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RM16M DCV-R
Installation and Operation

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PREFACE

This manual is written for users of the UDS RM16M DCV-R Universal Data Shelf. Please read it before you install the shelf, insert pc cards, connect any cables, or apply power to the power supplies. This manual includes the following:

Chapter 1	Introduction - Contains introductory information, shelf description, and use;
Chapter 2	Installation - Contains instructions for mechanical and electrical installation of the shelf, describes interfaces and cables;
Chapter 3	Operation - Provides information on operation and tests;
Chapter 4	Maintenance - Describes modem and power supply insertion and removal;
Appendix A	Specifications;
Appendix B	Mechanical Assembly;
Appendix C	24 Volt Input Shelf.
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Warranty	
Registration Card	

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Chapter 1 Introduction

GENERAL

The UDS RM16M DCV-R Universal Data Shelf™ is designed to accept up to 16 private line or direct connect modems.

All modems are plug-in printed circuit (pc) cards which are accessible from the front. This enables all active cards to be installed or replaced from the front of the unit without changes in wiring or cables.

The modem cards used are the same cards installed in the individual standalone modems. This feature enables a user to stock spare modem cards in shelves or standalone housings.

Two power supply slots are provided in the shelf. A power supply module installed in either slot will power all modems in the shelf. If two power modules are installed, each can power the shelf and act as a redundant power source.

The power module converts user supplied 48 volt DC input to + 15 Vdc, - 15 Vdc, and + 8.5 Vdc outputs for distribution to individual modem cards. The cards have regulators which convert the plus and minus 15 Vdc to plus and minus 12 Vdc and + 8.5 Vdc to + 5 Vdc. Refer to Appendix C for information on the 24 volt input shelf.

The rear panel contains connectors for interfacing to the Data Terminal Equipment (DTE) and to the telephone line. The DTE connector can be:

- 25-pin connector (standard)
- 50-pin mass termination connector (option)
- wire-wrap pins (option)

The telephone line connector can be

- 8-pin modular jack (standard)
- 50-pin termination connector which serves eight modems (option)
- wire-wrap pins (option)

DESCRIPTION

The shelf is a self contained unit, with a vertical panel height of 7.0 inches, a depth of 10.75 inches, and mounts in a 19 or 23 inch rack (Figure 1-1).

The location and orientation of the plug-in power module and modem cards are shown in Figures 1-2 and 1-3. The pc cards can be installed or replaced from the front of the unit without disturbing the cable connections at the rear of the unit.

LEDs are located on the front edge bracket of each card. The LEDs allow monitoring of the operating condition of the cards. The status and current operating sequence of all channels may be easily monitored to confirm proper operation. Test switches located on the front edge bracket of the cards are easily accessible. Some pc cards are equipped with LCD front panels. The LCD allows the user to change soft options and perform tests from the front panel.

Interface connectors for the modems are located on the rear panel. Different back panel options are available for both the 19 and 23 inch shelf.

The shelves in Figures 1-4 and 1-5 have mass termination connectors (50-pin) and wire-wrap pins for the TELCO connections. The EIA-232 connectors are standard 25-pin receptacles.

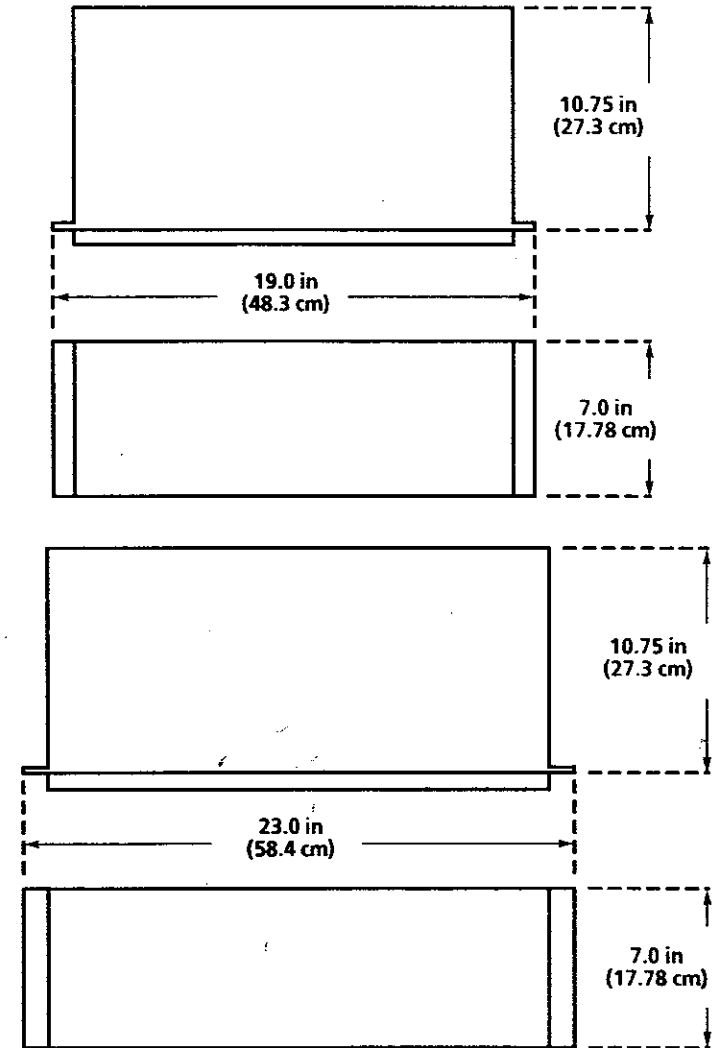


Figure 1-1
Mounting Dimensions

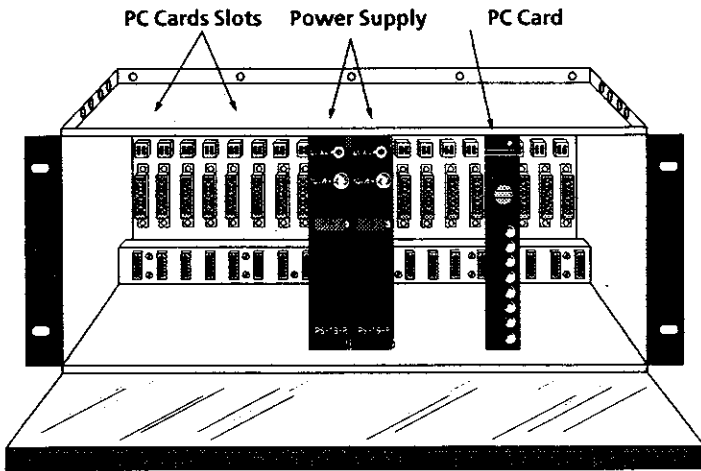


Figure 1-2
19-inch RM16M DCV-R

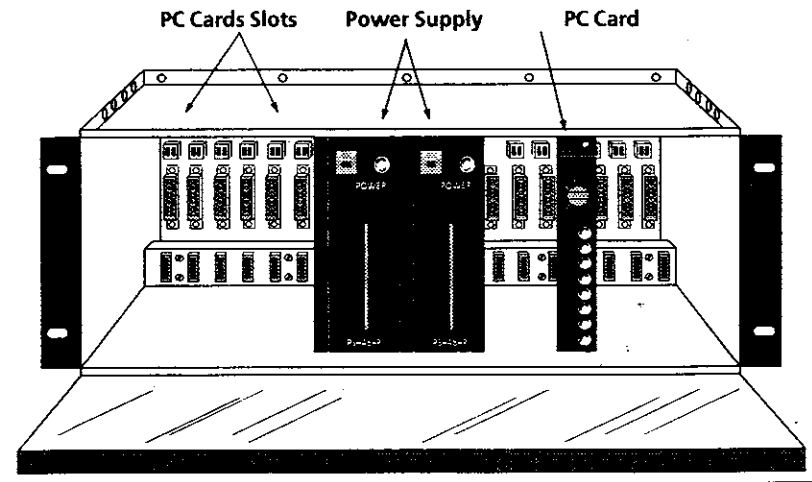


Figure 1-3
23-inch RM16M DCV-R

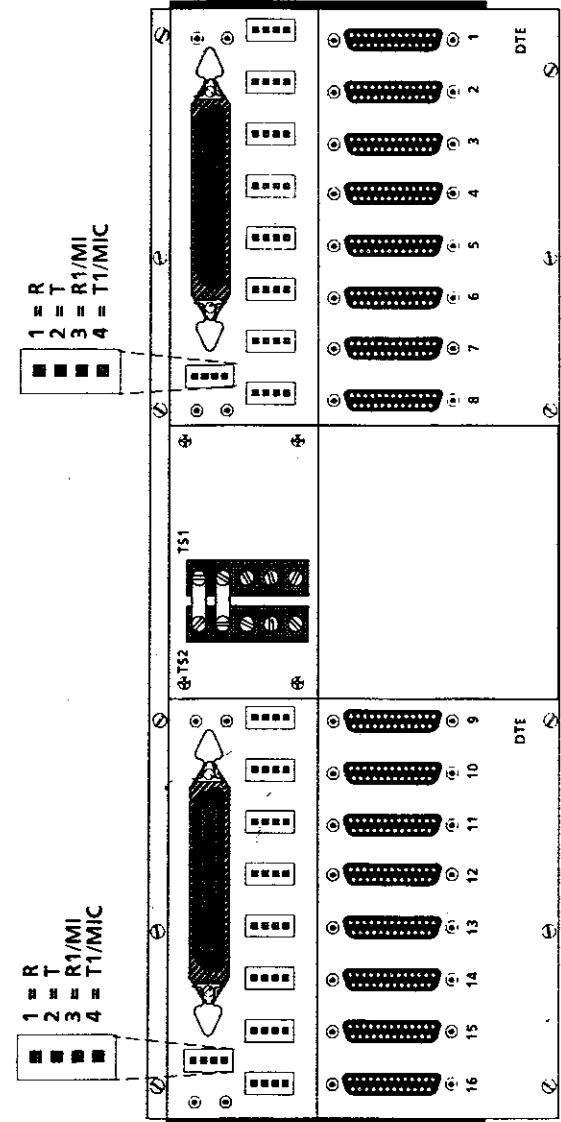


Figure 1-4
Rear Panel - 23 Inch Shelf with 25-Pin EIA-232 DTE Connectors and Mass Termination TELCO Connectors

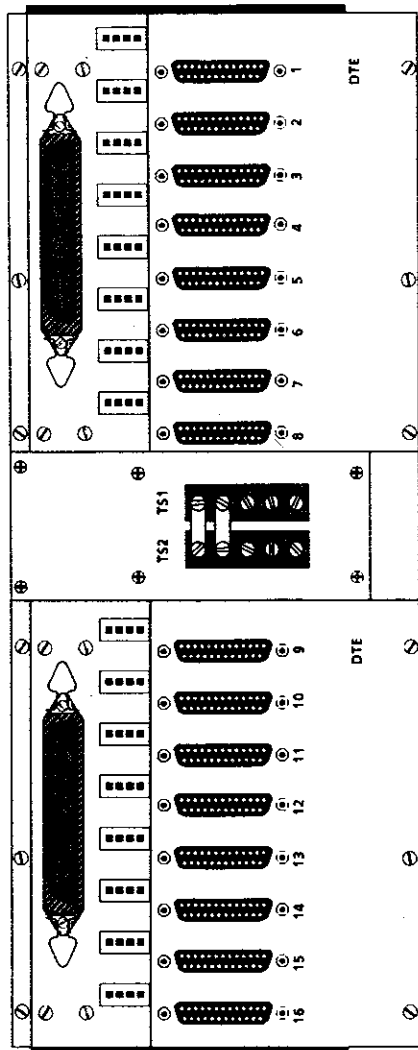


Figure 1-5
Rear Panel - 25-Pin DTE Connectors and 50-Pin Mass Termination Connectors



Telephone Jacks

Figure 1-6 shows mass termination for TELCO connection and EIA-232 DTE connectors. The mass termination DTE connectors each serve two modem slots. Wire-wrap pins are also available. The 19 inch and 23 inch shelves are identical except for the center power connection; therefore, only the 19 inch shelf is shown.

The rear panel shown in Figure 1-7 is segmented with 16 individual panels, one for each modem slot. The segments will vary according to the type of modem card in the shelf slot.

Figure 1-8 is a shelf with standard modular jacks for the TELCO connectors and standard 25-pin connectors for the DTE.

Figures 1-9 and 1-10 are rear panels for shelves containing modems with dial backup capability. The TELCO connector is connected to the dial-up lines and the TELSET/LL connector is for leased lines. Wire-wrap pins are not available on this backplane.

To connect into the dial-up network, a 6-pin or 8-pin standard telephone cable is required for each modem. Standard jack arrangements must be provided by the telephone company.

The jacks are identified by the telephone company Universal Service Ordering Code (USOC) and must be specified when ordering standard jack arrangements from the company.

The various jack arrangements ensure that the signal level received at the telephone company central office does not exceed - 12 dBm. The shelf has been registered with the FCC per the requirements of Part 68 of the FCC Rules for:

1. Programmable Mode - The local telephone company will install a resistor internal to the jack (USOC RJ45S or RJ41S).

2. Permissive Mode - The individual modem cards are preprogrammed for a maximum transmit level of -9 dBm (USOC RJ11C or RJ16X).

MODEM TYPES

The shelf accepts various types of dial-up, leased line, and DDS modems as well as multiplexers, dial backup units, and automatic calling units. The different types of cards may be mixed within the enclosure in any manner desired. Each has been independently tested and meets Part 68, FCC rules and regulations.

Various other type products such as multiplexers and automatic dialers can be installed in the shelf if special back panels are provided.

**LocalView
DC SHELF
MODEL**

The LocalView DC shelf is a special model of the DCV-R that provides for modem system network management.

Figure 1-11 shows the shelf rear panel for the LocalView system. LocalView allows devices in a shelf to be controlled or interrogated through shared input / output devices.

The system includes a controller which resides in slot 16 of the shelf and a modified backplane which utilizes unused pins on the power connector to pass data, address, and control information between the controller and device cards.

LocalView allows a single controller to address up to five shelves. With these shelves fully populated, a total of 79 device cards can be addressed either from the LCD on the front of the controller or through an RS232 port on the rear of the controller. For information concerning LocalView, refer to the LocalView controller card manual.

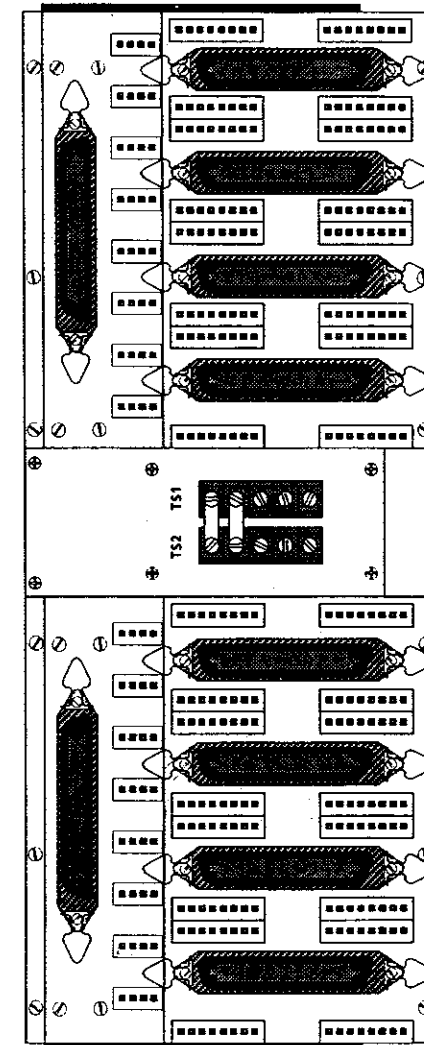


Figure 1-6
Rear Panel - 19 Inch Shelf with Mass Termination Connectors for DTE and TELCO Connections

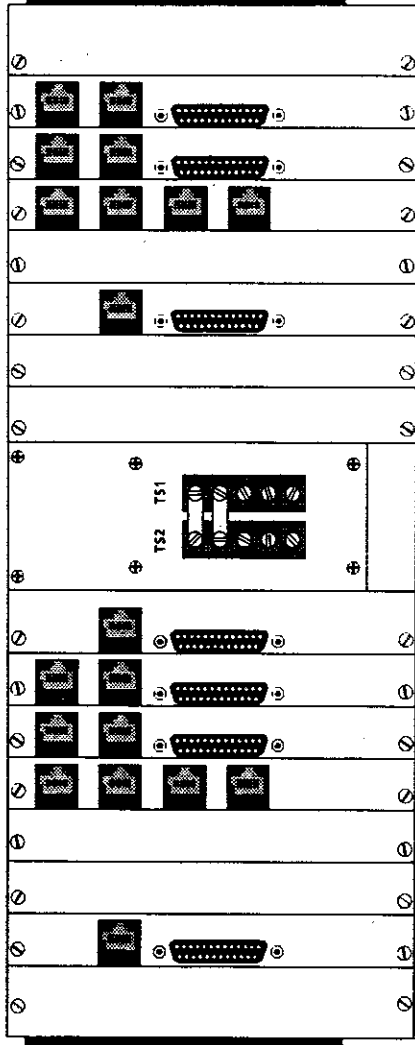


Figure 1-7
Rear Panel - 19 Inch Shelf with Segmented Rear Panels

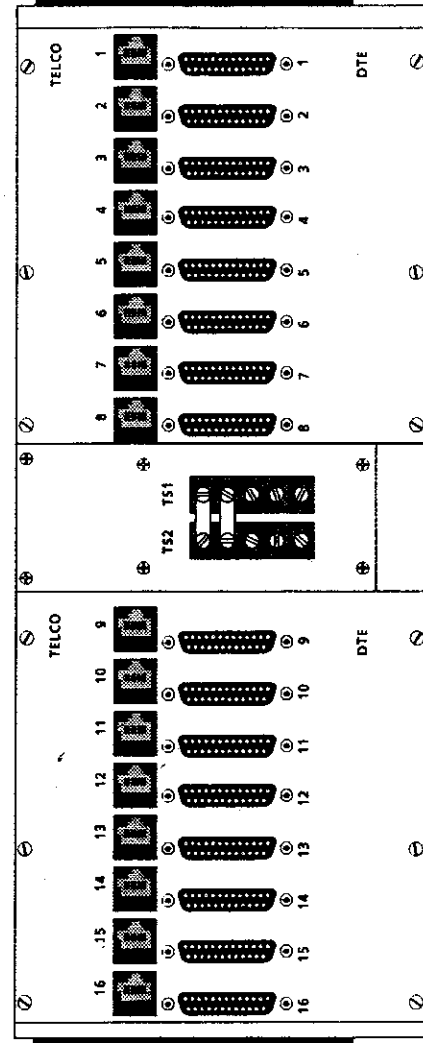


Figure 1-8
Rear Panel - 19 Inch Shelf with Standard Modular TELCO Jacks and 25-Pin EIA-232 DTE Connectors

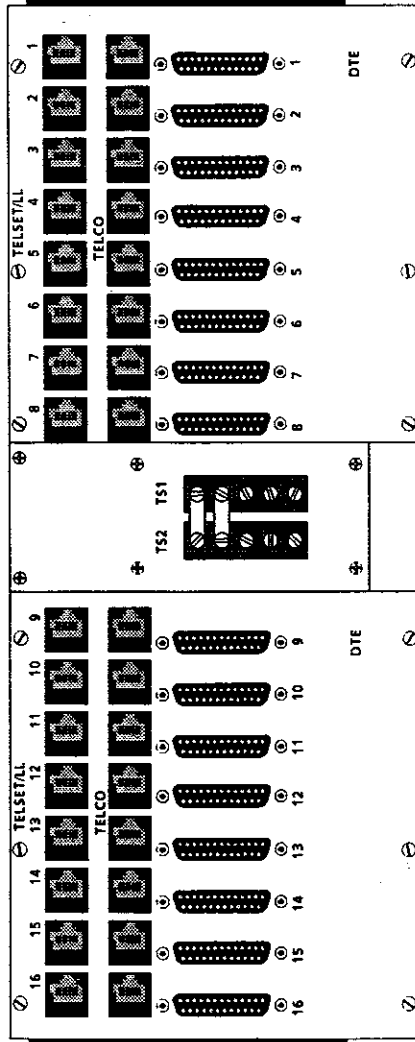


Figure 1-9
Rear Panel - 19 Inch Shelf with Dial Backup Rear Panel with Modular Connectors

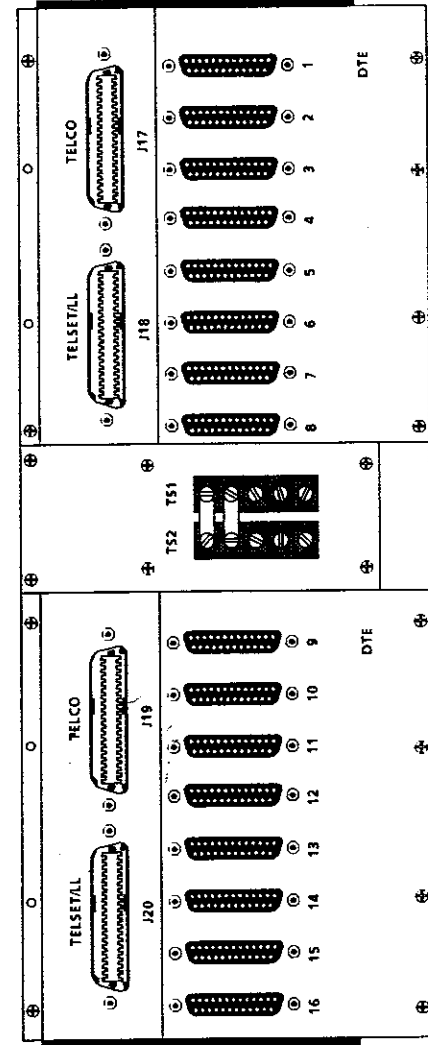


Figure 1-10
Rear Panel - 19 Inch Shelf with Dial Backup Rear Panel with Mass Termination

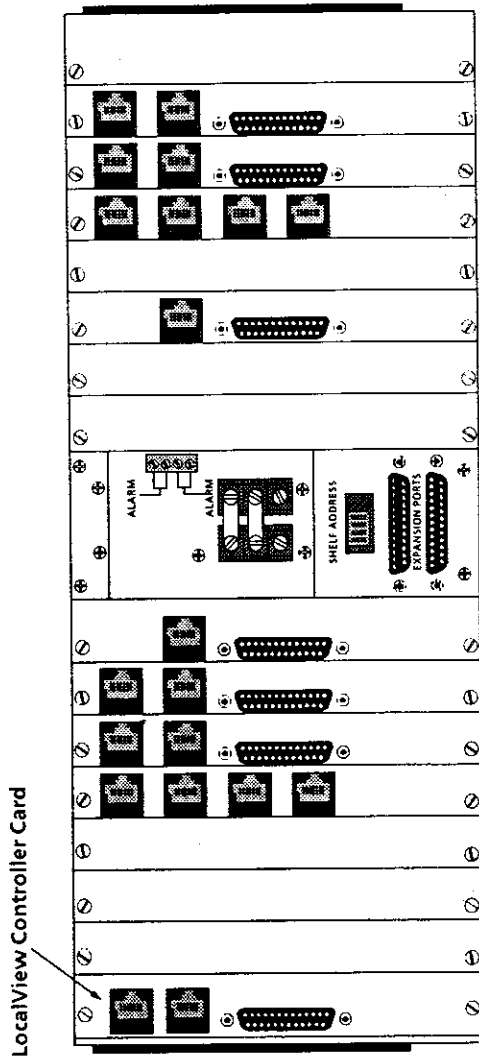


Figure 1-11
Rear Panel - LocalView DC Shelf



Chapter 2 Installation

GENERAL

This chapter provides information for the mechanical and electrical installation of the shelf.

RECEIPT INSPECTION

After unpacking the equipment, check the contents against the packing list. Inspect the equipment for any damage that may have occurred in shipment. If damage or equipment shortage is noted contact Universal Data Systems. UDS suggests that you keep the shipping crate and packing material for future shipment.

SITE PREPARATION

The shelf should be installed with access to a power source capable of furnishing 48 ± 4 Vdc at 3.5 amps, and no farther than 50 feet from the associated data terminal.

The installation area should be clean, well lighted, and free from extremes of temperature, humidity, appreciable shock, and vibration. Allow at least 36 inches of frontal clearance for operating and maintenance accessibility. Ensure at least 4 inches at the rear of the enclosure for interface cable clearance and unobstructed air flow.

Side and top clearances for rack-mounted equipment are as dictated by the rack-cabinet provisions but should allow a free flow of cooling air (Figure 2-1).

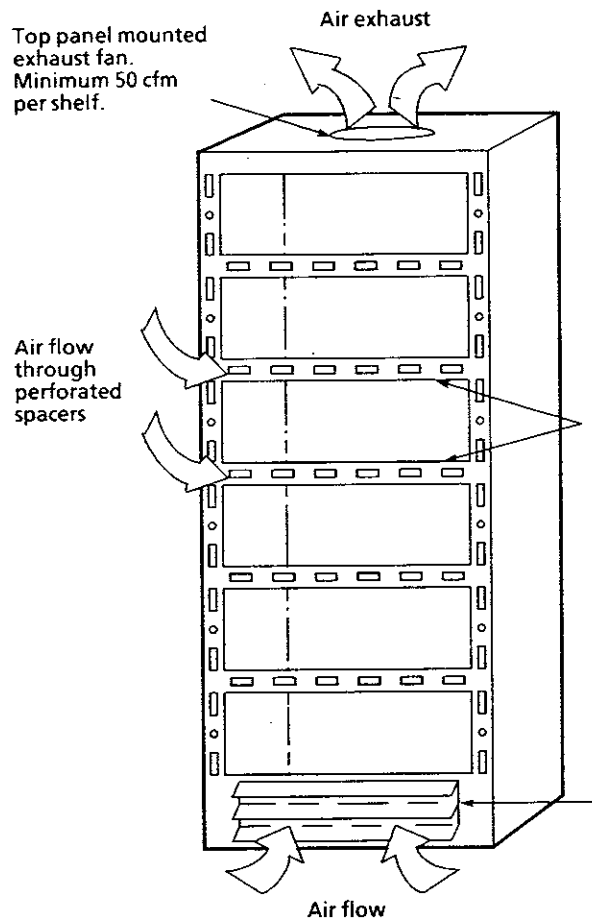


Figure 2-1
Shelf Cabinet

**INSTALLATION
PROCEDURE**

Service personnel should be familiar with the complete installation procedure before installing the shelf.

**Tools/Equipment/
Material Required**

Special tools or test equipment are not required for installation.

CAUTION

To prevent damage to enclosure components from overheating, ensure clearances of 1 3/4 inch top and bottom between mounted enclosures. Make adequate provision for cool air circulation and exhaust of warm air, such as air intake louvers in the bottom panel of the shelf cabinet and an adequate CFM exhaust fan located in the top panel of the shelf cabinet.

**Mechanical
Assembly**

The shelf is available in both 19 and 23 inch dimensions and fits into the associated 19 or 23 inch cabinet. The 19 inch shelf will also fit into the 23 inch cabinet by removing the shelf mounting brackets and reinstalling them in the reversed position so the wider tabs are available for mounting into the cabinet. With a full complement of cards the weight is approximately 50 pounds.

**Electrical
Installation**

All interface and power connections to the enclosure are located on the rear panel.

Incoming source power can connect to TS1, TS2, or both. If only one power source is available it can connect to either terminal strip with shunt bars installed to connect power to the opposite strip (Figure 2-2). The bars should always be installed if only one power source is used and must be removed if two power sources are used.

If only one power module is used it will supply power to all 16 slots. TS1 supplies the left hand power module when viewed from the front and TS2 supplies power to the right hand power module.

TS1 and TS2 alarms and chassis ground are connected internally. An alarm condition exists on the alarm circuit when any operating or supply voltage is lost on either power supply. The faulty power supply can then be identified by observing which front panel power LED is out.

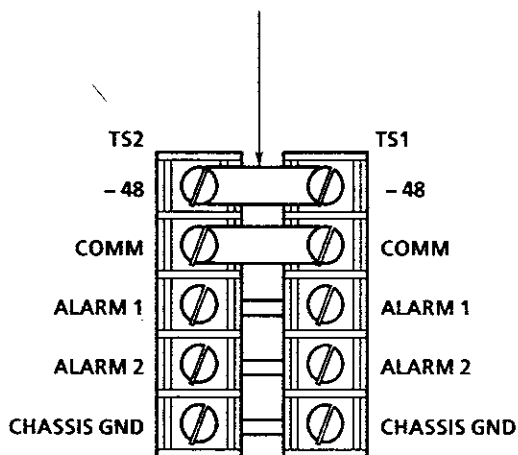


Figure 2-2
Power Terminals

Alarm Circuit

The alarm terminals are dry contacts which originate on the shelf power supply. Loss of any voltage in the module causes the contact between alarm 1 and 2 to close. When voltage is regained the contact opens.

Digital EIA-232 Interface

The 16 EIA-232 digital input connectors are labeled and shown in Figure 2-3. These connectors are Cannon or Cinch 25-Pin D series, as defined in EIA-232. The active pin connections are given in Tables 2-1 and 2-2. Note that some modems might not use all the functions listed.

The EIA-232 levels from the modem are as follows:

Received data mark: - 5 to - 15V
Received data space: + 5 to + 15V

Control signals OFF level: - 5 to - 15V
Control signals ON level: + 5 to + 15V

The expected levels on all inputs are:

Mark: - 3 to - 25V
Space: + 3 to + 25V

Controls OFF: - 3 to - 25V
Controls ON: + 3 to + 25V

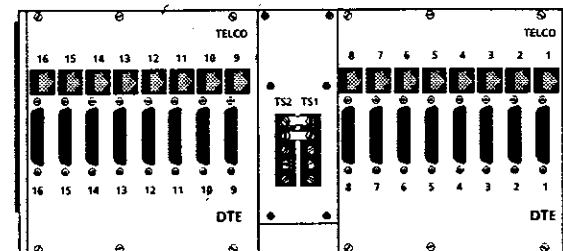


Figure 2-3
Interface Connections, Modular Jacks

Table 2-1
Digital Interface Signal Descriptions (232C)

Pin No.	EIA-232C	CCITT	Signal Name	Description
1	AA	101	Protective Ground or Earth Ground	Chassis ground. Isolated from signal ground or common return (pin 7).
2	BA	103	Transmit Data	Serial digital data (to be modulated) from a data terminal or other digital data source.
3	BB	104	Received Data	Serial digital data at the output of the modem receiver. The data is accompanied by an internal data rate clock (pin 17) whose positive-going transitions occur on the data transition. (Synchronous modems only.)
4	CA	105	Request to Send	A positive level to the modem when data transmission is desired.
5	CB	106	Clear to Send	A positive level from the modem after receipt of Request to Send (pin 4) and when the modem is ready to transmit.
6	CC	107	Data Set Ready	A positive level from the modem when power is on and it is ready to operate.
7	AB	102	Signal Ground or Common Return	Common signal and dc power ground. Isolated from protective ground (pin 1).
8	CF	109	Received Line Signal Detector	A positive level from the modem indicating the presence of a receive signal (carrier detect).
9			+ 12 volts	+ 12 voltage reference
10			- 12 volts	- 12 voltage reference
11			Not used	
12	SCF		Sec. Rec'd Line Signal Detector	Carrier detect on a secondary channel.
13	SCB	142	Sec. Clear to Send	Clear to send on a secondary channel.

Table 2-1 Cont.
Digital Interface Signal Descriptions (232C)

Pin No.	EIA-232C	CCITT	Signal Name	Description
14	SBA	141	Sec. Transmit Data	Transmitted data on a secondary channel.
15	DB		Transmit Clock (DCE)	A transmit data clock output for use by an external data source. Positive clock transitions correspond to data transitions.
16	SSB		Sec. Rec'd Data	Received data on a secondary channel.
17	DD	115	Receive Clock	A receive data rate clock output for use by the external data sink. Positive clock transitions correspond to data transition.
18				Not used
19	SCA	140	Sec. Request to Send	Request to send on a secondary channel.
20	CD	108.2	Data Terminal Ready	This circuit is positive when the DTE is ready to originate or answer a call in dial up operation.
21	SQ	110	Signal Quality Indicator	Signals on this circuit are used to indicate the probability of an error in the received data. A positive level indicates good signal quality while a negative level indicates poor signal quality.
22	CE	125	Ring Indicator	In direct dial operation, this circuit is positive in response to an incoming ring signal.
23	CH	111	Data Rate Select	Supplies a data rate control to select Primary or Fallback data rate.
24	DA	113	External Transmit Clock	A serial data rate clock input from the data source. Positive clock transitions correspond to data transitions.
25				Not used

Table 2-2
Digital Interface Signal Descriptions (232D)

Pin No.	EIA-232D	CCITT	Signal Name	Description
1		101	Shield	No Connection
2	BA	103	Transmit Data	Serial digital data (to be modulated) from a data terminal or other digital data source. It must be accompanied by a transmit clock (pin 15) or by an external data rate clock (pin 24). Data transitions should occur on positive-going transitions at clock. (Synchronous modems only.)
3	BB	104	Received Data	Serial digital data at the output of the modem receiver. The data is accompanied by an internal data rate clock (pin 17) whose positive-going transitions occur on the data transition. (Synchronous modems only.)
4	CA	105	Request to Send	A positive level to the modem when data transmission is desired.
5	CB	106	Clear to Send	A positive level from the modem after receipt of Request to Send and when the modem is ready to transmit.
6	CC	107	Data Set Ready	A positive level from the modem when power is on and it is ready to operate. In dial-up operation, the modem must be off-hook to give a high DSR signal.
7	AB	102	Signal Ground or Common Return	Common signal and DC power ground.
8	CF	109	Received Line Signal Detector	A positive level from the modem indicating the presence of a receive signal (carrier detect).
9			+ 12 volts	+ 12 voltage reference
10			- 12 volts	- 12 voltage reference
11	CG	110	Signal Quality Indicator	Signals on this circuit are used to indicate the probability of an error in the receive data. A positive level indicates good signal quality while a negative level indicates poor signal quality.

Table 2-2 Cont.
Digital Interface Signal Descriptions (232D)

Pin No.	EIA-232D	CCITT	Signal Name	Description
12			Not used	
15		114	Transmit Clock (DCE)	A transmit data clock output for use by an external data source. Positive clock transitions correspond to data transitions.
16			Not used	
17	DD	115	Receive Clock	A receive data rate clock output for use by the external data sink. Positive clock transitions correspond to data transition.
18		141	Local Loopback (Loop 3) Control	A positive level will cause the modem to go into a local analog loop, when strap enabled.
20	CD	108.2	Data Terminal Ready	This circuit is positive when the DTE is ready to originate or answer a call in dial up operation. DTR must always be active (high) in 2-wire private line operation. Cycling DTR causes retraining.
21		140	Remote Digital Loopback	A positive level will cause a digital loopback at a remote modem, when strap enabled.
22	CE	125	Ring Indicator	In direct dial operation, this circuit is positive in response to an incoming ring signal.
23	CH	111	Data Rate Select	Supplies a data rate control to select Primary or Fallback data rate.
24	DA	113	External Transmit Clock	A serial data rate clock input from the data source. Positive clock transitions correspond to data transitions.
25		142	Test Mode	Indicates when the modem is in a test mode.

NOTE
Tables 2-1 and 2-2 may vary depending on modem type. See manual pertaining to the particular pc card you are using.

TELEPHONE LINE INTERFACE

The shelf is FCC certified for connection to the dial-up Public Switched Telephone Network (PSTN).

Modular Jack Connectors

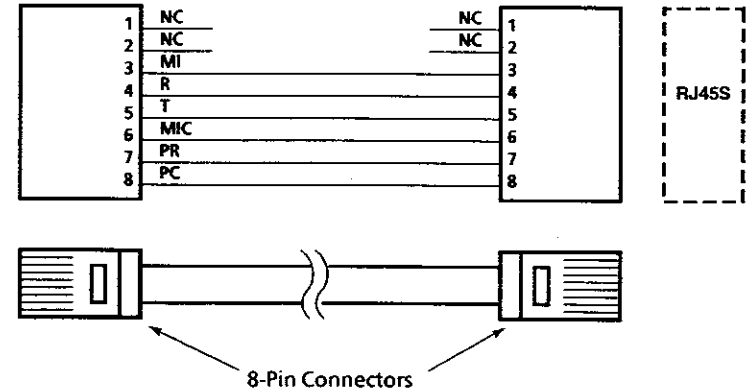
The standard rear panel contains sixteen 8-pin modular jacks to interface the modems to the telephone line. Each 8-pin jack has contacts that are used in various combinations depending on the type of service installed. Pin functions are described in Table 2-3.

Leased line modems have four contacts; namely a transmit pair and a receive pair.

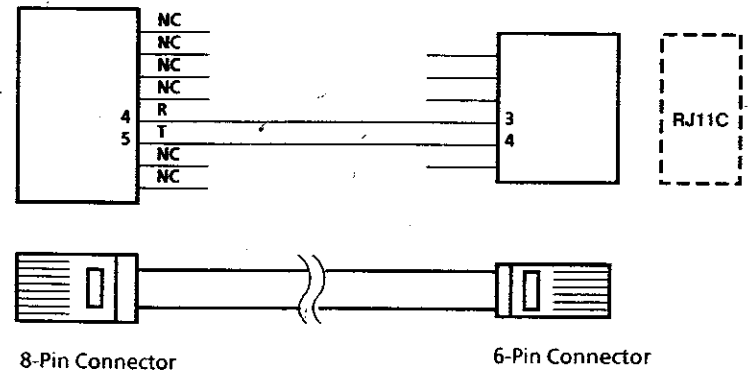
Figures 2-4, 2-5 and 2-6 show typical telephone line cable configurations. Figures 2-7 and 2-8 show DDS cables.

**Table 2-3
Modular Jack Pin Functions (Standard Modems)**

Pin No.	Function
1 2	R1 T1 } Xmit pair for DDS modems. Not used on other type modems.
3	R1/MI Receive ring for leased line modems. Mode indicator for dial line modems.
4	R Ring - dial or leased
5	T Tip - dial or leased
6	T1/MIC Receive tip for leased line modems. Mode indicator common for dial line modems.
7 8	PR PC } Programmable resistor connections for dial network modems.
7 8	T R } Rec pair for DDS type modems.



**Figure 2-4
Programmable Cable 1020192**



**Figure 2-5
Permissive Cable 1020202**

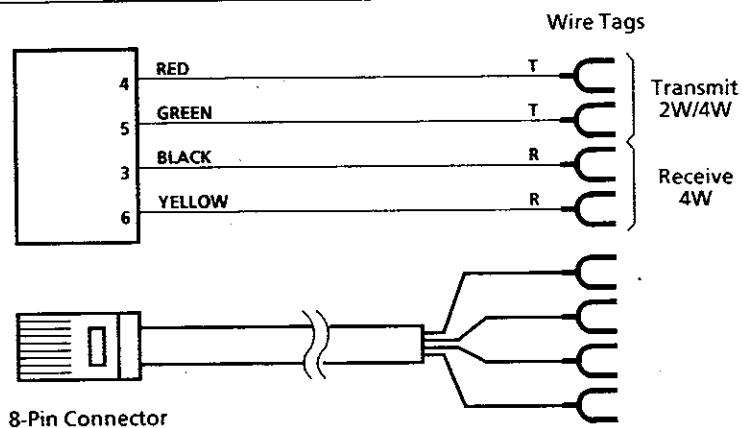


Figure 2-6
Leased Line Cable 1020636

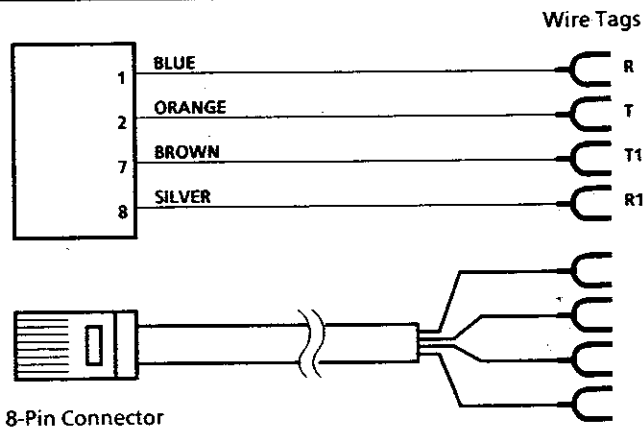


Figure 2-7
DDS Cable 1020569
Also used for dial backup type modems

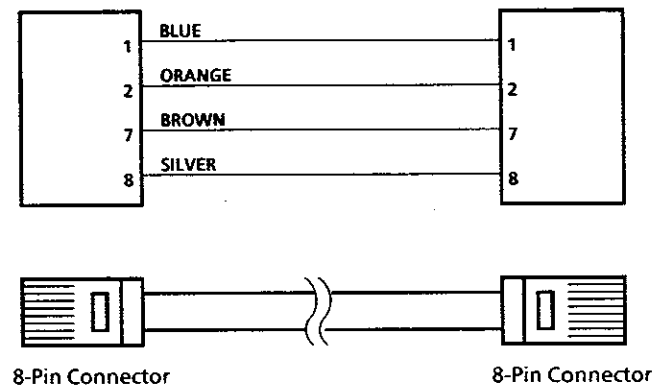


Figure 2-8
DDS Cable 1020575
Also used for dial backup type modems

Installation

Mass Termination Connector

As an option, a 50-pin mass termination connector may be specified for the TELCO connection. The adaptor for conversion from modular connectors to mass termination also has wire-wrap pins for TELCO connection (Tables 2-4 and 2-5).

Table 2-4
Pin Functions for 50-Position Jack and Wire-Wrap Pins
(Assembly 2962 and 0288)

J1	J2	P1	Pin Function	Resistor Designation	J1	J6	P5	Pin Function	Resistor Designation
1	4	1	R	R1	9	4	1	R	R5
26	5	2	T		34	5	2	T	
2	3	3	R1/MI		10	3	3	R1/MI	
27	6	4	T1/MIC		35	6	4	T1/MIC	
	J3	P2				J7	P6		
3	4	1	R	R2	11	4	1	R	R6
28	5	2	T		36	5	2	T	
4	3	3	R1/MI		12	3	3	R1/MI	
29	6	4	T1/MIC		37	6	4	T1/MIC	
	J4	P3				J8	P7		
5	4	1	R	R3	13	4	1	R	R7
30	5	2	T		38	5	2	T	
6	3	3	R1/MI		14	3	3	R1/MI	
31	6	4	T1/MIC		39	6	4	T1/MIC	
	J5	P4				J9	P8		
7	4	1	R	R4	15	4	1	R	R8
32	5	2	T		40	5	2	T	
8	3	3	R1/MI		16	3	3	R1/MI	
33	6	4	T1/MIC		41	6	4	T1/MIC	

CO compatible - Pins assigned in consecutive order for central office use.

J1 is a 50-position miniature jack, Amp. No. 552118-1 with bent bail assembly PN 552676-2.

J2 through J9 are 10-position connectors which interface to the modem boards.

P1 through P8 are 4-terminal wire-wrap connectors.

R1 through R8 (when used) are 1% resistors.

Not used for dial backup type modems.

Table 2-5
50-Position Jack and Wire-Wrap Pin Functions

J1	J2	P1	Pin Function	J1	J6	P5	Pin Function
2	4	1	Line 1 Ring	14	4	1	Line 5 Ring
27	5	2	Line 1 Tip	39	5	2	Line 5 Tip
1	3	3	Receive Ring 1 or MI	13	3	3	Receive Ring 5 or MI
26	6	4	Receive Tip 1 or MIC	38	6	4	Receive Tip 5 or MIC
28	7		PR 1	40	7		PR 5
3	8		PC 1	15	8		PC 5
	J3	P2			J7	P6	
5	4	1	Line 2 Ring	17	4	1	Line 6 Ring
30	5	2	Line 2 Tip	42	5	2	Line 6 Tip
4	3	3	Receive Ring 2 or MI	16	3	3	Receive Ring 6 or MI
29	6	4	Receive Tip 2 or MIC	41	6	4	Receive Tip 6 or MIC
31	7		PR 2	43	7		PR 6
6	8		PC 2	18	8		PC 6
	J4	P3			J8	P7	
8	4	1	Line 3 Ring	20	4	1	Line 7 Ring
33	5	2	Line 3 Tip	45	5	2	Line 7 Tip
7	3	3	Receive Ring 3 or MI	19	3	3	Receive Ring 7 or MI
32	6	4	Receive Tip 3 or MIC	44	6	4	Receive Tip 7 or MIC
34	7		PR 3	46	7		PR 7
9	8		PC 3	21	8		PC 7
	J5	P4			J9	P8	
11	4	1	Line 4 Ring	23	4	1	Line 8 Ring
36	5	2	Line 4 Tip	48	5	2	Line 8 Tip
10	3	3	Receive Ring 4 or MI	22	3	3	Receive Ring 8 or MI
35	6	4	Receive Tip 4 or MIC	47	6	4	Receive Tip 8 or MIC
37	7		PR 4	49	7		PR 8
12	8		PC 4	24	8		PC 8

Pins assigned for RJ27X data jack compatibility

For dial or leased line modems (not used for dial backup type modems).

Dial Backup Connections

Two special backplanes are available for use with dial backup modems. These backplanes provide either modular or mass termination jacks for both dial-up and leased line telephone line connections. See Figures 1-9 and 1-10.

Modems with dial backup capability have an option that allows them to switch to a dial-up line if the leased line fails. For this reason both the TELSET/LL and TELCO connections must be made. If the option will not be used, connect the modem to the appropriate service, either leased line or dial-up.

If standard modems (no dial backup capability) are installed they are limited to connection to the TELCO only.

Mass termination pin functions for the dial backup backplane are shown in Table 2-6. The 50-pin mass termination connectors are Cinch Number 97-CS-50 with screw lock assembly. The mating connector is 97-12500-181 or equivalent Modular jack pin functions are shown in Table 2-7. Wire wrap pins are not available.

NOTE

TELCO jack pin functions are identical for both standard and dial backup modems.

DTE connectors are the same as for standard modems.

Table 2-6
Dial Backup Mass Termination (50-Pin Receptacle) Pin Functions

Telco Connector		Telset/LL Connector		Telco Connector		Telset/LL Connector	
Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Ring 1	1	Xmit Ring 1	9	Ring 5	9	Xmit Ring 5
26	Tip 1	26	Xmit Tip 1	34	Tip 5	34	Xmit Tip 5
2	MI 1/Rec Ring 1	2	Rec Ring 1	10	MI 5/Rec Ring 5	10	Rec Ring 5
27	MIC 1/Rec Tip 1	27	Rec Tip 1	35	MIC 5/Rec Tip 5	35	Rec Tip 5
3	Ring 2	3	Xmit Ring 2	11	Ring 6	11	Xmit Ring 6
28	Tip 2	28	Xmit Tip 2	36	Tip 6	36	Xmit Tip 6
4	MI 2/Rec Ring 2	4	Rec Ring 2	12	MI 6/Rec Ring 6	12	Rec Ring 6
29	MIC 2/Rec Tip 2	29	Rec Tip 2	37	MIC 6/Rec Tip 6	37	Rec Tip 6
5	Ring 3	5	Xmit Ring 3	13	Ring 7	13	Xmit Ring 7
30	Tip 3	30	Xmit Tip 3	38	Tip 7	38	Xmit Tip 7
6	MI 3/Rec Ring 3	6	Rec Ring 3	14	MI 7/Rec Ring 7	14	Rec Ring 7
31	MIC 3/Rec Tip 3	31	Rec Tip 3	39	MIC 7/Rec Tip 7	39	Rec Tip 7
7	Ring 4	7	Xmit Ring 4	15	Ring 8	15	Xmit Ring 8
32	Tip 4	32	Xmit Tip 4	40	Tip 8	40	Xmit Tip 8
8	MI 4/Rec Ring 4	8	Rec Ring 4	16	MI 8/Rec Ring 8	16	Rec Ring 8
33	MIC 4/Rec Tip 4	33	Rec Tip 4	41	MIC 8/Rec 8Tip	41	Rec Tip 8

Table 2-7
Dial Backup Modular Jack Pin Functions

Telco Jack			Telset/LL Jack	
Pin	Function		Pin	Function
1	R	} Xmit pair for DDS modems. Not used on other type modems.	1	Xmit pair (Dial backup modems only)
2	T			
3	R1/ MI	Receive ring for leased line modems. Mode indicator for dialup modems.	3	Not used
4	R	Ring - dial or leased	4	Not used
5	T	Tip - dial or leased	5	Not used
6	T1/ MIC	Receive tip for leased line modems. Mode indicator common for dialup modems.	6	Not used
7	PR	} Programmable resistor connections for dial network modems.	7	Rec pair (Dial backup modems only)
8	PC			
7	T1	} Rec pair for DDS type modems.		
8	R1			

DIGITAL EIA-232 INTERFACE, SPECIAL BACKPLANE

The special backplane for the digital interface is shown in Figure 2-9. Pin functions for the assembly are shown in Table 2-8. The special backplane is offered as an option and plugs into the existing EIA-232 25-pin connector. One special assembly serves two modems (plugs into two 25-pin EIA-232 connectors). The assembly consists of a 50-position miniature ribbon connector, two 25-pin male connectors and wire wrap pins for all connections on the 25-pin connectors.

Digital Interface Special Backplane Installation

When the digital interface backplane is required, installation is as follows:

- Determine which two EIA-232 connectors require the special backplane. Each backplane will convert two EIA-232 connectors to one 50-position connector or 50-wire wrap pins.
- Plug the two 25-pin male connectors into the two 25-pin receptacles.
- Insert the four screws (for J1 and J3 on the special backplane) and tighten.

P1 and P2 are
25-position terminal
strips with 0.045"
wire wrap pins.

J2 is a 50-position
miniature jack,
AMP P/N 552118-1
with bent bail
assembly,
P/N 552562-2

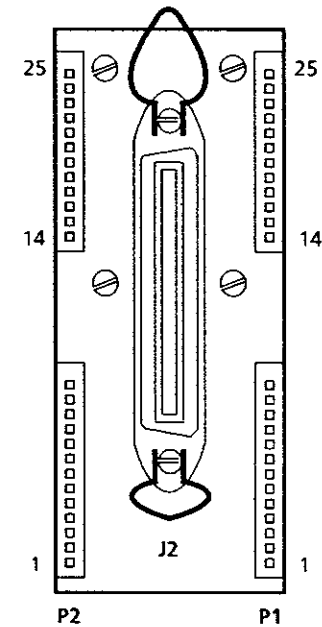


Figure 2-9
Digital Interface - Special Backplane

Table 2-8
Pin Functions of Digital Interface, Special Backplane

J2	J1	J3	Wire Wrap
1	1		P1 1
26	2		2
2	3		3
27	4		4
3	5		5
28	6		6
4	7		7
29	8		8
5	9		9
30	10		10
6	11		11
31	12		12
7	13		13
32	14		14
8	15		15
33	16		16
9	17		17
34	18		18
10	19		19
35	20		20
11	21		21
36	22		22
12	23		23
37	24		24
13	25		25
38		1	P2 1
14		2	2
39		3	3
15		4	4
40		5	5
16		6	6
41		7	7
17		8	8
42		9	9
18		10	10
43		11	11
19		12	12
44		13	13
20		14	14
45		15	15
21		16	16
46		17	17
22		18	18
47		19	19
23		20	20
48		21	21
24		22	22
49		23	23
25		24	24
50		25	25

STRAP AND SWITCH OPTIONS

When the mechanical and electrical installation procedures are completed, determine the configuration of each modem in the data system and set the straps/switches as required. For user option instructions, refer to the manual which applies to the modem in use.

Chapter 3 Operation

GENERAL

The shelf will accept leased line, PSTN, or DDS type modems. The leased line modems are designed to operate on conditioned or unconditioned leased lines. The PSTN type modems are designed to operate on the dial-up network and have features which allow establishment of dial-up circuits and data transfer. Some modems can operate on either leased lines or PSTN. The modems feature a standardized interface (EIA-232C or D) that provides for orderly calling, answering, and data modes. Many of the modems have automatic dialing and answering capabilities.

Power Module Operation

Each power module can receive its own - 48 Vdc supply or can receive power shunted from the other terminal strip.

Power module output operating voltages operate in parallel on a common bus for each voltage level. Each module can supply power requirements for all 16 slots.

Redundant Power

When both terminal strips are energized and two power modules are installed, each module supplies some percentage of bus load. Any loss of supply or operating voltage to one module will cause the other module to carry the entire load. If this happens the common alarm contacts close to reflect the alarm condition.

TEST MODES

Each plug-in modem card has a switch or switches which provide for modem testing. The test features of each modem are explained in the manual for the modem.

Operation

FRONT PANEL INDICATORS

The modems have LEDs mounted on the front edge of the card which indicate the status of various EIA-232 interface functions. The LEDs are explained in the manual related to the particular modem of interest.

Some pc cards have a liquid crystal display (LCD) for observing modem status or selecting options using the three pushbuttons on the front panel. The LCD functions are explained in the manual for the modem.

SPECIAL ASSEMBLIES

The shelf may be configured with assemblies which enhance or modify the operation of the basic modems. The operation of the special assemblies is explained in the manual for the associated equipment. Some special assemblies are:

- 801 Automatic Call Unit (ACU)
Can be used with a PSTN type modem for establishing automatic data calls on a dial up network. The shelf must be equipped with a segmented back panel.
- 720 Dual Dial Backup Unit (DDBU)
Can be used to establish dial backup for leased line modems. A segmented backplane is required for operation of the DDBU.



Chapter 4 Maintenance

GENERAL

An inoperative pc card should be replaced. No attempt at field repair is recommended: contact Universal Data Systems Service for instructions on repairs and replacement.

System power need not be turned off for simple pc card interchange. This allows normal operation of all other lines to continue.

The procedure for card removal and installation is explained in Chapter 2.

POWER SUPPLY MODULE

Operation

The power module converts user supplied 48 Vdc to + 15 Vdc, - 15 Vdc, and + 8.5 Vdc for use by the modem cards. The module plugs into a backplane which buses the low voltages to each modem slot. The voltages are used to generate + and - 12 Vdc, and + 5 Vdc. The regulators are located on the individual modem cards.

Power Supply Module Replacement

The power supply module should be installed or replaced by qualified personnel, using the following procedures:

Installation

- Position the module in the guide strips and slide into the housing.
- Connect dc power to the terminal strip on the rear panel.

If redundant power capability is not required, place the power module in the left hand power module slot. (Left when facing front of shelf.) If redundant power is required insert a power module into both power slots. If only one power module is installed, connect the power to TS1. TS1 connects to the left hand power module; TS2 connects to the right hand power module for redundant power application.

Removal

CAUTION
Grasp handle with one hand while supporting bottom of module with other hand.

- Grasp power module handle and slide out of housing.

Appendix A Specifications

SHELF DIMENSIONS	RM16M DCV-R (19)	RM16M DCV-R (23)
Width	19.0 inches	23.0 inches
Depth	10.75 inches	10.75 inches
Height	7.0 inches	7.0 inches
Weight	50 lbs.	50 lbs.
Power	Input power 48 Vdc \pm 4V Input current 3.5 amps max	
Environmental Conditions	Temperature 0°C to + 50°C (+ 32°F to 122°F)	
Alarm Contact Rating	Shorted impedance \leq .015 Ω Open impedance \geq 1.0 M Ω Volts = 60 Vdc max Current = 100 ma max	

Appendix B Mechanical Assembly

GENERAL

This appendix provides the front bracket LED assembly and the LCD standalone conversion information required to configure standalone units for the shelf mount.

FRONT BRACKET LED ASSEMBLY

The modem cards used in the RM16M DCV-R shelf are the same pc cards installed in standalone modem housings. When the modems are installed in the shelf, a bracket is placed on the front edge of the pc card. See Figure B-1. The bracket has a card puller and is labeled to indicate the LED and switch functions.

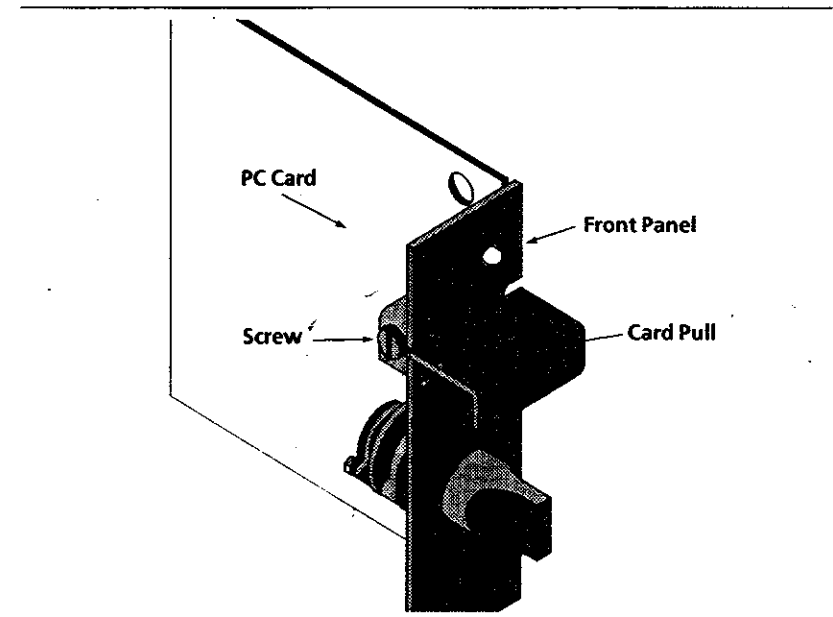


Figure B-1
Shelf Card Pull Position (Typical)

When the modem card is used in a standalone housing, the front bracket can be removed from the card or the card puller can be repositioned and the bracket can remain on the card. See Figure B-2.

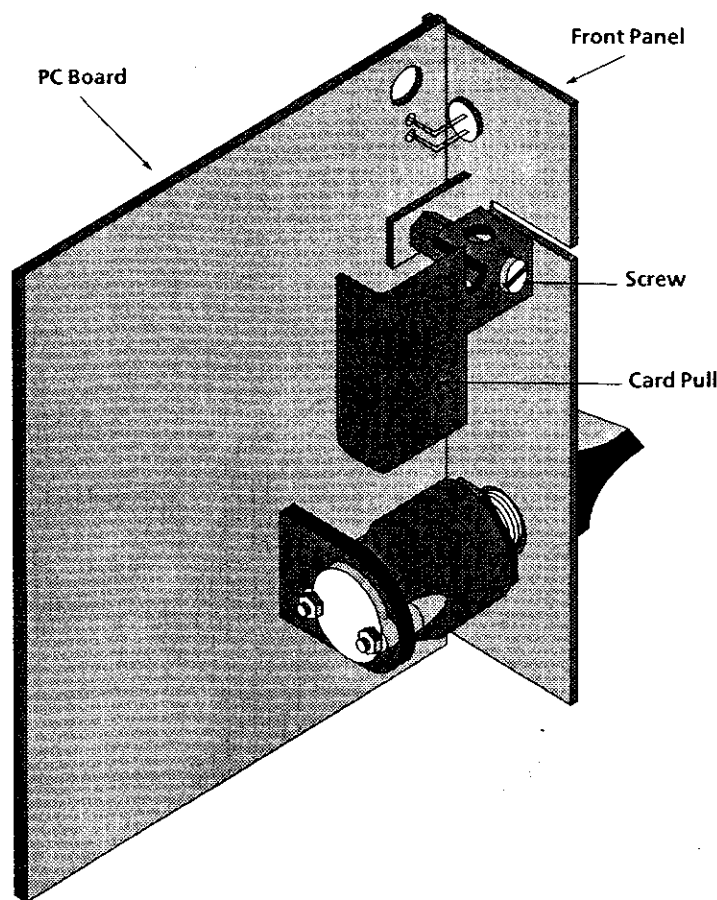


Figure B-2
Standalone Card Pull Position (Typical)

LCD STANDALONE
CONVERSION

The following instructions explain how to convert a standalone LCD modem to a rack mount assembly.

WARNING

Disconnect all cables prior to cover removal. Do not leave the wall transformer plugged into the wall outlet when unplugged from the modem.

Cover Removal

Place the unit on its side on a flat surface. To disengage the lock tab insert a medium size flat screwdriver blade in one of the bottom rear latch slots. DO NOT PUSH the screwdriver but lightly pry the handle away from the unit as illustrated in Figure B-3. Assist removal by pushing the cover from the chassis with your fingers on the unit rear edges. Repeat this procedure with the remaining three latch slots.

To replace the cover align the lock clips, rear guide grooves, and front lock tabs. Press the cover in place until the lock clips engage the lock tabs.

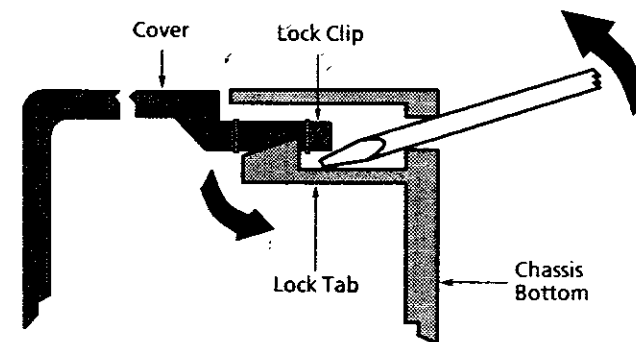


Figure B-3
Cover Removal

B
Mechanical Assembly

Once the cover is removed, disconnect the LCD connector cable from the pc board before removing the front panel.

NOTE

Because LCD connector styles vary, take note of the connectors configuration before removing.

Front Panel Removal

To detach the front panel use a flat edge screwdriver to release the two lock tabs. To release the lock tabs, insert the screwdriver between the front panel lock clip and chassis bottom lock tab, and twist the screwdriver until the clip releases (Figure B-4). Repeat this procedure for the other lock clip and then slide the front panel assembly forward until it is released from the chassis body.

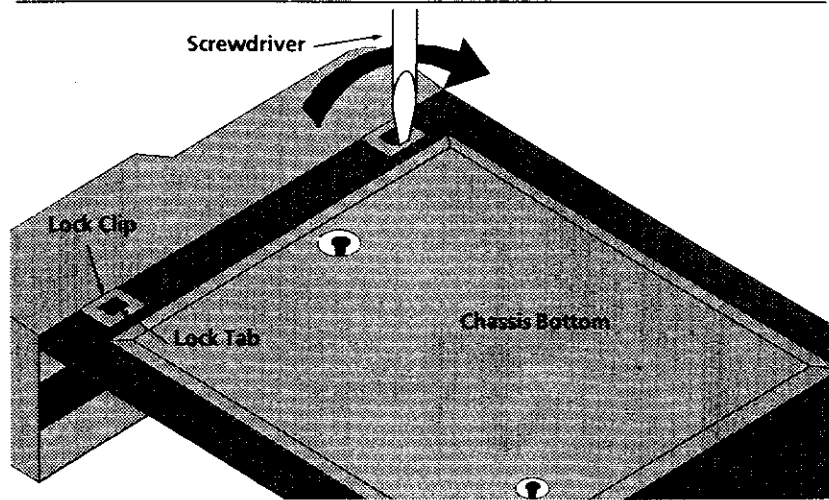


Figure B-4
Front Panel Cover Removal

Once the front panel assembly is removed, the pc board and LCD assembly can be removed.

B
Mechanical Assembly

LCD Assembly Removal

To remove the LCD panel assembly release the three lock tabs (Figure B-5) and pull the LCD assembly out from the front panel.

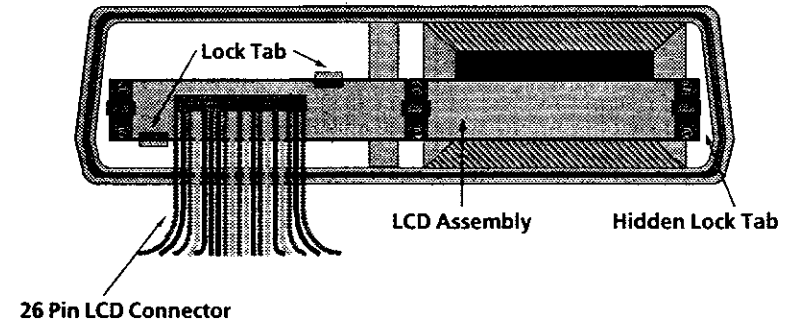


Figure B-5
Location of LCD Assembly Lock Tabs

Before removing the modem pc board, four lock tabs and a latch post must be released. Refer to Figure B-6 for the locations of the lock tabs and the latch post.

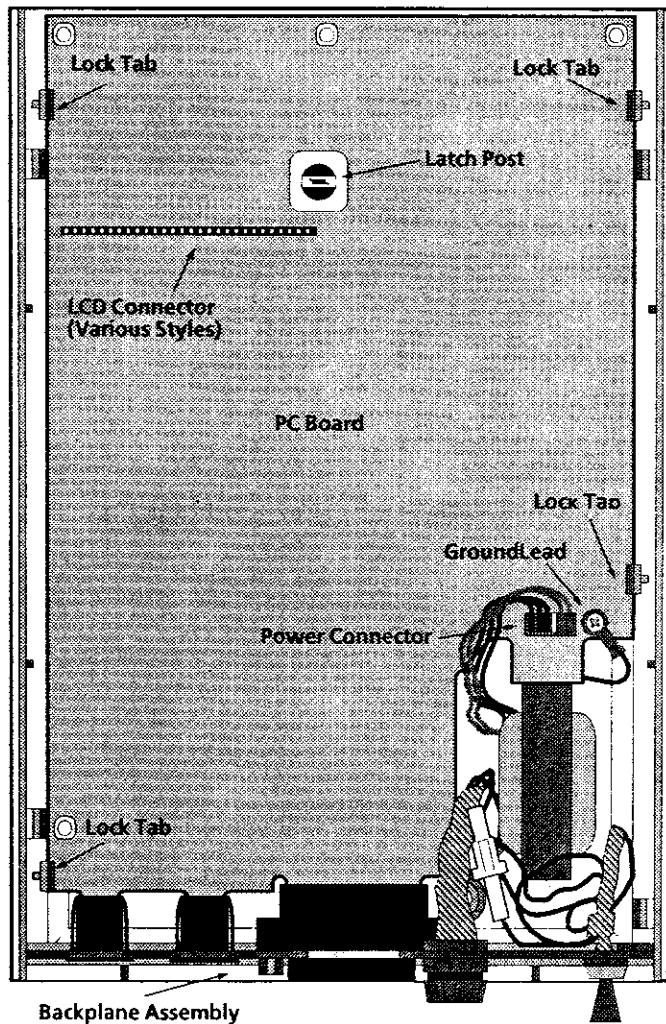


Figure B-6
Location of PC Board Lock Tabs and Latch Post

Releasing the
Latch Post

To release the latch post, insert a flat edge screwdriver under the latch post pull tab and pry up (Figure B-7). The latch post can also be released from inside the modem by depressing the center on the latch post.

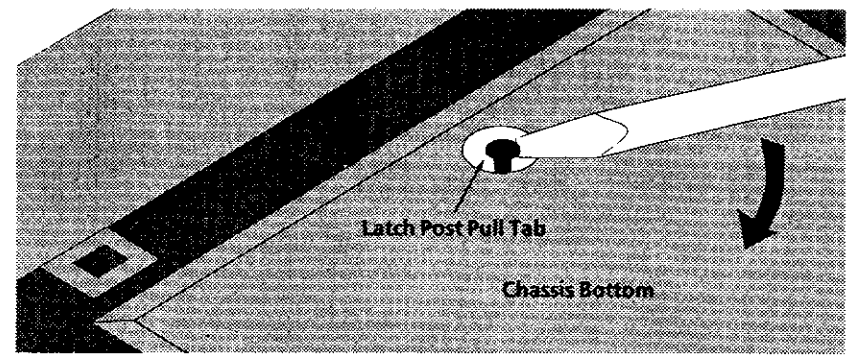


Figure B-7
Releasing the Latch Post

PC Board
Removal

Before removing the the pc board, disconnect the power connector and ground lead from its terminal post.

Individually pry the lock tabs away from the pc board edge and lift the board above the retaining lip of the lock tabs. Ensure all cable connectors have been disconnected. Carefully slide the pc board away from the backplane assembly. This will disengage the multi pin edge connectors from the backplane jacks and receptacles. The pc board should now be entirely free.

NOTE

The TELCO, TELSET, and DTE connectors are attached to the backplane and do not need to be removed separately.

B
Mechanical Assembly

Rack Mount Assembly

Retain the pc board, LCD assembly, and adapter kit for the rack mount assembly. Contact your distributor or sales representative for the specific rack mount adapter kit required for your application. The rack mount adapter kit contains the following:

- One bezel cover
- Three nuts
- Three short screws
- Three long screws
- Three lock washers
- One pull tab

There are three types of LCD assemblies found in stand alone modems:

Type A: contains slotted mounting brackets and a printed front panel.

This assembly requires the following:

- three short screws
- three nuts
- one pull tab

Type B: contains slotted mounting brackets and a non-printed front panel.

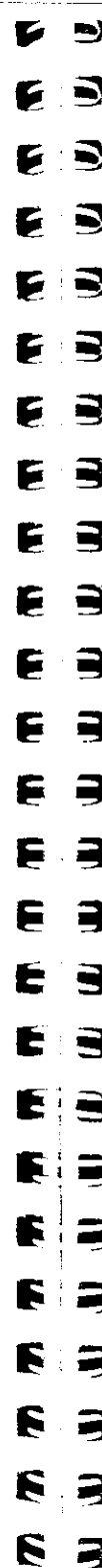
This assembly requires the following:

- three short screws
- three nuts
- one pull tab
- one bezel cover

Type C: contains solid mounting brackets and a printed front panel.

This assembly requires the following:

- three long screws
- three lock washers
- three nuts
- one pull tab



B
Mechanical Assembly

Type A Assembly

To assemble the Type A rack mount assembly attach the LCD assembly to the pc board with the three short screws and nuts. The nuts insert into slots in the mounting brackets and are fixed to prevent rotation.

Once the LCD assembly is attached, slide the pull tab into the LCD assembly. Finally, Connect the LCD connector to the pc board. Figure B-8 illustrates the Type A rack mount assembly.

Type B Assembly

To assemble the Type B rack mount assembly attach the LCD assembly to the pc board with the three short screws and nuts. The nuts insert into slots in the mounting brackets and are fixed to prevent rotation.

Once the LCD assembly is attached, firmly press the bezel cover over the LCD assembly. The bezel cover is held in place by two alignment posts on the back side. The bezel cover is notched on the right hand side, and the pull tab slides into the LCD assembly from the notched side. Finally, Connect the LCD connector to the pc board. Figure B-8 illustrates the Type B rack mount assembly.

Type C Assembly

To assemble the Type C rack mount assembly attach the LCD assembly to the pc board with the three long screws, lock washers and nuts. The nuts must be held to stop rotation.

Once the LCD assembly is attached, slide the pull tab into the LCD assembly. Finally, Connect the LCD connector to the pc board. Figure B-9 illustrates the Type C rack mount assembly.

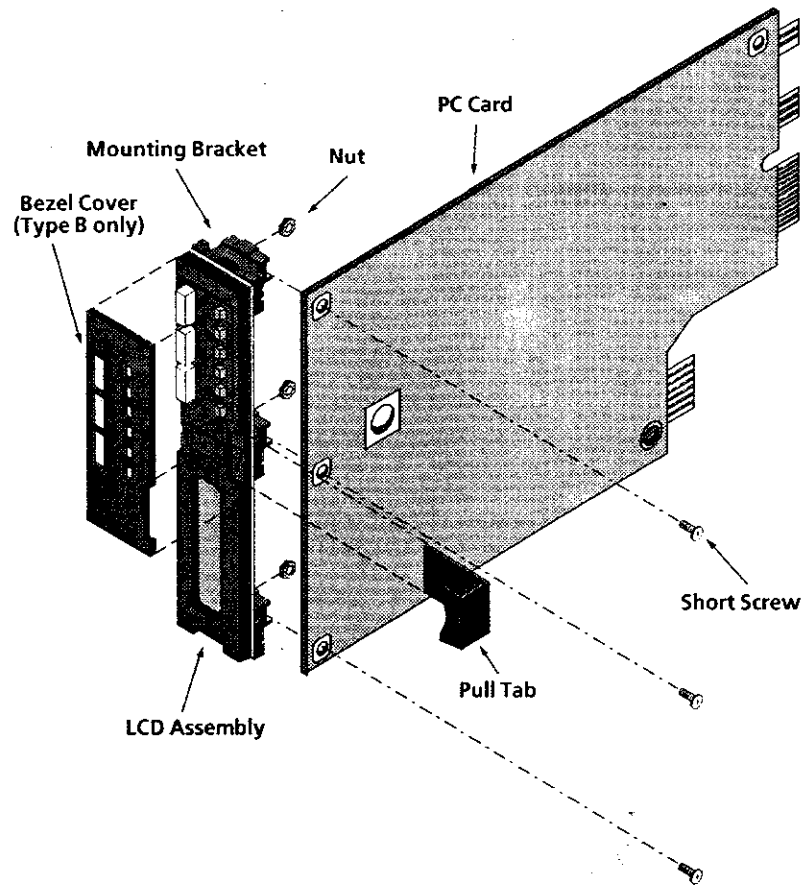


Figure B-8
Type A and B Rack Mount Card Assembly

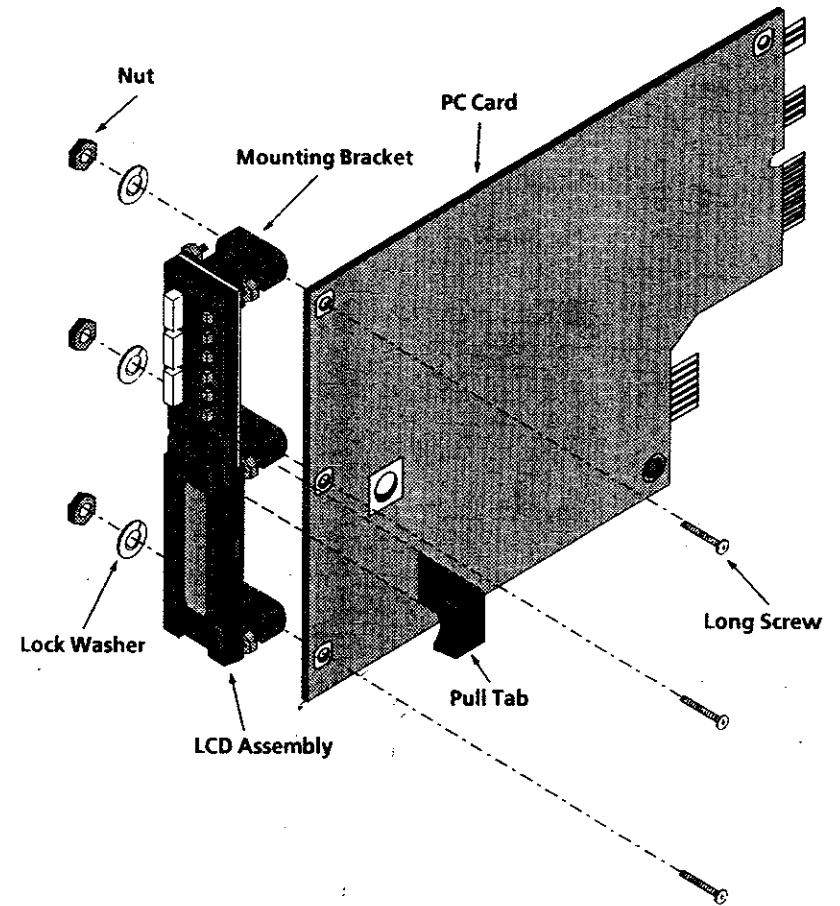


Figure B-9
Type C Rack Mount Card Assembly

B
Mechanical Assembly

**REAR PANEL
ASSEMBLY**

The segmented version of the shelf requires user installation of the individual rear panel segments. Each segment has captive screws at top and bottom and can be installed in any one of the 8 slots (Figure B-10).

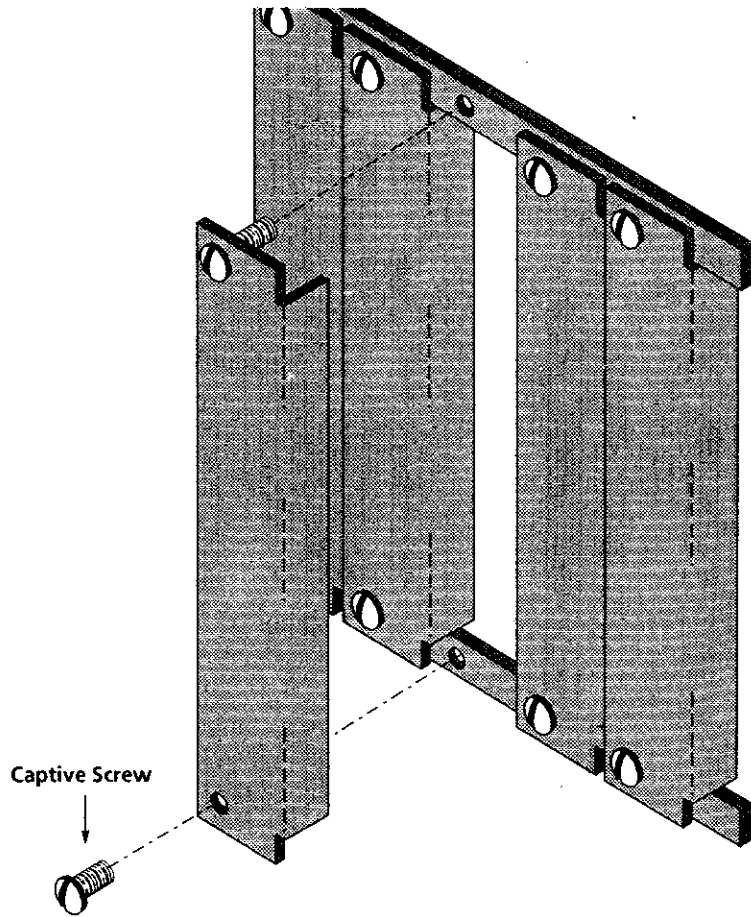


Figure B-10
Segmented Rear Panel Assembly

Appendix C
24 Volt Input Shelf

GENERAL

The RM16M DCV-R shelf is also available as a 24 volt input shelf. In operation and function it is identical to the 48 volt shelf as shown in Figure 1-5. The terminal strips are shown in Figure C-1.

NOTE

Other rear panel configurations available on request.

Links installed when only one 24 volt source is available. Must be removed if two power sources are used.

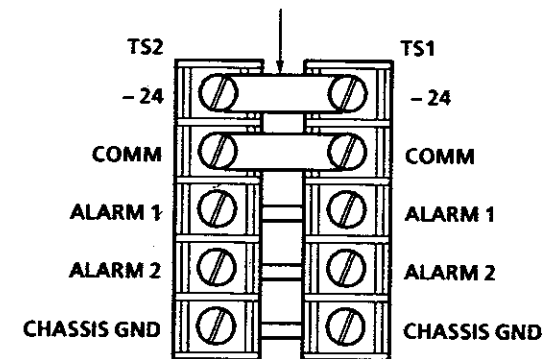


Figure C-1
24 Volt Power Terminal Strips

C

24 Volt Input Shelf

SPECIFICATIONS	Input power	24 Vdc \pm 4 V
	Input current	7 amps

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WARRANTY

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TECHNICAL SERVICE - RETURNED EQUIPMENT AND PARTS

Motorola has instituted a toll-free WATS line for the technical support of our customers. The number is 1-800-221-4380 between 7:00 AM and 6:00 PM Central Time, Monday through Friday. Do not return any item without first calling the toll-free number to receive service or technical instructions. The toll-free number is direct to the technical services department. Please feel free to use it for technical information, application information, and modem/data communication fault isolation. **If the lines are busy, please call back.**

PLEASE CALL US. WE'RE HERE TO HELP YOU.