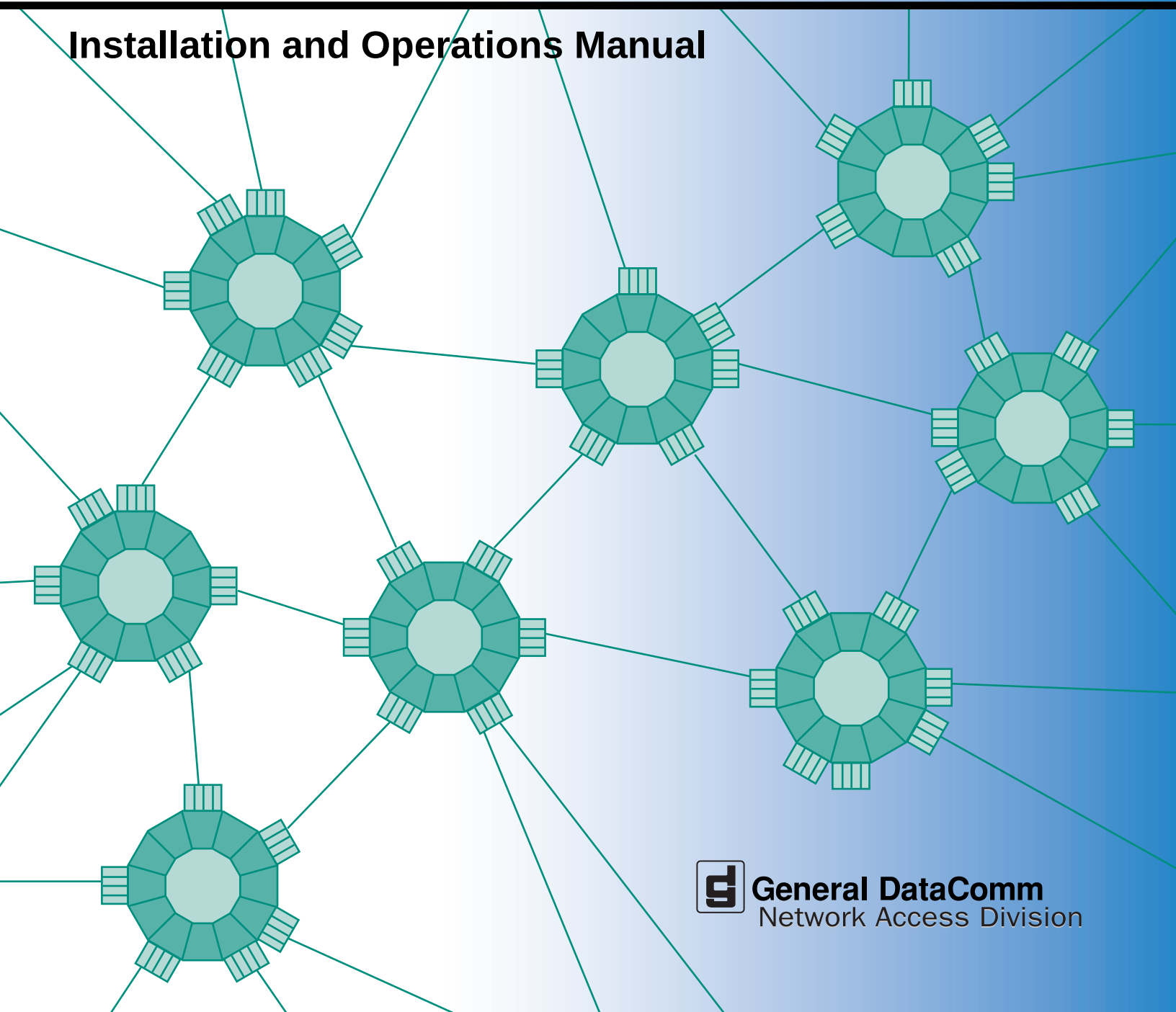
010R302-000
Issue 8
March 2001

SpectraComm/UAS® Shelf and Enclosure

Installation and Operations Manual



General DataComm
Network Access Division

010R302-000
Issue 8
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SpectraComm/UAS® Shelf and Enclosure

Installation and Operation Manual

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Trademarks

Documentation

Revision History

Issue Number	Date	Description of Change
07	Jun 00	Updated equipment list, corrected redundant power supply information, added new information. Deleted references to ferrite toroids.
08	Mar 01	Added information for DC Entry connectors

Related Publications

A listing of related user manuals is provided below. In addition to the hardware and software manuals, always read the software System Release Notes supplied with your product.

Publication Name	Publication Number*
Operating and Installation Instructions SpectraComm Manager Card	048R303-REV
Operating and Installation Instructions UAS 616	048R616-REV
Operating and Installation Instructions SpectraComm VF 28.8	060R112-REV
Operating and Installation Instructions UAS 700 G2/G3 and 702-G2	073R115-REV
Operating and Installation Instructions UAS 2011	070R163-REV
Operating and Installation Instructions UAS 700A-G2	073R116-REV
Operating and Installation Instructions UAS 710-D2	073R119-REV
Operating and Installation Instructions UAS 701-T2	073R124-REV
Operating and Installation Instructions SpectraComm 500A	048R302-REV
Operating and Installation Instructions SC 800 T3; DS-3 DSU/CSU	076R160-REV
Operating and Installation Instructions SC 553 DSU/CSU	076R155-REV
Operating and Installation Instructions SC 521A DSU	076R152-REV
Operating and Installation Instructions SC Dual V.34 Modem	060R113-REV
Operating and Installation Instructions SC 202 Modem	073R150-REV

Publication Name	Publication Number*
Operating and Installation Instructions SC 5001	076R100-REV
Operating and Installation Instructions SC PRI	076R114-REV
Operating and Installation Instructions SC 5553 DSUCSU Emulator	076R108-REV
Operating and Installation Instructions SC 5520 DSU Emulator	076R102-REV
Operating and Installation Instructions SC 5034; V.34 Modem Emulator	076R106-REV
Operating and Installation Instructions SC 5090; V.90 Modem Emulator	076R107-REV
Operating and Installation Instructions UAS 611	072R120-REV
Operating and Installation Instructions UAS 613	072R116-REV
Operating and Installation Instructions UAS 621	072R118-REV
Operating and Installation Instructions UAS 700-G2RP	073R130-REV
Operating and Installation Instructions UAS 7000	087R700-REV
Operating and Installation Instructions UAS 7000 DIU 7626	087R712-REV
Operating and Installation Instructions UAS 7000 DIU 7722	087R716-REV
Operating and Installation Instructions UAS 7000 DIU 7022	087R714-REV
Operating and Installation Instructions UAS 7000 DIU 7624	087R707-REV
Operating and Installation Instructions UAS 7001	087R702-REV
Operating and Installation Instructions UAS 7002	087R702-REV
Operating and Installation Instructions UAS 711-D2	073R121-REV
Operating and Installation Instructions UAS 7616 DIU	087R703-REV
Operation Manual UAS 7624 Local Management	087R710-REV
Operating and Installation Instructions UAS DATX (SCM/HDSL)	058R697-REV
Operating and Installation Instructions UAS HDSL (SCM/HDSL)	058R699-REV
Operating and Installation Instructions UAS SCM/2B1Q	058R698-REV

* For publications numbers, **REV** is the hardware manual revision (for example, -000, -001, etc.). **VREF** (if listed) is the software revision (for example, -V120 would read: Version 1.2) and corresponds to the most current revision.

Preface

Scope

This manual describes how to install and operate the product. The information contained in this manual has been carefully checked and is believed to be entirely reliable. However, as General DataComm improves the reliability, function, and design of their products, it is possible that information may not be current. Contact General DataComm for updated information on this or other General DataComm products.

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Manual Organization

The online (web-based) manual uses active areas which allow you to navigate through portions of the manual by clicking on any ***blue*** text.

This manual is divided into the following chapters:

Chapter 1, System Description

Chapter 2, Installation

Chapter 3, Operation

Chapter 4, Tests

Appendix A, Kit Instructions

Safety Information

This manual should be read in its entirety and all procedures completely understood before installing or operating the unit. The notes that appear throughout this manual must be read prior to any installation or operating procedure. Examples of notes used in this manual are shown below.

Note *A note provides essential operating information not readily apparent which you should be particularly aware of. A note is typically used as a suggestion.*

Important *Indicates an emphasized note. It is something you should be particularly aware of; something not readily apparent. Important is typically used to prevent equipment damage.*

The CAUTION, WARNING, and DANGER statements that appear throughout this manual are intended to provide critical information for the safety of both the service engineer and operator. These statements also enhance equipment reliability. The following definitions and symbols for CAUTION, WARNING, and DANGER as they are used in this manual comply with ANSI Z535.2, American National Standard for Environmental and Facility Safety Signs, and ANSI Z535.4, Product Safety Signs and Labels, issued by the American National Standards Institute.

CAUTION *Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury. It may also be used to alert against unsafe practices.*

WARNING *indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.*

DANGER *indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

Safety Guidelines

Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:

- Always use caution and common sense.
- Repairs must be performed by qualified service personnel only.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Never install telephone jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Never install telephone wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component. This product may contain static-sensitive devices that are easily damaged. Proper handling, grounding and precautionary ESD measures are essential when installing parts or cards. Keep parts and cards in antistatic packaging when not in use or during transport. If possible, use antistatic floorpads and workbench pads.

When handling components, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, like a screwdriver or a paper clip, to set switches.

FCC Part 68 Compliance

Connection of data communications equipment to the public telephone network is regulated by FCC Rules and Regulations. This equipment complies with Part 68 of these regulations which require all of the following:

All connections to the telephone network must be made using standard plugs and telephone company provided jacks or equivalent. Connection of this equipment to party lines and coin telephones is prohibited. A label on the component side of the unit's printed circuit board provides the FCC Registration number for the unit. If requested, give this information to the telephone company. To connect the product to the Public Telephone Network, you are required to give the following information to the telephone company:

- FCC Registration Number: TBD
- Facility Interface Codes: 04DU9-BN, 04DU9-DN, 04DU9-1KN, 04DU9-1SN
- Service Order Code: 6.0Y
- Telephone Company jack type: RJ48C

The telephone company may discontinue your service if the unit causes harm to the telephone network. If possible, you will be notified of such an action in advance. If advance notice is not practical, you will be notified as soon as possible and will be advised of your right to file a complaint with the FCC. The telephone company may change its communication facilities, equipment, operations and procedures where reasonably required for operation. If so, the telephone company will notify you in writing. All repairs or modifications to the equipment must be performed by General DataComm. Any other repair or modification by a user voids the FCC registration and the warranty.

Part 15 Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Notification

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Electromagnetic Compatibility

This Class A digital apparatus complies with Canadian ICES-003.

Avis D'industrie Canada

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la comformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

La Compatibilité d' Eléctro-magnetique

Cet appareil numerique de la classe A est conforme a la norme NMB-003 du Canada.

Deutschland

Überblick Sicherheit

Bitte lesen sie dieses Handbuch komplett durch und stellen sie sicher, daß sie alle Vorschriften verstehen, bevor sie das Gerät installieren oder betreiben. Die Hinweise in diesem Handbuch müssen vor Installation oder Betrieb gelesen werden. Beispiele für Hinweise sehen sie hier.

Hinweis *Ein Hinweis enthält wichtige Informationen zum Betrieb, die nicht auf den ersten Blick ersichtlichsind, und die zu beachten sind. Ein Hinweis dient als Vorschlag.*

Wichtig *Bedeutet einen besonders wichtigen Hinweis. Darauf sollten sie besonders achten, da dies nicht offensichtlich* ist. *Wichtige Hinweise dienen im Allgemeinen dazu, Schäden am Gerät zu vermeiden.*

Die Hinweise CAUTION (VORSICHT), WARNING (WARNUNG) und DANGER (GEFAHR), welche im Handbuch erscheinen, enthalten entscheidende Informationen für die Sicherheit sowohl des Servicepersonals als auch der Bediener. Diese Hinweise erhöhen die Zuverlässigkeit der Anlage. Die folgenden Definitionen und Symbole für VORSICHT, WARNUNG und GEFAHR, wie sie in diesem Handbuch auftreten, sind gemäß ANSI Z535.2, Amerikanischer Nationaler Standard für Sicherheitszeichen für Umwelt und Anlagen, und ANSI Z535.4, Produkt-Sicherheits-Zeichen und Beschriftungen, ausgegeben vom American National Standards Institute.

VORSICHT *bedeutet eine potentiell gefährliche Situation, die wenn sie nicht vermieden wird, zu leichten oder mittelschweren Verletzungen führen kann.*

WARNUNG *bedeutet eine drohende gefährliche Situation, die wenn sie nicht vermieden wird, zu schweren Verletzungen oder zum Tode führen kann.*

GEFAHR *bedeutet eine drohende gefährliche Situation, die wenn sie nicht vermieden wird, zwangsläufig zu schweren Verletzungen oder zum Tode führt.*

Sicherheitsrichtlinien

Unter normalen Umständen arbeitet die Anlage sicher und zuverlässig in ihrem Netzwerk. Falsche Handhabung oder Installation von Bestandteilen kann zu Ausfällen oder Gefahren für den Bediener führen. Seien sie vorsichtig und beachten sie die allgemeinen Regeln bei der Installation der

Netzwerkkabel. Beachten sie die folgenden Hinweise, besonders bei unsicheren Umständen oder potentiell gefährlichen Spannungen:

- Reparaturen dürfen nur von qualifiziertem Servicepersonal ausgeführt werden.
- Zur Vermeidung elektrischer Schläge darf die Anlage nicht mit geöffneter Abdeckung betrieben werden.
- Niemals Netzwerkstecker in feuchter Umgebung installieren, es sei denn der Stecker ist dafür ausgelegt.
- Niemals unisolierte Netzwerkdrähte oder Klemmen berühren, es sei denn das Netwerk ist am Interface abgeschaltet.
- Niemals Netzwerk bei elektrischem Gewitter verdrahten.

EC Declaration of Conformity

We: General DataComm Limited
Molly Millars Lane
Wokingham, Berkshire RG41 2QF, United Kingdom

On behalf of: General DataComm Inc.
Park Road Extension
Middlebury, CT 06762-1299, U.S.A.

The products to which this declaration relates are in conformity with the following relevant harmonized standards, the reference numbers of which have been published in the Official Journal of the European Communities.

Electromagnetic Compatibility

EN 55022: 1994

Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 50082-1: 1992

Generic immunity standard Part 1 Residential, Commercial, and Light Industry.

Safety

EN 60950: 1995 A1 through A3

Safety or Information Technology Equipment, following the provisions of the Low Voltage Directive, 73/23/EEC.

Service Support and Training

VITAL Network Services, a General DataComm company, is committed to providing the service support and training needed to install, manage, and maintain your GDC equipment. VITAL Network Services provides hands-on training courses through **VITAL Network Services Global Technology Training Services**. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems. Training courses are available at our centers in the US, UK, France, Singapore and Mexico, as well as at a customer's site.

For more information on VITAL Network Services or for technical support assistance, contact VITAL Network Services at:

VITAL Network Services World Headquarters

6 Rubber Avenue	Telephones:	Faxes:
Naugatuck, Connecticut 06770 USA	1 800 243 1030	1 203 723 5012
	1 888 248 4825	1 203 729 7611
http//www.vitalnetsvc.com	1 203 729 2461	

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Table of Contents

Chapter 1: System Description

Overview

You may house the SpectraComm or UAS (Universal Access System) product cards and power supply modules in the SpectraComm (5000) or UAS (7000) shelves and enclosures which are described in this manual. Refer to the individual product manuals for product-specific instructions and cabling.

Note *The UAS 7000 Shelf is similar to the SpectraComm 5000 Shelf with the exception of significant differences in the connector backplane used at Zone 1 on the rear panel. The UAS products use the Universal Backplane. In addition, the UAS 7000 products are used predominately in the Central Office environment which are usually DC powered.*

The SpectraComm and UAS products can include a mix or match of Advanced Network Access Transmission products including:

- The optional SCM card and the Alarm card.
- Sub-rate access products using VF 28.8 modems (the SpectraComm VF 28.8 requires G-revision or higher to operate with the SCM) or DATX data over voice.
- Narrow band access products using the GDC (General DataComm) 600 family (2B1Q technology basic rate 128 kbps).
- Wide band access products using the GDC 700 family (HDSL technology).
- Other SpectraComm products including the SpectraComm 5000 products and UAS 7000 products. Also, SpectraComm 500A, SpectraComm VF 28.8, SpectraComm 424 modems.
- Network Management cards for transmission products and multiplexed products.

Each shelf mounted Advanced Network Access transmission product interfaces with a standalone unit located at the far-end of the access loop. The wide variety of transmission products can be managed under a single network management scheme using the SpectraComm Manager (SCM) card and it's interface to an SNMP manager workstation.

Features

SpectraComm/UAS Shelf

The SpectraComm/UAS Shelf is constructed of formed sheet metal components measuring 7 inches (178 mm) high by 17.5 inches (445 mm) wide by 11.5 inches (292 mm) deep. Other features are:

- NEBs certified: GR-63-CORE, Level III and GR-1089-CORE.
- There are sixteen card slots and you can add two power supply module slots per shelf.

- You can add dual shelf expansion providing an extra two power supply module slots and an extra sixteen card slots.
- Easily removable backplane connector panels provide a diversity of products to be housed in the shelf.
- Plug-in power supply modules are available in the following voltages:
  - 100/117 Vac (47-63 Hz)
  - 220/240 Vac (47-63 Hz)
  - -48 and -60 Vdc (station battery) version (designed to meet Conducted Emissions requirements in Bellcore 1089)

MultiPak Enclosure

The MultiPak Enclosure (Figure 1-1) is constructed of molded plastic and formed sheet metal components measuring 9 inches (229 mm) high by 13.5 inches (343 mm) wide by 11.5 inches (292 mm) deep. The enclosure has a hinged plastic door assembly with a removable tinted window that allows you to view the product cards LEDs. Other features are:

- Low profile, compact design for desktop use.
- Packaging for ten plug-in-cards
- Separate rear connectors (Zones) for network and business equipment connections
- Plug-in power supply modules are available in the following voltages:
  - 100/120 Vac (47-63 Hz)
  - 220/240 Vac (47-63 Hz)

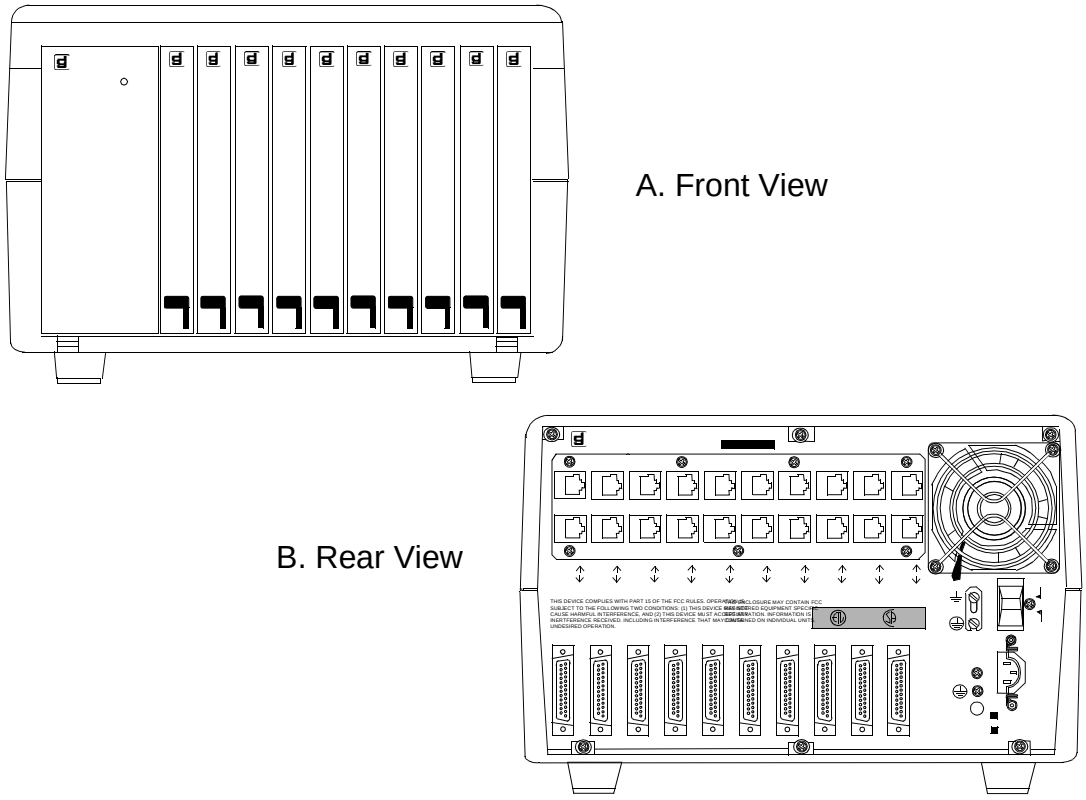


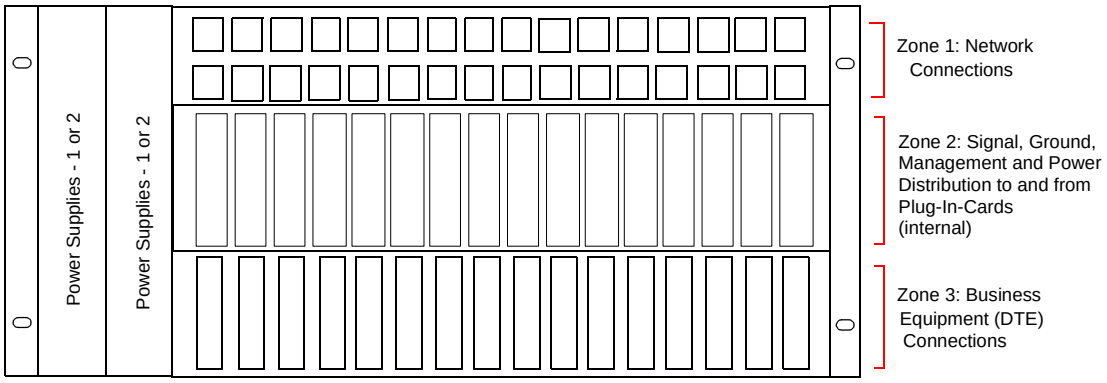
Figure 1-1 MultiPak Enclosure

UAS 7000 Product Cards in MultiPak Enclosure

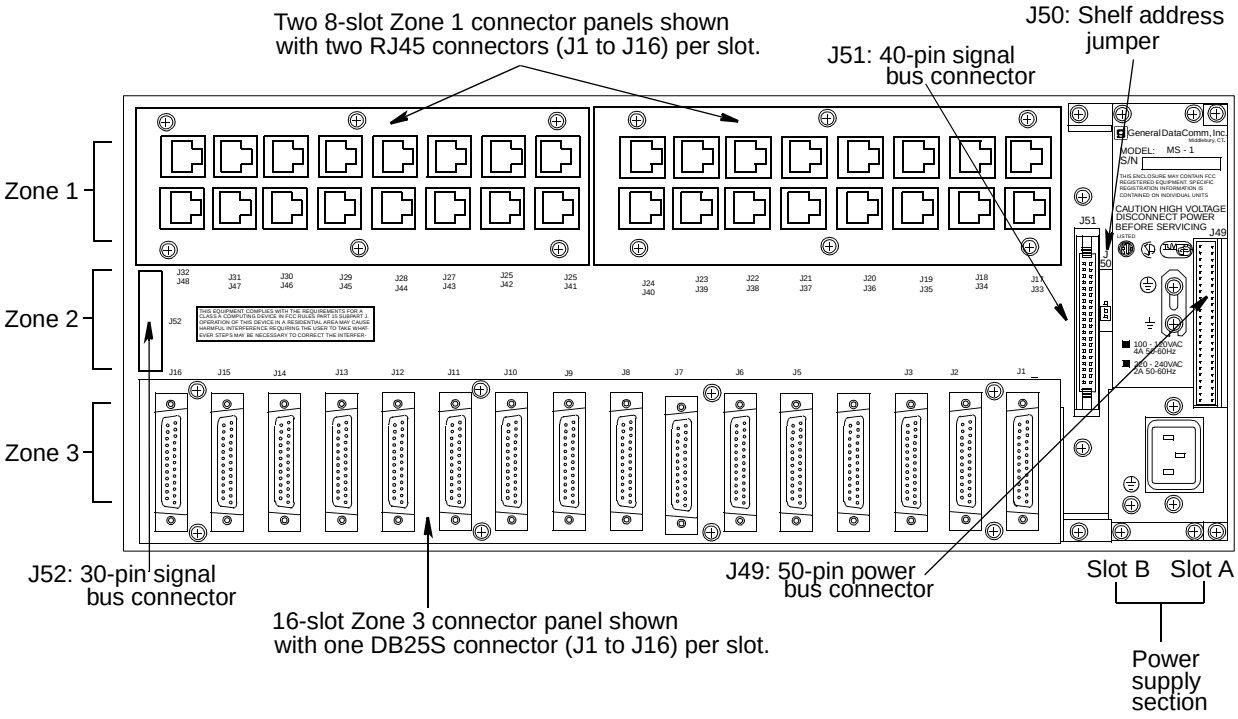
Although you may house the UAS 7000 product cards in the 10-slot MultiPak Enclosure, they are primarily used in a Central Office environment, and installed in an open rack or cabinet using the UAS 7000 Shelf. The enclosure may be used for bench-testing cards away from the rack environment. This requires using the modular connectors at Zone 1 located at the rear of the enclosure. If you desire to use the enclosure for this purpose, the 8-pin modular pin-outs on the enclosure are cross-referenced with the shelves Zone 1 50-pin connectors in *Chapter 2, Installation*.

Zones

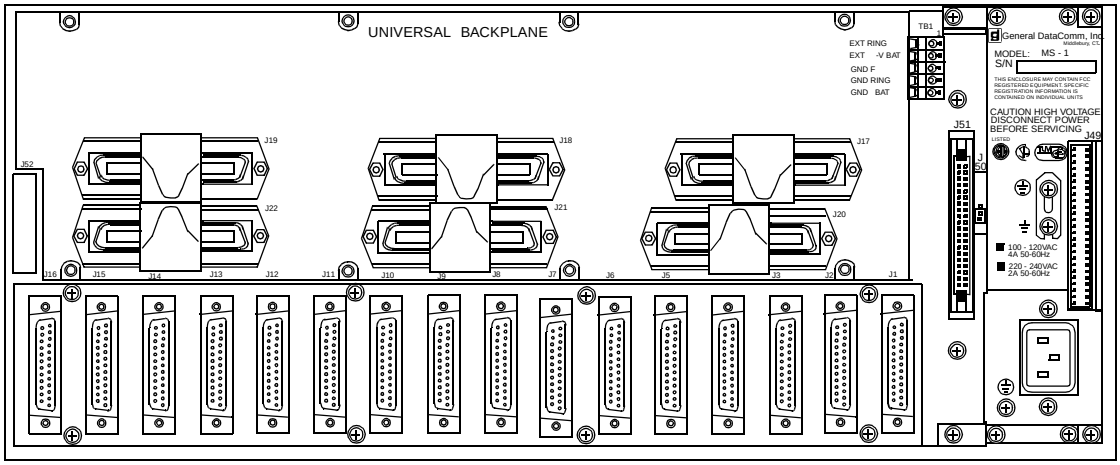
The rear panel of both the shelf and the enclosure is divided into three horizontal rows, (or Zones). Zone 1 (located at the top) and Zone 3 (located at the bottom) accept a variety of connector panels. Zone 1 is used for network interfaces, Zone 3 is used for business equipment. Zone 2 is used for internal busses and power. See *Figure 1-2* A through D.



A. Front View



B. Rear View - RJ45 and DB25 Connector Panels (AC)

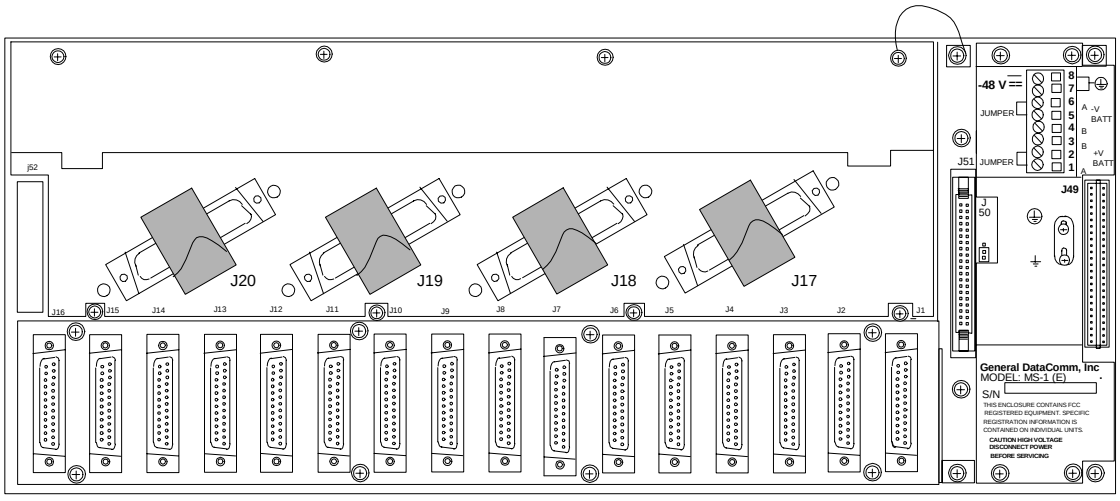


C. Rear View - Universal Backplane in Zone 1 (UAS - AC)

Note

The UAS 7000 product line can be AC or DC powered. DC-powered shelves and their components are found predominately in the Central Office environment. The DC power supply module is shown below in Figure 1-2D.

The Central Office (Telco) in the United States is separate from the Customer Premises. In some International applications PTTs (Postal Telephone & Telegraph) own and operate both the CO and the Customer Premises Equipment. Therefore, voltage (AC versus DC) and cabling requirements may vary.



D. Rear View - Standard 50-Pin Wire Wrap Backplane in Zone 1 (DC)

Figure 1-2 SpectraComm/UAS Shelf

Dual Shelves

You can easily add a second shelf to your system at any time. Two, interconnected shelves house up to 16 additional cards, for a total of 32, plus power supply modules. The optional SCM (SpectraComm Manager) Card, and Alarm Card can be shared with other cards in the shelf. Briefly, to add a shelf, you mount the second shelf below the first, interconnect them with the mandatory bus power cable and the optional bus signal cables, and select the shelf address by means of a header at the rear panel. *Chapter 2, Installation* describes, in detail Dual Shelves on page 236.

Redundant Power Supplies (Shelf Only)

You can power one shelf with one or two power supply modules. You can power two adjacent, interconnected shelves (using a mandatory power sharing cable), with up to two power supply modules per shelf.

(Refer to Load Number on page 239 in Chapter 2.

Multiple power supply modules provide backup power and load sharing (the load is divided among all functioning supplies).

SpectraComm Manager (SCM) Card (Optional)

The SpectraComm Manager (SCM) is a SNMP proxy agent for the product cards. This means that you can configure, diagnose, monitor, etc. the product cards through the SCM, not directly. The SCM supports three interfaces to a network manager. One is an Ethernet interface, the other is through a serial interface and the third is through a dial backup serial interface (only one serial interface is operational, regular or dial backup at a time). For detailed information on this card, refer to the product manual listed in *Related Publications on page ii* in the cover pages.

Alarm Card (Optional)

An optional plug-in Alarm Card allows you to monitor and control alarm conditions of associated product card(s). The alarm function is accomplished using the plug-in Alarm Card along with the existing shelf alarm bus and the associated product card(s).

Note *Use SpectraComm V.Fast Card revision G- or higher.*

Use SCM Card revision A- or higher.

The Alarm Card also:

- Provides contacts to activate local and remote customer alarm systems.
- Provides local and remote indication of alarms in a system.
- Provides separate cutoff controls for local and remote systems.

Further information on the optional Alarm Card may be found in *Chapter 2 (*Optional Cards on page 251*)* and Chapter *3 (*Alarm Card Front Panel on page 31*)*.

GDC Cabinet Profiles

You may use your own open rack or cabinet when installing the SpectraComm/UAS Shelf or General DataComm's offerings. The following paragraphs describe GDC's EP Cabinets and open racks (Data Service Bays).

Note *Installation of shelves in cabinets and racks are fully described in Chapter 2* *Shelf Mounting on page 28*

GDC's EP Cabinets and Data Service Bays are designed for modern Telco central offices. They support a complete range of data applications and the advantages of controlled access for testing and maintenance, as well as conformity with a variety of central office physical and environmental specifications. GDC also provides peripheral equipment such as Fuse and Alarm Panels (*GDC Pub. No. 010R401-000*), Fan Trays, and Air Baffles (the later GDC components are described in this manual) that may be used along with shelf installation. The larger EP cabinets have cable access through the bottom, rear or top or through removable side panels.

EP Cabinets

EP-6 - A line of high-density, easy access cabinets that comply with current UL and EN standards. They may be joined on either side to construct multi-cabinet equipment bays. There are four models available.

- EP-6B - basic model
- EP-6D - 117 Vac version with 300 cfm blower, three fans, a 10-position plug mold and a 20-amp circuit breaker.
- EP-6E - 230 Vac version with 300 cfm blower, three fans, a 10-position plug mold with IEC 320 connectors) and a 10-amp circuit breaker.
- EP-6/DC - -48 Vdc version with 300 cfm blower, three fans, and two power distribution panels, each with a 35-amp circuit breaker

EP-5 - 120 Vac desktop version that accommodates a single shelf, and includes a built-in fan. May be stacked together.

- EP-5E - 220/240 Vac version

EP-1B - accommodates a single 19 inch shelf

Detailed information on GDC's cabinets, and fuse and alarm panels can be found in the following GDC manuals:

- EP-6 Cabinet - *GDC Publication No. 010R318-00*
- Fuse/Alarm Panel - G*DC Publication No. 010R401-000*

Data Service Bays (open frame racks) - *Call your local GDC Sales Office for information on GDC's Data Service Bays.*

GDC also provides mounting brackets that accommodate 19, 23, and racks/cabinets. Refer to Equipment List *Table 1-1* for part numbers, and Chapter 2 Shelf Mounting on page 28 for installation procedures.

Equipment List and Technical Characteristics

The Equipment List and Technical Characteristics for the SpectraComm/UAS Shelf and Enclosure are found in *Table 1-1* and *Table 1-2*.

Table 1-1 Equipment List

Description	GDC Part No.
Shelves	
SpectraComm Shelf MS-2 Mod. 1, Dual Modular 100/120 Vac MS-2 Shelf 100/120 Vac GPS-11 Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M054-001 010B150-001 035P034-001 010C342-001 010C339-001 010D727-001
SpectraComm Shelf MS-2 Mod. 2, Dual Modular -48, 60 Vdc MS-2/DC Shelf -48, 60 Vdc DPS-11 Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M055-001 010B152-001 041P050-001 010C342-001 010C339-001 010D727-001
SpectraComm Shelf MS-2 Mod. 3, Dual Modular 220/240 Vac MS-2E AC Export Shelf 220/240 Vac GPS-11E Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M056-001 010B151-001 035P034-002 010C342-001 010C339-001 010D727-001
SpectraComm Shelf MS-2 Mod. 10, Dual Modular -48, 60 Vdc (redundant P.S.) MS-2/DC Shelf -48 - 60 Vdc DPS-11 Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25	010M070-001 010B152-001 041P050-001 010C342-001 010C339-001
SpectraComm Shelf MS-2 Mod. 4, (Mass Term) 100/120 Vac MS-2 Shelf 100/120 Vac GPS-11 Power Supply Z1-S-04H50PIN, 16-Slot 50-pos Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M057-001 010B150-001 035P034-001 010P145-001 010C339-001 010D727-001
SpectraComm Shelf MS-2 Mod. 5, (Mass Term) -48, 60 Vdc MS-2/DC Shelf -48, 60 Vdc DPS-11 Power Supply Z1-S-04H50PIN, 16-Slot 50-pos Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M058-001 010B152-001 041P050-001 010P145-001 010C339-001 010D727-001
SpectraComm Shelf MS-2 Mod. 6, (Mass Term) 220/240 Vac MS-2E AC Export Shelf 220/240 Vac GPS-11E Power Supply Z1-S-04H50PIN, 16-Slot 50-pos Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M059-001 010B151-001 035P034-002 010P145-001 010C339-001 010D727-001

Table 1-1 Equipment List (Continued)

Description	GDC Part No.
Shelves (continued)	
SpectraComm/UAS Shelf MS-2 Mod. 7, (Mass Term) 100/120 Vac MS-2 Shelf 100/120 Vac GPS-11 Power Supply Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply Universal Zone 1 Backplane	010M073-001 010B150-001 035P034-001 010C339-001 010D727-001 010C377-001
SpectraComm/UAS Shelf MS-2 Mod.8, (Mass Term) 220/240 Vac MS-2E AC Export Shelf 220/240 Vac GPS-11E Power Supply Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply Universal Zone 1 Backplane	010M074-001 010B151-001 035P034-002 010C339-001 010D727-001 010C377-001
SpectraComm/UAS Shelf MS-2 Mod. 9, (Mass Term) -48, -60 Vdc MS-2/DC Shelf -48, -60 Vdc DPS-11 Power Supply Z3-S-16DB25, 16-Slot DB25 Universal Zone 1 Backplane	010M075-001 010B152-001 041P050-001 010C339-001 010C377-001
SpectraComm Shelf MS-2 Mod. 11, (Mass Term) -48, -60 Vdc (redundant P.S.) MS-2/DC Export Shelf -48, - 60 Vdc DPS-11 Power Supply (2) Z3-S-16DB25, 16-Slot DB25 (2) Z1-S-045HOPIN	010M071-001 010B152-001 041P050-001 010C339-001 010P145-001
SpectraComm/UAS Shelf MS-2 Mod. 12, (Mass Term) -48, -60 Vdc (redundant P.S.) MS-2/DC Shelf -48, - 60 Vdc DPS-11 Power Supply (2) Z3-S-16DB25, 16-Slot DB25 Universal Zone 1 Backplane	010M076-001 010B152-001 041P050-001 010C339-001 010C377-001
Enclosures	
SpectraComm MultiPak Enclosure ME-2 Model 1 (100/120 Vac) with DB25 Zone 3 connectors	010B163-001
SpectraComm MultiPak Enclosure ME-2 Model 2 (100/120 Vac) with V.35 Zone 3 connectors	010B164-001
SpectraComm MultiPak Enclosure ME-2E Model 3 (220/240 Vac international); power cord optional, specify type, with DB25 Zone 3 connectors	010B163-002
SpectraComm MultiPak Enclosure ME-2E Model 4 (220/240 Vac, international); power cord optional, specify type, with V.35 Zone 3 connectors	010B164-002
Enclosure Power Supplies	
GPS-13 100/120 Vac input power supply	035P010-001
GPS-13E 220/240 Vac input power supply (international)	035P010-002
Connector Panel Kits	
8-Slot RJ45, Zone 1, Shelf	010K338-001
8-Slot Dual RJ45, Zone 1, Shelf	010K342-001
8-Slot Dual Shielded, Zone 1, Shelf	010K342-002
8-Slot Blank (required to cover unused slots)	010K341-001

Table 1-1 Equipment List (Continued)

Description	GDC Part No.
Enclosure Power Supplies	
16-Slot DB-25, Zone 3, Shelf	010K339-001
16-slot V.35, Zone 3, Shelf	010K068-001
16-Slot Blank (required to cover unused slots)	010K342-001
16-Slot 50-pin or wirewrap, Zone 1, Shelf	010K345-001
Universal Backplane 16-Slot 50-pin, Zone 1, Shelf	010K072-001

Miscellaneous Equipment	
26” Mounting Brackets, Flush-Mount (for use with UAS/SpectraComm Shelf)	010J027-001
19" Fan Tray Assembly, AC Domestic (120 Va c)	010B160-001
19" Fan Tray Assembly, AC Export (220/240 Va c)	010B161-001
19" Fan Tray Assembly, -48 Vdc	010B162-001
19” to 23” Mounting Brackets, Center-of-Gravity (for use with Fan Tray Assembly)	018K347-001
19” to 23” Mounting Brackets, Flush-Mount (for use with Fan Tray Assembly)	018K348-001
Air Baffle Kit (includes 19/23” mounting brackets)	010K414-001
26” Mounting Brackets, Flush-Mount (for use with Air Baffle Assembly)	010K418-001
Blank Panel, Card Slot	010P142-001
Blank Panel, Power Supply	010D727-001
66M Block	SYS 326P032
66E Block	338C001-A06
Terminal Grounding Lug Kit	010K030-001
10BASE - 2 LAN Adapter	058B033-001
10BASE - T LAN Adapter	058H209-001
DB25 to V.35 Adapter	209-036-025
Optional Cards	
Alarm Card with Interface Adapter	010M072-001
SpectraComm Manager Card	058P150-001
Interface Adapter Card	048P068-001
Card Retention Kit	010K021-001

Table 1-1 Equipment List (Continued)

Description	GDC Part No.
Cables	
Power Cord - Domestic 100/120 Vac (Ferrite Suppression)	028H104-006
Power Cord - International 220 Vac (Our. - 2-prong)	830-061-002
Power Cord - International 220 Vac (UK)	830-060-102
Bus Power Cable (expansion shelf - AC power supply)	024H610-002
Bus Power Cable (expansion shelf - DC power supply)	024H610-001
Bus Signal Cable (inter-shelf 40-pin)	029H510-001
Bus Signal Cable (inter-shelf 30-pin)	029H509-001
Bus Power Cable (expansion shelf - AC/DC power supply - NEBs compliant configuration)	024H610-004
Bus Signal Cable (inter-shelf 40-pin - NEBs compliant configuration)	029H510-002
Bus Signal Cable (inter-shelf 30-pin - NEBs compliant configuration)	029H509-002
EIA-232 to V.35 Cable	027H572-001
Cable, M/M, shielded, 50-pin 10 feet	830-002S011
Cable, M/M, shielded, 50-pin 25 feet	830-002S008
Cable, M/M, shielded, 50-pin 50 feet	830-002S012
V.35 to V.35 Cable	027H516-xxx
10BASE - 2 Cable 5 meter 15 meter 30 meter	 S-125H003-001 S-125H004-001 S-125H005-001

Table 1-2 Technical Characteristics

Item	Characteristic
Shelf	
Physical	
Height	7 in (178 mm)
Width	17-1/2 in (445 mm), without brackets
Depth	11-1/2 in (292 mm)
Weight	18 lb (8.2 kg) empty shelf (add 1 lb 5 oz., or 0.6 kg, per power supply)
Shipping weight	19 lb 5 oz. (8.8 kg), empty shelf (add 1 lb 5 oz., or 0.6 kg, per power supply)
Enclosure	
Physical	
Height	9 in (229 mm)
Width	13.5 in (343 mm), without brackets
Depth	11.5 in (292 mm)
Weight	12 lb (5.4 kg), including power supply
Shipping weight	13 lb 5 oz. (6 kg), including power supply
Environmental	
Operating Temperature	32° to 122°F (0° to 50°C)
Non-operating Temperature	-40° to 185°F (-40° to 85°C)
Humidity, operating	5% to 95% without condensation
Altitude: Operating	0 ft. to 10,000 ft. (0 m to 3,047 m). Derate by 1°C/1000 ft. above sea level.
Altitude: Non-operating	0 ft. to 40,000 ft. (0 m to 12,191 m)
Power Supplies	
GPS-11	
No. Per System	1 or 2 per shelf, up to 4 for a dual shelf
Input Power	90-129 Vac, (100-120 nom.) 50/60 Hz
Output Power	+5V 16A max. +12V 1.67A -12V 1.67A Total Power = 96W max. Load Number = 16.0 max.
GPS-11E	
No. Per System	1 or 2 per shelf, up to 4 for a dual shelf
Input Power	175-264 Vac, (220-240 nom.) 50/60 Hz
Output Power	+5V 16A +12V 1.67A –12V 1.67A Total Power = 96W max. Load Number = 16.0 max.

Table 1-2 Technical Characteristics (Continued)

Item	Characteristic
DPS-11	
No. Per System	1 or 2 per shelf, up to 4 for a dual shelf
Input Power	–42 to -70 VDC, (-48 VDC nom.) 3A DC max. input current
Output Power	+5V 16A +12V 1.67A –12V 1.67A Total Power = 96W max. Load Number = 16.0 max
GPS-13	
No. Per System	1 per enclosure
Input Power	90-129 Vac, (100-120 nominal) 50/60 Hz
Output Power	+5V 20A +12V 1.05A –12V 1.05A Total Power 100W Total Power = 100W max. Load Number = 10.0 max.
GPS-13E	
No. Per System	1 per enclosure
Input Power	175-264 VAC, (220-240 nom.) 50/60 Hz
Output Power	+5V 20A +12V 1.05A –12V 1.05A Total Power 100W Total Power = 100 W max. Load Number = 10.0 max.
Alarm Card	
Alarm Contact Rating	1 amp at 48 VDC
Load Power	+5V 0.2W +12V 0.9W Load Number = 0.7

Chapter 2: Installation

Overview

This chapter describes the installation of the GDC SpectraComm/UAS Shelf and Enclosure; a family of products that provides both a packaging and system solution for data communication needs. This chapter does not describe the configuration or other details of specific product cards: for that information, refer to the individual product's manual, listed in *Related Publications* located in the front cover pages.

Because of the family similarities, differences in configuration or operation of either the shelf or enclosure, will be discussed for each unit.

Unpacking

Inspect the box for damage; if any is observed, notify the shipper immediately. Save the box and packing material; you can use it to reship the unit, if necessary.

Frame Assembly Installation

This portion of the SpectraComm/UAS Shelf/Enclosure manual provides you with general instructions for the physical installation of the rack frame assemblies. This procedure is limited to mounting and securing the frame metal work and terminating safety ground cables to the frame.

Note *Power cable requirements specified in this manual are recommendations. Cabling for each site is unique and must be specified and certified by your site engineering personnel for all applications.*

Physical Requirements

Placement of the frame assembly within a facility requires a site survey to determine the most appropriate location.

Floor Type

The frame is configured for installation on either computer or hard floors, in either 19" X 7' - 6" or 19" X 9' relay racks. The nine foot rack is for use in raised computer floor applications and allows the equipment rack to be bolted to the hard floor below the computer floor tiles.

Expansion

Place the frame in a location that can provide for future expansion. Because GDC's cabinets and frames support such a wide range of applications, please refer to the product manual or GDC's Regional Sales Office for product card density.

Installation Procedures

Your Central Office (CO) may include specific procedures (job documentation) for installing the frames to the floor of the selected location. Furthermore, in some cases, such as earthquake zones, local standards and procedures may apply. In such cases, follow your company policies and local practices, using the following information as a guide only.

Recommended Tools

1. Heavy duty, two wheeled hand truck.
2. Masonry drill bit and hand drill.
3. Flat head and Phillips head screwdrivers.
4. Box wrenches.
5. Concrete anchor assemblies.
6. Rack isolation kit.
7. Plastic insulators (for overhead bracing isolation).
8. Additional hardware as needed.

General Procedures

1. Verify that the selected area dimensions and location of reference points correspond to your floor plan.
2. Mark equipment locations on floor.
3. Determine frame type.
4. Install concrete anchors in floor and clean area of debris.
5. Move frame to the floor location for installation.
6. Locate frame over mounting anchors.
7. Use the recommended hardware to secure the frame to the floor.
8. Use a level to check the leveling and alignment of the frame at the base, top, and both sides.
9. Connect adjacent frames together with appropriate hardware, but don’t tighten.
10. Torque the floor anchors to the manufactures recommended foot-pounds.
11. Tighten the adjacent frame bolts.

DC Power and Grounding

The DC frame assembly requires only -48 VDC power.

Primary and secondary DC power is applied from the facility secondary -48Vdc distribution panel to a either a customer-provided or secondary sourced fuse and alarm panel. This panel is usually located at the top of each frame since the primary and secondary power is generally located at the ceiling. The fuse and alarm panel then distributes fused -48Vdc to each equipment shelf via the power and alarm cable harness.

Note *SpectraComm/UAS Shelf rear panel power input connectors can only accept 12 gauge wire or smaller.*

As your alarm panel may not be provided by GDC, refer to your job documentation for cable routing and use of this panel.

The power and alarm cables from the alarm panel go to the individual shelf power supplies..

Note *Signal and frame ground from each DC shelf should be jumpered together and connected to the ground bar on the bottom of the rack with 12 gauge wire. If a separate digital ground is provided, the signal and frame ground should be brought out separately.*

Frame Test Procedure

Input Voltage - Measure and confirm -42 to -56 Vdc (-48 Vdc nominal) at the battery connections on the rear of the fuse and alarm panel, and the power inputs to each shelf. Measure the +V Batt and -V Batt test points on the rear panel of each power supply installed in the shelf.

Shelf Configuration

So that you can correctly order and install your equipment, you must first consider several factors. You must know:

- Are you mounting the shelves in an EP cabinet (which one?) or an open frame rack (Bay)?
- How many shelves are you installing?
- Do you prefer redundant or non-redundant power system? (refer to *Multiple Power Supplies (shelf only) on page 2-40 in this chapter*)
- If you are using redundant supplies, are the shelves power-independent or is it an interconnected, dual-shelf system?
- Do you prefer (or require) forced air cooling or convection cooling?
- The following information should be adhered to when stacking shelves in Open Frame or EP-6 Cabinets. They are based on worst case power requirements (fully loaded 96 Watt power consumption). Although lightly loaded shelves require less cooling, it is recommended that these guidelines be followed to eliminate the necessity to upgrade in the field. In any case, be sure to use blank filler panels in any unused slot of the shelf when a fan is used. When you install only one power supply, you MUST install a power supply blank front panel (GDC Part No. 010D727-001) to cover the unused slot. See Figure 2-4 and refer to Table 2-1.

Power Supplies and Cooling

Power supplies in a redundant power system (shelf only) run cooler than non-redundant systems because the load is divided between them. Thus, the cooling requirements may be lower for a system with redundant supplies.

Refer to *Load Number on page 2-39* and *Multiple Power Supplies (shelf only) on page 2-40* in this chapter.

Fan Tray Assemblies

Fan Tray Assembly	Part No.
DC	010B162-001
AC Domestic	010B160-001
AC Export	010B161-001

You can install Fan Tray Assemblies for forced air cooling in all racks and cabinets. One fan tray can cool two shelves below it and two shelves above it, drawing cool air in at the bottom and exhausting warm air at the top. This means that you can install two shelves below the bottom fan tray, two shelves above the top fan tray, and up to four shelves between two fan trays. You cannot install a Fan Tray Assembly between a main shelf and expansion shelf. Except for the basic model, EP-6 cabinets require fewer fan trays because the cabinet includes blowers at the bottom and fans at the top.

Important *Refer to Figure 2-3 for Bellcore GR-63-CORE Frame Level R4-15 Firespread Criteria requirements.*

The DC-powered Fan Tray Assembly, illustrated in *Figure 2-1*, has an front panel Alarm indicator. It is normally off, and lights when the internal fan(s) lose power. You may use the rear panel external (*Alarm Card on page 2-54*) contacts for the same purpose: ALM COM = Common, ALM N.C. = Normally closed, ALM N.O. = Normally open.

The AC-powered Fan Tray Assembly has no indicators, and there are provisions for a line cord at the rear of the assembly.

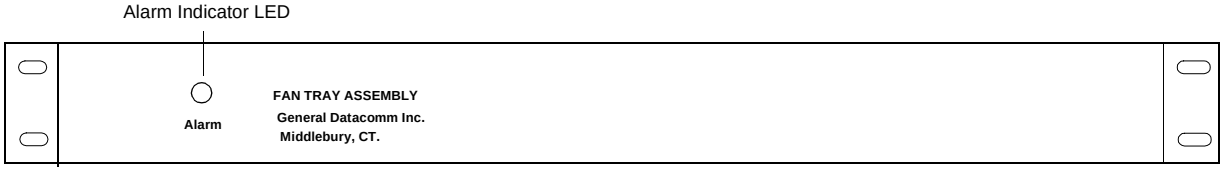


Figure 2-1 DC-Powered Fan Tray Assembly (Front View)

Fuse Replacement

The DC and AC Fan Tray Assemblies have a fuse mounted on the rear panel.(*Figure 2-2*) When replacing the fuse, be sure to use the correct type (fuse information is printed on the left side of the rear panel).

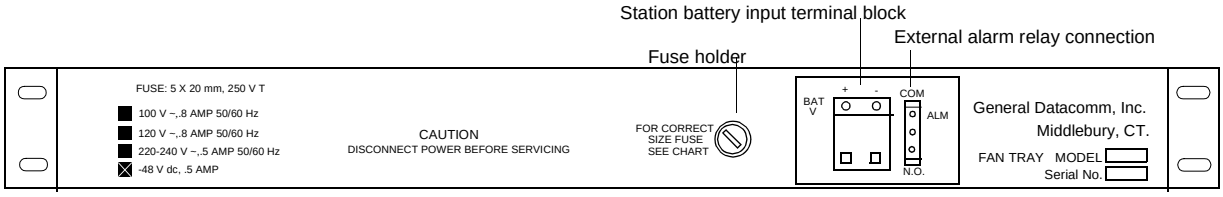


Figure 2-2 DC-Powered Fan Tray Assembly Fuse Location (Rear View)

Air Baffles

In an open rack (bay) you can install a mid-mounted air baffle, instead of fan trays, for convection cooling. The baffle is simply sheet metal bent at an angle to divert hot air rising. The baffle draws cool air in at the bottom (for the shelf above it) and exhausts warm air at the top (from the shelf below it). With non-redundant supplies, you must install a baffle above every shelf. With redundant supplies, you must install a baffle above every two shelves. (A baffle is not required at the very bottom or the very top, only between shelves.) The GDC part number for the baffle kit is 010K414-001.

Refer to *Figure 2-3* and *Air Baffle Installation on page 2-16* for Bellcore GR-63-CORE Frame Level Firespread configuration.

Air Flow

Each shelf requires an unrestricted air flow of at least 37 cfm. Do not install any unit which blocks the flow of air through the closed column formed by stacked shelves. (For example, a flat shelf used for setting standalone modems on). A Proper installation of the shelves with fans or baffles creates an enclosed column and provides the proper air flow.

Important

In a cabinet application that uses a fan, there must be no open space between components, and you MUST install blank front panels in all unused slots. When you install only one power supply, you MUST install a power supply blank front panel, P/N 010D727-001, to cover the unused slot.

Failure to do so may result in overheating and subsequent power supply shutdown.

There must be adequate provision for the circulation of cooling air and exhaust of warm air.

Figure 2-3, *Figure 2-4* and *Table 2-1* illustrate and describe EP-6 Cabinet and Open Frame SpectraComm/UAS Shelf configurations.

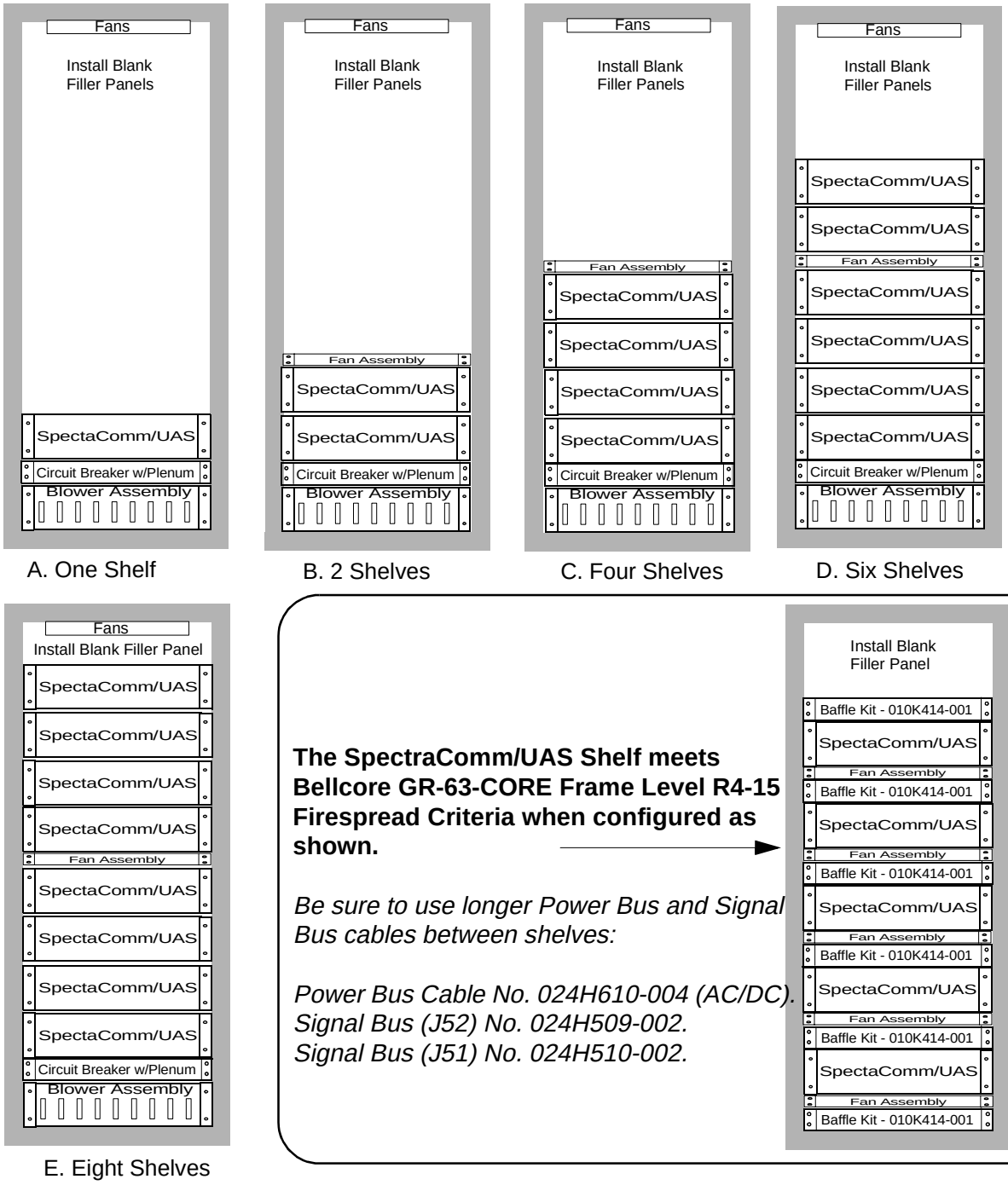


Figure 2-3 SpectraComm/UAS Shelves in EP-6 Cabinet

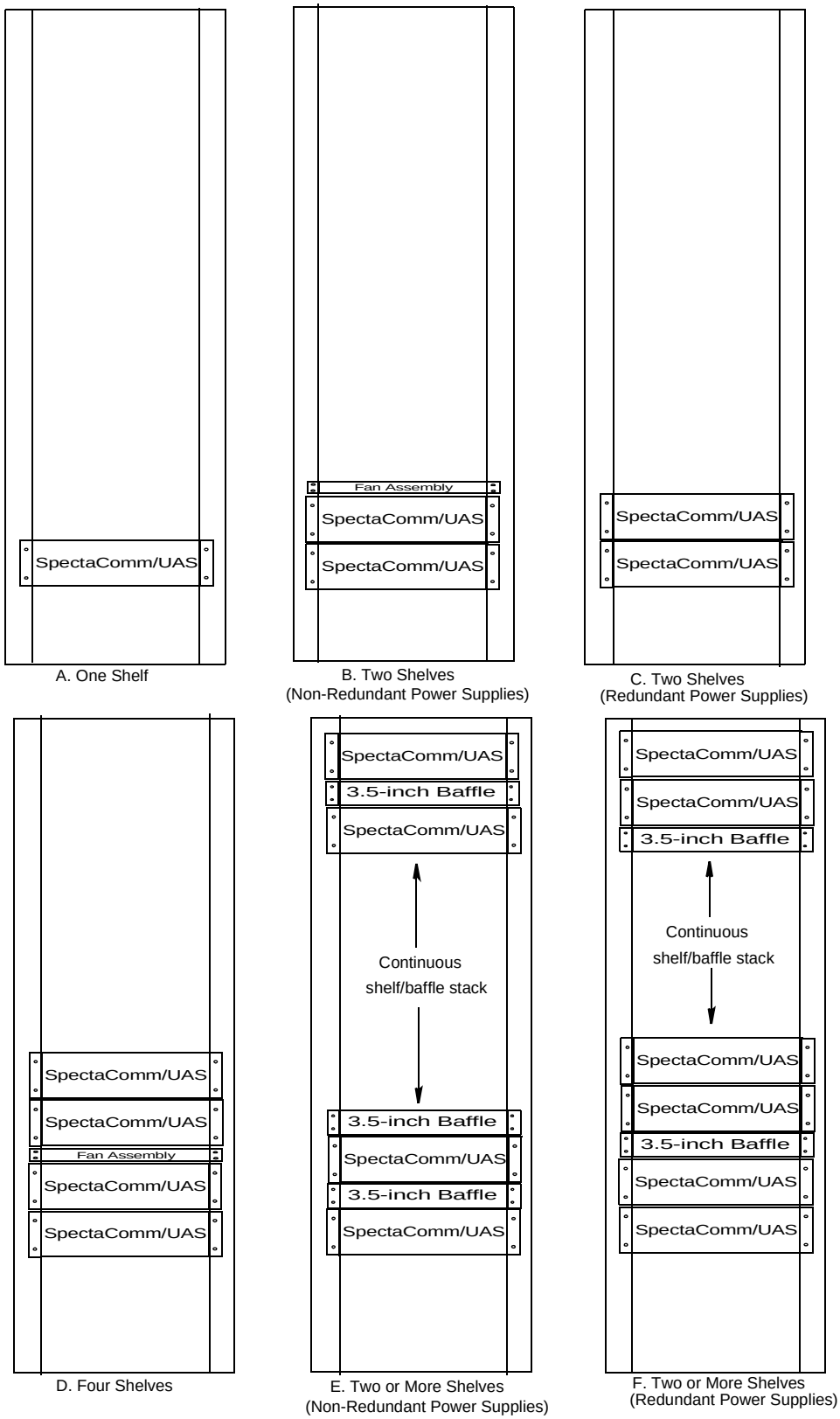


Figure 2-4 SpectraComm/UAS Shelves in 7’ 6” Open-Frame Rack (Bay)

Table 2-1 Shelf Configurations

Cabinet	Power Supplies	Cooling Method Fan	*Baffle
EP-6			
1 shelf	redundant/non-redundant	optional	not applicable
2 shelves	non-redundant	optional	not applicable
	redundant	optional	not applicable
4, 6, 8 shelves	non-redundant	1 required	not applicable
	redundant	1 required	not applicable
Open Frame (Rack/Bay)			
1 shelf	non-redundant	optional	optional
	redundant	optional	optional
2 shelves	non-redundant	1 required	1 required
	redundant	optional	optional
4 shelves	non-redundant	1 required	3 required
	redundant	1 required	1 required
6 shelves	non-redundant	2 required	5 required
	redundant	2 required	2 required
8 shelves	non-redundant	2 required	7 required
	redundant	2 required	3 required

Use of the fan assembly for forced air cooling is optional in single-shelf configurations and in configurations with two shelves with redundant supplies. Most other configurations require one or more fan assemblies.

*The SpectraComm/UAS Shelf meets Bellcore GR-63-CORE Frame Level R4-15 Firespread Criteria when configured as shown in *Figure 2-3*. This arrangement requires the use of Air Baffle Kit No. 010K414-001.

Shelf Mounting

You can mount the shelf in a standard 19- or 23-inch wide equipment rack, such as one of GDC's EP-Series 19-inch cabinets. You can move the brackets, as illustrated in Figure 2-5, to provide flush or center-of-gravity mounting, and to accommodate typical frames. For all racks, mount the shelf from the front of the rack.

Be sure to install shelves and power supplies as described under *Shelf Configuration on page 2-3*. Failure to do so may result in overheating and subsequent power supply shutdown.

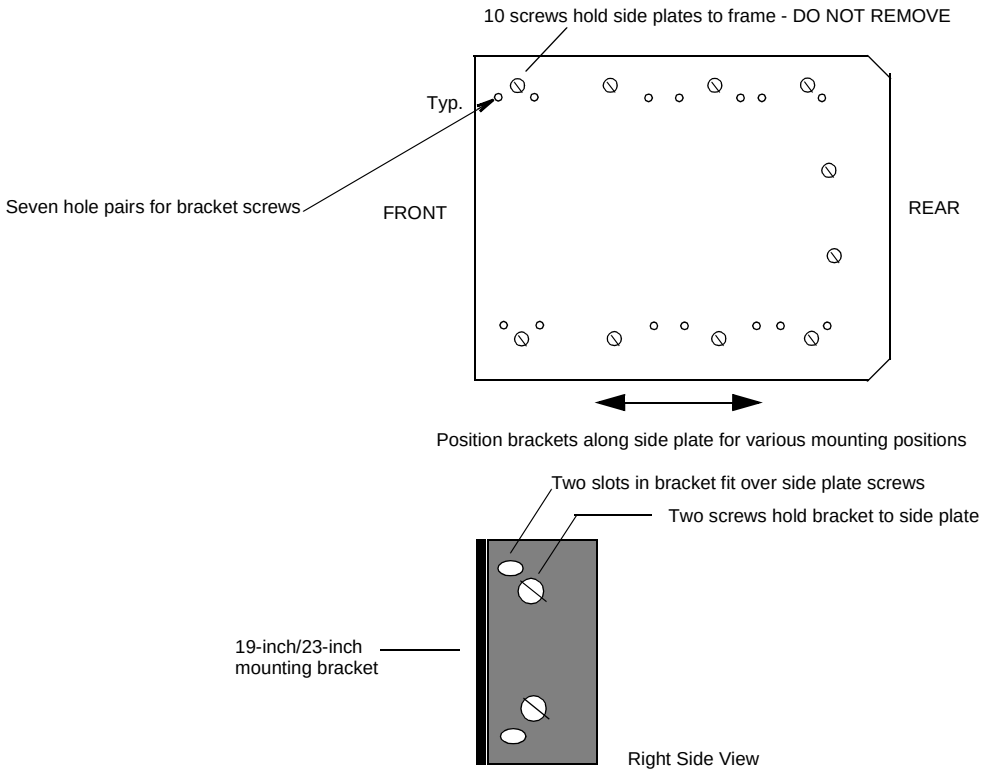


Figure 2-5 Rackmount Shelf Bracket Installation

19-Inch Rackmounting

The shelf is shipped for 19-inch rackmounting in an EP-series cabinet, for example (the brackets are installed with the long flange against the shelf side plate, as illustrated in Figure 2-6). Position the shelf at the desired height and secure it with the included mounting hardware (screws and washers).

Flush Mounting

For flush mounting, use hole pair #2, and install each bracket with the short flange facing the front.

Center-of-Gravity Mounting

For center-of-gravity mounting, use hole pair #5, and install each bracket with the short flange facing the front.

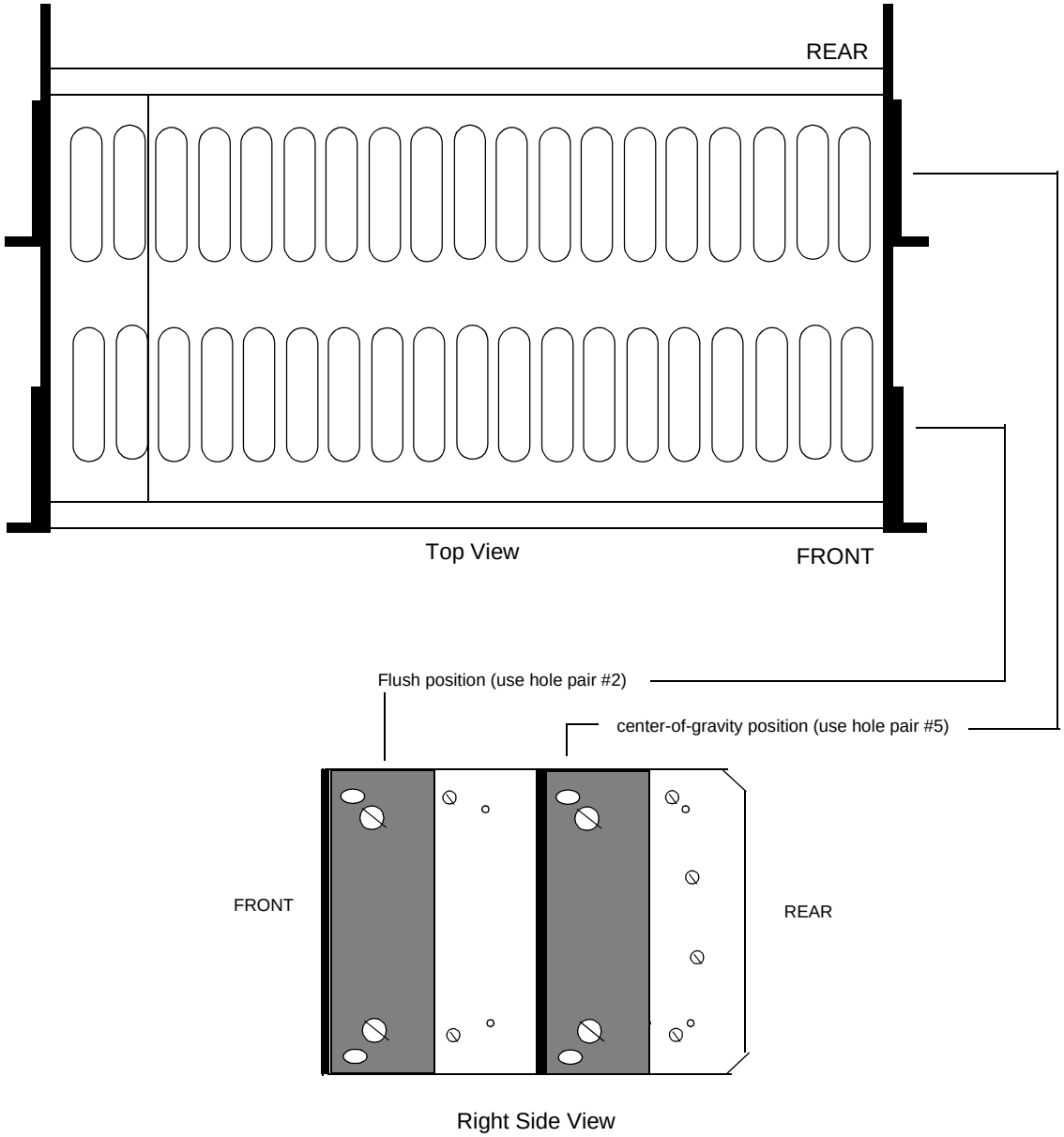


Figure 2-6 Rackmount Shelf Bracket Installation (19-Inch Rack)

23-Inch Rackmounting

To mount the shelf in a 23-inch rack, remove the brackets (held in place with two screws) and install them with the short flange against the shelf's side plate, as illustrated in Figure 2-7, using the original screws. Position the shelf at the desired height and secure it with the included mounting hardware (screws and washers).

Flush Mounting (P/N 010K348-001)

For flush mounting, use hole pair #1, and install each bracket with the long flange facing the front.

Bulbe Angle Frame Mounting (P/N 010K347-001)

For Bulbe Angle Frame mounting, use hole pair #3, and install each bracket with the long flange facing the rear.

#5 XBAR Frame Mounting

For #5 XBAR Frame mounting, use hole pair #4, and install each bracket with the long flange facing the rear.

Unequal Flange Frame Mounting

There are two types of Unequal Flange Frames. For the one type, use hole pair #5, and install each bracket with the long flange facing the front. For the other type, use hole pair #7, and install each bracket with the long flange facing the rear.

M Frame Mounting

For M Frame mounting, use hole pair #6, and install each bracket with the long flange facing the rear.

26-Inch Rackmounting

Optional 26-inch mounting brackets are also available. Use GDC Part No. 010J027-001. Follow the same installation procedures for 19 and 23 inch mounting.

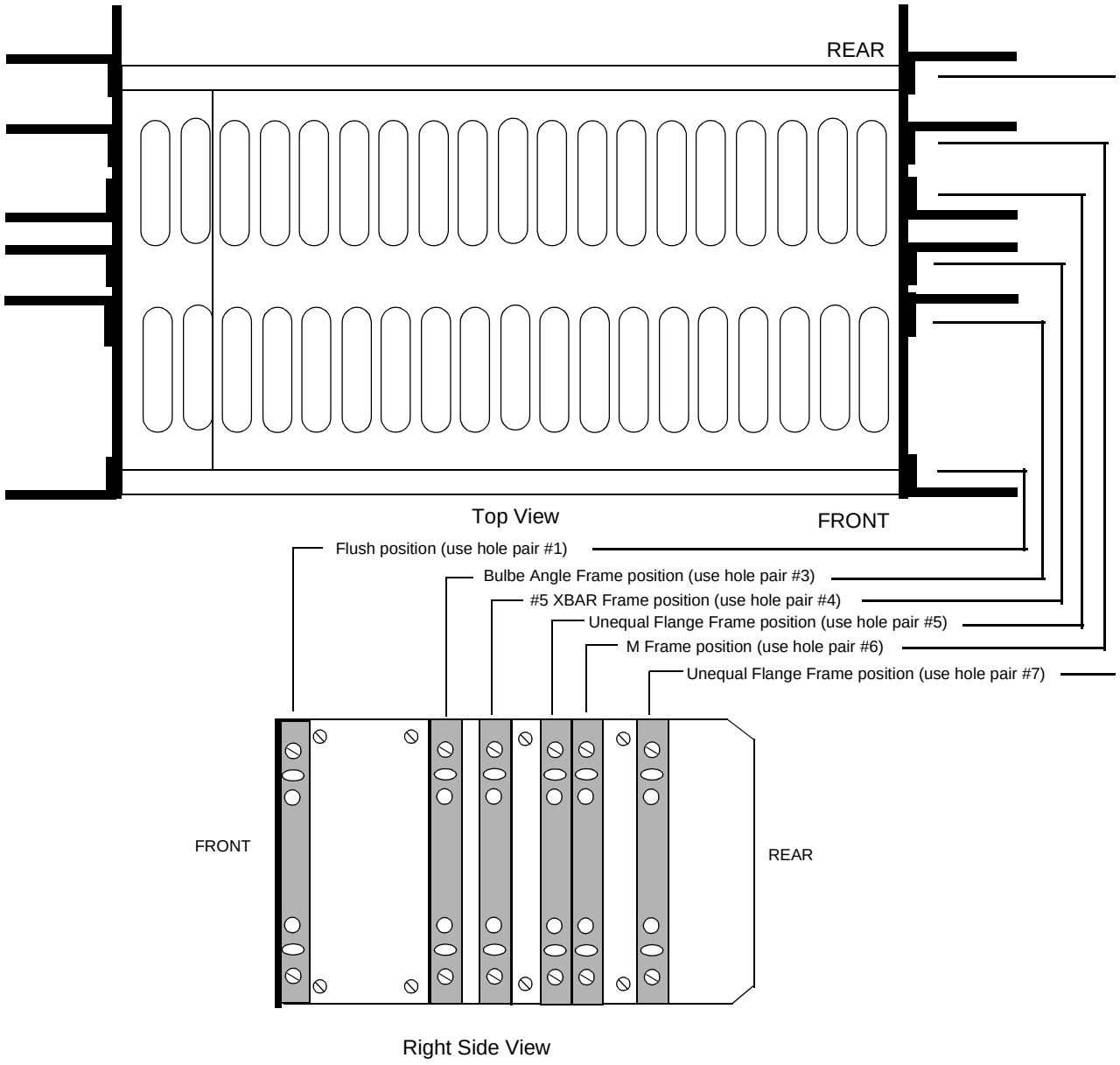


Figure 2-7 Rackmount Shelf Bracket Installation (23-Inch Rack)

Fan Tray Assembly Mounting

You may need to install one or more Fan Tray Assemblies to provide proper air flow through the cabinet or rack. (Refer to *Shelf Configuration on page 2-3* to determine whether your installation requires fan trays and which configuration to use.) Each fan tray uses 1.75 inches of vertical rack space. For all racks, mount the fan tray from the front of the rack.

To mount a fan tray:

1. If required, install mounting brackets as described below.
2. Place the fan tray on top of the existing shelf, with the front panel lettering right side up and readable. Proper orientation of the fan tray is critical.
3. Mount the next shelf directly above the fan tray: Do not leave any open space between them.

The fan tray mounts flush in a 19-inch rack without modification. Other mounting arrangements require mounting bracket kits, as described below and illustrated in Figure 2-8.

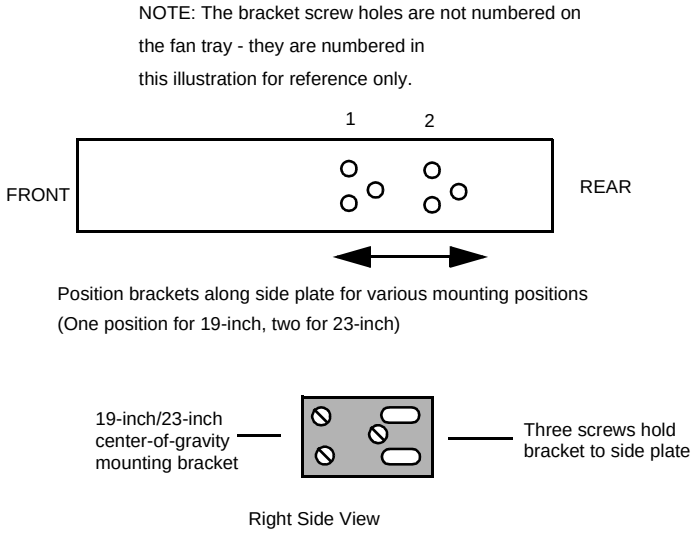


Figure 2-8 Rackmount Fan Tray Bracket Installation

19-Inch Rackmounting

The fan tray is shipped for 19-inch flush rackmounting in an EP-series cabinet, for example (the front panel has mounting holes spaced for a 19-inch rack, eliminating the need for brackets). Position the fan tray at the desired height and secure it with the included mounting hardware (screws and washers). Figure 2-9 illustrates mounting the fan tray in a 19-inch rack

Flush Mounting

For flush mounting, install the fan tray as shipped.

Center-of-Gravity Mounting

For center-of-gravity mounting, use two holes in set #1 and hole in hole set #2,and install each bracket included in the kit (GDC Part No. 010K347-001) with the short flange facing the front, using the included screws.

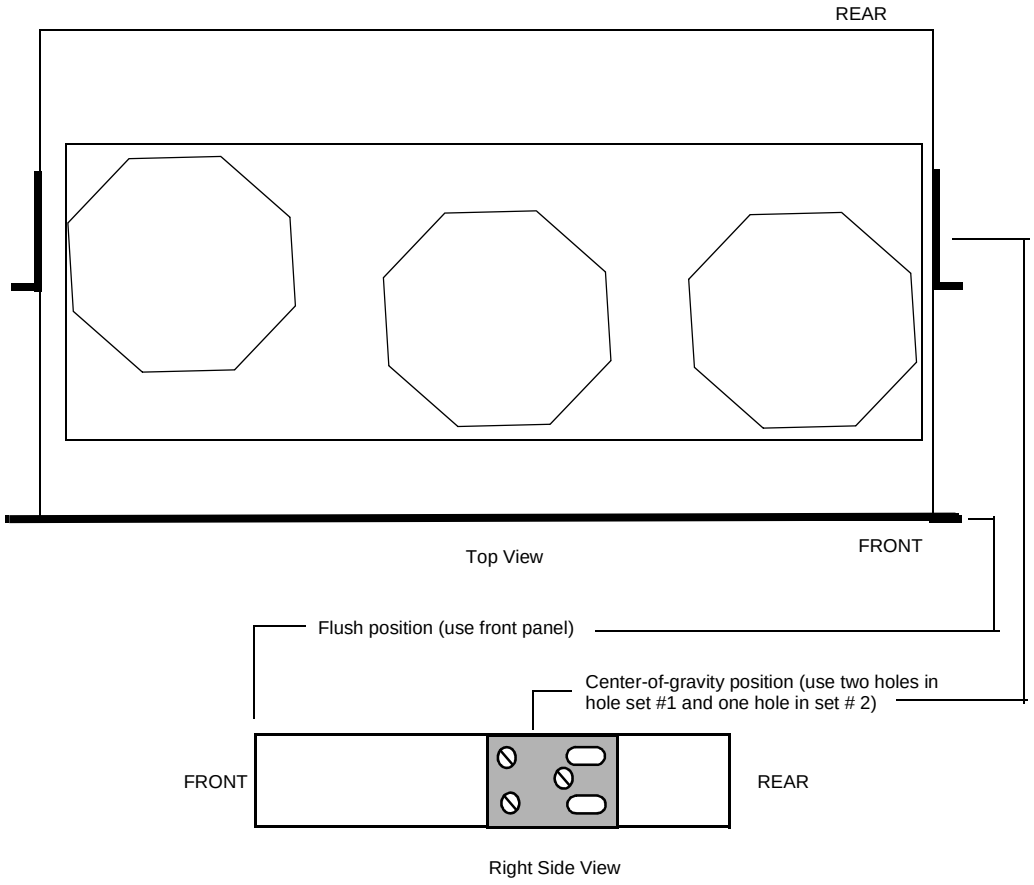


Figure 2-9 Rackmount Fan Tray Bracket Installation (19-Inch Rack)

23-Inch Rackmounting

To mount the fan tray in a 23-inch rack, install the brackets with the short flange against the fan tray's side plate, as illustrated in Figure 2-10, using the included screws. (Flush mounting utilizes front panel adapters.) Position the fan tray at the desired height and secure it with the included mounting hardware (screws and washers).

Flush Mounting

For flush mounting, install each front panel adapter included in the kit (GDC P/N 010K348-001) with the painted surface facing the front. Use two of the included screws to attach each adapter to the front panel.

Bulbe Angle Frame Mounting

For Bulbe Angle Frame mounting, use hole set #1, and install each bracket included in the kit (GDC P/N 010K347-001) with the long flange facing the front.

#5 XBAR Frame Mounting

For #5 XBAR Frame mounting, use hole set #2, and install each bracket included in the kit (GDC P/N 010K347-001) with the long flange facing the front.

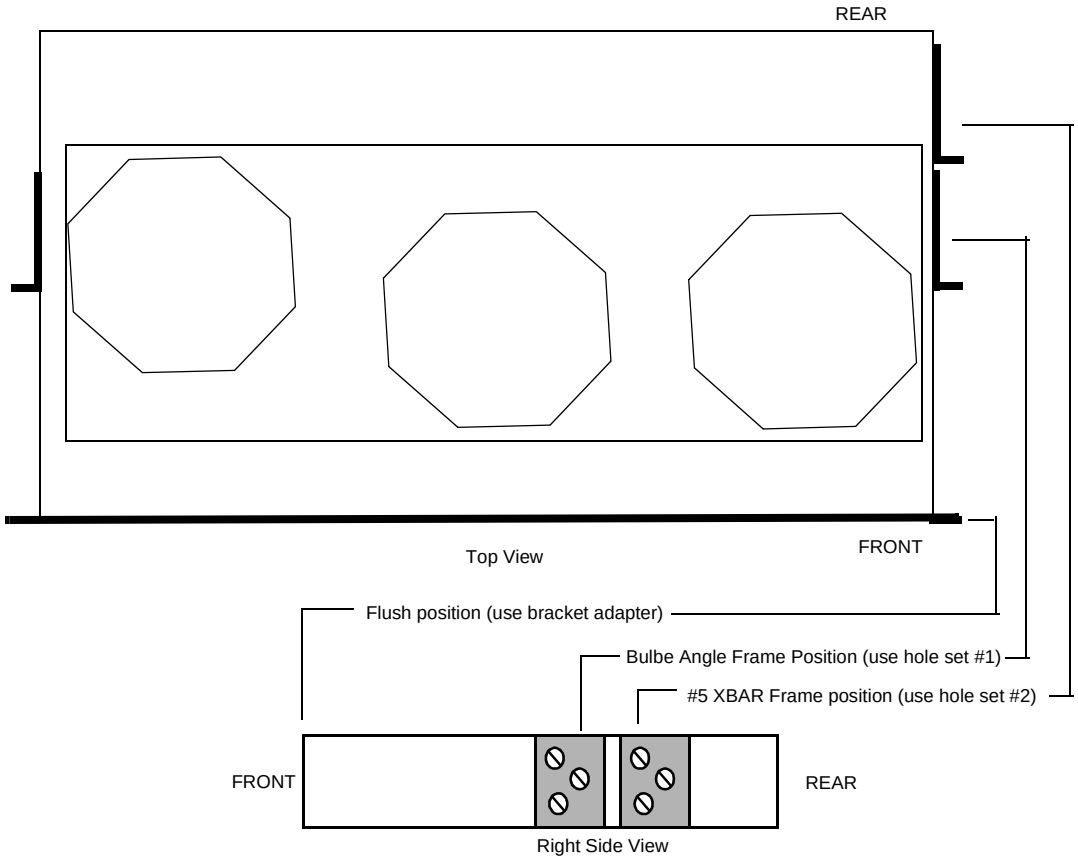
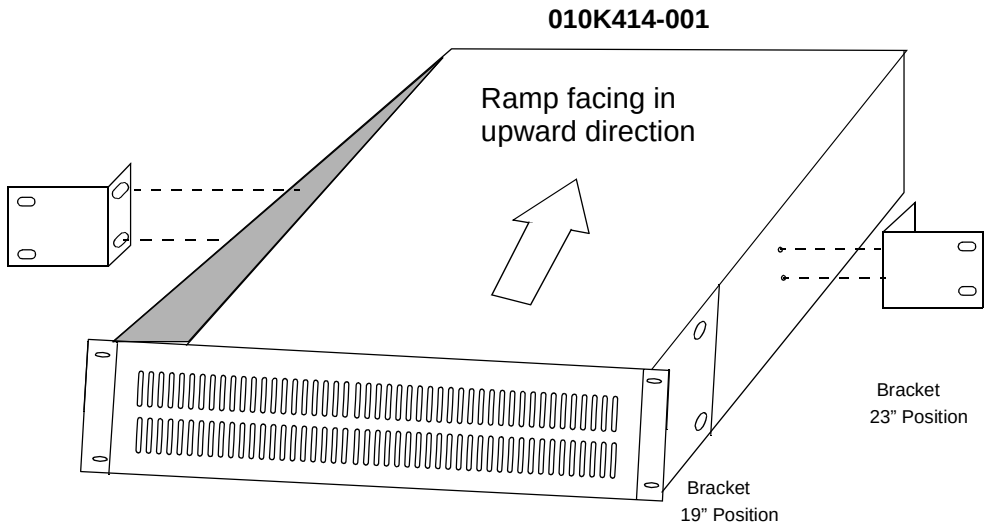


Figure 2-10 Rackmount Fan Tray Bracket Installation (23-Inch Rack)

Air Baffle Installation

You may need to install one or more Air Baffles (Air Baffle Kit No. 010K414-001) to provide proper air flow through the cabinet or rack. (Refer to *Shelf Configuration on page 2-3* to determine whether your installation requires baffles and which configuration to use.)



1. The brackets can be attached to the air baffle in the front or mid locations as shown. by turning them to the 19” or 23” position. Fasten them with the supplied hardware.
2. Lift the baffle into the frame or cabinet with the ramp facing upward. Fasten with supplied hardware.

Figure 2-11 Air Baffle Installation

26-Inch Rackmounting

Optional 26-inch mounting brackets are also available. Use GDC Part No. 010K418-001. Follow the same installation procedures for 19 and 23 inch mounting.

Connector Panels

The shelf and enclosure supports a variety of SpectraComm/UAS family products by using field-replaceable rear connector panels. The shelves rear panel is divided into three zones, with unique connector panels for Zones 1 and 3. Each connector panel has card edge connectors on one side to mate with the product cards and one of several types of connectors on the other side to connect to the network or business equipment (DTE). The shelf and enclosure is shipped with the proper connector panels installed for your system. However, you may need to install others as your system requirements change.

Zone 1 Shelf - supports one or two 8-slot connector panels with RJ45 8-position modular jacks or four standard 50-pin (25-pair) connectors and wire wrap pins or six universal 50-pin (25-pair) connectors without wire-wrap pins.

Zone 3 Shelf - supports 16-slot DB25 or V.35 connector panels.

The enclosure supports one 10-slot Zone 1 connector panel with RJ45 8-position modular jacks. Zone 3 may be ordered with 10-slot DB25 or V.35 connectors. These are fixed panels and are not field-replaceable.

Zone 2 Shelf - Located in the middle of the shelf, Zone 2 provides card edge connectors for signal buses, ground, power distribution to the plug-in cards, and ribbon cable connectors for shelf interconnection. The Zone 2 backplane is a permanent part of the shelf and is not field-replaceable.

Table 2-2 lists the kit numbers for the connector panels, Figure 2-12, Figure 2-14 and Figure 2-14 show examples.

Table 2-2 Connector Panels

Item	GDC Part No.	Description
1. Figure 2-12	010K338-001	8-Slot RJ45, Zone 1, Shelf
2. Figure 2-12	010K342-001	8-Slot Dual RJ45, Zone 1, Shelf
3. Figure 2-12	010K342-002	8-Slot Dual Shielded, Zone 1, Shelf
4. Figure 2-12	010K341-001	8-Slot Blank (required to cover unused slots)
5. Figure 2-12	not field-replaceable	10-Slot RJ45, Zone 1, Enclosure
6. Figure 2-12	not field-replaceable	10-Slot Dual RJ45, Zone 1, Enclosure
7. Figure 2-12	not field-replaceable	10-Slot DB-25, Zone 3, Enclosure
8. Figure 2-12	not field-replaceable	10-Slot V.35, Zone 3, Enclosure
9. Figure 2-12	010K339-001	16-Slot DB-25, Zone 3, Shelf
10. Figure 2-12	010K068-001	16-slot V.35, Zone 3, Shelf
11. Figure 2-12	010K342-001	16-Slot Blank (required to cover unused slots)
12. Figure 2-13	010K345-001	Standard Backplane 50-pin/wirewrap, Zone 1, Shelf
13. Figure 2-14	010K072-001	Universal Backplane 50-pin, Zone 1, Shelf

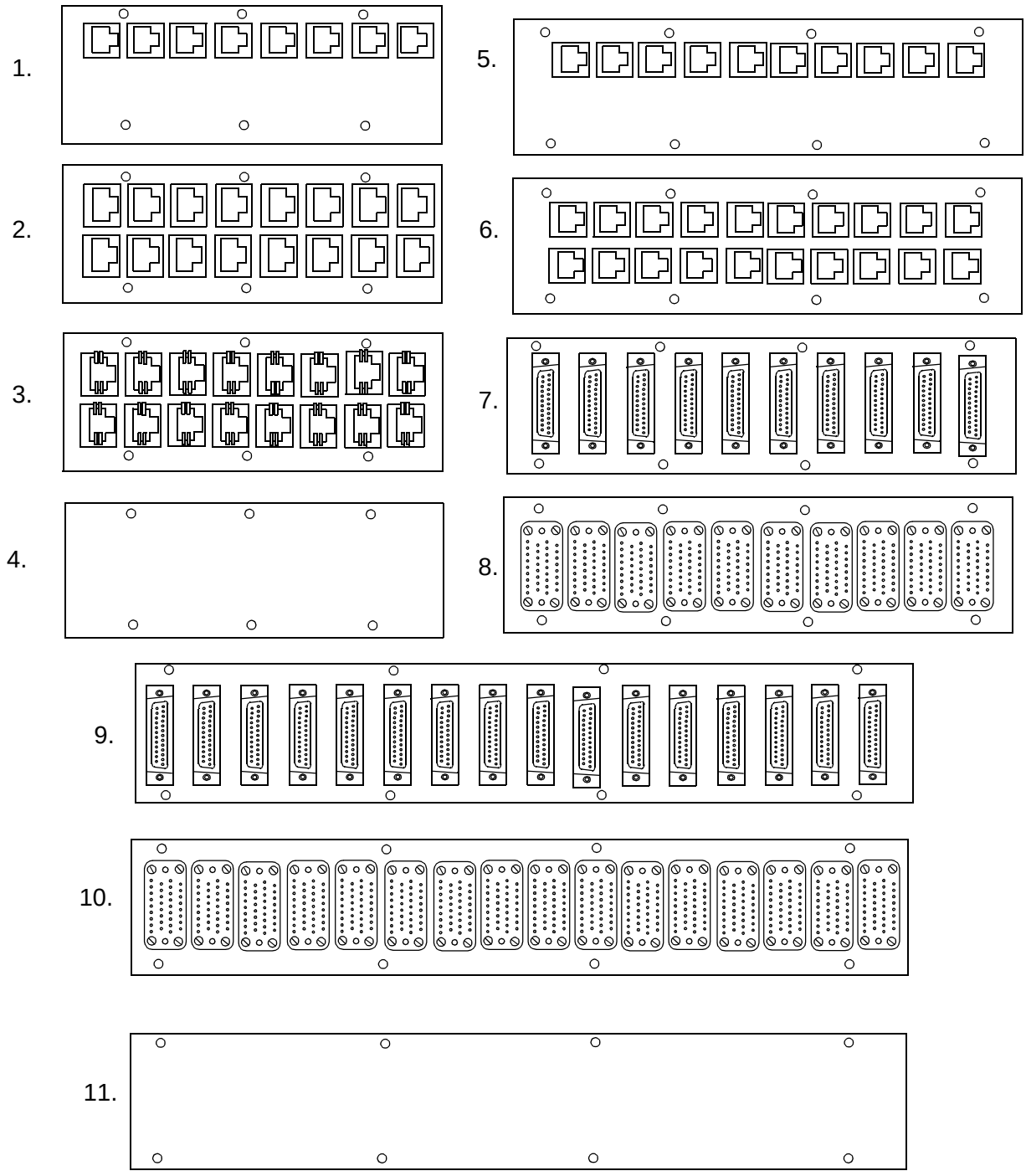


Figure 2-12 Connector Panels

Modular Pin Assignments

Table 2-3 describes the RJ45 modular jack pin assignments for each type of product card that may be used in the shelf. Table 2-4 describes the communications line interface for the RJ45 jacks.

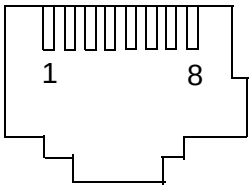
Table 2-3 Modular Pin Assignments by Product Type

Signal	SN Modem (Dual)	PL Modem	T1	DDS	Voice/ Busses	HDSL	3 x 2B1Q Proprietary	DATX	3 x 2-Wire Switched	4 x 2-Wire Switched	TIA-568
(P=Private)											
P8	PC	R1		R1	SB						Pair 4-
P7	PR	T1		T1	M						Pair 4+
P6	MIC	TEK6			SG			Pass-thru			Pair 2-
P5	T		T		T	E1-T		Phone T			Pair 1+
P4	R		R		R	E1-R		Phone R			Pair 1-
P3	MI	TEK5			E			Pass-thru			Pair 2+
P2		T	T1	T	R1	E1-T1		Pass-thru			Pair 3-
P1		R	R1	R	T1	E1-R1		Pass-thru			Pair 3+
(S=Switched)											
S8	PC			R1	SB	HDSL 3-R	Line 3	GND		Tip 4	
S7	PR			T1	M	HDSL 3-T	Line 3	+12	Tip 3	Tip 3	
S6	MIC				SG			Pass-thru	Tip 2	Tip 2	
S5	T		T		T	HDSL 1-T	Line 2	Line T	Ring 1	Ring 1	
S4	R		R		R	HDSL 1-R	Line 2	Line R	Tip 1	Tip 1	
S3	MI				E			Pass-thru	Ring 2	Ring 2	
S2			T1	T	R1	HDSL 2-T	Line 1	Pass-thru	Ring 3	Ring 3	
S1			R1	R	T1	HDSL 2-R	Line 1	Pass-thru		Ring 4	

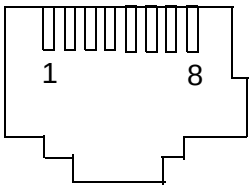
Note: T-R is 4W Transmit (toward network) or 2W, T1-R1 is a 4W Receive (from network)

Table 2-4 Communications Line Interface (RJ45 Jack)

Function				
Lower Jacks		**Upper Jacks**		
Pin	**S/N Prog. (RJ45S)**	**LADC, DDS (RJ48S)**	**T1.5 (RJ48C/X)**	**EIA, P/L, TBS-18 (JM-8)**
1	—	R	R1	R
2	—	T	T1	T
3	MI	—	—	TEK 5/E
4	R	—	R	—
5	T	—	T	—
6	MIC	—	—	TEK 6/M
7	PR	T1	—	T1
8	PC	R1	—	R1



Upper jacks
J17 to J32
(Private Line *)



Lower jacks
J33 to J48
(Switched Network *)

* Unless otherwise noted.

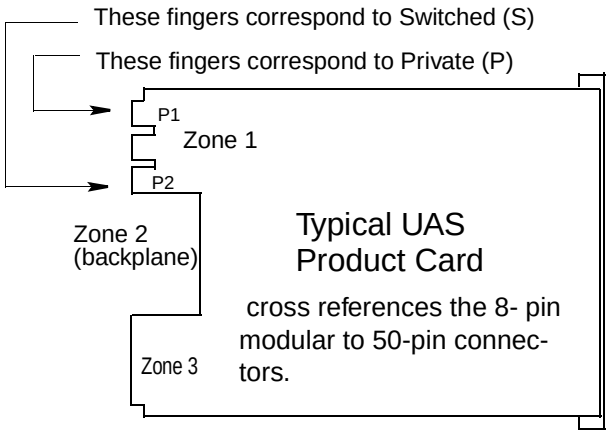
Modular Jacks (Shelf Rear View)

Zone 1 Connections For UAS Product Classes

The Zone 1 8-pin modular jack pin assignments for UAS product types are shown in Table 2-5.

Table 2-5 UAS Modular Jack Pin Assignments

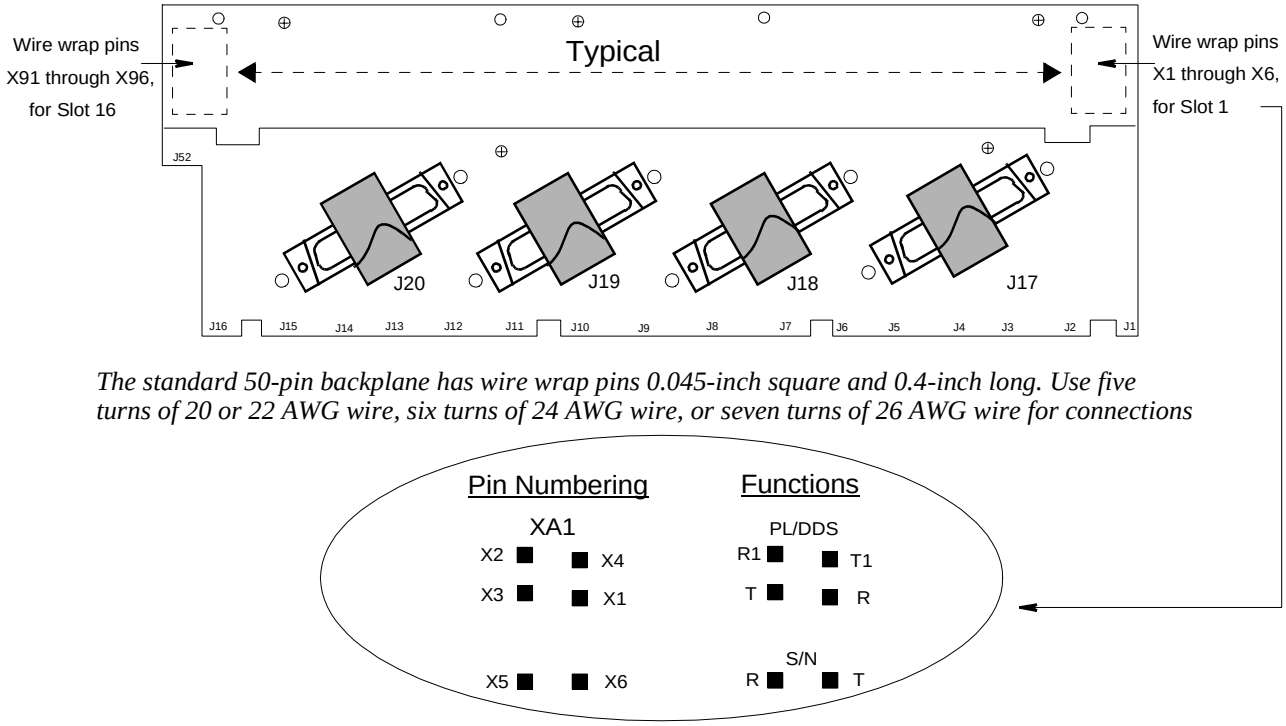
Signal	T1/ E1	HDSL	3 x 2B1Q Proprietary	6 x 2B1Q Proprietary	TIA-568
(P=Private)					
P8				Line 6	Pair 4-
P7				Line 6	Pair 4+
P6					Pair 2-
P5	T	E1-T		Line 5	Pair 1+
P4	R	E1-R		Line 5	Pair 1-
P3					Pair 2+
P2	T1	E1-T1		Line 4	Pair 3-
P1	R1	E1-R1		Line 4	Pair 3+
(S=Switched)					
S8		HDSL3-R	Line 3	Line 3	
S7		HDSL3-T	Line 3	Line 3	
S6					
S5	T	HDSL1-T	Line 2	Line 2	
S4	R	HDSL1-R	Line 2	Line 2	
S3					
S2	T1	HDSL2-T	Line 1	Line 1	
S1	R1	HDSL2-R	Line 1	Line 1	



Mass Termination Use

Standard 50-Pin Wire-Wrap Backplane

In SpectraComm systems the standard 50-pin backplane was developed for private line and switched network connections for private line modems with a dial back-up feature in each shelf slot. See Figure 2-13. The private line connections for slots 1-16 are in the 50-pin connectors J18 and J20. The switched network connections for slots 1-16 are in the 50-pin connectors J17 and J19. Refer to Table 2-6. Wire-wrap pins are added for private line connections of T, R, T1 and R1 on each slot. Wire-wrap pins are added for switched network signals T and R on each slot. Refer to Table 2-7



The standard 50-pin backplane has wire wrap pins 0.045-inch square and 0.4-inch long. Use five turns of 20 or 22 AWG wire, six turns of 24 AWG wire, or seven turns of 26 AWG wire for connections

Figure 2-13 Standard 50-Pin Wire-Wrap Backplane

Note *Other types of products may use this backplane if their I/O signals correspond with the listings in Table 2-6 and Table 2-7.*

Table 2-7 also describes the wiring for the Dual V.34 modem if you use the standard 50-pin backplane connectors. Table 2-8 describes the wiring for the S/N, P/L and describes the wiring for the DDS functions and Dual V.34 modem if you use the standard 50-pin backplane wire-wrap pins.

Table 2-6 Communications Line Interface 50-Pin or Wire Wrap (Mod. 4, 5, 6, 11)

Function				Connector and Slot	
Pin	**Switched Network (RJ27X)**	**Private Line (JM25X, RJ2GX)**	**DDS**	**Conn. J17 (S/N) Conn. J18 (P/L, DDS)**	**Conn. J19 (S/N) Conn. J20 (P/L, DDS)**
26	MI	T	T	1	9
1	MIC	R	R		
27	T	T1	T1		
2	R	R1	R1		
28	PR	TEK 5/E	—		
3	PC	TEK 6/M	—		
29	MI	T	T	2	10
4	MIC	R	R		
30	T	T1	T1		
5	R	R1	R1		
31	PR	TEK 5/E	—		
6	PC	TEK 6/M	—		
32	MI	T	T	3	11
7	MIC	R	R		
33	T	T1	T1		
8	R	R1	R1		
34	PR	TEK 5/E	—		
9	PC	TEK 6/M	—		
35	MI	T	T	4	12
10	MIC	R	R		
36	T	T1	T1		
11	R	R1	R1		
37	PR	TEK 5/E	—		
12	PC	TEK 6/M	—		
38	MI	T	T	5	13
13	MIC	R	R		
39	T	T1	T1		
14	R	R1	R1		
40	PR	TEK 5/E	—		
15	PC	TEK 6/M	—		
41	MI	T	T	6	14
16	MIC	R	R		
42	T	T1	T1		
17	R	R1	R1		
43	PR	TEK 5/E	—		
18	PC	TEK 6/M	—		
44	MI	T	T	7	15

Table 2-6 Communications Line Interface 50-Pin or Wire Wrap (Mod. 4, 5, 6, 11) (Continued)

Function				Connector and Slot	
Pin	**Switched Network (RJ27X)**	**Private Line (JM25X, RJ2GX)**	**DDS**	**Conn. J17 (S/N) Conn. J18 (P/L, DDS)**	**Conn. J19 (S/N) Conn. J20 (P/L, DDS)**
19	MIC	R	R		
45	T	T1	T1		
20	R	R1	R1		
46	PR	TEK 5/E	—		
21	PC	TEK 6/M	—		
47	MI	T	T	8	16
22	MIC	R	R		
48	T	T1	T1		
23	R	R1	R1		
49	PR	TEK 5/E	—		
24	PC	TEK 6/M	—		
50	unassigned	unassigned	unassigned	—	—
25	unassigned	unassigned	unassigned		

Table 2-7 50-Pin Connector Wiring for Dual V.34 Modems (060P027-001)

Pin	J17 Channel B Switched Network or Private Line	J18 Channel A Switched Network or Private Line	Slot	J19 Channel B Switched Network or Private Line	J20 Channel A Switched Network or Private Line	Slot
26		T			T	
1		R	1		R	9
27	T			T		
2	R			R		
29		T			T	
4		R	2		R	10
30	T			T		
5	R			R		
32		T			T	
7		R	3		R	11
33	T			T		
8	R			R		

Table 2-7 50-Pin Connector Wiring for Dual V.34 Modems (060P027-001) (Continued)

Pin	J17 Channel B Switched Network or Private Line	J18 Channel A Switched Network or Private Line	Slot	J19 Channel B Switched Network or Private Line	J20 Channel A Switched Network or Private Line	Slot
35		T			T	
10		R	4		R	12
36	T			T		
11	R			R		
38		T			T	
13		R	5		R	13
39	T			T		
14	R			R		
41		T			T	
16		R	6		R	14
42	T			T		
17	R			R		
44		T			T	
19		R	7		R	15
45	T			T		
20	R			R		
47		T			T	
22		R	8		R	16
48	T			T		
23	R			R		

Table 2-8 Wire Wrap Pin Functions

Function						
Switched Network (RJ27X)		**Private Line (JM25X, RJ2GX)**		**DDS**		**Slot**
T	X6	T	X3	T	X3	1
R	X5	R	X1	R	X1	
		T1	X4	T1	X4	
		R1	X2	R1	X2	
T	X12	T	X9	T	X9	2
R	X11	R	X7	R	X7	
		T1	X10	T1	X10	
		R1	X8	R1	X8	
T	X18	T	X15	T	X15	3
R	X17	R	X13	R	X13	
		T1	X16	T1	X16	
		R1	X14	R1	X14	
T	X24	T	X21	T	X21	4
R	X23	R	X19	R	X19	
		T1	X22	T1	X22	
		R1	X20	R1	X20	
T	X30	T	X27	T	X27	5
R	X29	R	X25	R	X25	
		T1	X28	T1	X28	
		R1	X26	R1	X26	
T	X36	T	X33	T	X33	6
R	X35	R	X31	R	X31	
		T1	X34	T1	X34	
		R1	X32	R1	X32	
T	X42	T	X39	T	X39	7
R	X41	R	X37	R	X37	
		T1	X40	T1	X40	
		R1	X38	R1	X38	
T	X48	T	X45	T	X45	8

Table 2-8 Wire Wrap Pin Functions (Continued)

Switched Network (RJ27X)		Private Line (JM25X, RJ2GX)		DDS		Slot
R	X47	R	X43	R	X43	
		T1	X46	T1	X46	
		R1	X44	R1	X44	
T	X54	T	X51	T	X51	9
R	X53	R	X49	R	X49	
		T1	X52	T1	X52	
		R1	X50	R1	X50	
Switched Network (RJ27X)		**Private Line (JM25X, RJ2GX)**		**DDS**		**Slot**
T	X60	T	X57	T	X57	10
R	X59	R	X55	R	X55	
		T1	X58	T1	X58	
		R1	X56	R1	X56	
T	X66	T	X63	T	X63	11
R	X65	R	X61	R	X61	
		T1	X64	T1	X64	
		R1	X62	R1	X62	
T	X72	T	X69	T	X69	12
R	X71	R	X67	R	X67	
		T1	X70	T1	X70	
		R1	X68	R1	X68	
T	X78	T	X75	T	X75	13
R	X77	R	X73	R	X73	
		T1	X76	T1	X76	
		R1	X74	R1	X74	
T	X84	T	X81	T	X81	14
R	X83	R	X79	R	X79	
		T1	X82	T1	X82	
		R1	X80	R1	X80	

Table 2-8 Wire Wrap Pin Functions (Continued)

Switched Network (RJ27X)		Private Line (JM25X, RJ2GX)		DDS		Slot
T	X90	T	X87	T	X87	15
R	X89	R	X85	R	X85	
		T1	X88	T1	X88	
		R1	X86	R1	X86	
T	X96	T	X93	T	X93	16
R	X95	R	X91	R	X91	
		T1	X94	T1	X94	
		R1	X92	R1	X92	

Table 2-9 Wire Wrap Wiring for Dual V.34 Modems (060P027-001)

Function				
Switched Network or Private Line Chan B		Switched Network or Private Line Chan A		Slot
T	X6	T	X3	1
R	X5	R	X1	
T	X12	T	X9	2
R	X11	R	X7	
T	X18	T	X15	3
R	X17	R	X13	
T	X24	T	X21	4
R	X23	R	X19	
T	X30	T	X27	5
R	X29	R	X25	
T	X36	T	X33	6
R	X35	R	X31	
T	X42	T	X39	7
R	X41	R	X37	
T	X48	T	X45	8
R	X47	R	X43	
T	X54	T	X51	9

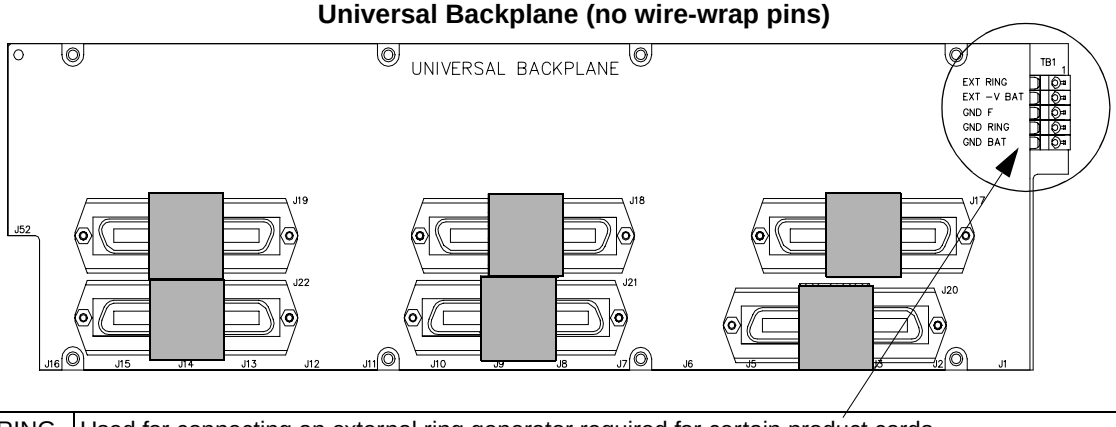
Table 2-9 Wire Wrap Wiring for Dual V.34 Modems (060P027-001)

R	X53	R	X49	
T	X60	T	X57	10
R	X59	R	X55	
T	X66	T	X63	11
R	X65	R	X61	
T	X72	T	X69	12
R	X71	R	X67	
T	X78	T	X75	13
R	X77	R	X73	
T	X84	T	X81	14
R	X83	R	X79	
T	X90	T	X87	15
R	X89	R	X85	
T	X96	T	X93	16
R	X95	R	X91	

Universal Backplane

The universal's backplane primary function is to bring all product cards I/Os that normally go to RJ45 connectors in Zone 1 to 50-pin connectors for mass termination use. Connectors J17, J18, J19 correspond to Zone 1's top row of RJ45's and J20, J21, and J22 correspond to Zone 1's bottom row of RJ45's. Figure 2-14 describes signal designations. Pin numbers correspond to RJ45 P1 through P8 on the top row and RJ45 S1 through S8 on the bottom row.

Universal Backplane (no wire-wrap pins)



EXT RING	Used for connecting an external ring generator required for certain product cards. Electrical rating is 6 A at 100VRMS.
EXT -V BAT	Used for connecting an external battery. Required for certain product cards. Electrical rating is 10 A at 56VRMS.
GND F	Used for connecting an external functional ground used in products requiring ground start, etc. Electrical rating is 6A.
GND RING	Used as the ground return for an external ring generator. Electrical rating is 6A.
GND BAT	Used for the return for an external battery. Normally connects to the positive side of the battery. Electrical rating is 10A.
Note: Refer to individual product manuals for specific external connections required for different applications. This backplane is capable of passing up to 2.048 Mbps signals. For best performance (noise, crosstalk, etc.) balanced circuits are required.	

Standard 50-Pin Backplane (wire-wrap pins)

Figure 2-14 Universal Backplane

Table 2-10 Universal Backplane Conversion Pin Assignments-by Slot-(50-Pin Telco to 8-Pin Mod.)

Signal	(Slot 1) J17	(Slot 2) J17	(Slot 3) J17	(Slot 4) J17	(Slot 5) J17	((Slot 6) J17
P1	1	5	9	13	17	21
P2	26	30	34	38	42	46
P3	2	6	10	14	18	22
P4	3	7	11	15	19	23
P5	28	32	36	40	44	48
P6	27	31	35	39	43	47
P7	4	8	12	16	20	24
P8	29	33	37	41	45	49
Signal	**(Slot 1) J20**	**(Slot 2) J20**	**(Slot 3) J20**	**(Slot 4) J20**	**(Slot 5) J20**	**((Slot 6) J20**
S1	1	5	9	13	17	21
S2	26	30	34	38	42	46
S3	2	6	10	14	18	22
S4	3	7	11	15	19	23
S5	28	32	36	40	44	48
S6	27	31	35	39	43	47
S7	4	8	12	16	20	24
S8	29	33	37	41	45	49
Signal	**(Slot 7) J18**	**(Slot 8) J18**	**(Slot 9) J18**	**(Slot 10) J18**	**(Slot 11) J18**	**((Slot 12) J18**
P1	1	5	9	13	17	21
P2	26	30	34	38	42	46
P3	2	6	10	14	18	22
P4	3	7	11	15	19	23
P5	28	32	36	40	44	48
P6	27	31	35	39	43	47
P7	4	8	12	16	20	24
P8	29	33	37	41	45	49
Signal	**(Slot 7) J21**	**(Slot 8) J21**	**(Slot 9) J21**	**(Slot 10) J21**	**(Slot 11) J21**	**((Slot 12) J21**
S1	1	5	9	13	17	21
S2	26	30	34	38	42	46
S3	2	6	10	14	18	22
S4	3	7	11	15	19	23
S5	28	32	36	40	44	48
S6	27	31	35	39	43	47
S7	4	8	12	16	20	24
S8	29	33	37	41	45	49

Signal	(Slot 13) J19	(Slot 14) J19	(Slot 15) J19	(Slot 16) J19
P1	1	5	9	13
P2	26	30	34	38
P3	2	6	10	14
P4	3	7	11	15
P5	28	32	36	40
P6	27	31	35	39
P7	4	8	12	16
P8	29	33	37	41
Signal	**(Slot 13) J22**	**(Slot 14) J22**	**(Slot 15) J22**	**(Slot 16) J22**
S1	1	5	9	13
S2	26	30	34	38
S3	2	6	10	14
S4	3	7	11	15
S5	28	32	36	40
S6	27	31	35	39
S7	4	8	12	16
S8	29	33	37	41

Note: Refer to Table 2-11 for typical signal descriptions.

Table 2-11 Universal Backplane Pin Assignments by Product Type

Signal	SN Modem (Dual)	PL Modem	T1	DDS	Voice/ Busses	HDSL	3 x 2B1Q Proprietary	DATX	3 x 2-Wire Switched	4 x 2-Wire Switched	TIA-568
(P=Private)											
P8	PC	R1		R1	SB						Pair 4-
P7	PR	T1		T1	M						Pair 4+
P6	MIC	TEK6			SG			Pass-thru			Pair 2-
P5	T		T		T	E1-T		Phone T			Pair 1+
P4	R		R		R	E1-R		Phone R			Pair 1-
P3	MI	TEK5			E			Pass-thru			Pair 2+
P2		T	T1	T	R1	E1-T1		Pass-thru			Pair 3-
P1		R	R1	R	T1	E1-R1		Pass-thru			Pair 3+
(S=Switched)											
S8	PC			R1	SB	HDSL3-R	Line 3	GND		Tip 4	
S7	PR			T1	M	HDSL3-T	Line 3	+12	Tip 3	Tip 3	
S6	MIC				SG			Pass-thru	Tip 2	Tip 2	
S5	T		T		T	HDSL1-T	Line 2	Line T	Ring 1	Ring 1	
S4	R		R		R	HDSL1-R	Line 2	Line R	Tip 1	Tip 1	
S3	MI				E			Pass-thru	Ring 2	Ring 2	
S2			T1	T	R1	HDSL2-T	Line 1	Pass-thru	Ring 3	Ring 3	
S1			R1	R	T1	HDSL2-R	Line 1	Pass-thru		Ring 4	
Note: T-R is 4W Transmit (toward network) or 2W, T1-R1 is a 4W Receive (from network)											

Universal Backplane and Grounding Kit for Shielded Cables

The universal backplane uses 50-pin Amphenol cables that mate with the associated backplane connectors. One screw (for each cable hood) is used to provide frame ground to the backplane.

The shield should only be grounded at one end.

The screws in the kit are included in a small cloth bag attached your universal backplane. Six screws are provided. The included clips are not used.

Using the screws included in the kit, attach the cable hood to one side of the 50-pin cable connector as shown in *Figure 2-15*. The mating hex standoffs are already attached to the backplanes.

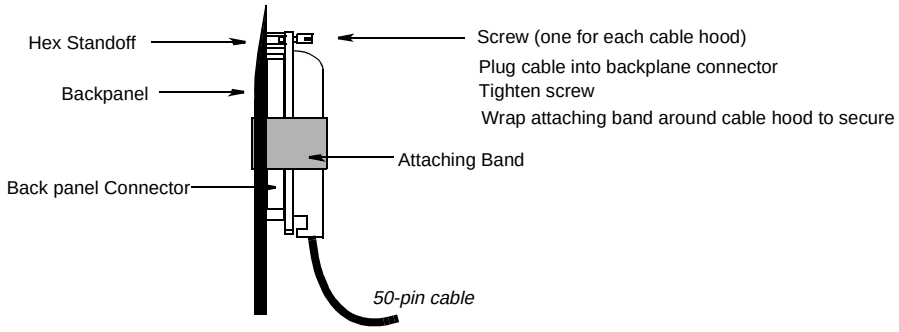


Figure 2-15 Universal Backplane Grounding Kit for Shielded Cables

DTE Pin Assignments

Located at the bottom of the shelf, Zone 3 is used for business equipment connections. The SpectraComm Shelf supports one 16-slot Zone 3 connector panel per shelf, with either one DB25 (25-pin female D-sub miniature) connector per slot for TIA/EIA-232-F compatible equipment or one 34-pin female V.35 connector per slot for V.35 - ISO 2593 compatible equipment. To use V.35 - ISO 2593 compatible equipment with a DB25 connector panel, if the plug-in card supports it, connect it with Adapter P/N 209-036-025 which replaces Adapter Cable P/N 027H572-001. Table 2-12 and Table 2-13 describe the pinouts of each of the business equipment interface types.

Table 2-12 Business Equipment Interface (TIA/EIA-232-F, ITU-T V.24)

Pin	232-E	V.24	Name	Function	Description
2	BA	103	SD	Transmitted data	Transfers data signals from DTE for modulation and transmission over communications line.
3	BB	104	RD	Received data	Transfers data signals to DTE that were received over communications line and demodulated by DCE.
4	CA	105	RS	Request to send	Indicates to DCE that DTE is prepared to transmit.
5	CB	106	CS	Clear to send	Indicates to DTE that DCE is prepared to transmit.
6	CC	107	DSR	Data set ready	Indicates to DTE that DCE is prepared for data communications.
7	AB	102	SIG GND	Signal ground	Establishes a common ground reference for all interface circuits except protective ground.
8	CF	109	CO	Received line signal detector	Indicates to DTE that DCE is receiving data.
9			+12 V	+12 volts	+12 V supply
10			–12 V	–12 volts	–12 V supply
15	DB	114	SC	DCE transmitter signal element timing	Transfers transmitter signal timing information from DCE to DTE.
17	DD	115	RC	Receiver signal element timing	Transfers receiver signal timing information from DCE to DTE.
18	LL		ALE	Analog Loopback enable	Transfers signal from DTE to control Analog Loopback test.
20	CD	108.2	TR	Data terminal ready	Indicates to DCE that DTE is prepared for data communications.
21	RL		RLE	Remote Digital Loopback enable	Transfers signal from DTE to control Remote Digital Loopback test mode.
24	DA	113	TC	DTE transmitter signal element timing	Transfers transmitter signal timing information from DTE to DCE (external clock).
25	TM		TMI	Test mode indicator	Indicates to DTE that DCE is in a test mode.

Table 2-13 Business Equipment Interface (V.35 - ISO 2593)

Pin	V.35	Name	Function	Description
B	102		Signal ground	Establishes a common ground reference for all interface circuits except protective ground.
C	105	RS	Request to send	Indicates to DCE that DTE is prepared to transmit.
D	106	CS	Clear to send	Indicates to DTE that DCE is prepared to transmit.
E	107	DSR	Data set ready	Indicates to DTE that DCE is prepared for data communications.
F	109	CO	Receive line signal detect	Indicates to DTE that DCE is receiving data.
H	108.2	TR	Data terminal ready	Indicates to DCE that DTE is prepared for data communications.
NN	142	TME	Test mode	Indicates to DTE that DCE is in a test mode.
L	141	ALE	Analog Loopback enable	Transfers signal from DTE to control Analog Loopback test.
P S	103 103	SD-A SD-B	Transmitted data	Transfers data signals from DTE for modulation and transmission over communications line.
R T	104 104	RD-A RD-B	Received data	Transfers data signals to DTE that were received over communications line and demodulated by DCE.
U W	113 113	TT-A TT-B	Terminal timing	Transfers transmitter signal timing information from DTE to DCE (external) clock).
V X	115 115	RT-A RT-B	Receive timing	Transfers receiver signal timing information from DCE to DTE.
Y AA/a	114 114	ST-A ST-B	Transmit timing	Transfers transmitter signal timing information from DCE to DTE.
N	140	RLE	Remote Digital Loopback enable	Transfers signal from DTE to control Remote Digital Loopback test mode.

Installing Connector Panels

Each connector panel kit includes an installation instruction sheet. Abbreviated instructions are described below. *Appendix A, Kit Instructions* describes the installations in detail.

To install a connector panel:

1. Turn off the power supply.
2. Unseat, but do not remove, the plug-in cards in the affected slots.
3. Label and remove the network or business equipment cables for the affected slots.
4. Remove the connector panel mounting screws and the connector panel.
5. Install the new connector panel per the instructions included in the kit. Be careful not to install the Zone 3 connector panels upside down.
6. Connect the network or business equipment cables.
7. Reseat cards, and turn on the power supply.

Single Shelf

The SpectraComm/UAS Shelf is equipped with reversible adapter ears which permit it to be installed in either a standard 19-inch (483mm) wide equipment rack/cabinet or a 23-inch (584mm) wide rack/cabinet (26-inch mounting brackets are also available refer to *26-Inch Rackmounting on page 2-11*). It is secured with the available hardware through four slotted holes in the flanges at the front edges of the shelf assembly. Figure 2-16 shows a universal backplane installed in a single DC shelf as typically found in a UAS 7000 system located at the Central Office.

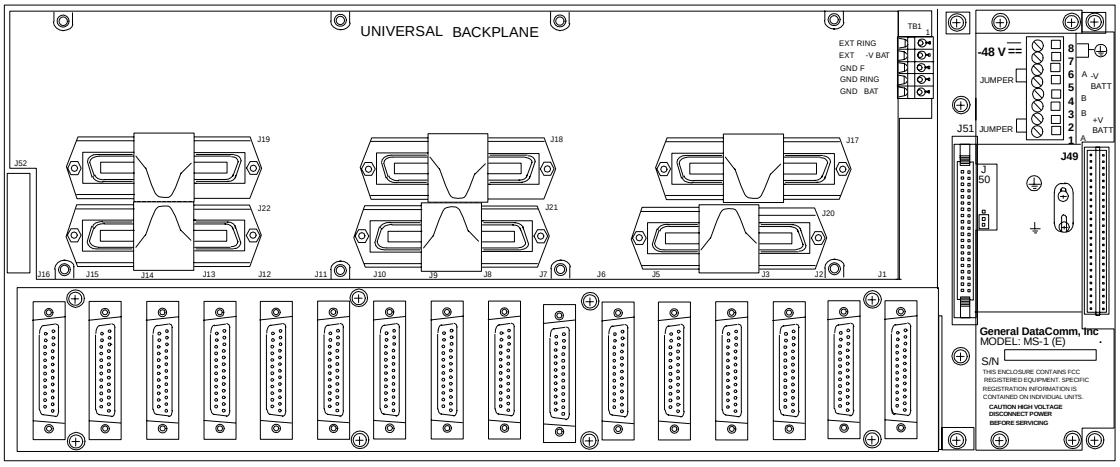


Figure 2-16 Universal Backplane in DC Shelf - Rear View

Note *When using the Universal Backplane, avoid cable interference by installing the rear panel 50-pin Telco cables from right to left.*

Dual Shelves

Adding dual (or expansion) shelves allows up to four power supply modules and extra cards in the upper and lower shelves. Two shelves require a minimum of two power supply modules (one in each shelf). To have power supply redundancy for either of the two supplies, a third power supply module can be placed in either shelf. To have full power supply redundancy for the two supplies, a fourth supply can be added to the shelf that has an empty power supply slot. For example, if a dual shelf has three power supply modules and any one power supply fails, the remaining two power supplies provide power for both shelves. Each shelf requires separate AC or DC input power.

To add an expansion shelf:

1. Remove power from the shelf.
2. A shelf used for expansion must be mounted directly below the main shelf, with no intervening gap, to allow for inter-shelf cabling.
3. Shelf address jumper J50 is recessed under a protective cover located next to J51 at the rear of the shelf. It may be accessed with long-nose pliers or similar tool. The shelf address jumper tells the product cards whether they are in an upper shelf or a lower shelf of a dual shelf configuration. If a lower shelf is used for expansion, it's jumper must be placed in the lower position (see Figure 2-17*).* The original (upper) shelf must have its jumper placed in the upper position. Its default position (single shelf) is upper (see Figure 2-18).

4. The expansion shelf must be linked using a Power Bus Cable 024H610-001 (DC shelf) or 024H610-002 (AC shelf) between rear panel connectors J49 (observe proper keying). To prevent the possibility of the Power Bus Cable coming loose from J49, use tie wraps included in the Expansion Shelf package to secure both ends of the cable to holes in the side panels of the shelf.

5. Attach Signal Bus Cable(s)

   - Attach Signal Bus Cable 029H509-001 between J52 of the upper shelf and J52 of the lower shelf.
   - Attach Signal Bus Cable 029H510-001 between J51of the upper shelf and J51of the lower shelf.

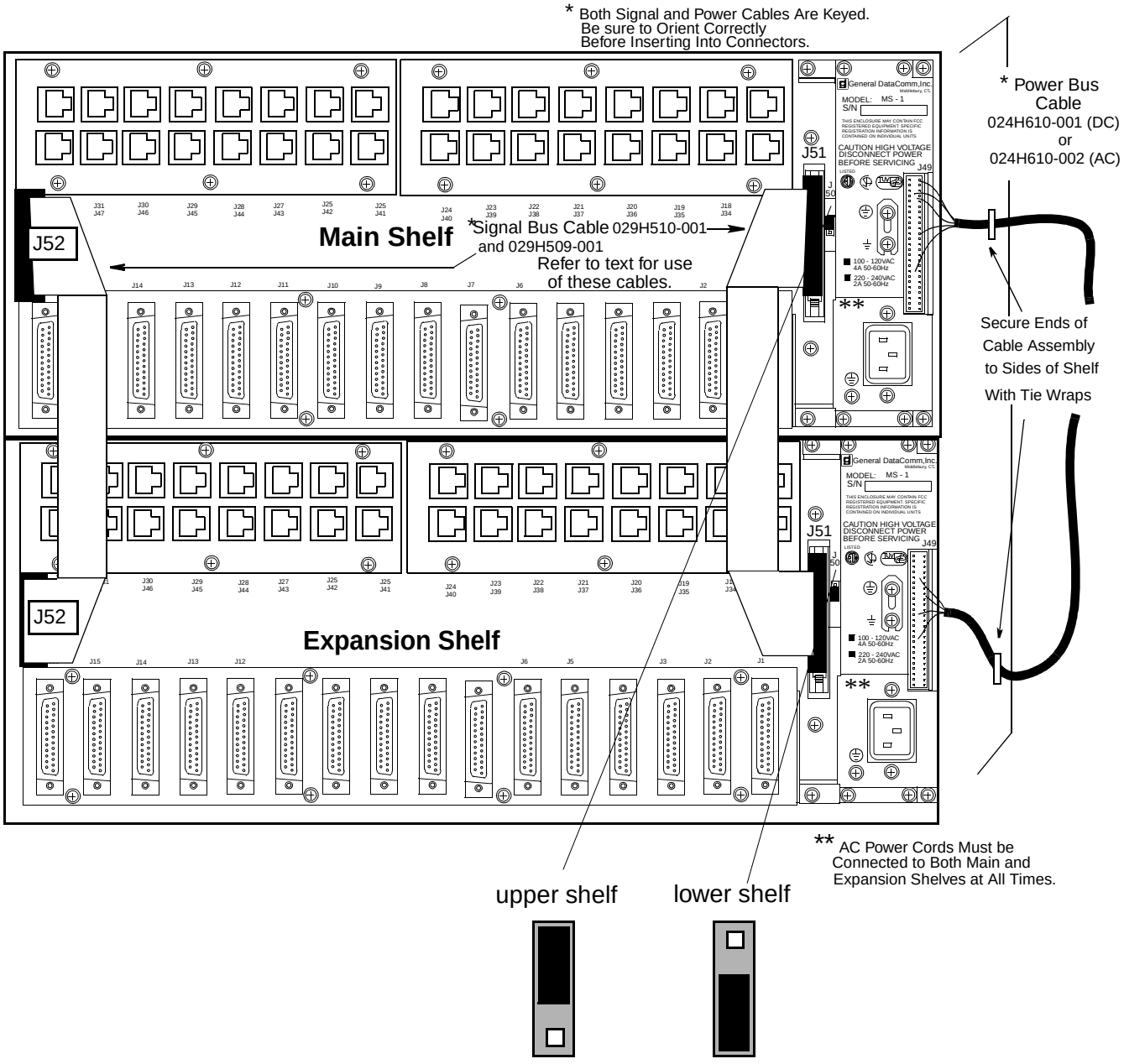
Figure 2-17 shows a dual shelf arrangement using RJ45 panels in Zone 1. For a UAS 7000 system, the Universal Backplane is used in Zone 1.

Important *When using a dual shelf arrangement in an EP-6 Cabinet, for a Bellcore GR-63-CORE Frame Level R4-15 Firespread Criteria configuration, longer signal and power cables must be used. These part numbers are:*

Power Bus Cable GDC No. 024H610-004 (AC/DC).

Signal Bus Cable (J52) GDC No. 024H509-002.

Signal Bus Cable (J51) GDC No. 024H510-002.



NOTE:

When using a dual shelf arrangement in an EP-6 Cabinet, for a Bellcore GR-63-CORE Frame Level R4-15 Firespread Criteria configuration, longer signal and power cables must be used. These part numbers are:

Power Bus Cable GDC No. 024H610-004 (AC/DC).

Signal Bus Cable (J52) GDC No. 024H509-002.

Signal Bus Cable (J51) GDC No. 024H510-002.

Figure 2-17 Rear Panel - Expansion Shelf Cabling

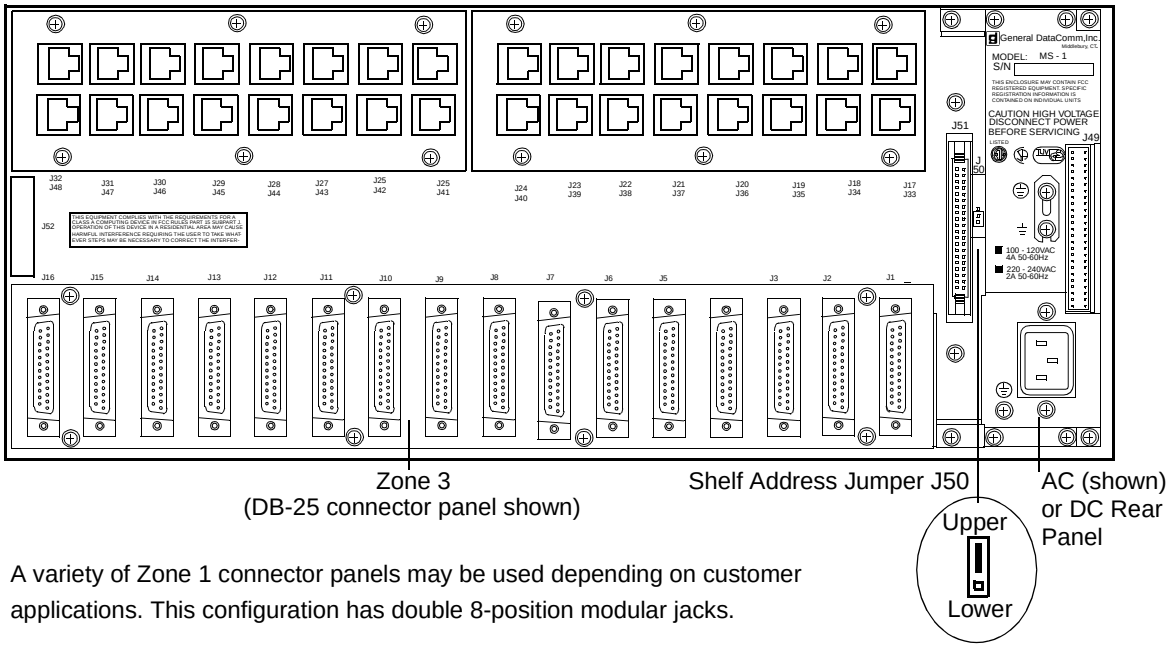


Figure 2-18 Rear Panel - Single Shelf Address Jumper

Load Number

When configuring the shelf or enclosure it is necessary to ensure that the total load of all the product cards does not exceed the capacity of the power supply(s). The Load Number is a tool which enables you to calculate the power consumption of the system when it is configured. The Load Number is normalized to the number of slots in a shelf (16), or in an enclosure (10). For example, in a single shelf the sum of the Load Numbers should not exceed 16, and in a multiple shelf, the sum should not exceed 32. The Load Number should not exceed 10 in an enclosure.

Each power supply is designed to power plug-in product cards whose Load Numbers total up to no more than 16 (or 10 for enclosure). Exceeding these Load Number requirements violates GDC warranties with regard to performance of that system.

An example calculation using Load Numbers follows:

In a UAS shelf, you install one DPS-11 power supply, one SCM SpectraComm Manager Card, and five NIU/DIU 7624 product cards.

The Load Number for the SCM Card is 1.0 and the Load Number for one NIU/DIU 7624 card (dual slot) is 2.0.

Therefore: 1+10 (5x2) = 11 which is less than 16. If you add an Alarm Card which has a Load Number of 0.4 you still would be within the recommended requirements.

The Load Number for each product card is listed in the *Specifications or Technical Characteristics* table in each product manual.

Multiple Power Supplies (shelf only)

You can power one SpectraComm/UAS shelf with up to two power supplies. An adjacent, interconnected shelf (using associated Power Bus cable) can be powered with up to two more supplies. Each shelf is required to house at least one power supply. Additional power supplies need to be installed when redundancy is required.

In a redundant system, if one power supply fails, the remaining (redundant) power supply has the capacity to maintain power to that shelf. The second power supply current shares with the first power supply with the benefit that both power supply modules run cooler and therefore will have a lower expectant failure rate.

Note *To have power supply redundancy for either of the two supplies, a third power supply can be placed in either shelf. To have full power supply redundancy for the two supplies, a fourth supply can be added to the shelf that has an empty power supply slot. For example, if a dual shelf has three power supplies and any one power supply fails, the remaining two power supplies provide power for both shelves.*

Table 2-14 and Figure 2-19 describe and illustrate the number of power supplies required for various configurations.

Table 2-14 Load Number per Number of Power Supplies

Application	Load Number from 0 to 16	Load Number from 16 to 32
Single Shelf Non-Redundant	One	Not Allowed
Single Shelf Redundant	Two	Not Allowed
Multi-Shelf Non-Redundant	Two	Two
Multi-Shelf Redundant	Two to Four	Three to Four

Non-redundant supplies in independent shelves

Each shelf is independent of the other. Failures in one shelf do not affect the other shelf. Stagger power supplies as shown in Figure 2-19 for optimal cooling. Refer to Table 2-1 for cooling requirements for multiple shelf stack-ups. This configuration does not use any cables between shelves.

Non-redundant supplies in multiple shelves

With two power supplies powering two interconnected shelves, failure of any one supply may bring both shelves down. Stagger power supplies as shown in Figure 2-19 for optimal cooling. Refer to Table 2-1 for cooling requirements for multiple shelf stack-ups. Note that a Fan Tray Assembly is required for this configuration as well as a Power Bus Cable and Signal Bus Cables.

Important *Be sure to install shelves and power supplies as described under Shelf Configuration on page 2-3. Failure to do so may result in overheating and subsequent power supply shutdown.*

For safety and EMI purposes, all unused power supply slots must have filler panels (P/N 010D727-001), to cover the unused slot.

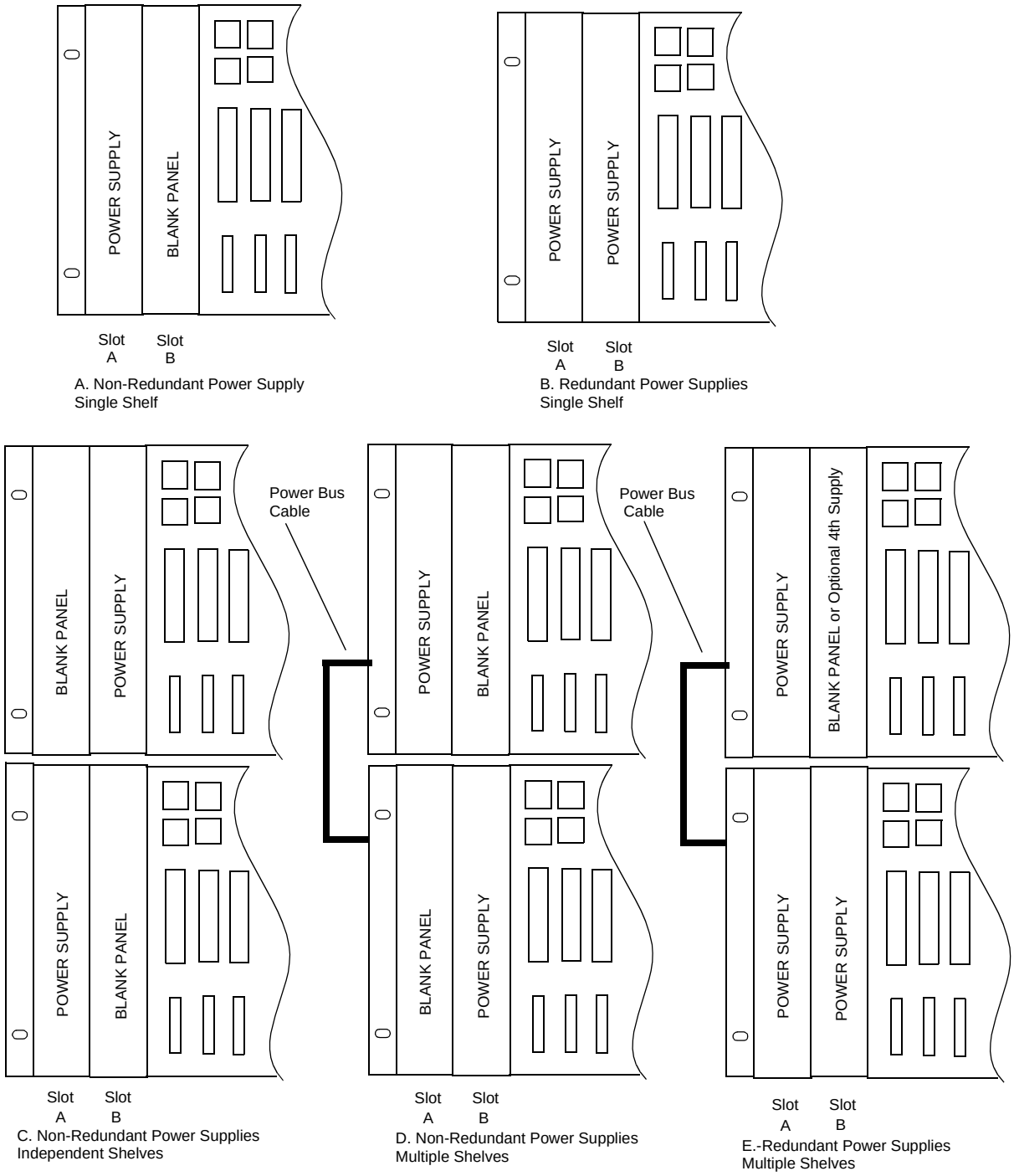


Figure 2-19 Power Supply Configuration

Grounding

Proper frame grounding is important for the following reasons:

Safety

The chassis of the AC powered shelf or enclosure must be connected to protective (earth) ground for safety reasons. This is normally done via the power cord's ground wire, or optionally via a separate ground wire from a grounded post (chassis ground) on the rear panel.

Figure 2-20 shows an optional ground connection on an AC or DC shelf using an anti-rotational lug or a ring lug terminal.

Important *The optional ground connection is made by crimping a 10 or 12 AWG wire to one of the lugs in the terminal lug kit GDC Part No. 010K030-001 using Burndy Electric Co. Hytool Type Y1OD. Call Burndy customer service 1-800-346-4175 for tool order information.*

Attach the lug and wire to the left side plate of the shelf as shown in Figure 2-20 using the hardware supplied in the kit.

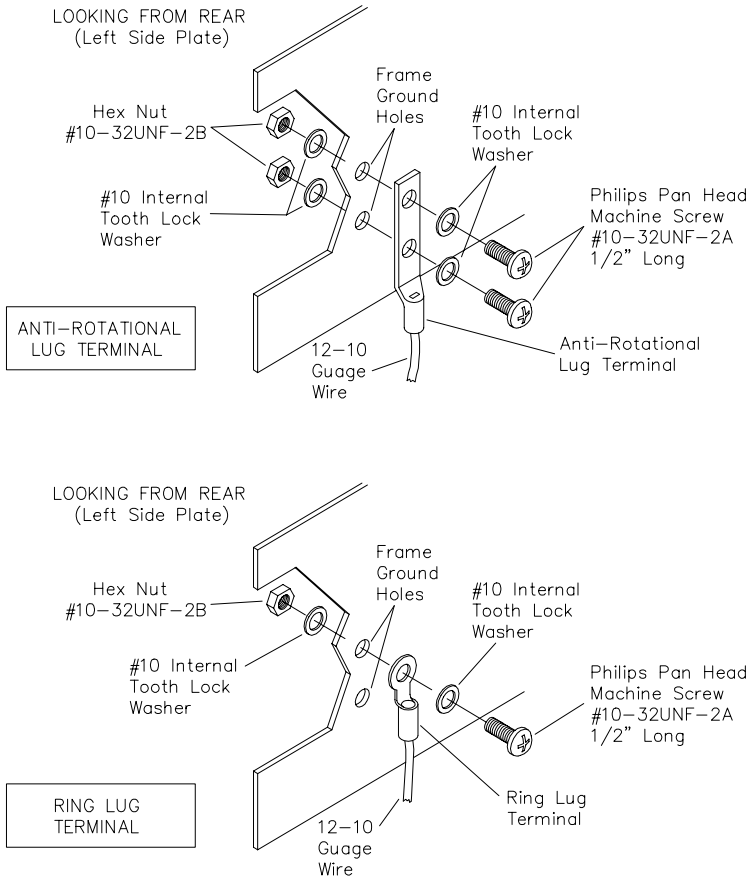


Figure 2-20 Shelf Frame Ground Connection

EMI (Electromagnetic Interference)

Shielded cables minimize EMI and are required for Zone 3 I/O connections to meet the radiated EMI limits for FCC Part 15 Class A and EN55022 Class A.

These shielded cables are connected to the SpectraComm chassis and thus to local earth ground. This occasionally causes a problem if the equipment to which the shelf is connected is at a different ground potential than the shelf, and that equipment also grounds the cable shields to its earth ground. These shielded cables are connected to chassis ground via the two mounting screws on the connector hood. Refer to paragraph below: Tying Signal Ground to Chassis Ground.

Tying Signal Ground to Chassis Ground

You must provide a good earth connection to the cabinets or racks that the shelves are mounted in. This is in addition to any earth conductor that may exist. Continuity between the shelves and cabinets or racks must be verified.

It is common practice to tie chassis ground and signal ground together. Signal ground is the 0V reference for the digital circuits in the unit, and is also the reference for unbalanced data interfaces such as TIA/EIA-232-F and RS423. The default (shipped) and preferred position for the Signal Ground-Chassis ground strap is shorted. This is usually best for AC power line noise immunity, but a problem can exist if signal grounds on two equipments (at different chassis ground potentials) are connected together via a data cable. A large current can flow in the signal ground lead (TIA/EIA-232-F pin 7). To prevent this, make sure the potential difference between grounds is less that 0.25 V RMS. Alternatively, open the connection between chassis ground and signal ground on the unit and connect a wire from chassis ground to the preferred earth point.

The enclosure and shelf are shipped from the factory with the signal and chassis ground strapped together at the two screw terminals located on the rear panels.

Figure 2-21 shows the grounding function and Figure 2-26 illustrates the ground strapping.

To common signal ground to chassis ground:

1. Loosen both ground post screws
2. Slide or rotate the strap to make contact with both ground terminals
3. Tighten both screws

To attach separate wire to earth at a remote location:

1. Loosen both ground post screws
2. Slide the strap up, then rotate it one-half turn to prevent it from contacting the signal ground terminal
3. Connect a wire from earth ground to the earth point

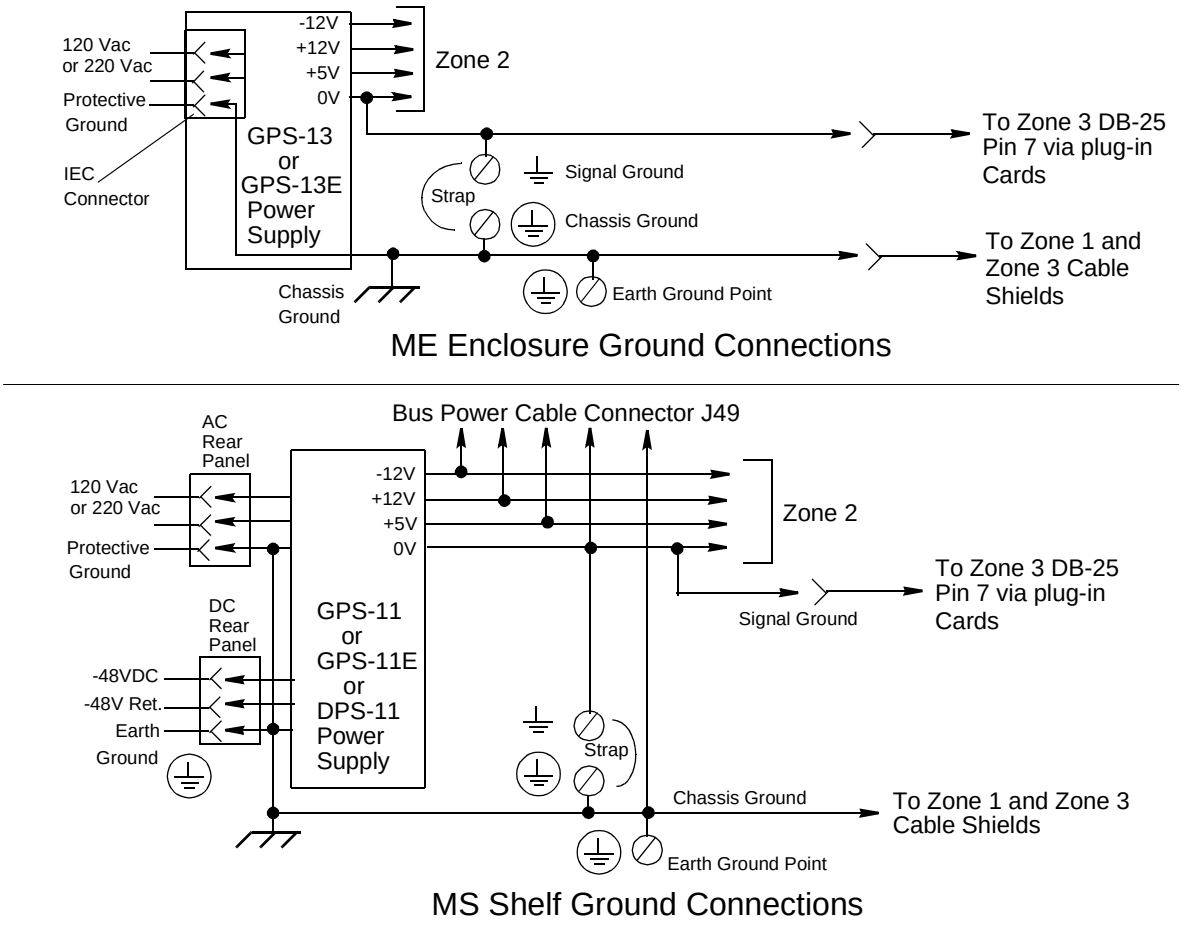


Figure 2-21 Ground Connections

AC-Powered Units

Enclosure

The MultiPak Enclosure uses a GPS-13 (100/120 V) or GPS-13E (220/240 V international) power supply for non-redundant use only. It accepts AC input power and supplies DC power to the plug-in cards via connectors in the enclosure backplane.The front panel is illustrated in *Figure 2-22*. The power supply is rated at 100 watts total (+5 VDC = 0 - 20A, ±12 VDC = 0 - 1.0A).

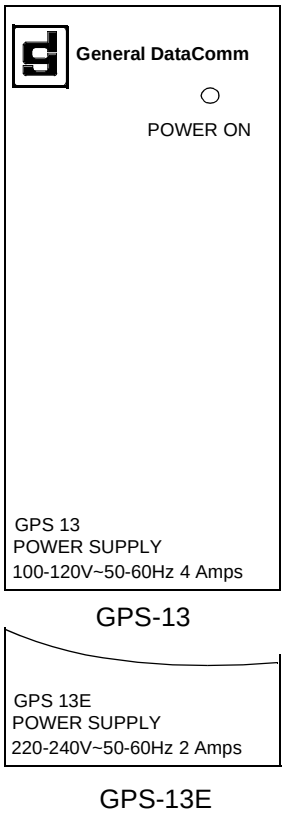


Figure 2-22 Enclosure Power Supply

The power supply module has a front panel green LED POWER ON indicator. The POWER ON/OFF switch is located on the rear panel of the supply. If the power supply fails, there is no power. The enclosure's power supply module is installed from the front of the enclosure and secured by two screws at the rear of the enclosure. See Figure 2-23 for removal procedure.

Power Cord

The enclosure is equipped with an IEC-type North American AC power cord. (Export AC power cords are optional). Connect the line cord plug to a polarized grounded outlet providing the required AC power.

1. The ac outlet should not be under switch control.
2. The unit should be powered by the same ac source as the equipment to which it is connected, to prevent large circulating currents caused by differences in ground potential. If it is not possible to determine whether the equipment is powered by the same ac source, verify that a potential difference of less than 0.25 Vrms exists between the grounding circuits of the respective power outlets.

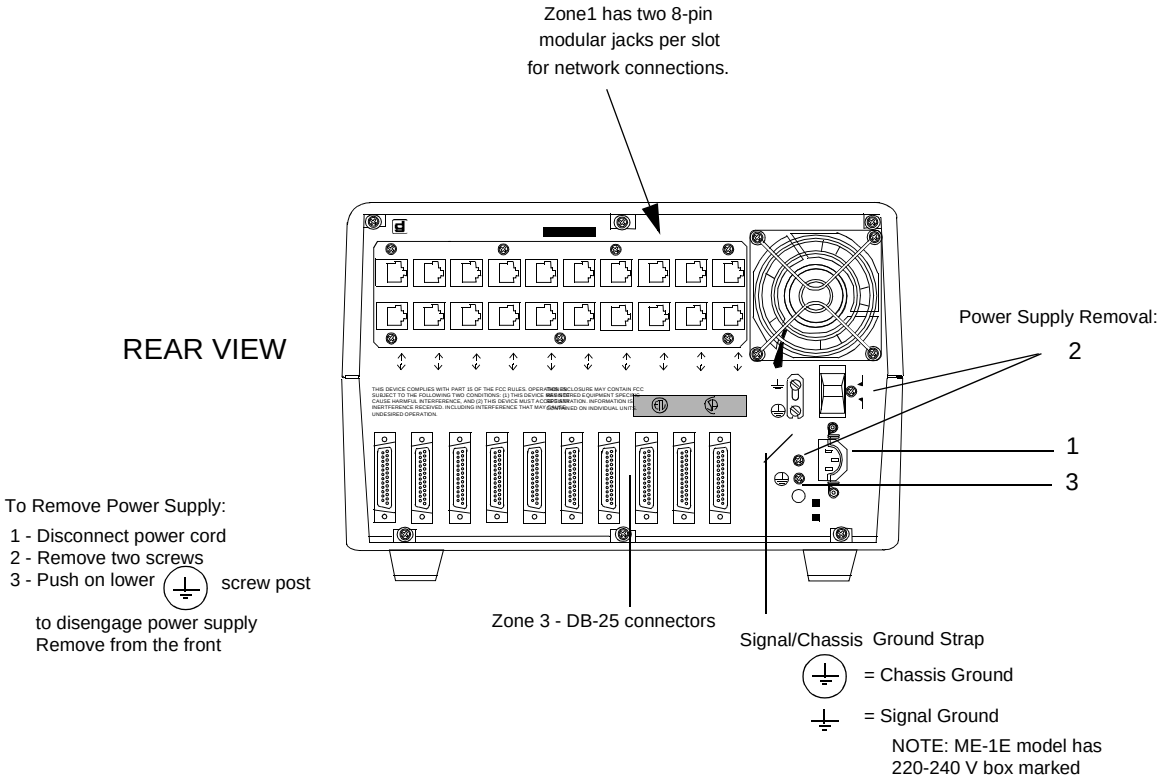


Figure 2-23 10-Slot Enclosure - Cover Removal

AC Shelf

Sixteen slots are used for plug-in cards and for a space reserved for up to two GPS-11 power supplies. A single GPS-11 supports a fully loaded shelf. Two GPS-11 modules mounted in the same shelf provide load sharing in normal service or a back-up source of power if one of the modules fails. A dual shelf configuration allows up to sixteen more product slots and two more supply modules. Refer *to* *Dual Shelves on page 2-36* in this chapter. The GPS-11 is available in two versions: the GPS-11 for North America and the GPS-11E for international use. The front panels are illustrated in Figure 2-24. The power supply is rated at 96 watts max. (+5 VDC = 0 - 16A, ±12 VDC = 0-1.67A).

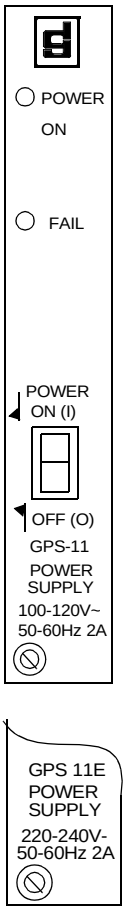


Figure 2-24 Shelf Power Supply AC Modules Front Panels

Each power supply module has a front panel green LED POWER ON indicator and a red LED FAIL indicator. A POWER ON/OFF switch is also located on the front panel.

The shelf power supply module(s) is inserted from the front of the shelf and secured in place with one screw located on the front panel. Be sure to fully seat the power supply module, and secure the front panel screw with a screwdriver.

Power Cord

The domestic shelf power cord has a built-in ferrite core to help suppress noise. Connect the line cord plug to a polarized grounded outlet providing the required AC power. Export line cords are optional. For part numbers refer to *Chapter 1* - Equipment List and Technical Characteristics on page 1-8.

- The ac outlet should be under switch control.
- The unit should be powered by the same ac source as the equipment to which if it is connected, to prevent large circulating currents caused by differences in ground potential. If it is not possible to determine whether the equipment is powered by the same ac source, verify that a potential difference of less than 0.25 Vrms exits between the grounding circuits of the respective power outlets.
- In a multiple-shelf system, you must provide primary power to each shelf and Fan Tray Assembly. The Bus Power Cable, links the power supply outputs together to provide the system's redundant load sharing features, but it does not carry primary power.
- Special line cords are provided for high noise environments.

DC-Powered Shelves

Besides operation from AC input voltages, a DC shelf is available that uses one or two DPS-11 power supplies. They operate from one or (optionally) two -48 VDC station battery(s). The DC power supply is rated at 96 watts max. (+5 VDC = 0 - 16A, ±12 VDC = 0-1.67A). See Figure 2-25.

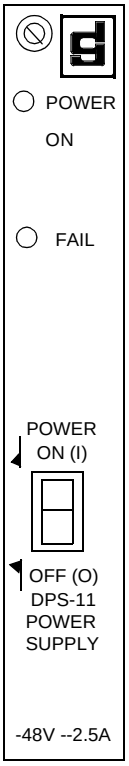
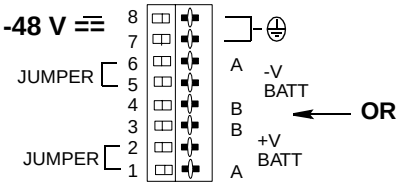


Figure 2-25 Shelf Power Supply DC Module Front Panel

The dc-powered shelves require customer provided station battery power. Use No. 16 to 12 AWG stranded, insulated copper wire for battery connections, sized to carry 3 amps at –48 V dc nominal per shelf.

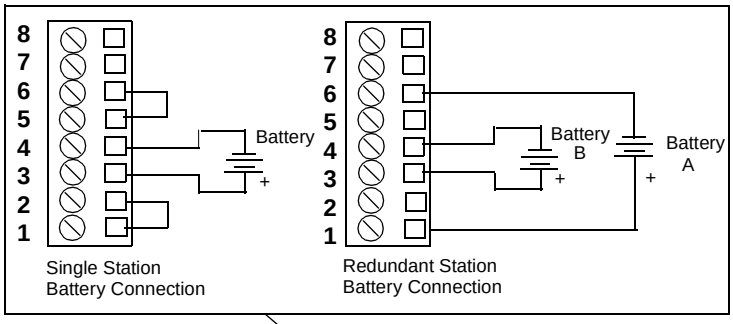
When a single -48 VDC station battery is used, connect a short jumper wire to terminals 1 and 2, and another to terminals 5 and 6. Connect the station battery positive side to terminal 3, and the negative side to terminal 4. Be sure to observe polarity when you connect the leads to the station battery.

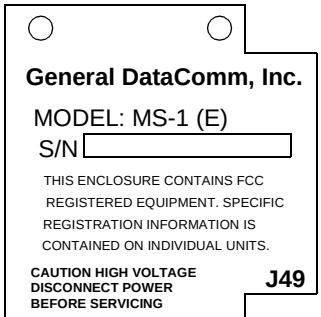
When two batteries (redundant battery system) are used, disconnect jumpers (if any) on 1 and 2, and 5 and 6. Connect station battery B positive side to 3, and B negative side to 4. Battery A positive side connects to 1 and its negative side connects to 6. Be sure to observe polarity when connecting leads to the station battery A and B. See Figure 2-26.

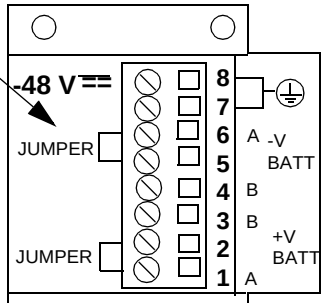


"Spring-loaded" terminal strips may be found on later models. Push bat handle to the right and insert wires at the rear of the terminal strip. The silk screening nomenclature remains the same for both style connectors.

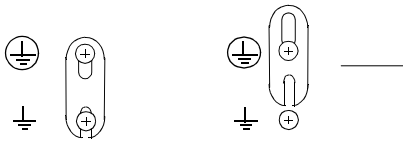
The tightening torque for the screw-type terminal is 7.0 lb.-in.





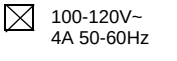


Shelf Ground Strap Connections



Signal ground commoned to chassis ground (factory default)

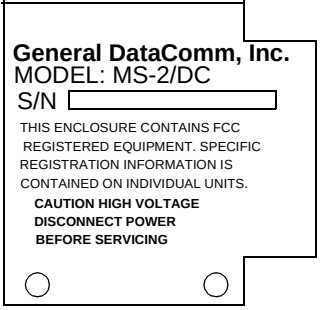
Signal and Chassis grounds open



Chassis ground connection to earth ground.

Signal ground: This ground is connected to all plug-in cards and provides a common circuit reference point.

Male IEC



Chassis ground connection to earth ground
Located on auxiliary panel on DC shelf

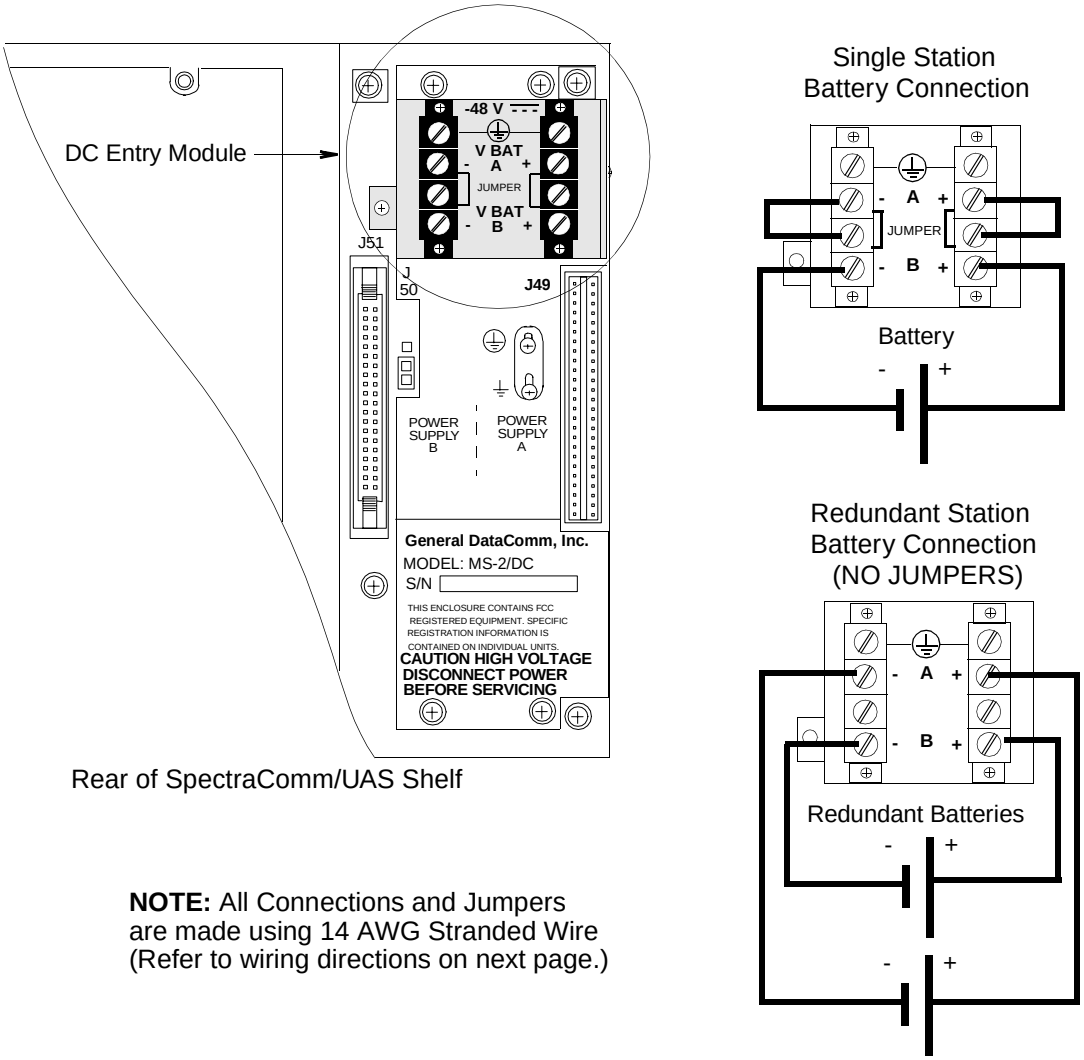
Shelf Rear Panel Assembly (AC)
(-E Version Has 220-240V Box Marked)

Shelf Rear Panel Assembly (DC)

Figure 2-26 Station Battery Use

DC Entry Shelves

Wiring connections for the DC entry module are located at the rear of the SpectraComm/UAS Shelf equipped with battery screw connectors. Figure 2-27 illustrates the proper wiring connections.



NOTE: All Connections and Jumpers are made using 14 AWG Stranded Wire (Refer to wiring directions on next page.)

Figure 2-27 Wiring for DC Entry Module

Required Parts for Wiring the DC Entry Module:

Materials:

- Molex crimp tool # 19285-0016 or 19285-0004
- Molex ring terminals, light blue (for number 14-16 wire) #19073-0067 or BB-823-06
- Number 14 AWG stranded wire
- # 6 lock washers

To Wire a DC Entry Module:

Single Station Battery

1. Cut stranded wire to the desired length and strip end. Add ring terminals to one end of wire.
2. Make jumpers: cut stranded wire to the desired length and strip ends. Add ring terminals to both ends of wire.
3. Crimp on ring terminal using crimping tool
4. Remove associated terminal block screw and add lock washer between screw and ring terminal - tighten screw

Redundant Station Battery

1. Follow above instructions - delete step two (2) - NO JUMPERS.

Inserting a Power Supply Module

To insert a power supply module:

Total the Load Number of every card used in the housing.

GPS-11/13 and DPS-11/13:

1. Verify that you are installing the correct type power supply; that is a DC Power Supply Module (DPS) for a DC chassis or an AC Power Supply Module for an AC chassis. (The AC chassis can be easily identified by the power rating information on the rear panel of the shelf).
2. Turn off the POWER ON switch before installing.
3. Remove filler panel and insert the module slowly into its slot with the GDC logo on top.
4. Tighten the front panel screw to press the front panel firmly against the shelf frame and seat the module.

To remove a power supply:

1. Turn off the power supply
2. Wait 60 seconds, then loosen the front panel screw to unseat the power supply, then pull on the screw to extract.

Preoperational Check

Before installing the plug-in product cards, apply power with only the power supplies installed. On power-up, check that each power supply POWER ON LED is lit and the FAIL indicator is off.

If not, retry steps. If unsuccessful, do not attempt to repair the unit, for assistance call GDC VITAL Network Services listed in *Service Support and Training on page -xi* in the Preface of this manual.

Product Card Installation

For configuration or other details of specific plug-in cards, refer to the product's manual.

To insert a plug-in card:

1. Insert the card into its slot with the GDC logo on top, then slide it in until it makes contact
2. Pull down the ejector tab and firmly push the card in until it seats in the rear connectors

To remove a plug-in card, pull down the ejector tab to unseat the card, then pull on the ejector tab.

Optional Cards

SCM Card

The optional SpectraComm Manager (SCM) card is used to locally manage up to 15 product cards in a shelf. Under SNMP network manager control, it performs configuration, diagnostic restoral and status functions. It is installed in the SpectraComm/UAS Shelf along with other SpectraComm or UAS products. You may install the SCM card in any slot. For detailed information refer to the product manual listed in *Related Publications on page -ii* located in the front cover pages.

Alarm Card

The alarm function is accomplished using the plug-in Alarm Card along with the existing shelf or enclosure alarm bus, and the associated cards.

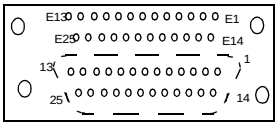
- Provides contacts to activate local and remote customer alarm systems
- Provides local and remote indication of alarms in a system
- Provides separate cutoff controls for local and remote systems

Typically, the alarm outputs are used to drive the visual and audible alarms within a central office. There are four types of alarms: Major, Minor, Power Good (Major), and power status (Minor). Major and Minor alarms are defined depending on the card(s) used in the system. When an alarm is detected, the associated card activates circuitry on the Alarm Card. To assure that transient signals do not trigger the alarm, there is a built-in time delay of approximately 100 ms. When an alarm exists, front panel LED indicators light, providing a local indication (minimum on-time of approximately 0.75 seconds). At the same time internal relays are activated, providing external control of visual and/or audible indications.

You may make Major, Minor and Audible Alarm connections by wire wrapping to connectors on the Alarm Interface Adapter. The Alarm Interface Adapter mounts on the rear of the shelf or enclosure at Zone 3 at the position assigned to the Alarm Card slot.

Table 2-15 describes the Alarm Card pinouts.

Table 2-15 Alarm Card Pinouts

		**Shelf/Enclosure DB25 Pin No.**	**Alarm Adapter Card (wire-wrap pin No.)**
Major Alarm	Common	1	E1
	Normally Open	2	E2
	Normally Closed	3	E3
Minor Alarm	Common	7	E7
	Normally Open	8	E8
	Normally Closed	9	E9
Audible	Normally Closed	20	E20
	Normally Open	21	E21
	Common	22	E22
Wire-wrap pins - press fit,.045 sq., Auto-Splice 8-452 F52240 Contact closures are shown in power-up condition (No Alarm)			

The Alarm Card receives power when you insert it into the shelf or the enclosure. Inserting or extracting it does not cause any errors in the system.

An Alarm Card power failure sets all alarms except the Audible Alarm. To deactivate the alarms, extract the Alarm Card from the shelf or enclosure.

Use the ACO front panel switch to cut-off the external audible alarms; the front panel alarm indicators remain ON.

Note

1. *When inserting an Alarm Card into a powered shelf or enclosure, Major, Minor and Audible Alarms go ON for approximately 0.75 seconds then OFF.*
2. *When applying power to a shelf or enclosure, the Major, Minor, and Audible Alarms go ON for approximately 0.75 seconds then OFF*

Alarm Card Options

Figure 2-28 helps to locate and describe the switches and headers on the Alarm Card.

The configuration is set at the factory to match your network's operation. The option switch is shown in its normal or default (factory shipped) positions.

You need to check these settings when you first install the card. You need not repeat the procedure unless you change your network.

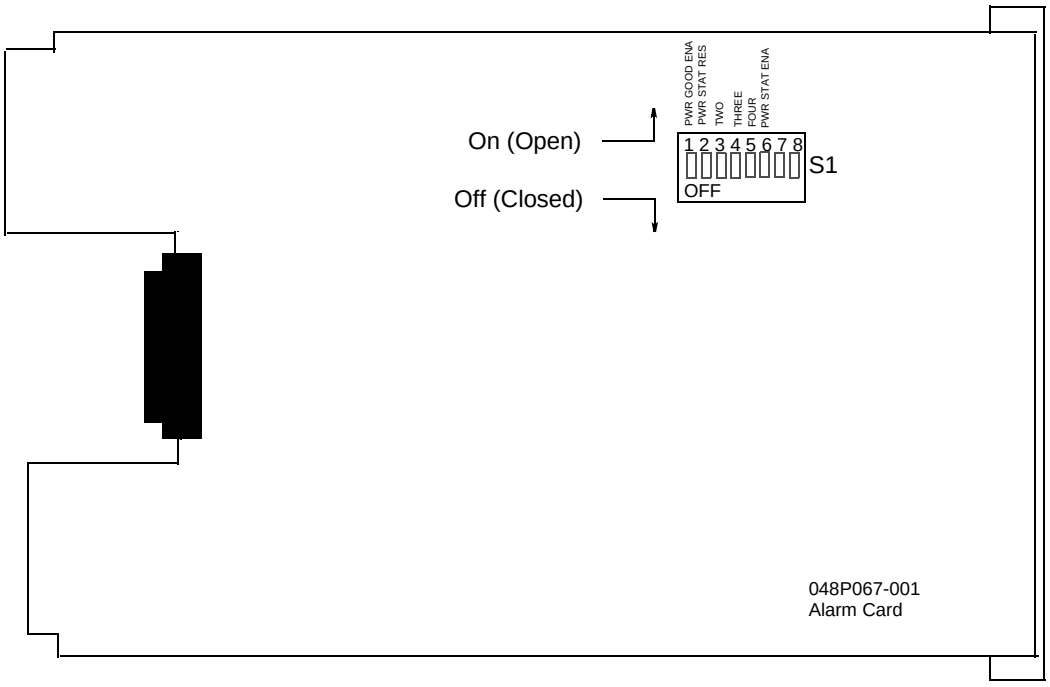


Figure 2-28 Alarm Card

Table 2-16 Alarm Card Option Settings

S1 Option Settings	Description
PWR GOOD ENA (pos. 1)	Enable/Disable Power Good Detector (Failure in a power supply) - This signal is considered a Major alarm, and may be enabled or disabled.
PWR STAT RES (pos. 2)	Enable/Disable Power Status Pull-up Resistor, (Normally ON). OFF for future use.
TWO (pos. 3) THREE (pos. 4) FOUR (pos. 5)	Power Status Threshold - This option sets the threshold on the power status detector depending on how many power supplies (2, 3, or 4) are installed in the system. When this option is set position 6 should be ON and if a power supply fails or is taken out of the shelf/enclosure, the Minor alarm is activated. When one power supply is used, set 2, 3, and 4 to OFF.
PWR STAT ENA (pos. 6)	Enable/Disable Power Status Detector - This signal is considered a Minor alarm and may be enabled or disabled. When one power supply is used, set to OFF.
Positions 7 and 8 not used.	

Chapter 3: Operation

Overview

This chapter describes the controls and indicators of the power supply modules and the optional Alarm Card that you may use to check operation. All operations of the SpectraComm/UAS Shelf and Enclosure are controlled automatically after they are properly installed. They have no operating instructions (except for the test procedures given in *Chapter 4, Tests*).

Controls And Indicators

Power Supply Front Panel

Each power supply has the following controls and indicators:

- The POWER ON/OFF switch controls input power to the power supply
- The green POWER ON indicator, normally lit, goes off when input power is removed or when fuse F1 opens
- The red FAIL indicator, normally off, lights when the power supply in a redundant system fails or shuts down due to an overload.

Note *In a redundant system, with no product cards installed, the power supply FAIL indicator may light. This does not mean that the power supply has failed. Reset the shelf by turning off the POWER ON/OFF switch, then turn it on when a load is applied (i.e., with product cards installed).*

Fan Tray Front Panel

The dc-powered Fan Tray Assembly, illustrated in Figure 3-1, has an ALARM indicator. It is normally off, and lights when input power is removed or when the fuse opens. The ac-powered Fan Tray Assembly has no indicators.

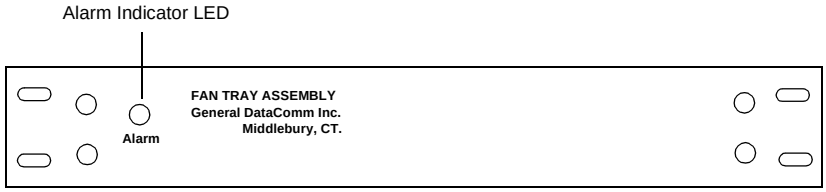


Figure 3-1 DC-Powered Fan Tray Assembly Front Panel Indicator

Alarm Card Front Panel

Figure 3-2 shows the Alarm Card front panel and explains the function of the front panel indicators and switch. You may check the operation of each card by monitoring the indicators. The colors of the LED indicators on the card's front panels are consistent in function:

Red and yellow are used for alarms or "service-affecting" conditions. This includes test modes that are interfering with normal user data. Alarm conditions depend on the cards, but normally, red indicates a Major Alarm (a number of problems), and yellow indicates a Minor Alarm (channel alarms). The green LED indicators are used for all other conditions.

ON

Green LED is on when power is supplied to the Alarm Card.

AUDIBLE

Green LED is on when front panel ACO switch is on.

MIN

Yellow LED is on when a minor alarm is active.

MAJ

Red LED is on when a major alarm is active.

AUDIBLE ACO

This 3-position switch has the following functions:

ENBL - Permanently on. Major or minor alarms do not activate the audible alarm.

DSBL - Permanently off. All major or minor alarms activate the audible alarm.

RESET - Momentary on. The first alarm does not activate the alarm relay. When the first alarm is de-activated, the ACO circuit is reset to ACO "OFF" allowing the next alarm to activate the audible alarm relay.

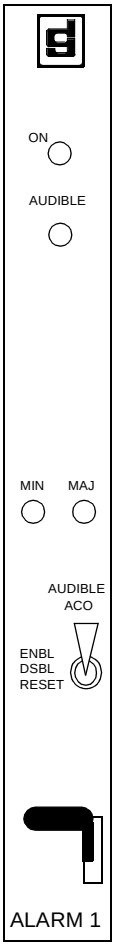


Figure 3-2 Alarm Card

Chapter 4: Tests

Overview

This chapter describes tests that you can perform after installing the SpectraComm/UAS Shelf and Enclosure.

Trouble-Shooting

In a redundant system, the front panel power supply FAIL indicator lights when the power supply shuts down due to an overload or when there is an absence of input voltage, including an absence caused by turning off the POWER ON/OFF switch. If a power supply shuts down due to an overload, turn off the power supply, wait one minute, then turn it on. If the power supply shuts down again, the power supply, a backplane or a product card is defective.

Fuse Replacement

The Fan Tray Assembly, illustrated in Figure 4-1, has a fuse mounted on the rear panel. When replacing the fuse, be sure to use the correct type (fuse information is printed on the left side of the rear panel).

Figure 4-2 illustrates the location of fuse F1 for the DPS-11 power supply, and Figure 4-3 illustrates the location of fuse F1 for the GPS-11 and GPS-11E power supplies. When replacing the fuse, be sure to use the correct type (fuse information is printed on the pc card, near the fuse holder).

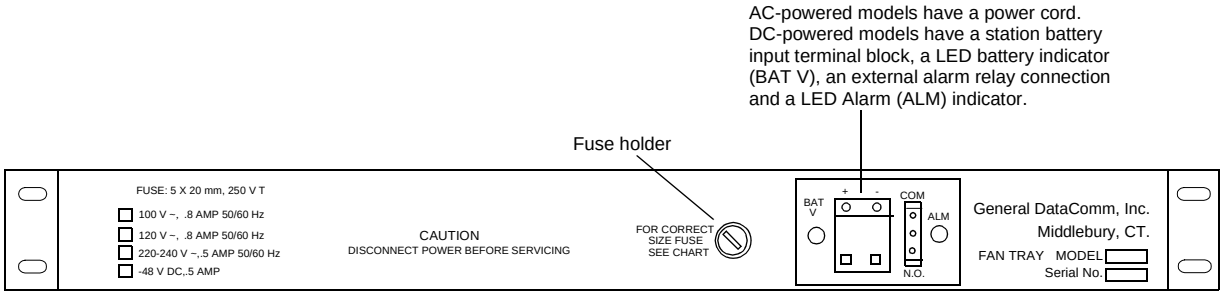


Figure 4-1 DC-Powered Fan Tray Assembly Fuse Location

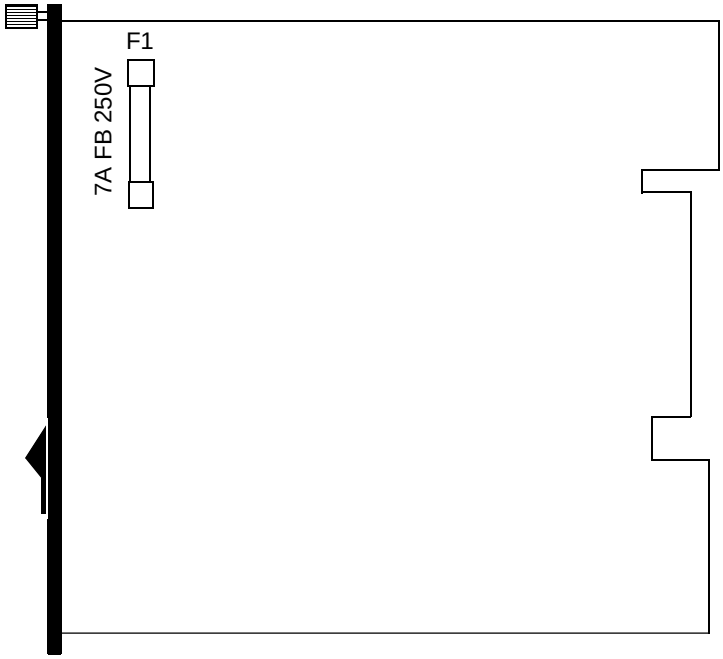


Figure 4-2 DPS-11 Power Supply Fuse Location

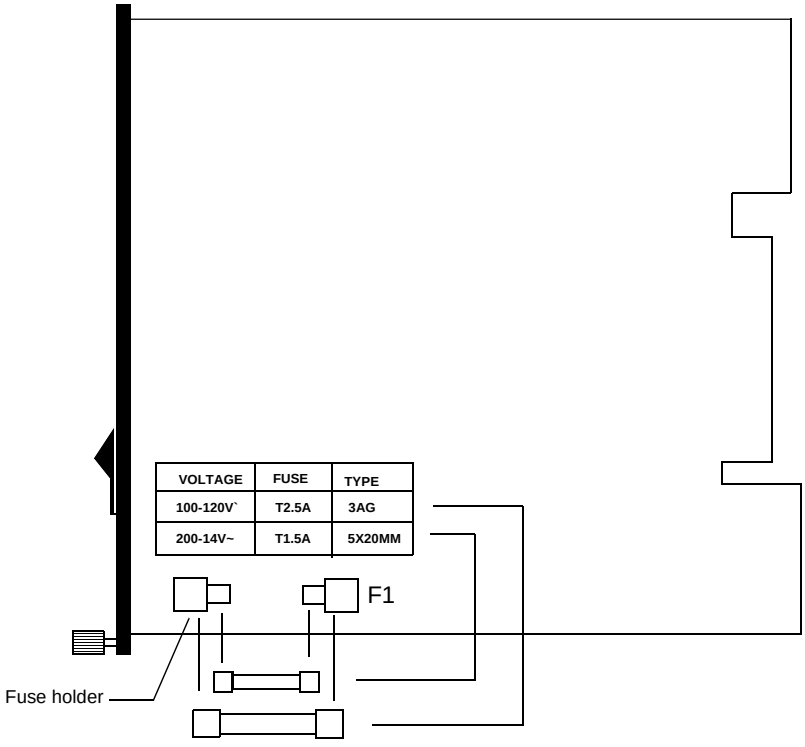


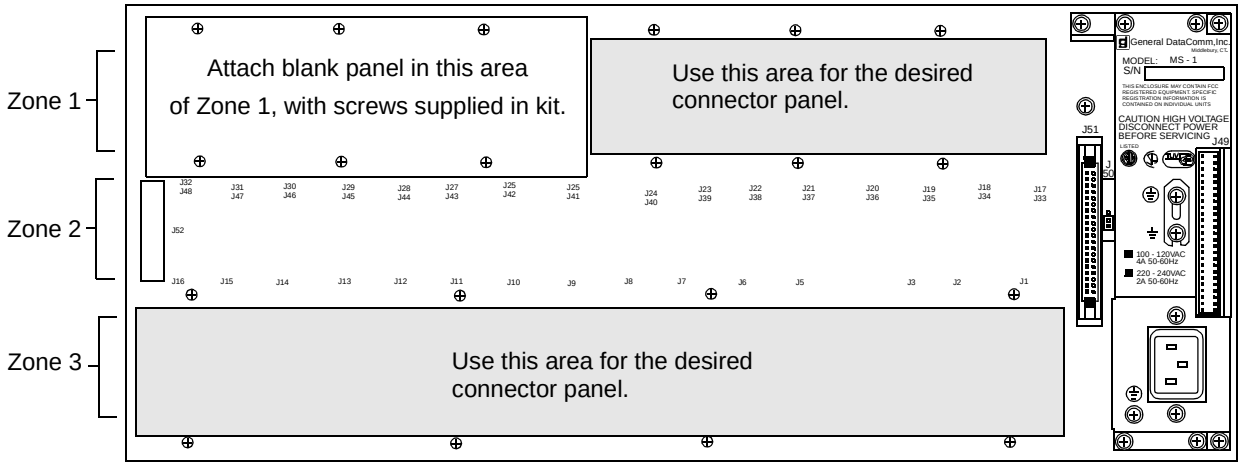
Figure 4-3 GPS-11/GPS-11E Power Supply Fuse Location

Appendix A: Kit Instructions

This Appendix summarizes installation instruction sheets for connector panels (each connector panel on the rear of the SpectraComm/UAS Shelf includes an installation instruction sheet) and some of the other kits that may be shipped with your shelf.

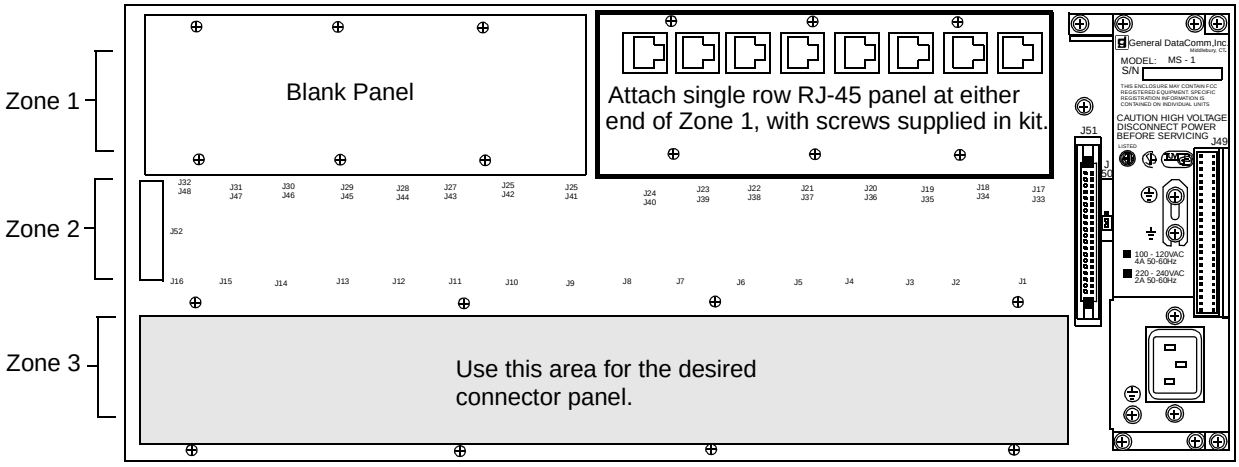
Blank Panel in Zone 1

Kit No. 010K341-001, Pub. No. 010R202-000



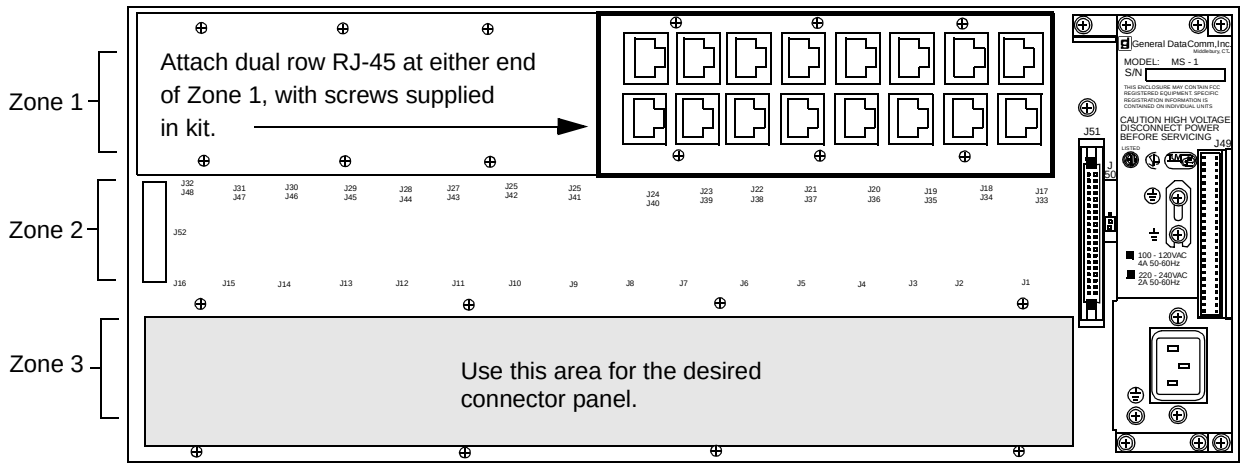
Single Row RJ-45 Panel in Zone 1

Kit No. 010K338-001, Pub No. 010R203-000



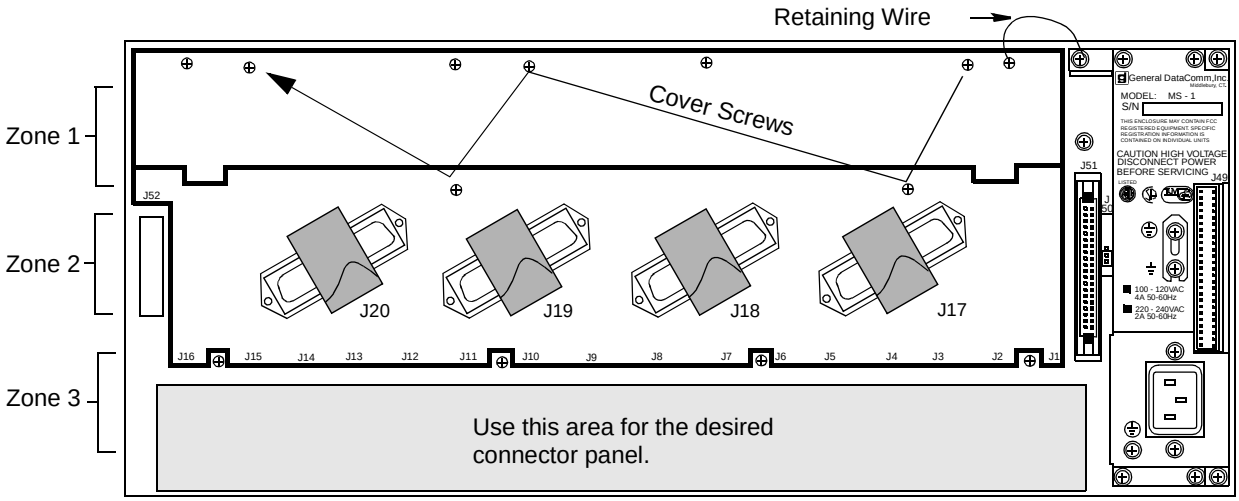
Dual Row RJ-45 Panel in Zone 1

Kit No. 010K342-001, Pub No. 010R204-000



50-Pin Harness Card in Zone 1

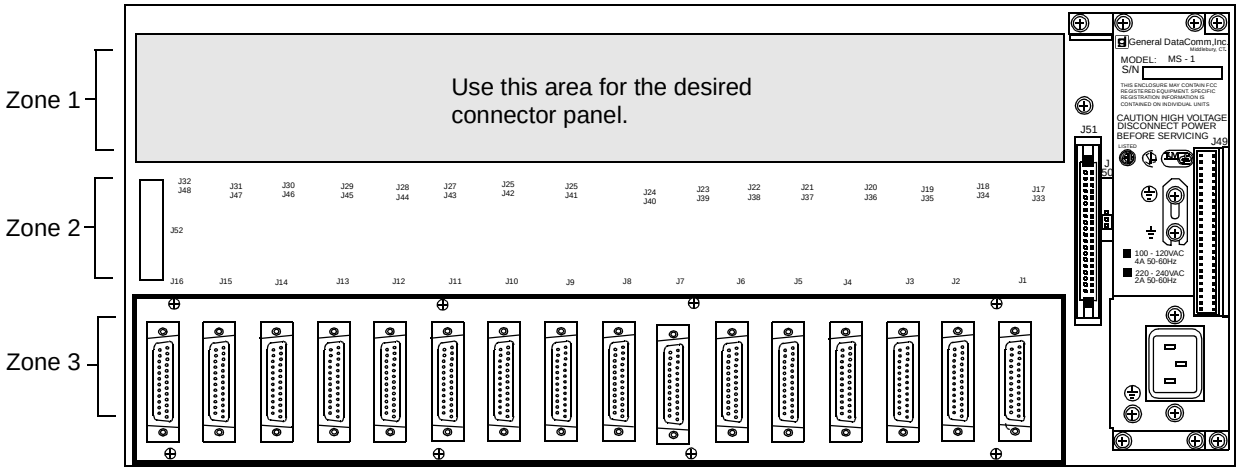
Kit No. 010K345-001, Pub. No. 010R205-000



1. Loosen screws which retain clear plastic cover on the harness card and remove cover.
2. Attach harness card to Zone 1 of the shelf, with screws supplied in the kit (8 pieces).
3. Re-attach clear plastic cover.
4. Attach retaining wire to existing screw on the shelf.

16 DB-25 Panel in Zone 3

Kit No. 010K339-001, Pub No. 010R206-000

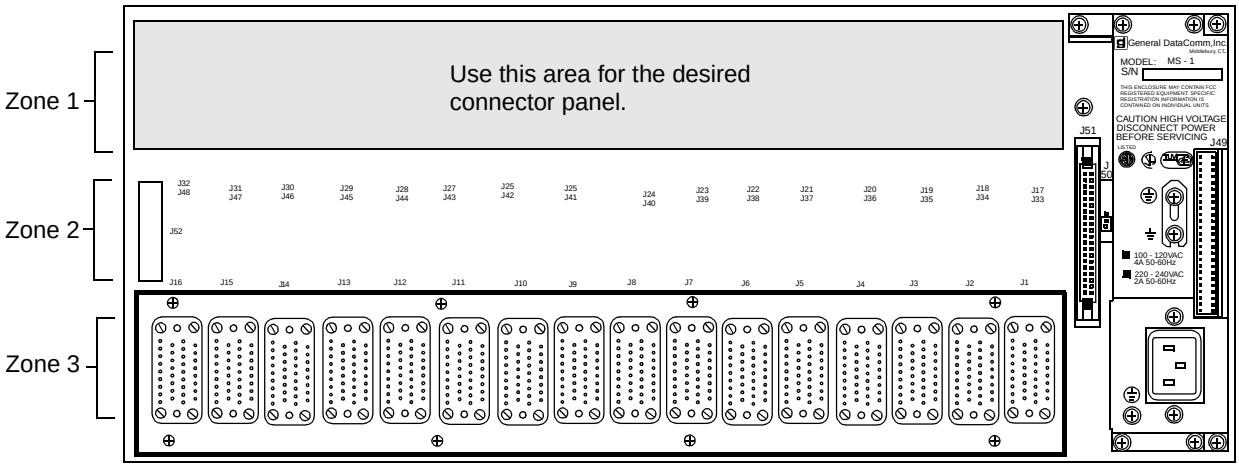


Attach 16 DB-25 panel in Zone 3, with screws supplied in kit.

Be careful not to install panel upside down.

16 V.35A Panel in Zone 3

Kit No. 010K068-001, Pub No. 010R207-000



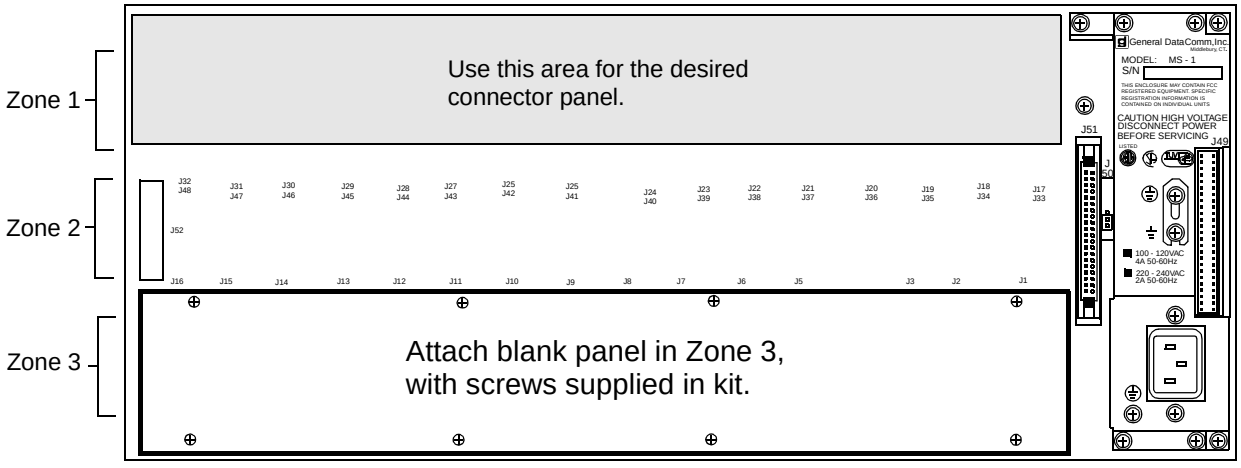
Attach 16 V.35A panel in Zone 3, with screws supplied in kit.

Be careful not to install panel upside down.

Holes without contacts are on the top of the connectors.

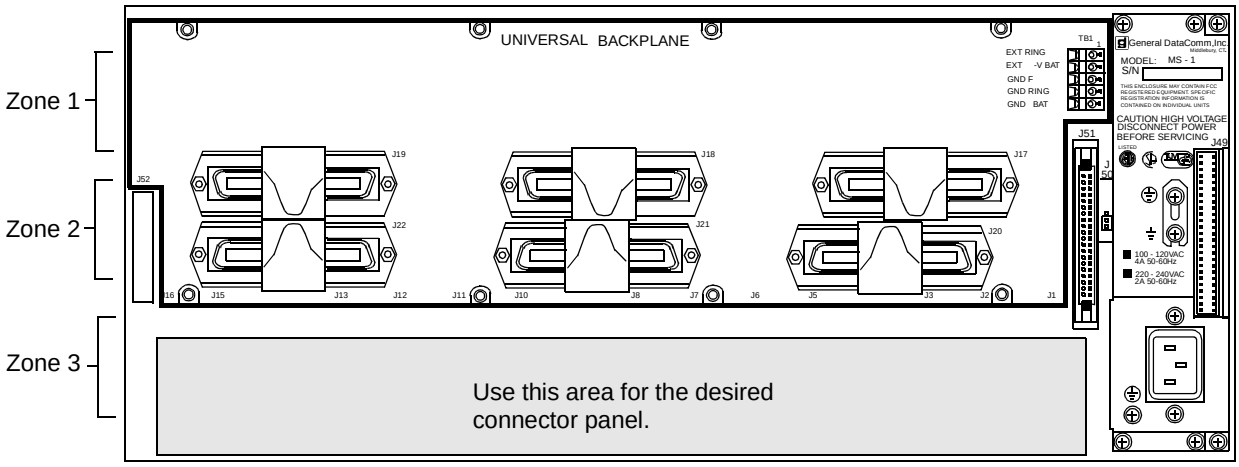
Blank Panel in Zone 3

Kit No. 010K343-001, Pub No. 010R208-000



50-Pin Universal Harness Card in Zone 1

Kit No. 010K072-001, Pub No. 010R302-K1



Attach harness card to Zone 1 of the shelf, with screws supplied in the kit (8 pieces).

Standard 50-Pin Backplane Cable Hold-Down Kit

Kit No. 010K402-001

Overview

This kit allows you to secure 50-pin Amphenol cables to the standard 50-pin Zone 1 connectors without the use of the earlier attaching band. It also includes the parts necessary to modify the Amphenol cable hood hardware which allows you to attach the cable to the new Connector Bracket. Figure A-1 shows the original Zone 1 connectors and hold-down attaching bands, Figure A-2 shows the new Connector Bracket arrangement.

Contents:

- Connector Bracket, 010E308-001 (4)
- 1/4” 4-40 hex standoff, 106-011-404 (4)
- 4-40 screw, 007-440-625 (4)
- 4-40 split washer 035-003-004 (8)
- 4-40 nut, 066-001-440 (8)
- 4-40 captive screw, 031-440-001 (4)
- 4-40 screw and hardware, 007-440-312 (4)
- Cable Retaining Plate, 010E215-001 (4)

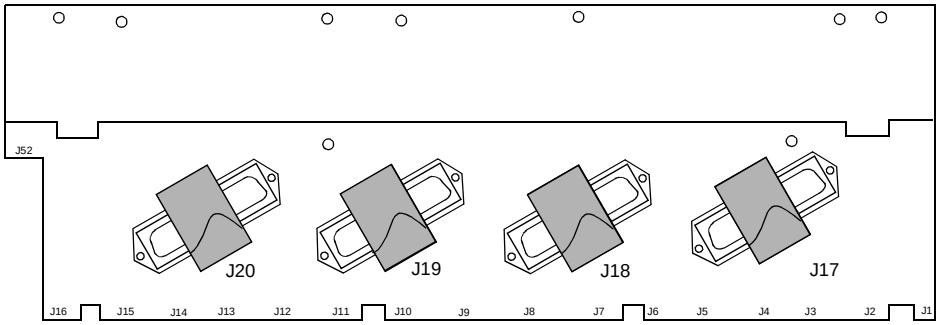


Figure A-1 50-Pin Zone 1 Connectors With Attaching Band

Instructions

1. Remove existing hardware and existing brackets (with attaching band) from each of the Zone 1 connectors.
2. Replace with new Connector Brackets (010E308-001) and hardware included in kit (hex standoff towards the bottom).
3. Attach the Retaining Plate to the cable connector hood as shown, using the screws in the kit. See *Figure A-2*.

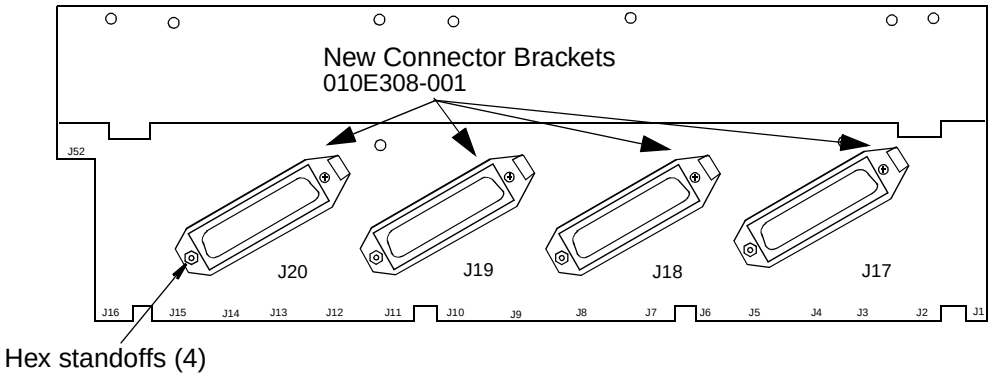
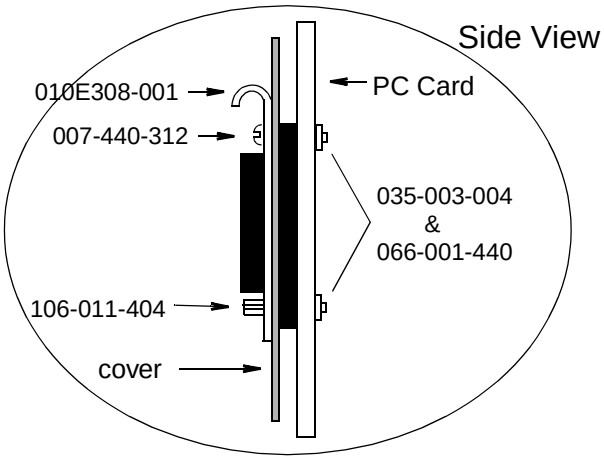
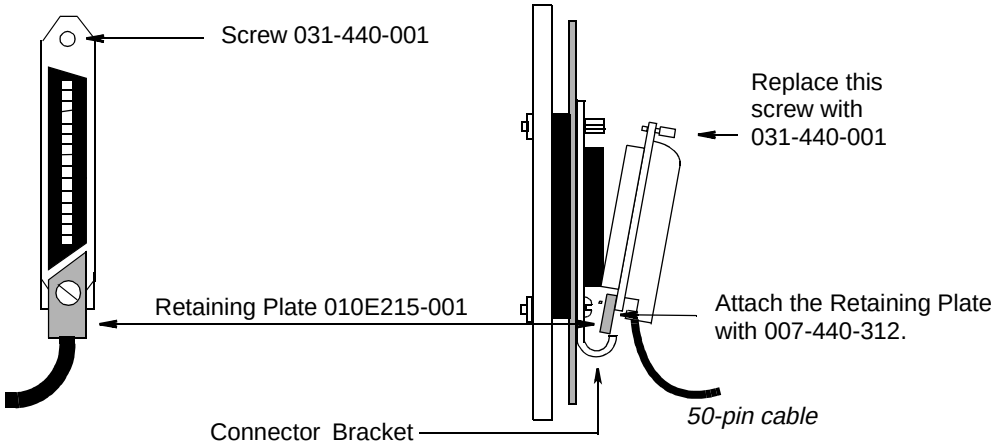


Figure A-2 50-Pin Zone 1 Connectors With New Connector Brackets



50-Pin Cable Hood With Retaining Plate and New Hardware



50-Pin Universal Backplane Kit

Kit No. 010K072-001

Overview

This kit allows you to install the 50-pin Universal Backplane on the SpectraComm Shelf.

Instructions

1. Remove the 8 screws that hold the existing Zone 1 backplane (connector panel). If a standard 50-pin backplane is being replaced, it will have a clear plastic cover which has to be removed before you can access the 8 screws. Save these screws, they are used to mount the new Universal Backplane.
2. Attach the new backplane to Zone 1 of the shelf, with the 8 screws you removed in step 1.
3. When 50-pin shielded cables are attached to the Universal Backplane's connectors, be sure to use frame grounding kit (GDC Part No. 010K070-001) which include 3 sets of screws and clips (discard). See Figure A-3.

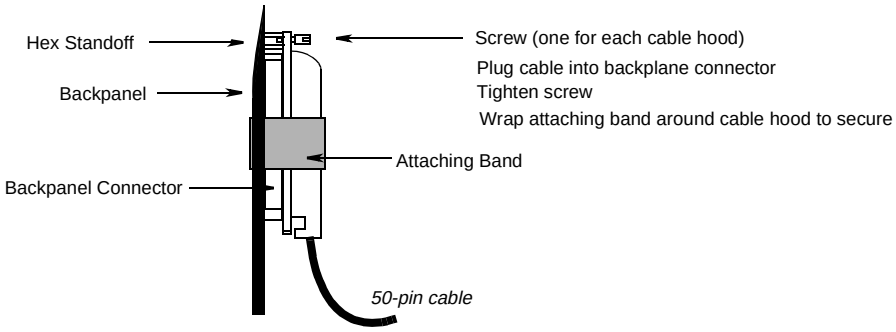


Figure A-3 50-Pin Universal Backplane Kit

Card Retaining Bar Kit

Kit No. 010K021-001, Pub. No. 010R209-000

The optional Card Retaining Bar (locking bar) prevents cards from being unseated unintentionally.

1. Loosely attach 2 screws to the shelf from the kit of hardware.
2. Slide the slotted tabs of the retaining bar under the heads of the screws and tighten screws. See Figure A-4.

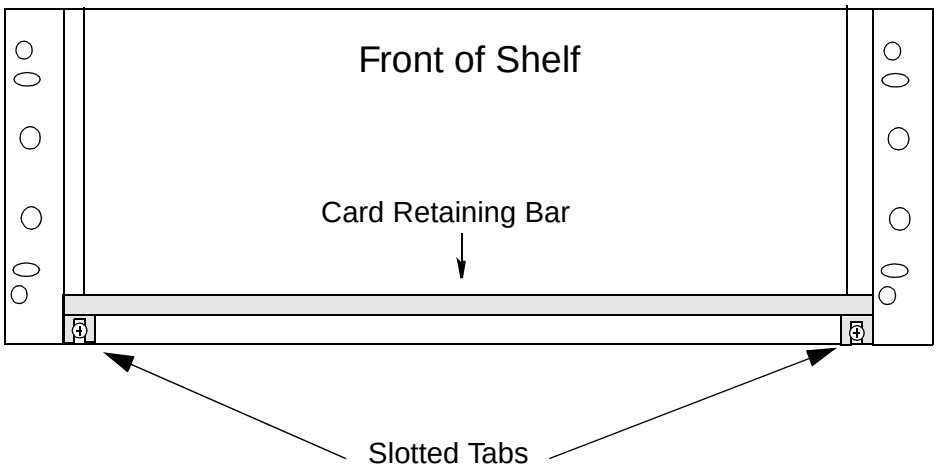
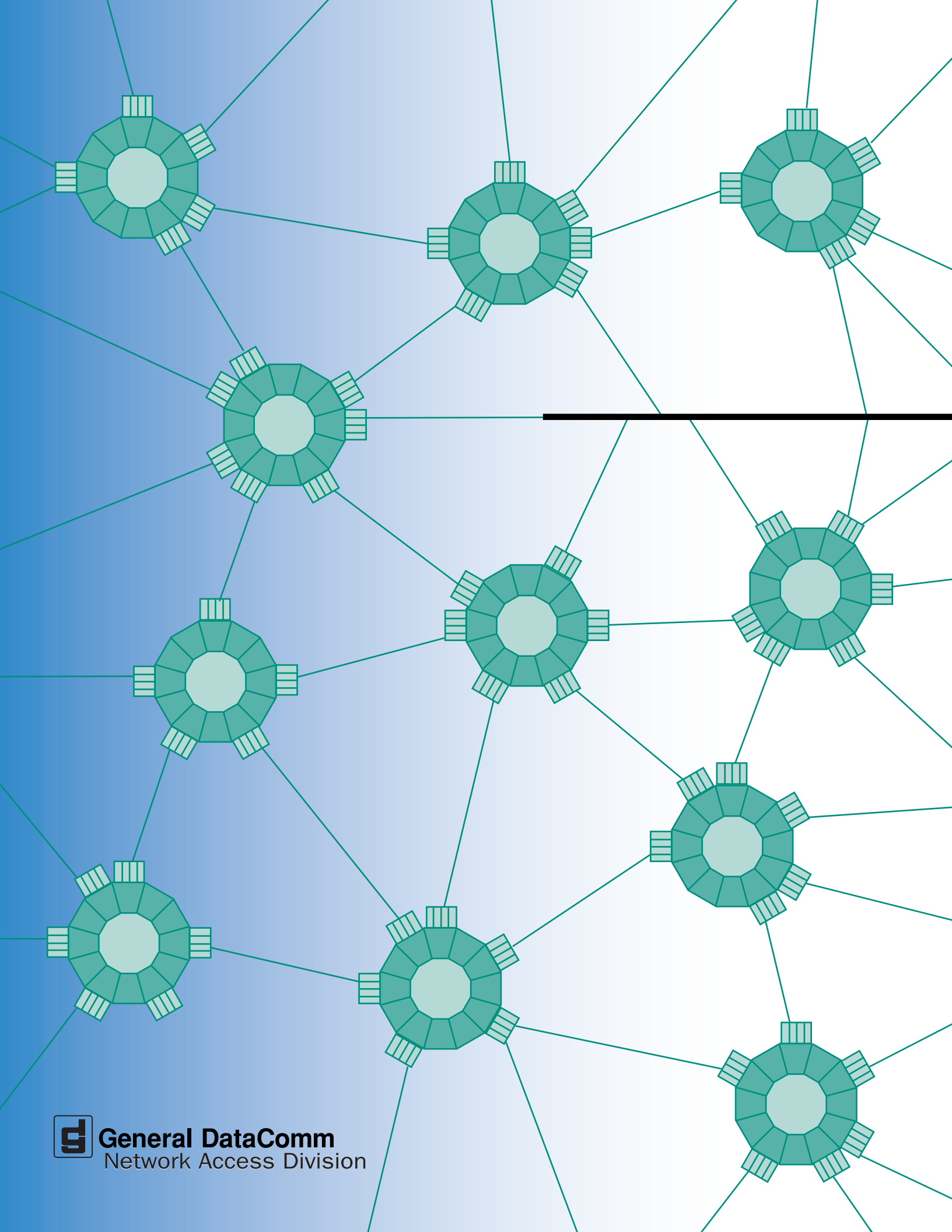


Figure A-4 Card Retaining Bar



General DataComm
Network Access Division