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RACAL INSTRUMENTS
1266
4 Slot VXI Mainframe

PUBLICATION NO. 980880

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Racal Instruments

CE Declaration of Conformity

We

Racal Instruments Inc.
4 Goodyear Street
Irvine, CA 92718

Declare under sole responsibility that the

1266 4-Slot VXI Chassis
P/N 407866-001

conforms to the following Product Specifications:

Safety: EN61010-1:1993+A2:1995

EMC: EN61326:1997+A1:1998, Class A / EN 61326-1:1997 + A1:1998

Standard	Limit
CISPR 11:1990 / en 55011-1991	Group 1, Class A
IEC 61000-4-2:1995+A1998 / EN 61000-4-2:1995	4 KV CD, 8kV AD
IEC 61000-4-3:1995 / EN 61000-4-3:1995	3 V/m, 80 – 1000MHz
IEC 61000-4-4:1995 / EN 61000-4-4:1995	0.5 kV sig. Lines, 1 kv power lines
IEC 61000-4-5:1995 / EN 61000-4-5:1996	0.5 kV L-L, 1 kV L- G
IEC 61000-4-6:1995 / EN 61000-4-6:1998	3 V, 0.15 – 80 MHz
IEC 61000-4-11:1994 / EN 61000-4-11:1998	1 cycle, 100%

Supplementary Information:

The above specifications are met when the product is installed with faceplates installed over all unused slots, as applicable

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC. It complies with Canadian ICES-001.

Irvine, CA, February 24, 2004

Karen Evensen, Engineering Director

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FOR YOUR SAFETY

Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.



This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.



If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.



Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.



Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid “live” circuit points.

Before operating this instrument:

1. Ensure the proper fuse is in place for the power source to operate.

2. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

Do not operate until, performance is checked by qualified personnel.

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Chapter 1
Getting Started

Chapter Overview

Chapter contents are:

- Product Overview 1-1
- Initial Mainframe Setup 1-3
- Installing VXI Instruments 1-5
- Front Panel Features 1-6

Product Overview

The 1266 VXI mainframe is designed in full compliance with VXIbus specification revision 1.4 and VMEbus system specification revision C.1. The mainframe has three configurations: Standard, Portable, and Rack Mount.

- The **Standard Configuration** consists of the 4-slot C-size mainframe with front panel monitor, protective bumpers and a carrying handle. Optional filler panels and shields can be added to the Standard Configuration.
- The **Rack Mount Configuration** consists of the Standard Configuration with the protective bumpers and carrying handle removed. For this configuration, the mainframe can be rack mounted using the Rack Mount/Cable Route Adapter Kit with either the Rack Slide Kit or the Support Rail Kit.

Figure 1-1 shows the options and accessories available for the 1266 mainframe. See *Appendix A - 1266 Product Specifications* for description and part numbers for mainframe and accessory options.

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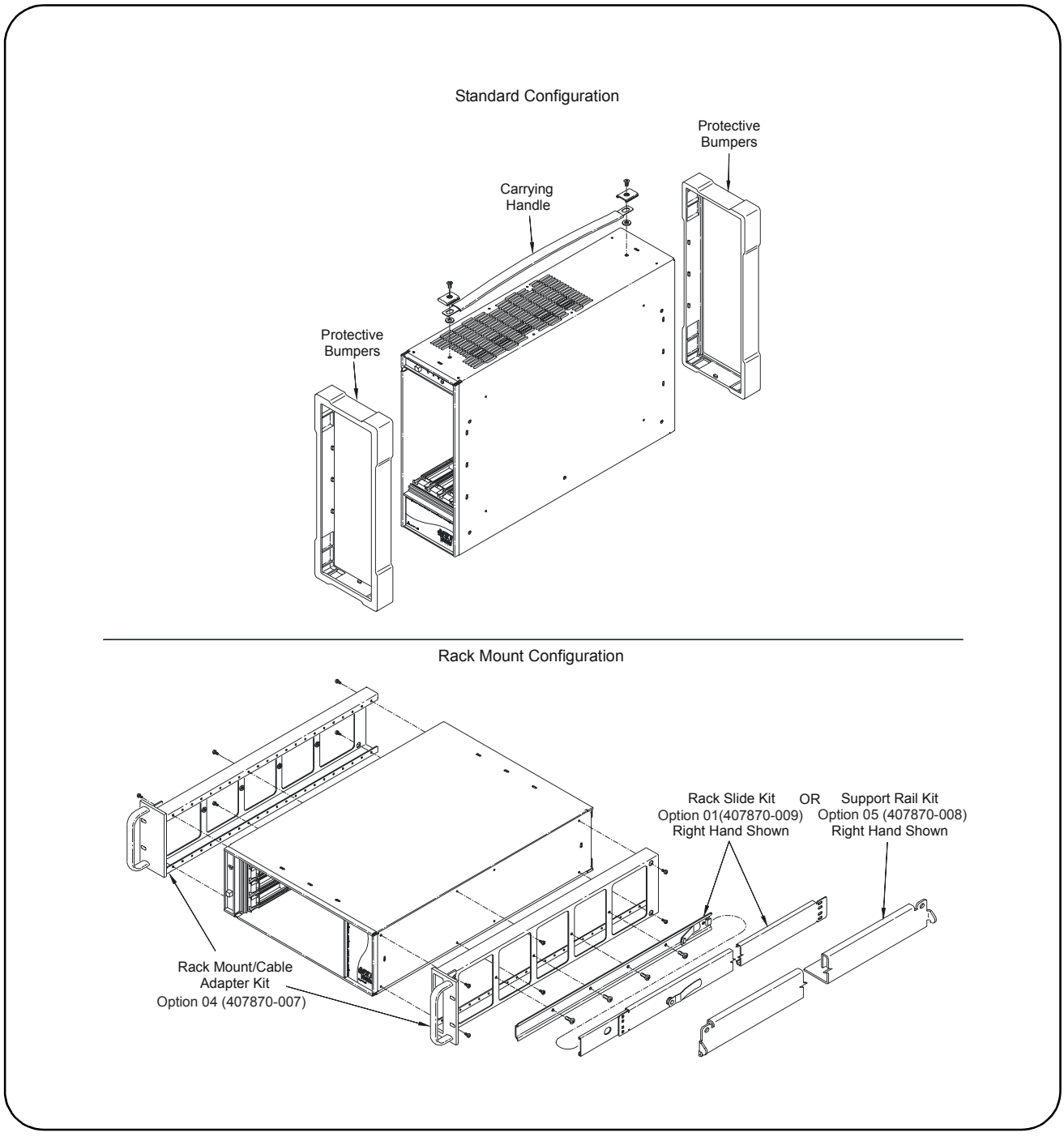


Figure 1-1. 1266 Mainframe Configurations/Options

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Initial Mainframe Setup

The 1266 mainframe is shipped from the factory ready to use. This section describes procedures for initial mainframe setup, including:

- AC Power Requirements
- Positioning the Mainframe for Adequate Cooling
- Connecting Permanent Earth Ground

NOTE This chapter shows initial setup procedures for the Standard Configuration. See *Chapter 2 - Installing Mainframe Options* for information on rack mounting the mainframe and installing mainframe options.

AC Power Requirements

The 1266 mainframe can be operated at line voltages of 90 - 140 Vac (@ 47 Hz to 440 Hz) or 90 - 264 Vac (@47 - 66 Hz). The mainframe ships with a power cord and with a fuse installed in the power supply. The fuse is suitable for all line voltages, but is not accessible. *Appendix A - 1266 Product Specifications* contains input power specifications.

WARNING **The power cord is the only way to disconnect the mainframe from AC power. Therefore, the power cord must be accessible to the operator at all times. When the 1266 mainframe is mounted in a system cabinet, the power cord need not be accessible since the cabinet must have its own disconnect device. Some fault conditions require removal of AC power for recovery to occur. See *Chapter 3 - Servicing the Mainframe*.**

Positioning the Mainframe for Adequate Cooling

A cooling fan provides air for module and power supply cooling. The fan operates in Variable Speed or Full Speed mode as controlled by the front panel Fan Speed switch. Full Speed mode is recommended for maximum cooling when acoustic noise is not a factor.

Variable Speed mode allows quietest operation while providing sufficient power supply and module cooling. In Variable Speed mode, the fan speed is controlled automatically as a function of temperature rise in the mainframe and the ambient temperature.

Airflow enters the 1266 mainframe rear panel, flows through the power supply, fan and modules and exhausts out the left side (as viewed from the front in horizontal orientation). This allows mainframes to be stacked or rack-mounted directly on top of one another.

When placing the mainframe on a work bench or if the mainframe is rack mounted, provide at least a one-inch clearance at the back and sides to allow proper air flow. (Air filters are not necessary on 1266 mainframes.)

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Connecting Permanent Earth Ground

The mainframe can be connected to a permanent earth ground. This connection is made on the back of the mainframe (see Figure 1-2).

WARNING **For protection from electrical shock when operating at frequencies greater than 66 Hz, connect the chassis ground terminal to permanent earth ground.**

1 Connect a 16 AWG (1.3 mm or larger) wire to the PEM nut shown in Figure 1-2. The wire must be green with a yellow stripe, or bare (no insulation). Use a M4 x 10 screw, grounding lug, and toothed washers (or toothed lug) as shown in Figure 1-2.

2 Attach the other end of the wire to a permanent earth ground using toothed washers or a toothed lug.

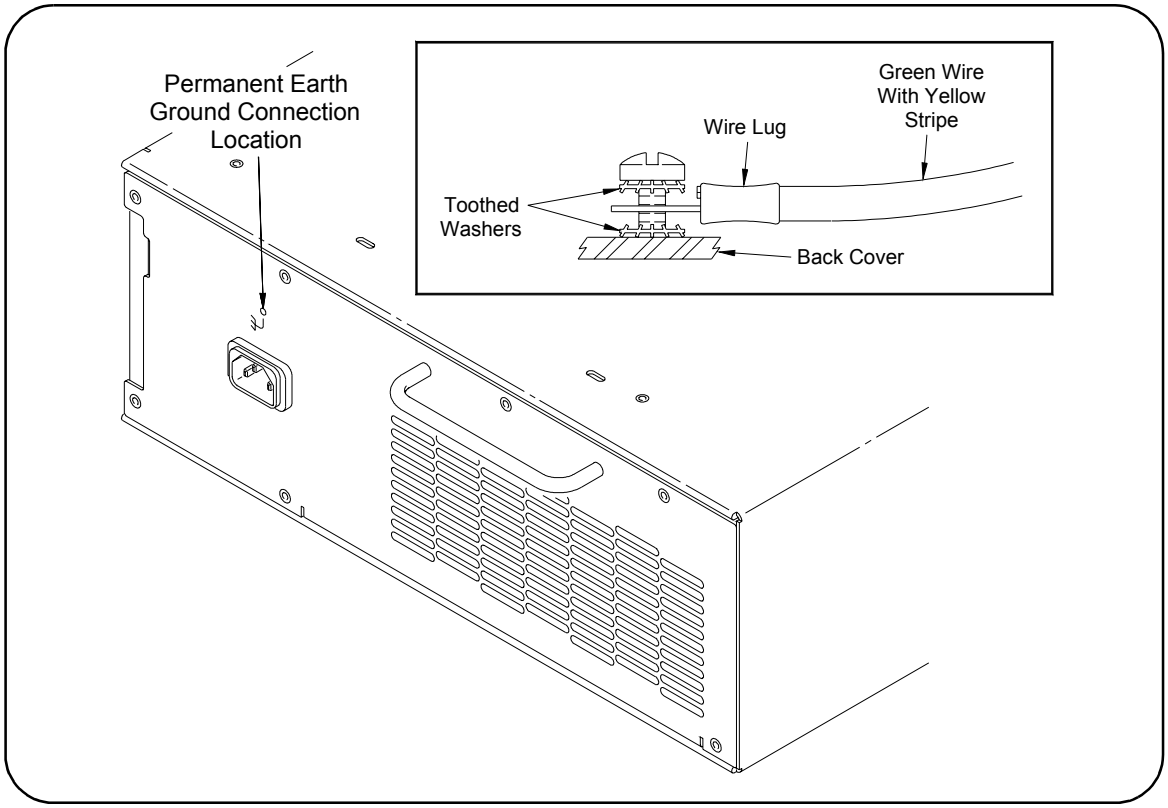


Figure 1-2. Connecting the 1266 Mainframe to a Permanent Earth Ground

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Installing VXI Instruments

This section shows how to install VXI instruments (modules) in a 1266 mainframe, including:

- Slot 0 Functions
- Installation Guidelines
- Installing C-Size Instruments

Slot 0 Functions

The 1266 mainframe has 4 slots labeled 0 through 3. Any VXI instrument can be installed in slots 1 through 3. However, slot 0 is reserved for devices capable of providing the system's slot 0 functionality, such as the Racal 1260-00C GPIB Slot 0 controller or the Agilent E8491A, IEEE 1394 Firewire Slot 0 controller. This functionality includes:

- locating instruments installed in the mainframe
- managing (arbitrating) data flow across the backplane
- providing the system clock (SYSCLK - 16 MHz)

Installation Guidelines

1 Multiple instruments that combine to create a virtual instrument (e.g., a scanning multimeter), and instruments which access the backplane local bus should be installed in adjacent slots.

2 To prevent damage to VXI instruments, do not install instruments unless the **Power On/Standby** switch is in Standby position.

3 Insert the instrument into the mainframe by aligning the instrument with the card guides inside the mainframe. Slowly push the instrument into the slot until it seats in the backplane connectors. The front panel of the instrument should be even with the front edges of the mainframe.

When installing or removing an instrument in Slot 0, you will need to move the front panel protective bumper aside. Restore the bumper to its original position after the instrument is installed or removed.

4 Tighten the retaining screws on the top and bottom of the module.

WARNING **All instruments within the VXI mainframe are grounded through the mainframe chassis. During installation, tighten the instrument's retaining screws to secure the instrument to the mainframe and to make the ground connection.**

NOTE *The 1266 is shipped with 1-slot plastic filler panels that do not provide EMC protection.*
To comply with EMC requirements, order 1-slot metal filler panels (407870-004) to cover empty mainframe slots.

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Installing C-Size Instruments

Install C-size modules directly into the mainframe by first placing the module's card edges into the front module guides (top and bottom). Side the module to the rear of the mainframe until the module connectors mate solidly with the backplane connectors. Secure the module's front panel to the mainframe using the module's front panel mounting screws.

The easiest way to install B-size modules is with a "B to C size adapter" allowing a B-size module to be installed just like a C-size.

Front Panel Features

Figure 1-3 shows the 1266 Front Panel features, and the table describes the features. When the mainframe is connected to an AC supply and the **Power** Switch is pressed ON, the **Voltages, Temp**, and **Fan** lights flash Amber for about one second, and then turn Green. These lights should remain Green. A flashing Amber light indicates an error condition. In this case, see *Chapter 3 - Servicing the Mainframe.*

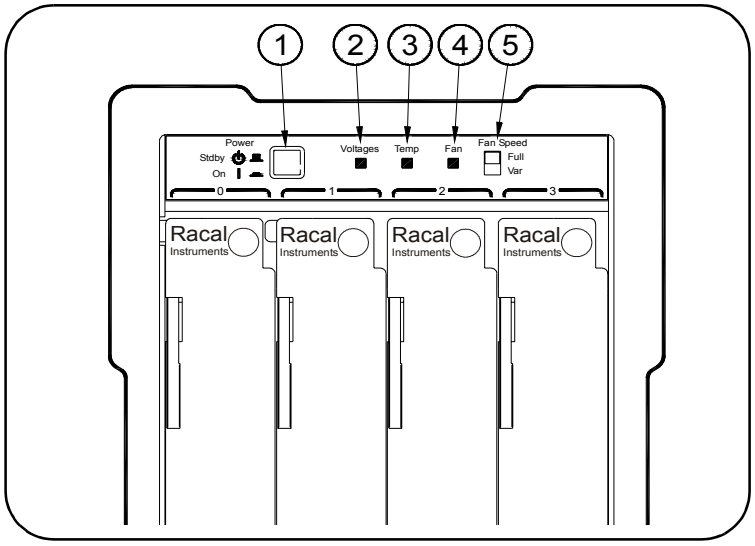


Figure 1-3. 1266 Mainframe Front Panel Features

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No.	Indicator/Switch	Description
1	Power Switch	**Stdby** - AC power is applied to the mainframe, but not to installed VXI instruments. **On** - AC power applied to the mainframe, and DC power to installed VXI instruments.
2	Voltages Indicator	**Green** - all voltages on the VXI backplane are present. (Does not necessarily indicate voltages are within VXI specifications.) **Flashing Amber** - one or more voltages is not present or is incorrect. The backplane voltages and allowed variations are listed below: Voltage — Allowed Variation +5V — +4.875V to +5.125V +12V — +11.64V to +12.6V -12V — -12.6V to -11.64V +24V — +23.28V to +25.2V -24V — -25.2V to -23.28V -5.2V — -5.46V to -5.044V -2V — -2.1V to -1.9V
3	Temp Indicator	**Green** - the power supply temperature is acceptable. **Flashing Amber** - the power supply is approaching thermal shutdown.
4	Fan Indicator	**Green** - mainframe cooling fan is operating properly. **Flashing Amber** - mainframe cooling fan is not operating.
5	Fan Speed Switch	**Full** - the mainframe cooling fan is operating at full speed. **Var**(iable) - the mainframe cooling fan is providing adequate cooling (default setting).

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Chapter 2
Installing Mainframe Options

Chapter Overview

This chapter contains procedures to install hardware options available with the 1266 mainframe, including:

- Rack Mounting Using Rack Slide Kit 2-2
- Rack Mounting Using Support Rail Kit 2-12
- Installing Intermodule Chassis Shields 2-20
- Installing the Airflow Restricter Kit 2-22

NOTE *Mainframe illustrations in this chapter may show empty mainframes. However, you may receive integrated (pre-configured) VXI systems with VXI instruments (modules) already installed in the mainframe.*

In general, you will NOT need to remove the VXI instruments to perform installation procedures in this chapter. However, to install shields you must first remove any installed instruments. To do this, reverse the procedure in Installing VXI Instruments in Chapter 1 - Getting Started to remove the instruments.

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Rack Mounting Using Rack Slide Kit

This section contains instructions to mount the 1266 mainframe in a standard EIA cabinet using the Option 04, Rack Mount/Cable Route Adapter Kit (P/N 407870-007) and the Option 01, Rack Slide Kit (P/N 407870-009). The rack slide kit allows you to extend the mainframe from the cabinet for easier access to installed instruments.

Parts List

Table 2-2 shows the parts for the Standard Rack Mount/Cable Routing Kit and for the Rack Slide Kit.

Table 2-1. Rack Mount Kit and Rack Slide Kit Parts Lists

Quantity	Description
Rack Mount/Cable Route Adapter Kit Option 04 (407870-007)	
1	Rack Mount Adapter (right)
1	Rack Mount Adapter (left)
2	Handle (for Rack Mount Adapters)
4	10-32 X 0.375" Flat Head Screw (Handle Screws)
12	M3 X 0.5 Pan Head Screw (Adapter-to Mainframe Screws)
4	Adapter Dress Screw
4	Self-Retained Nut (for Rack Mount Adapters)
Rack Slide Kit Option 01 (407870-009)	
1 pair	Rack Slides
12	10-32 X .375" Pan Head Screw
4	10-32 X .50" Flat Head Screw
8	10-32 Self-Retained Nut

Installation Procedure

There are three main steps to rack mount the 1266 mainframe using the Option 04, Rack Mount/Cable Route Adapter Kit and the Option 01, Rack Slide Kit:

- Configure the Mainframe
- Set up Rack Cabinet
- Install the Mainframe

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Configure the Mainframe Remove Mainframe Items (as applicable) (Figure 2-3)

1 Remove the two protective bumpers.

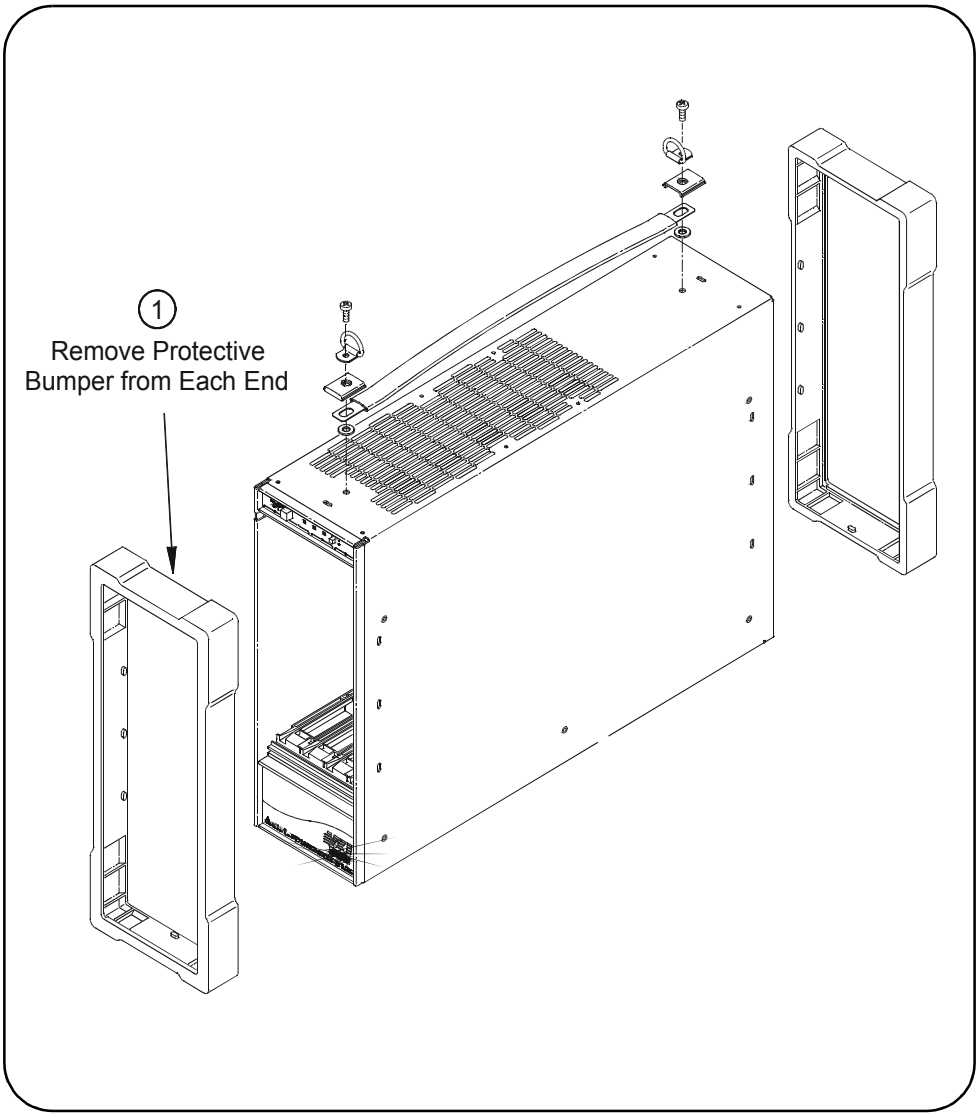


Figure 2-1. Removing Mainframe Items

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Attach Handles to Rack Mount Adapters (Figure 2-4)

1 Attach a handle to the LH Rack Mount Adapter, Option 04 (P/N 407870-007) using two 10-32 X 0.375" flat head screws.

2 Attach a handle to the RH Rack Mount Adapter using two 10-32 X 0.375" flat head screws.

NOTE *The rack mount adapter without the opening is the left-side (LH) Rack Mount Adapter and the rack mount adapter with the cable routing opening is the right-side (RH) Rack Mount Adapter.*

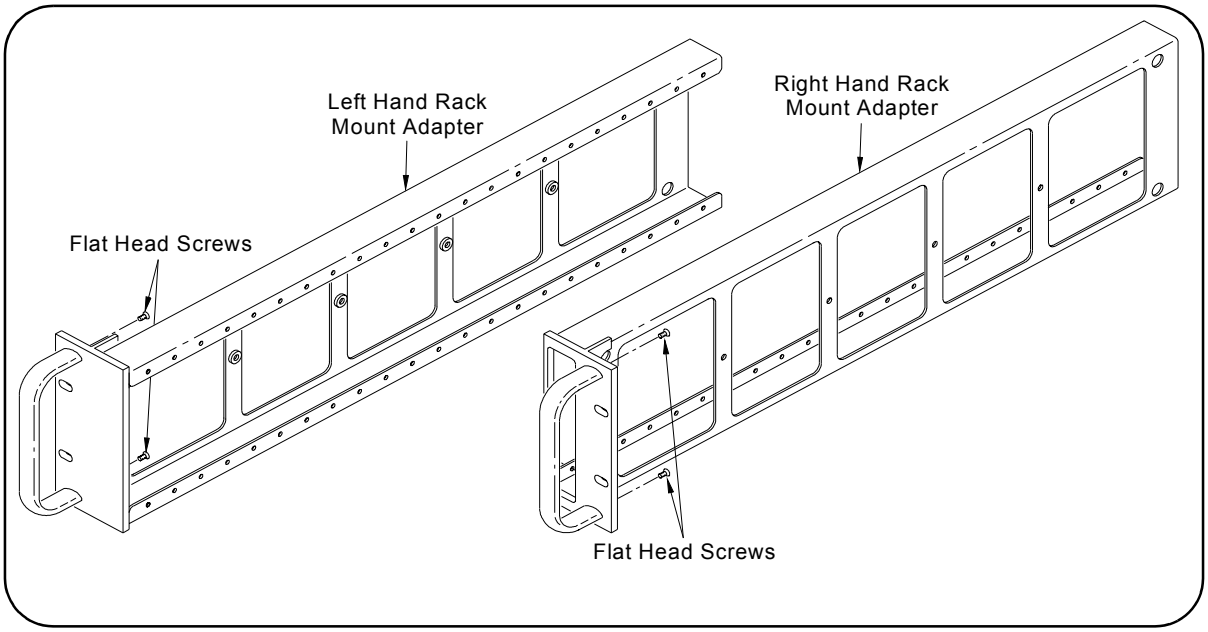


Figure 2-2. Attaching Handles to the Rack Mount Adapters

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Attach Rack Mount Adapters to Mainframe (Figure 2-5)

NOTE *The mainframe can be recess mounted up to 207 mm (approximately 8 inches) in 23 mm (approximately 1 inch) increments. When recessing the mainframe, make sure that six screws are used to attach the adapters on each side.*

For mass interconnect systems, the mainframe must generally be recessed. Check the mass interconnect system manufacturer's instructions BEFORE attaching the adapters to the mainframe.

For easier installation, place the screws in the openings before you begin attaching the adapters.

1 Attach the LH Rack Mount Adapter to the left side of the mainframe using six M3 X 0.5 pan head screws.

2 Attach the RH Rack Mount Adapter to the right side of the mainframe using six M3 X 0.5 pan head screws.

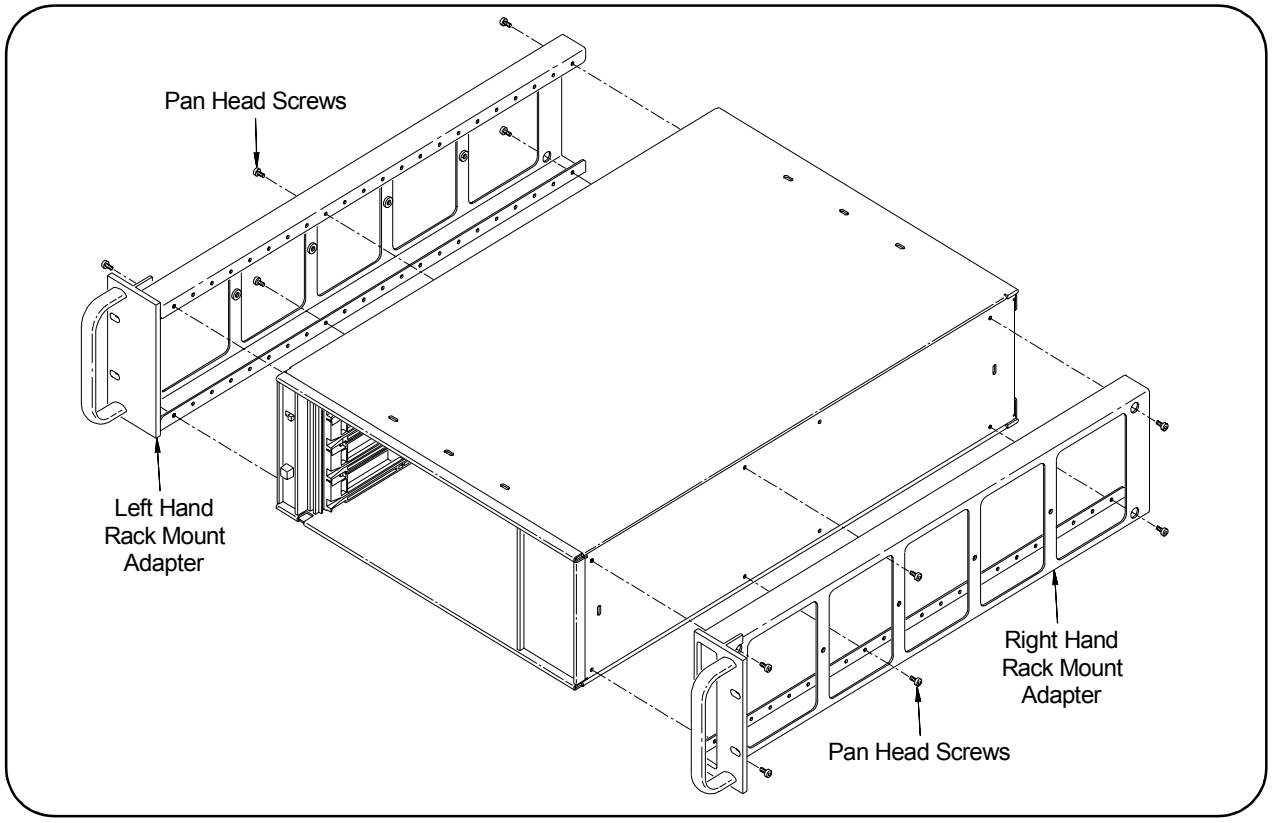


Figure 2-3. Attaching the Rack Mount Adapters to the Mainframe.

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Set Up Rack Cabinet

Remove Rack Slide Chassis Sections (Figure 2-6)

1 Open the Option 01, Rack Slide Kit (407870-009).

2 Remove the Left-Side (LH) Rack Slide Chassis Section from the Intermediate Section.

3 Slide the Intermediate Section back into the Stationary Section.

4 Remove the Right-Side (RH) Rack Slide Chassis Section from the Intermediate Section.

5 Slide the Intermediate Section back into the Stationary Section.

NOTE *Be sure to mark the chassis sections as RH or LH so you can install them on the proper side of the Rack Mount Adapters. (The Rack Slide is marked with - RH or - LH on the label to identify it.)*

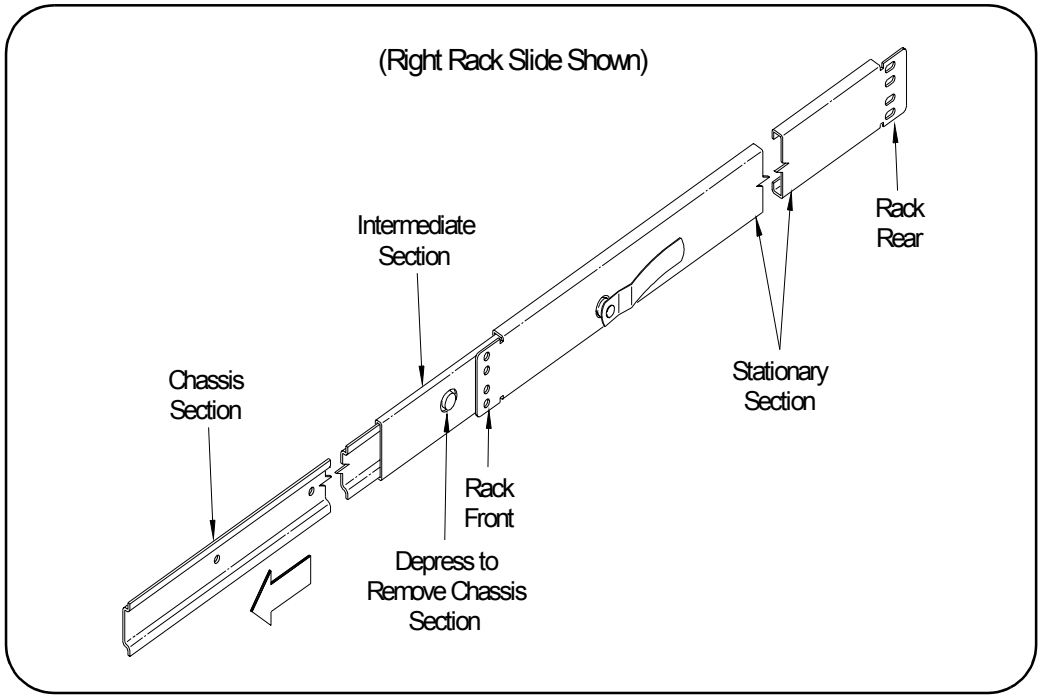


Figure 2-4. Removing Rack Slide Chassis Section

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Connect Chassis Section to Rack Mount Adapters (Figure 2-7)

1 Connect the LH Rack Slide chassis section to the LH Rack Mount Adapter using four 10-32 x 0.375" pan head screws.

2 Connect the RH Rack Slide chassis section to the RH Rack Mount Adapter using four 10-32 x 0.375" pan head screws.

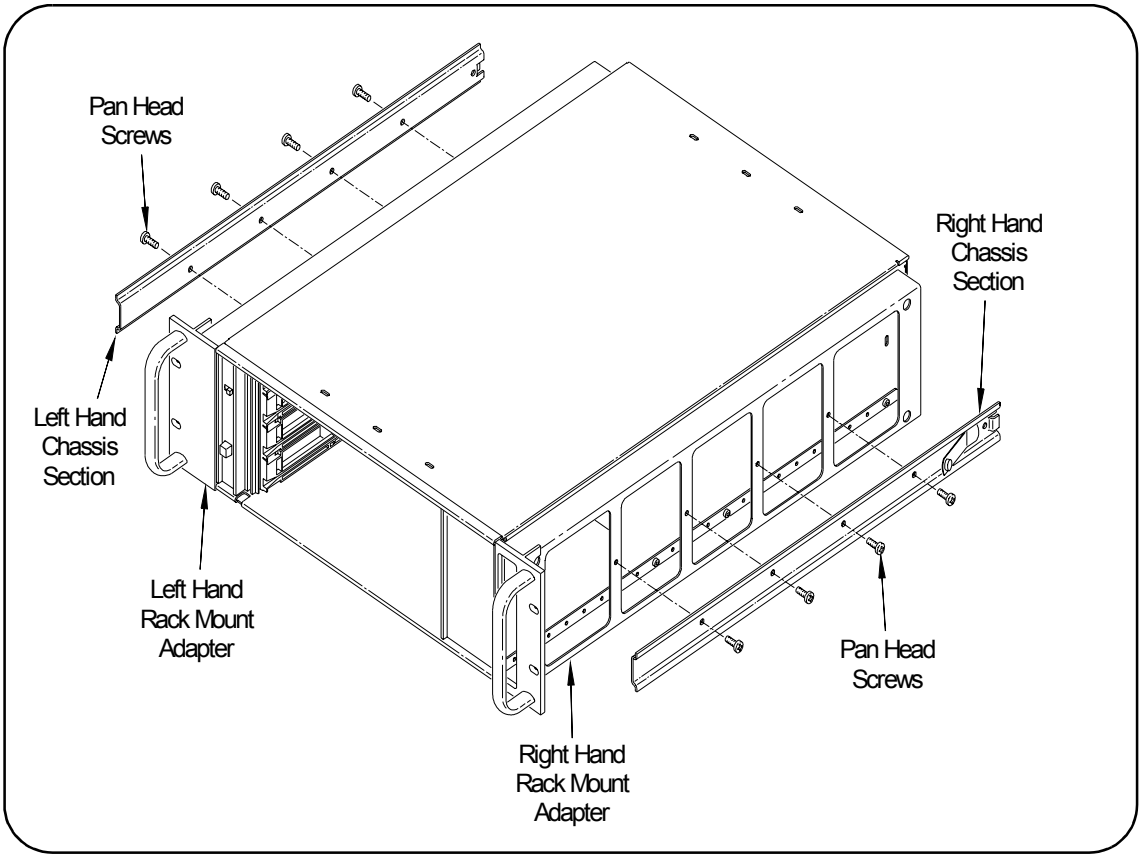


Figure 2-5. Connecting Chassis Section to Rack Mount Adapters

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Install Channel Nuts for Rack Mount Adapters (Figure 2-8)

1 Determine the location for the mainframe in the cabinet. The 1266 mainframe requires 3 EIA Units, and should be placed between the EIA markers.

2 Select the holes for the LH and RH Rack Mount Adapters. See Figure 2-9 for the RH Rack Mount Adapter hole locations. (LH Rack Mount Adapter hole locations are the same.)

3 Slide two 10-32 Self-Retained Nuts (provided in the Rack Mount/ Cable Route Adapter Kit) over the selected holes in the right hand front vertical column of the cabinet. These nuts will be used to connect the RH Rack Mount Adapter.

4 Slide two 10-32 Self-Retained Nuts over the selected holes in the left hand front vertical column of the cabinet. These nuts will be used to connect the LH Rack Mount Adapter.

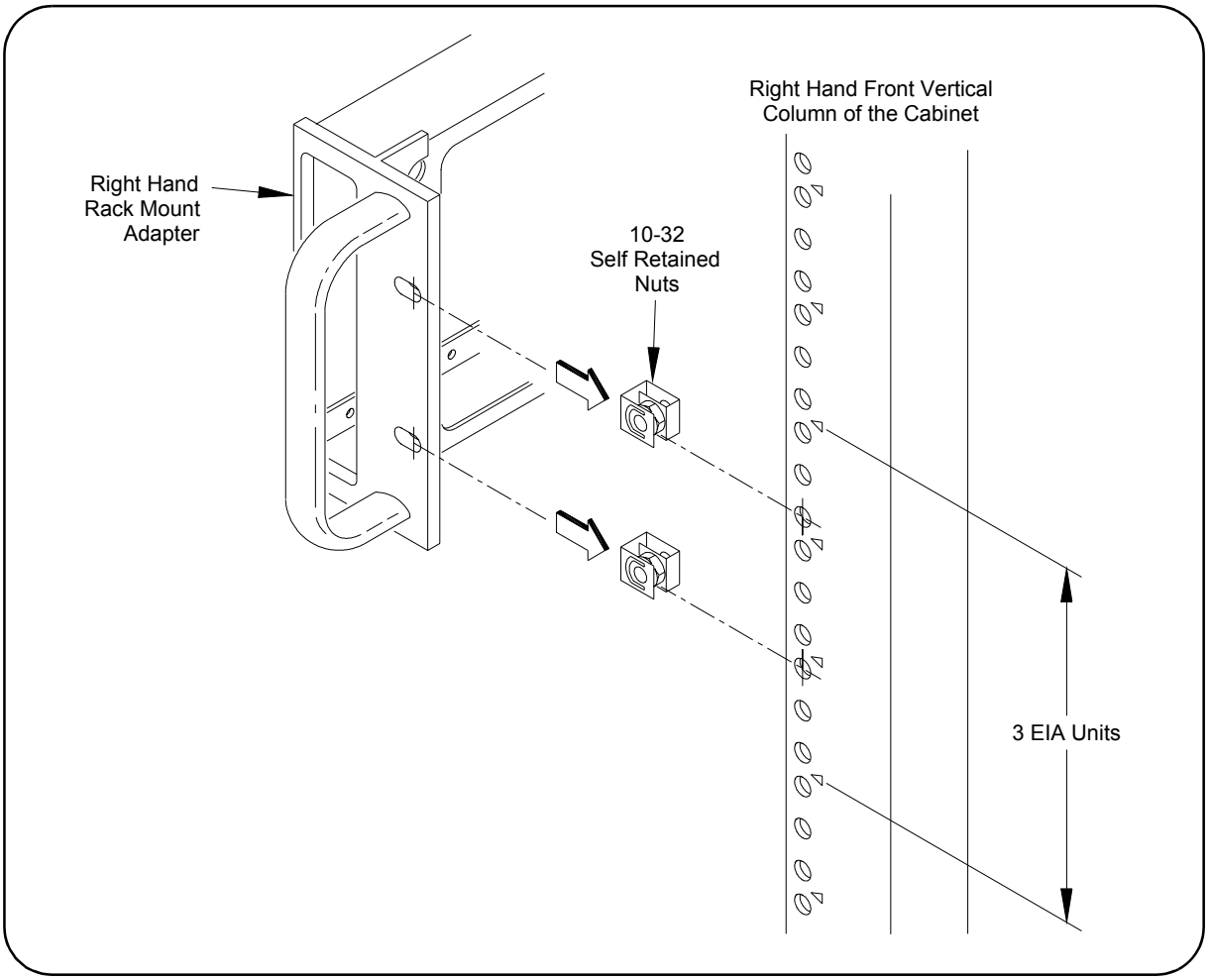


Figure 2-6. Installing Rack Mount Adapter Channel Nuts

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Install Rack Slide Stationary Sections (Figure 2-9)

NOTE *The Rack Slides occupy the center EIA unit of the three EIA units required for the 1266 mainframe.*

1 Slide four 10-32 Self-Retained Nuts on the selected holes in the right hand vertical column of the cabinet. See Figure 2-10 for hole locations.

2 Attach the RH Rack Slide Stationary Section to the right hand vertical column of the cabinet. Use two 10-32 x 0.5" flat head screws at the front of the rack slide, and two 10-32 x 0.375" pan head screws at the rear of the rack slide.

3 Repeat steps for the LH Rack Slide Stationary Section.

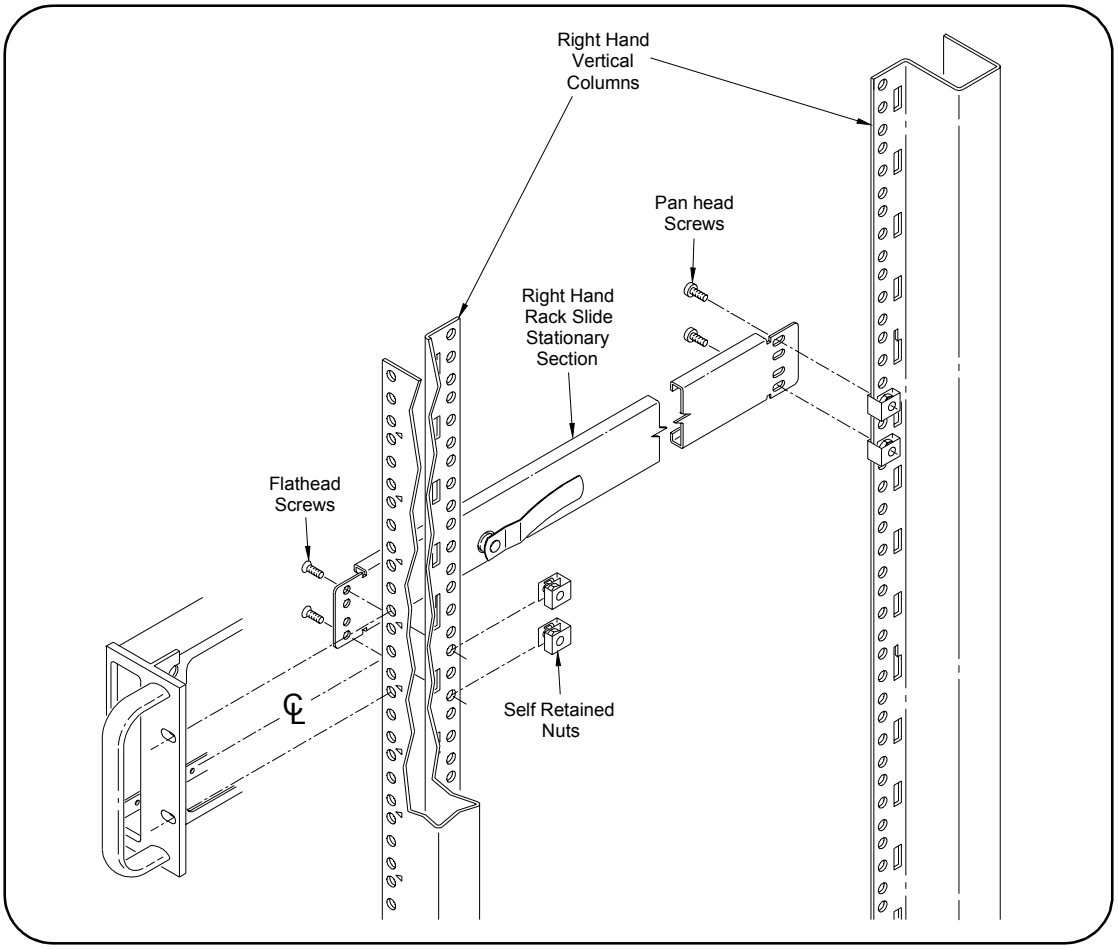


Figure 2-7. Installing Rack Slide Stationary Sections

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Installing the Mainframe

Install the Mainframe in the Rack (Figure 2-10)

1 Slide the Rack Slide Intermediate Sections out from the Rack Slide Stationary Sections until they lock into place.

WARNING **To prevent possible injury during rack mounting, two people should lift the mainframe into the rack.**

2 With one person on each side, lift the mainframe and slide the Chassis Sections into the Intermediate Sections until the Chassis Sections lock into place.

3 Slide the mainframe into the cabinet until the Rack Mount Adapter flanges are against the front vertical columns of the cabinet. (You will need to depress the Chassis Section Slide Locks twice to fully slide the mainframe to the columns.)

4 Secure the mainframe to the rack using the four adapter dress screws.

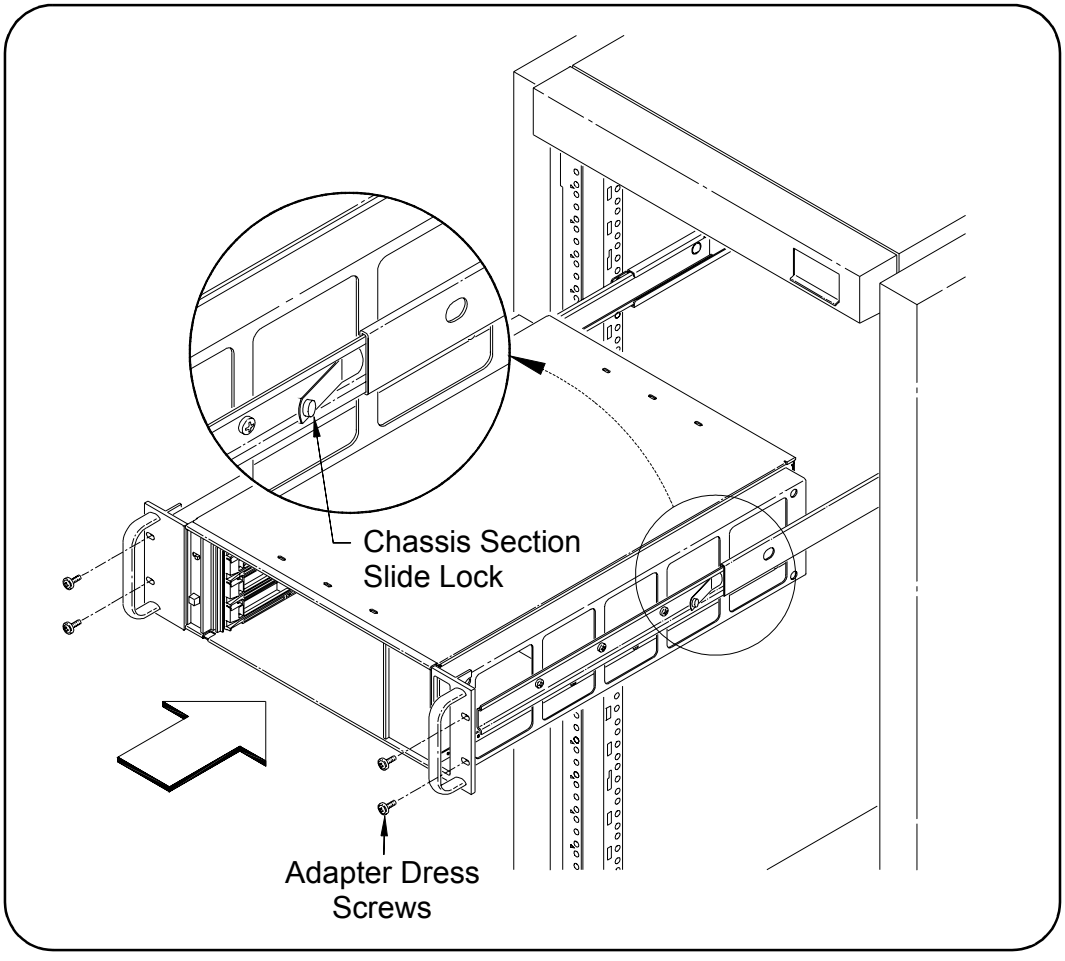


Figure 2-8. Installing the Mainframe

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Connect/Route VXI Instrument Cables (Figure 2-11)

1 As required, install VXI instruments in the mainframe (See *Chapter 1 - Getting Started*).

2 Connect cable(s) to instrument front panel terminals as required.

3 Route cables through the right side cable tray/RH Rack Mount Adapter, as required.

NOTE *Cables should not be routed on the left side of the mainframe as the cables may interfere with proper airflow.*

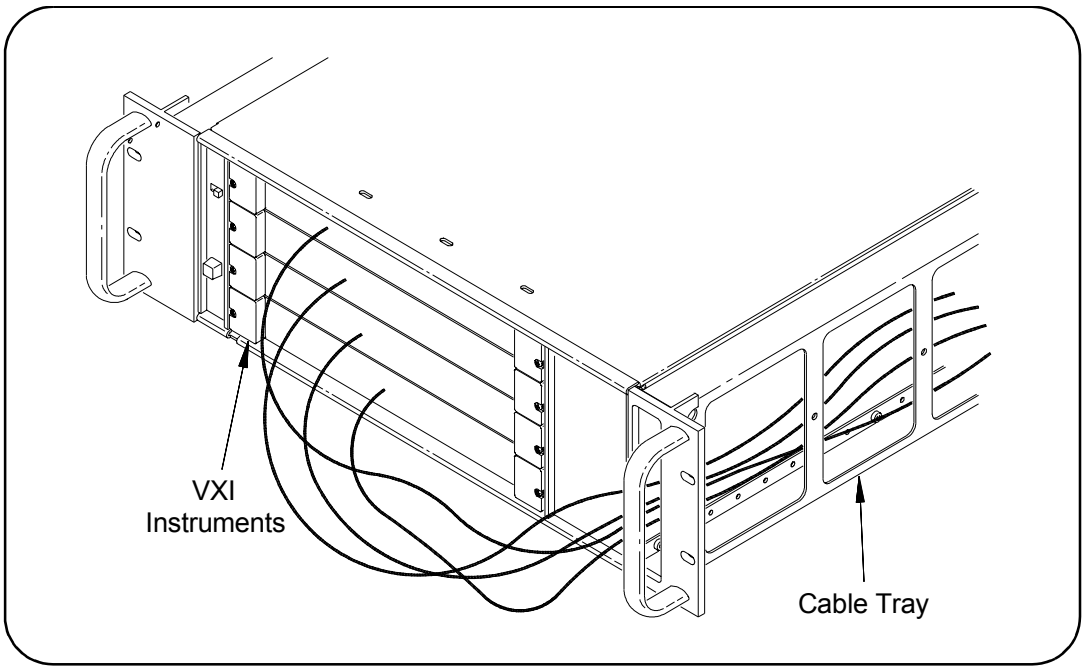


Figure 2-9. Routing VXI Instrument Cables

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Rack Mounting Using Support Rail Kit

This section contains instructions to mount the 1266 mainframe in a standard EIA cabinet using the Rack Mount/Cable Route Adapter Kit Option 04, (P/N 407870-007) and the Support Rail Kit Option 05, (P/N 407870-008). The Option 05 is only compatible with standard EIA cabinets.

Parts List

Table 2-3 shows the parts for the Standard Rack Mount/Cable Routing Kit and the Support Rails Kit

Table 2-2. Rack Mount Kit and Support Rail Kit Parts Lists

Quantity	Description
Rack Mount/Cable Route Adapter Kit Option 04, (P/N 407870-007)	
1	Rack Mount Adapter (right)
1	Rack Mount Adapter (left)
2	Handle (for Rack Mount Adapters)
4	10-32 X 0.375" Flat Head Screw (Handle Screws)
12	M3 X 0.5 Pan Head Screw (Adapter-to Mainframe Screws)
4	Adapter Dress Screw
4	Self-Retained Nut (for Rack Mount Adapters)
Support Rail Kit Option 05, (P/N 407870-008)	
2	Support Rail
4	10-32 Self-Retained Nut
4	10-32 X 0.5" Pan Head Screw

Installation Procedure

There are three main steps to rack mount the 1266 mainframe using the Rack Mount/Cable Route Adapter Kit Option 04 and the Support Rail Kit Option 05:

- Configure the Mainframe
- Set up Cabinet Racks
- Install the Mainframe

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Remove Mainframe Items (as applicable) (Figure 2-12)

1. Remove the two protective bumpers.

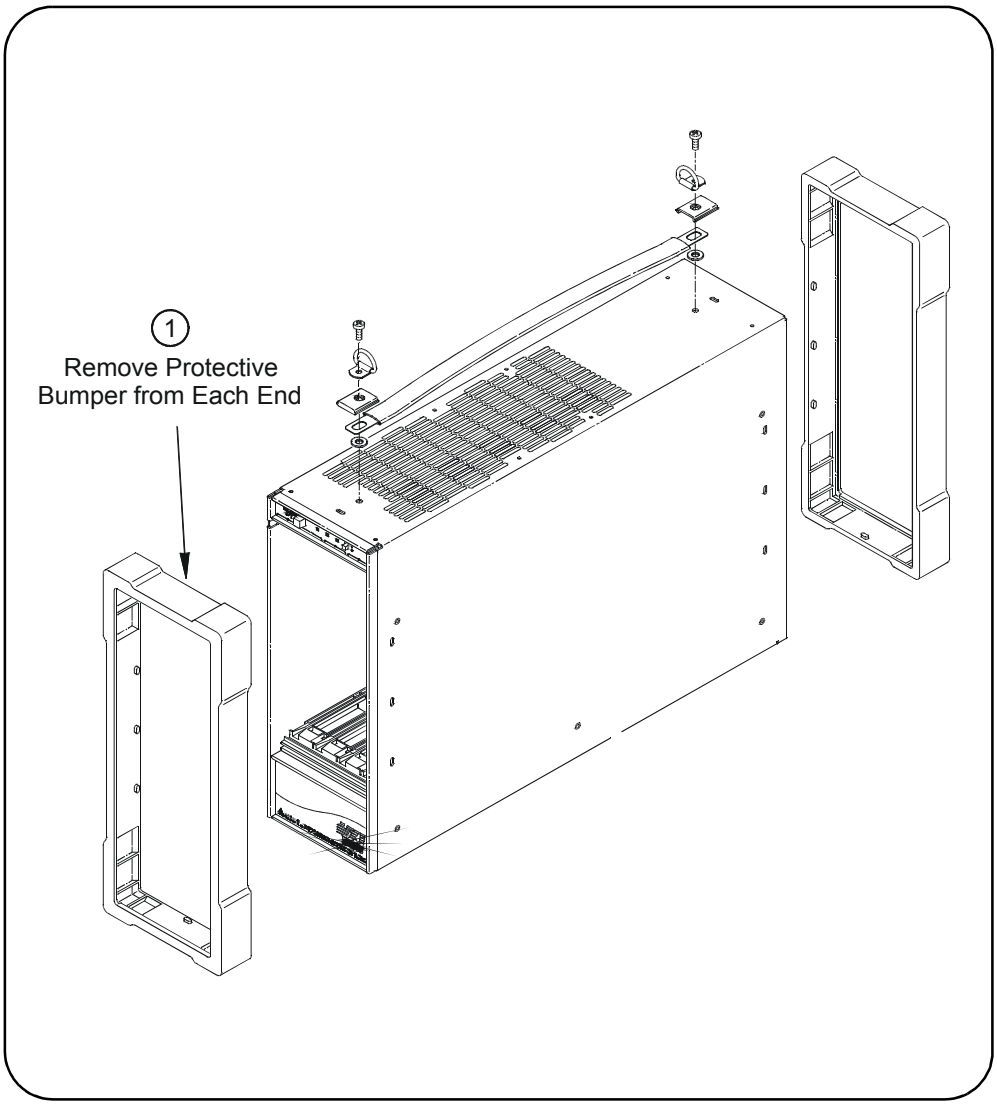


Figure 2-10. Removing Mainframe Items

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Attach Handles to Rack Mount Adapters (Figure 2-13)

1 Attach a handle to the LH Rack Mount Adapter using two 10-32 X 0.375" flat head screws.

2 Attach a handle to the RH Rack Mount Adapter using two 10-32 X 0.375" flat head screws.

NOTE *The rack mount adapter without the opening is the left-side (LH) Rack Mount Adapter, and the rack mount adapter with the cable routing opening is the right-side (RH) Rack Mount Adapter.*

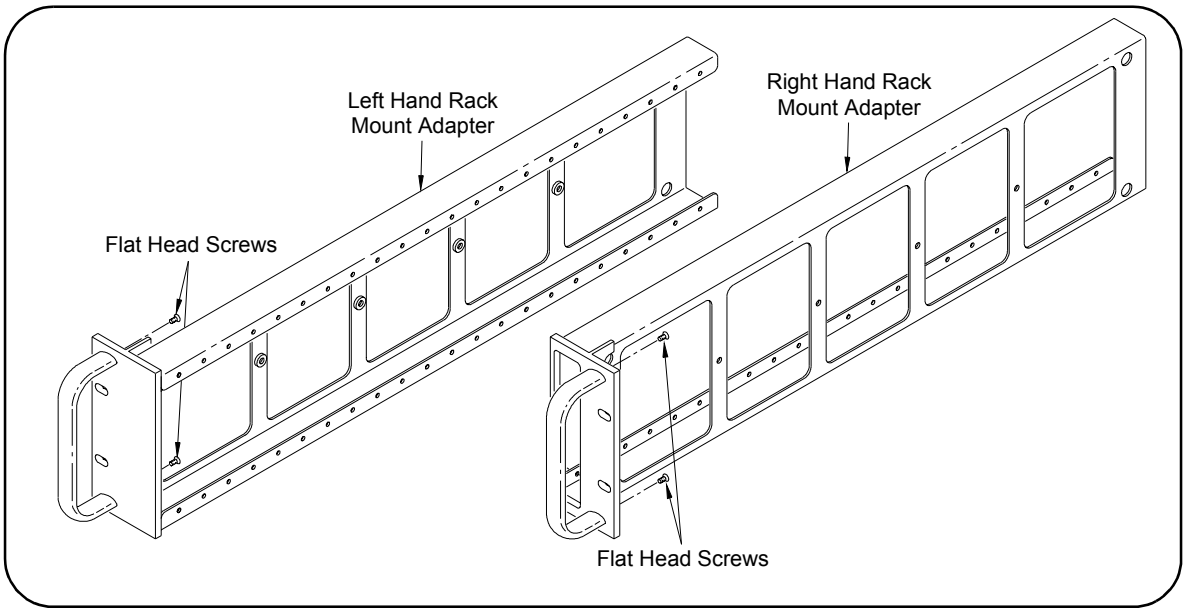


Figure 2-11. Attaching Handles to the Rack Mount Adapters

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Attach Rack Mount Adapters to Mainframe (Figure 2-14)

NOTE *The mainframe can be recess mounted up to 207 mm (approximately 8 inches) in 23 mm (approximately 1 inch) increments. When recessing the mainframe, make sure that six screws are used to attach the adapters on each side.*

For mass interconnect systems, the mainframe must generally be recessed. Check the mass interconnect system manufacturer's instructions BEFORE attaching the adapters to the mainframe.

For easier installation, place the screws in the openings before you begin attaching the adapters.

1 Attach the LH Rack Mount Adapter to the left side of the mainframe using six M3 X 0.5 pan head screws.

2 Attach the RH Rack Mount Adapter to the right side of the mainframe using six M3 X 0.5 pan head screws.

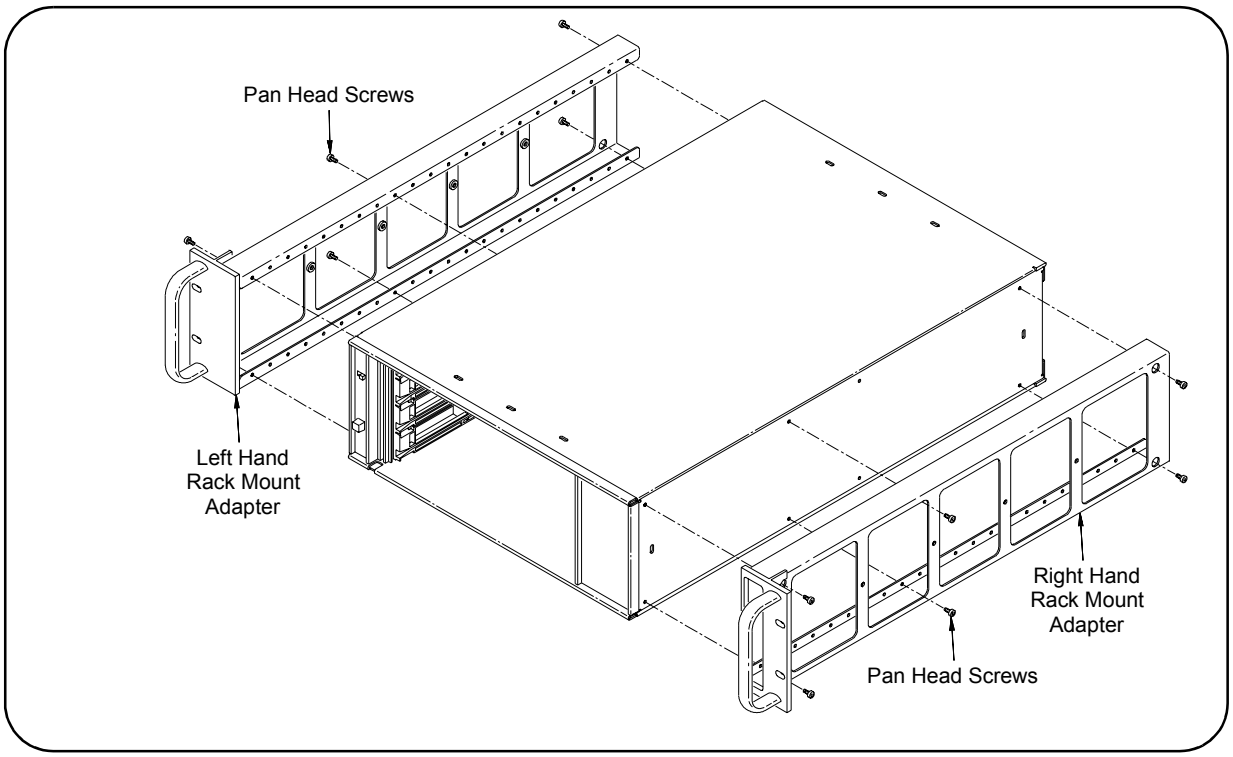


Figure 2-12. Attaching the Rack Mount Adapters to the Mainframe.

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Install Channel Nuts for Rack Mount Adapters (Figure 2-15)

NOTE *Some racks use tapped holes or other methods for attaching equipment. In this case, the self retaining nuts may not be required.*

1 Determine the location for the mainframe in the cabinet. The 1266 mainframe requires 3 EIA Units, and should be placed between the EIA markers.

2 Select the holes for the LH and RH Rack Mount Adapters. See Figure 2-17 for the RH Rack Mount Adapter hole locations. (LH Rack Mount Adapter hole locations are the same.)

3 Slide two 10-32 Self-Retained Nuts (provided in the Rack Mount/ Cable Route Adapter Kit) over the selected holes in the right hand front vertical column of the cabinet. These nuts will be used to connect the RH Rack Mount Adapter.

4 Slide two 10-32 Self-Retained Nuts over the selected holes in the left hand front vertical column of the cabinet. These nuts will be used to connect the LH Rack Mount Adapter.

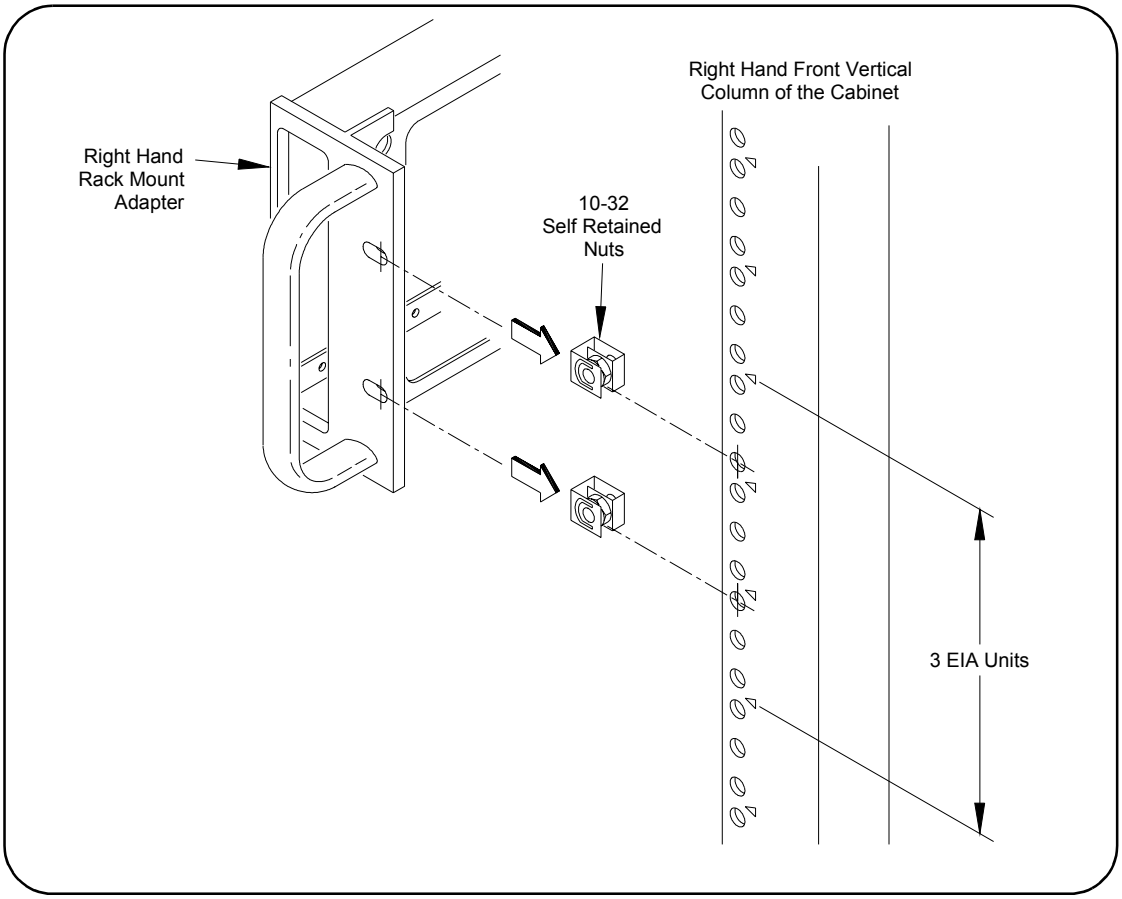


Figure 2-13. Installing Rack Mount Adapter Channel Nuts

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Install Support Rails (Figure 2-16)

1 Open the Support Rail Kit Option 05 (P/N 407870-008).

2 Hook the Support Rails in position in the Rack Cabinet. The Support Rails occupy the bottom EIA unit of the three units required for the 1266 mainframe.

3 Slide a 10-32 Self-Retained Nut (provided in the Support Rail Kit) over the appropriate holes in the front and rear right hand vertical columns in the cabinet. Repeat for the left hand vertical columns.

4 Secure each Support Rail to the columns as shown in Figure 2-18.

WARNING **To avoid possible injury or equipment damage, always secure the Support Rails with mounting screws before installing equipment.**

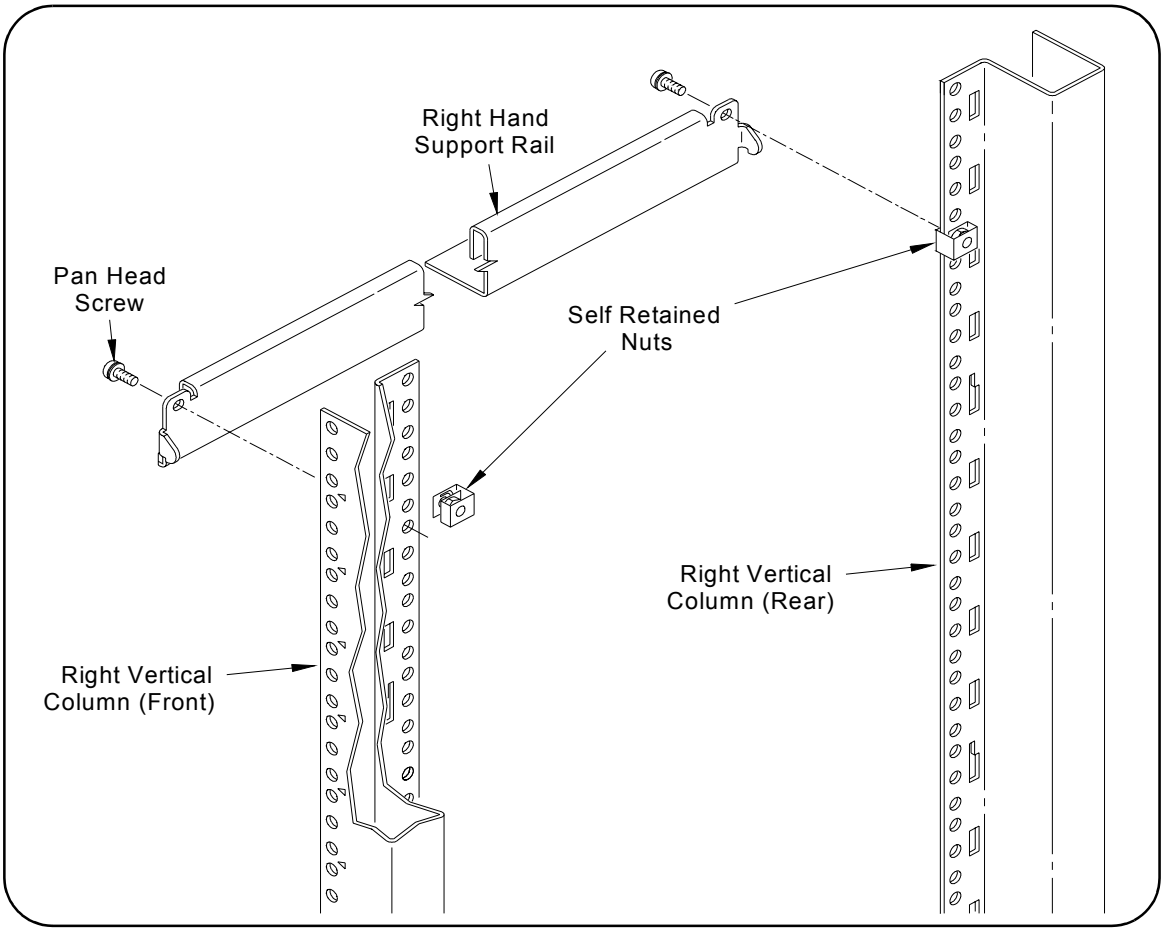


Figure 2-14. Installing Support Rails

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Installing the Mainframe

Install the Mainframe in the Rack Cabinet (Figure 2-17)

1 With one person on each side, lift the mainframe and slide the mainframe fully onto the Support Rails.

WARNING **To prevent possible injury during rack mounting, two people should lift the mainframe into the rack.**

2 Slide the mainframe into the rack until the Rack Mount Adapter flanges are against the rack's front vertical columns.

3 Secure the mainframe to the rack using the four adapter dress screws.

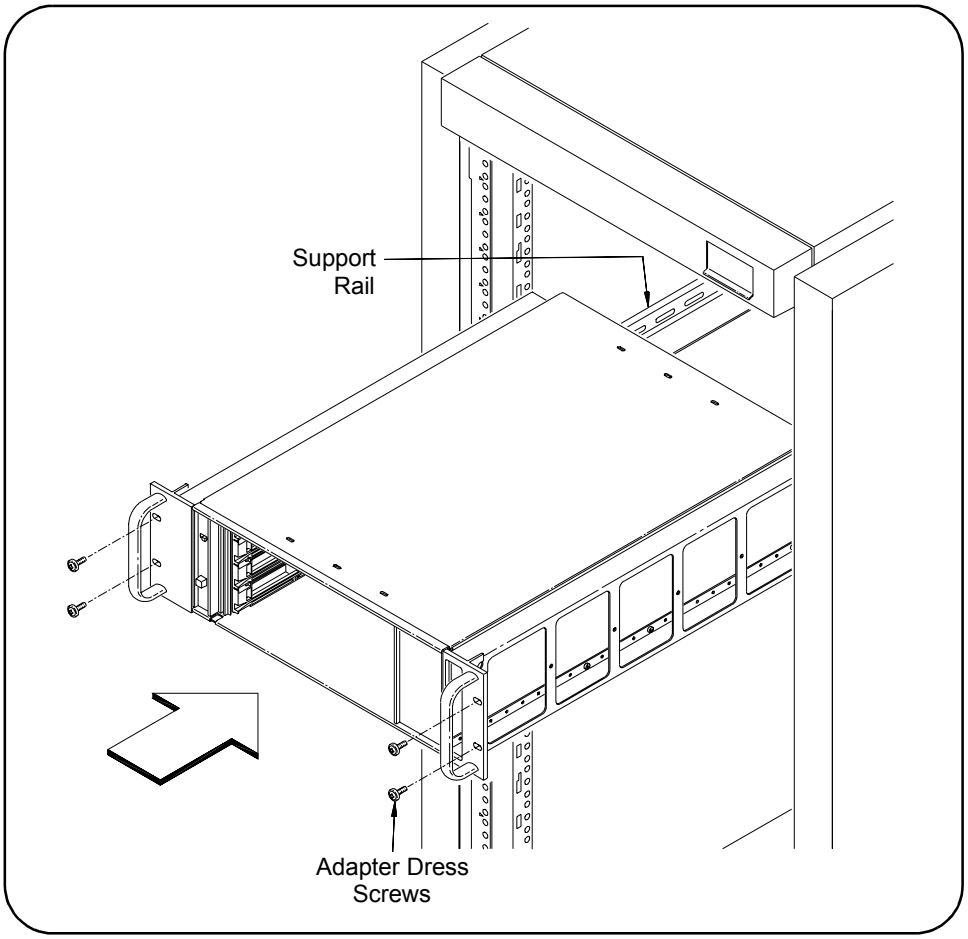


Figure 2-15. Installing the Mainframe

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Connect/Route VXI Instrument Cables (Figure 2-18)

1 As required, install VXI instruments in the mainframe (See *Chapter 1 - Getting Started*).

2 Connect cable(s) to instrument front panel terminals as required.

3 Route cables through the right side cable tray/RH Rack Mount Adapter, as required.

NOTE *Cables should not be routed on the left side of the mainframe as the cables may interfere with proper airflow.*

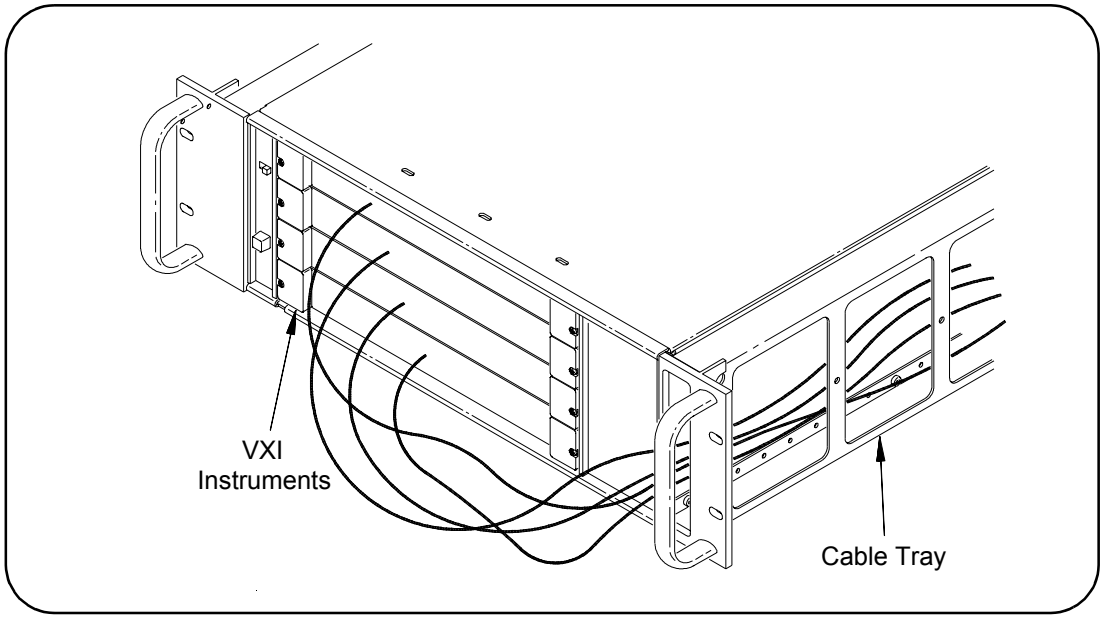


Figure 2-16. Routing VXI Instrument Cables

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Installing Intermodule Chassis Shields

This section describes how to install Option 52, Intermodule Chassis Shield Kit, (P/N 407870-003) in the 1266 mainframe. The chassis shield is the implementation of VXI revision 1.4, specification B.7.3.4 that allows grounded shielding between mainframe slots. The shield is used to isolate VXI modules that generate electromagnetic interference (EMI) at excessive levels, or to protect VXI measurement modules from noise sources.

WARNING **Do not install intermodule chassis shields while the mainframe is turned on or plugged into an AC power source.**

Parts List

The parts included in the Option 52 (P/N 407870-003) kit are shown in Table 2-4.

Table 2-3. Option 52 Parts List.

Quantity	Description
1	Chassis Shield
8*	Grounding Spring

* Includes 4 extra springs.

Installation Procedure

Each mainframe slot has top and bottom chassis shield guides (Figure 2-19). Chassis shields should be installed on both sides of an instrument generating interference/noise, or installed on both sides of a sensitive instrument.

1 **Insert Grounding Springs**. Insert grounding springs into the four sockets (two top, two bottom) along the shield guides. Use a small flat blade screwdriver to secure each spring under the socket tab.

NOTE *Use the chassis shield to cover the vent holes inside the mainframe when installing grounding springs in the top guide sockets. This prevents the springs from falling into the mainframe if they are accidently dropped.*

2 **Install the Chassis Shield.** Align the chassis shield with the shield guides and gently slide the shield into the mainframe. Be careful not to crimp the front grounding springs with the edge of the shield. Slide the shield in until it reaches the end of the shield guide.

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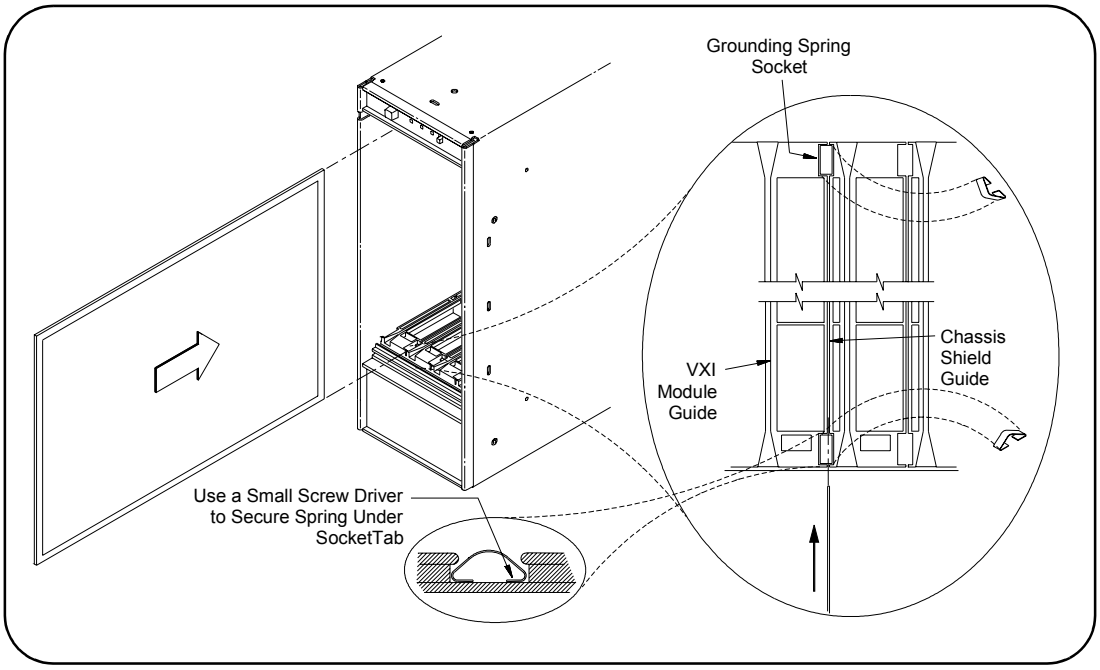


Figure 2-17. Installing the Grounding Springs and Chassis Shield.

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Installing the Airflow Restricter Kit

This section shows how to install an (optional) airflow restricter kit (P/N 407870-001) in the 1266 mainframe. To install the kit:

1 Disconnect AC power from the mainframe and place mainframe on bench.

2 As required, remove filler panels and/or installed VXI instruments from the mainframe.

3 Follow the steps in Figure 2-20 to install the Airflow Restricter.

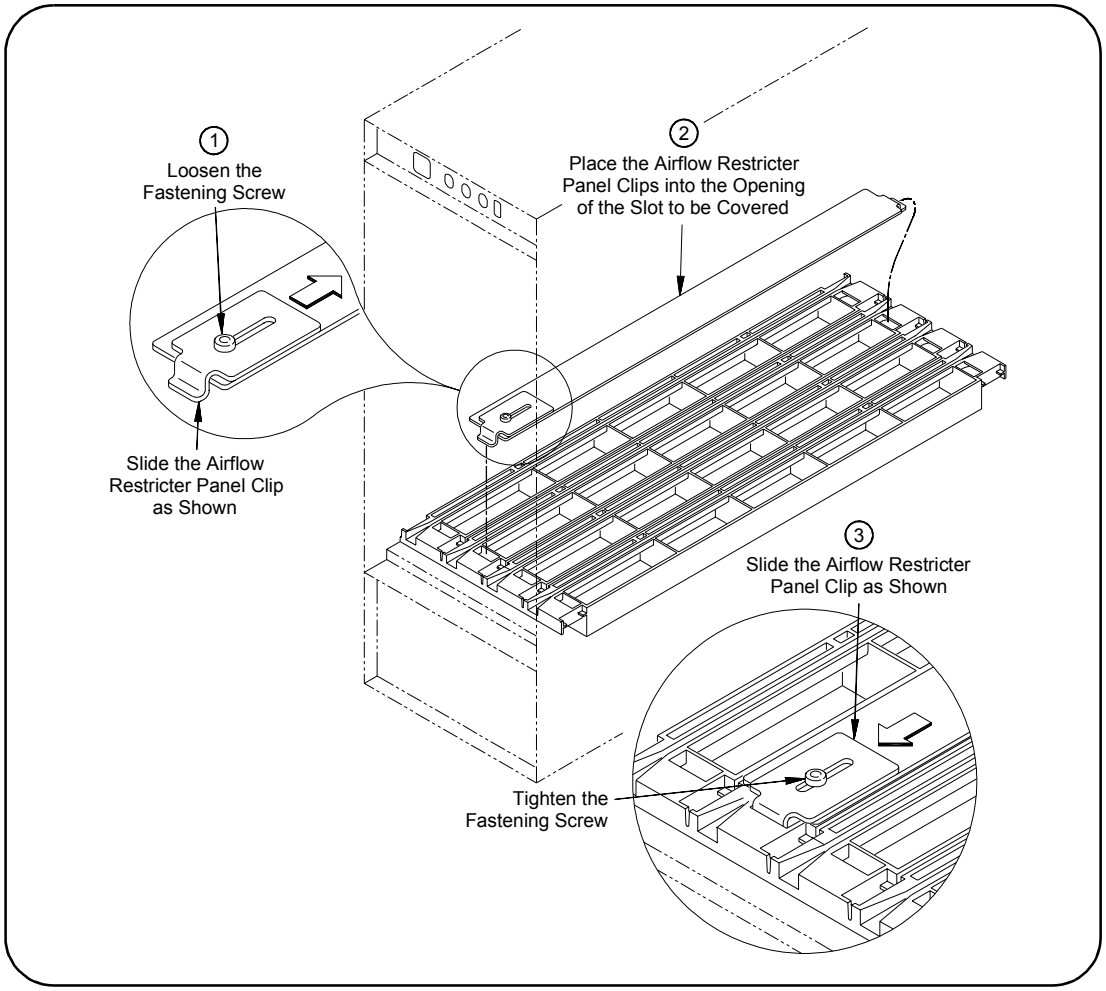


Figure 2-18. Installing the Airflow Restricter

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Chapter 3
Servicing the Mainframe

Chapter Overview

This chapter contains information for troubleshooting and replacing selected components of the 1266 VXI mainframe. This chapter includes the following information:

- Replaceable Parts List 3-1
- Problem Isolation 3-2
- Replacing Mainframe Components 3-2
- Cleaning Instructions 3-9

WARNING **There are no user-serviceable parts inside the mainframe. Repair is limited to replacement of the components listed in Table 3-1. Replacement of these components must be performed at a static-controlled workstation by trained service personnel only.**

Replaceable Parts List

These replacement parts are available from Racal Instruments under the part numbers shown in Table 3-1. Contact Racal Instruments to obtain replacement parts.

Table 3-1. 1266 Replaceable Part Numbers

Component	Part Number
Power Supply Assembly (includes Power Supply and Interconnect Board) (Standard)	407870-010 (remanufactured)
Fan Assembly	407870-002

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Problem Isolation

Table 3-2 lists primary mainframe symptoms, possible cause(s), and suggested actions. Table 3-1 shows replacement part numbers.

Table 3-2. Isolating Problems in the 1266 Mainframe

Symptom	Possible Cause	Action
No mainframe power	Power Supply fuse blown or defective Power Supply	- There are **NO** replaceable power line fuses on mainframe. - If the mainframe power supply fails to operate, replace the Power Supply Assembly.
	Short between some supplies can latch the Power Supply OFF	- Switch to Standby mode, and then remove AC power. - Recovery can occur when AC power is reapplied and the mainframe **Power** switch is switched to ON. - If problem remains, replace Power Supply Assembly.
Flashing Voltages Indicator	Backplane voltage(s) may be incorrect	- Cycle mainframe **Power** switch. - Remove VXI instruments to ensure they are not the cause. - Check cable connections at Monitor and Backplane Board. - Replace Power Supply Assembly.
Flashing Temp Indicator	Power supply temperature is high.	- Mainframe is nearing automatic shutdown. - Check for proper air flow and clearance around the fan. - Check power requirements of installed VXI instruments. - Replace Fan Assembly as required. - Replace Power Supply Assembly as required.
Flashing Fan Indicator	Fan has failed or fan connection loose	- Turn off mainframe to avoid possible overheating. - Check fan connections to P3 on Backplane Board. - Replace Fan Assembly as required.
Monitor indicators and fan remain OFF when **Power** switch is pressed.	Defective Monitor Board (E8408-66502) or loose cable to Monitor Board	- Check cable connections at Monitor and Backplane Board. - Replace Monitor Board as required.
Slot 0 Card SYSFAIL Indicator	VXI Instrument failure	- The Slot 0 card SYSFAIL indicator will turn ON and remain ON when a VXI instrument installed in the mainframe fails.

Replacing Mainframe Components

This section gives guidelines to replace 1266 mainframe components, including:

- Removing Mainframe Accessory Items
- Removing the Mainframe Cover
- Replacing the Power Supply Assembly
- Replacing the Monitor Board
- Replacing the Fan Assembly
- Replacing the Front Panel Tapped Strip
- Replacement Power Cords

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Removing Mainframe Accessory Items

For some component removal/replacement, you may need to remove mainframe accessory items (as applicable) (see Figure 3-1)

1 Remove the two protective bumpers.

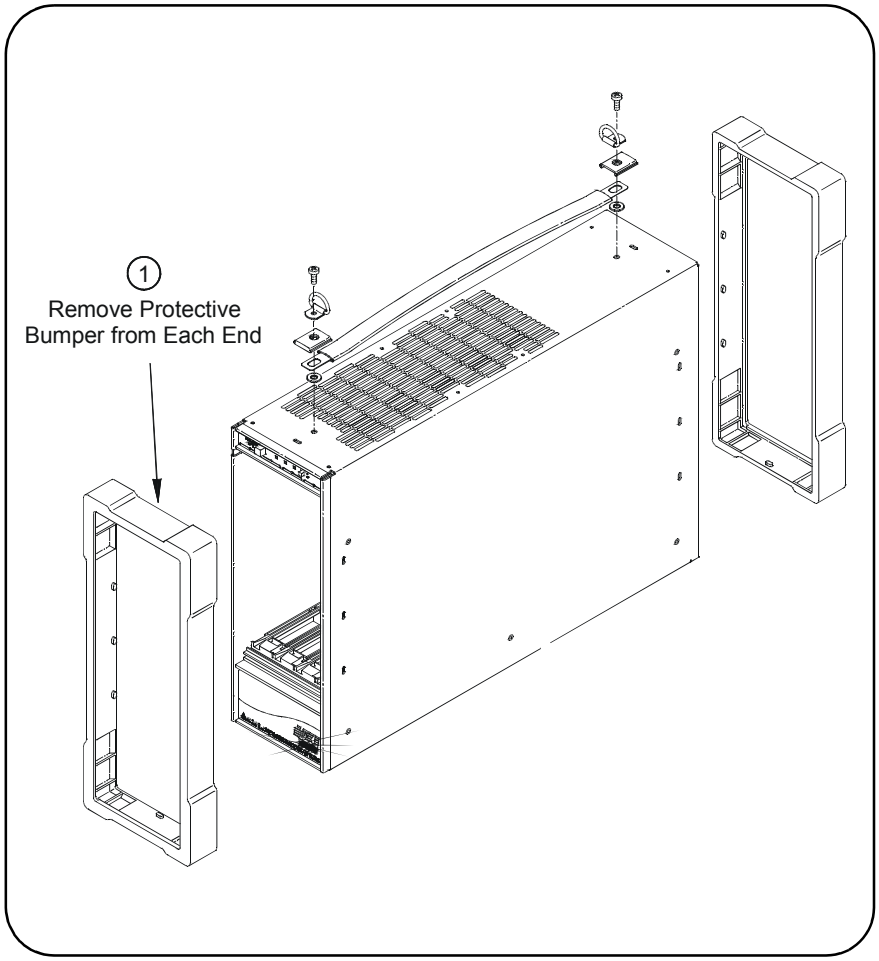


Figure 3-1. Removing Mainframe Accessory Items

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Removing the Mainframe Cover

For some component removal/replacement, you may need to remove mainframe cover (see Figure 3-2).

1 Turn off the mainframe and remove the AC power cord.

2 If mainframe is rack-mounted, remove the mainframe from the rack and place the mainframe at a static-controlled workstation.

3 Remove mainframe items as required. See "Removing Mainframe Items".

4 Remove the ten M3x6 flat head screws (five on each side of the mainframe).

5 Slide the mainframe cover toward the rear of the mainframe, and then lift the mainframe cover off the mainframe.

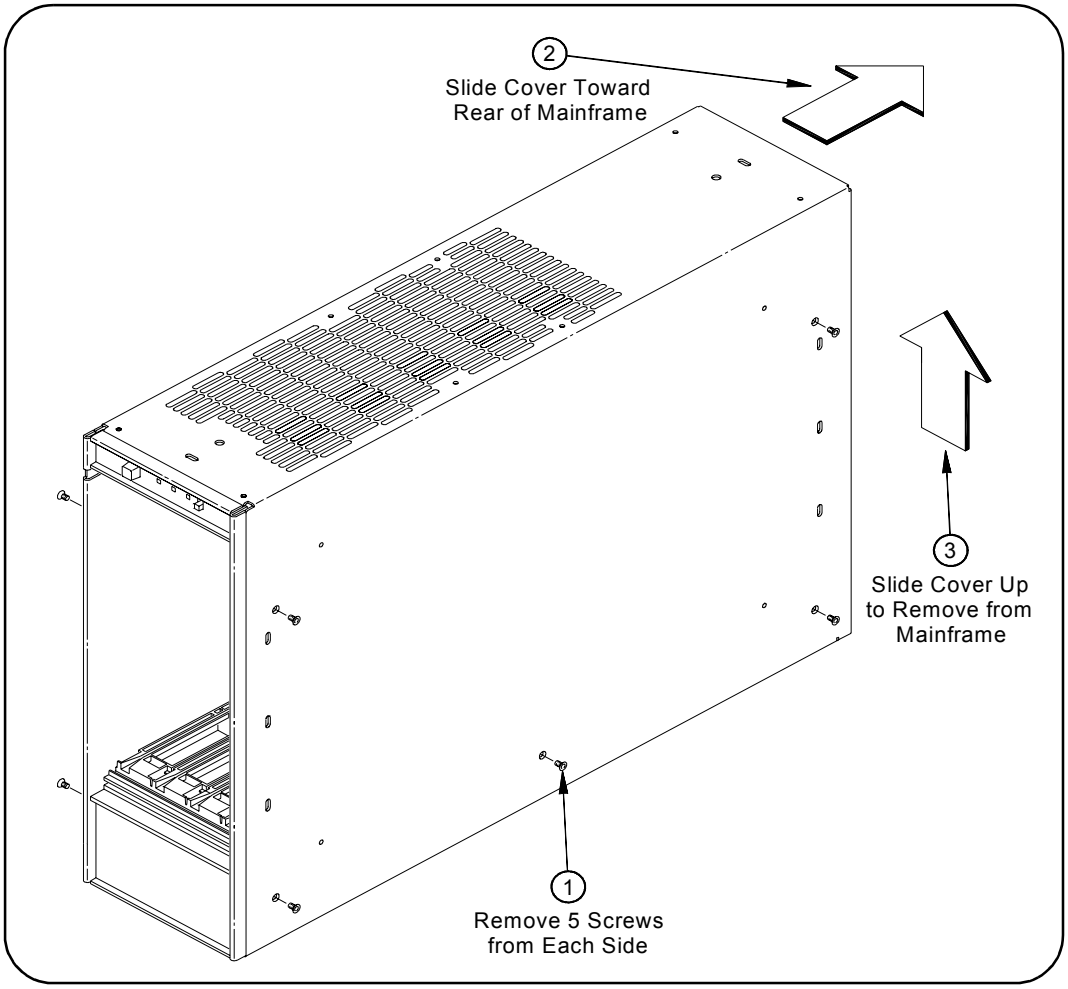


Figure 3-2. Removing the Mainframe Cover

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Replacing the Power Supply Assembly

This section gives guidelines to replace the Power Supply Assembly (P/N 407870-010) in the 1266 mainframe (see Figure 3-3).

NOTE *Although the Power Supply Assembly contains the power supply and the Interconnect Board, do NOT remove the Power Supply or the Interconnect Board from the Assembly. Return the entire Power Supply Assembly to Racal Instruments for a (remanufactured) Power Supply Assembly. See Table 3-1 for replacement part numbers.*

Be sure to observe static-free procedures when removing/installing the Power Supply Assembly.

1 Turn off mainframe power and remove the AC power cord.

2 Follow the steps in Figure 3-3 to remove the Power Supply Assembly.

3 Reverse the steps in Figure 3-3 to replace the Power Supply Assembly and to restore the mainframe to its original configuration.

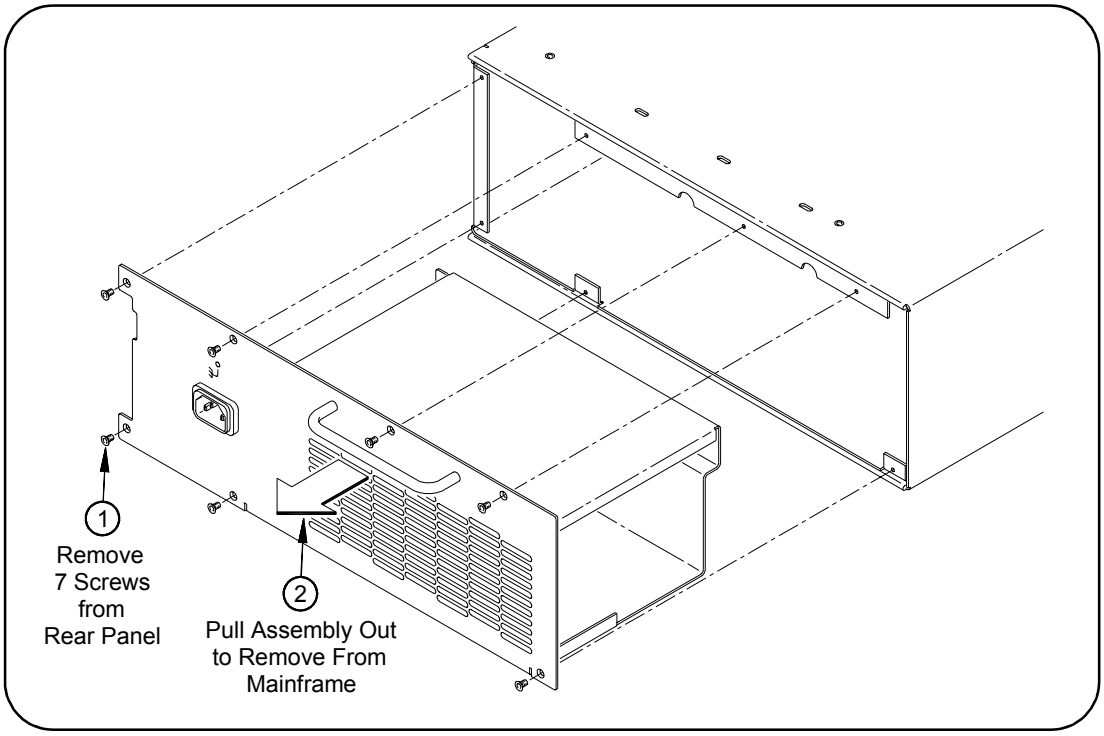


Figure 3-3. Removing the Power Supply Assembly

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Replacing the Monitor Board

This section gives guidelines to replace the Monitor Board.

1 Turn off the mainframe and remove the AC power cord.

2 If the mainframe is rack-mounted, remove the mainframe from the rack and place the mainframe at a static-controlled workstation.

3 Remove mainframe option items as required. See "Removing Mainframe Accessory Items".

4 Remove the mainframe cover. See "Removing the Mainframe Cover".

5 Follow the steps in Figure 3-4 to disconnect the ribbon cable and to remove the Monitor Board.

6 Reverse the steps in Figure 3-4 to install a replacement Monitor Board and to re-connect the ribbon cable.

7 Replace the mainframe cover by reversing the steps in "Removing the Mainframe Cover".

8 Reinstall mainframe options removed in step 3 OR reinstall the mainframe in the rack (as required). Reconnect the AC power cord.

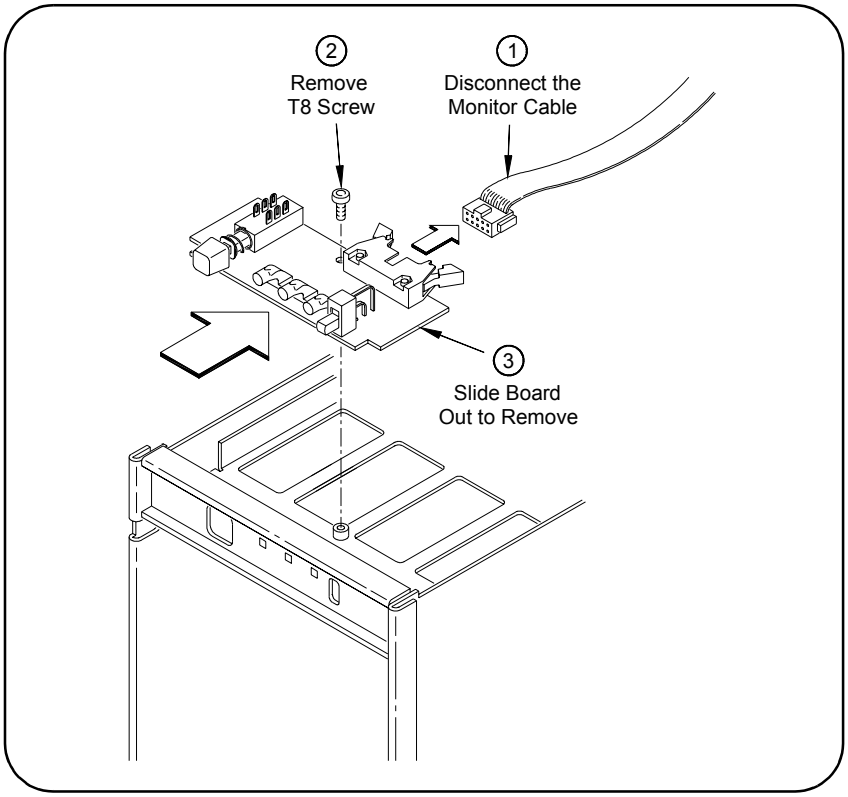


Figure 3-4. Removing the Monitor Board

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Replacing the Fan Assembly

This section gives guidelines to replace the Fan Assembly in the 1266 mainframe (see Figure 3-5). See Table 3-1 for a replacement part number.

1 Turn off the mainframe and remove the AC power cord.

NOTE *Be sure to observe static-free procedures when removing/installing the Fan Assembly.*

2 Remove mainframe accessory items as required. See "Removing Mainframe Accessory Items".

3 Remove the Power Supply Assembly. See "Replacing the Power Supply Assembly".

4 Remove the Fan Assembly by following the steps in Figure 3-5.

5 Install the replacement fan assembly by reversing the steps in Figure 3-5.

6 Reinstall the Power Supply Assembly by reversing the steps in "Replacing the Power Supply Assembly".

7 Reinstall mainframe accesssory items removed in step 2. Reconnect AC power cord.

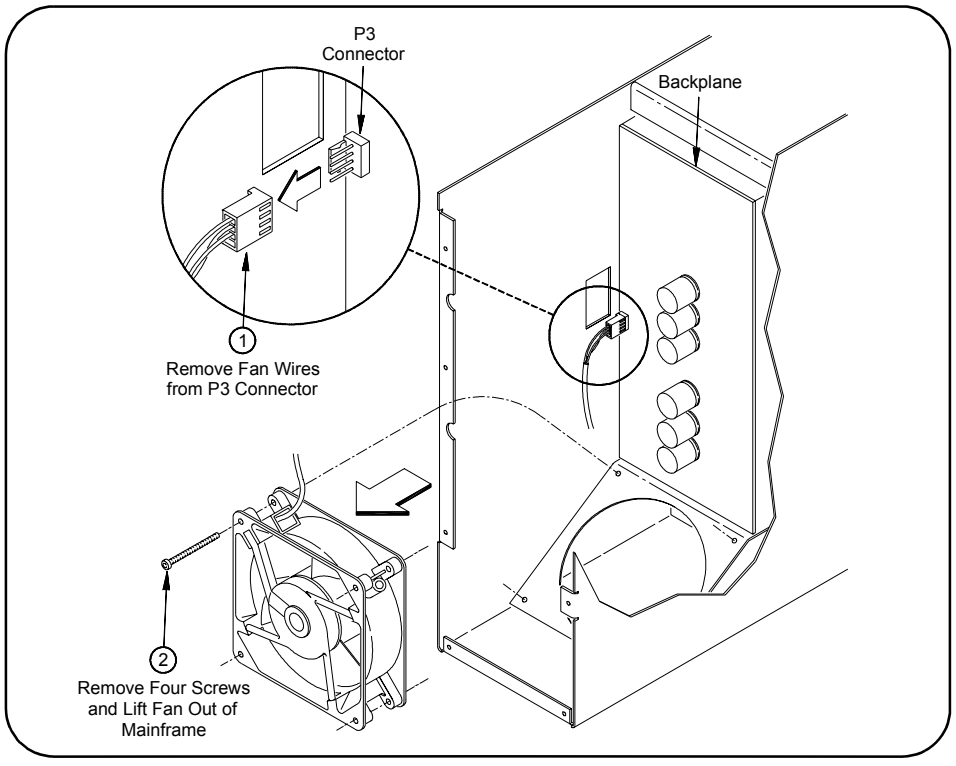


Figure 3-5. Removing the Fan Assembly

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Replacing the Front Panel Tapped Strip

This section gives guidelines to replace the Front Panel Tapped Strip.

1 Turn off the mainframe and remove the AC power cord.

2 If the mainframe is rack-mounted, remove the mainframe from the rack and place the mainframe at a static-controlled workstation.

3 Remove mainframe accessory items as required. See "Removing Mainframe Accessory Items".

4 Remove the mainframe cover. See "Removing the Mainframe Cover".

5 Remove the Front Panel Tapped Strip as shown in Figure 3-6.

6 Install the replacement Front Panel Tapped Strip by reversing the steps in Figure 3-6.

7 Replace the mainframe cover by reversing the steps in "Removing the Mainframe Cover".

8 Reinstall mainframe accessory items removed in step 3 OR reinstall the mainframe in the rack (as required). Reconnect AC power cord.

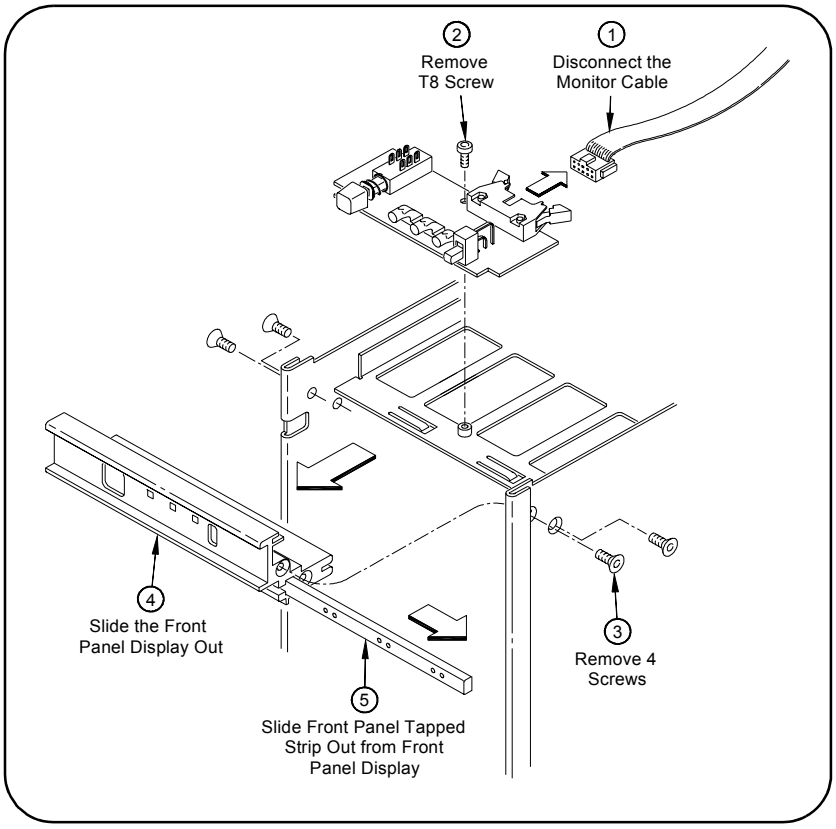


Figure 3-6. Removing the Front Panel Tapped Strip

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Cleaning Instructions

The only cleaning required for the 1266 mainframe is to wipe the exterior of the mainframe with a clean, damp cloth and dry with a clean, dry cloth. Do not attempt to clean any interior parts of the mainframe.

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Notes:

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Appendix A
1266 Product Specifications

Product Description

This section describes the 1266 mainframe, including:

- Product Dimensions
- Options and Accessories
- General VXI Specifications
- Mainframe Monitor Specifications
- Backplane Specifications

Product Dimensions

Figure A-1 shows 1266 dimensions. Empty mainframe weight is 8.6 Kg (19 lb.) without protective bumpers and 9.1 Kg (20 lb.) with bumpers. Weight with four average VXI modules installed is 15.9 Kg (35 lb). Maximum module weight is 3.5 Kg (7.7 lbs) per slot to comply with shock and vibration specifications. Heavier modules may be installed if the shock and vibration environment is less severe.

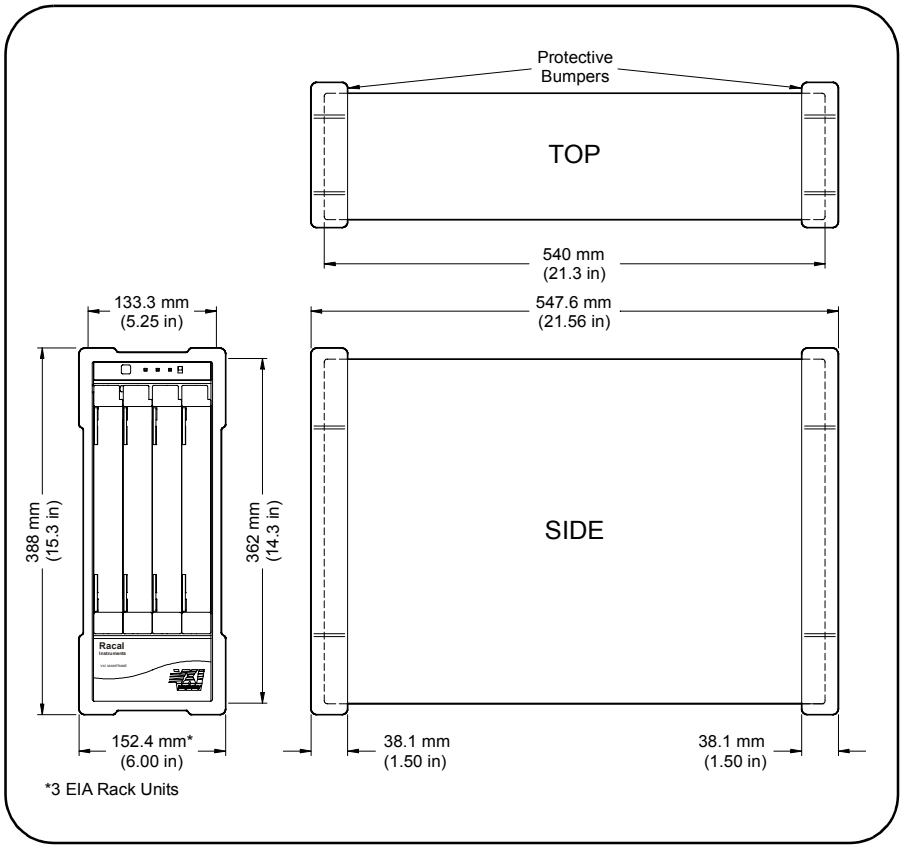


Figure A-1. 1266 Mainframe Dimensions

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Options and Accessories

Description	Product Number
Standard Configuration	
4-Slot, C-Size 175 W VXI Mainframe (includes front panel indicators, protective bumpers, and carrying handle)	1266 407866
(Remanufactured) Power Supply Assembly (Standard)	407870-010
Airflow Restricter (1-slot)	407870-001
Replacement Fan Assembly	407870-002
8 Installed Backplane Connector Shrouds (Option 51)	407870-051
Intermodule Chassis Shield Kit (Option 52)	407870-003
EMC Filler Panel (1-slot)	407870-004
VXI Slot Filler Panel (1-slot)	407870-005
1266 User/Service Manual (if ordered separately)	980880
Rack Mount Configuration	
Rack Mount/Cable Route Adapter Kit (Option 04). Must also use either Option 05, Support Rail Kit or Option 01, Rack Slide Kit	407870-007
Support Rail Kit (Option 05). Used with Option 04.	407870-008
Rack Slides to mount in rack cabinet (Option 01). Used with Option 05.	407870-009

General VXI Specifications

Category	Specifications
VXI Device Type:	Mainframe
Data Transfer Bus:	All per VXIbus Specification, Rev 1.4

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Category	Specifications
Size:	C-Size
Slots:	4 available
Connectors:	P1/P2
Shared Memory:	n/a
VXI Buses:	per VXIbus Spec, Rev 1.4

Monitor Specifications

Interface	Description
Power Switch	**Stdby** - AC power is applied to the mainframe, but not to installed VXI instruments. **On** - AC power applied to the mainframe, and DC to installed VXI instruments.
Voltages Indicator	**Green** - all voltages on the VXI backplane are present. (Does not necessarily indicate that voltages are within the VXI specification.) **Flashing Amber** - one or more voltages is missing or incorrect. The backplane voltages and allowed variations are listed below: Voltage — Allowed Variation +5V: +4.875V to +5.125V +12V: +11.64V to +12.6V -12V: -12.6V to -11.64V +24V: +23.28V to +25.2V -24V: -25.2V to -23.28V -5.2V: -5.46V to -5.044V -2V: -2.1V to -1.9V
Temp Indicator	**Green** - the power supply temperature is acceptable. **Flashing Amber** - the power supply is approaching thermal shutdown.
Fan Indicator	**Green** - mainframe cooling fan is operating properly. **Flashing Amber** - mainframe cooling fan is not operating.
Fan Speed Switch	**Full** - the mainframe cooling fan is operating at full speed. **Var**(iable) - the mainframe cooling fan is providing adequate cooling (default setting).

Backplane Specifications

- Automatic daisy-chain jumpering for BUS GRANT and IACK signals.
- Full differential distribution of CLK10.
- ACFAIL* and SYSRESET* in full compliance with the VMEbus and VXIbus Specifications.
- Surface mount construction and no sockets for maximum reliability.

Power Specifications

This section describes 1266 mainframe power specifications for the Standard configurations.

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Total Usable Power

Temperature	Usable Power (90-264 Vac)[1]
0 - 40°C	175 W
40 - 50°C	150 W
50 - 55°C	125 W
[1] Total output before thermal shutdown or safety limitation.	

Peak and Dynamic Current

Voltage	Peak Current I_{MP} (Amps)[1,2]	Dynamic Current I_{MD} (Amps)[1,3]
+5V[4,5]	17A	2.5A
+12V[6]	2.7A	1.0A
- 12V[6]	2A	0.8A
+24V	2A	1.0A
-5.2V[5]	2A	1.0A
- 2V	2A	1.0A

[1] Specifications apply at the mainframe backplane, 0 - 55°C.

[2] I_{MP} = Rated mainframe peak DC output current as defined by the VXIbus Specification.

[3] I_{MD} = Rated mainframe peak-to-peak dynamic current as defined in the VXIbus Specification by a current vs. frequency curve.

[4] +5V must have 1.0A minimum load for other supplies to be in regulation specification.

[5] (Standard Only) Maximum +5V current can be increased if -5.2V load is less than 2.0A maximum. Maximum = 17.0A +1.2*(2.0A - Load on -5.2V).

[6] Maximum +12V current can be increased if -12V load is less than 2.0A maximum. Maximum = 2.7A + 1.2*(2.0A - Load on -12V)

Output Voltage

Voltage	Allowed Variation*	Ripple/Noise DC Load*	Induced Ripple/Noise*
+5V	+0.25V / –0.125V	50mV	50mV
+12V	+0.60V / –0.36V	50mV	50mV
-12V	–0.60V / +0.36V	50mV	50mV
+24V	+1.20V / –0.72V	150mV	150mV

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Voltage	Allowed Variation*	Ripple/Noise DC Load*	Induced Ripple/Noise*
-24V	–1.20V / +0.72V	150mV	150mV
-5.2V	–0.26V / +0.156V	50mV	50mV
-2V	–0.10V / +0.10V	50mV	50mV

* Specifications apply at the backplane, 0 - 55 ^{O}C.

Power Input

Area	Specification	Comments
Input Voltage/ Frequency	90 Vac min - 140 Vac max (47 Hz min - 440 Hz max) 90 Vac min - 264 Vac max (47 Hz min - 66 Hz max)	
Input Voltage	90 Vac to 264 Vac CAT II 280 VA max	Automatic Ranging
Inrush Current	< 75A @ 264 Vac < 35A @ 132 Vac	Cold start
Power Switch	On/Standby	
Chassis Ground Tap	M4 x 0.7 threaded nut insert	On rear of mainframe

Cooling Specifications

This section lists 1266 mainframe cooling specifications, including:

- Cooling Table
- Cooling Chart

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Cooling Table

Area	Specification/Comments
Cooling Modes	High or variable cooling mode switchable on the front panel. Same fan cools power supply and modules.
High-Speed Fan Mode	Maximum airflow all the time.
Variable Fan Speed Mode:	Fan speed changes between high and low as a function of ambient and power supply temperatures.
AirFlow Path	Air is routed into the mainframe rear and exhausted out the left side (viewed from the front) when the mainframe is in horizontal orientation. When the mainframe is rack-mounted, allow 50 mm of clearance at the rear and left side for proper airflow.
Acoustic Noise*	High Speed Fan Mode: <40 dBA. Variable Fan on Low Speed: <30 dBA.

* Sound power at bystander position one meter in front of mainframe.

Cooling Chart

Figure A-2 shows 1266 cooling specifications (for all 1266 slots) per VXI-8 Specification Draft 2.0 and Airflow Test Fixture revision 1.7 with:

- VXI-8 Standard Modules installed in other slots.
- Measurements taken at 1,500 m altitude.

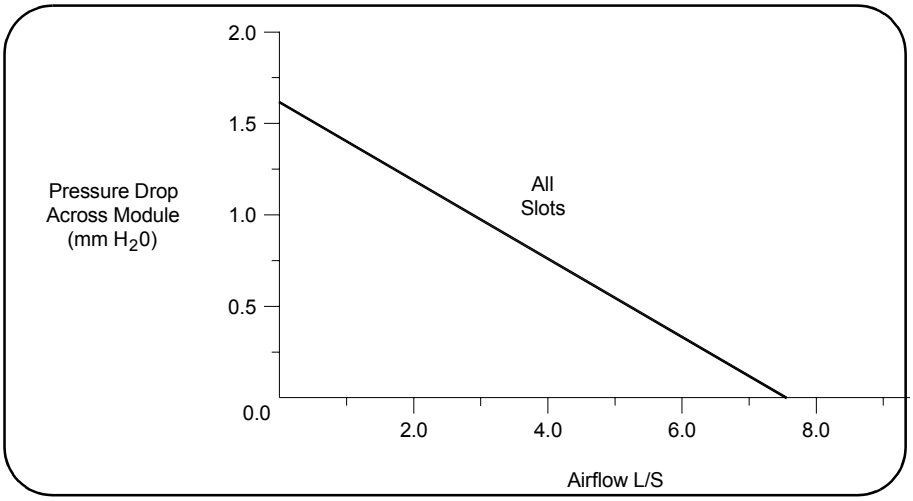


Figure A-2. 1266 Mainframe Cooling Capacity

Safety/Environmental Specifications

This section describes safety and environmental specifications for the 1266 mainframe, including:

- Environmental Specifications
- Electromagnetic Compliance/Safety Specifications

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- Power Supply Protection
- Repair

Environmental Specifications

Area	Specification
Operating Location	Indoor: Sheltered location where air temperature and humidity is controlled within this product's specifications and the equipment is protected against direct exposure to climatic conditions such as direct sunlight, wind, rain, snow, sleet and icing, water spray or splash, hoarfrost, or dew (typically indoors). Pollution degree 2.
Temperature	Operating Temperature Range: 0°C to +55°C Storage Temperature Range: -40 °C to +70° C
Humidity (Non-condensing)	Operating Humidity Range: - Up to 95% RH from 0°C to +40 °C - Up to 65% RH from +40°C to +55°C Storage Humidity Range: - Up to 95% RH from 0°C to +55°C - Up to 90% RH from +55 °C to +65°C
Shock	End Use Handling: Half sine waveform, <3 msec duration, Δ v = 160 cm/sec minimum Transportation: Trapezoidal waveform, Δ v = 605 cm/sec, 30 g minimum
Vibration	Operating and Functional: 5 to 500 Hz, 0.0001 g^2/Hz Spectral Density Survival, Swept Sine: 5 to 500 Hz Resonance Search, 5 minute dwell on resonances at 0.5g Survival, Random: 0.015 g^2/Hz Spectral Density
Altitude	Up to 3,000 m

Electromagnetic Compliance/Safety Specifications

The 1266 mainframe conforms to the EMC and safety product specifications listed in the Declaration of Conformity.
EMC performance can be further enhanced with the following shields:

- Front panel gasketing provided per VXI Rev. 2.0, B.7.2.3
- Backplane connector shields per VXI Rev 2.0, B.7.2.3
- Intermodule chassis shields per VXI Rev 2.0, B.7.3.4

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Power Supply Protection

The supply is protected from over-temperature, over-voltage, short-to-ground, and short-to-other output. Protection modes vary, from removing the fault condition to cycling the power on/standby switch to removing and reconnecting AC power.

Over-Temperature Protection

The front panel **Temp** (temperature) indicator flashes when an internal temperature is high enough to cause the mainframe to approach thermal shutdown, but the **Temp** indicator does not cause shutdown. When thermal shutdown limit is reached, all supplies are automatically turned off. Recovery occurs automatically when the mainframe has cooled sufficiently.

Over-Voltage Protection

Over-voltage will generally cause a global shutdown, and recovery occurs when the **Power On/Standby** switch is cycled. However, some over- voltage conditions on the +5V and +12V can cause a shutdown that will not respond by cycling the **Power On/Standby** switch. In this case, the **Power On/Standby** switch should be placed in Standby position and AC power must be removed and reapplied before the mainframe will turn on again.

Short-to-Ground Protection

Short circuit behavior varies with the specific supply, but (in general) recovery should occur when the short is removed. This table summarizes short-circuit behavior for each supply voltage.

Supply Shorted	Short-Circuit Behavior
+5V or +12V	Causes global shutdown. After about 250 msec, the supplies will automatically attempt to turn on. Global shutdown and restart attempts will continue until the fault is removed.
+24V	Puts supply in foldback current limiting mode.
-24V	Puts supply in foldback current limiting mode, and shuts down the -12V, -5.2V, and -2V supplies.
-12V	Continuously draws about 7 Amps and shuts down the -5.2V and -2V supplies.
-5.2V	Continuously draws about 7 Amps (Standard).
-2V	Continuously draws about 5 Amps.

Short-to-Other Protection

A short-to-other output will generally cause a global shutdown. When the fault is removed, the supplies will typically recover when the **Power On/Standby** switch is cycled. However, if this switch is cycled while the fault is still present, some supplies may become active or global shutdown may occur again.

Conditions such as +5V-to-other output and -12V-to-(-5.2V) may cause a shutdown that will not respond to cycling the **Power On/Standby** switch. In this case, the **Power On/Standby** switch should be placed in Standby

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position and AC power must be removed and reapplied before the mainframe will turn on again.

Repair

Diagnosis and troubleshooting through the front panel monitor (*MTTR* = *Mean Time to Repair*).

Item	Time
MTTR, power supply assembly:	< 20 min (w/mainframe and modules fully installed in rack)
MTTR, fan:	< 30 min (w/mainframe and modules fully installed in rack)

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Notes:

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Racal Instruments

REPAIR AND CALIBRATION REQUEST FORM

To allow us to better understand your repair requests, we suggest you use the following outline when calling and include a copy with your instrument to be sent to the Racal Repair Facility.

Model_____ Serial No._____ Date_____

Company Name_____ Purchase Order #_____

Billing Address_____

City

State/Province Zip/Postal Code Country

Shipping Address_____

City

State/Province Zip/Postal Code Country

Technical Contact_____ Phone Number ( ) _____

Purchasing Contact_____ Phone Number ( ) _____

1. Describe, in detail, the problem and symptoms you are having. Please include all set up details, such as input/output levels, frequencies, waveform details, etc.

2. If problem is occurring when unit is in remote, please list the program strings used and the controller type._____

3. Please give any additional information you feel would be beneficial in facilitating a faster repair time (i.e., modifications, etc.)_____

4. Is calibration data required? Yes No (please circle one)

Call before shipping

Note: We do not accept "collect" shipments.

Ship instruments to nearest support office.

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