT1

Quad-Height Modules
W940, W942, W950, W952

+5 Vdc	AA2, BA2, CA2, DA2
GND	AC2, AT1, BC2, BT1, CC2, CT1, DC2, DT1

Some of these wire wrappable modules are equipped with low-profile IC sockets that accept either 14- or 16-pin DIP ICs; others accept 14- or 16-pin DIP ICs either with or without sockets; and others, in addition to accepting 14- or 16-pin DIP ICs, are equipped to accept 24-pin DIP ICs. These different configurations are described in the following table. All of these modules have etched and gold-plated contact fingers and all have handles attached.

Wire Wrappable Modules

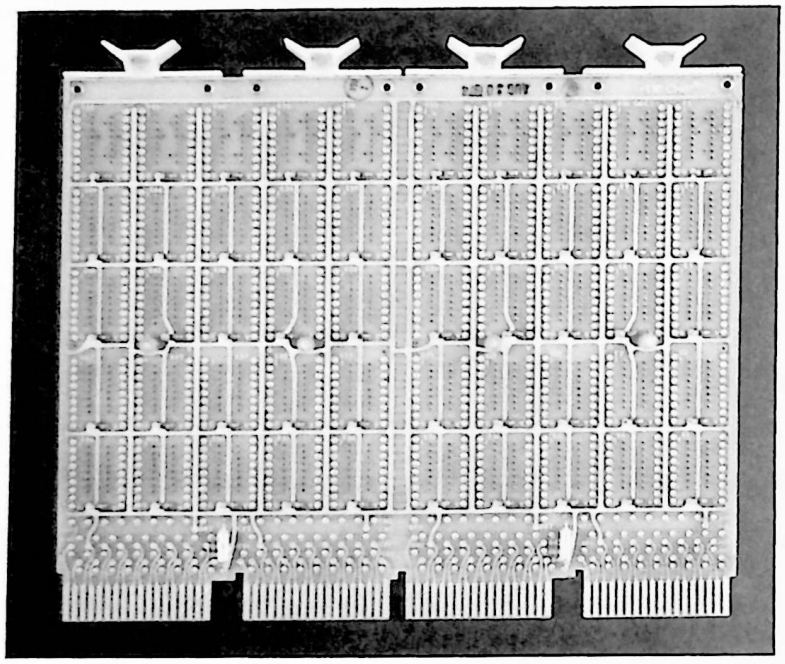
Part No.	Contact Fingers	Size	Description
W940	144	Quad-height, extended length	Accommodates up to fifty 14- or 16-pin DIP ICs with or without sockets. (Sockets not included.)
W941	72	Double-height, extended length	Same as W940 except accommodates up to twenty-five 14- or 16-pin DIP ICs with or without sockets. (Sockets not included.)
W942	144	Quad-height, extended length	Same as W940 except equipped with 50 low-profile, 16-pin DIP IC sockets.
W943	72	Double-height, extended length	Same as W941 except equipped with 25 low-profile, 16-pin DIP IC sockets.
W950	144	Quad-height, extended length	Accommodates up to thirty 14- or 16-pin DIP ICs and up to eight 24-pin DIP ICs with or without sockets. (Sockets not included.)
W951	72	Double-height, extended length	Same as W950 except accommodates up to fifteen 14- or 16-pin DIP ICs and up to four 24-pin DIP ICs with or without sockets. (Sockets not included.) The four 24-pin locations can also accommodate four 14- or 16-pin ICs instead of the 24-pin ICs.
W952	144	Quad-height, extended length	Same as W950 except equipped with 30 low-profile, 16-pin DIP IC sockets and eight 24-pin DIP IC sockets.
W953	72	Double-height, extended length	Same as W951 except equipped with 15 low-profile, 16-pin DIP IC sockets and four 24-pin DIP IC sockets.

Discrete components, such as transistors and potentiometers, can also be mounted on these wire wrappable boards. The DIP IC socket must be removed by the user from the socket-equipped module (W942, W943, W952, and W953) if one or more discrete components are to be mounted at an IC location; the modules that are not socket-equipped (W940, W941, W950, and W951) do not require user modification to mount a component(s). The IC locations where discrete components can be mounted and the IC pin numbers that can be used to mount discrete components are listed in a table that follows.

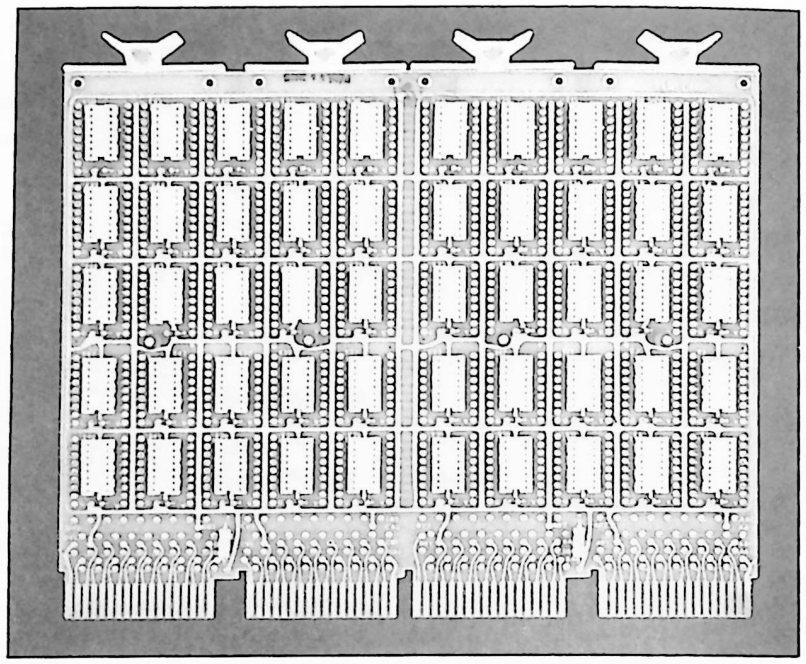
Discrete Component Mounting Table

Module	Component	IC Location	DIP IC Pins
W940 and W942*	Transistor, Type TO–5 Package (3 per IC location)	E5, E10, E15, E20, E25, E30 E35, E40, E45, and E50 (Top row locations)	1, 15, and 3; 14, 4, and 12; 6, 10, and 8
	Potentiometer, Trimpot RJ11 Package (2 per IC location)	Same as for transistors	1, 4, and 8; 16, 13, and 9
W941 and W943*	Transistor, Type TO–5 Package (3 per IC location)	E5, E10, E15, E20, and E25 (Top row locations)	Same as for W940 and W942
	Potentiometer, Trimpot RJ11 Package (2 per IC location)	Same as for transistors	Same as for W940 and W942
W950 and W952*	Transistor, Type TO–5 Package (3 per IC location)	E5, E10, E15, E40, E45, and E50 (Top row locations of 14- or 16-pin ICs)	Same as for W940 and W942
		E54 and E58 (Top row locations of 24-pin IC)	22, 4, and 20; 5, 19, and 7; 17 9, and 15
	Potentiometer, Trimpot RJ11 Package (2 per IC location)	E5, E10, E15, E40, E45, and E50 (Top row locations of 14- or 16-pin ICs)	Same as for W940 and W942
		E54 and E58 (Top row locations of 24-pin IC)	22, 19, and 15; 3, 6, and 10
W951 and W953*	Transistor, Type TO–5 Package (3 per IC location)	E5, E10, and E15 (Top row locations of 14- or 16-pin ICs)	Same as for W940 and W942
		E54 (Top row location of 24-pin IC)	22, 4, and 20; 5, 19, and 7; 17, 9, and 15
	Potentiometer, Trimpot RJ11 Package (2 per IC location)	E5, E10, and E15 (Top row locations of 14- or 16-pin ICs)	Same as for W940 and W942
		E54 (Top row location of 24-pin IC)	22, 19, and 15; 3, 6, and 10

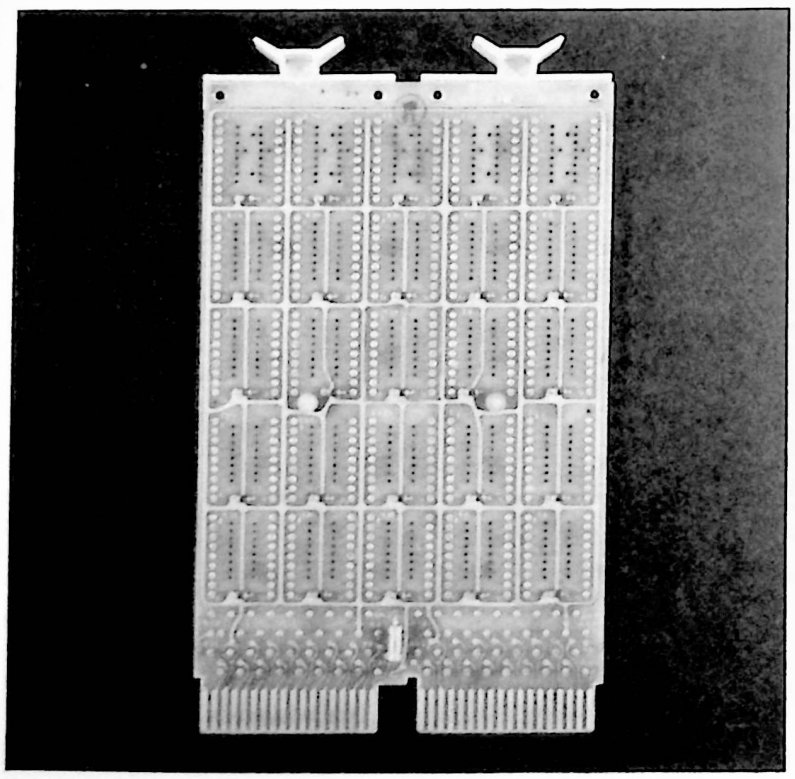
* Modules W942, W943, W952, and W953 are equipped with IC sockets; these sockets must be user-removed if a discrete component is to be mounted instead of a DIP IC at any specified location.



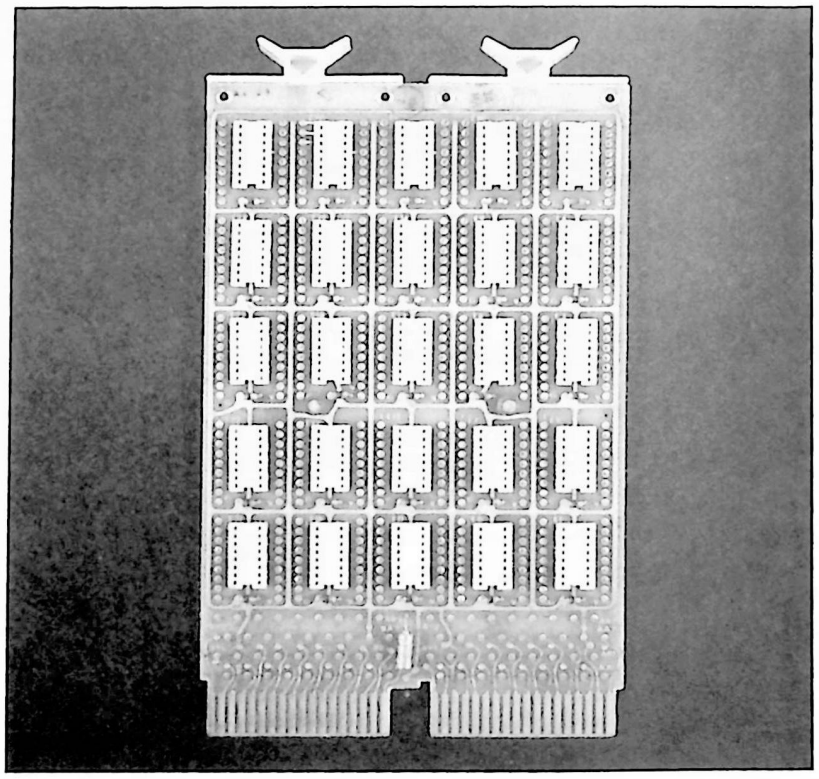
W940



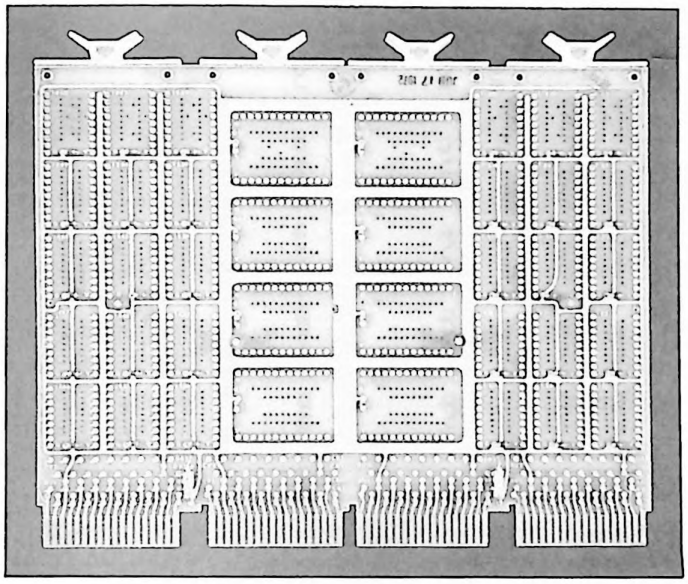
W942



W941



W943



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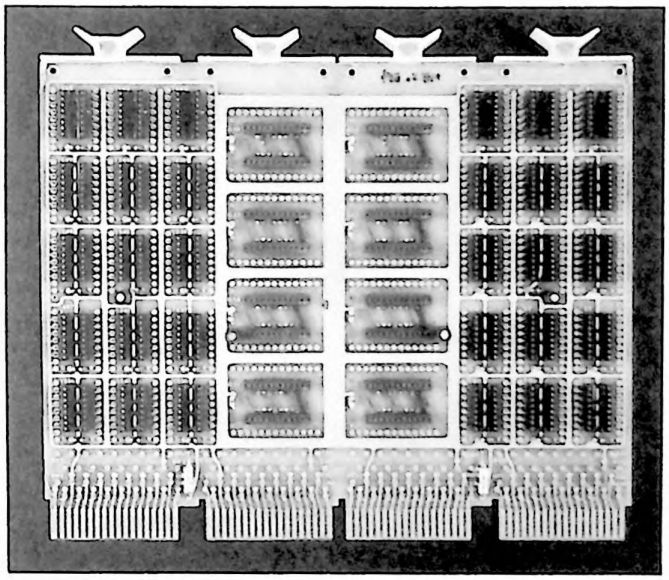

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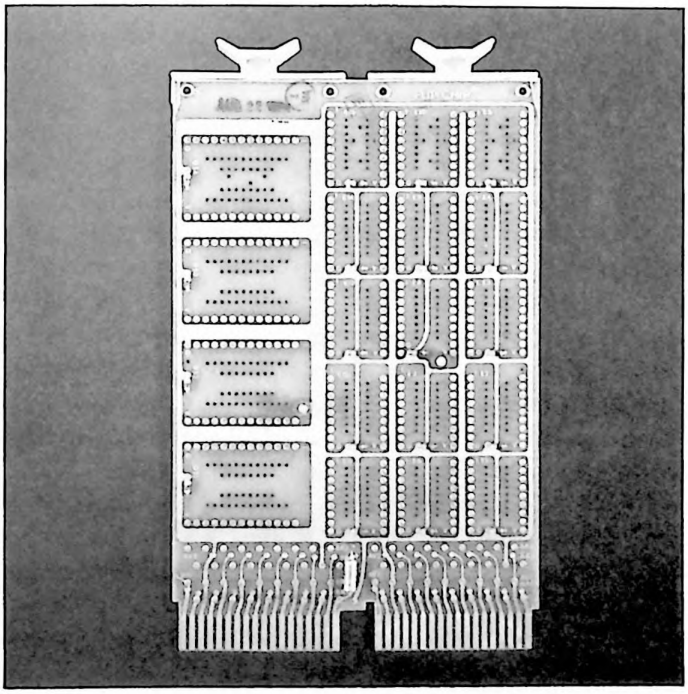
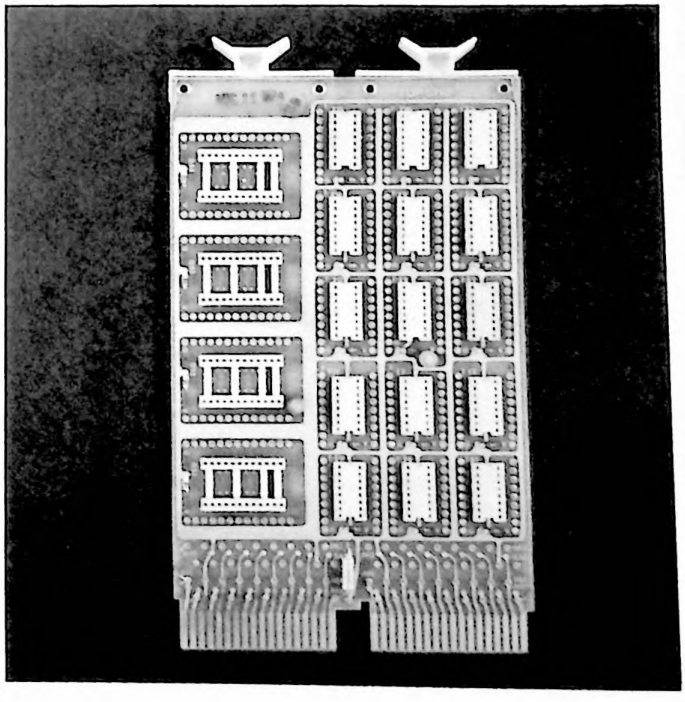


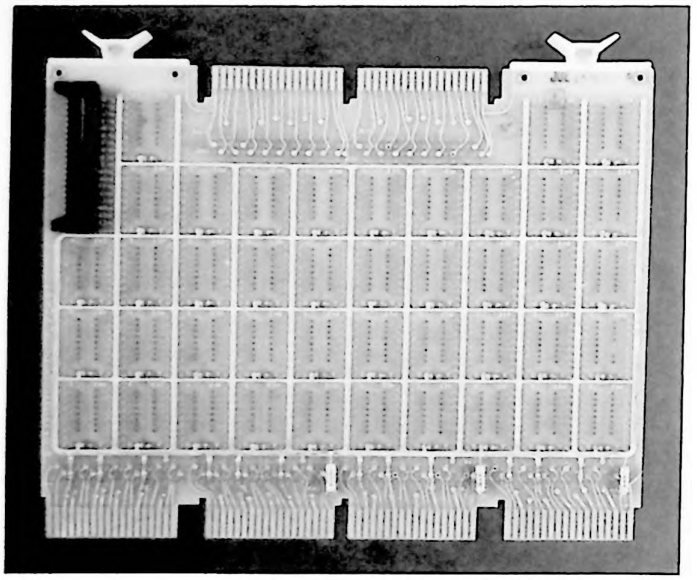
W951



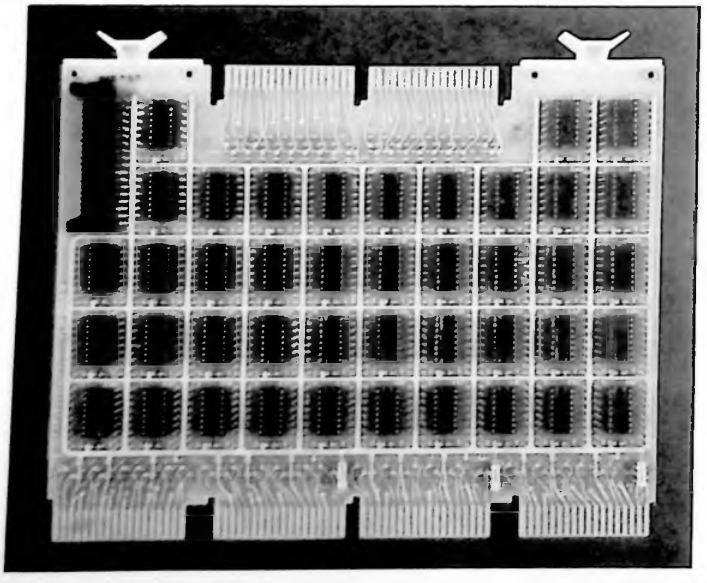
W953

WIRE WRAPPABLE MODULES

PDP-8/e WIRE WRAPPABLE MODULE BOARDS – W966 AND W967



W966



W967

The W966 and W967 are wire wrappable modules designed specifically for the PDP-8/e. Both are quad-height, extended length modules that can accommodate forty-two 14- and/or 16-pin, dual-in-line package (DIP) integrated circuits (ICs). The wire wrappable modules are completely compatible with standard module mounting blocks described in Section 2. These glass epoxy, wire wrappable modules have +5 Vdc power and ground bused (printed circuit etch tracks) to wire wrap pins at each IC location to facilitate connection of V_{CC} and ground to the appropriate IC wire wrap pins. The wire wrap pins each accommodate two 30 AWG wire wraps.

All power and ground lines are common to the PDP-8/e Omnibus. Board contact fingers are dedicated to +5 Vdc power and ground in accordance with the following chart:

Quad-Height Modules
W966, W967

+5 Vdc	AA2, BA2, CA2
GND	AC1, AC2, AF1, AF2, AN1, AN2, AT1, AT2 BC1, BC2, BF1, BF2, BN1, BN2, BT1, BT2 CC1, CC2, CF1, CF2, CN1, CN2, CT1, CT2 DC1, DC2, DF1, DF2, DN1, DN2, DT1, DT2

The W966 and W967 modules each have 72 contact fingers at the top (handle end) with terminating wire wrap pins. When one H966 or H967 is adjacent to another H966 or H967, signals can be bused from one module to the other module via these contact fingers by using an H851 edge connector. One H851 can bus 36 signals; two H851s are required to bus all 72 signals. (The H851 is described in Section 4.)

An H854 40-pin I/O connector (male), terminating with wire wrap pins, is located on the W966 and W967 modules. This I/O connector provides access to the "outside world"; it can accept any cable that is equipped with an H856 connector. (The H854 and the H856 are described in Section 4.) Preassembled cables equipped with an H856 on one end are the BC08J-XX and BC08K-XX series; these are described in the *DIGITAL Logic Handbook*. Eighteen pins (D, F, J, L, N, R, T, V, X, Z, BB, DD, FF, JJ, LL, NN, RR, and TT) on the H854 are available for "outside world" signals, and 22 pins (A, B, C, E, H, K, M, P, S, U, W, Y, AA, CC, EE, HH, KK, MM, PP, SS, UU, and VV) are dedicated to ground.

The W966 and the W967 are the same except the W967 is equipped with 42 low-profile, 16-pin DIP IC sockets.

BLANK MODULE BOARDS

Blank module boards provide a convenient method of breadboarding (mounting) experimental or prototype circuits, and they provide a low-cost method of producing limited runs of production modules with special circuitry. They are completely compatible with the standard module mounting blocks described in Section 2. These glass epoxy, blank module boards have etched and gold-plated contact fingers and all have handles attached. The attached handles are stamped with their Digital Equipment Corporation identification number (part number). The handles on copper-clad boards are attached with reusable nylon hardware. Blank handle 937, described elsewhere in this section, is available; this blank handle can be user-titled and is, therefore, particularly useful for identifying user-etched, copper-clad module boards for limited production runs.

Blank module boards are available in three basic forms: plain, perforated, and copper-clad. The following table lists and describes the blank module boards that are available.

Plain blank module boards provide complete flexibility in the placement of components since they are not perforated (predrilled), and they permit easy changes to the circuitry since etching is not required. Component connections are made via hook-up wire. Plain blank boards are, therefore, ideal for experimental or prototype modules because they permit easy changes to the circuitry and nearly unlimited component placement, and yet they provide stability and security for the circuits and components. All sizes are available, and all have etched and gold-plated contact fingers.

Perforated blank module boards provide nearly the same advantage as plain blank module boards except they are predrilled with 0.052-in. (0.132-cm) diameter holes spaced 0.1 in. (0.254 cm) center-to-center horizontally and vertically. This eliminates the need for user drilling and only slightly reduces the choices of component placement. All sizes are available, and all have etched and gold-plated contact fingers.

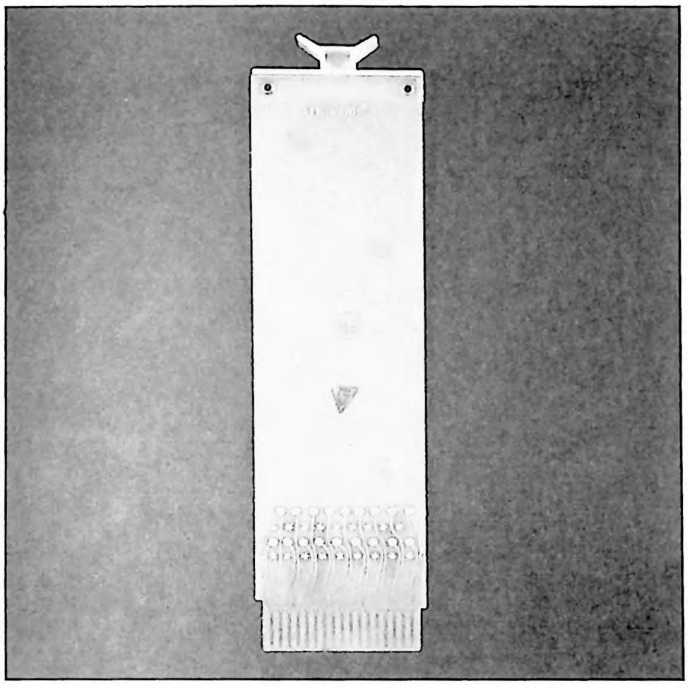
Copper-clad blank module boards provide a method of producing limited runs of modules with special circuitry and components. A complete selection of copper-clad blank module boards is available: some may be user-etched on both sides and others may be user-etched on one side. All sizes are available, and all have etched and gold-plated contact fingers.

Blank Module Boards

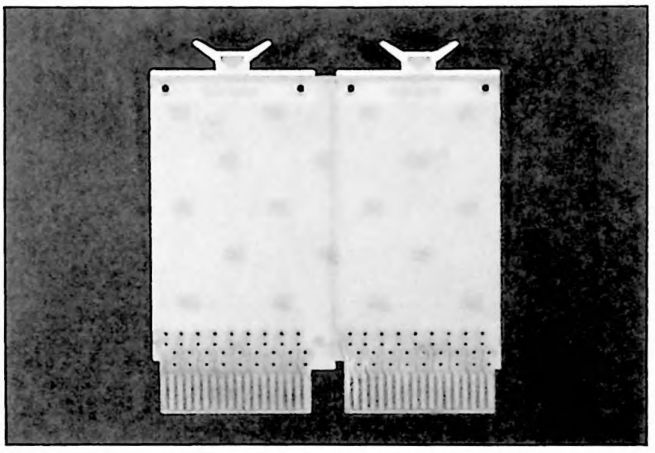
Part No.	Type	Contact Fingers	Size	Description
W930	Plain	36	Single-height, extended length	Bare board with 36 feed-through eyelets. Printed circuit etching from the eyelets to the contact fingers.
W970	Plain	36	Single-height, standard length	Bare board with 36 plated-through holes in the printed circuit etching to the contact fingers.
W971	Plain	72	Double-height, standard length	Same as W970 except double-height and has 72 plated-through holes and two handles.
W972	Copper-clad	36	Single-height, standard length	Copper-clad on both sides.
W9720	Copper-clad	36	Single-height, extended length	Same as W972 except extended length.

Blank Module Boards (Cont)

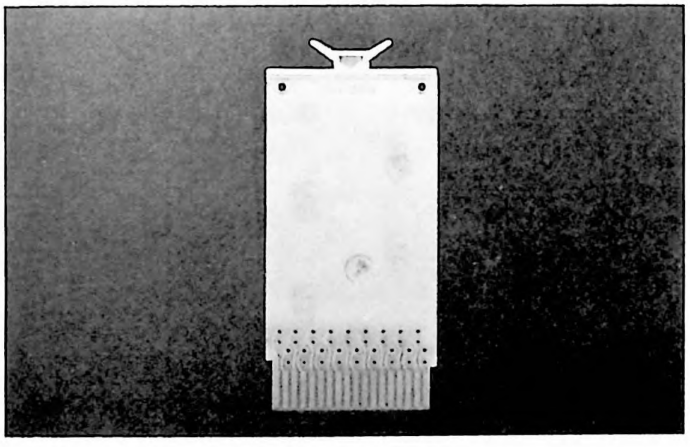
Part No.	Type	Contact Fingers	Size	Description
W9721	Copper-clad	72	Double-height, extended length	Same as W9720 except double-height and has two attached handles.
W9722	Copper-clad	144	Quad-height, extended length	Same as W9720 except quad-height and has four attached handles.
W973	Copper-clad	72	Double-height, standard length	Same as W972 except double-height.
W974	Perforated	36	Single-height, standard length	Perforated board with 36 plated-through holes in the printed circuit etching to the contact fingers.
W975	Perforated	72	Double-height, standard length	Same as W974 except double-height and has 72 plated-through holes and two handles.
W990	Plain	18	Single-height, standard length	Bare board with 18 split-lug terminals. Printed circuit etching from the split-lugs to the contact fingers. This board has contact fingers on one side only.
W991	Plain	36	Double-height, standard length	Same as W990 except double-height and has 36 split-lug terminals and two handles.
W992	Copper-clad	18	Single-height, standard length	Same as W972 except copper-clad on one side only and has contact fingers on one side only.
W993	Copper-clad	36	Double-height, standard length	Same as W973 except copper-clad on one side only and has contact fingers on one side only.
W998	Perforated	18	Single-height, standard length	Same as W974 except has 18 plated-through holes and has contact fingers on one side only.
W999	Perforated	36	Double-height, standard length	Same as W975 except has 36 plated-through holes and has contact fingers on one side only.



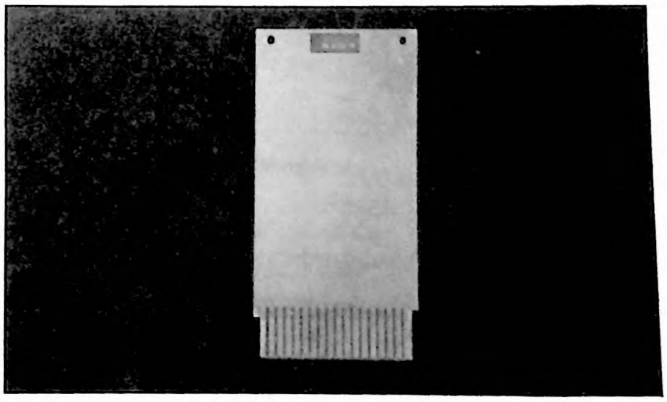
W930



W971

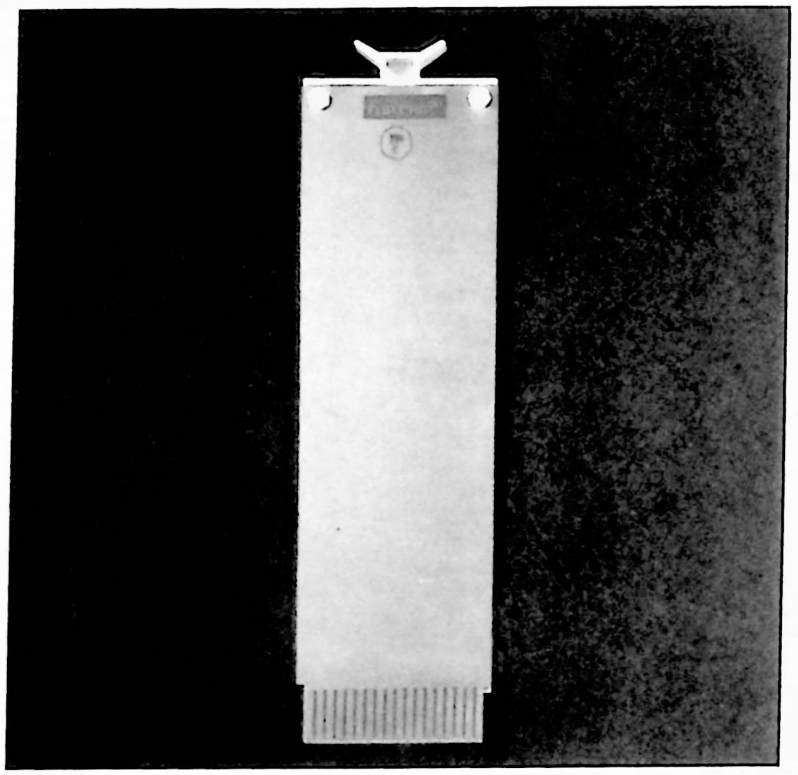


W970

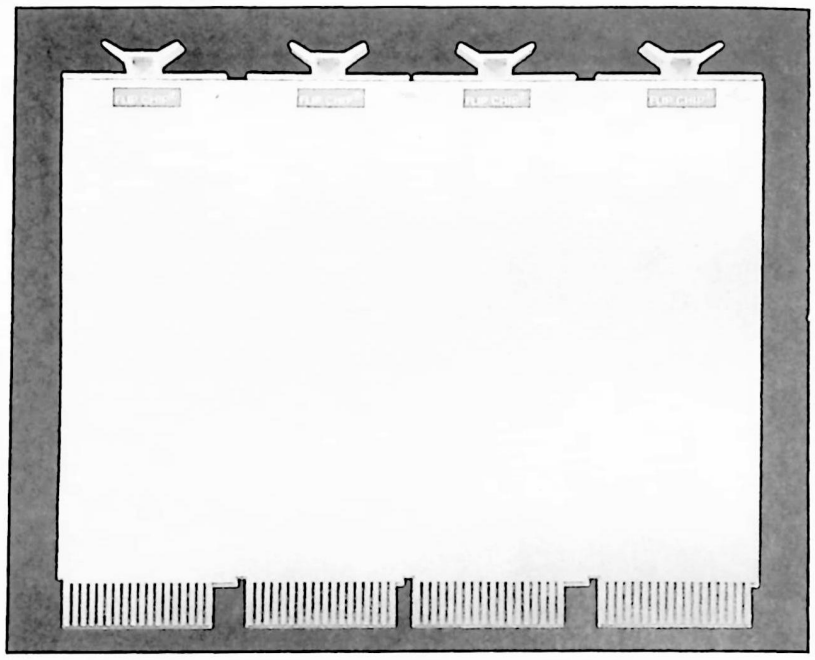


W972

BLANK MODULE BOARDS



W9720



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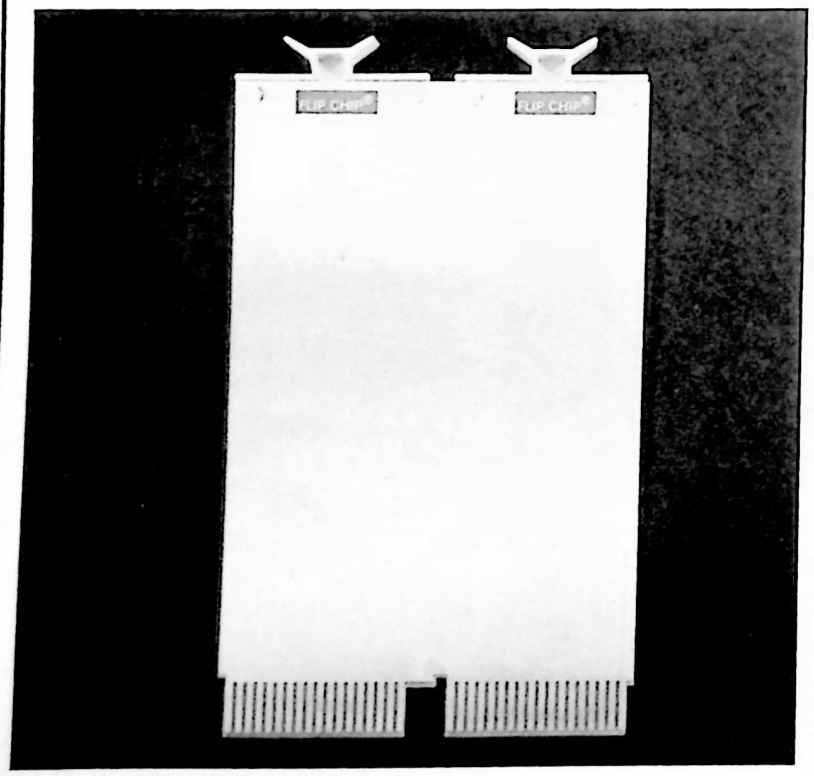
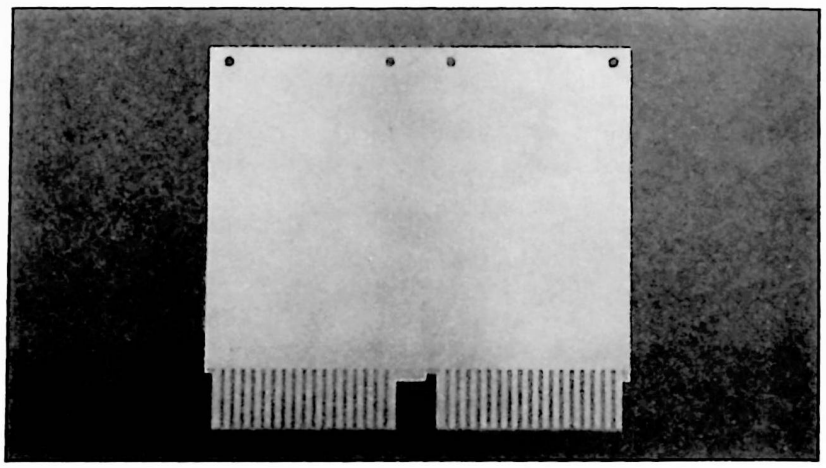
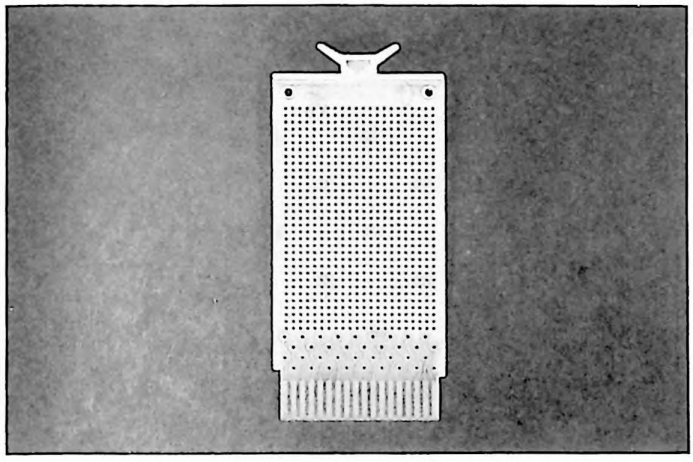


W9721

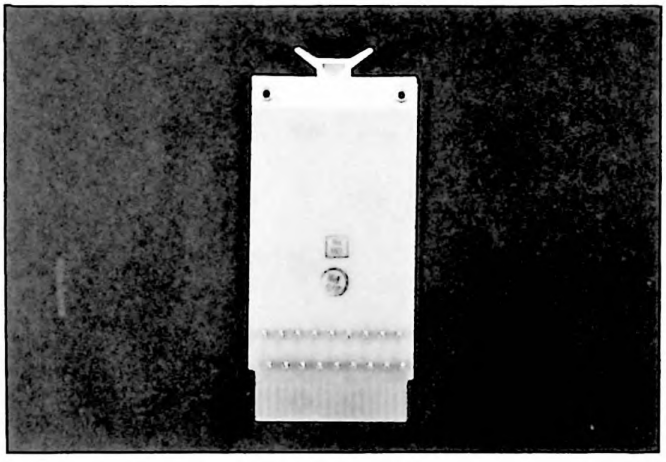


W973

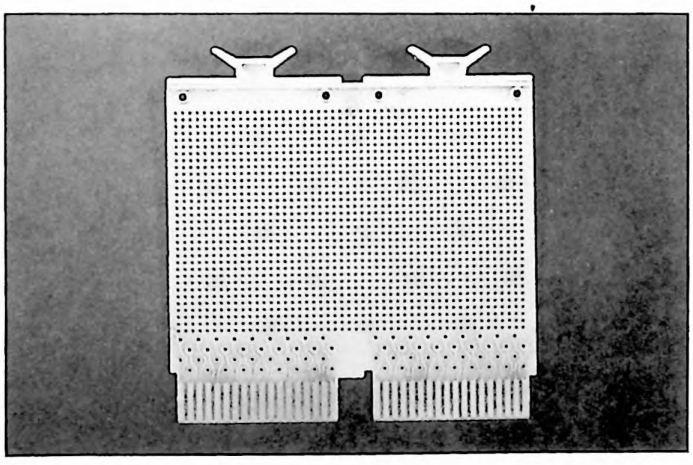
BLANK MODULE BOARDS



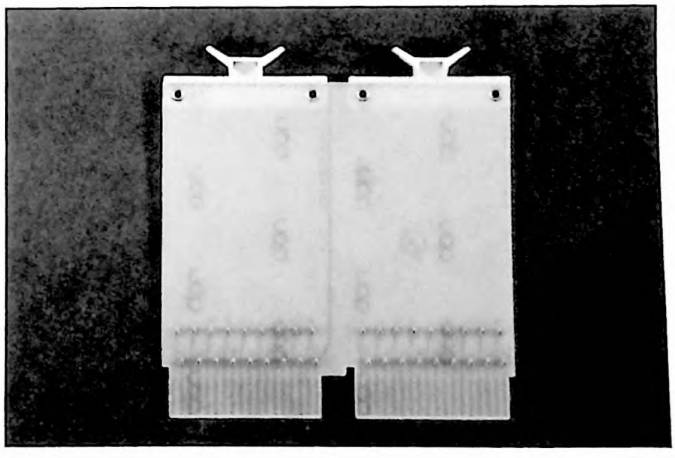
W974



W990

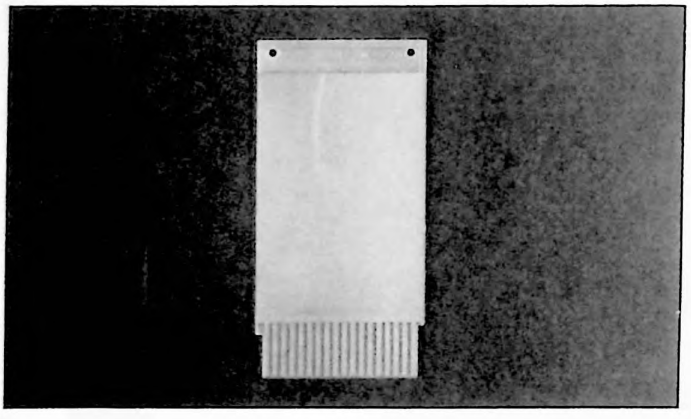


W975

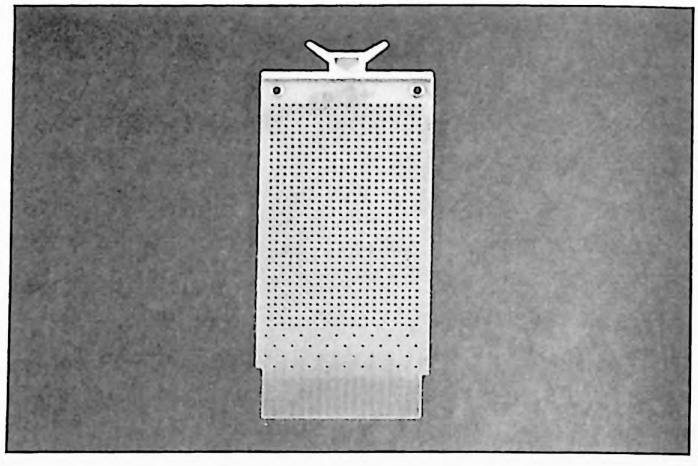


W991

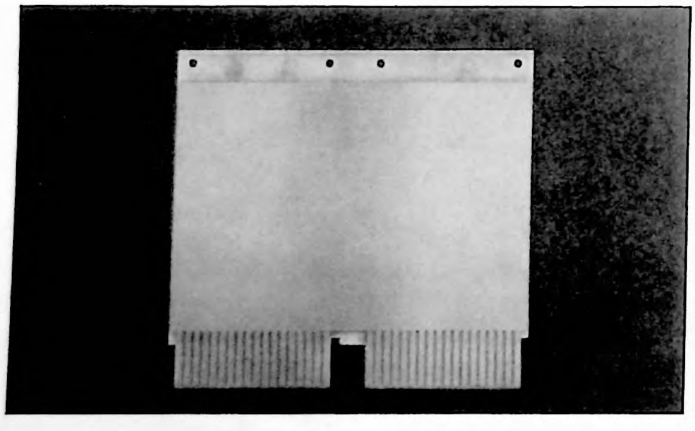
BLANK MODULE BOARDS



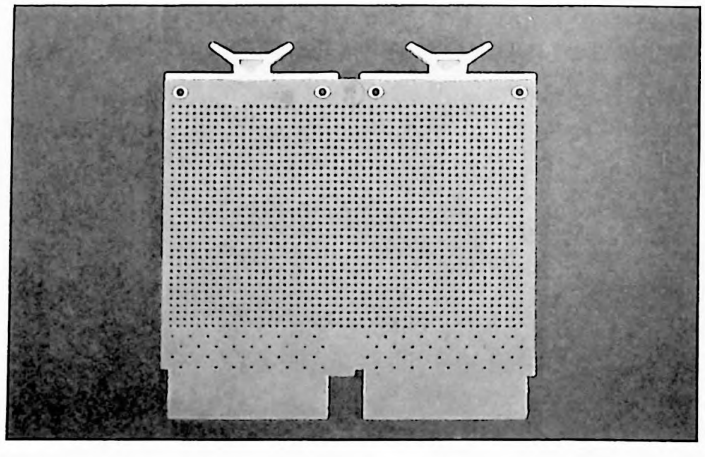
W992



W998



W993



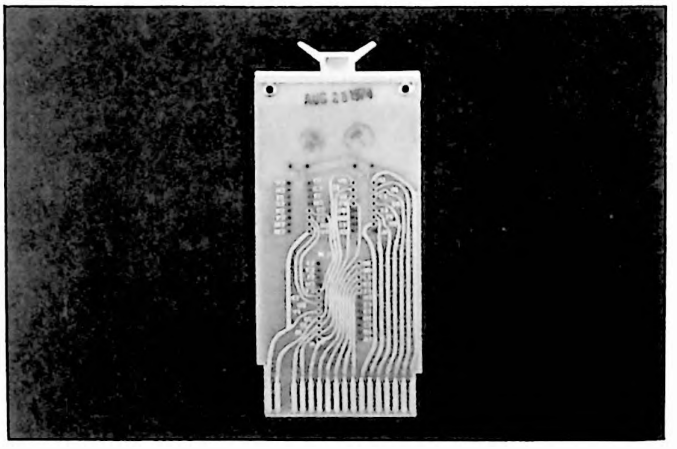
W999

BLANK MODULE BOARDS

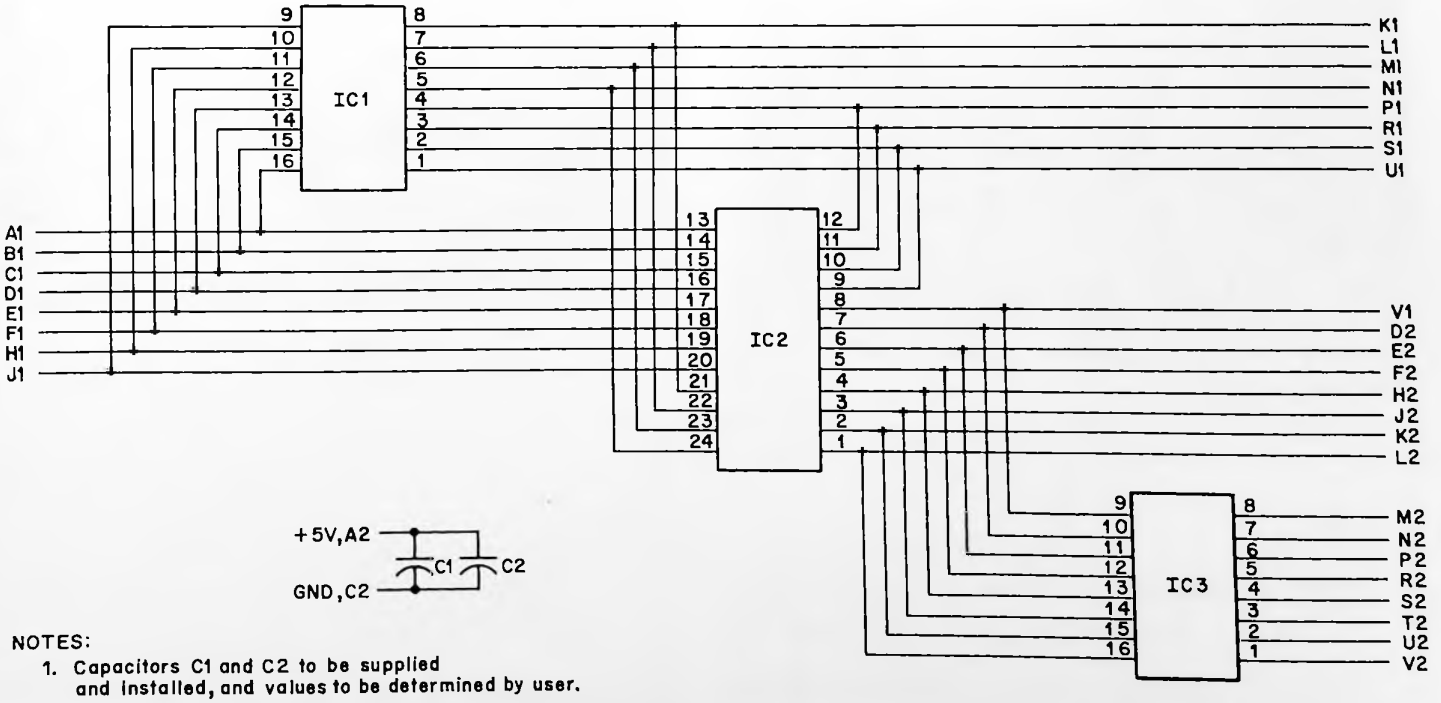
SPECIAL-PURPOSE BLANK MODULE BOARDS

Special-purpose blank module boards provide pre-etched mounting facilities for user-defined, supplied, and installed components. These special-purpose module boards are low-cost and ideal for prototype and limited-production runs of circuitry unique to each user. They are completely compatible with the standard module mounting blocks described in Section 2. These glass epoxy module boards have etched and gold-plated contact fingers and all have handles attached. The attached handles are stamped with their Digital Equipment Corporation identification number (part number).

MSI Module Board – W960



The W960 MSI Module Board is a single-height, standard length module board that can accommodate either two 14- or 16-pin dual-in-line package (DIP) integrated circuits (ICs) or one 24-pin DIP IC, either with or without sockets. All IC pin plated-through hole locations are identified with their associated board contact finger and are all brought out to the board contact fingers via printed circuit etching, as shown on the following schematic diagram.

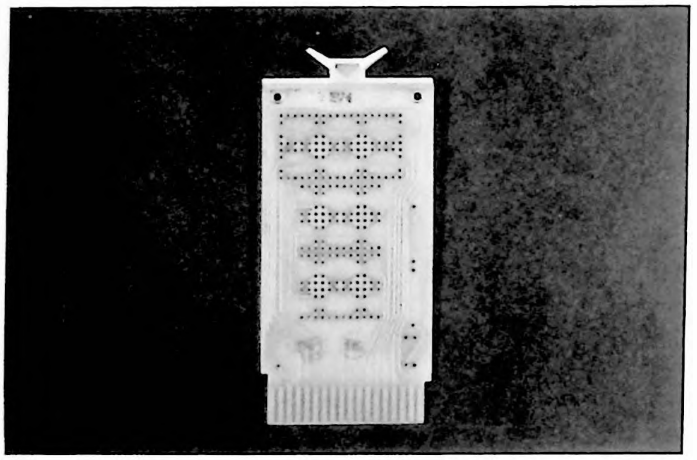


NOTES:

1. Capacitors C1 and C2 to be supplied and installed, and values to be determined by user.
2. Integrated circuits IC1 and/or IC2 or IC3 to be supplied and installed by user.

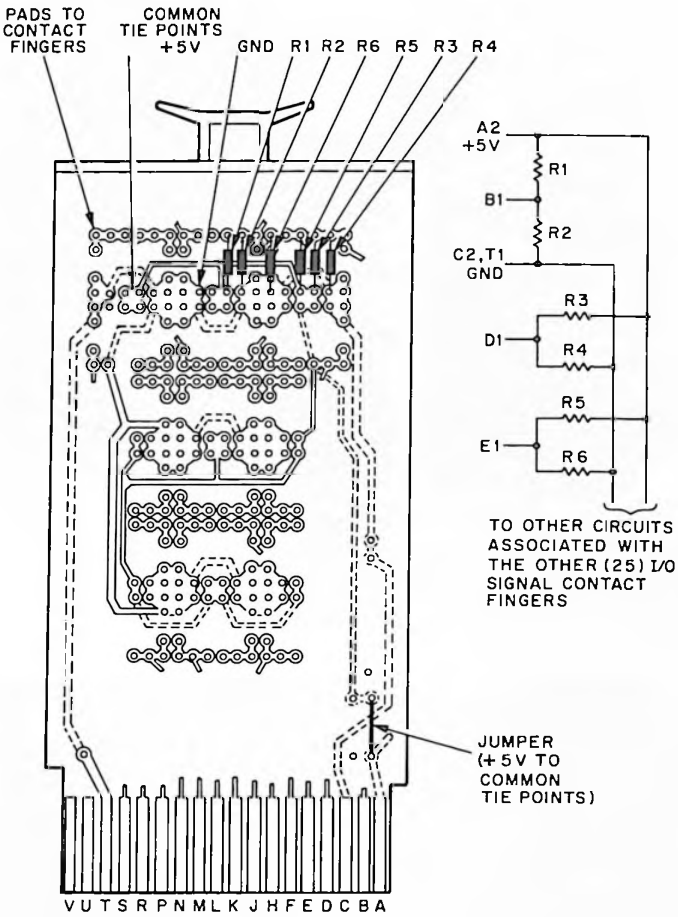
CP-1268

Universal Terminator Board — W964



The W964 Universal Terminator Board is a single-height, standard length module. It is an etched and drilled module that can be used for mounting user-selected and user-supplied discrete components to provide a variety of termination or voltage source circuits for up to 28 signal pins. Each signal pin can have two components connected to ground and one component connected to a common tie point. Any discrete component can be mounted on the W964 if the physical size is approximately the size of a 1/4-W resistor or disk capacitor. Three typical pull-up/termination network circuits are illustrated on the following component layout and schematic diagram.

The 28 contact fingers (signal pins) that can be used for I/O signals are B1, D1, E1, F1, H1, J1, K1, L1, M1, N1, P1, R1, S1, D2, E2, F2, H2, J2, K2, L2, M2, N2, P2, R2, S2, T2, U2, and V2. The pads associated with the contact fingers are identified on the boards to facilitate mounting the discrete components. Contact fingers A2 and B2* are dedicated to voltage. Contact fingers C2 and T1 are dedicated to ground.



NOTES:

1. All PC etch not shown; of that shown, side 1 etch shown with solid lines and side 2 etch shown with dashed lines.
2. Resistance values to be determined by user.
3. Resistors to be supplied by user.
4. Pull-up/termination network schematic diagram shows three typical networks (to contact fingers B1,D1, and E1)

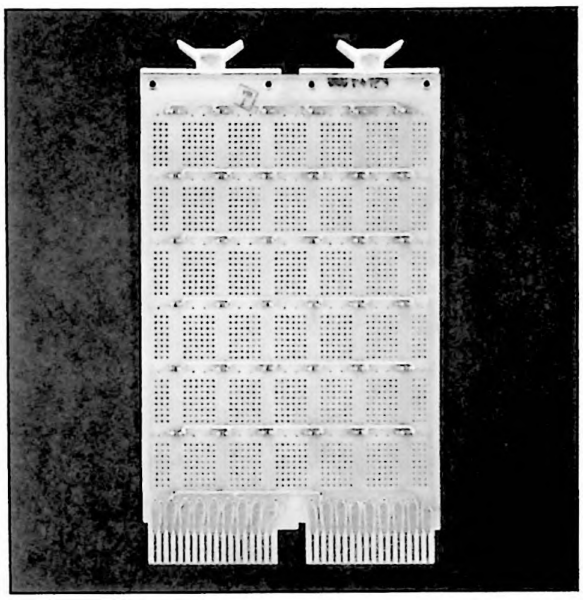
CP-1269

W964 Component Layout Diagram
and Pull-Up Termination Schematic Diagram

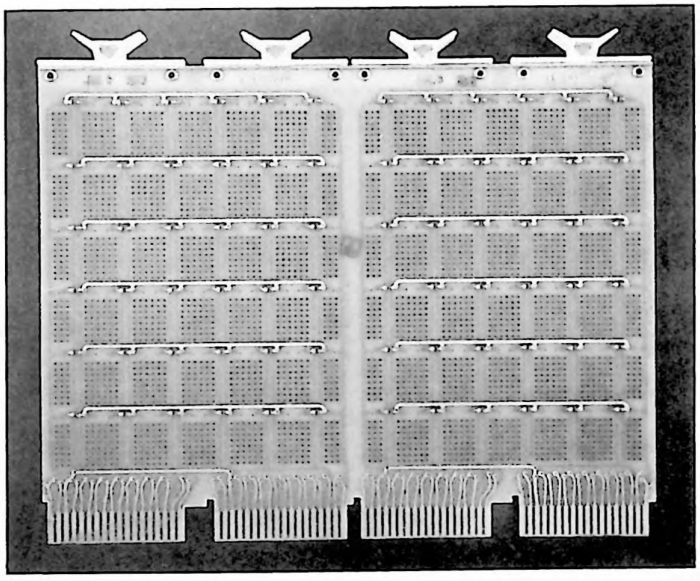
*In many systems, contact finger B2 is bused to −15 V.

COLLAGE MODULE BOARDS

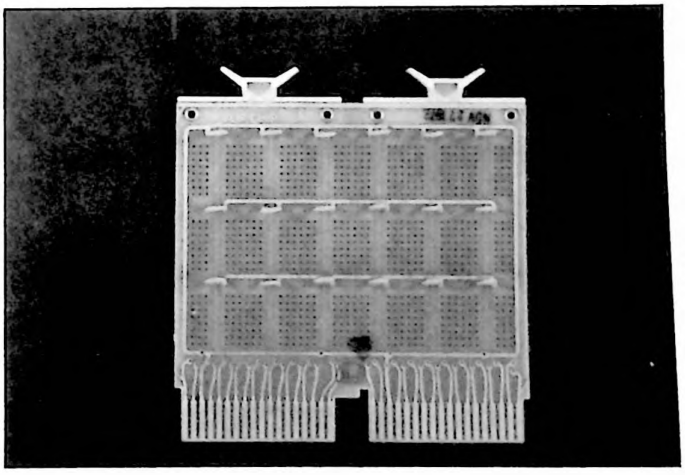
Collage module boards provide a convenient, low-cost method of producing prototype or limited runs of production modules with special circuitry that uses 14- or 16-pin dual-in-line package (DIP) integrated circuits (ICs), with or without wire wrap sockets and/or solder sockets. These different configurations are described in the table that follows. Collage module boards are completely compatible with the standard module mounting blocks described in Section 2. These glass epoxy modules have +5 Vdc power and ground bused (printed circuit etch tracks) to plated-through holes at each IC location to facilitate connection of V_{cc} and ground to the appropriate IC pin. W968 contact fingers AA2, BC2, CA2, and DA2 are dedicated to +5 Vdc and contact fingers AC2, AT1, BC2, BT1, CC2, CT1, DC2, and DT1 are dedicated to ground. W969 and W979 contact fingers AA2 and BA2 are dedicated to +5 Vdc and contact fingers AC2, AT1, BC2, and BT1 are dedicated to ground.



W969



W968



W979

Collage Module Boards

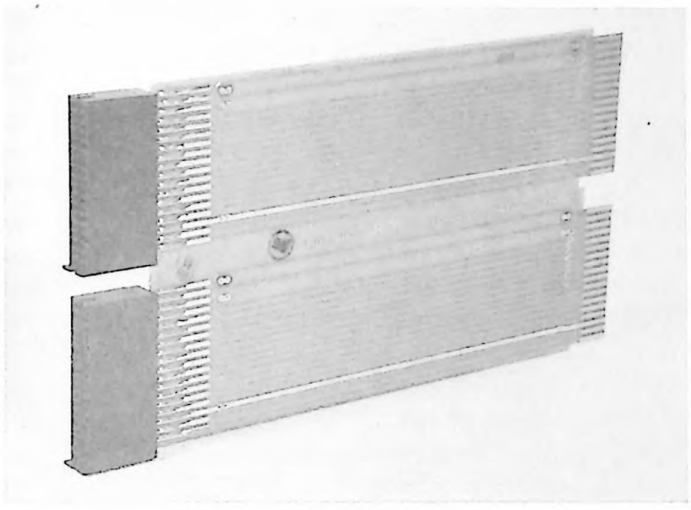
Part No.	Contact Fingers	Size	Description
W968	144	Quad-height, extended length	Accommodates up to seventy-two 14- or 16-pin DIP ICs with or without wire wrap sockets and/or solder sockets.
W969	72	Double-height, extended length	Same as W968 except accommodates 36 ICs.
W979	72	Double-height, standard length	Same as W968 except accommodates 18 ICs.

MODULE EXTENDER BOARDS

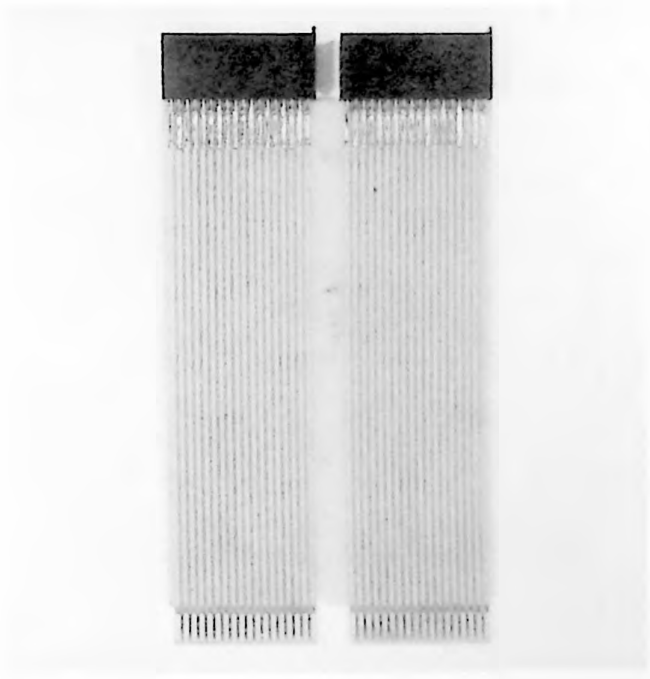
Module extender boards are usually used to extend system modules for test and/or maintenance. Module extender boards permit access to the system module circuits and components without breaking tlie electrical connections between the system module and the backplane or mounting panel wiring. Extended length module extender boards should be used when the system comprises extended length system modules. Double-height and quad-height module extender boards should be used when the system module to be extended is double or quad high; however, two single-height module extender boards could be used to extend a double-height system module, or two double-height (or four single-height) module extender boards could be used to extend a quad-height system module. The following table describes the module extender boards. The board contact fingers connect directly to the connector socket pins on a 1:1 basis except as noted in the "Description" column of the table.

Module Extender Boards

Part No.	Contact Fingers	Size	Description
W900	72	Double-height, extended length	Used in systems comprising extended length modules to extend a double-height, 72-pin module with +5 Vdc power at contact fingers AA2 and BA2 and with ground at contact fingers AC2, BC2, AT1, and BT1, i.e., most double-height M-series modules. This is a multilayer module: layer 2 is the ground plane and layer 3 is the +5 Vdc power plane.
W980	18	Single-height, standard length	Used in systems comprising standard length modules to extend a single-height, 18-pin (one side only) module, i.e., most A-, K-, and W-series modules. None of the contact fingers are interconnected.
W982	36	Single-height, standard length	Used in systems comprising standard length modules to extend a single-height, 36-pin module, i.e., single-height M-series modules. None of the contact fingers are interconnected.
W983	72	Double-height, standard length	Used in systems comprising standard length modules to extend a double-height, 72-pin module, i.e., double-height M-series modules. None of the contact fingers are interconnected.
W984	72	Double-height, extended length	The same as W983 except the W984 is an extended length module extender board and should be used to extend a system module located beside one, or between two, extended length modules.
W987	144	Quad-height, extended length	The same as W984 except the W987 is a quad-height module extender board and should be used to extend quad-height (144-pin) modules.

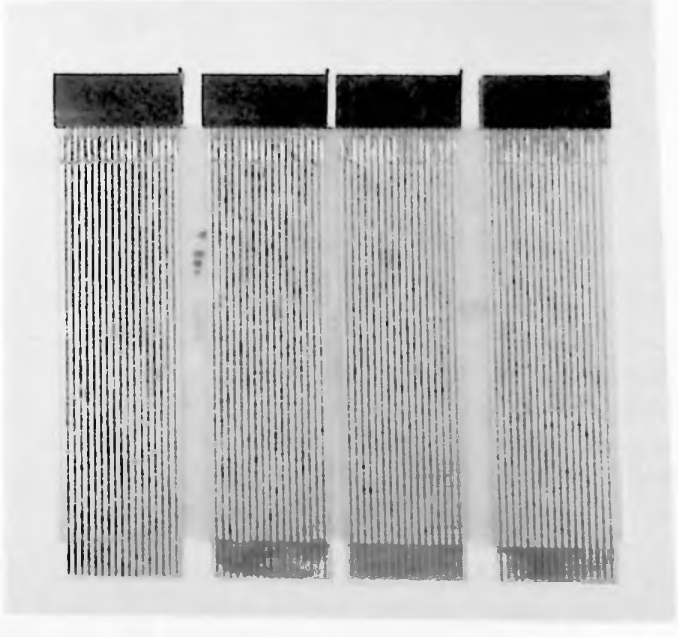


W900

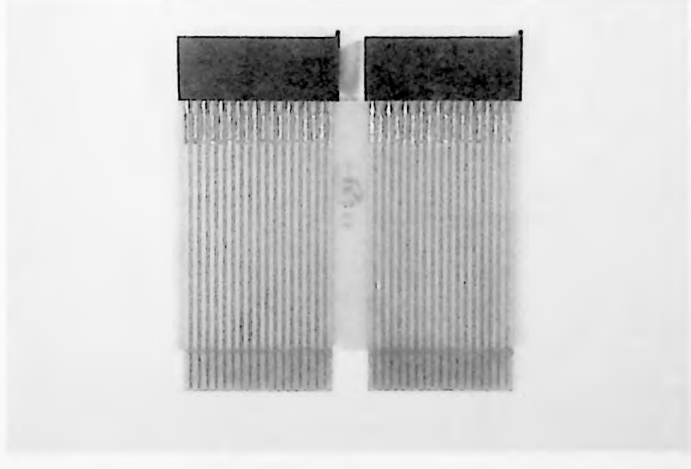


W984

W980



W987



W983

INTEGRATED CIRCUIT (IC) SOCKETS

IC Sockets – 953, 954

953

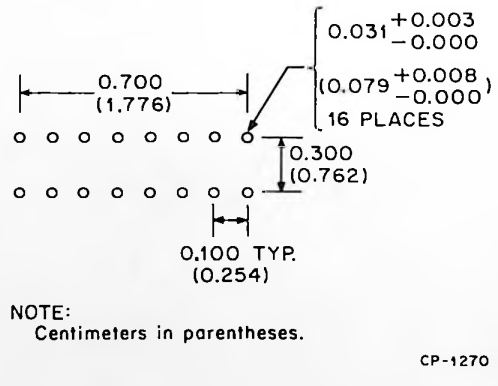
954

The 953 and 954 integrated circuit (IC) sockets provide low-cost, reliable production packaging of 14- or 16-pin, dual-in-line package (DIP) integrated circuits (ICs). These low-profile IC sockets are especially useful for limited-production runs of special, user-designed circuitry using the blank or wire wrappable module boards (described in this section), which are available without factory-installed IC sockets. IC sockets 953 and 954 are available in packages of ten ICs per package.

The 953 IC socket is fabricated from nylon and has 16 beryllium copper contacts, gold over nickel plating, with wire wrap pins. The contacts are rated at 1.0 A max per contact and have a ganged IC retention force of 1 lb (0.454 kg) min. IC engagement force is 10 lb (4.54 kg) max. The wire wrap pins are 0.025/0.026 in. (0.064/0.066 cm) square and 0.650 in. (1.651 cm) long. Interlead capacitance is 0.6 pF max at 1 MHz. The 953 accepts 0.015 in. (0.038 cm) max by 0.030 in. (0.076 cm) max rectangular IC leads. The 953 is 0.830/0.855 in. (2.101/2.172 cm) long and 0.450/0.480 in. (1.143/1.212 cm) wide overall. It occupies 0.236 in. (0.599 cm) max of space when installed on a PC board; however, an IC, when installed, is seated 0.1555 in. (0.394 cm) max above the PC board.

The 954 IC socket is fabricated from nylon and has 16 beryllium copper contacts, gold over nickel plating, with solder tail pins. The contacts are rated at 1.0 A max per contact, and have a ganged IC retention force of 1 lb (0.454 kg) min. IC engagement force is 10 lb (4.54 kg) max. The solder tail pins are 0.025/0.026 in. (0.064/0.066 cm) by 0.0065/0.0067 in. (0.0165/0.0170 cm), and 0.115/0.140 in. (0.292/0.356 cm) long. Interlead capacitance is 0.6 pF max at 1 MHz. The 954 accepts 0.015 in. (0.038 cm) max by 0.030 in. (0.076 cm) max rectangular IC leads. The 954 is 0.830/0.855 in. (2.101/2.172 cm) long and 0.450/0.480 in. (1.143/1.212 cm) wide overall. It occupies 0.236 in. (0.599 cm) max of space when installed on a PC board; however, an IC, when installed, is seated 0.155 in. (0.394 cm) max above the PC board. Standoff tabs on the base of the 954 body enable solder flux to be easily flushed.

The following mounting hole layout diagram illustrates the PC board drilling code for the 953 and 954 IC sockets.



953 and 954 IC Socket
Mounting Hole Layout Diagram

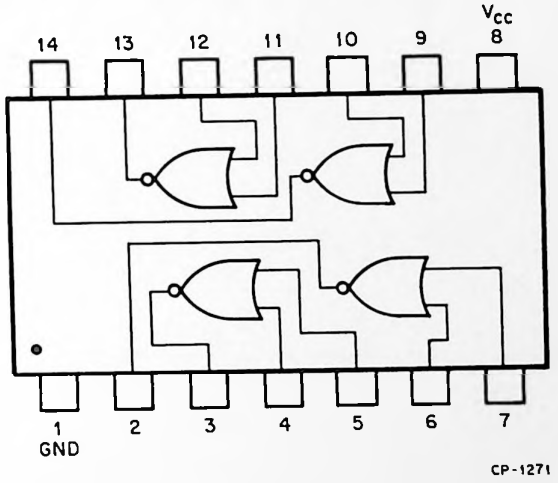
INTEGRATED CIRCUITS (ICs)

Digital Equipment Corporation offers a variety of special ICs. These ICs are described in the following paragraphs.

DEC8640 Unibus Receiver IC (Quad 2-Input NOR Gates) — 956

The 956 is a package of ten 14-pin, dual-in-line package (DIP) DEC8640* integrated circuits (ICs). Each IC comprises four 2-input NOR gates. (See the pin layout and equivalent logic diagram.) Each gate performs the Boolean function $\overline{X} = A + B$. The DEC8640 gates are especially suitable as Unibus receivers because of their high impedance characteristics and, hence, minimal loading on the bus.

The electrical characteristics of the DEC8640 gates are listed in the table that follows.

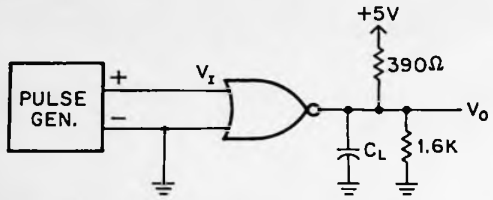


DEC8640 IC Pin Layout and Equivalent Logic Diagram (Quad 2-Input NOR Gates)

*DEC8640 IC replaces DEC380 IC.

DEC8640 Unibus Receiver IC (Quad 2-Input NOR Gates) Characteristics

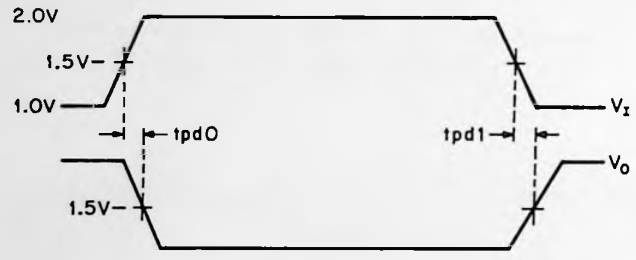
Characteristic	Test Parameters	Value
Supply Voltage (V_{cc})		4.75/5.25 V
Fan-out (each output)		16.0 mA
Input High Voltage	I_O = 20.0 mA, V_{cc} = 5.25 V	1.70 V min
Input Low Voltage	I_O = -2.0 mA, V_{cc} = 5.25 V	1.47 V max
Output High Voltage	V_I = 1.30 V, V_{cc} = 4.75 V	2.40 V min
Output Low Voltage	V_I = 1.70 V, V_{cc} = 5.25 V	0.4 V max
Input High Current	V_I = 3.80 V, V_{cc} = 5.25 V	80.0 μA max
Input High Current	V_I = 3.80 V, V_{cc} = 0 V	80.0 μA max
Input Low Current	V_I = 0.0 V, V_{cc} = 5.25 V	-10.0 μA max
Propagation Delay Time to Logical Low Level	See test setup diagram C_L = 15 pF C_L = 50 pF	 10.0 ns min, 30.0 ns max 10.0 ns min, 35.0 ns max
Propagation Delay Time to Logical High Level	See test setup diagram C_L = 15 pF C_L = 50 pF	 10.0 ns min, 30.0 ns max 10.0 ns min, 35.0 ns max



PW = 100ns
tr, tf ≤ 10ns
f = 1mHz
V_{CC} = 5.00V

CP-1315

DEC8640 Test Setup Diagram



RISE TIME = 10ns
FALL TIME = 10ns
PULSE WIDTH = 100ns

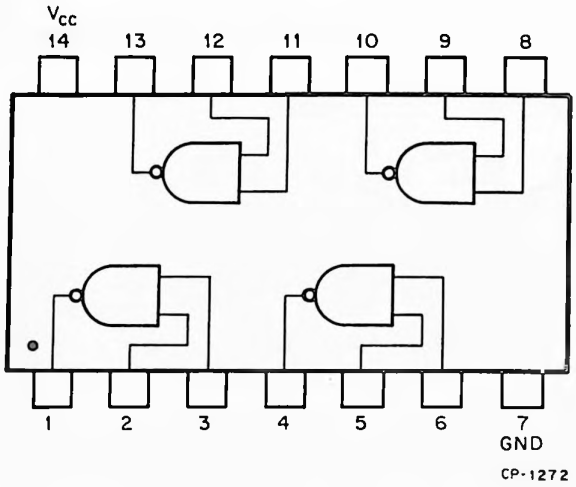
CP-1316

DEC8640 Propagation Time Delay
Pulse Shapes

DEC8881-1 Unibus Driver IC (Quad 2-Input NAND Gates) – 957

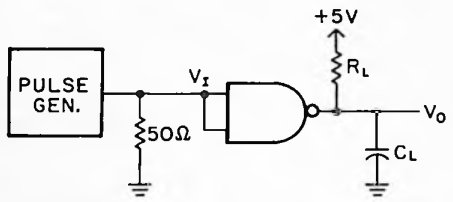
The 957 is a package of ten 14-pin, dual-in-line package (DIP) DEC8881-1 integrated circuits (ICs). Each IC comprises four 2-input NAND gates. (See the pin layout and equivalent logic diagram.) Each gate performs the Boolean function $\overline{X} = AB$. The DEC8881-1 ICs are especially suitable as Unibus drivers because of their capability to sink 70 mA with a collector voltage of less than 0.8 V. The DEC8881-1 has an open-collector output.

The following table lists the electrical characteristics of the DEC8881-1 gates.



CP-1272

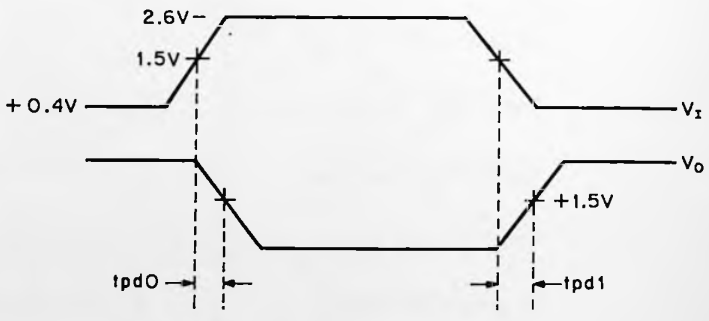
DEC8881-1 Unibus Driver IC Pin Layout
and Equivalent Logic Diagram
(Quad 2-Input NAND Gate)



PW = 100ns
tr, tf = ≤ 10ns
f = 1mHz
V_{CC} = 5.00V

CP-1313

DEC8881-1 Setup Diagram



RISE TIME = 10ns
FALL TIME = 10ns
PULSE WIDTH = 100ns

CP-1314

DEC8881-1 Propagation Time Delay
Pulse Shapes

DEC8881-1 Unibus Driver IC (Quad 2-Input NAND Gates) Characteristics

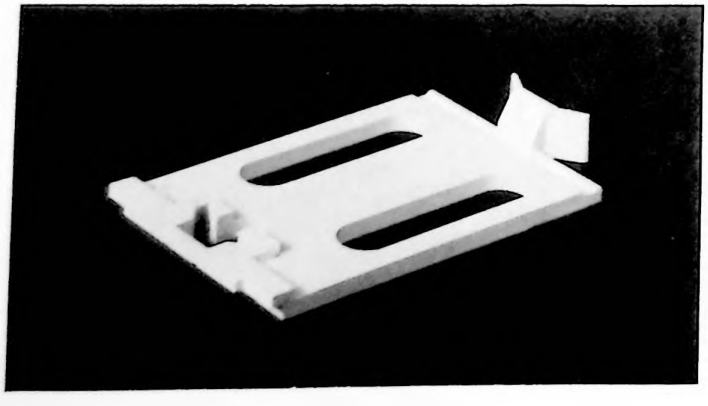
Characteristic	Test Parameters	Value
Supply Voltage (V_{cc})		4.75/5.25 V
Input High Voltage Required at Both Inputs to Ensure Logical Low Level at Output	I_{SINK} = 50 mA, V_{cc} = 4.75 V	2.0 V min
Input Low Voltage Required at Either Input to Ensure Logical High Level at Output	V_{cc} = 4.75 V	0.8 V max
Output Reverse Current	V_{IN} = 0.8 V, V_{OUT} = 3.5 V, V_{cc} = 4.75 V	25.0 μA max
Logical Low Output Voltage	V_{IN} = 2.0 V, I_{SINK} = 70 mA, V_{cc} = 4.75 V	0.8 V max
Logical Low Input Current (each input)	V_{IN} = 0.4 V, V_{cc} = 5.25 V	-1.6 mA max
Propagation Delay Time to Logical Low Level	See test setup diagram C_L = 15 pF, R_L = 100 ohms	25 ns max
Propagation Delay Time to Logical High Level	See test setup diagram C_L = 15 pF, R_L = 3.9K ohms	35 ns max

MODULE HANDLES, MODULE HANDLE EXTENDERS, AND MODULE HOLDERS

Module Handle – 937

The 937 (90-08337-08) is a package containing 25 blank, gray module handles and the eyelets to attach them to modules. These blank handles are generally user-attached to prototype or limited-production run modules that utilize blank copper-clad or wire wrappable modules. The blank handles provide a convenient method of identifying the prototype or limited-production run modules because the user can put his own identification on the handle. The handles are compatible with the handles of all Digital Equipment Corporation standard A-, K-, M-, and W-series modules. They have two 0.128-in. (0.325-cm) diameter mounting holes spaced 2.00 in. (5.08 cm) center-to-center.

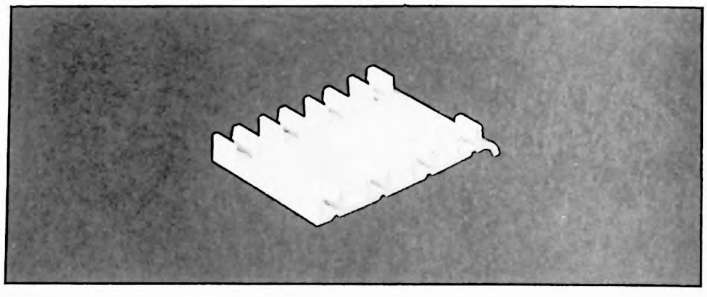
Module Handle Extender – H850



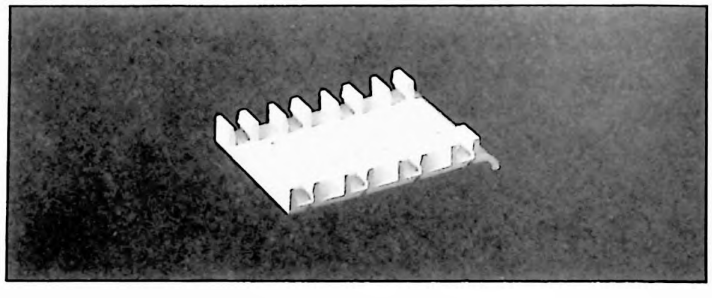
The H850 Module Handle Extender mounts over the handle of a single-height, single-length module and physically extends the length to make a single-length module congruous with extended length modules. The H850, in addition to making removal and insertion of single-length modules easier when the system predominantly utilizes extended length modules, adds to the appearance of the system by making the modules the same length.

The H850 is manufactured from durable, U.L. Standard No. 94 recognized material and is sized to fit over Digital Equipment Corporation's standard module handle. It is sold in lots of ten.

Module Holders – H852, H853



H852



H853

The H852 and H853 Module Holders are used to maintain rigidity of the modules in a system. Each module holder fits over the top (handle end) of modules of the same length in adjacent slots of a system unit. The H852, a ribbed type holder, fits between handles of modules in the same connector block; the H853, a nonribbed type holder, fits between the handles of modules in adjacent (end-to-end) connector blocks. For example, on quad-high modules, an H852 fits between handles 1 and 2, an H853 fits between handles 2 and 3, and an H852 fits between handles 3 and 4.

The H852 and H853 are manufactured from durable, plastic-like material that is nonconductive. They are sold in lots of 25 each.

TERMS AND CONDITIONS

Prices

All prices listed herein apply only within the continental U.S.A. and Canada, are based on delivery FOB DIGITAL's plant, and are subject to DIGITAL's Standard Terms and Conditions, including the return-to-factory warranty set forth below (or as may be set forth in modified form in an effective discount agreement).

Volume Discount Schedule – The following discount schedule is based on total dollar value of the order at list prices (for all items except cabinets).

Aggregate List Price	Applicable Discount
$ 5,000 - 9,999	3%
10,000 - 19,999	5%
20,000 - 49,999	10%
50,000 - 99,999	15%
100,000 - 249,999	18%
250,000 - 499,999	20%
500,000 - 999,999	22%
$1,000,000 - And Over	25%

Cabinet Discount Schedule – The following discount schedule is for cabinet purchases only. The discount is computed from the total list price of cabinet parts purchased. On blanket purchase orders, minimum releases of 10 units (cabinets) or balance is required.

Sale in Dollars	Discount
$ 500 - 999	8%
1,000 - 1,499	12%
1,500 - 2,499	20%
2,500 - 4,999	25%
5,000 - 7,499	26%
7,500 - 9,999	28%
$10,000 - And Over	30%

Warranty

Warranty for Logic Products equipment listed in the current *Logic Handbook, Logic Products Price List,* and *Hardware/Accessories Catalog* is:

1. B, R, W, M, K, and A series modules are warranted as stated below for a period of one (1) year from date of shipment. H and non-catalog FLIP-CHIP modules, DECkits, data entry terminals, remote data acquisition systems, power supplies, cables, cabinets, labs, hardware, and accessories are warranted as stated below for a period of ninety (90) days from date of shipment.

2. All Logic Products equipment is warranted against defects in material and workmanship under normal and proper use and in their original unmodified condition. DIGITAL's sole obligation for equipment that is defective under the terms of this warranty is limited to repair or replacement (at its option) at its factory, at no charge to customer. All replaced equipment becomes the property of DIGITAL. As a condition of this warranty, the customer must obtain a DIGITAL Return Authorization Number from the local DIGITAL Sales Office and must return all equipment, prepaid, to:

   Digital Equipment Corporation
   Logic Products Services
   Repair Section
   One Iron Way
   Marlborough, Massachusetts 01752

   Transportation charges for the return to the customer shall be paid by DIGITAL within the continental U.S.A. and Canada and will be made on a UPS or Parcel Post insured basis. The warranty outside of the continental U.S.A. and Canada is limited to repair or replacement only and excludes all costs of shipping, customs clearance, and other related charges.

3. Premium methods of shipment are available at customer expense and will be used only when specifically requested. DIGITAL maintains a factory repair service for customer convenience and will repair equipment beyond the warranty at then current prices as long as repair components are available.

4. All the above warranties include the *Disclaimer of Warranties* clause as contained in DIGITAL's Standard Terms and Conditions.

PRODUCT INDEX

PRICE LIST

Part No.	Title	Price in U.S. Dollars
12-09154	Chassis Slides	25/pr
12-09224	Latch	1
12-09340-00	8-Pin Cable Connector (Female) Housing (2/pkg)	1/pkg
12-09340-01	8-Pin Cable Connector (Male) Housing (2/pkg)	1/pkg
12-09350-(all dash items)	Cable Connector (Female) Housing	1/pkg
12-09351-(all dash items)	Cable Connector (Male) Housing	1/pkg
12-09378-01	Male Connector Pins (8/pkg)	1/pkg
12-09379-01	Female Connector Pins (8/pkg)	1/pkg
12-09395	Inlay Strip, Light Grey	1
12-09703	Chassis Slides (Tilt)	52/pr
12-09764	Cable Clamp (5/pkg)	1/pkg
12-09774	Inlay Strip, Light Grey	1
12-09925	Cable Clamp (4/pkg)	1/pkg
12-10152-1	Connector Block	5
12-10945	Chassis Slides	19/pr
12-11046	Receptacle	8
12-11191	Receptacle	12
12-11194	Receptacle	24
12-11386	Thick Latch	1
17-00001-00	Cable, 9-Conductor Flat Coaxial	1/ft
17-00002-00	Cable, 19-Conductor Flat Mylar	1/ft
17-00002-01	Cable, 60-Conductor Flat Mylar	2/ft
17-00004-00	Cable, 40-Conductor Flat Mylar	2/ft
17-00012	Cable, 6-Conductor Round	0.50/ft
17-00018	Cable, 20-Twisted Pairs Round	2/ft
1907	Cover Panel	9
1945-19	Hold-Down Bar	20
29-15201	Touchup Paint, Black	3/can
29-15202	Touchup Paint, Grey (Bezel/68)	3/can
29-15205	Touchup Paint, Grey (End Panel/101)	3/can
55-08153-1	Mounting Panel Stacking Bar (Left)	7
55-08153-2	Mounting Panel Stacking Bar (Right)	7
55-08153-3	Mounting Panel Stacking Bar (Left)	7
55-08153-4	Mounting Panel Stacking Bar (Right)	10
74-06782	Kickplate	6
74-06793	Kickplate	10
74-07128	Inlay Strip, Marigold/Russet Orange (with DIGITAL logo)	12
74-07348-1	Inlay Strip, Copen Blue/Bright Orange	11
74-07348-2	Inlay Strip, Marigold/Russet Orange	9

Part No.	Title	Price in U.S. Dollars
74-07348-4	Inlay Strip, Chartreuse/Lime Peel	28
74-07348-6	Inlay Strip, Magenta/Bright Rose	32
74-07512	System Unit Mounting Frame Straps	4/pr
74-07513	System Unit Mounting Frame Straps	5/pr
74-07789	Spacer	1
74-07926-1	Inlay Strip, Magenta/Bright Rose	6
74-07926-2	Inlay Strip, Terra Cotta/Amber	12
74-09819	Key-Lock Strike Plate	1
861-A	Power Controller	300
861-B	Power Controller	300
861-C	Power Controller	300
90-06990	Cabinet Door Ground Strap	5
90-07786	Tinnerman Clip Nuts and Pan Head Screws	5/bag
90-08887	Cabinet Frame Ground Strap	5
91-05740	Wire Wrapping Wire, 30 AWG (1000 ft/spool)	60/spool
91-07470-44	Hookup (Solder) Wire, 24 AWG	0.30/ft
91-07575	Cable, 20-Conductor Flat Ribbon	0.60/ft
91-07688	Wire Wrapping Wire, 24 AWG (1000 ft/spool)	50/spool
91-07706	Cable, 4-Conductor Round	0.50/ft
913-(all dash items)	Patch Cords, 24 AWG	25/100
914-7	7-Inch Power Patch Cord (10/pkg)	4/pkg
914-19	19-Inch Power Patch Cord (10/pkg)	4/pkg
915	Patch Cords, 26 AWG	33/100
917-2.5	Daisy Chain	50
917-5	Daisy Chain	50
932	Bus Strip (5/pkg)	3/pkg
933	Bus Strip	1
934	Replaced by 91-07688	--
935	Replaced by 91-05740	--
937	Blank Module Handle (25/pkg)	7/pkg
939	Bus Strip (6/pkg)	9/pkg
940	Cable Clamp (25/pkg)	7/pkg
941	Cable Clamp (25/pkg)	7/pkg
943	Cable Clamp (25/pkg)	7/pkg
944	Cable Clamp (25/pkg)	7/pkg
953	Wire Wrap IC sockets (10/pkg)	12/pkg
954	Solder IC Sockets (10/pkg)	8/pkg
956	Integrated Circuit - Unibus Receiver (10/pkg)	26/pkg
957	Integrated Circuit - Unibus Driver (10/pkg)	19/pkg
BA11-ES	Expander Mounting Box	500
BB11	System Interfacing Unit	150
BB11-A	System Interfacing Unit	160

Part No.	Title	Price in U.S. Dollars
BB11-B	Double System Interfacing Unit	239
BC05H-6	Line Set	60
BC05J-6	Line Set	60
CAB-I	Cabinet Assembly (Short Size)	535
CAB-J	Cabinet Assembly (Short Size)	462
CAB-K	Cabinet Assembly (Short Size)	386
DD11-A	System Interfacing Unit	250
DD11-B	System Interfacing Unit	250
H001	Standoff Bracket	7/pr
H002	Standoff Bracket	15/pr
H014	Mounting Panel	20
H019	Expander Frame	35
H020	Connector Block Mounting Frame	15
H021	Standoff End Plate (Right)	7
H022	Standoff End Plate (Left)	20
H024	Standoff End Plate (Right)	7
H025	Standoff End Plate (Left)	20
H033	System Unit Mounting Frame	8
H034	Double System Unit Mounting Frame	15
H035	Vertical System Unit Mounting Frame	20
H322	Distribution Panel	150
H704-A	Power Supply (±15 Vdc)	325
H707	Power Supply (±15 Vdc)	430
H710	Power Supply (+5 Vdc)	190
H716	Power Supply (+5 Vdc, -15 Vdc)	160
H720-C	Power Supply (+5 Vdc, -15 Vdc, +8 Vdc, -25 Vdc)	645
H720-D	Power Supply (+5 Vdc, -15 Vdc, +8 Vdc, -25 Vdc)	645
H720-E	Power Supply (+5 Vdc, -15 Vdc, +8 Vdc, -22 Vdc)	645
H720-F	Power Supply (+5 Vdc, -15 Vdc, +8 Vdc, -22 Vdc)	645
H721	Power Supply (+5 Vdc, -15 Vdc, +10 Vdc)	800
H722	Step-Down Transformer	100
H726-B	Power Supply (+5 Vdc)	215
H740-D	Power Supply (+5 Vdc, -15 Vdc, +15 Vdc)	540
H800-F	Connector Block (Solder-Fork Pins)	9
H800-W	Connector Block (Wire Wrap Pins)	9
H801-F	Replacement Contacts for H800-F (18/pkg)	2/pkg
H801-W	Replacement Contacts for H800-W (18/pkg)	2/pkg
H802	Connector Block (18-Pin)	4
H803	Connector Block (288-Pin)	14
H8030	Connector Block (72-Pin)	6
H805	36 Replacement Contacts (for H803, H863)	4/pkg
H807	Connector Block (36-Pin)	5

Part No.	Title	Price in U.S. Dollars
H808	Connector Block (144-Pin)	12
H809	36 Replacement Contacts (for H808)	4
H810(24)	Wire Wrap Tool Kit for 24 AWG Wire	99
H810-A	Wire Wrap Tool Kit for 30 AWG Wire	130
H810-B	Wire Wrap Tool Kit for 24 and 30 AWG Wire	160
H810-C	Wire Wrap Gun with Bit for 24 AWG Wire	150
H810-D	Wire Wrap Gun with Bit for 30 AWG Wire	150
H810-E	Wire Wrap Gun	130
H811(24)	Hand Wire Wrapping Tool for 24 AWG Wire	35
H811-A	Hand Wire Wrapping Tool for 30 AWG Wire	35
H812(24)	Hand Wire Unwrapping Tool for 24 AWG Wire	10
H812-A	Hand Wire Unwrapping Tool for 30 AWG Wire	12
H813(24)	Wire Wrap Gun Bit for 24 AWG Wire	30
H813-A	Wire Wrap Gun Bit for 30 AWG Wire	30
H814(24)	Wire Wrap Gun Sleeve for 24 AWG Wire	21
H814-A	Wire Wrap Gun Sleeve for 30 AWG Wire	21
H820	Grip-Clip Connectors for 24 AWG Wire	48/1000
H821	Grip-Clip Connectors for 30 AWG Wire	98/1000
H825	Hand Crimping Tool for H820	146
H826	Hand Crimping Tool for H821	210
H850	Module Handle Extender	10/10
H851	Edge Connector	15
H852	Module Holder	7/25
H853	Module Holder	7/25
H854	I/O Connector (Male)	12
H856	I/O Connector (Female)	8
H863	Connector Block (288-Pin)	14
H904-A	Horizontal System Unit Mounting Enclosure	*
H905-A	Horizontal System Unit Mounting Enclosure	*
H906	Vertical System Unit Mounting Enclosure	*
H907-A	Horizontal System Unit Mounting Enclosure	*
H909-A	System Unit Drawer	150
H909-BA	System Unit Drawer	625
H911-J	Mounting Panel	180
H911-K	Mounting Panel	170
H911-R	Mounting Panel	160
H911-S	Mounting Panel	170
H913	Mounting Panel	270
H914	Mounting Panel	125
H916	Mounting Panel	270
H917	Mounting Panel	260

*Contact Sales Support Manager, Logic Products, for pricing information.

Part No.	Title	Price in U.S. Dollars
H9190	Expander Panel	250
H920	Module Drawer	225
H921	Front Panel	15
H923	Chassis Slides	85/pr
H925	Module Drawer	250
H930	System Unit Drawer	300
H933-A	System Unit	39
H933-B	System Unit	39
H933-C	System Unit	54
H933-CA	System Unit	55
H933-CB	System Unit	55
H933-D	System Unit	42
H934-CB	Double System Unit	232
H941-AA	Mounting Panel Frame	175
H941-BA	8-Inch Deep Cover for H941-AA	70
H941-BB	11.4-Inch Deep Cover for H941-AA	80
H950-AA	Cabinet Frame (Standard Size)	163
H950-BA	Full Door (RH)	47
H950-CA	Full Door (LH)	47
H950-DA	Mounting Panel Door Frame (RH)	47
H950-EA	Mounting Panel Door Frame (LH)	47
H950-FA	Mounting Frame Door Skin	25
H950-G	Cabinet Table	85
H950-HA	Short Door	48
H950-HB	Short Door	48
H950-HC	Short Door	48
H950-HD	Short Door	60
H950-HE	Short Door	60
H950-HF	Short Door	65
H950-HG	Short Door	65
H950-HH	Short Door	60
H950-HJ	Short Door	60
H950-HK	Short Door	65
H950-JA	Short Door	60
H950-JE	Short Door	60
H950-LA	Logo Frame Panel (Aluminum)	12
H950-LB	Logo Frame Panel (Plastic)	9
H950-PA	Bezel Cover Panel	11
H950-QA	Bezel Cover Panel	14
H950-SA	Filter	4
H952-AA	End Panel	65
H952-BA	Stabilizer Feet	32/pr

Part No.	Title	Price in U.S. Dollars
H952-CA	Fan Assembly (115 Vac)	48
H952-CB	Fan Assembly (230 Vac)	48
H952-EA	Casters (4/set)	10/set
H952-FA	Levelers (4/set)	2/set
H952-GA	Filler Strip Set	55/set
H952-HA	Free-Standing Table	130
H957-AA	Cabinet Frame (Short Size)	160
H957-BA	Full Door	60
H957-CA	Full Door	60
H957-DA	Mounting Panel Door Frame (RH)	45
H957-EA	Mounting Panel Door Frame (LH)	45
H957-FA	End Panel (Right)	63
H957-FB	End Panel (Left)	63
H957-GA	Filler Strip Set	50/set
H957-HA	Fan Assembly (115 Vac)	70
H957-JA	Cover Plate (Bottom)	15
H957-LA	Logo Frame Panel (Aluminum)	20
H957-SA	Filter	4
H960-BC	Cabinet Assembly (Standard Size)	800
H960-BD	Cabinet Assembly (Standard Size)	800
H960-CA	Cabinet Assembly (Standard Size)	800
H960-CB	Cabinet Assembly (Standard Size)	700
H961-A	Cabinet Assembly (Standard Size)	500
H961-AA	Cabinet Assembly (Standard Size)	500
H961-AB	Cabinet Assembly (Standard Size)	500
H967-BA	Cabinet Assembly (Short Size)	800
H967-BB	Cabinet Assembly (Short Size)	800
H970-BA	Free-Standing Table	200
H970-CA	Free-Standing Table	200
K940	Mounting Support	7
K941	Mounting Bracket	6
K943-R	Mounting Panel	116
K943-S	Mounting Panel	116
K980	Standoff End Plates	6/pr
K981	Standoff End Plates	7/pr
M901	Cable Connector	15
M903	Cable Connector	10
M904	Cable Connector	10
M908	Cable Connector	10
M9100	Adapter (H854-to-H854) Connector	30
M912	I/O Bus Cable Connector	25
M915	Cable Connector	30

Part No.	Title	Price in U.S. Dollars
M917	Cable Connector	10
M918	Cable Connector	10
M919	Unibus Cable Connector	10
M920	Unibus Connector Module	45
M922	Cable Connector	6
M925	Cable Connector	9
M926	Cable Connector	27
M927	Cable Connector	6
M929	Unibus Cable Connector	30
M933	Cable Connector	17
M935	Omnibus Connector Module	45
M936	Cable Connector	15
M937	Cable Connector	15
M943	Cable Connector	6
M945	Cable Connector	20
M946	Cable Connector	20
M953	Cable Connector	25
M954	Cable Connector	27
M955	Cable Connector	27
M957	Cable Connector	21
M959	Cable Connector	10
M960	TU56-TD8-E Command Cable Connector	45
M961	TU56-TD8-E Data Cable Connector	45
M971	Cable Connector	30
M972	Cable Connector	30
M973	TTY Cable Connector	30
M975	FLIP CHIP-to-H854 Adapter	35
M976	Unibus Cable Connector	18
M981	Internal Unibus Terminator Module	90
M983	RK05 Disk Drive Cable Connector	14
W011	Cable Connector	6
W018	Cable Connector	9
W020	Cable Connector	8
W021	Cable Connector	6
W022	Cable Connector	6
W023	Cable Connector	6
W024	Cable Connector	10
W027	Cable Connector	7
W028	Cable Connector	6
W031	Cable Connector	5
W033	Cable Connector	5
W900	Module Extender Board	100

Part No.	Title	Price in U.S. Dollars
W930	Blank Module	11
W940	Wire Wrappable Module	70
W941	Wire Wrappable Module	40
W942	Wire Wrappable Module	140
W943	Wire Wrappable Module	75
W950	Wire Wrappable Module	65
W951	Wire Wrappable Module	40
W952	Wire Wrappable Module	151
W953	Wire Wrappable Module	81
W960	MSI Mounting Board	8
W964	Universal Terminator Board	10
W966	PDP-8/e Wire Wrappable Module	85
W967	PDP-8/e Wire Wrappable Module	165
W968	Collage Mounting Board	45
W969	Collage Mounting Board	30
W970	Blank Module	9
W971	Blank Module	14
W972	Blank Module	9
W9720	Blank Module	6
W9721	Blank Module	8
W9722	Blank Module	13
W973	Blank Module	15
W974	Blank Module	9
W975	Blank Module	19
W979	Collage Mounting Board	26
W980	Module Extender Board	15
W982	Module Extender Board	19
W983	Module Extender Board	29
W984	Module Extender Board	32
W987	Module Extender Board	43
W990	Blank Module	7
W991	Blank Module	12
W992	Blank Module	4
W993	Blank Module	8
W998	Blank Module	4
W999	Blank Module	9

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COMPONENTS GROUP

DIGITAL EQUIPMENT CORPORATION, Component Group Headquarters: 1 Iron Way, Marlborough, Mass. 01752, Telephone: (617) 481-7400

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