

The SYSTEM 5000 INSTALLATION MANUAL

Installation Precautions - *Adherence to the following will aid in problem-free installation with long-term reliability:*

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until this manual is read and understood.

CAUTION - *System Reacceptance Test after Software Changes:* To ensure proper system operation, this product must be tested in accordance with NFPA 72-1993 Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49° C/32-120° F and at a relative humidity of 85% RH (non-condensing) at 30° C/86° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a nominal room temperature of 15-27° C/60-80° F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. *Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes.* Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

Fire Alarm System Limitations

While installing a fire alarm system may make lower insurance rates possible, it is not a substitute for fire insurance!

An automatic fire alarm system - typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control with remote notification capability can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

Any fire alarm system may fail for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in walls, or roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second floor detector, for example, may not sense a first floor or basement fire. Furthermore, all types of smoke detectors - both ionization and photoelectric types, have sensing limitations. No type of smoke detector can sense every kind of fire caused by carelessness and safety hazards like smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time.

Rate-of-Rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist.

Equipment used in the system may not be technically compatible with the control. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled.

The most common cause of fire alarm malfunctions, however, is inadequate maintenance. All devices and system wiring should be tested and maintained by professional fire alarm installers following written procedures supplied with each device. System inspection and testing should be scheduled monthly or as required by National and/or local fire codes. Adequate written records of all inspections should be kept.

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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Section One:

General Information

Introduction

The System 5000 is an expandable multi-zone Fire Alarm Control Panel designed with maximum flexibility and modularity as a basic requirement. The heart of the system is the Central Processor Unit (CPU-5000) module which monitors and directs the actions of all other modules in the system. Fifteen other modules may be installed in various configurations, as listed in Table 1.1. Internal communications are accomplished over a high-speed serial bus.

The CPU-5000 is provided with the *Basic Equipment* package. This module provides two Style Z and/or Style Y Notification Appliance Circuits, Form-C alarm and trouble contacts, Remote Station alarm and trouble outputs, and a Municipal Master Box output.

A Main Power Supply (MPS-24A/MPS-24AE or MPS-24B/MPS-24BE) and an initiating circuit module (IZM-8) must be added to make the basic system functional.

The basic system can be expanded using one or more of the following optional modules or boards:

- | | |
|-------------------------------------|--|
| * IZM-8 Initiating Zone Module | * VCE-4 Voice Control Expander |
| * IZE-A Initiating Zone Expander | * DCM-2 Dual Channel Module |
| * ICM-4 Indicating Circuit Module | * TCM-2 Time Control Module |
| * ICE-4 Indicating Circuit Expander | * TCM-4 Time Control Module |
| * AVPS-24 Audio-Visual Power Supply | * AIM-200 Addressable Intelligent Module |
| * CRM-4 Control Relay Module | * FFT-7 Fire Fighters Telephone |
| * CRE-4 Control Relay Expander | * AMG-1 Audio Message Generator |
| * ARM-4 Auxiliary Relay Module | * UDACT Universal Digital Alarm |
| * VCM-4 Voice Control Module | Communicator/Transmitter |

System expansion must comply with:

- 1) The physical limitations of the cabinet configuration.
- 2) The electrical limitations of the system power supply.
- 3) The capacity of the Secondary Power Source (standby batteries).

See Section Two for a description of the various optional modules, and Section Three for installation information.

Key Features

- * Distributed microprocessor electronics using latest technology.
- * Field programmable in minutes using front panel touch switches.
- * Large system capacity, Conventional or Addressable/Intelligent devices.
- * Voice alarm options with solid state messages.
- * Extensive line of serial annunciators.
- * Manual On/Off/Disable control for all Notification circuits and control relays.
- * Plug-in terminal blocks for ease of field wiring.
- * Walk test any portion of system while remainder provides fire protection.
- * Liquid crystal display and printer options.

Before proceeding, the installer should be familiar with the following documents and standards (as appropriate):

Document Number	Product
15581	System 5000 Operator's Manual
15582	System 5000 Operating Instructions
15584	System 5000 Field Programming Manual
15890	The Voice Alarm System 5000 Manual
15842	The Annunciator Control System
15048	The Annunciator Fixed System
15885	The LDM Series Lamp Driver
15805	The TCM-2 Time Control Module
15924	The TCM-4 Time Control Module
15949	The AIM-200 Addressable Intelligent Module
15037	The LCD-80 Liquid Crystal Display
15216	The UZC-256 Universal Zone Coder
15666	The NIB-96 Network Interface Board
15342	The ACM-8R Annunciator Control Module
74-06200-005-A	Noti-Fire 911A
15207	The AFM-16A Annunciator Fixed Module
15378	Device Compatibility Document
50050	The UDACT Manual

NFPA Standards:

NFPA 72-1993 Installation, Maintenance, and Use of Carbon Dioxide Extinguishing Systems
 NFPA 72-1993 Installation, Maintenance, and Use of Halon 1301 Extinguishing Systems
 NFPA 72-1993 Installation, Maintenance, and Use of Halon 1211 Extinguishing Systems
 NFPA 2001 Clean Agent Fire Extinguishing Systems
 NFPA 72-1993 Installation, Maintenance, and Use of Central Station Signaling Systems
 NFPA 72-1993 Installation, Maintenance, and Use of Local, Auxiliary, Remote Station and Proprietary Protective Signaling Systems.
 NFPA 72-1993 Emergency Voice Alarm Service
 NFPA 72-1993 Automatic Fire Detectors
 NFPA 72-1993 Installation, Maintenance, and Use of Notification Appliances for Protective Signaling Systems
 NFPA 72-1993 Testing Procedures for Signaling Systems

Underwriters Laboratories Documents:

UL 38 Manually Actuated Signaling Boxes
 UL 217 Smoke Detectors, Single and Multiple Station
 UL 228 Door Closers - Holders for Fire Protective Signaling Systems
 UL 268 Smoke Detectors for Fire Protective Signaling Systems
 UL 268A Smoke Detectors for Duct Applications
 UL 346 Waterflow Indicators for Fire Protective Signaling Systems
 UL 464 Audible Signaling Appliances
 UL 521 Heat Detectors for Fire Protective Signaling Systems
 UL 864 Standard for Control Units for Fire Protective Signaling Systems
 UL 1481 Power Supplies for Fire Protective Signaling Systems
 UL 1638 Visual Signaling Appliances

Other:

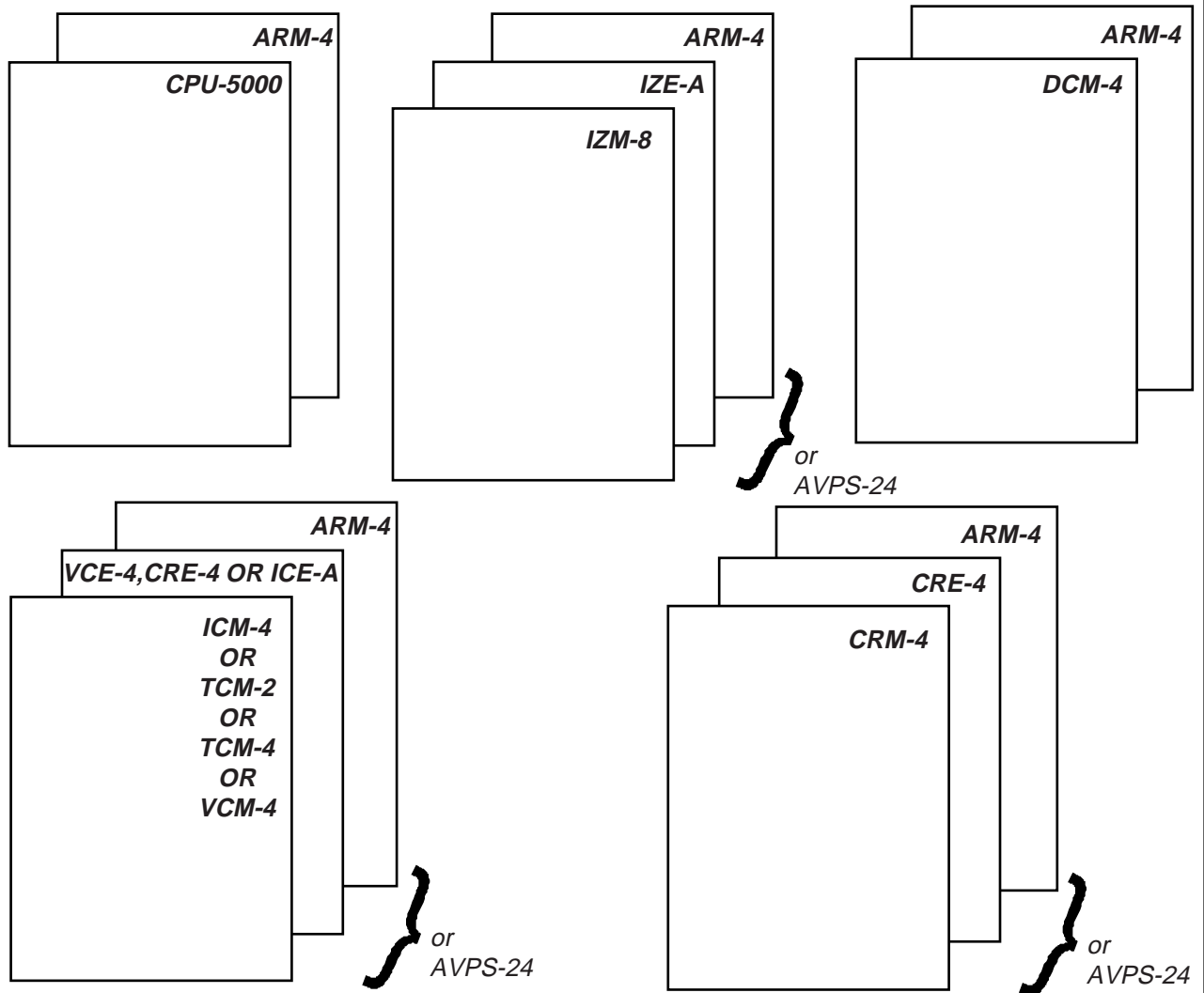
EIA-232D Serial Interface Standards
 EIA-485 Serial Interface Standards
 NEC Article 300 Wiring Methods
 NEC Article 760 Fire Protective Signaling Systems

- ** Applicable Local and State Building Codes
- ** Requirements of the Local Authority Having Jurisdiction

Table 1-1: Physical Configuration Options

Modules can share positions with expander boards and Audio-Visual Power Supplies as illustrated in this table.

Permissible Position Sharing Combinations



- Notes:
- 1) ARM-4 must be mounted under or in a position adjacent to its associated CRM-4 or CRE-4
 - 2) Recommended only when space is limited

Table 1-2: Cabinet Configuration Options

Cabinet	Maximum Number of Chassis	Primary Module Positions
CAB-A3	1	4
CAB-B3	1 or 2	4 or 8
CAB-C3	1, 2 or 3	4, 8, or 12
CAB-D3	1, 2, 3 or 4	4, 8, 12 or 16

Minimum System Configurations

The following System 5000 components are required for compliance with NFPA 72-1993.

1. **BE-5000 Basic Equipment Package** which includes:
CPU-5000 Central Processor Module, VP-1 Vented Dress Panel, BP-3 Battery Dress Panel, CHS-4 Chassis, interconnecting cables and instruction manuals.
2. An **IZM-8 Initiating Zone Module** for up to eight Style B Initiating Device Circuits or an **AIM-200 Addressable Intelligent Module** for up to 198 addressable devices.
3. **Main Power Supply** (MPS-24A/MPS-24AE or MPS-24B/MPS-24BE).
4. **Standby Batteries** - refer to Standby Power Requirements, Section 8.
5. **Cabinet** (CAB-A3, B3, C3 or D3)

In addition, the following equipment is required for the specific NFPA standards listed below:

An NFPA 72-1993 Remote Station Protected Premises Control Unit requires:

6. Sprinkler Supervisory service requires a **CRM-4 Control Relay Module** and a Cable Assembly (Part # 71270). Refer to Section 6.2.

An NFPA 72-1993 Proprietary Protected Premises Control Unit requires:

7. **NIB-96 Network Interface Board** Refer to Section 6.5. Not for sprinkler supervisory service.

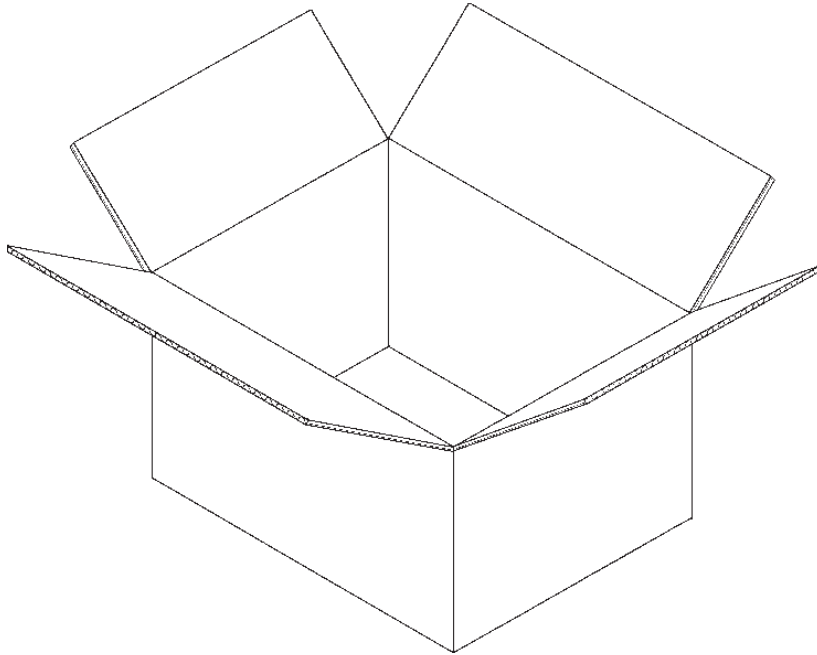
An NFPA 72-1993 Central Station Protected Premises Control Unit requires:

8. Notifier UDACT Universal Digital Alarm Communicator/Transmitter or
9. **Notifier 911A Digital Alarm Communicator**. Refer to Section 6.6
10. Sprinkler Supervisory and/or Waterflow Alarm service requires a **CRM-4 Control Relay Module**. Refer to Section 6.6).

An NFPA 72-1993 Emergency Voice/Alarm Communication System requires:

11. **VCC-1, VTCC-1, VCC-2 or VTCC-2 Voice/Telephone Command Center** for a voice evacuation system.
12. **AA-30 or AA-120 Audio Amplifier**.
13. **VCM-4 Voice Control Module** for up to four speaker or telephone circuits or **DCM-4 Dual Channel Module**.

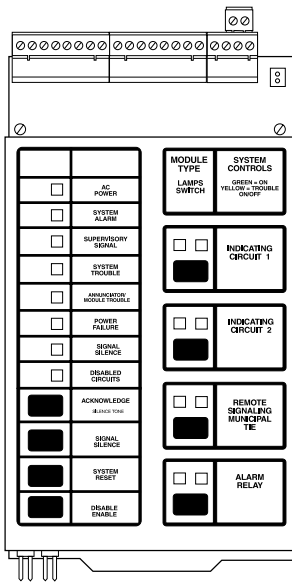
Section Two: Inventory



The System 5000 is offered under a **Basic Equipment (BE-5000)** package which provides the CPU-5000 Module, the VP-1 Vented Dress Panel, BP-3 Battery Dress Panel, one CHS-4 Chassis, interconnecting cables and instruction manuals.

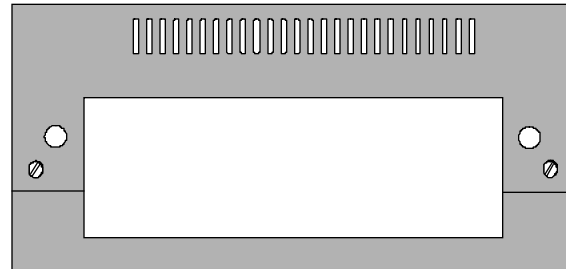
Additional components include modules and devices not provided in the Basic Equipment package. These components also include several items necessary to complete a basic system, such as the Main Power Supply, an initiating module, and cabinets. See Section One for Minimum System Requirements.

The BE-5000 Basic Equipment Package



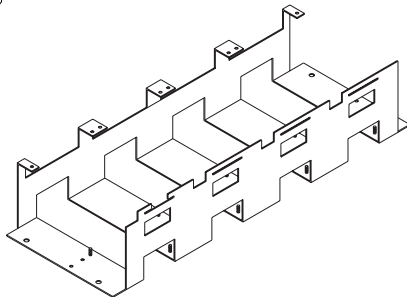
CPU-5000 Central Processor Module

This module is the heart of the System 5000. It controls and monitors the system modules and provides a full accounting of system status. In addition, the CPU contains two Notification Appliance Circuits, a Remote Signaling Municipal Tie Circuit, and Form-C alarm and trouble contacts. Field programming of the system is accomplished from this module via the use of the Programming Key. Slide-In labels for programming, control, and system operation are provided with the CPU, as well as End-of-Line and Dummy Load resistors.



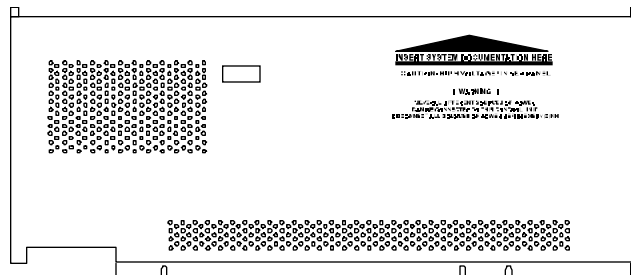
VP-1 Vented Dress Panel

Covers the top row of modules in the System 5000.



CHS-4 Chassis

For the mounting of up to four System 5000 modules or AVPS-24 Audio-Visual Power Supplies. Occupies one cabinet row.

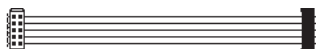


BP-3 Battery Dress Panel

Covers the MPS and the batteries in the System 5000.



Main Bell Power Harness (71093)



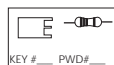
Power Ribbon (71085)



Power Harness (71086)



First-Row Ribbon Cable (71087)



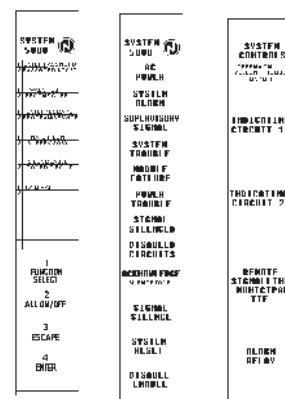
CPU Programming Key



Dummy Load Resistor 4.7K, 1/2 watt (71245)

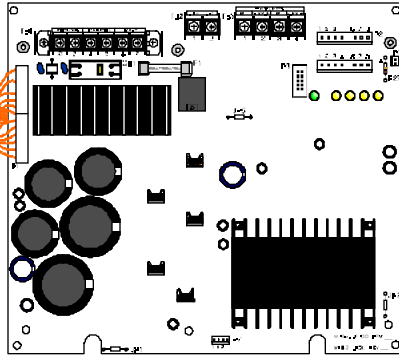


End-of-Line Resistor 4.7K, 1/2 watt (71252)



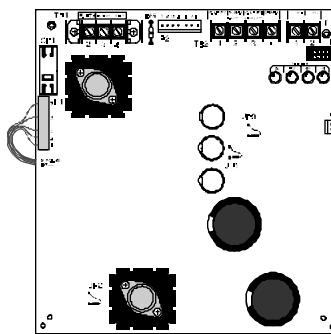
CPU Slide-in Labels

Power Supplies and Amplifiers



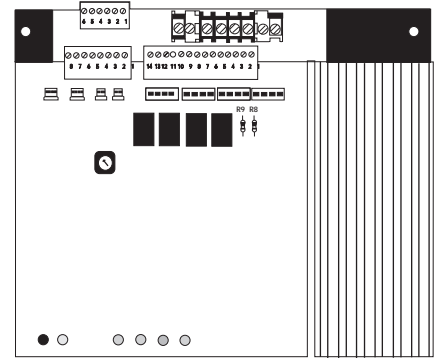
MPS-24A

The MPS-24A supplies the regulated power needed to run system modules. It also supplies up to 3 amps of regulated Notification Appliance power, permitting the use of a variety of standard UL listed 24 VDC Notification Appliances. Up to one amp of resettable power is available for four wire smoke detectors. The MPS-24A contains an integral battery charger.



MPS-24B

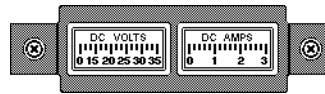
The MPS-24B supplies the regulated power needed to run System 5000 modules. It also supplies up to 2.0 amps of regulated Notification Appliance power, permitting the use of a variety of standard UL listed 24 VDC Notification Appliances (see Appendix B). Up to 200mA of resettable power is available for four wire smoke detectors. The MPS-24B contains an integral battery charger.



AA-30

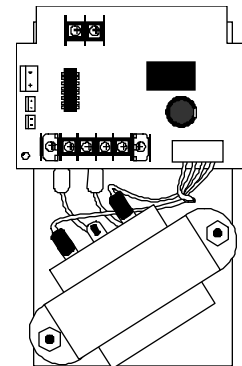
The AA-30 Audio Amplifier provides up to 30-watts of audio power for driving speaker circuits. The AA-30 amplifies the audio signal fed in from an Audio Message Generator (AMG-1) and mounts to one-half of a CHS-4L Chassis.

For more information on the AA-30, refer to the Voice Alarm System 5000 Manual.



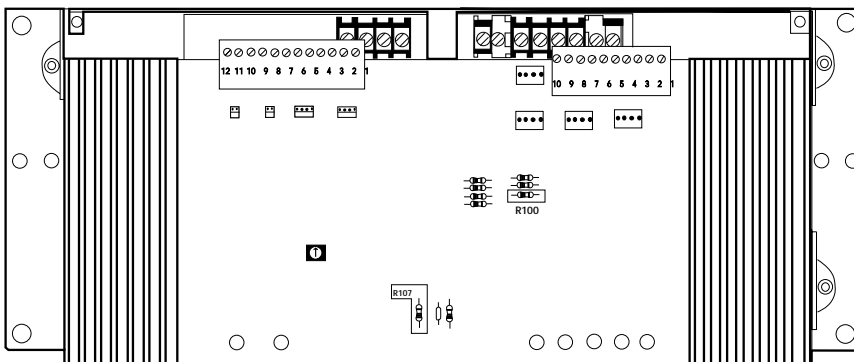
MPM-2

The Main Power Meter-2 provides a voltmeter and ammeter for the Main Power Supply (MPS-24A only).



AVPS-24

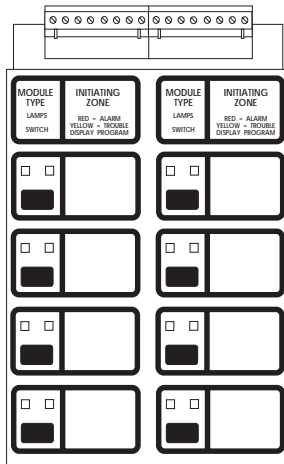
The AVPS-24 Audio/Visual Power Supply provides up to 3 amps of additional Special Purpose Power (unregulated, unfiltered) for output modules. The AVPS-24 mounts to one-fourth of a CHS-4 Chassis. In space-critical applications, the AVPS-24 can be mounted underneath system modules on the CHS-4 Chassis except for the CPU. See Appendix A for a list of compatible, UL-listed Notification Appliances.



The AA-120

The AA-120 Audio Amplifier provides 120 watts of audio power that is compatible with 25V_{RMS} speakers. Speaker zone selection is performed by Voice Control Module.

Initiating Modules



IZM-8 Initiating Zone Module

This module provides eight Style B Initiating Device Circuits. Circuits are power-limited and are user programmable for standard fire, Waterflow Alarm, Supervisory service or command inputs. Also provided are End-of-Line Resistors, Dummy Load Resistors, and Slide-In Labels.

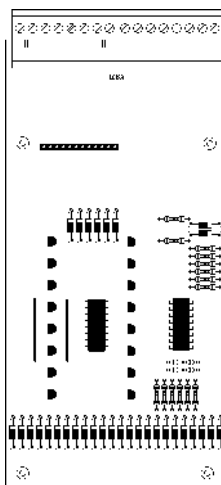


Eight 4.7K, 1/2-watt
End-of-Line Resistors



Eight 4.7K, 1/2-watt
Dummy Load Resistors

INITIATING ZONE
RED - ALARM
YELLOW - TROUBLE
LAMP SWITCH



IZE-A Initiating Zone Expander

Converts the eight Initiating Device Circuits on the Initiating Zone Module (IZM-8) for Style D operation. The expander plugs into the bottom of the IZM-8.

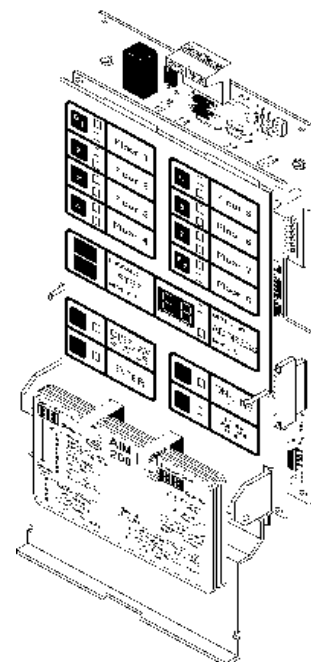
AIM-200 Addressable Intelligent Module

The AIM-200 Addressable Intelligent Module serves as an interface between the System 5000 and intelligent/addressable devices. To the CPU, the AIM-200 "looks like" an IZM-8 Initiating Zone Module. On its single SLC loop, the AIM-200 can communicate with up to 99 intelligent detectors (SDX-551, CPX-551 and FDX-551) and 99 addressable modules (MMX-1, MMX-2, MMX-101, CMX-1, CMX-2 and BGX-101L).

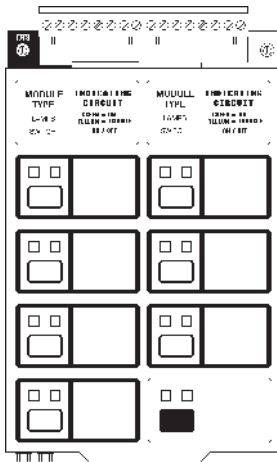
The 198 devices are "mapped" into 8 software "zones." The status of these zones is reported to the CPU. The AIM-200 includes a digital display for identifying the exact device address within a zone. The display is also used to display device types and analog detector sensitivity values.

The system can communicate up to 192 AIM points on LCD-80 or ACS annunciators when so programmed.

For more information refer to AIM Manual.

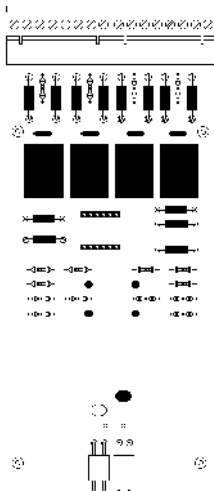


Modules



ICM-4 Indicating Circuit Module

Provides four Notification Appliance Circuits for Style Y or Style Z operation. Maximum signaling current is 3.0 amps (3 amps max per circuit). Circuits are field programmable to respond to a single initiating zone, a group of zones, or all initiating zones. Circuits feature manual ON/OFF control switches and can be disabled or enabled as needed. ELRs, Dummy Load Resistors, slide-in labels and an Auxiliary Bell Power Harness (below) are provided with each module.



ICE-4 Indicating Circuit Expander

Expands the ICM-4 to a total of 8 Notification Appliance Circuits (either Style Y or Style Z). Circuit ratings are identical to those of the ICM-4. An Auxiliary Bell Power Harness (below) is provided with each expander. The expander plugs into the bottom of the ICM-4.

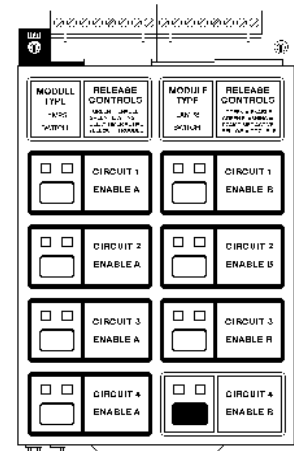


TCM-2 and TCM-4 Time Control Modules

The TCM-2 Time Control Module provides single hazard releasing device service, including a programmable delay timer, cross-zone, manual release, and abort options.

The TCM-4 Time Control Module (illustrated at right) provides four circuits for either releasing or dual-coded evacuation service.

For more information, refer to the respective time control module installation manual.



Modules

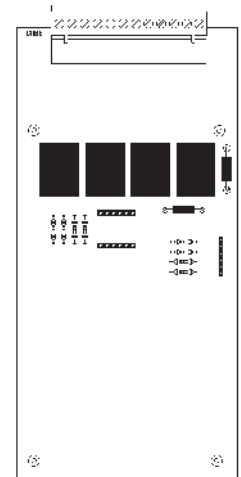


CRM-4 Control Relay Module

Provides four standard dry Form-C alarm contacts rated for 5 amps @ 120 VAC or 28 VDC (resistive). Each relay is field programmable to respond to a single Initiating Device Circuit, a group of circuits, or all Initiating Device Circuits. Each relay features manual ON/OFF control switches and can be disabled or enabled as needed. Slide-in labels are provided with each module.

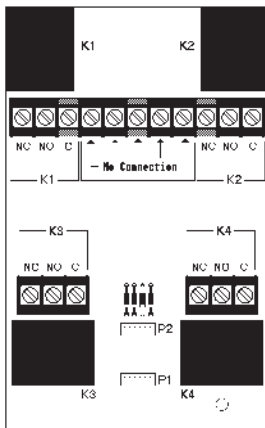
CRE-4 Control Relay Expander

Expands the capacity of the Control Relay Module (CRM-4) to eight Form-C alarm relays. Relays are identical to those on the CRM-4. The expander plugs into the bottom of the CRM-4, ICM-4, TCM-2 or TCM-4.

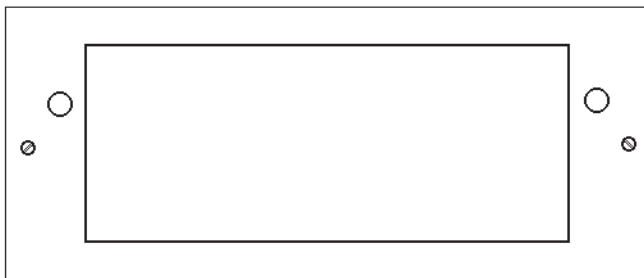


ARM-4 Auxiliary Relay Module

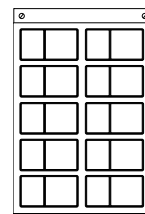
Provides four auxiliary Form-C relays that can be controlled by a relay module (CRM-4 or CRE-4). The normally-open contacts are rated for 20 amps and the normally-closed contacts are rated for 10 amps at 125 VAC and 30 VDC (resistive). The module is provided with a ribbon for connection to the driving relay module.



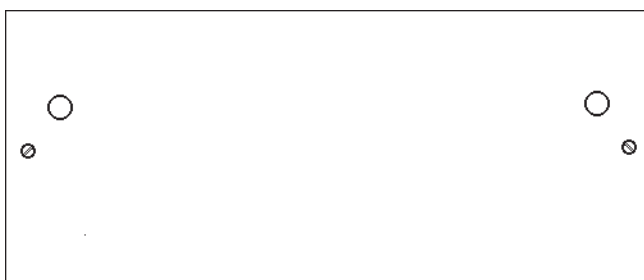
Cabinet Hardware



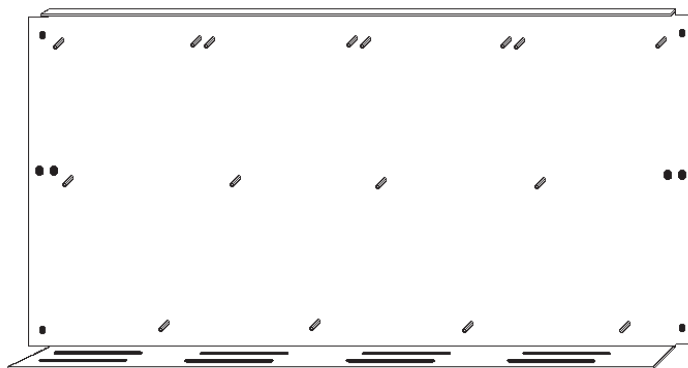
MP-1 Module Dress Panel



BM-1 Blank Module



DP-1 Blank Dress Panel



CHS-4M

Chassis/Dress Panel Assembly

For expansion beyond the first row in the cabinet. One CHS-4M is needed for each additional row of system modules. The CHS-4M includes the CHS-4 Chassis, the MP-1 Module Dress Panel, and the Expander Ribbon.

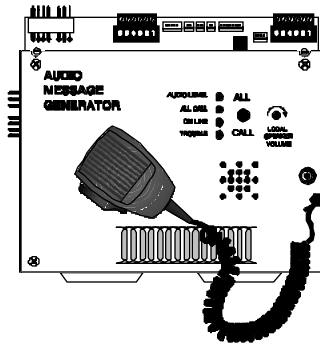
CHS-4L Chassis

The low-profile CHS-4L Chassis is used to mount AA-30 Audio Amplifiers, Audio Message Generators (AMG-1), the Fire Fighters Telephone (FFT-7), or AVPS-24 Audio Visual Power Supplies.



Expander Ribbon

Voice Evacuation Equipment



Audio Message Generator

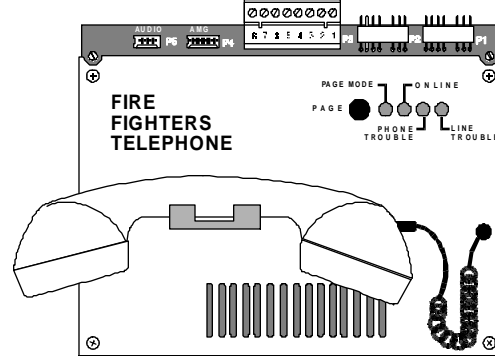
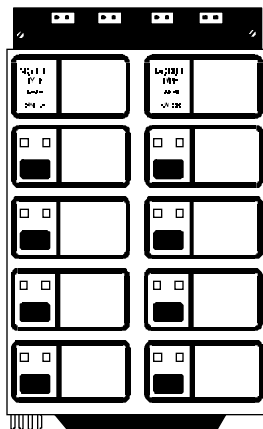
The heart of a voice evacuation system, the Audio Message Generator (AMG-1) provides a variety of tone, including a slow whoop, yelp, yeow, siren, hi/lo, or steady tone. A built-in microphone allows for paging through speaker circuits. Optionally, up to four digitally-recorded voice messages may be installed in the AMG-1. Prerecorded VROM-(n) voice messages are available from the factory, and one or two messages can be installed in the AMG-1. With optional VRAM-1 memory chips installed, up to two user-defined messages may be programmed into the AMG-1 (one per VRAM). Up to 24 seconds in length, both user-messages can be produced at the AMG-1 through the built-in microphone, or downloaded through a standard audio cassette recorder.

Audio Tone Generator

The ATG-2 Audio Tone Generator is similar to the AMG-1, but provides tones and microphone only (no message). It may provide two simultaneous tones for dual channel application.

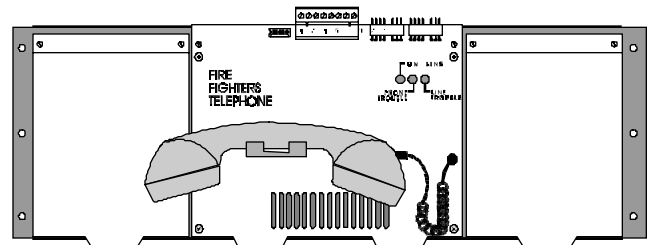
The DCM-4 Dual Channel Module

The DCM-4 Dual Channel Module provides the system with the capability to select one of two different audio sources for switching to a particular speaker circuit. Up to four circuits can be employed.



Fire Fighters Telephone

The FFT-7 Fire Fighter's Telephone provides the Voice Alarm System with fire fighter's telephone capability. With the FFT-7, up to seven telephones may conduct a simultaneous conversation.

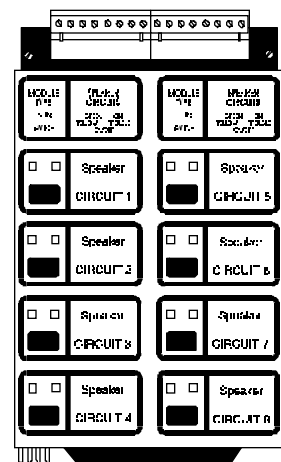


FFT-7S Fire Fighters Telephone

The FFT-7S Fire Fighter's Telephone provided with the TCC-1 basic equipment package operates like the FFT-7 without paging capabilities.

The VCM-4 Voice Control Module

The Voice Control Module-4 provides the system with up to four Style Y or Style Z speaker circuits. Moving a jumper on the VCM-4 configures the module for driving fireman's telephone circuits. When configured for telephone circuits, the VCM-4 accepts its signal directly from an FFT-7 Fire Fighters Telephone. Add an optional VCE-4 Voice Control Expander to the back of the VCM-4 to provide telephone or speaker circuits 5-8.

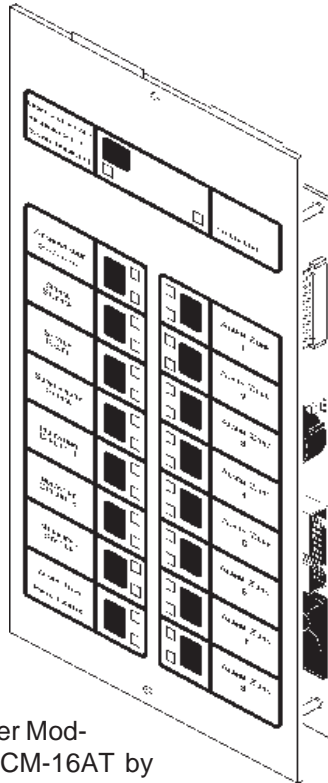


For more details on voice evacuation equipment, refer to the Voice Alarm System Manual.

Annunciator Modules

ACM-16AT

The Annunciator Control Module-16AT contains 16 red alarm and 16 yellow trouble LEDs, 16 momentary touch-pad switches for controlling each point, a system trouble LED, an ON LINE/POWER LED, and a local piezo sounder with a silence/acknowledge switch for audible indication of alarm and trouble conditions at each annunciator.

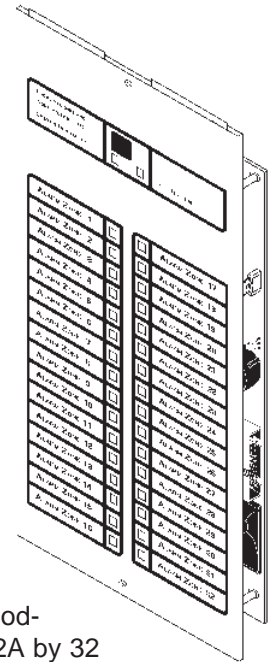


AEM-16AT

The Annunciator Expander Module-16AT expands the ACM-16AT by 16 system points. The AEM-16AT is identical in size and in frontal appearance to the ACM-16AT. One to three of these expander modules can be supported by an ACM-16AT, to a maximum of 64 system points.

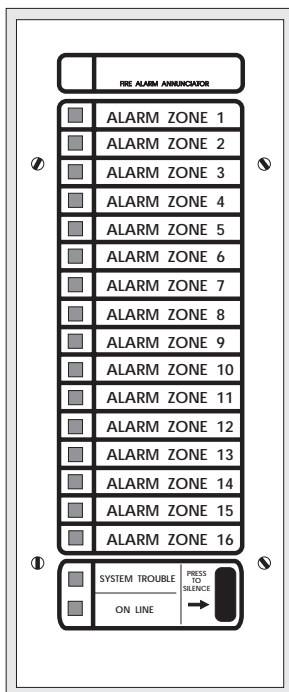
The ACM-32A

The Annunciator Control Module-32A contains 32 red alarm LEDs, a system trouble LED, an ON LINE/POWER LED, and a local piezo sounder with a silence/acknowledge switch for audible indication of alarm and trouble conditions at each annunciator.



AEM-32A

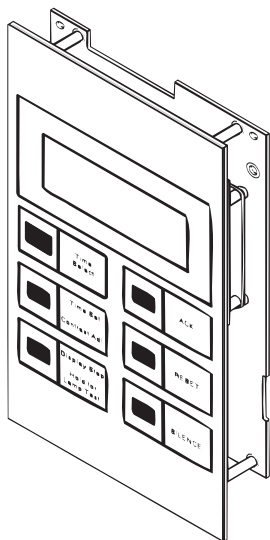
The Annunciator Expander Module-32A expands the ACM-32A by 32 system points. The AEM-32A is identical in frontal appearance to the ACM-32A. One expander module can be supported by an ACM-32A, providing a maximum of 64 points. Note: The AEM-32A cannot be used to expand the ACM-16AT.



The AFM-16A

The AFM-16A contains 16 red alarm LEDs, a System Trouble LED, an ON LINE LED, a local piezo sounder and a silence/acknowledge switch. The AFM-16A is intended for use in systems that require 16 annunciation points or less. Only one AFM-16A annunciator may be used in a system.

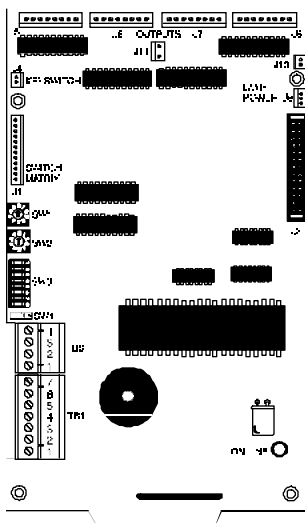
For more information on these annunciator modules, refer to the respective installation manual.



LCD-80

The LCD-80 alphanumeric annunciator display module. The LCD-80 provides a remote or local digital display and a printer interface.

- 80-character LCD display backlights under normal & alarm conditions.
- Control switches for Acknowledge, Signal Silence and System Reset.
- Time/date display field.
- ABF-1 package with key switch & phone jack options.
- Mounts up to 6000 feet from the panel.
- Local piezo sounder with alarm/trouble resound.



The LDM-32

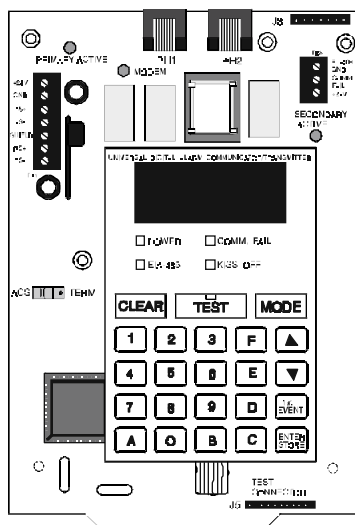
The LDM-32 Lamp Driver Annunciator Module provides 32 alarm lamp driver outputs for connection to a custom graphic annunciator. The LDM-32 can be alternately selected via a DIP switch for 16 alarm, 16 trouble and 16 switch inputs for control of such system functions as signal silence and system reset. The LDM-32 mounts to a CHS-4L Chassis or to a custom backbox.

The LDM-E32

The Lamp Driver Annunciator Expander Module LDM-E32 expands the LDM-32 by 32 system points (maximum of 64 points).

The LDM-R32

The LDM-R32 Relay Expander Module LDM-R32 provides the LDM-32 or LDM-E32 with 32 dry Form-A (normally open) contacts. The relay module serves as a slave of the particular lamp driver annunciator to which it is connected. A power-limited power supply must be used.



The UDACT

The Universal Digital Alarm Communicator/Transmitter may be used with the System 5000 to transmit status to UL listed Central Station Receivers via the public switched telephone network. The UDACT mounts externally in a separate enclosure. EIA-485 annunciator communications bus and 24-volt (nominal) connections are required.

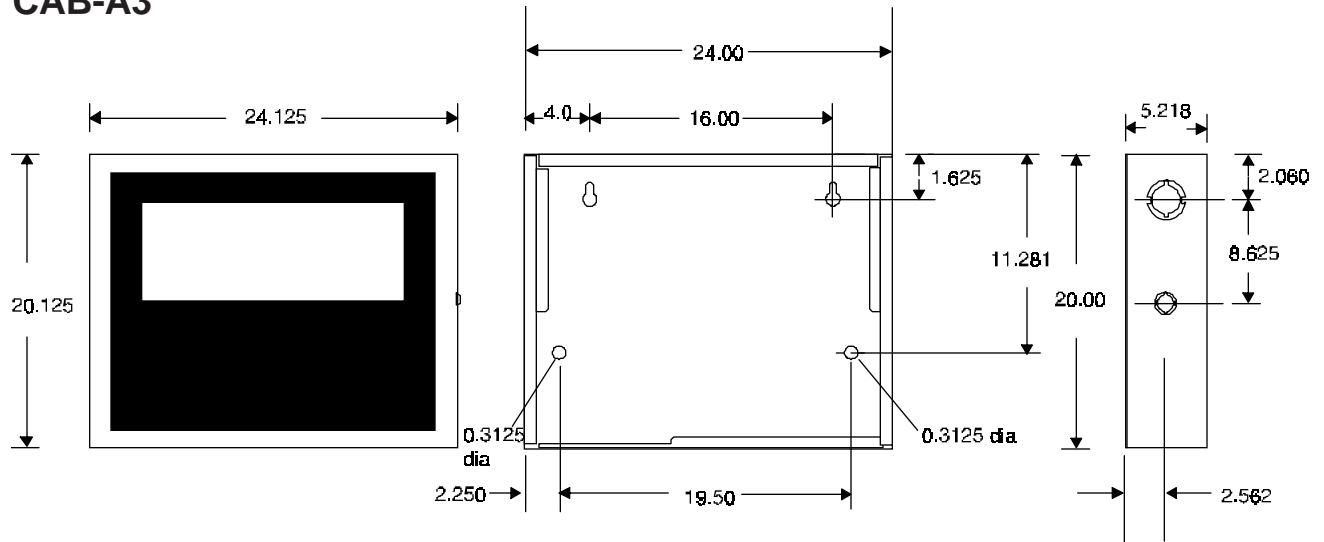
For more details refer to the respective manual.

Cabinets

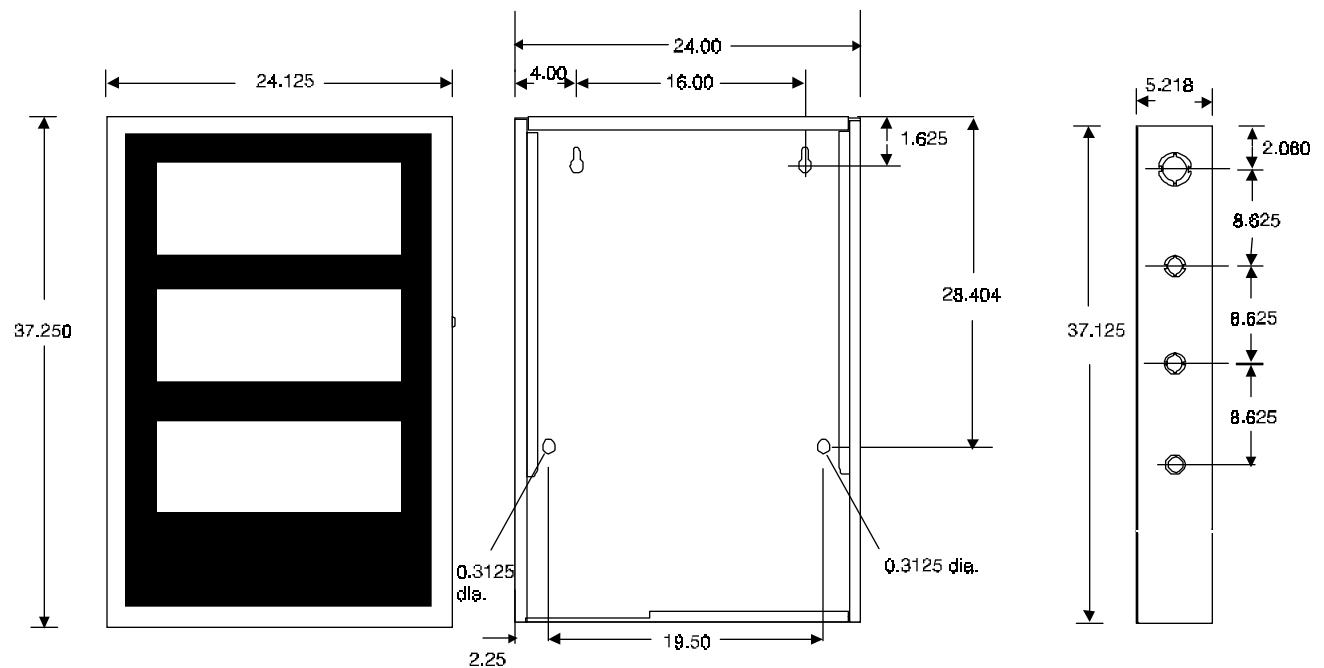
Cabinets CAB-A3, B3, C3 and D3

The CAB-A3, B3, C3 and D3-size cabinet assemblies consist of a backbox and a locking door with two keys. The backbox and door can be ordered separately or as a complete package. Doors may be hinged right or left. A semi-flush trim ring kit is available for each box size.

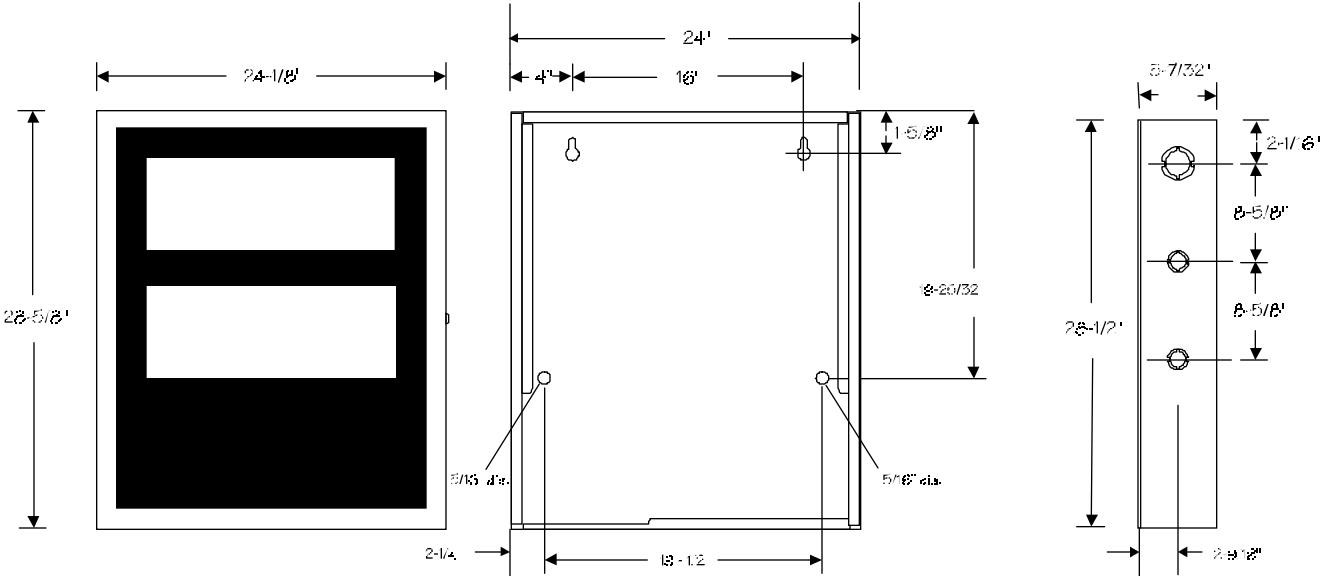
CAB-A3



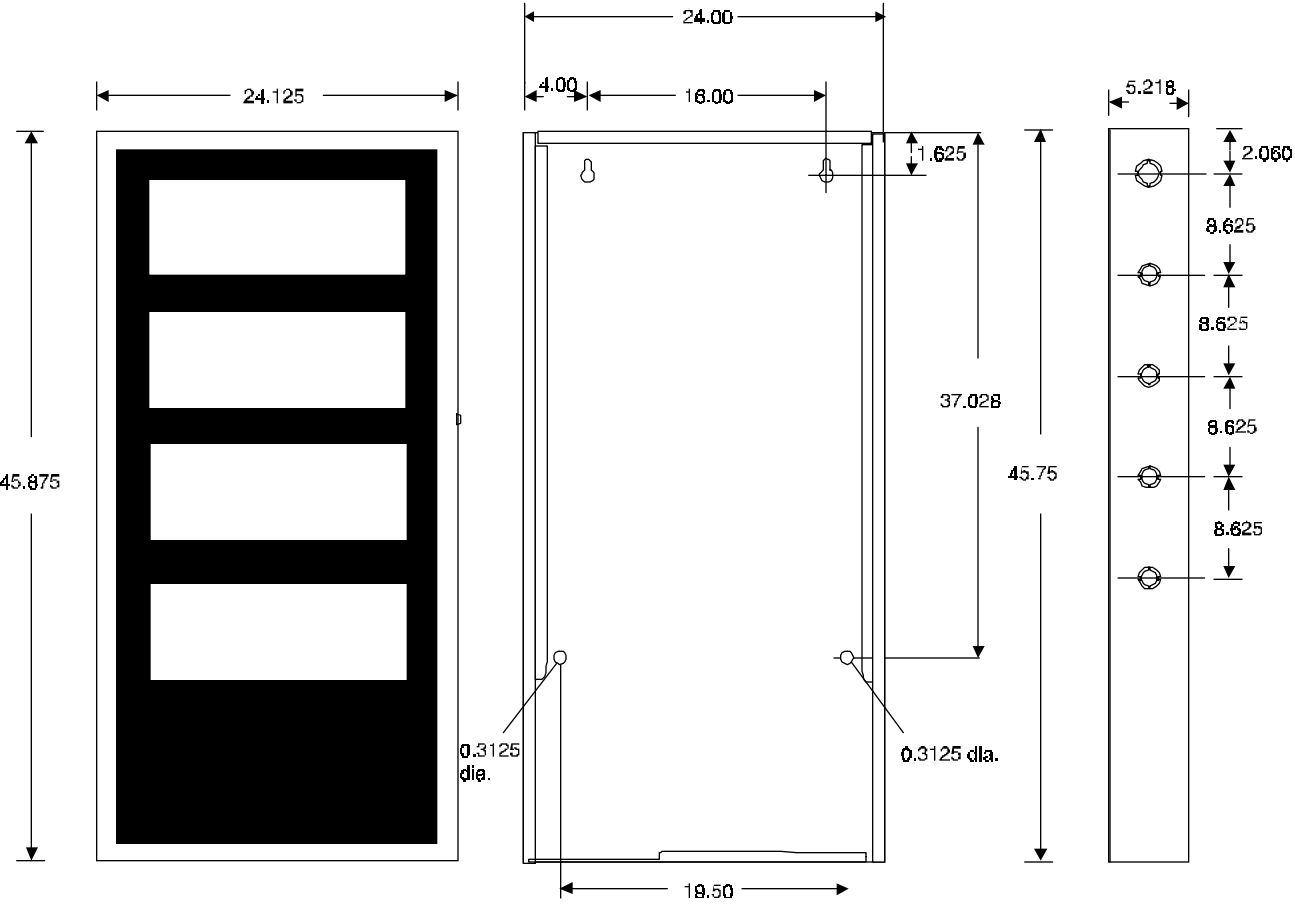
CAB-C3



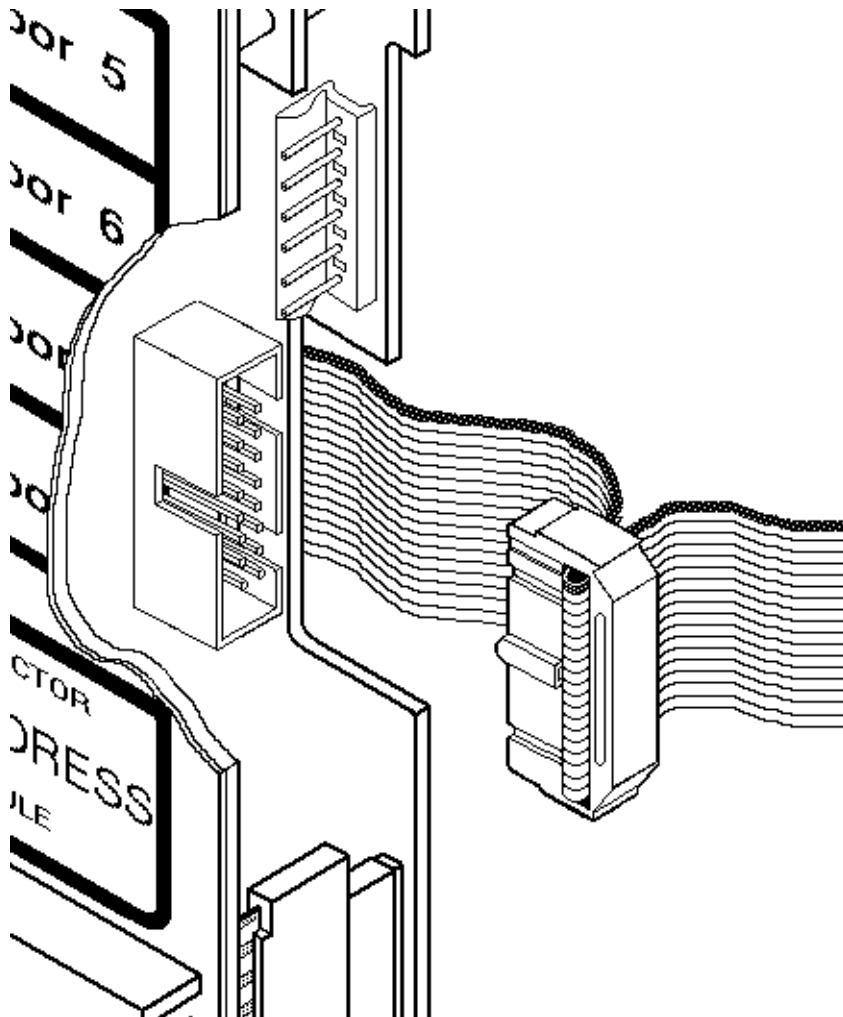
CAB-B3



CAB-D3



Section Three: Installation



Modules in the system communicate with the CPU through a common ribbon cable connection.

Installation Outline

The following procedure outlines the installation and field wiring of the system's modules and refers to illustrations in Sections 3, 4 and 5. This procedure, and its diagrams and instructions, must be followed closely to avoid damage to the control panel and its associated equipment. To a great extent, reliability depends upon proper installation and maintenance.

3.1 Cabinet - Mount the cabinet and draw all field wiring through the knockouts provided. Ensure that the cabinet is properly grounded to earth.

NOTE: If the door is to be hung on the left side, mount door hardware now. The MPS rests on the lower door mount.

NOTE: Do not draw wiring into the bottom 9 inches of the cabinet or conflict with the power supply and batteries may result.

3.2 Chassis - Mount all chassis. Refer to Figures 3-1 for installation of the CHS-4 and CHS-4L chassis.

3.3 Main Power Supply - Mount the Main Power Supply to the cabinet as illustrated in Figure 3-3. *Do not wire anything at this time!*

3.4 Audio Visual Supplies - If any optional Audio Visual Power Supplies (AVPS-24) are to be employed, mount them to the chassis. Refer to Figure 3-2 for mounting of the AVPS-24 to the CHS-4.

3.5 Audio Visual Cables - Connect the AVPS Trouble Cable(s). Connect the Auxiliary Bell Power Harness to the AVPS-24. Refer to Figure 5-7 to connect these cables.

3.6 Auxiliary Relay Modules - If any optional Auxiliary Relay Modules (ARM-4) are to be employed, mount them to the chassis as illustrated in Figure 3-4.

3.7 Preliminary System Wiring - The Main Power Supply and any AVPS-24s or ARM-4s should be wired at this time while their terminals are readily accessible. Refer to Section Five to wire the Main Power Supply, the AVPS-24s (see Figure 5-7) and any ARM-4s (see Figure 4-1).

3.8 Module Ribbon Cables - Connect the 1st Row Ribbon Cable to the CPU as illustrated in Figure 3-5. For each additional row of modules installed in the cabinet, connect an Expander Row Ribbon Cable to the CPU.

3.9 CPU-5000 - Install the CPU module in the top left cabinet position as illustrated in Figure 3-8. Connect the Power Ribbon and Power Harness between the CPU and the Main Power Supply as illustrated in the respective figure in Section Four.

3.10 Module Expander Boards - If optional expanders are to be used with a module, install as illustrated in Figure 3-6.

3.11 Modules - Mount each module in its respective chassis position as shown in Figure 3-7.

3.12 Field-wire each module, using the following figures for reference:

CPU-5000 Figures 4-2 and 4-3.

IZM-8 (Style B) Figure 4-4.

IZM-8 (Style D) Figure 4-5.

ICM-4/ICE-4 Figure 4-6.

CRM-4/CRE-4 Figure 4-7.

For the following devices, refer to their respective installation manual:

TCM-2

TCM-4

LCD-80

UZC-256

ACM Series

AIM-200

AFM Series

NIB-96

ACM-8R

UDACT

911A

VCM-4/VCE-4, DCM-4, AMG-1, FFT-7 and AA-30:
For installation and field wiring of voice alarm equipment, refer to the Voice Alarm System 5000 Manual.

3.13 Power-on-check - Apply AC power to the system. *Do not connect the batteries at this time!* To silence the audible trouble sounder, push the ACKNOWLEDGE switch on the CPU. The system should reflect the following status:

On the CPU

- * Green AC POWER indicator is on.
- * SYSTEM TROUBLE and POWER FAILURE indicators will be on due to the absence of batteries.

* ANNUNCIATOR or MODULE TROUBLE indicator may light shortly after AC power is applied (applies only to a system that has not been previously configured).

On each module

* The yellow trouble indicators may come on approximately 10 seconds after AC power is applied (applies only to a system that has not been previously configured).

On each AVPS-24

* The yellow trouble indicators will light due to the absence of batteries.

On the MPS

* The BATTERY FAIL indicator will be on due to the absence of batteries.

Failure of the AC POWER indicator, or the presence of indications not mentioned above may suggest an installation problem. Carefully review the installation instructions to isolate the source.

3.14 Programming - To configure and program the system for operation, refer to the Field Programming Manual.

3.15 Batteries - Once the system has been programmed and is functional, connect the batteries. Ensure that all indicators except AC POWER are extinguished.

3.16 Testing - Fully field test the system by conducting the test procedure in Section Seven.

3.17 Dress Panels - Complete the installation by installing the cabinet door first, followed by the Battery Dress Panel (BP-3), and finally, installing all remaining dress panels (VP-1, DP-1, and the MP-1).

Connect grounding cable between
MPS earth ground terminals and at
least one chassis.

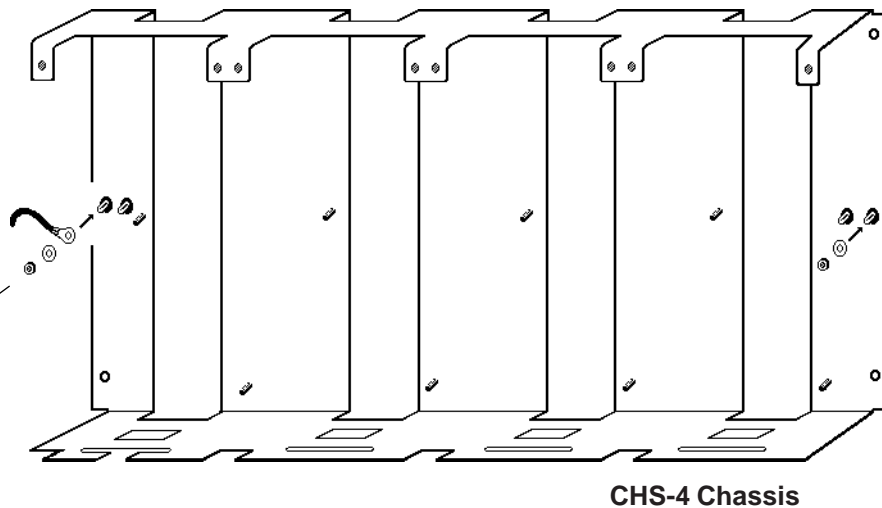
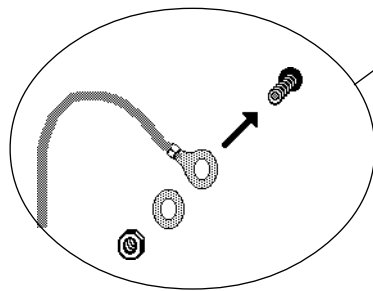


Figure 3-1: Installing the CHS-4 Chassis

To install a CHS-4, place it over the screw mounts on the cabinet. Connect a Grounding Cable Assembly (71033) to one of the screw mounts. Secure the assembly with two nuts provided. Repeat for each CHS-4 in the cabinet.

The optional CHS-4L chassis is used to mount an AMG-1 Audio Message Generator, FFT-7 Fire Fighters Telephone, or AA-30 Audio Amplifiers in the cabinet. To install a CHS-4L, place it over the screw mounts on the cabinet. Connect a Grounding Cable Assembly (71033) to one of the screw mounts. Secure the assembly with two nuts provided. Repeat for each CHS-4L in the cabinet.

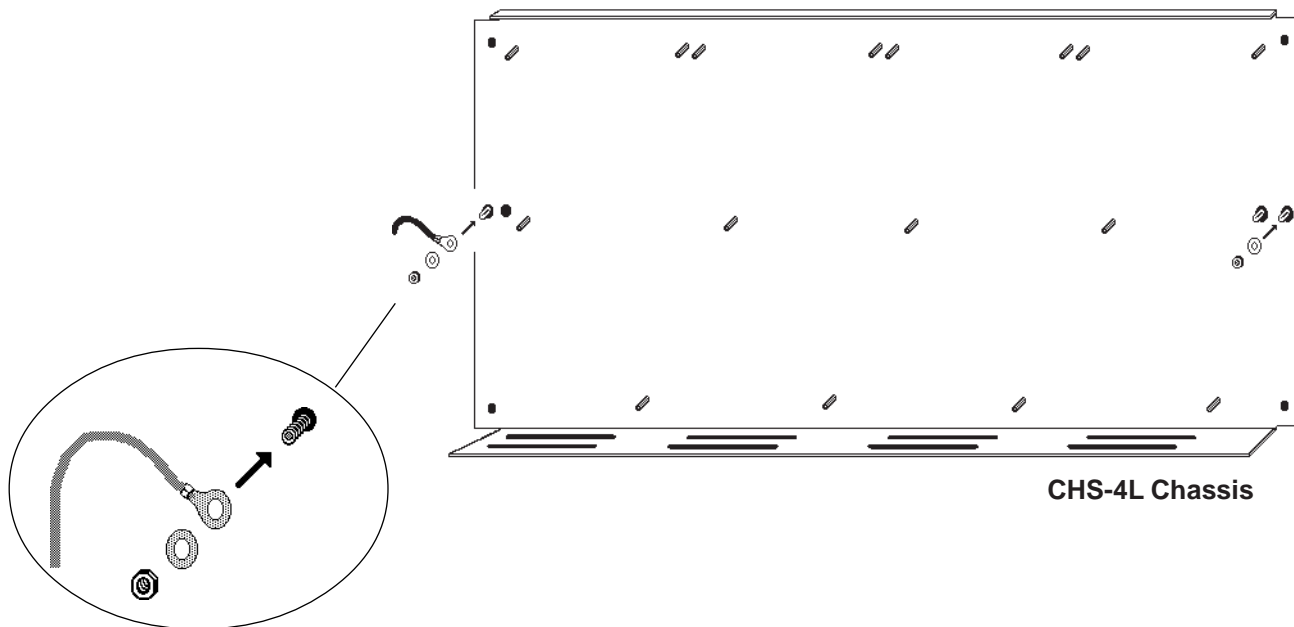


Figure 3-2a: Installing the RS-1459

Install RS-1459 over any two unused screw mounts on the CHS-4, or CHS-4L using the supplied standoffs and secure with two nuts. Refer to Figure 4-2 for wiring information.

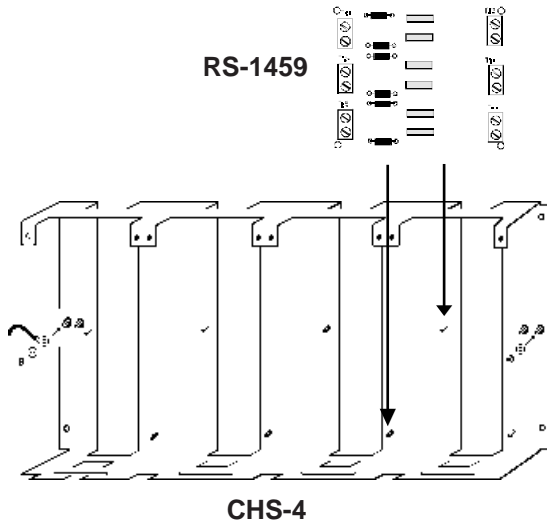
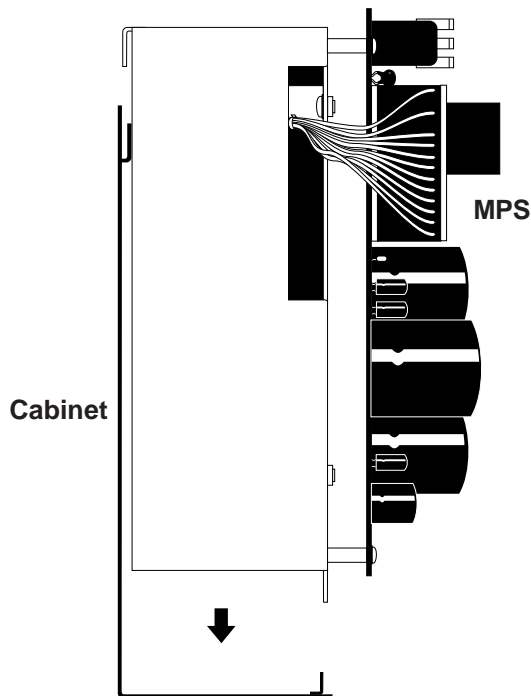
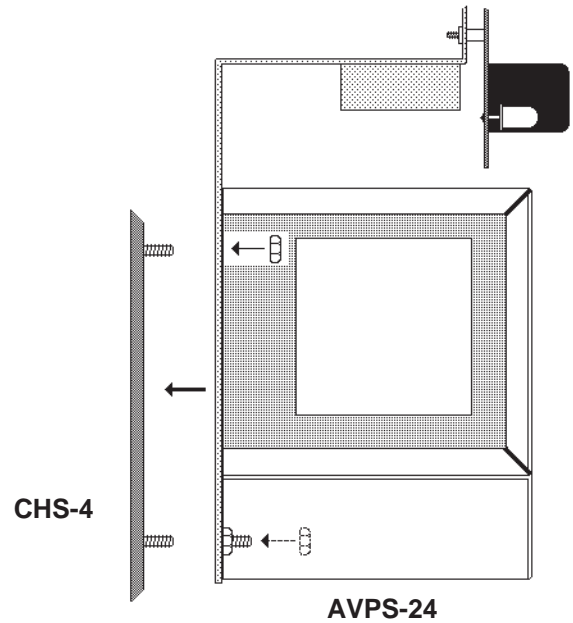


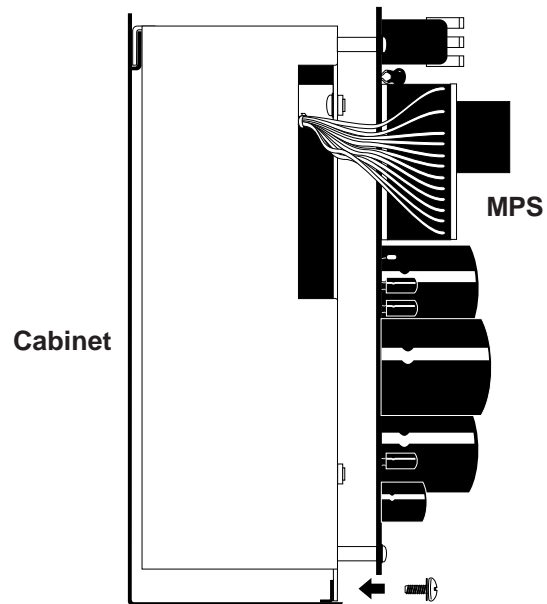
Figure 3-2b: Installing the AVPS-24

Install AVPS-24 over the screw mounts on the CHS-4, or CHS-4L and secure with two nuts.



Step 1

Place the MPS into the cabinet, ensuring that the upper bracket engages the support bracket on the cabinet.



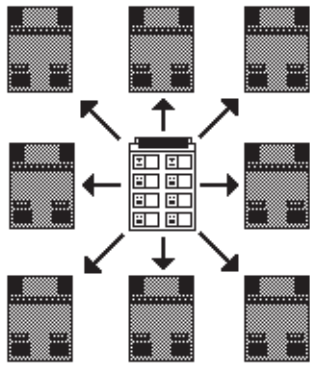
Step 2

Secure the bottom of the MPS to the bottom cabinet support with the two screws provided. (One screw for MPS-24B)

Figure 3-3: Mounting the Main Power Supply in the Cabinet

Step 1:

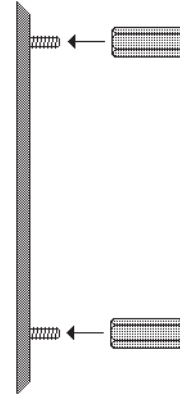
Select a position on the chassis for the ARM-4:



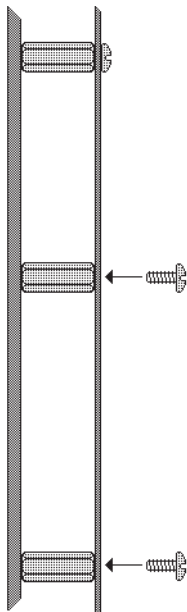
The module can be driven by either a CRM-4 or a CRE-4. It can be placed against the chassis in any one of eight positions relative to the CRM-4 or CRE-4 as illustrated at left. The ARM can also be installed directly underneath the CRM-4 or CRE-4. One ARM-4 can support one CRM-4 OR one CRE-4. If

auxiliary relays for both modules are desired, two ARM-4s, mounted in separate positions, will be needed.

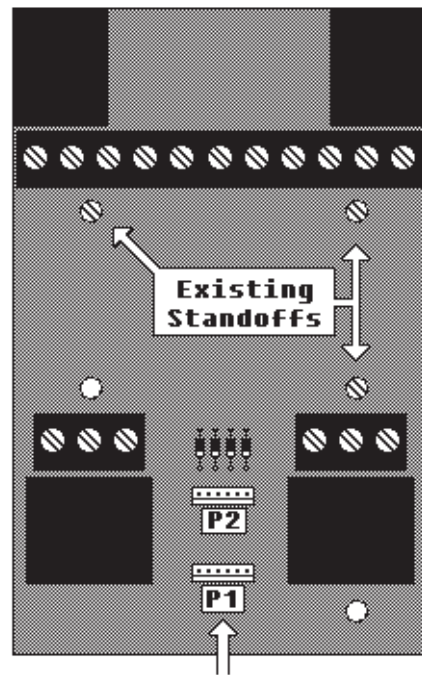
NOTE: For ease of installation and service, mount the ARM-4 in a dedicated position on the chassis (if available) with no module or expander board above it.

**Step 2:**

Secure the two loose standoffs to the screw mounts on the chassis at the desired location for the ARM-4. Ensure that the existing standoffs are installed in the locations illustrated in STEP 4.

**Step 3:**

Position the ARM-4 over the standoffs on the chassis and fasten with two remaining screws.

**Step 4:**

Complete the installation of the ARM-4:

Connect one end of the ARM Ribbon Cable to Plug P1 on the ARM-4. Connect the other end of the cable to Jumper JP5 on the CRM-4 or CRE-4 employed to drive the ARM-4.

Figure 3-4: Mounting the ARM-4 Auxiliary Relay Module

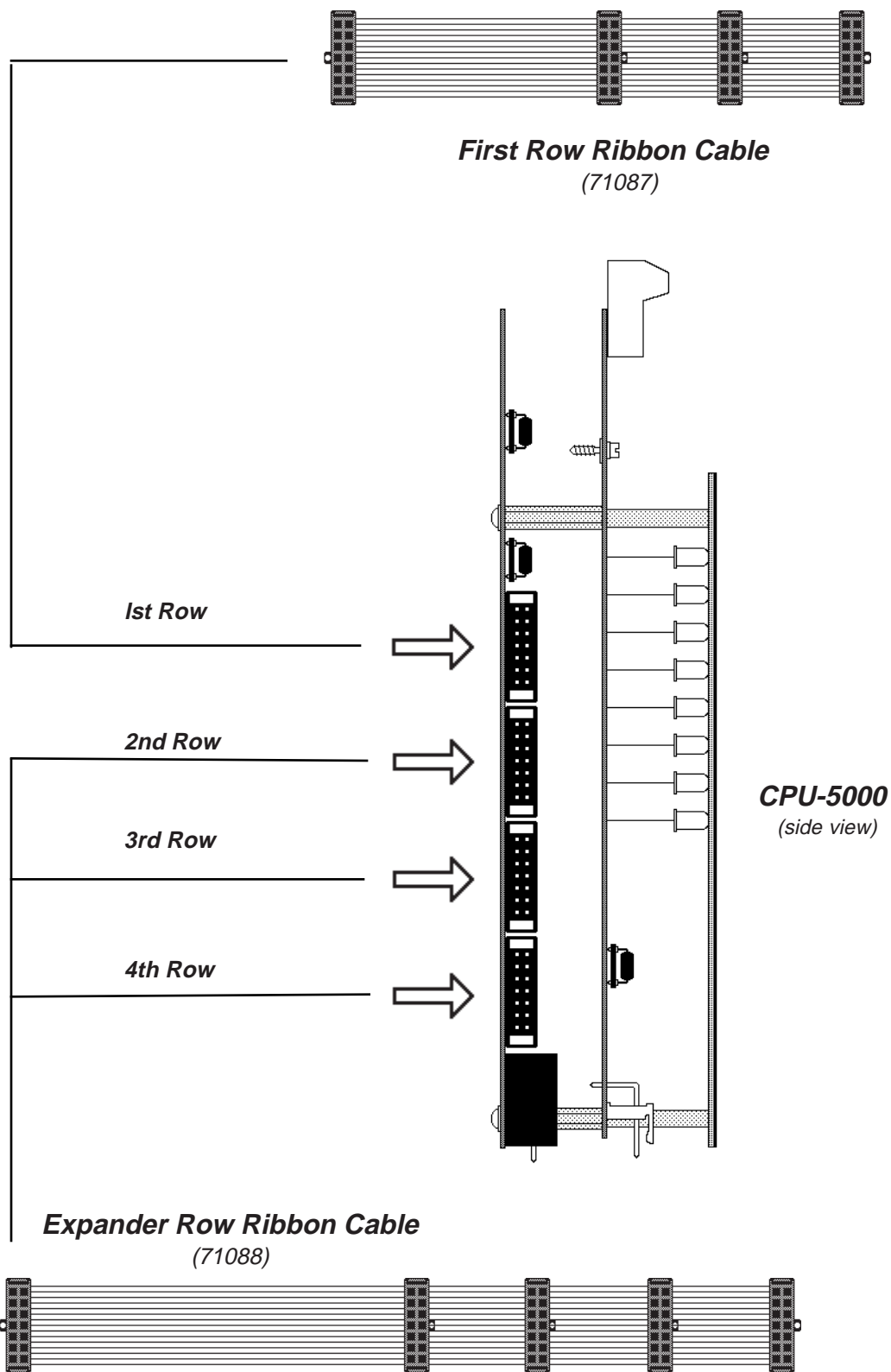


Figure 3-5: Connecting Row Ribbon Cables to the CPU-5000

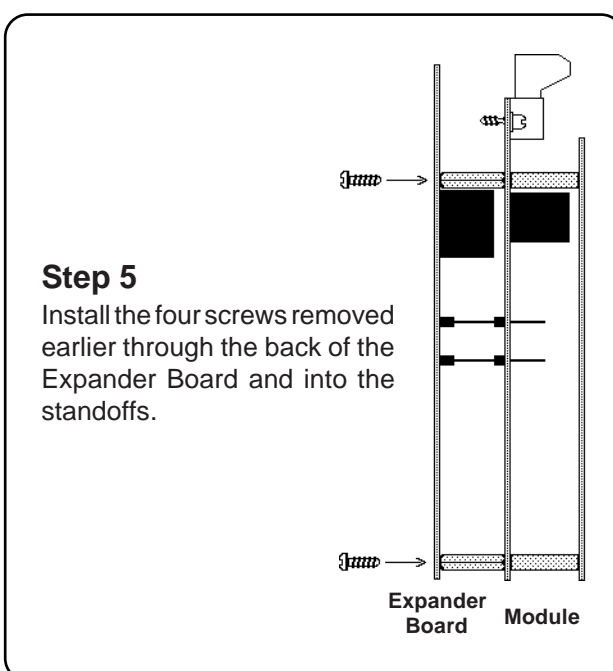
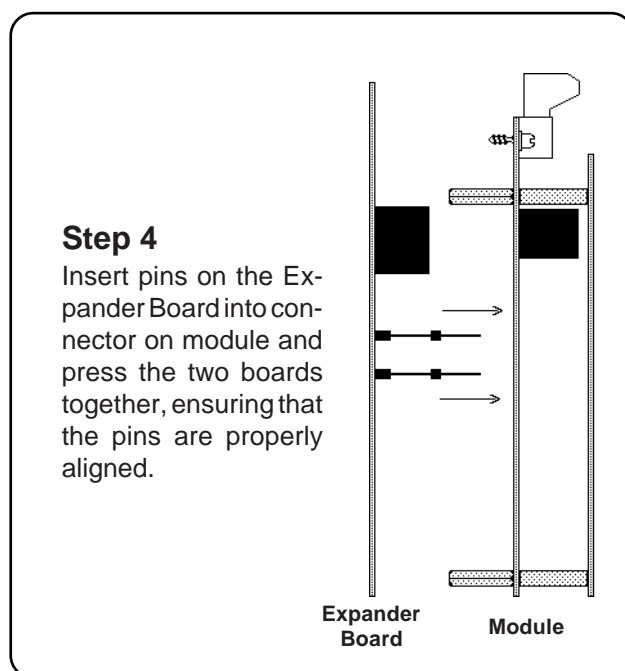
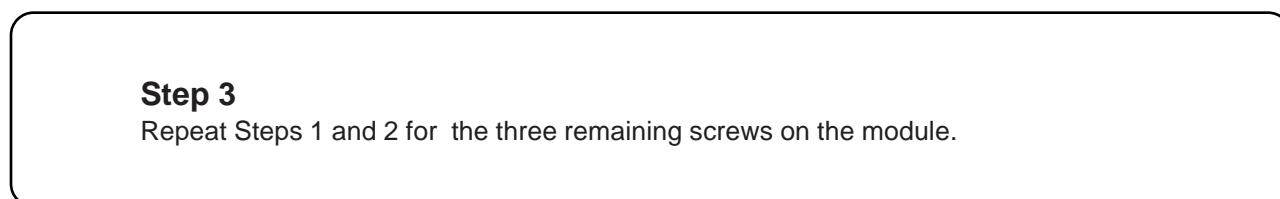
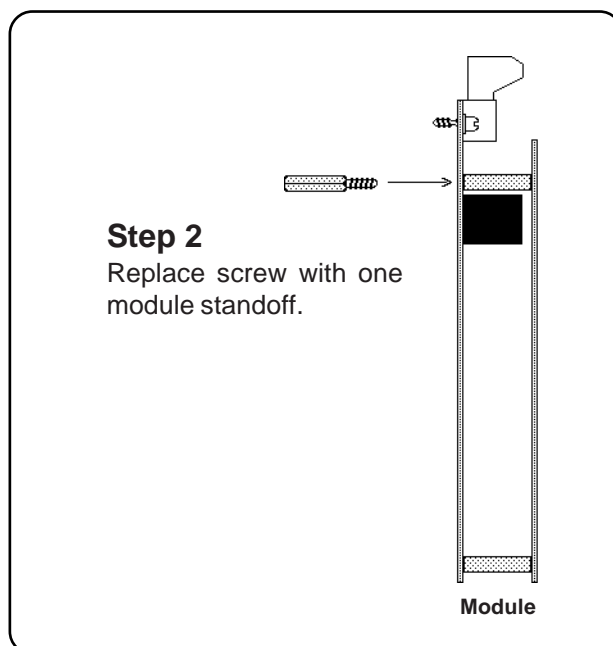
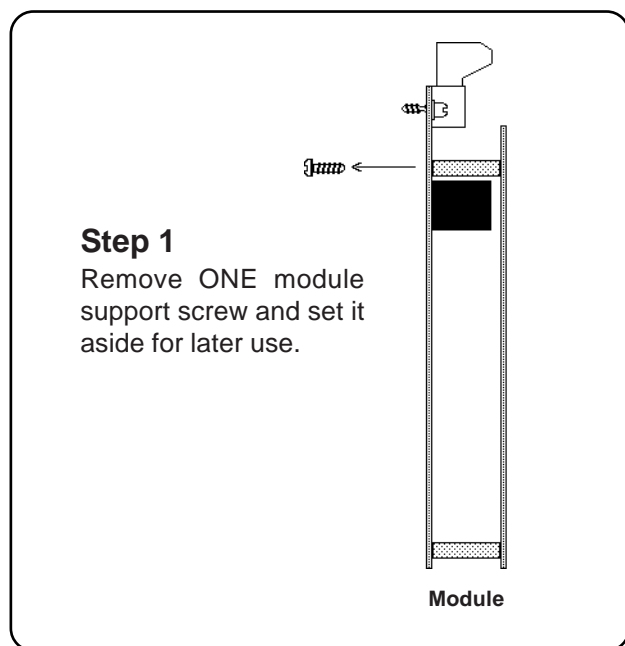


Figure 3-6: Mounting Optional Module Expanders

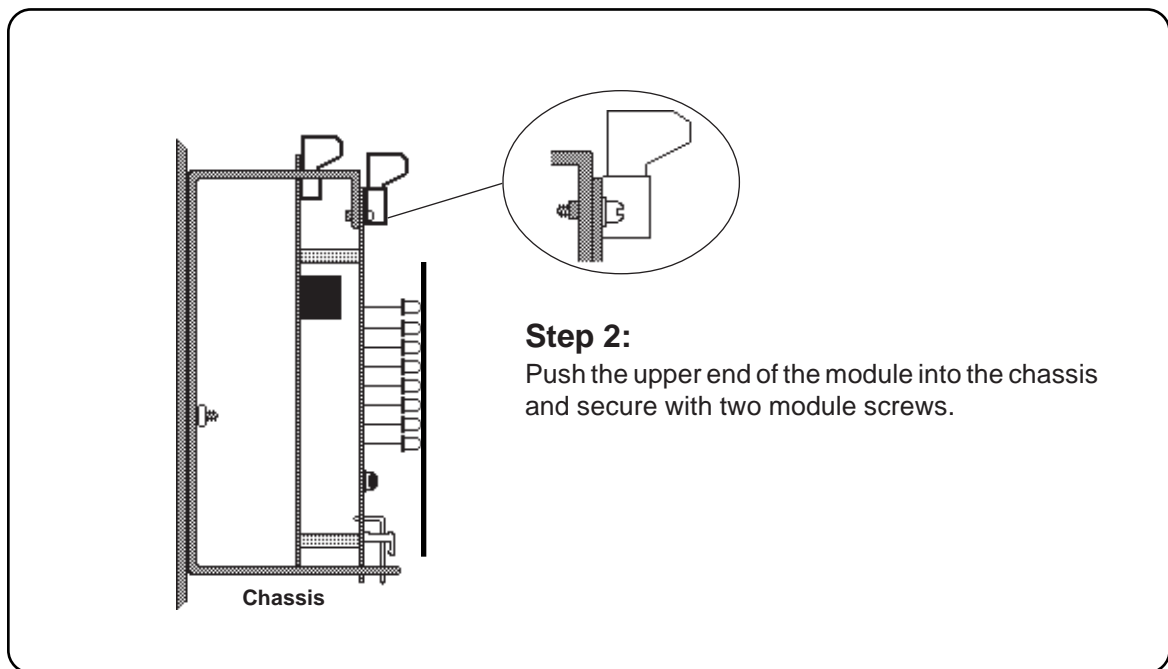
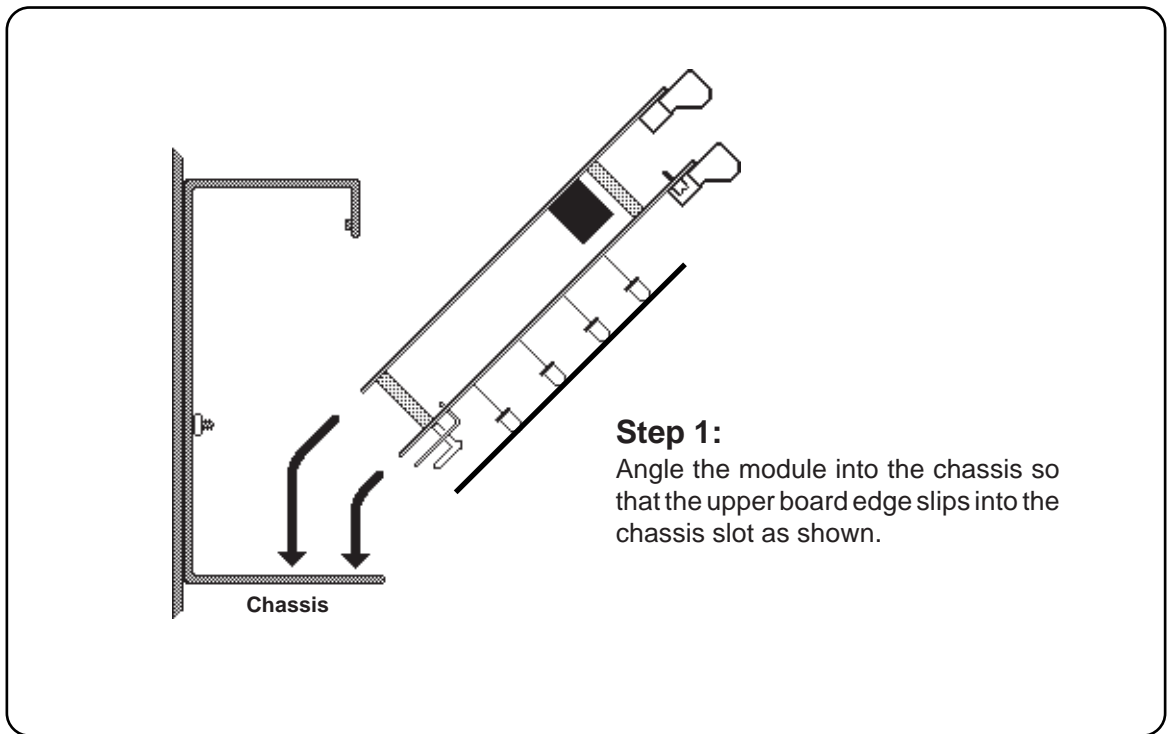


Figure 3-7: Mounting Modules in the Chassis

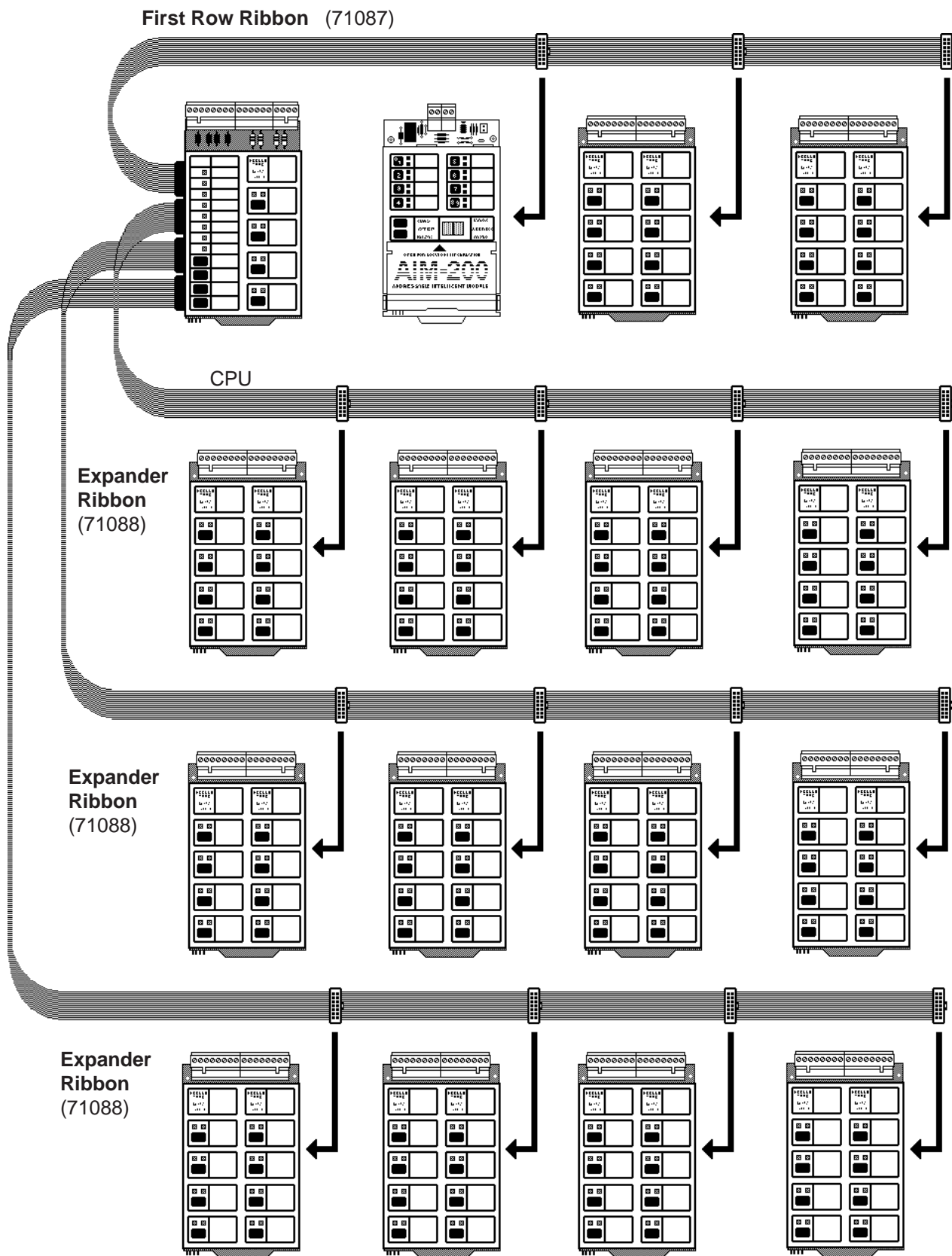
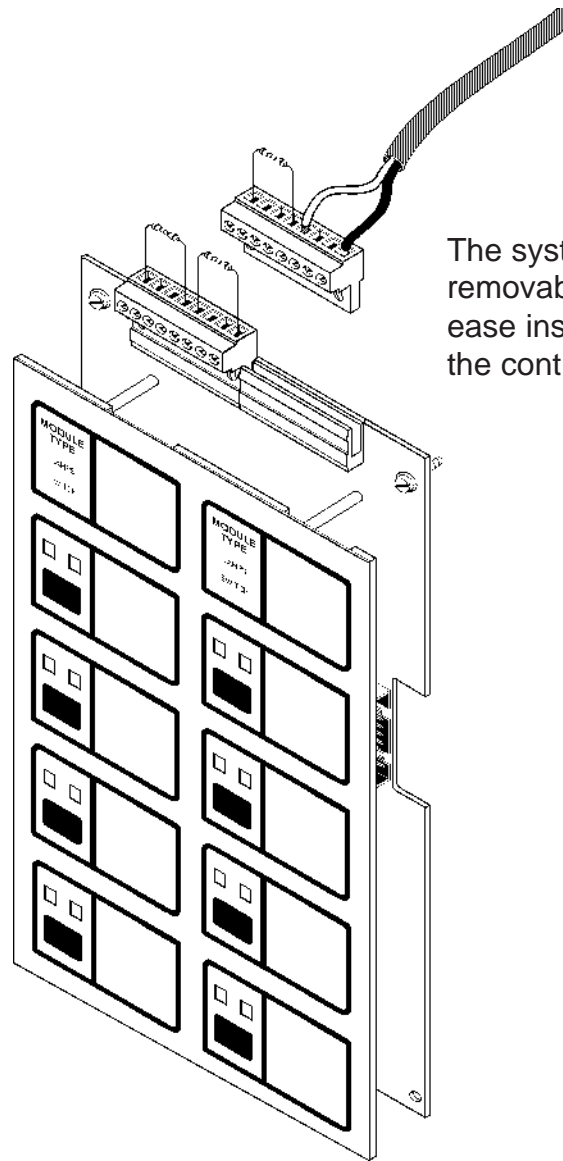


Figure 3-9: Connecting Row Ribbon Cables to Modules

Section Four: Field Wiring the Modules



The system's modules feature removable terminal blocks that ease installation and servicing of the control panel.

Section 4.1: UL Power-limited Wiring Requirements

Power-limited and nonpower-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25" away from any nonpower-limited circuit wiring. Furthermore, all power-limited and nonpower-limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. A typical wiring diagram for the System 5000 is shown below.

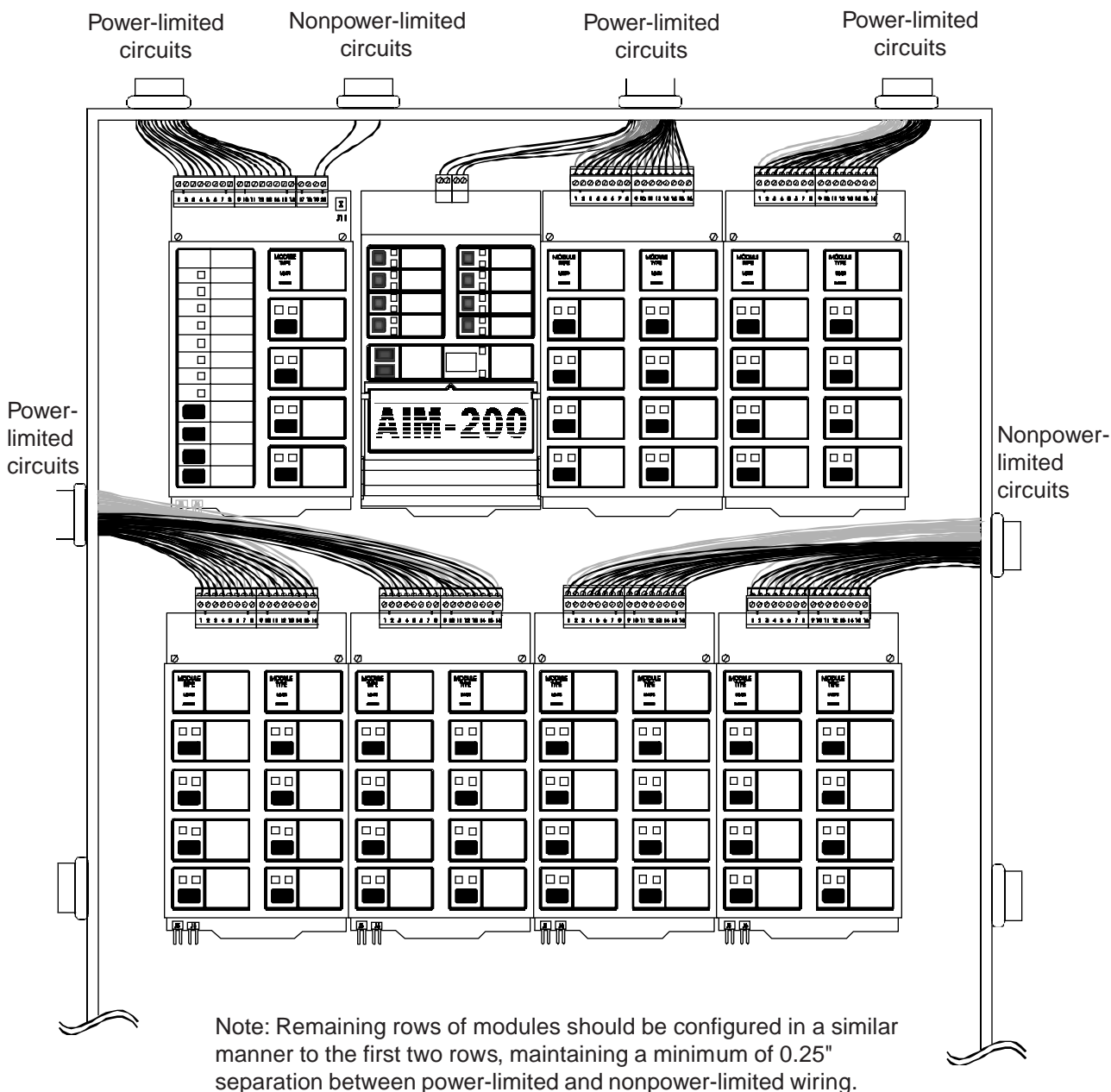


Figure 4-1: Typical Wiring Diagram for UL Power-limited Wiring Requirements

Section 4.2: UL Power-limited Wiring Requirements - Power Supplies

The diagram below shows a typical System 5000 installation and is provided as a guide for proper wiring placement. The AC and battery wiring are not power-limited. A separation of at least 0.25" must be maintained between power-limited and nonpower-limited wiring. Install the tie wraps and adhesive squares as indicated below.

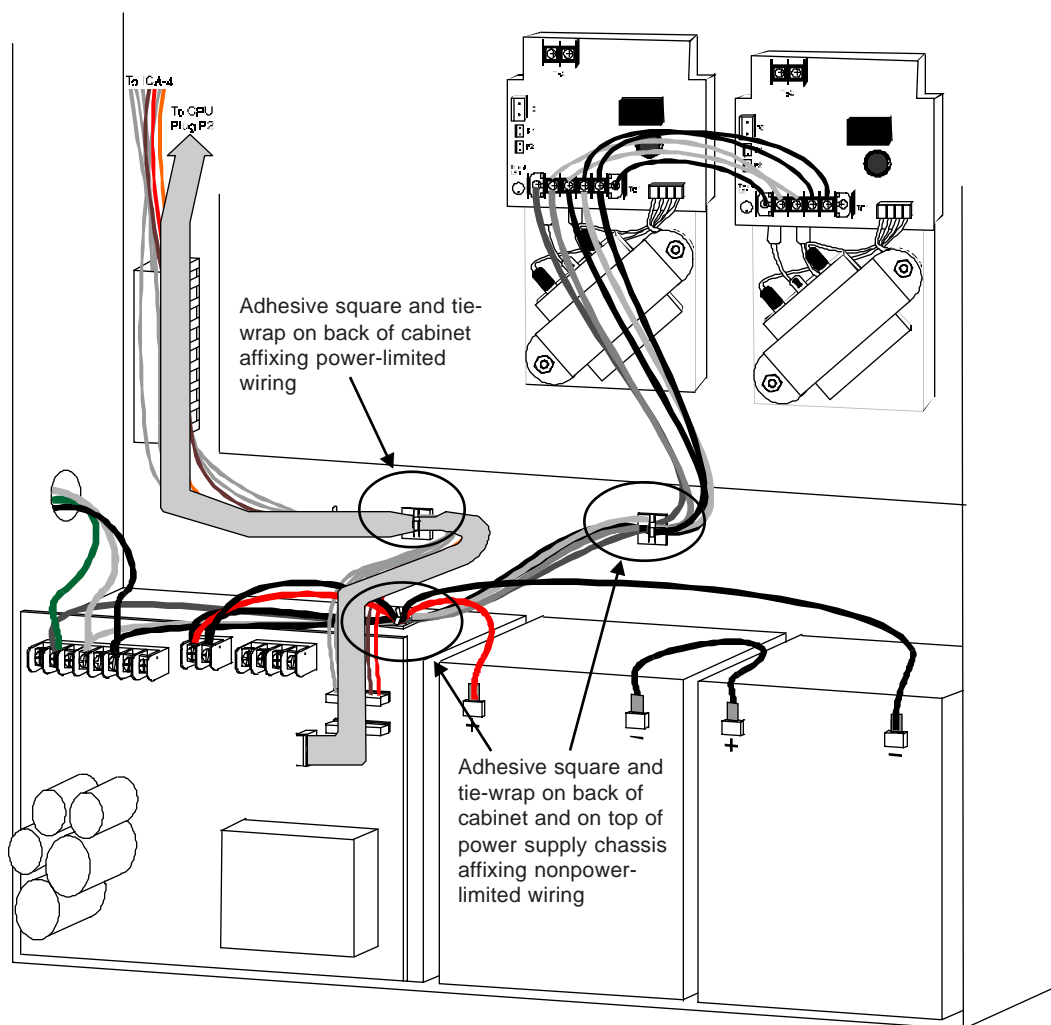
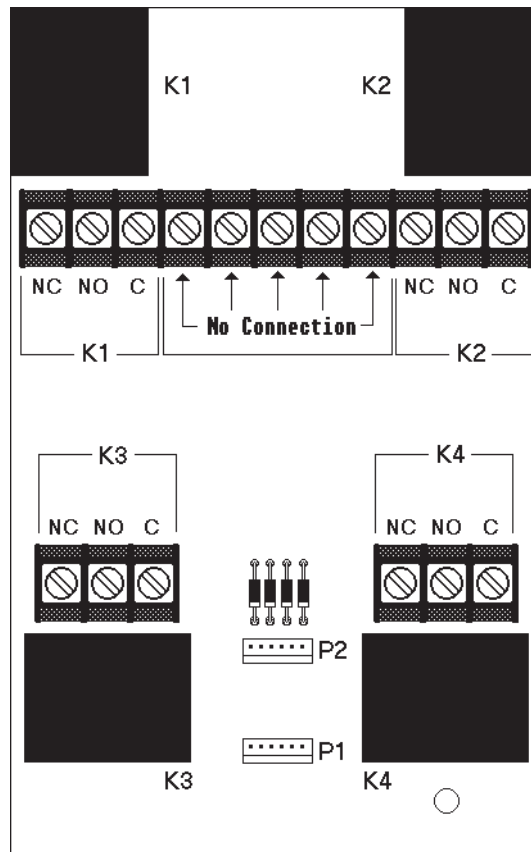


Figure 4-2: Power-limited and Nonpower-limited Wiring for Power Supplies



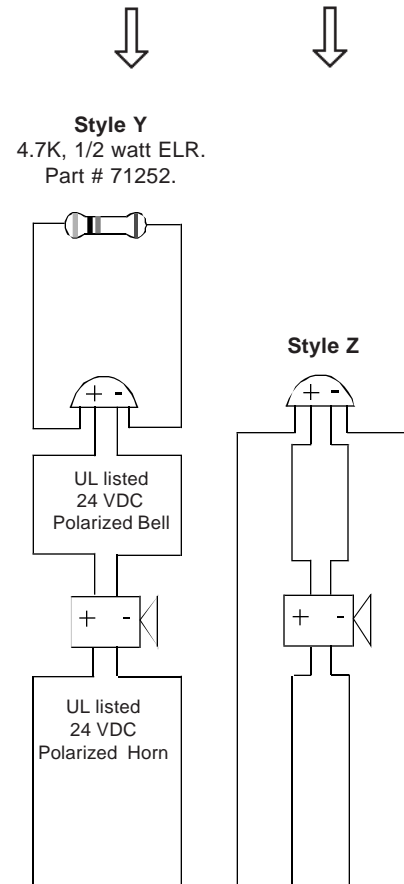
<i>Resistive Load</i>	<i>Contacts N.O. N.C.</i>	
<i>125 VAC 30 VDC</i>	<i>20A</i>	<i>10A</i>
	<i>20A</i>	<i>10A</i>
<i>Contact Ratings</i>		

Figure 4-3: Terminal Assignments for Module Control of the ARM-4 Auxiliary Relay Module

Figure 4-4: Field Wiring the CPU-5000

Typical Supervised, Power-limited Notification Appliance Circuits

Use only UL-listed Notification Appliances (see Appendix A). Wire devices according to the manufacturer's instructions. Maximum current per circuit is 3.0 amps.

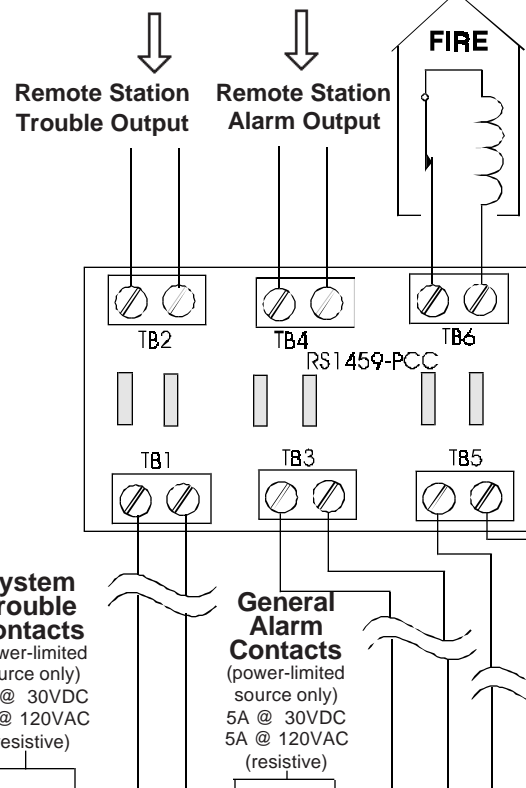


Non-Supervised, Power-limited Remote Station Outputs

Standby polarity shown

24 volts DC (nominal). Power-limited, 10 mA maximum rated current. Internal resistance = 1360 ohms (nominal)

Intended for connection to the polarity reversal circuit of a remote station receiving unit having compatible ratings (see Fire-Lite model RS-82).



Municipal Box Ratings (nonpower-limited)

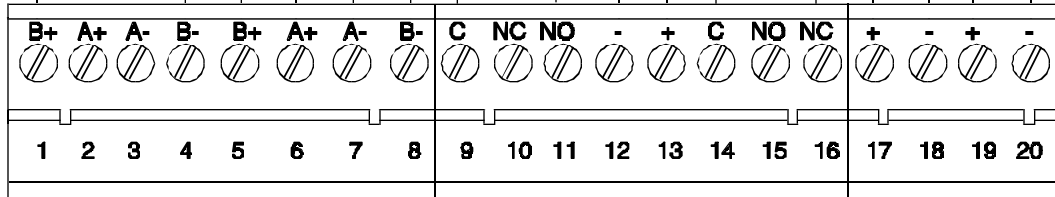
- 1) Trip current = 0.25 Amperes (min)
- 2) Coil voltage = 3.65 VDC (min)
- 3) Coil resistance = 14.6 ohms (max)

4.7K, 1/2 watt ELR. must be placed across this circuit if there is no transmitter connected

Municipal box wiring must be run in conduit.

Municipal Box Output

Nonpower-limited and supervised (for open circuits). Max Current (short circuit) = 0.6 amps. Max Voltage (open circuit) = 27.6 VDC. Max Wire Resistance = 5 Ohms



- 1) The Municipal Box Output is not power-limited, therefore do not use the Municipal Box Output and the power-limited Remote Station Alarm Output simultaneously.
- 2) Notification circuits, Remote Station Trouble output, and the Remote Station Alarm output are power limited and may be connected to limited-energy cable.
- 3) The RS-1459 module is required when the Remote Station or Municipal Box Output is connected to a circuit that exits the protected premises. Exception - The RS-1459 is not required for the Municipal Box Output if all of the following conditions exist: (1) wiring is in conduit, (2) wire length is less than 1000 meters and (3) wiring does not cross any power lines.
- 4) Wire Notification Appliances according to their instructions.
- 5) Terminal blocks will accept #12 to #22 AWG wire.
- 6) Size Notification circuit wire for a maximum drop of 2.0 volts DC
- 7) See Device Compatibility Document for compatible Notification Appliances.
- 8) For zone coded Notification circuits, see the UZC-256 manual.

Dummy-Loading unused CPU-5000 circuits

An unused Notification circuit can be terminated with one dummy-load resistor (illustrated below left) or with two jumpers (illustrated below right).

If the Municipal Box Output is not to be used, it must be terminated with a dummy-load resistor.

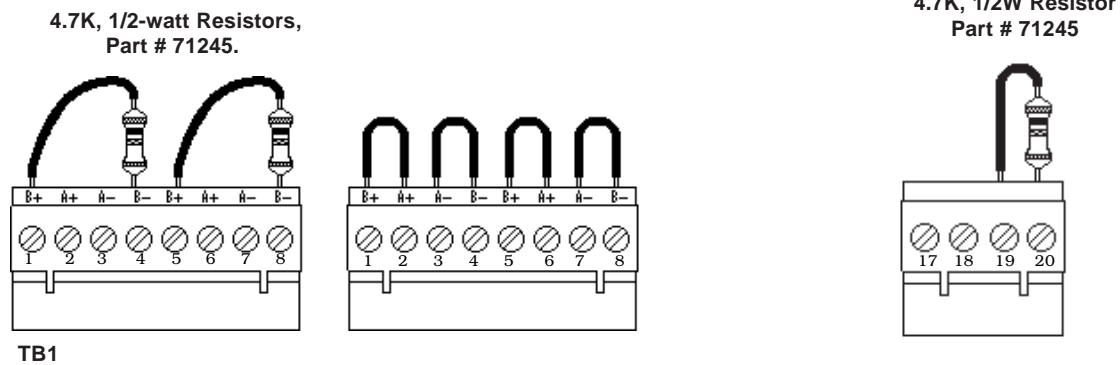
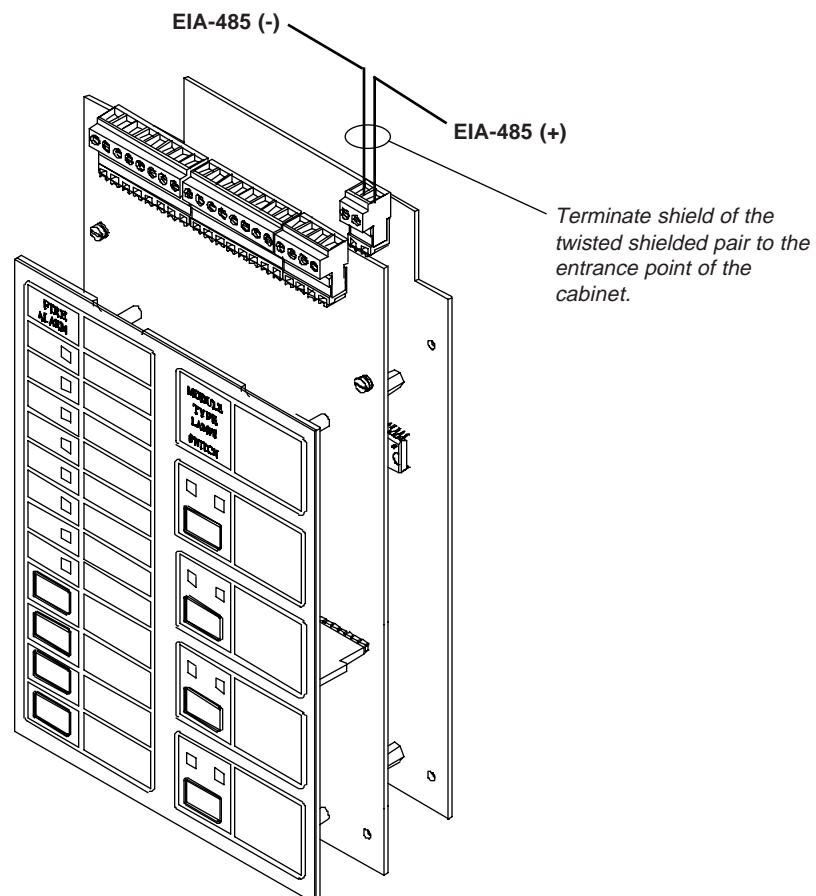


Figure 4-5: Connecting the EIA-485 Interface

The control panel communicates with the ACS, AFM, LCD-80, NIB-96, UZC-256, ACM-8R and LDM modules through the EIA-485 interface on the CPU. The EIA-485 interface is also used to connect to an AMG-1 in Voice Alarm systems. To get access to the EIA terminal block (which is installed on the lower CPU board), unplug the right-most terminal block of TB1. **NOTE:** Twisted shielded cable is required.

EIA-485 Interface



Typical NFPA Style B Initiating Device Circuit

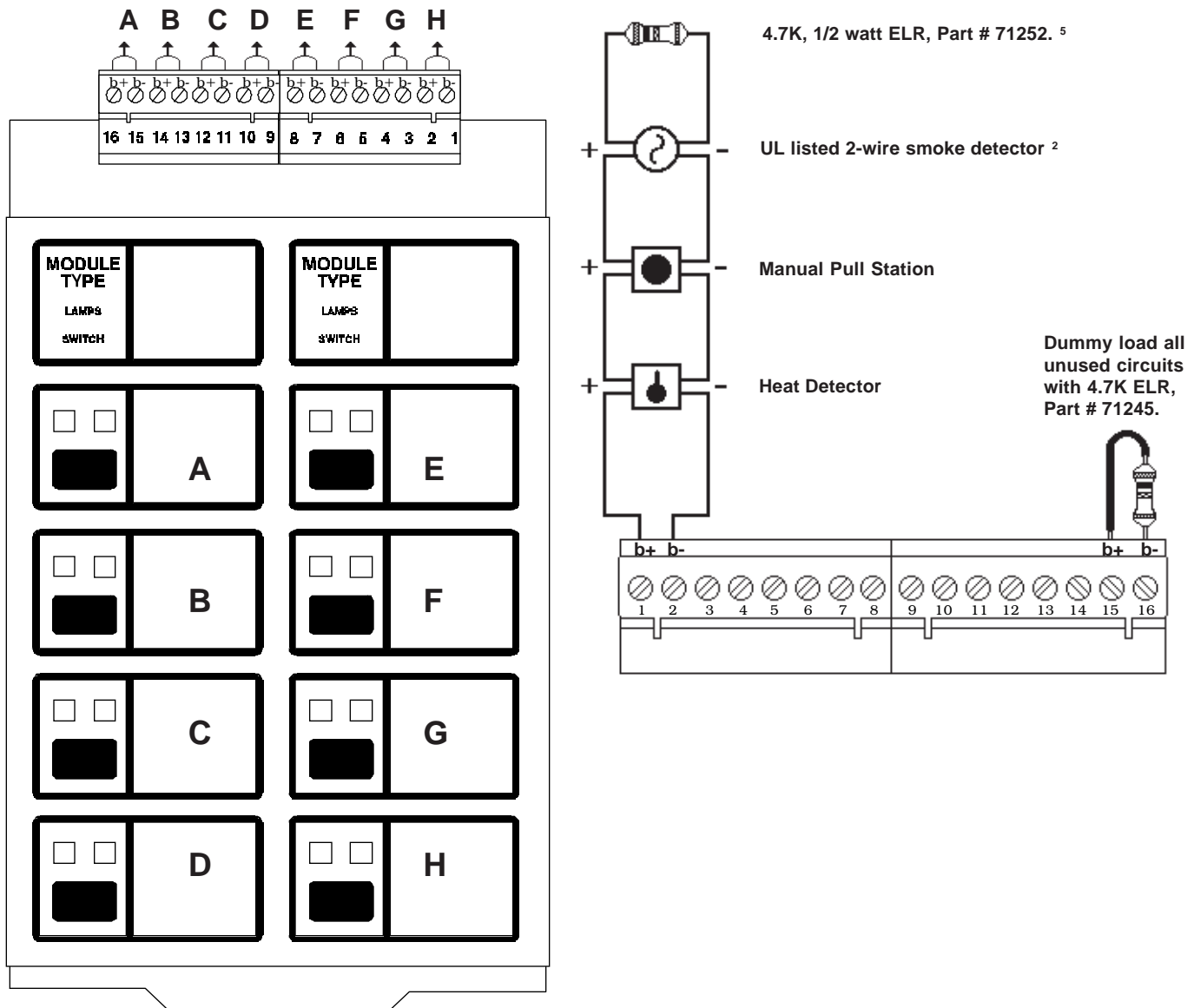


Figure 4-6: NFPA Style B Field Wiring of the IZM-8 Initiating Zone Module

- 1) Initiating Device Circuits are supervised, power limited and may be connected to limited-energy cable. Initiating devices include non-coded manual pull station, heat detectors, photo and ion detectors, waterflow alarm and waterflow supervisory devices. Connect waterflow alarm devices to a dedicated circuit, programmed for waterflow option. Connect N.O. waterflow supervisory devices to a dedicated zone programmed for supervisory operation. Terminal Block will accept #12 to #22 AWG wire. Initiating circuit current will ensure alarming of one two-wire detector only.
- 2) Use only the compatible, UL-listed 2-wire smoke detectors that are listed in the Device Compatibility Document.
- 3) For connection of 4-wire smoke detectors and initiating devices requiring separate 24 VDC power, refer to Section Six.
- 4) Wire initiating devices according to the manufacturer's instructions packaged with each device.
- 5) For Canada, model N-ELR End-of-Line Resistor Assembly required.
- 6) Max line resistance due to wiring is 100 ohms.

Typical NFPA Style D Initiating Device Circuit

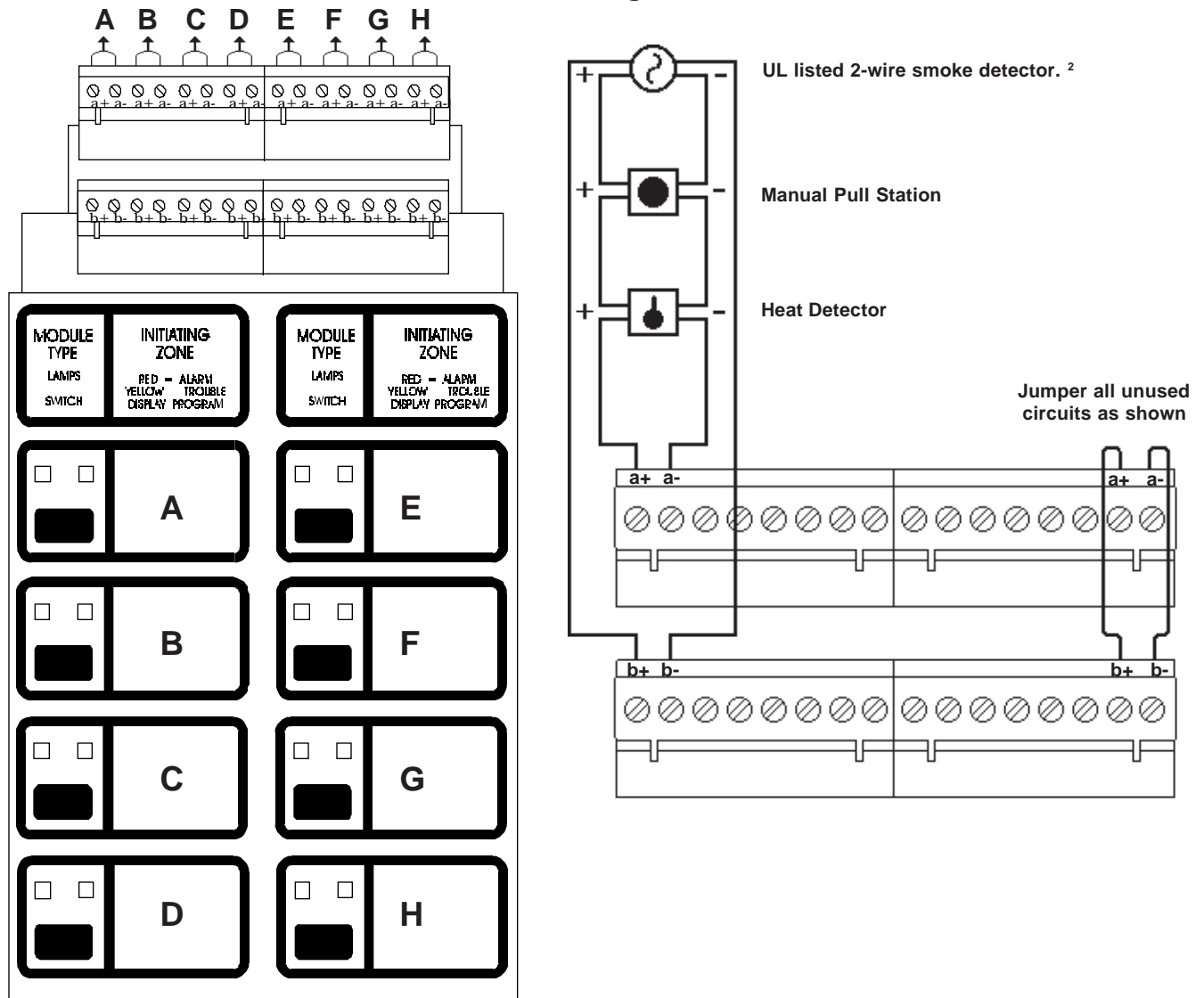
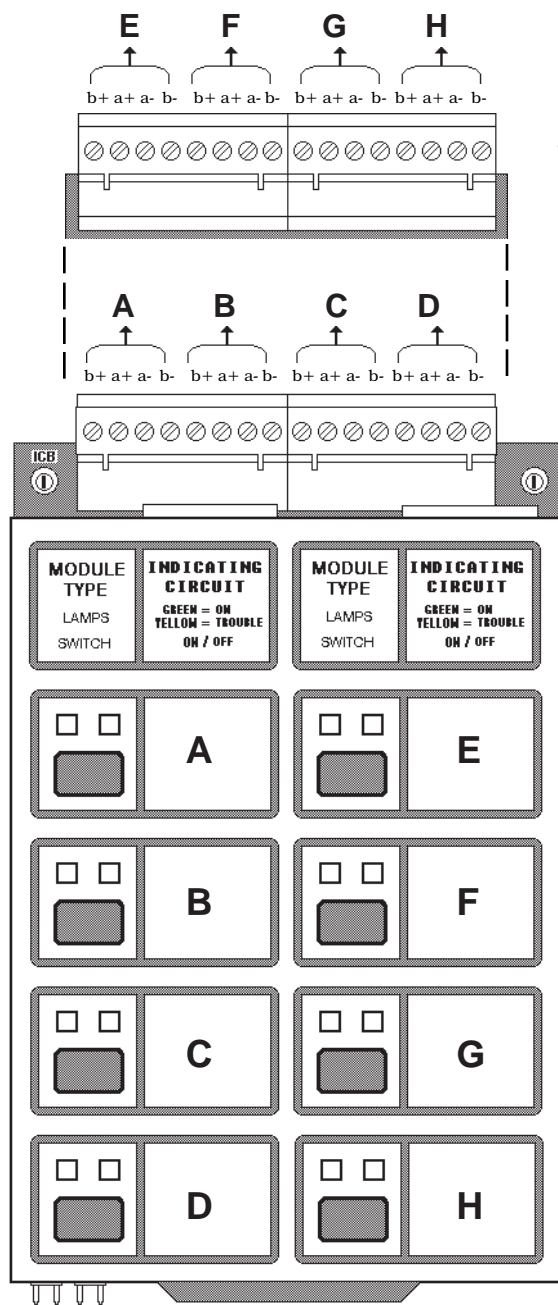


Figure 4-7: Style D Field Wiring of IZM-8 Initiating Zone Module with IZE-A Expander

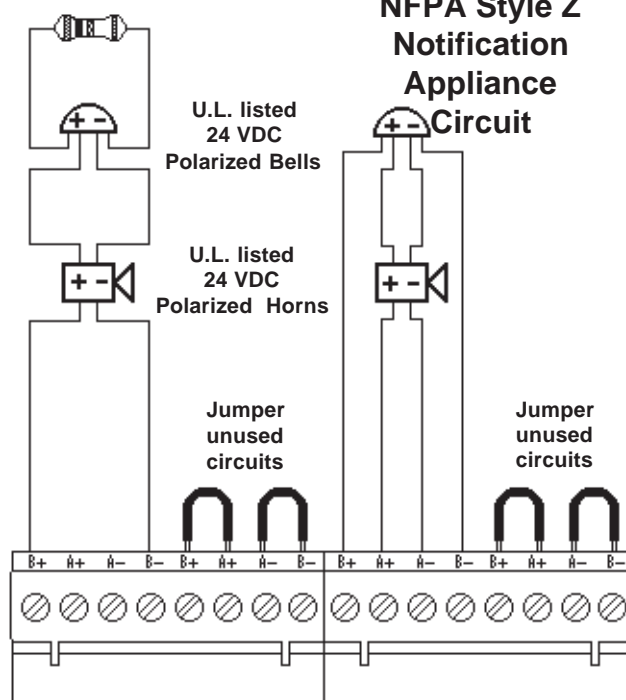
- 1) Initiating Device Circuits are supervised, power limited and may be connected to limited-energy cable. Initiating devices include non-coded manual pull station, heat detectors, photo and ion detectors, waterflow alarm and waterflow supervisory devices. Connect waterflow alarm devices to a dedicated circuit, programmed for waterflow option. Connect N.O. waterflow supervisory devices to a dedicated zone programmed for supervisory operation. Terminal Block will accept #12 to #22 AWG wire. Initiating circuit current will ensure alarming of one two-wire detector only.
- 2) Use only the compatible, UL-listed 2-wire smoke detectors that are listed in the Device Compatibility Document.
- 3) For connection of 4-wire smoke detectors and initiating devices requiring separate 24 VDC power, refer to Section Six.
- 4) Wire initiating devices according to the manufacturer's instructions packaged with each device.
- 5) Max line resistance due to wiring is 100 ohms.



Optional ICE-4 Indicating Circuit Expander. Positions E, F, G, and H are active only with this board installed. Note that CRE-4 expander may also be installed on the ICM-4.

Typical NFPA Style Y Notification Appliance Circuit

4.7K, 1/2 watt ELR, Part # 71252. ⁵



Typical NFPA Style Z Notification Appliance Circuit

Figure 4-8: NFPA Style Y, Z Field Wiring of Indicating Circuit Module (ICM-4) and Expander (ICE-4)

- 1) Notification circuits are supervised, power limited and may be connected to energy-limited cable.
- 2) Use only the compatible, UL-listed Notification Appliances listed in Device Compatibility Document.
- 3) Wire Notification Appliances according to the manufacturer's instructions packaged with each device.
- 4) Maximum current per circuit is 3.0 amps. Maximum current per module is dependent on the power supply (MPS or AVPS) employed.
- 5) For Canada, model N-ELR End-of-Line Resistor Assembly required. (style Y only)
- 6) Size wiring for no more than 2-volt drop (loss) at the last device on the circuit.
- 7) For zone coded applications, see the UZC-256 manual.
- 8) For power wiring see Figure 6-7.
- 9) The ICM-4 is California Code programmable (microprocessor Rev. B or higher). To program for California Code, cut diode D35.

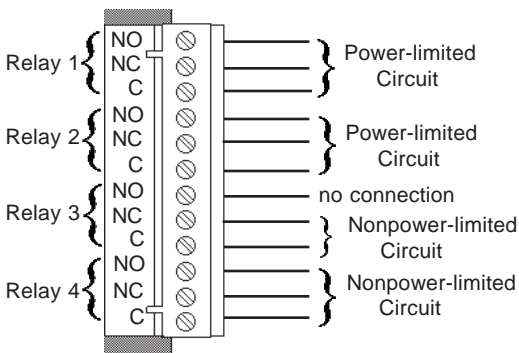
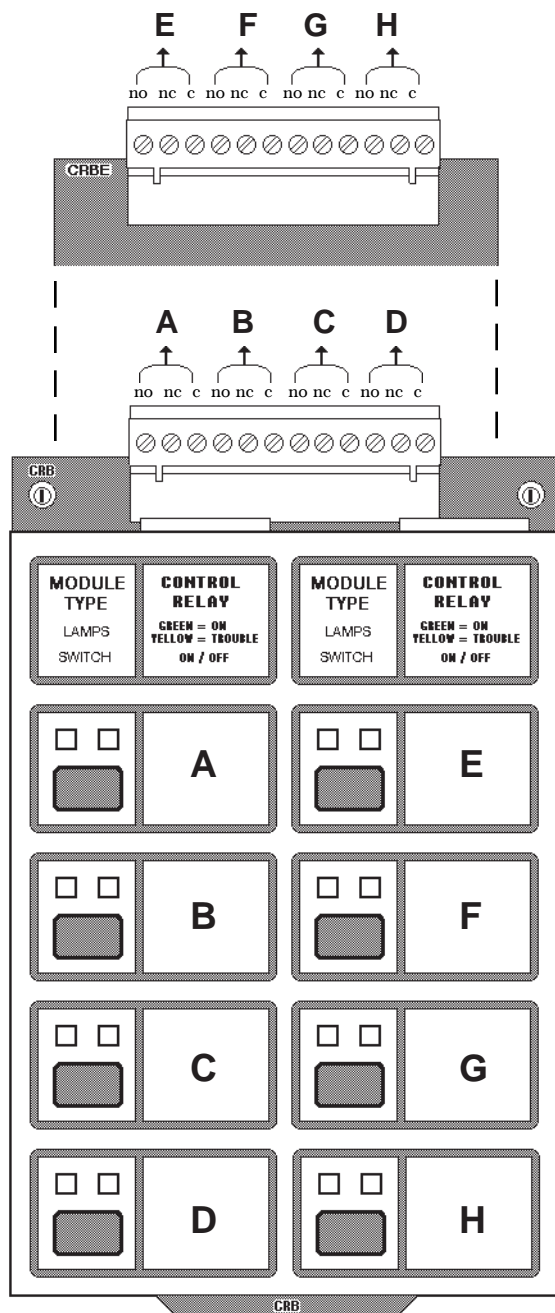


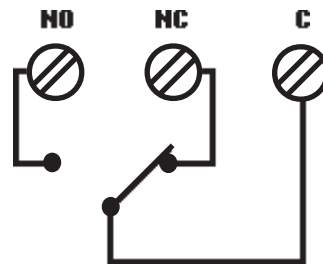
Figure 4-9:

Field Wiring Control Relay Module (CRM-4) and Expander (CRE-4)

* Optional CRE-4 Control Relay Expander. Positions E, F, G and H are active only with this board installed.

- 1) These Form-C gold-plated, silver alloy relay contacts are for medium duty switching or Pilot Duty.
- 2) UL contact ratings are 5 amps @ 125 volts AC (resistive) or 30 volts DC (resistive) and 2 amps @ 125 volts AC (inductive).
- 3) Activation of a CRM-4 or CRE-4 relay occurs automatically when an alarm is detected on a selected (programmed) Initiating Device Circuit.

Note: Refer to the Power-limited label located on the FACP door. Make a notation on the label for each circuit being employed as a Nonpower-limited circuit. (Refer to the example on the label).



Typical Form-C Control Relay in Standby Position

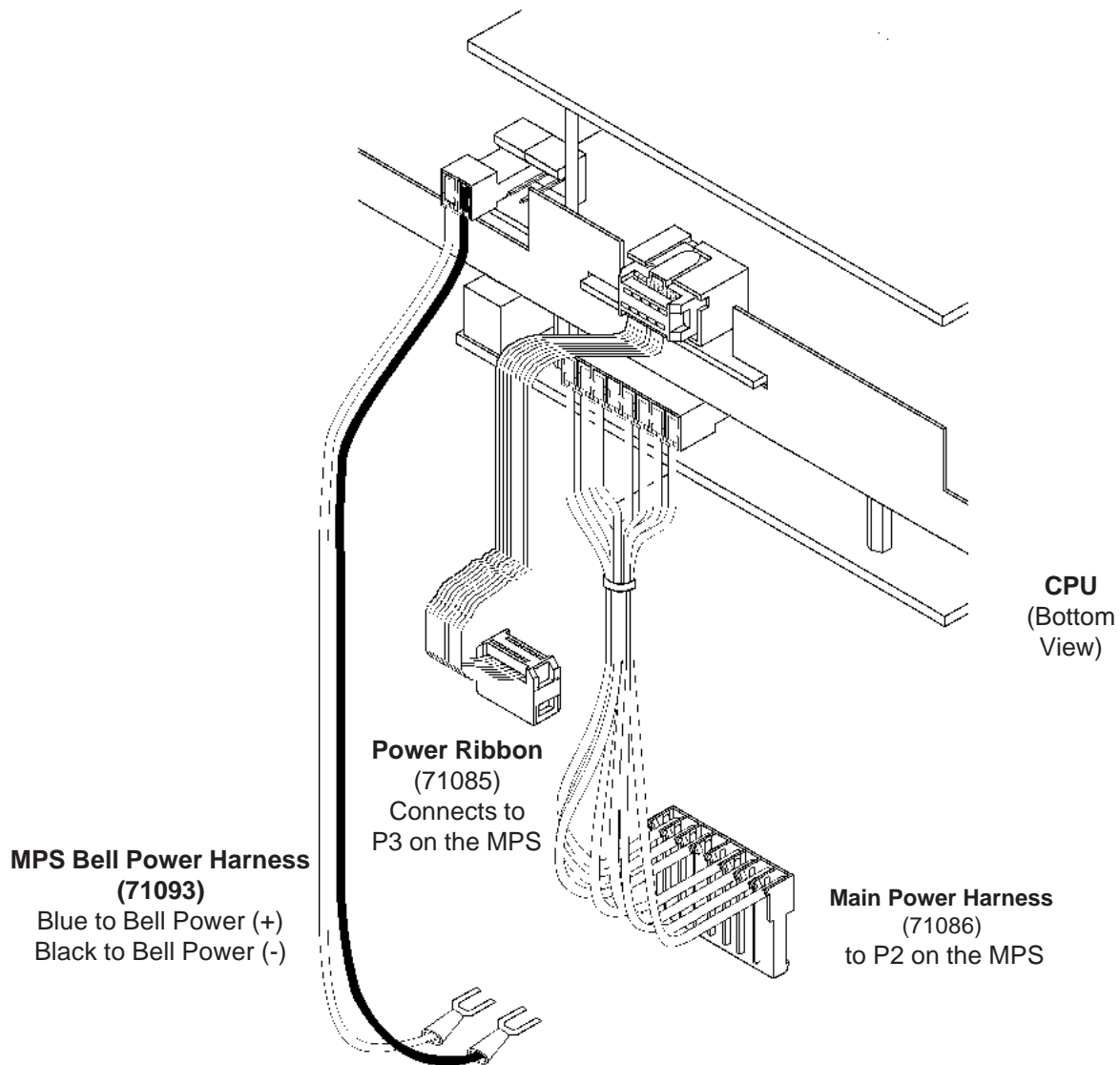
Non-power-limited and power-limited wiring must have a minimum distance of 0.25" wire to wire and must enter and exit from different knockouts. If this module is used to drive nonpower-limited and power-limited circuits, please follow the instructions:

- 1) Skip a set of dry contacts to maintain the 0.25" required space between power-limited and nonpower-limited circuits. The wiring of this module must follow UL Power-limited Wiring Requirements.

OR

- 2) If this module is needed to drive power-limited and nonpower-limited relays that are next to each other, refer to the figure to the left showing a typical connection:

Section Five: The Power Supplies



Three cables complete the electrical connection between the CPU and the Main Power Supply.

Section 5.1: The MPS-24A Main Power Supply

The MPS-24A Main Power Supply is an optional supply capable of powering the control panel continuously during standby and alarm conditions. A total of 3.0 amps (internal) @ 24 VDC regulated is available from the MPS Main Power Supply for operating the system during Standby conditions. No more than 6 amps @ 24 VDC can be drawn from the MPS-24A during alarm.

Figures 5-2 and 5-3 illustrates connections for primary and secondary power to the MPS-24A Main Power Supply, as well as terminal and harness connections for the system.

AC Power Requirements

The primary power requirement for the MPS-24A is 120 VAC, 50/60 Hz, 1.8 amps and the primary power requirement for the MPS-24AE is 220/240 VAC, 50/60 Hz, 0.9 amps.

Connecting the Primary Power Source

With the breaker at the main power distribution panel turned off, remove the plastic insulating cover from Terminal Block TB1 and connect the system primary power source. Connect the service ground to TB1- 2 and ground the power supply assembly to the cabinet with a Chassis Ground cable (71073) to TB1 Terminal 1. Connect the primary Neutral line to TB1 Terminal 4 and the primary Hot line to TB1 Terminal 6. Do not route 120/240 VAC wiring in the same conduit as other system circuits. After completion of these connections reinstall the plastic insulating cover over the terminal strip. Leave the main power breaker off until installation of the entire system is complete.

Connecting the Secondary Power Source ^(24 VDC)

Secondary power (batteries) is required to support the system during loss of primary power. These batteries reside in the control panel cabinet, or in a separate NR45-24 Remote Battery Charger cabinet which can be mounted up to 20 feet away from the control panel (for connection of an NR45-24, refer to Figure 5-6).

Connect the Battery Positive Cable (71071) to TB2 Terminal 1 (+) and the Battery Negative Cable (71072) to TB2 Terminal 2 (-). ***Do not connect the Battery Interconnect Cable (Part Number 71070) at this time. This connection will be made just after initial system primary power-up.***

Four-Wire Smoke Detector Power ^(24 VDC)

Up to one amp of current for four-wire smoke detectors can be drawn from TB3 Terminals 1 (+) and 2 (-). Power is removed from these terminals during system reset. This 24 VDC regulated four-wire smoke detector power is power-limited but must be supervised via an end-of-line listed Power Supervision Relay. The power supervision relay is energized by the four-wire power circuit and its contact must be connected in series with an Initiating Device Circuit.

Notification Appliance power ^(24 VDC)

Up to 3 amps of regulated current for powering Notification appliances can be drawn from TB3 Terminals 3 (+) and 4 (-). Power is not removed from these terminals during system reset. If a resettable power circuit is desired, cut JP5 on the MPS-24A (note that a maximum of 2 amps is available with JP5 cut).

Note: On the MPS Bell Power Harness, the fork lugs must be cut off and wires stripped for connection to the MPS-24A.

Annunciator Power ^(24 VDC)

ACS Annunciators can be powered either from the Four-Wire Smoke Detector output or the Notification Appliance power output. Both outputs provide the filtered, regulated, power-limited source required by the annunciators. The power run to the annunciators is supervised by the annunciator (*Loss of Communications error*).

System Harness Connections

Internal power for the system is provided via the Power Harness. Connect this harness from P2 on the MPS to the CPU. If employing an AMG-1, connect a Power Harness from P4 on the MPS to P1 on the AMG-1. This same power can be fed to other boards or modules requiring internal power. Signaling between the CPU and the MPS is accomplished through connection of the Power Ribbon (71085) to P3 on the MPS-24A.

Figure 5-1: Field Wiring the MPS-24A Power Supply

Four-Wire Smoke Detector/Annunciator Power

24 VDC (20.4-26.4, 200 mV ripple), 1 amp max. Filtered, regulated and resettable.
Power-limited but must be supervised via a UL approved Power Supervision Relay.

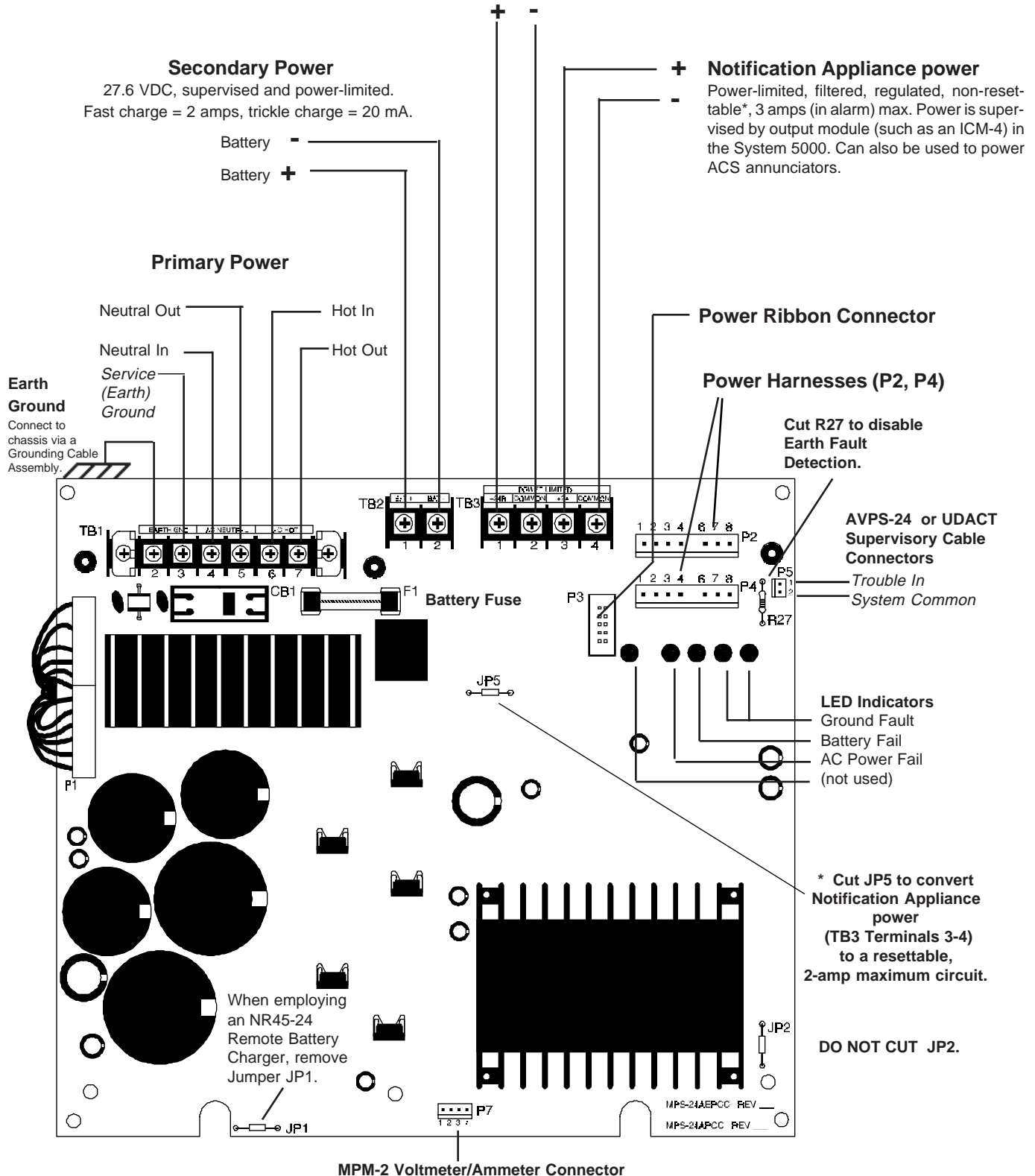


Figure 5-2: Harness Connections for the MPS-24A

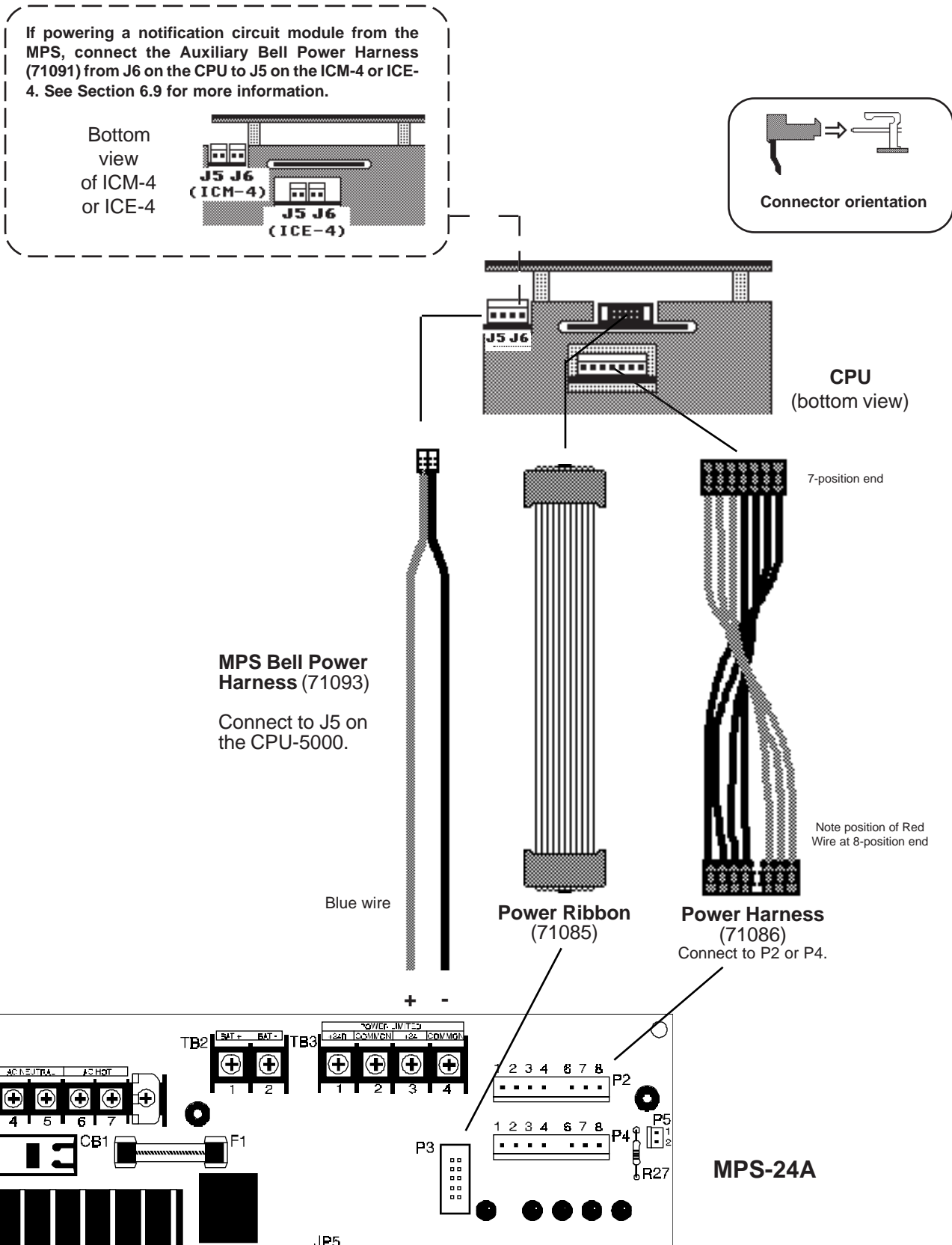
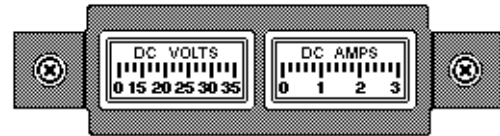


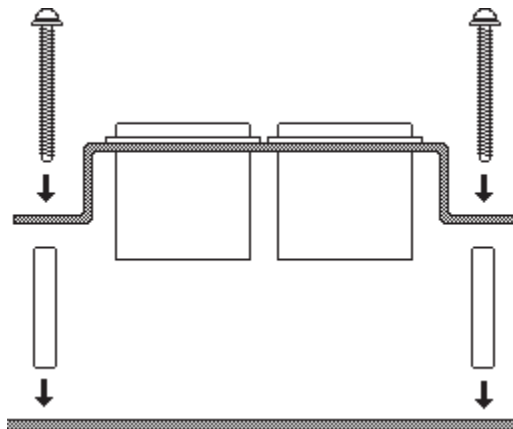
Figure 5-3: Installing an Optional Main Power Meter

The optional Main Power Meter (MPM-2) can be installed on the Main Power Supply (MPS-24A only). One scale on the MPM-2 provides an indication in volts of the voltage across the batteries in the system. A second scale indicates the battery charging current in amps.



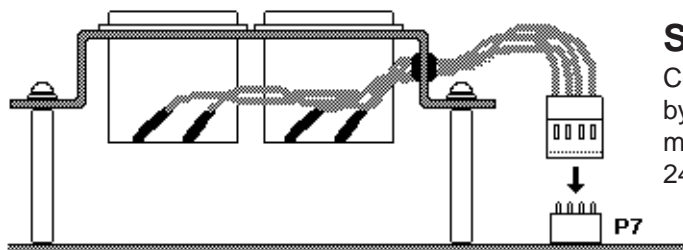
Step 1

Remove the two screws in the bottom left-hand corner of the MPS-24A.



Step 2

Thread the two standoffs provided into the holes vacated by the two screws just removed. Place the MPM-2 assembly over the standoffs and secure with the two original screws



Step 3

Complete the installation of the MPM-2 by plugging the female connector on the meter cable into Plug P7 on the MPS-24A.

Section 5.2: The MPS-24B Main Power Supply

*Note: The MPS-24B has been designed to support single-cabinet row systems only.
This amounts to enough power for the CPU and up to three other modules as a maximum.*

The MPS-24B Main Power Supply is a supply capable of powering the system continuously during standby and alarm conditions. A total of 750 mA @ 24 VDC regulated is available for operating the system during Standby conditions.

Figures 5-5 and 5-6 illustrate connections for primary and secondary power to the MPS-24B Main Power Supply, as well as terminal and harness connections.

AC Power Requirements

The primary power requirement for the MPS-24B is 120 VAC, 50/60 Hz, 1.8 amps and the primary power requirement for the MPS-24BE is 220/240 VAC, 50/60 Hz, 0.9 amps.

Connecting the Primary Power Source

With the breaker at the main power distribution panel turned off, remove the plastic insulating cover from Terminal Block TB1 and connect the system primary power source. Connect the service ground to TB1-2. Ground the power supply assembly to the cabinet with a Chassis Ground cable (71073) to TB1 Terminal 2. Connect the primary Neutral line to TB1 Terminal 3 and the primary Hot line to TB1 Terminal 4. Do not route 120/240 VAC wiring in the same conduit as other circuits. After completion of these connections reinstall the plastic insulating cover over the terminal strip. Leave the main power breaker off until installation of the entire control panel is complete.

Connecting the Secondary Power Source ^(24 VDC)

Secondary power (batteries) is required to support the system during loss of primary power. These batteries reside in the control panel cabinet. Connect the Battery Positive Cable to TB3 Terminal 1 (+) and the Battery Negative Cable to TB3 Terminal 2 (-). *Do not connect the Battery Interconnect Cable at this time. This connection will be made just after initial primary system power-up.*

Earth Fault Detection

The MPS-24B automatically employs detection of earth faults in the system (unless Resistor R55 is removed).

Four-Wire Smoke Detector Power ^(24 VDC)

Up to 200mA of current for 24 VDC four-wire smoke detectors can be drawn from TB2 Terminals 1 (+) and 2 (-). Power is removed from these terminals during system reset (unless Jumper JP1 is removed). This regulated four-wire smoke detector power is power-limited but must be supervised via a UL listed Power Supervision Relay. The power supervision relay is energized by the four-wire power circuit and its contact must be connected in series with an Initiating Device circuit.

Annunciator Power ^(24 VDC)

The four-wire smoke detector output is the only source on the MPS-24B that can be used to power ACS Annunciators. The power run to the annunciators is inherently supervised (*Loss of Communications* error).

Note: The total current draw for all annunciator modules and four-wire detectors cannot exceed 200 mA either in standby or in alarm.

Notification Appliance power ^(24 VDC)

Up to 2.0 amps of RMS regulated current for powering Notification appliances can be drawn from TB2 Terminals 3 (+) and 4 (-). Power is not removed from these terminals during system reset.

Note: This output is not suitable for powering annunciators!

System Harness Connections

Internal power for the system is provided via the Power Harness. Connect this harness from P2 on the MPS to the CPU. Signaling between the CPU and the MPS is accomplished through connection of the Power Ribbon (71085) to P3 on the MPS-24B.

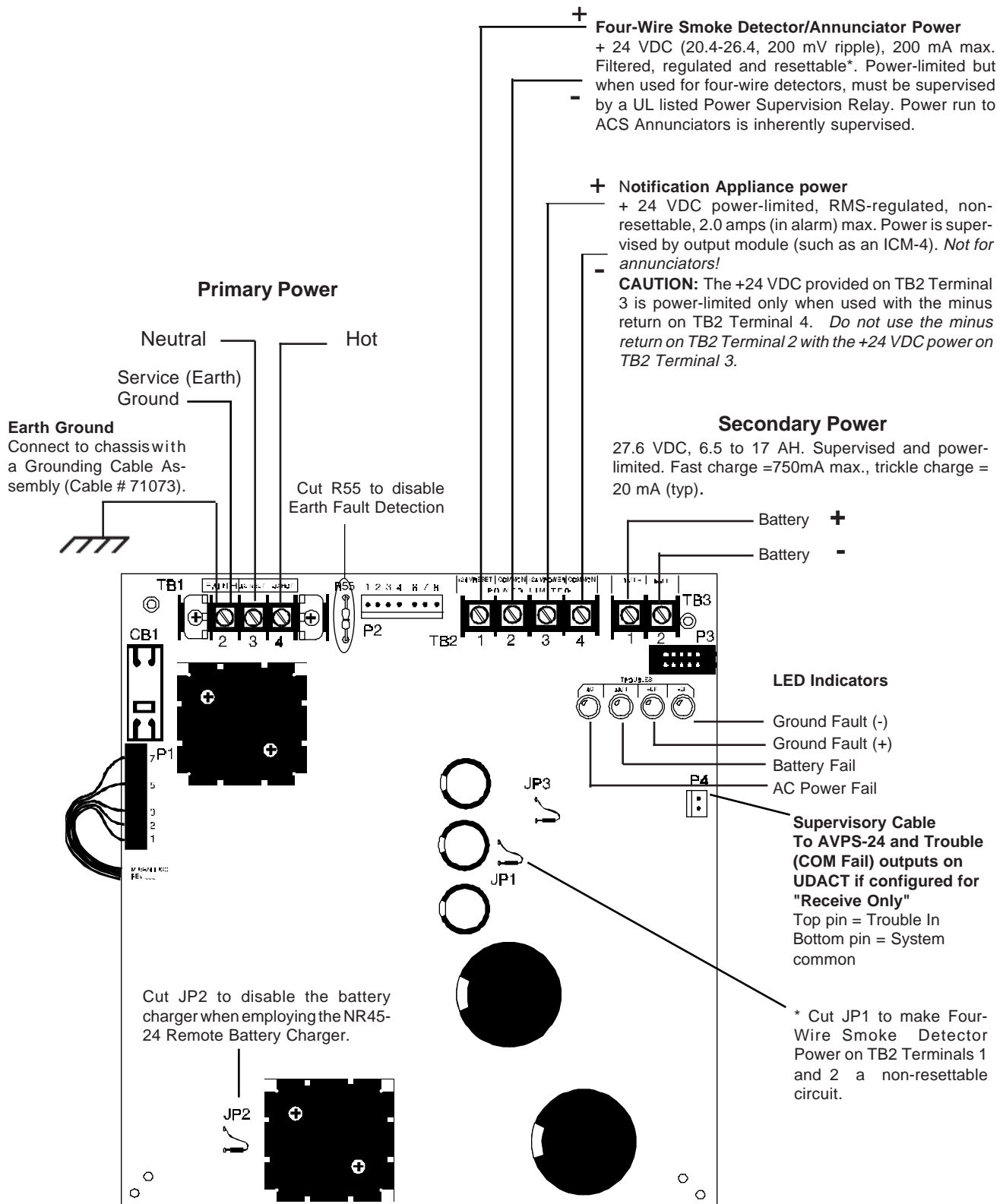
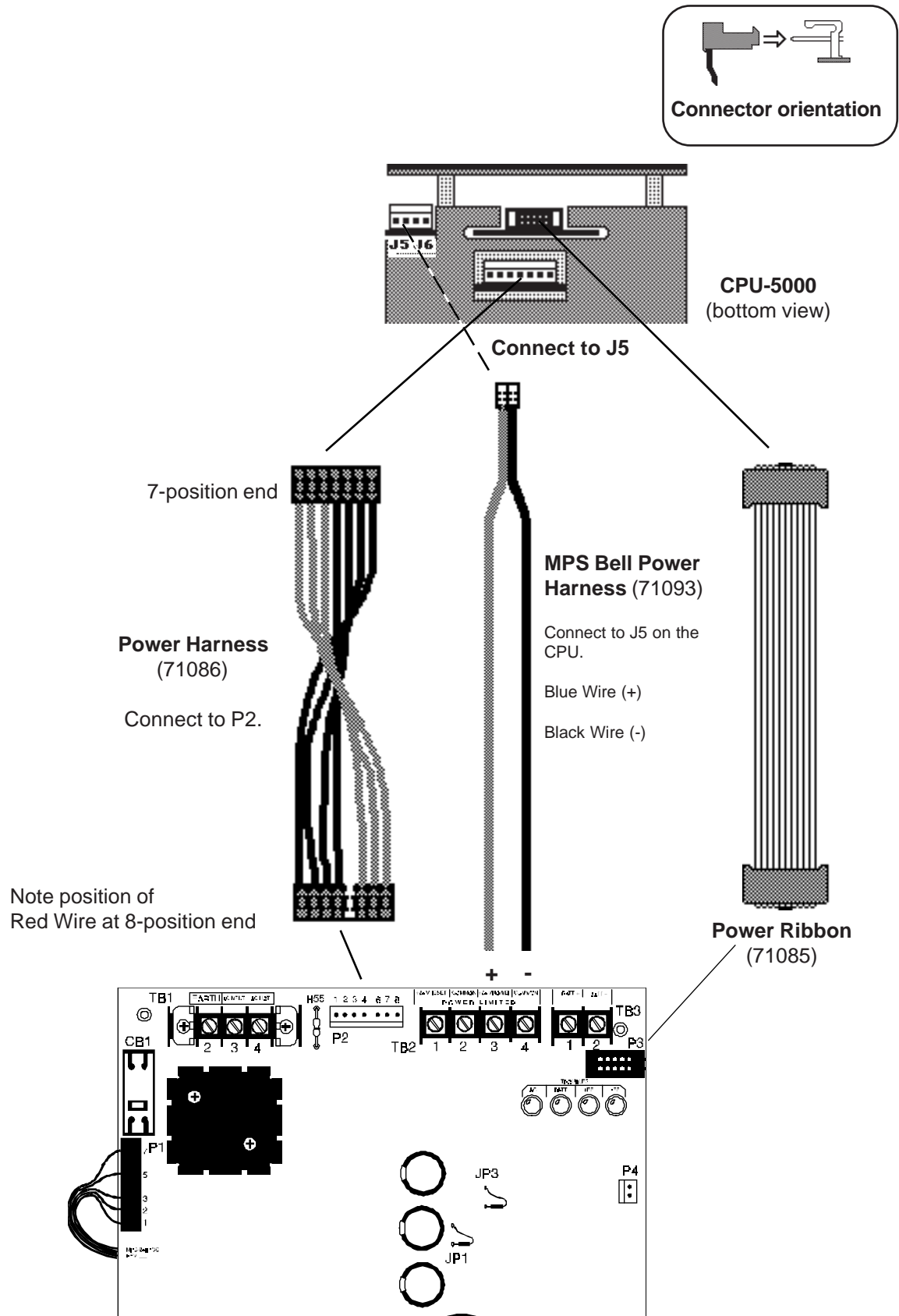


Figure 5-5: Field Wiring the MPS-24B Power Supply

Figure 5-6: Harness Connections for the MPS-24B

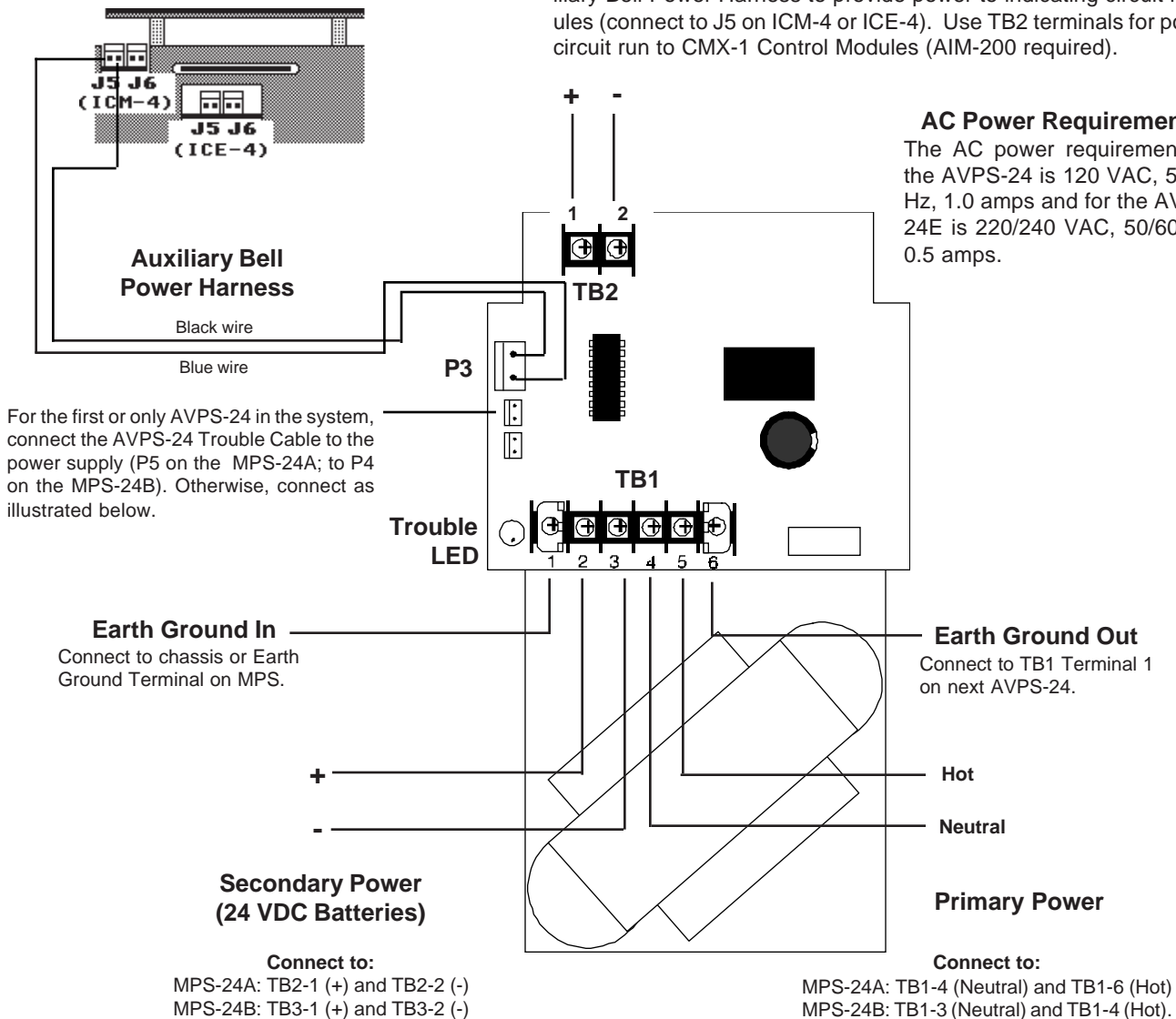


24 VDC Special Purpose Power

Unfiltered, unregulated, power-limited (3.0 amps max). Use the Auxiliary Bell Power Harness to provide power to indicating circuit modules (connect to J5 on ICM-4 or ICE-4). Use TB2 terminals for power circuit run to CMX-1 Control Modules (AIM-200 required).

AC Power Requirements

The AC power requirement for the AVPS-24 is 120 VAC, 50/60 Hz, 1.0 amps and for the AVPS-24E is 220/240 VAC, 50/60 Hz, 0.5 amps.



For multiple Audio Visual Power Supplies

To P5 on MPS-24A; or to P4 on the MPS-24B.

First AVPS-24

Last AVPS-24

Figure 5-7: Field Wiring the Optional AVPS-24

Section 5-5: The NR45-24 Remote Battery Charger

When the secondary power source requirements demand batteries that cannot be adequately charged by the main power supply employed, an NR45-24 Remote Battery Charger must be used. The NR45-24 mounts in its own cabinet, up to 20 feet away from the control panel. The NR45-24 is capable of charging 55-ampere-hour batteries, which are also contained in the charger cabinet.

AC Power Requirements

The primary power requirement for the NR45-24 Remote Battery Charger is 120 VAC, 50/60 Hz, 1.0 amps and the primary power requirement for the NR45-24E is 220/240 VAC, 50/60 Hz, 0.5 amps.

Connecting the Primary Power Source

With the breaker at the main power distribution panel turned off, connect the primary Hot line to Terminal 1 on the battery charger and the primary Neutral line to Terminal 2. All connections between the control panel and the battery charger must be made in conduit, using #12 AWG wire. Do not route 120/240 VAC wiring in the same conduit as other control panel circuits. Leave the main power breaker off until installation of the entire system is complete.

Connecting the Secondary Power Source ^(24 VDC)

Do not connect AC power or batteries until the system is completely wired and ready for testing. Refer to Wiring Diagram and Instructions for the NR45-24 Charger (DWG. No. 1977-41) for additional information.

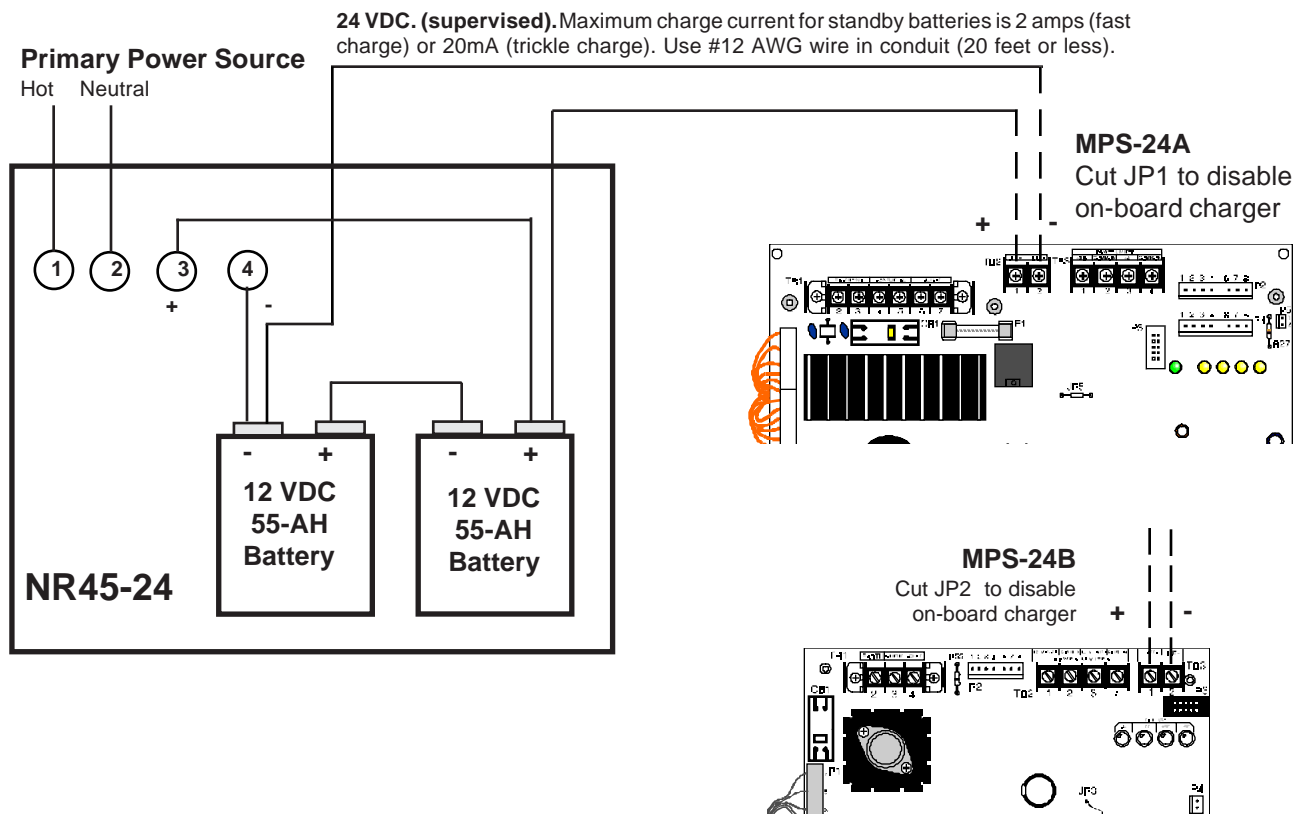


Figure 5-8: NR45-24 Remote Battery Charger Connections

Section Six: Applications

6.1 Waterflow Alarm

A waterflow alarm device may be connected to an IZM-8 Initiating Zone Module circuit (zone) provided that the circuit is programmed to activate at least one Notification Appliance Circuit and one of the following conditions are met:

- 1) The Initiating Device Circuit is programmed for waterflow operation
OR
- 2) The Notification Appliance Circuit is programmed as non-silenceable.

6.2 Supervisory Service

Supervisory Devices: Normally open supervisory devices may be connected to any IZM-8 Initiating Zone Module circuit provided that the initiating device circuit is programmed for supervisory operation. This circuit must be dedicated to supervisory devices.

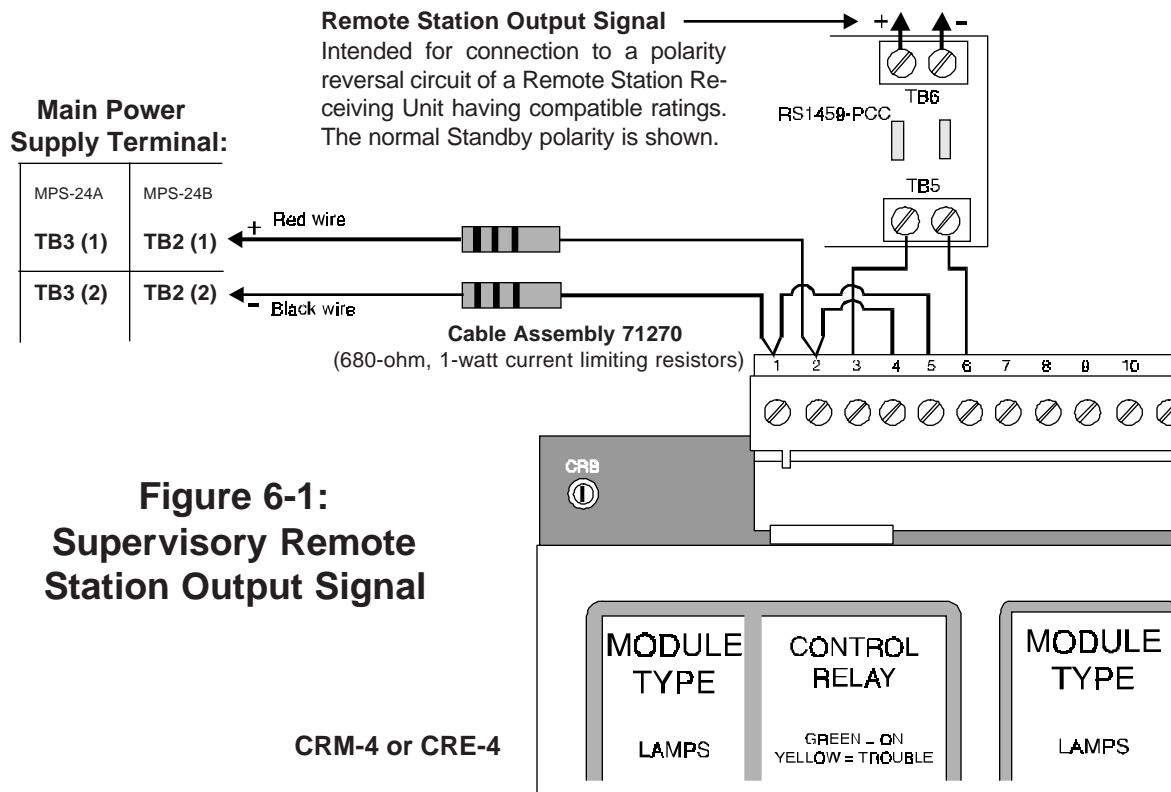
Supervisory Remote Station Output specifications:

Output: 24VDC nominal, 70 mv ripple maximum

Internal Resistance: 1360 ohms nominal

Maximum Rated Current: 10mA

A Supervisory Remote Station output signal can be obtained by connecting two relay outputs from a control Relay Module (CRM-4) as shown in Figure 6-1. The supervisory zone must be programmed to activate both relays.



6.3 Central Station

The control panel can be employed as a Central Station Premise Control Unit when used in conjunction with a compatible, UL listed Electrically Activated Transmitter installed in accordance with Section 6.5 or when used in conjunction with a compatible, UL listed Digital Alarm Communicator, such as the 911A, installed in accordance with Section 6.6.

6.4 Proprietary Protective Signaling

The control panel can be employed as a Central Station Premise Control Unit when used in conjunction with a compatible, UL listed Electrically Activated Transmitter installed in accordance with the instructions given in Section 6.5.

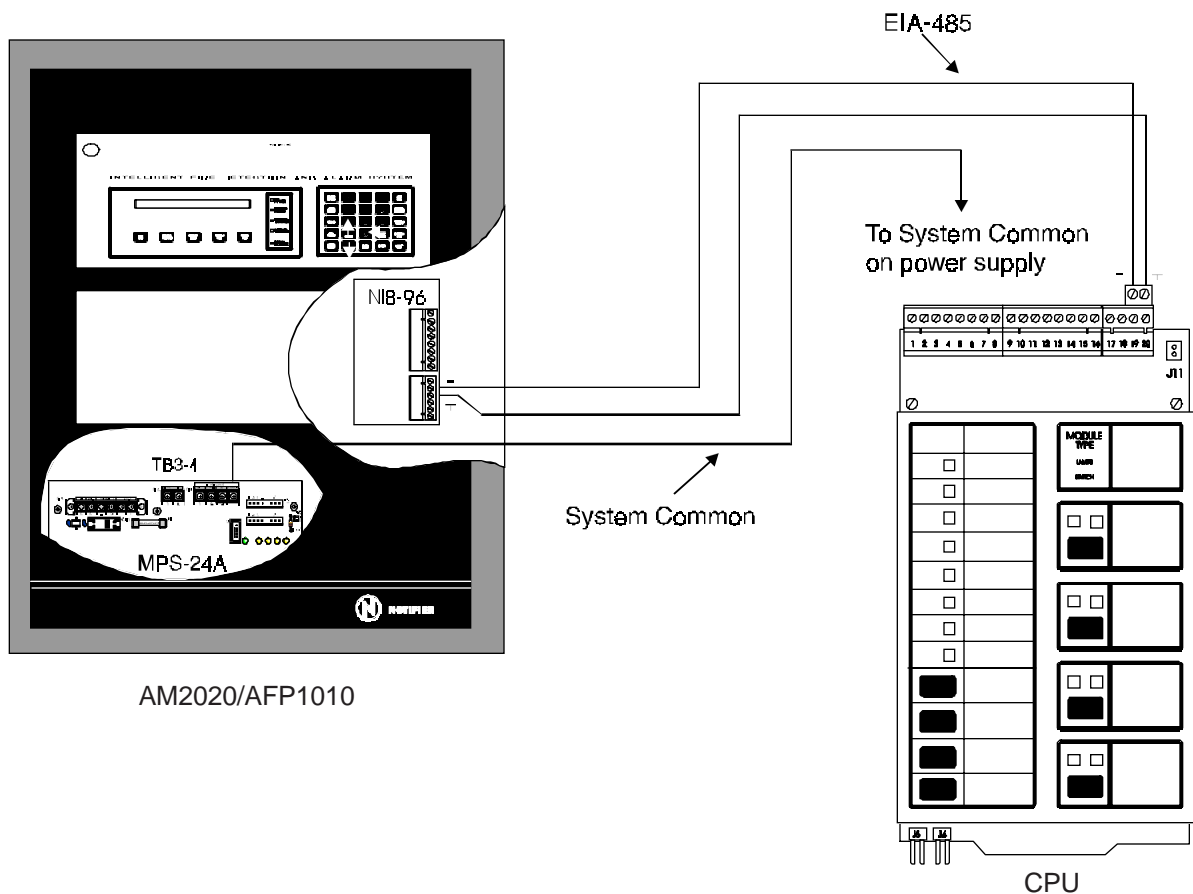
6.5 Transmitters

Electronically actuated transmitters can be used with the control panel to form Central Station and Proprietary Protective Signaling Systems provided that the following conditions are satisfied:

- 1) The control unit is used with the Notifier NIB-96 transmitter.
- 2) The receiving unit is the Notifier AM2020/AFP1010.
- 3) The transmitters are installed according to their instructions. (see NIB-96 manual)
- 4) The control, transmitters and receivers must have a standby power source that can supply 24 hours of operating power.

The NIB-96 is suitable for Central Station, and Proprietary Protective Signaling service when installed according to Figure 6-2 and the NIB-96 manual.

Figure 6-2: NFPA 72-1993 Proprietary Protective Signaling System



6.6 Digital Communicators

The S5000 will support a Digital Alarm Communicator Transmitter (DACT) provided that the panel is configured and programmed for DACT operation. Software P/N 73451 (or higher) will support DACT's that are activated via relay contacts (Notifier 911A and MS-5012), while Software P/N 73610 (or higher) will support the Notifier UDACT via the EIA-485 annunciator port.

Digital communicators can be used with the control panel to form Central Station Signaling Systems provided the following conditions are satisfied:

- 1) The DACT is the Noti-Fire 911A Digital Communicator.
- 2) The Receiving Unit is an Ademco No. 685.
- 3) The 911A is installed in accordance with the 911A Installation Manual.
- 4) The communicator cabinet is installed in the control panel cabinet with all interconnecting wiring installed according to the 911A manual.
- 3) The control, communicator and receiver have a secondary power source that can supply 24 hours of operating power.

911AC/911AC Digital Communicator

The Noti-Fire 911A/911AC Digital Alarm Communicator Transmitter (DACT) is a three-channel digital communicator designed to provide for off-premises monitoring of a fire alarm control panel. For stand-alone application, use the 911AC kit that includes a transformer and an enclosure(s) for both the 911A and the transformer. The 911A is triggered by the alarm, trouble and/or supervisory contacts received from the control panel and converts them into digital transmission format. It communicates with a digital receiver by means of one of two transmission formats, BFSK or Pulsed Fast Single Round format.

Install the Noti-Fire 911A Digital Communicator in accordance with the 911A Installation Manual. Connections between the control panel and the digital communicator are illustrated in Figure 6-3A and 6-3B.

Power Requirements: 26VDC, 30 mA in Normal; 138 mA while communicating; 166.8mA with alarm & trouble relays while communicating.

Retard time and Reset time must be programmed for zero second when connecting the alarm initiating circuit to an existing control panel.

For more detailed instructions on the Noti-Fire 911A/911AC, refer to Document 74-06200-005.

Note: The 911A and 911AC are not FM-approved.

MS-5012

The MS-5012 may be used as a slave communicator to a master FACP. In slave configuration, five channels may be triggered by the relay outputs of the master panel. Zone 1 is used for General Alarm, Zone 2 is used for general trouble, Zone 4 is used for supervisory. Zone 3 and 5 may be programmed to match the FACP relay function. Connections are shown in Figure 6-3C.

For additional wiring instructions, refer to the MS-5012 manual.

DACT

The FACP must be programmed for DACT operation, see Document 15584. Programming the FACP for DACT operation will delay the reporting of an AC loss condition for approximately eight hours (Software P/N 73451 or higher) and modify the EIA-485 Annunciator Port protocol (Software P/N 73610 or higher) for UDACT operation. The modified protocol is compatible with ACM, AFM, LDM, LCD-80 annunciators and AMG audio message generators. Annunciators, AMGs and a UDACT can be connected to the EIA-485 annunciator port simultaneously. However, the modified EIA-485 protocol alters the assignment of the first eight yellow annunciator LED's as follows:

Trouble Point (Yellow LED)	Software P/N 73451 and lower	Software P/N 73610 and higher	
		Without UDACT	With UDACT
1	System Trouble	System Trouble (less AC loss)	System Trouble (less AC loss)
2	Signal Silenced	Signal Silenced	Signal Silenced
3	Not Used	Not Used	Not Used
4	Supervisory	Supervisory	Supervisory
5	Notification Circuit 1 Trouble	Notification Circuit 1 Trouble	Notification Circuit 1 Trouble
6	Notification Circuit 2 Trouble	Notification Circuit 2 Trouble	Notification Circuit 2 Trouble
7	Municipal Tie Trouble	Municipal Tie Trouble	Low Battery/Gnd Fault
8	Panel Trouble	AC Fail	AC Fail

The FACP must be programmed for annunciators whenever it is connected to a UDACT because the UDACT receives the FACP status on the EIA-485 annunciator port. Refer to the table below for typical EIA-485 annunciator port configurations.

FACP		AMG	UDACT (note 1)	Annunciator (note 2)
Size (Points)	Annun. Mode			
1 to 64	1 to 64 points	Not Installed	Receive/Transmit Start Monitor Address 1 Stop Monitor Address 1	Not Installed
1 to 64	Dual 1 to 64 points	Not Installed	Receive/Transmit Start Monitor Address 2 Stop Monitor Address 2	One Receive/Transmit Annunciator at Address 1. Additional annunciators may be employed in the Receive Only Mode, also at Address 1.
1 to 64	Dual 1 to 64 points	Receive/Transmit Address 1 (fixed)	Receive/Transmit Start Monitor Address 2 Stop Monitor Address 2	Annunciators, set to address 1 or 2, may be employed in the Receive Only Mode
1 to 64	Quad 1 to 64 points	Receive/Transmit Address 1 (fixed)	Receive/Transmit Start Monitor Address 2 Stop Monitor Address 2	Two annunciators must be installed in the Receive/Transmit Mode. One at address 3 and one at address 4. Additional annunciators may be employed in the Receive Only Mode.
65 to 128	65 to 128 points	Not Installed	Receive/Transmit Start Monitor Address 1 Stop Monitor Address 2	Not Installed
65 to 128	Dual 1 to 128 points	Not Installed	Receive/Transmit Start Monitor Address 1 Stop Monitor Address 2	A 128 point annunciator, set to address 3 and 4, must be installed in the Receive/Transmit Mode. Additional annunciators may be employed in the Receive Only Mode.
65 to 128	Dual 1 to 128 points	Receive/Transmit Address 1 (fixed)	Receive/Transmit Start Monitor Address 3 Stop Monitor Address 4	An annunciator must be installed at address 2 in the Receive/Transmit Mode
All S5000 systems with AIM point annunciation	AIM, 256 points	Not Installed	Receive/Transmit Start Monitor Address 1 Stop Monitor Address 4	Annunciator, set to address 1, 2, 3 and/or 4 may be employed in the Receive Only Mode
All S5000 systems with AIM point annunciation	AIM, 256 points	Receive/Transmit Address 1 (fixed)	Receive Only Start Monitor Address 1 Stop Monitor Address 4 (note 3)	Annunciators, set to address 1, 2, 3 and/or 4 may be employed in the Receive Only Mode

Notes:

- 1) UDACT requires software P/N 73624 or higher.
- 2) The wiring to Receive Only annunciators will be supervised if the wiring is connected sequentially and a Receive/Transmit device is the last item connected to both the power and the EIA-485 circuits. The Receive/Transmit device functions as an End-of-Line Device.
- 3) The UDACT's output (TB3-2) must be monitored by the FACP. Comm Fail can be connected to the FACP via the Aux Trouble Input on the Main Power Supply (P5-1 on MPS-24A or P4-1 on the MPS-24B). See Connections diagrams.

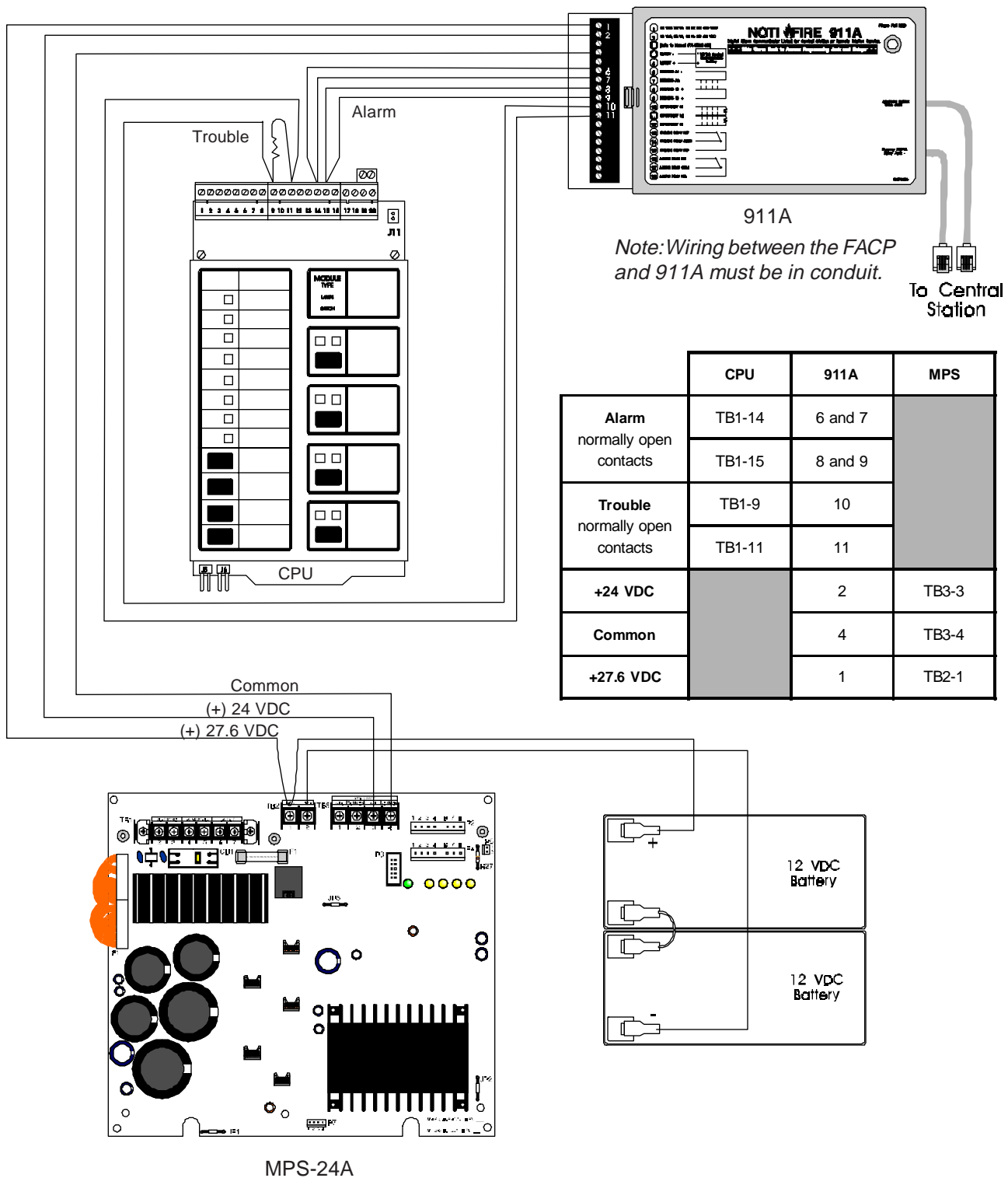


Figure 6-3A: Connection of a 911A Digital Communicator

*For Supervisory contacts, program the initiating zone(s) and map the output to the supervisory contacts. Set Zone 2/3 in DACT for Mode 3.

NOTI-FIRE 911AC DACT* – For connection to a Central Station Receiver or Protected Premises Receiving Unit. This unit must be installed as illustrated below. For additional information on the 911AC, refer to document 74-06200-005. If the NOTI-FIRE 911AC DACT is not mounted in the RP-1001 backbox, all connections must be in conduit, less than 20 feet in length, in the same room.

** This application using the NOTI-FIRE 911AC DACT is not FM-approved.*

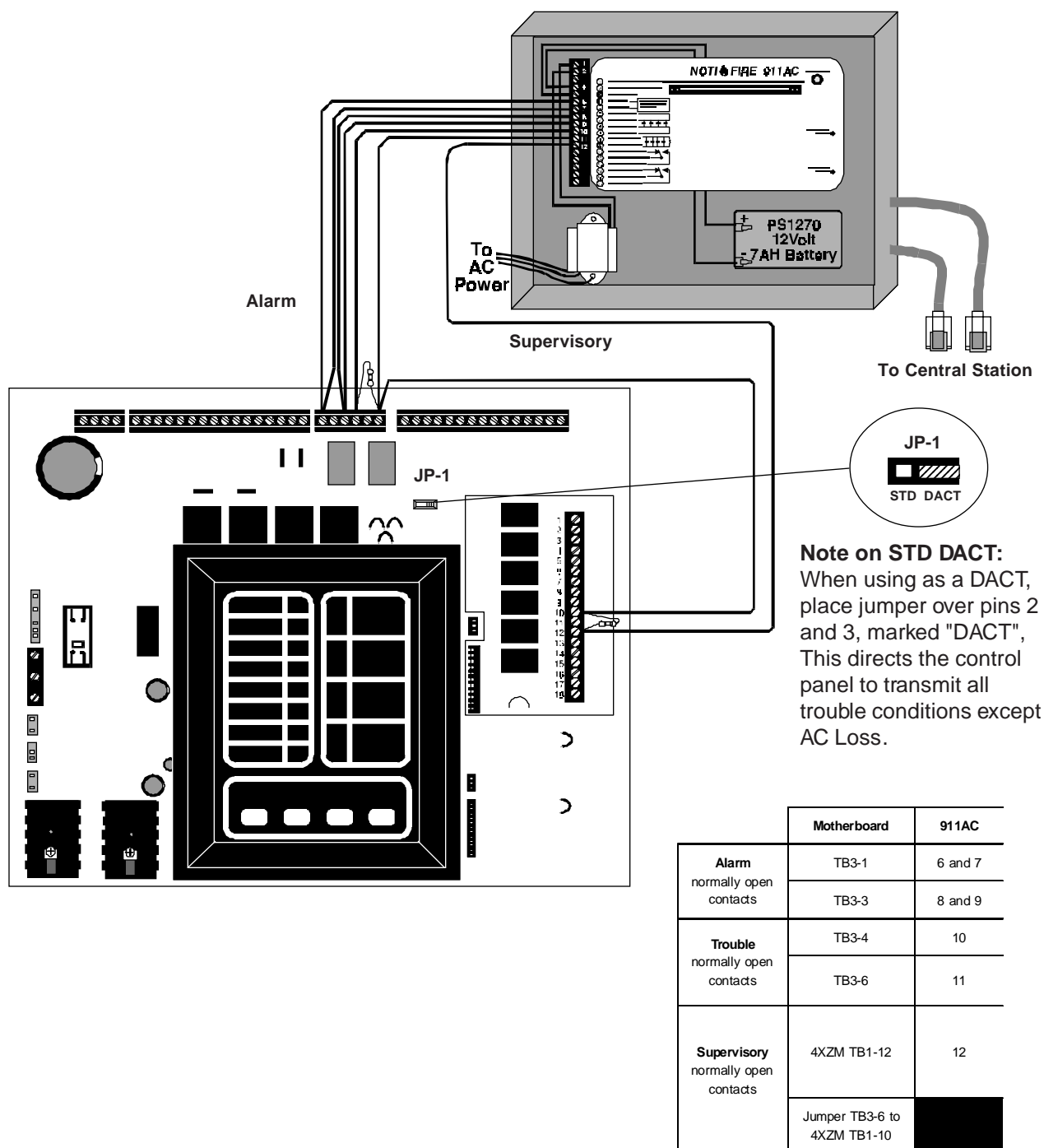


Figure 6-3B: Connection of a 911AC Digital Communicator

MS-5012 as a DACT

The MS-5012 may be used as a slave communicator to a master FACP. In slave configuration, five channels may be triggered by the relay outputs of the master panel. Zone 1 is used for General Alarm, Zone 2 is used for general trouble, Zone 4 is used for supervisory. Zone 3 and 5 may be programmed to match the FACP relay function.

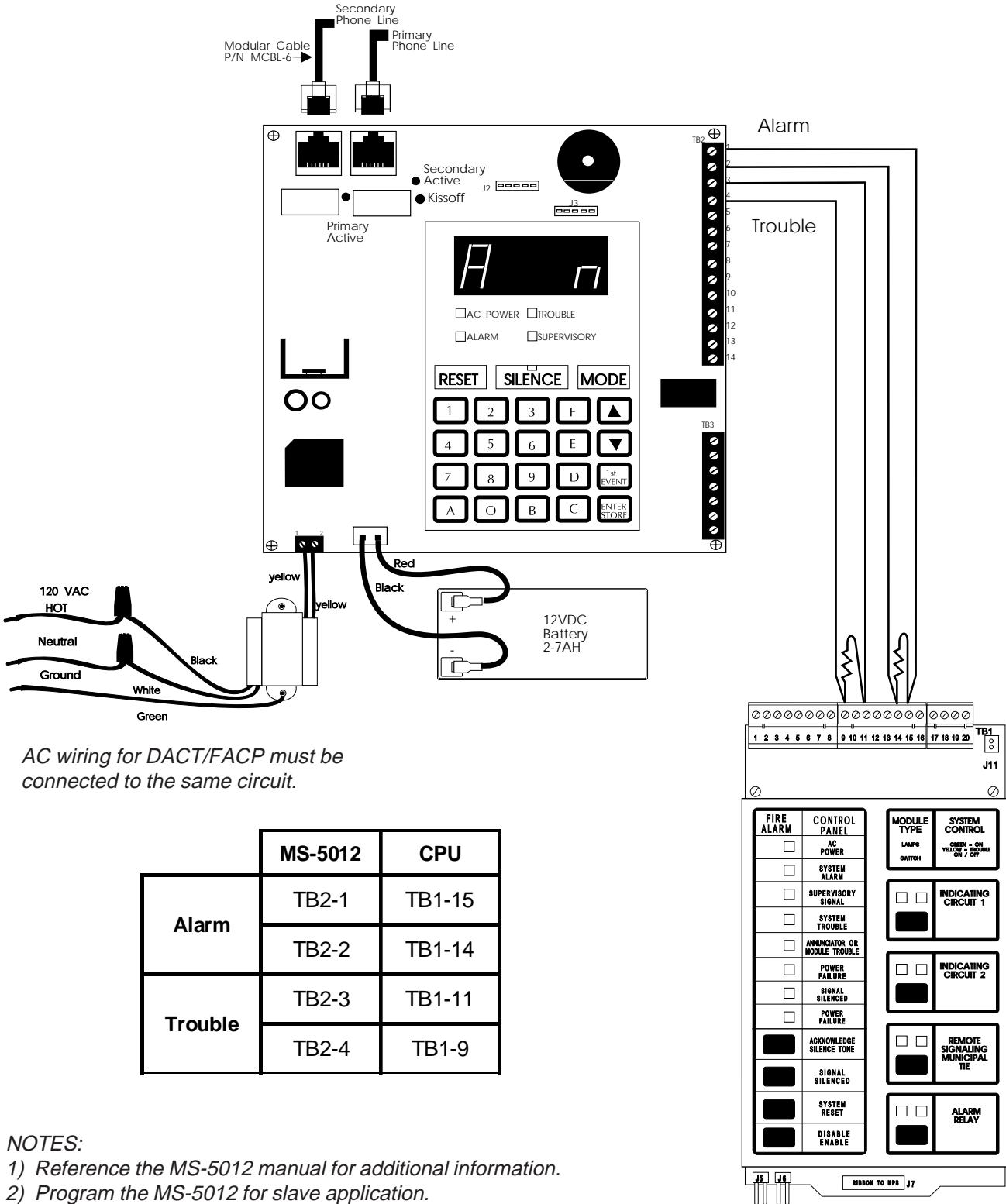


Figure 6-3C: Connection of a MS-5012 as a Slave Communicator

Universal Digital Alarm Communicator Transmitter

The UDACT may be mounted in the System 5000 control panel or remotely in an ABS-8R or UBS-1 enclosure up to 6000 feet away from the control panel. All power must be removed from the control panel before making any connections to prevent circuit damage. The EIA-485 serial interface is connected between the control panel and UDACT using twisted, shielded pair wire. Power should be wired from the control panel's main power supply 24 VDC (nominal) filtered, non-resettable output to TB1 on the UDACT.

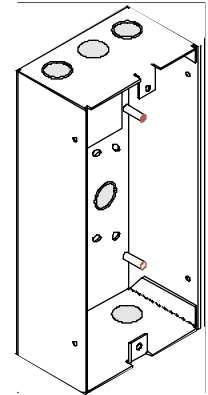


Figure 6-4: ABS-8R

UDACT mounting in System 5000

Remove all power from the System 5000 by disconnecting AC and batteries. Install the three supplied nylon support posts for the top and bottom left of the UDACT, one aluminum/nylon and one aluminum standoff in the CHS-4 chassis slot in which the UDACT is to be installed (refer to Figure 6-5). Position the UDACT on the standoffs and secure on aluminum standoff with a #6-32 screw.

Connect the communication line between the EIA-485 terminal block on the CPU-5000 and TB-1 terminals 3 and 4 on the UDACT being certain to observe polarity (refer to Figure 6-6). Recommended wire is 12 AWG to 18 AWG twisted pair. If no other devices are connected to the EIA-485, install a 120 ohm EOL resistor across UDACT TB1 terminals 3 and 4.

Connect the supplied Ground Strap from the UDACT Earth Ground terminal on TB3 to the CHS-4 chassis. Connect 24 VDC filtered, regulated power to TB1 terminals 1 and 2 on the UDACT (refer to Figure 6-7).

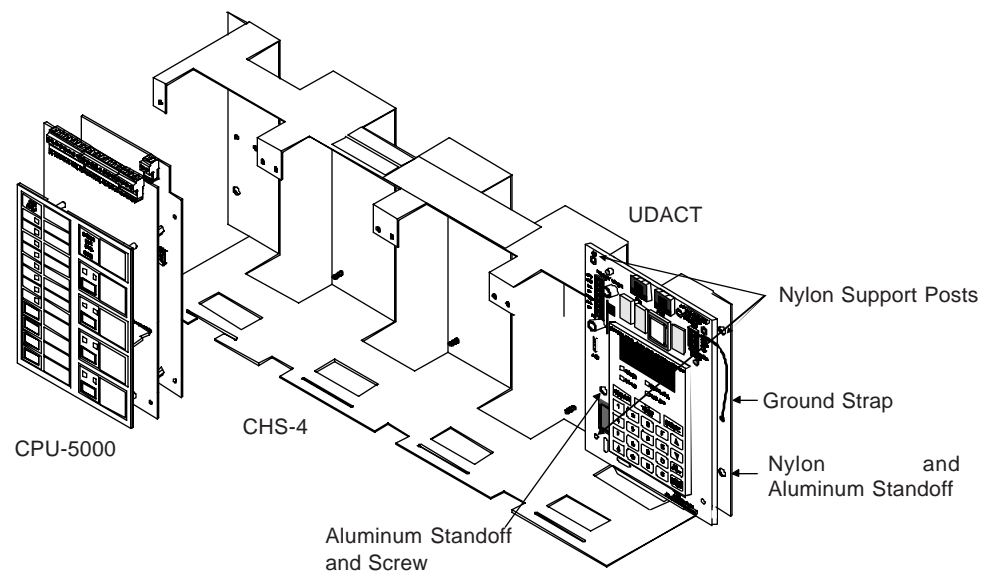


Figure 6-5: UDACT Mounting in CHS-4

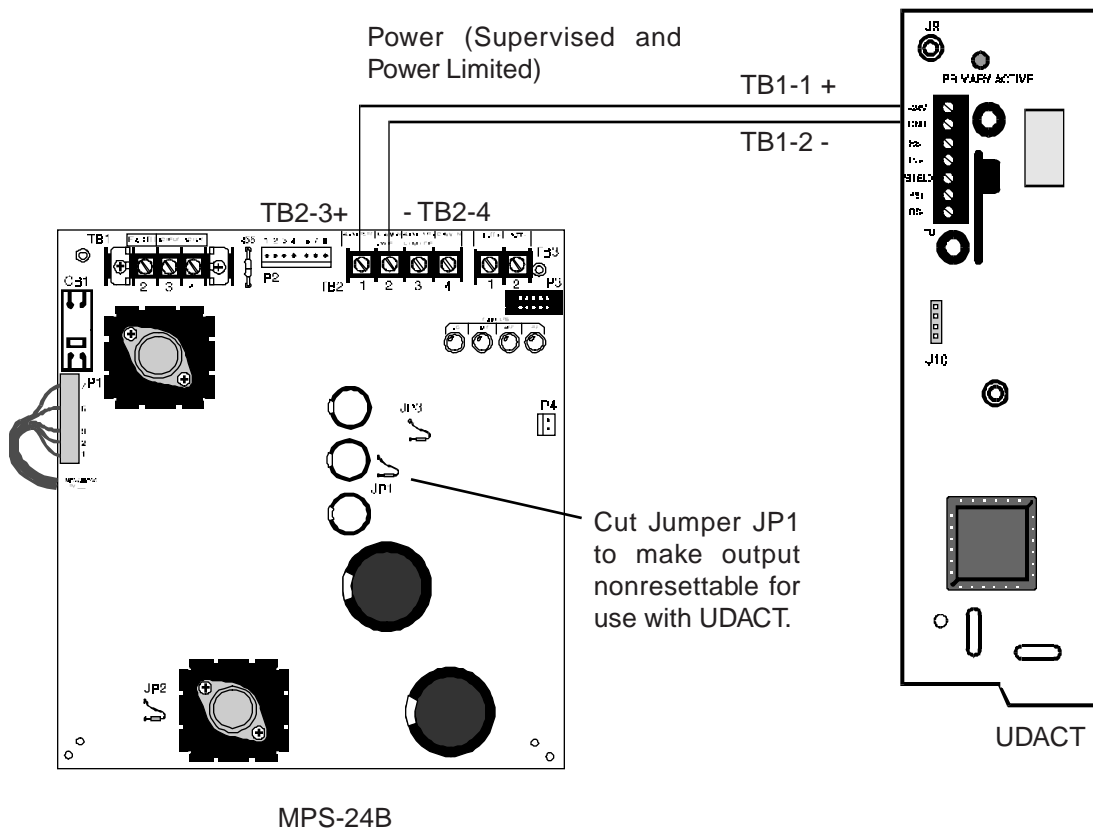
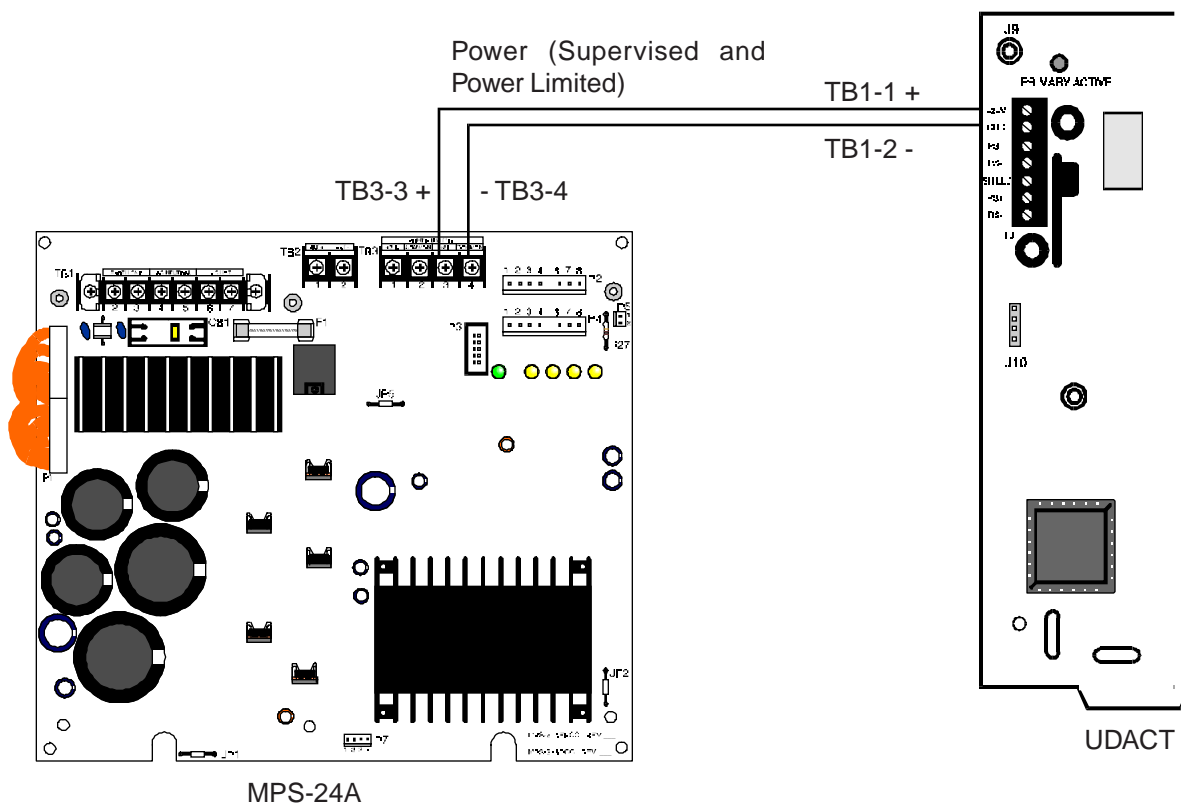


Figure 6-7: 24 VDC Power Connection to UDACT

6.7 Tee-Tapping

One Tee-Tap will be allowed on Style Y Notification Appliance Circuits if a 10K End-of-Line Resistor (Part# 71274) is used on each branch as shown in Figure 6-4.

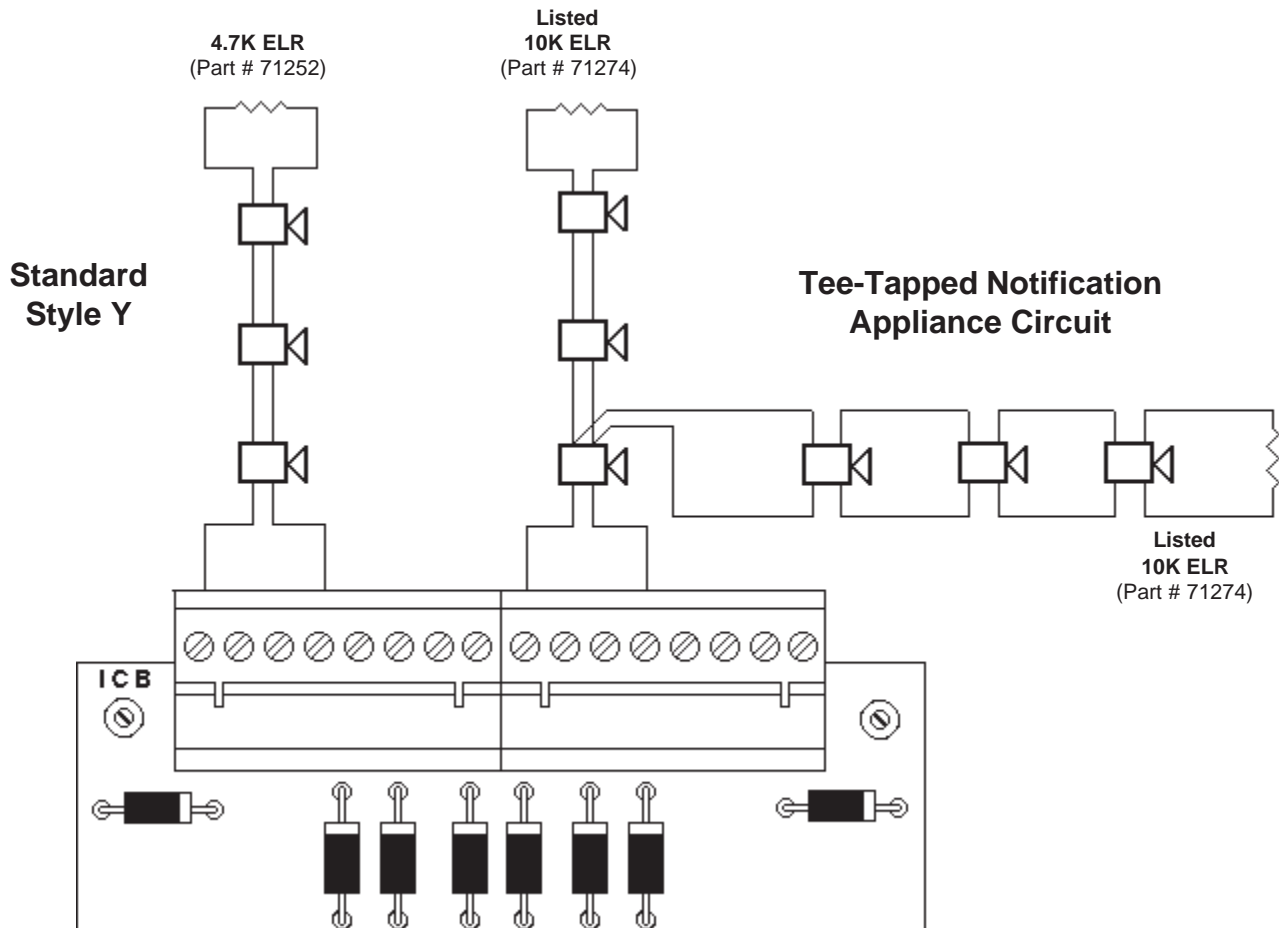


Figure 6-8: Tee-Tapping Notification Appliance Circuits

Note: Factory Mutual (FM) recommends this application not be used.

6.8 Four-Wire Smoke Detectors

Initiating devices requiring 24 VDC operating power can be wired as illustrated in Figures 6-5 and 6-6.

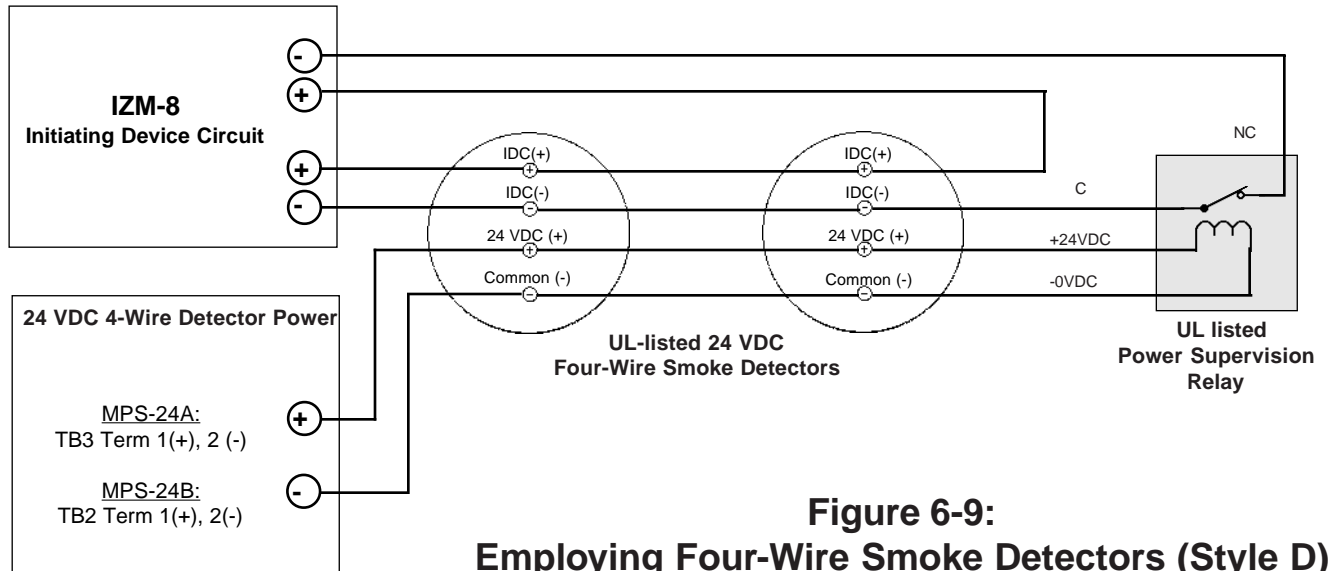


Figure 6-9:
Employing Four-Wire Smoke Detectors (Style D)
All connections are supervised and power limited

**Notes on
Style B
and
Style D
field wiring:**

- 1) The Power Supervision Relay coil leads must be connected to the last detector base 24V screw terminal.
- 2) Calculation of the maximum allowable resistance in the 24VDC detector power wiring:

$$R_{max} = \frac{(20.6 - V_{om})}{(N)(I_s) + (NA)(I_a) + (I_r)}$$

Where: R_{max}-is the maximum resistance of the 24V wires
V_{om}-is the minimum operating voltage of the detector or end of line relay, whichever is greater, in volts.

N-is the total number of detectors on the 24V supply loop.
I_s-is the detector current in standby.
NA-is the number of detectors on the 24V power loop which must function at the same time in alarm.
I_a-is the detector current in alarm.
I_r-is the end of line relay current.

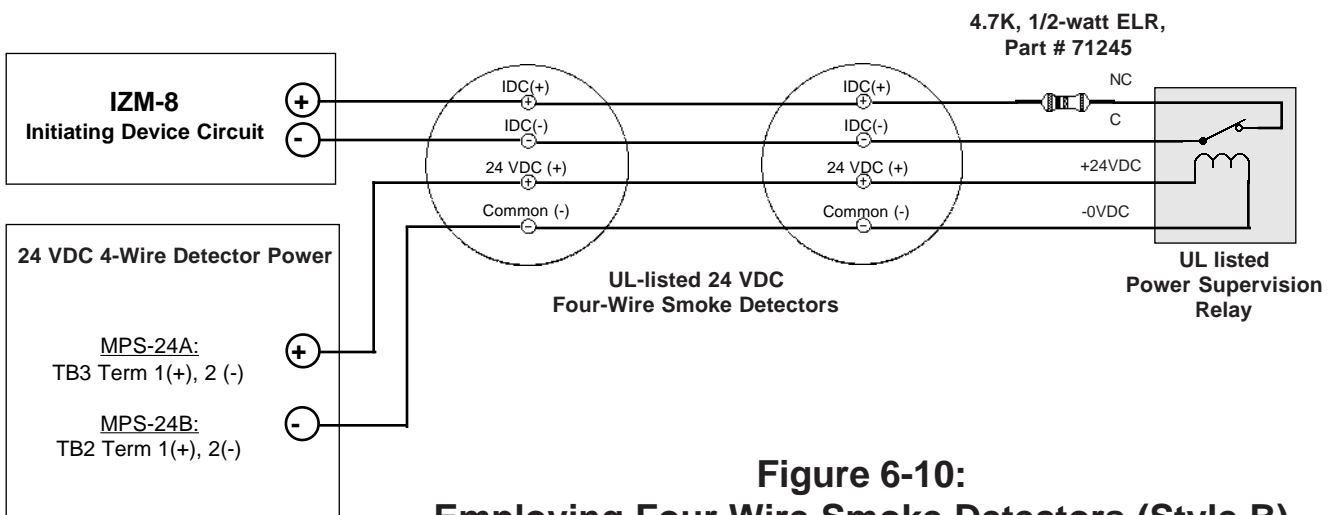
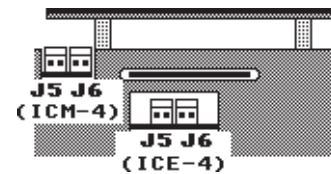


Figure 6-10:
Employing Four-Wire Smoke Detectors (Style B)
All connections are supervised and power limited

6.9 Notification Appliance Circuit Current Limitations

The total current available from any group of Indication Appliance Circuits cannot exceed 3.0 amps. Figure 6-7 illustrates some of the typical power supply/Notification Appliance Circuit configurations.

Note: The term "total" in these figures assumes that no Notification Appliance power is drawn for any other purpose.



Bottom wire of the
ICM-4/ICE-4

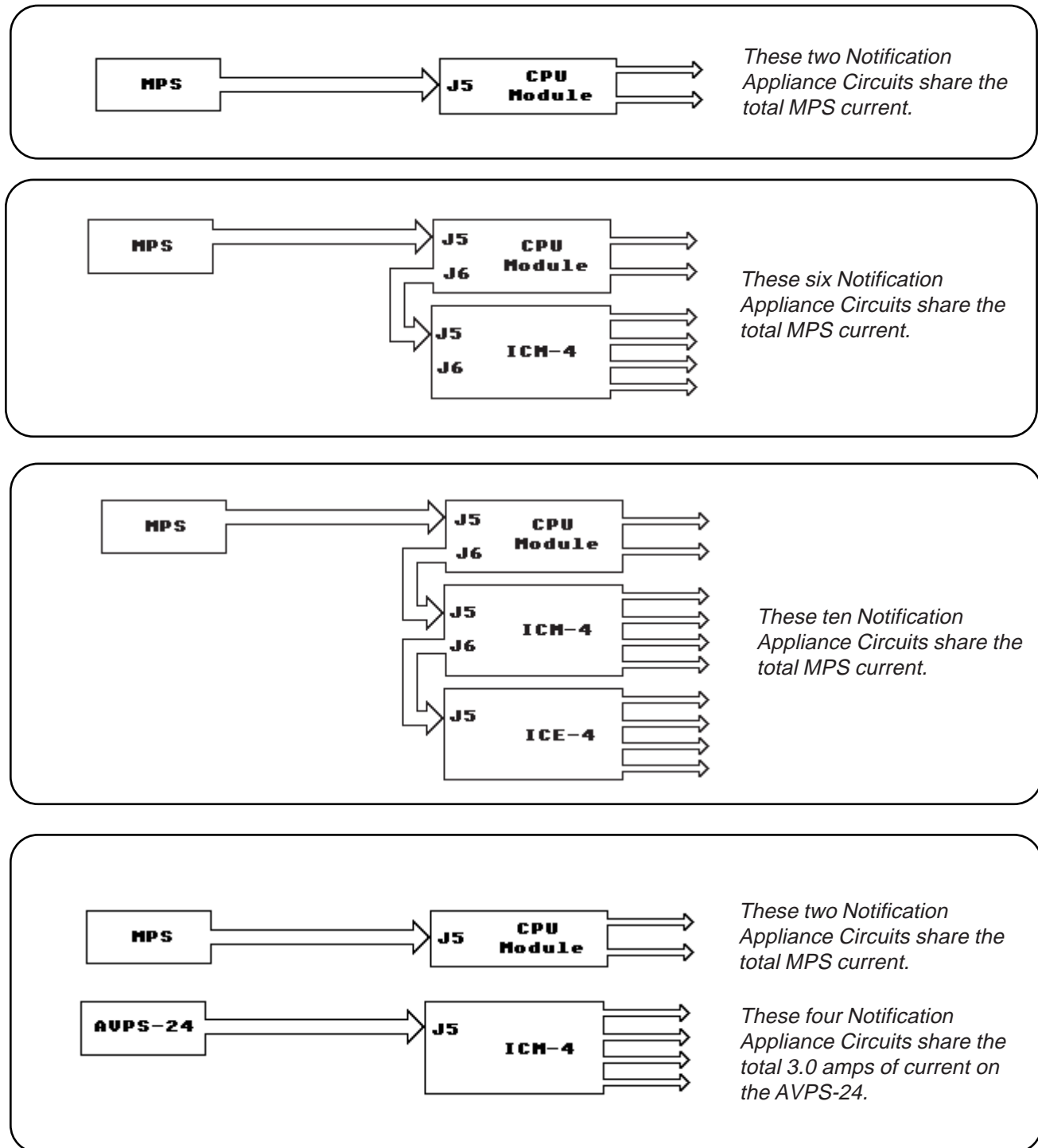
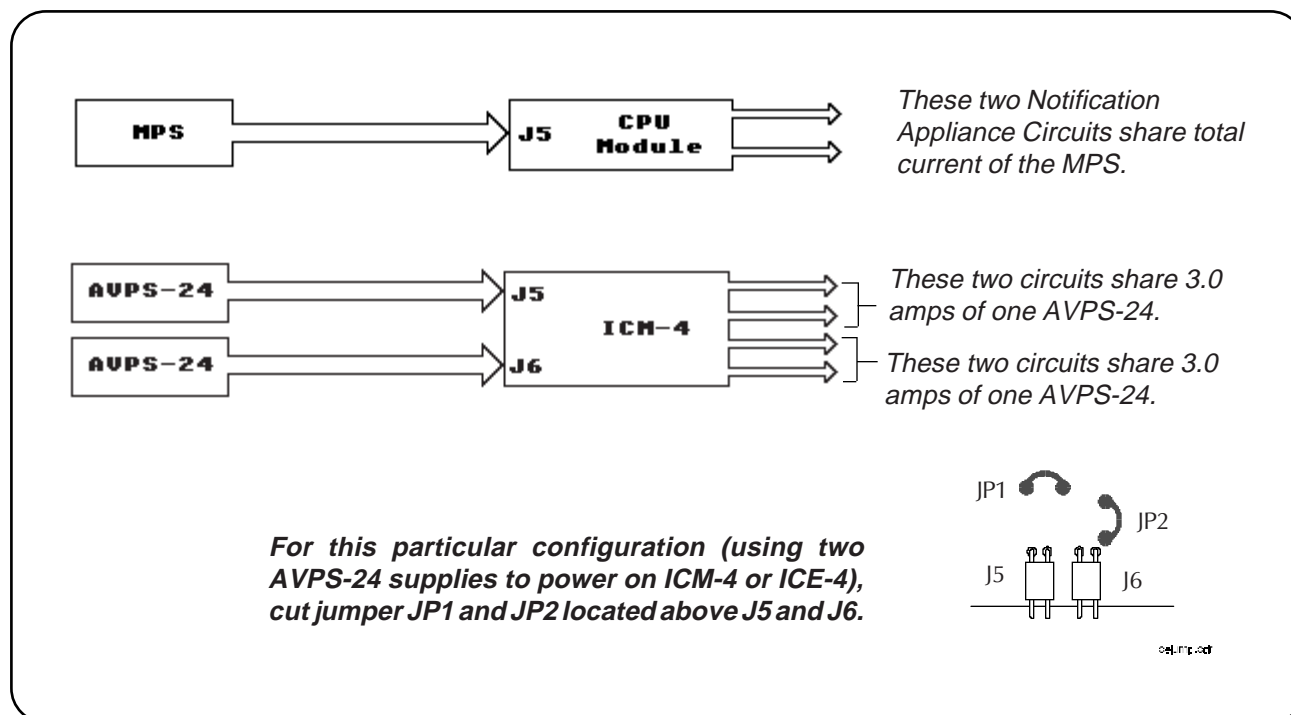
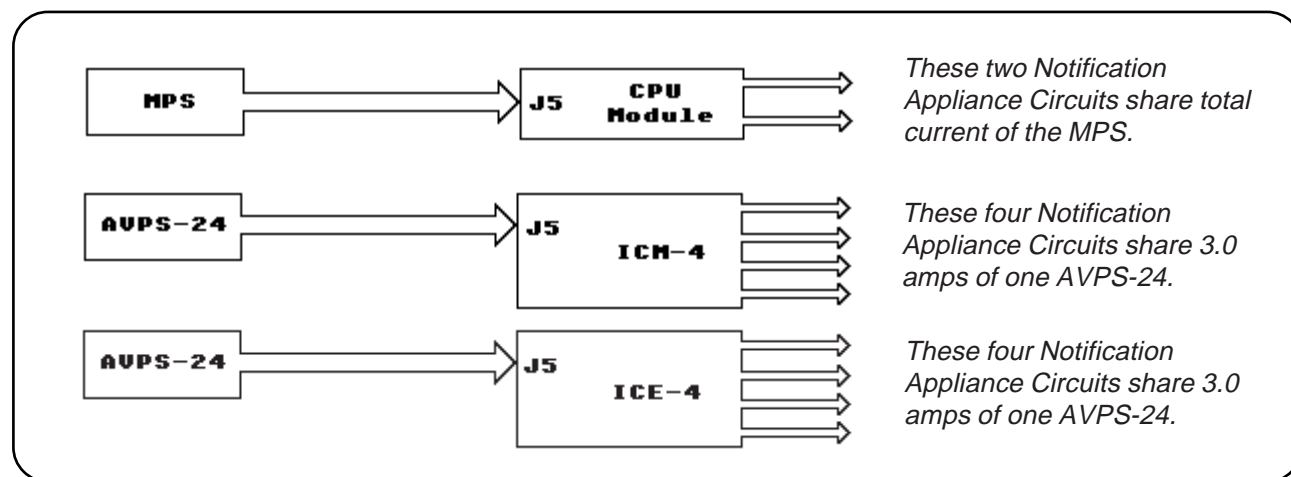
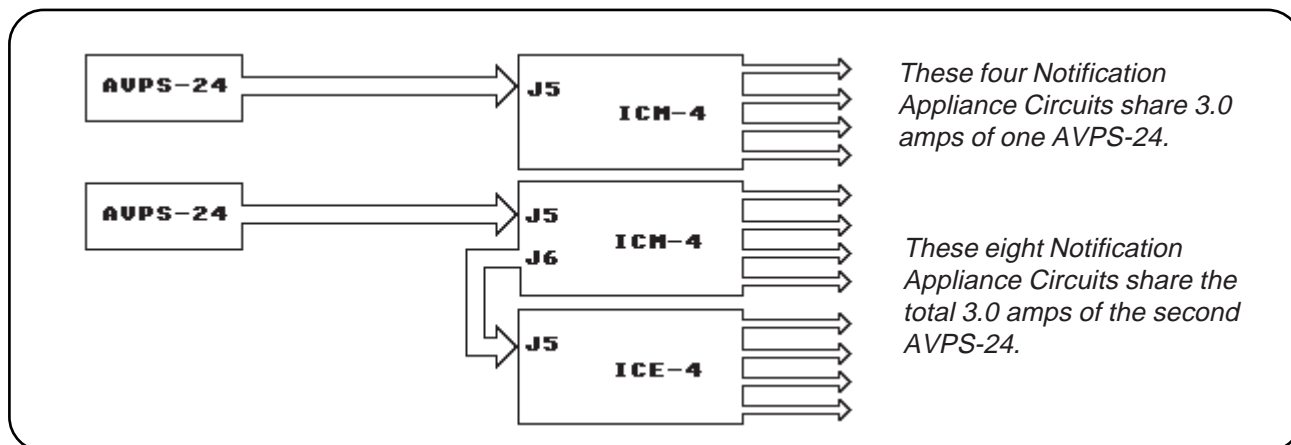


Figure 6-11: Typical Supply/Notification Circuit Configurations



Remote Command Inputs

The function of Acknowledge, Signal Silence, and Reset can be executed from remote switches. The switches are wired to IZM-8 circuits which must be programmed for this special operation. Additional functions, outlined below, can also be accomplished through IZM-8 circuits.

Presignal Inhibit: IZM-8 zone 1. Program zone as non-alarm and supervisory. This command issued to inhibit presignal operation. Upon entering presignal, the CPU checks zone 1 on all IZM-8 and AIM-200 modules. If the zone is active (shorted), all presignal or PAS operation will be ignored.

Telephone page: IZM-8 zone 2. Program zone as non-alarm and supervisory. Telephone Page is used for remote paging when the fire fighter wishes to manually select speaker circuits. Telephone Page will be activated when a telephone call-in is received and zone 2 has been activated (shorted). The CPU will then activate the telephone circuit, transmit a Telephone Page command to the AMG-1 Audio Message Generator which will patch the call through to the AMG-1 output. When zone 2 returns to normal, the CPU will deactivate the telephone circuit and transmit a page off command to the AMG-1. Never program a telephone circuit for silenceable operation or inhibit its switch function.

All-Call Telephone Page: IZM-8 zone 3. Program zone as non-alarm and supervisory. All-Call Telephone Page operates the same as Telephone Page, with the exception that the CPU will initiate the All-Call function, which activates all silenceable circuits not programmed for switch inhibit. When zone 3 returns to normal, the CPU will deactivate the All-Call Telephone Page function (re-execute all zone-to-output mapping). Notification circuit that should not activate during all-call telephone page must be programmed for non-silenceable and/or switch inhibit operation.

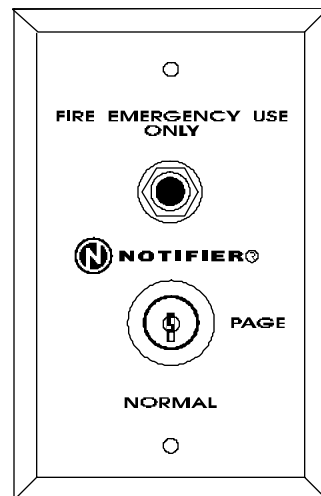
All-Call (General Alarm): IZM-8 zone 4. Program zone as non-alarm and supervisory. Provides a simple evacuation function for non-voice alarm systems. All-Call does not perform telephone functions, but, rather, initiates an All-Call function that activates all silenceable circuits that are not programmed for switch inhibit. When zone 4 returns to normal, the CPU will deactivate the All-Call function (re-execute all zone-to-output mapping). Notification circuits that should not activate during all-call (general alarm) must be programmed for non-silenceable and/or switch inhibit operation.

Emergency Alert: IZM-8 zone 5. Program zone as non-alarm and supervisory. Use as an evacuation signal for tornados, bomb-scares and other non-fire emergency situations. If the System 5000 is not in alarm, activation (short) on zone 5 will activate all Notification Appliance Circuits and output relays, that are mapped to zone 5, with a steady signal. Programmed March Time or Temporal code is ignored. A fire alarm will take priority over an emergency alert. Notification Appliance Circuit used for fire must be programmed for MTC or Code 3 operation. Emergency Alert is for local signalling only, do not map to "Remote Signalling/Municipal Tie" outputs.

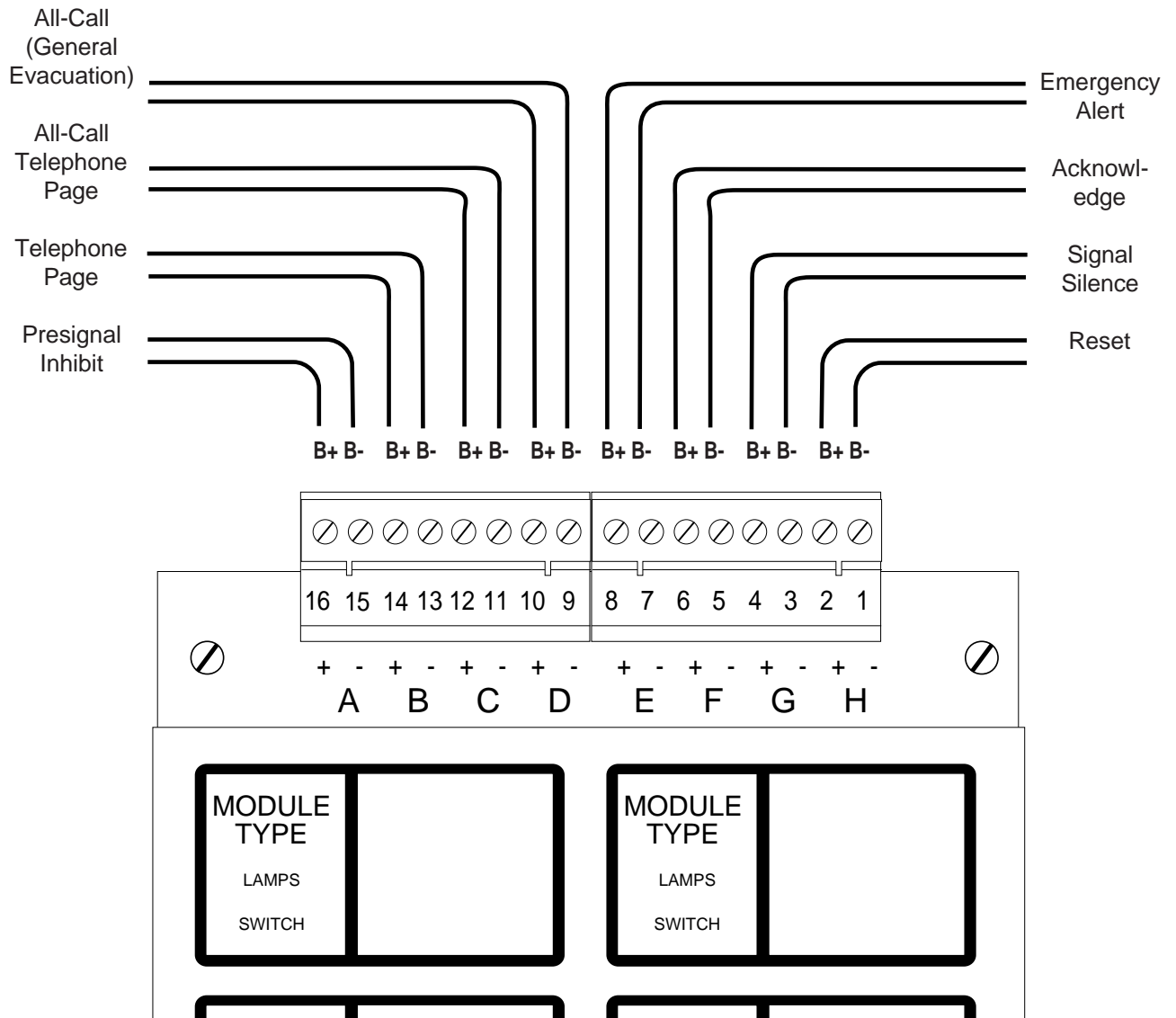
Acknowledge: IZM-8 zone 6. Program circuit as non-alarm and supervisory. Use to remotely execute an Acknowledge command without the need of an ACM-16AT annunciator.

Signal Silence: IZM-8 zone 7. Program circuit as non-alarm and supervisory. Use to remotely execute the Signal Silence command without the need of an ACM-16AT annunciator.

System Reset: IZM-8 zone 8. Program circuit as non-alarm and supervisory. Use to execute the Reset function without the need of an ACM-16AT annunciator.



Notifier model RPJ-1



Remote Command Input Connections

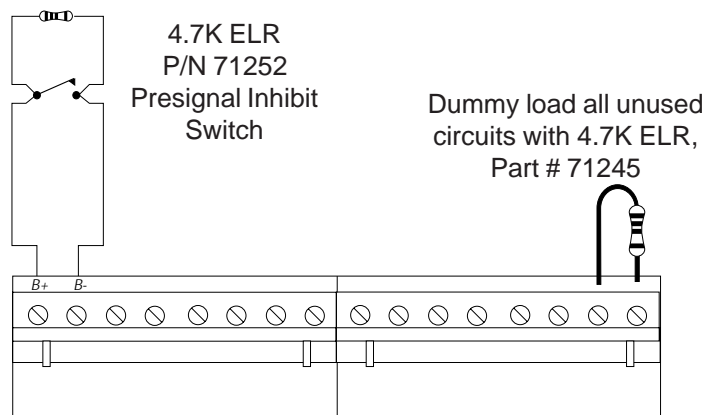
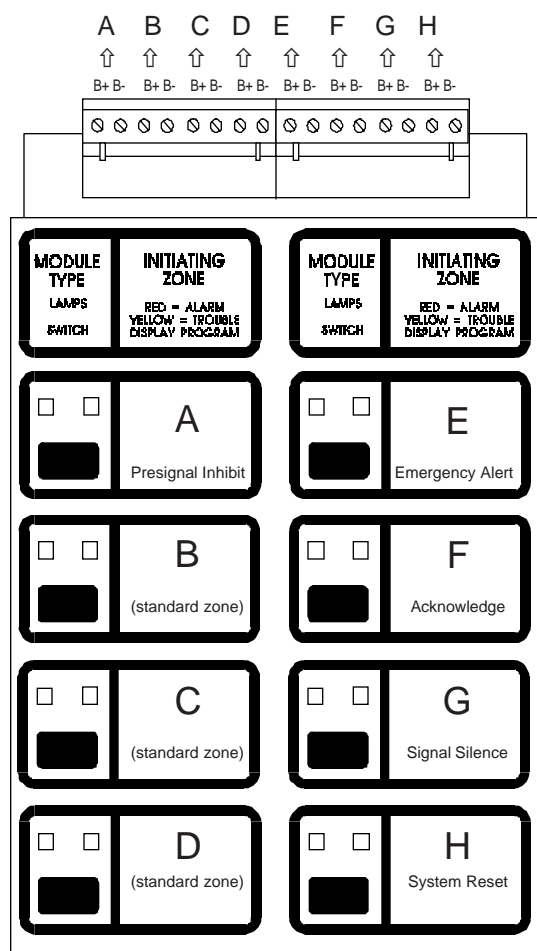
Notes:

1. Initiating Command Circuits are supervised, power limited, and may be connected to limited-energy cable.
2. Maximum line resistance allowed due to wiring is 100 ohms.

Connection Diagram For Remote Presignal Inhibit, All-Call (General Alarm), Emergency Alert, Acknowledge, Signal Silence and System Reset Switches.

Use circuit "D" for All-Call (General Evacuation), "E" for Emergency Alert, "F" for Acknowledge, "G" for Signal Silence, and "H" for Reset.

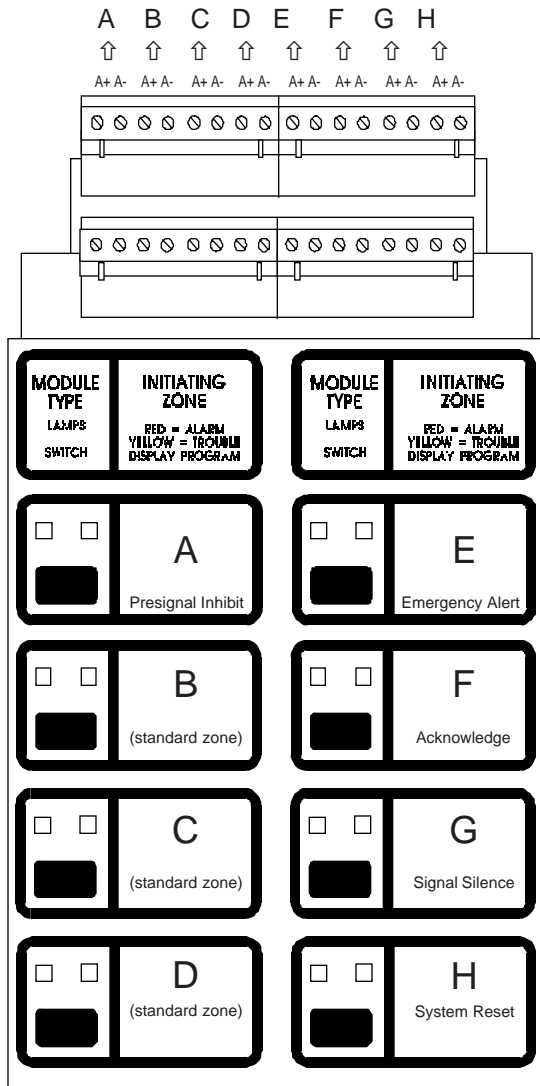
Style B



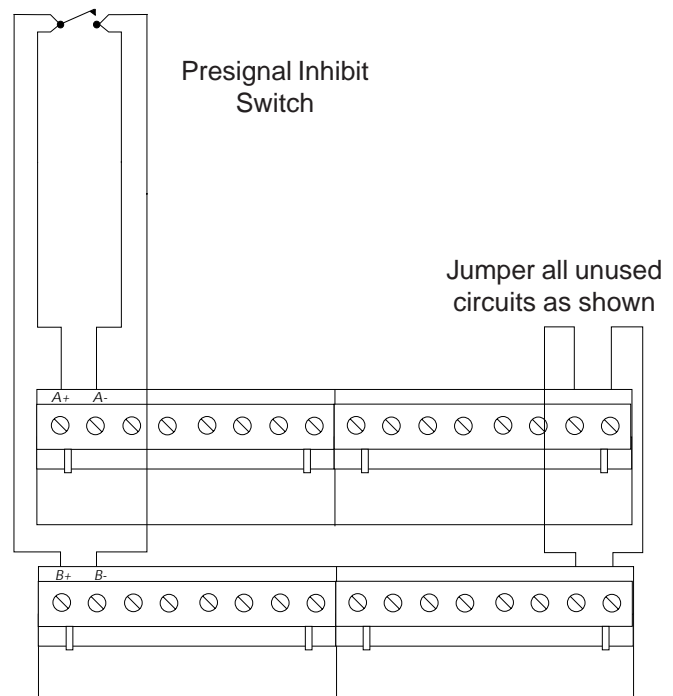
- 1) Switches used to control Presignal Inhibit, Acknowledge, Signal Silence or System Reset must be key operated, located within a locked cabinet, or arranged to provide equivalent protection against unauthorized use.
- 2) Switches must be UL listed to switch 30 VDC at 50mA.
- 3) If a key operated switch is used, the key should be removable in both open and closed positions, when used for Presignal Inhibit. The keys should be removable in the open position only when used for Acknowledge, Signal Silence or System Reset.
- 4) The Presignal Inhibit, Emergency Alert, Acknowledge, Signal Silence or System Reset functions can be controlled by a relay contact from a CR-4/CRE-4 Relay Module, which can be operated from switches on ACM-16AT, AEM-16AT, AFM-16AT, or LDM-32 Annunciators.
- 5) Locate Acknowledge, Signal Silence and System Reset switches adjacent to a system annunciator so that system status is available to the operator.
- 6) Remote Command Circuits are supervised and power limited. Maximum wire resistance per circuit is 100 ohms. Circuits wired for Style B operation requires a 4.7K ELR (P/N 71252) at the end of the line.

Connection Diagram For Remote Presignal Inhibit, All-Call (General Alarm), Emergency Alert, Acknowledge, Signal Silence and System Reset Switches.

Use circuit "D" for All-Call (General Evacuation), "E" for Emergency Alert, "F" for Acknowledge, "G" for Signal Silence, and "H" for Reset.



Style D



- 1) Switches used to control Presignal Inhibit, Acknowledge, Signal Silence or System Reset must be key operated, located within a locked cabinet or arranged to provide equivalent protection against unauthorized use. Switches must be UL listed to switch 30 VDC at 50mA.
- 2) If a key operated switch is used, the key should be removable in both open and closed positions, when used for Presignal Inhibit. The keys should be removable in the open position only when used for Acknowledge, Signal Silence or System Reset.
- 3) The Presignal Inhibit, Emergency Alert, Acknowledge, Signal Silence or System Reset functions can be controlled by a relay contact from a CR-4/CRE-4 Relay Module, which can be operated from switches on ACM-16AT, AEM-16AT, AFM-16AT, or LDM-32 Annunciators.
- 4) Locate Acknowledge, Signal Silence and System Reset switches adjacent to a system annunciator so that system status is available to the operator.
- 5) Remote Command Circuits are supervised and power limited. Maximum wire resistance per circuit is 100 ohms. Circuits wired for style B operation requires a 4.7K ELR (P/N 71252) at the end of the line.

Connection Diagram for Telephone Page

RPJ-1 Installation

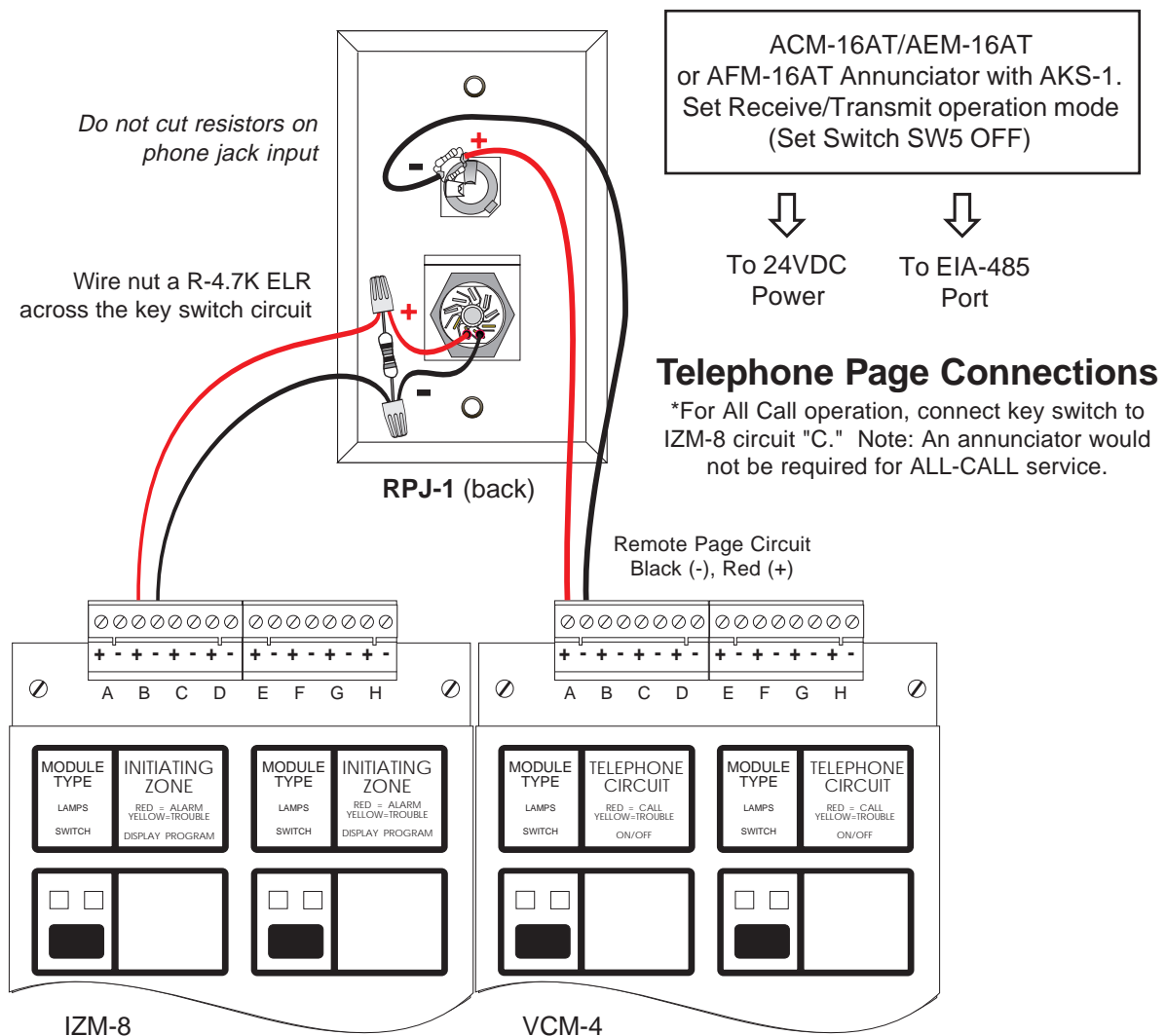
The RPJ-1 Remote Paging Jack mounts to a deep single-gang electrical box (4 x 2-1/8 x 2-1/2). Connect the key switch's red and black leads to an IZM-8 Zone 2 as illustrated below. Program Zone 2 as *non-alarm* and *supervisory*.

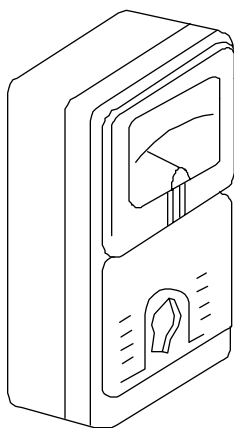
Connect the phone jack's red and black leads to a VCM-4 circuit. Do not program this circuit for silenceable operation or inhibit its switch functions. Ensure that the VCM-4's configuration jumper is set over JP4.

Telephone paging from RPJ-1 circuitry is supervised and power limited. Maximum wire resistance per circuit is 100 ohms (except for annunciator power which is 10 ohms). An ACS or AFM Annunciator is used for speaker circuit selection and must be mounted adjacent to the paging telephone station (not required for ALL-CALL operation).

RPJ-1 Operation

Telephone page is used for remote paging when the fire fighter wishes to manually select speaker circuits. To execute a remote page, insert the key into the RPJ-1 and turn counterclockwise. This will short-circuit zone 2. The CPU-5000 will then activate the telephone circuit, transmit a Telephone Page command to the AMG-1 Audio Message Generator, which will patch the call through to the AMG-1 output. Insert handset into the RPJ-1 phone jack and begin paging. When paging is complete, remove the handset, wait for speaker activation, lock the RPJ-1 and remove the key. When zone 2 returns to normal, the CPU will deactivate the telephone circuit and transmit a page-off command to the AMG-1.





Section Seven: Testing the System

7.1 Acceptance Test

Upon completion of the original installation and following subsequent modifications, a complete operational test should be conducted on the entire installation for the purpose of verification of compliance with the applicable NFPA standards. Testing should be conducted by a factory-trained distributor in the presence of a representative of the Authority Having Jurisdiction and the Owner's Representative. Follow procedures contained in NFPA Standard 72-1993, Chapter 7, "Inspection, Testing and Maintenance."

7.2 Periodic Testing and Service

Periodic testing and servicing of the control panel, all initiating and Notification devices, and any other associated equipment is essential to insure proper and reliable operation. Testing and servicing should be in accordance with the schedules and procedures outlined in the following documents:

- 1) NFPA Standard 72-1993, Chapter 7, "Inspection, Testing and Maintenance."
- 2) The service manuals and instructions for the peripheral devices contained in your system. Correct any trouble condition or malfunction immediately.

7.3 Operational Checks

Between formal periodic testing and servicing intervals, the following operation checks should be performed monthly or more frequently when required by the Authority Having Jurisdiction.

- 1) Check that the green "AC POWER" LED is illuminated.
- 2) Check that all yellow LEDs are off.
- 3) Holding "SYSTEM RESET" depressed should sequentially light all system LEDs.
- 4) Before proceeding, a) notify fire department and/or central alarm receiving station if alarm conditions are transmitted; b) notify facility personnel of test so that alarm sounding devices are ignored during test period; c) when necessary, activation of alarm Notification appliances and speakers can be prevented by depressing the ON/OFF SWITCH on the Notification Appliance Circuit(s) or speaker circuit(s) to be disabled, while depressing the DISABLE/ENABLE switch.

- 5) Activate an Initiating Device Circuit via an alarm initiating device and check that all active Notification appliances function. Reset the alarm initiating device, the control panel, and any other associated equipment. In voice alarm applications, confirm that the proper tone(s) and/or messages sound during alarm conditions. Select the paging function and confirm that the message can be heard in the affected fire zones.
- 6) Repeat Step 5 for each Initiating Device Circuit.
- 7) On systems equipped with a Fire Fighters Telephone circuits, initiate a call from a telephone circuit and confirm ring tone. Answer call and confirm communication with incoming caller. Terminate call and repeat for each telephone circuit in the system.
- 8) Remove AC power, activate an Initiating Device Circuit via an alarm initiating device and check that active Notification Appliances sound, and alarm indicators illuminate. Measure the battery voltage while Notification Appliances are activated. Replace any battery with a terminal voltage less than 21.6 volts. Reapply AC Power. Note: This test requires fully charged batteries, if batteries are new or discharged due to a recent power outage, allow the batteries to charge for 48 hours before testing.
- 9) Enable any Notification Appliance Circuit(s) that were disabled in Step 4C. Disabled circuits are enabled by first depressing the DISABLE/ENABLE switch on the CPU, followed by depressing the ON/OFF switch on the disabled circuit.
- 10) Check that all yellow LEDs are off and that the green "AC POWER" LED is illuminated.
- 11) Notify fire, central station and/or building personnel that test is complete.

7.4 Battery Checks and Maintenance

The maintenance-free sealed lead-acid batteries used in the system do not require the addition of water or electrolyte. They are charged and are maintained in a fully charged state by the main power supply's float charger during normal system operation. A discharged battery will charge at 1.5 amps (typically) and obtain its float voltage of 27.6 volts within 48 hours.

Replace any battery that is leaking or damaged. Replacement batteries may be obtained from the manufacturer. Minimal replacement battery capacity is indicated on the control panel's marking label. To check battery and system, Refer to Section 7.3.



Batteries contain Sulfuric Acid which can cause severe burns to the skin and eyes and damage to fabrics. In the event a battery leaks and contact is made with the Sulfuric Acid, immediately flush skin and/or eyes with water for at least 15 minutes. For eyes, seek immediate medical attention. A good neutralizing solution for Sulfuric Acid is water and household baking soda. Care should be taken to insure proper handling of the battery to prevent short-circuiting. Accidental shorting of the leads from uninsulated work benches, tools, bracelets, rings, and coins should be avoided. Shorting the battery leads can damage the battery, equipment, and could cause injury to personnel.

Section Eight: Supply Calculations

Section 8.1: The 120/240 VAC Fire Alarm Circuit

The control panel requires connection to a separate dedicated 120/240 VAC fire alarm circuit, which must be labeled "FIRE ALARM." This 120/240 VAC circuit must connect to the line side of the main power feed of the protected premises. No other equipment may be powered from the fire alarm circuit. The 120/240 VAC circuit wire run must run continuously, without any disconnect devices, from the power source to the fire alarm control panel. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Code as well as local codes. Use #12 AWG wire with 600-volt insulation for this circuit.

Device Type	No. of Devices		Current (amps)		Total Current
AVPS-24/AVPS-24E	[]	X	1.0/0.5	=	
AA-30/AA-30E	[]	X	1.0/0.5	=	
AA-120/AA-120E	[]	X	1.85/0.9	=	
MPS-24A/MPS-24AE or MPS-24B/MPS-24BE	1	X	1.8/0.9	=	
Remote Battery Charger	R45-24/ R45-24E	X	1.0/0.5	=	
Sum Column for AC Branch Current Required =					amps

Table 8.1: 120 VAC Fire Alarm Circuit

Use Table 8-1 to determine the total amount of current, in AC amps, that the AC service must be capable of supplying to the system.

Section 8.2: The Main Power Supply

The MPS must be capable of powering all internal system devices (and several external types of devices) continuously during non-fire alarm conditions. Use Table 8-2A to determine the Non-Fire Alarm Load on the MPS regulator when a primary power is applied. A finite amount of additional current must be provided by the power supply during a fire alarm condition. Use Table 8-2B to determine the additional current needed during fire alarms. The requirements for non-fire alarm and fire alarm current loads cannot exceed the capabilities of the power supply in either case.

The MPS-24A provides up to 3.0 amps of regulated current for operating the system in standby (non-fire alarm) and up to 6.0 amps during fire alarms. The MPS-24A contains battery charging circuitry and a 1-amp regulated output for powering 4-wire smoke detectors. The MPS-24B provides 750 mA of regulated power for system modules and 2.0 amps for Notification Appliances.

S5000 System Current Draw Calculation Table (Table 8-2A)

Note: The Primary Power Source Non-Alarm Current and Alarm Current columns of this table are not battery calculations. They are simply current calculations to confirm that the MPS can supply enough current to support the system during Primary Non-Fire Alarm and Fire Alarm conditions.

Note: Throughout these current calculation tables, the word "primary" refers to the FACP's primary source of power, i.e. 120/240 VAC power. The word "secondary" refers to the FACP's backup batteries (or any other 24 VDC uninterruptable, regulated power supply listed for Fire Protective Signaling and connected in place of the batteries).

Part One - Non-Alarm Current (Primary Power Source): This column of Table 8-2A allows the user to calculate the current that will be drawn from the MPS during a non-alarm condition, with AC power applied. This current draw cannot exceed 3.0 amps (MPS-24A) or 0.750 amps (MPS-24B). This column does not account for current drawn from TB2-3 and TB2-4 in Non-Alarm conditions on the MPS-24B which is limited to 0.800 amps, exclusive of the 0.750 amps limit on the Non-Alarm Current Load. Current drawn from TB2-1 and TB2-2 on the MPS-24B cannot exceed 0.200 amps at any time.

Part Two - Fire Alarm Current (Primary AC Power): The second column of Table 8-2A allows the system designer to determine the additional current load that must be supported by the MPS during a fire alarm condition with primary power applied. This current drawn during a fire alarm cannot exceed 0.750 amps on the MPS-24B. This column does not account for current draw from TB-3 and TB2-4 in fire alarm which is limited to 2.0 amps exclusive of the 0.750 amps fire alarm load. The total current drawn from the MPS-24A during a fire alarm cannot exceed 6.0 amps and 2.3 amps for the MPS-24B.

Note: Typically, a system should be designed around the capacity to activate all output circuits and relays, and support fire alarms on no less than 10% of initiating device circuits (subject to the requirements of the Local Authority Having Jurisdiction (LAHJ)).

Concerning 4-wire detectors: In Table 8-2A, the current to be entered for 4-wire smoke detectors is the manufacturer's rated fire alarm current minus the manufacturer's rated non-fire alarm current.

Concerning notification appliances: The MPS provides a regulated supply for notification appliance circuits, permitting the use of any 24VDC notification appliances UL listed for Fire Alarm Systems. Note: No more than 3.0 amps of current can be drawn from the MPS-24A and no more than 200 mA from the MPS-24B.

Part Three - Non-Fire Alarm Current (Secondary battery power): The last column of Table 8-2A allows the system designer to calculate the secondary non-fire alarm current. This is the current that will be drawn from the secondary source in a non-fire alarm condition during AC power loss. This figure is required to complete the standby battery calculations. After adding up all the individual current draws, the total figure is then transferred to Table 8-2C.

Category	Primary, Non-Fire Alarm Current (amps)			Primary, Fire Alarm Current (amps)			Secondary, Non-Fire Alarm Current (amps)		
	Qty	X [current draw]=	total	Qty	X [current draw]=	total	Qty	X [current draw]=	total
CPU	1	x [0.031] =	0.03-1	1	x [0.223]=	0.22-3	1	x [0.031] =	0.031
MPS-24A/MPS-24AE MPS-24B/MPS-24BE	1	x [0.064]= x [0.062]=		1	x [0.064]= x [0.062]=		1	x [0.104]= x [0.022]=	
AVPS-24/AVPS-24E	[]	x [0.009]=		[]	x [0.009]=		[]	x [0.009]=	
MPM-2	[]	x [0.006]=		[]	x [0.006]=		[]	x [0.006]=	
IZM-8	[]	x [0.047]=		[]	x [0.047]=		[]	x [0.047]=	
IZE-A	[]	x [0.004]=		[]	x [0.003]=		[]	x [0.004]=	
ICM-4, CRM-4	[]	x [0.007]=		[]	x [0.072]=		[]	x [0.007]=	
ICE-4	[]	x [0.001]=		[]	x [0.065]=		[]	x [0.001]=	
CRE-4		not applicable		[]	x [0.065]=		[]	not applicable	
TCM-2, TCM-4	[]	x [0.007]=		[]	x [0.072]=		[]	x [0.007]=	
AIM-200 (see manual)	[]	x [] =		[]	x [] =		[]	x [] =	
DCM-4	[]	x [0.008]=		[]	x [0.080]=		[]	x [0.008]=	
VCE-4	[]	x [0.001]=		[]	x [0.040]=		[]	x [0.001]=	
VCM-4	[]	x [0.007]=		[]	x [0.040]=		[]	x [0.007]=	
AFM-16AT, AFM-32A	[]	x [0.040]=		[]	x [0.056]=		[]	x [0.040]=	
ACM-16AT, ACM-32A	[]	x [0.040]=		[]	x [0.056]=		[]	x [0.040]=	
AEM-16AT, AEM-32A	[]	x [0.002]=		[]	x [0.018]=		[]	x [0.002]=	
AFM-16A	[]	x [0.025]=		[]	x [0.065]=		[]	x [0.025]=	
LCD-80	[]	x [0.100]=		[]	x [0.100]=		[]	x [0.050]=	
ACM-8R (refer to Doc. 15342)	[]	x [] =		[]	x [] =		[]	x [] =	
LDM (refer to Doc. 15885)	[]	x [] =		[]	x [] =		[]	x [] =	
UZC-256	[]	x [0.035]=		[]	x [0.085]=		[]	x [0.035]=	
NIB-96	[]	x [0.022]=		[]	x [0.] =		[]	x [0.022]=	
AMG-1, AMG-E, ATG-2 FFT-7, FFT-7S	[]	x [0.060]= x [0.060]=		[]	x [0.060]= x [0.120]=		[]	x [0.060]= x [0.060]=	
AA-30 AA-120		NOT APPLICABLE					[] []	x [0.045]= x [0.050]=	
2-Wire Smoke Detectors (refer to the Device Compatibility Document for current draws)	[] [] [] []	x [] = x [] = x [] = x [] =		[] [] [] []	x [] = x [] = x [] = x [] =		[] [] [] []	x [] = x [] = x [] = x [] =	
1 to 30 zones 31 to 40 zones 41 to 50 zones 51 to 60 zones 61 to 70 zones 71 to 80 zones 81 to 90 zones 91 to 100 zones 101 to 110 zones 111 to 120 zones		NOT APPLICABLE		[]	x [0.120]= x [0.160]= x [0.200]= x [0.240]= x [0.280]= x [0.320]= x [0.360]= x [0.400]= x [0.440]= x [0.480]=		NOT APPLICABLE		
911A Communicator UDACT Communicator	[] []	x [0.030]= x [0.040]=		[] []	x [0.167]= x [0.100]=		[] []	x [0.030]= x [0.040]=	
Other devices drawing power from the power supply excluding Notification Appliance Power	[] []	x [] = x [] =		[] []	x [] = x [] =		[] []	x [] = x [] =	
4-Wire Smoke Detectors (see note 1)	[] []	x [] = x [] =		[] []	x [] = x [] =		[] []	x [] = x [] =	
Power Supervision Relays (see note 1)	[]	x [] =		[]	x [] =		[]	x [] =	
Releasing Device Draw from TC-2/TC-4 circuits (see notes 1 and 2)		NOT APPLICABLE		[]	x [] =		NOT APPLICABLE		
Remote Station Circuits (see note 1)	[]	x [0.018]=		[]	x [0.018]=		[]	x [0.018]=	
Sum each column for totals		Primary, non-alarm total: x [] = x [] =			Primary, alarm total: x [] = x [] =			Secondary, non-alarm total: x [] = x [] =	

Table 8-2B: S5000 System Current Draw Calculations

NOTES:

- 1) The total regulated load current supplied to external circuits cannot exceed 3.0 amps (MPS-24A) or 200 mA (MPS-24B).
- 2) MPS-24B: Enter only Notification Appliance draw from TCM-2/TCM-4 circuits. MPS-24A: Enter total notification appliance draw for entire system. Do not include power from AVPS-24 supplies!
- 3) The total regulator load cannot exceed 6.0 amps in alarm and 3.0 amps in standby (MPS-24A) or 750 mA in alarm and standby (MPS-24B).

Maximum Secondary Power Fire Alarm Current Draw

Use Table 8-2B to determine the maximum current requirements of secondary power source during fire alarm conditions. The total obtained in Table 8-2B is the amount of current that the batteries must be capable of supplying. This figure will be used in Table 8-2C to determine the size of the batteries needed to support five minutes of fire alarm operation.

Table 8-2B assumes that while in a fire alarm condition, the batteries must feed the main power supply and any additional supplies (AVPS-24, AA-30 and AA-120) with the maximum rated power each supply can provide. Note: Due to the maximum rating of 9 amps imposed when using PS-12250 batteries, it may be necessary to calculate the exact requirements of the secondary supply. In that case, add the Secondary Non-Fire Alarm Load obtained in Table 8-2A to the total fire alarm current draw of all Notification Appliances in the system and substitute that figure in Table 8-2B for the Main Power Supply and any additional supplies.

Device	# in Alarm (simultaneously)	Multiply By	Current in Amps	Total Current/Type
MPS-24A/MPS-24AE or MPS-24B/MPS-24BE	1	X	6.0 or 2.93	
AVPS-24/AVPS-24E	[]	X	3	
AA-30/AA-30E	[]	X	3	
AA-120/AA-120E	[]	X	7.3	
Sum Column for Secondary Fire Alarm Load* =				amps

* The Secondary Fire Alarm Load cannot exceed 9.0 amps with PS-12250 batteries and 20 amps with PS-12550 batteries.

Table 8-2B: Maximum Secondary Power Fire Alarm Current Draw

Secondary Non-Fire Alarm Load (from third column, Table 8-2A)	X	Required Secondary Non-Fire Alarm Standby Time (24 or 60 hours)	=	Non-Fire Alarm Secondary Standby Amp Hours
Secondary Fire Alarm Load (from Table 8-2B)	X	Required Fire Alarm Time (For 5 min., enter 0.084, for 15 min., enter 0.25)	=	Secondary Fire Alarm Amp Hour Requirement
Sum Column for Total Secondary Ampere Hours calculated			=	
Multiply by the derating factor X 1.2			=	
Total Secondary Ampere Hours Required			=	amps

Table 8-2C: Secondary Power Standby and Fire Alarm Load

Notes:

1. NFPA 72 Local and Proprietary systems require 24 hours of standby power followed by five minutes in alarm. NFPA 71 Central Station, and NFPA Auxiliary and Remote Station Systems require 60 hours of standby power followed by five minutes in alarm. Batteries installed in a system powered by a generator need to provide at least four hours of standby power.
2. If the total exceeds 25 AH (17 AH on the MPS-24B), an NR45-24 Remote Battery Charger is needed. If the total exceeds 55 AH, a UL listed Uninterruptable Power Supply with sufficient amp-hour capacity is needed.

Calculating battery size needed

Table 8.2E sums the standby and alarm loads to arrive at the battery size, in ampere hours, needed to support the system. Each MPS has a specific range of batteries that can be charged properly. Select batteries that meet or exceed the Total Ampere-Hours calculated and the are within the acceptable charger range:

Battery Size	Voltage Rating	Number Required	Part Number	Cabinet Size
7.0 AH	12 volts	two	PS-1270	CAB-A3,B3,C3,D3
9.5 AH	6 volts	four	PS-695	CAB-A3,B3,C3,D3
12 AH	12 volts	two	PS-12120	CAB-A3,B3,C3,D3
25 AH	12 volts	two	PS-12250	CAB-A3,B3,C3,D3
55 AH	12 volts	two	PS-12250	CAB-A3,B3,C3,D3

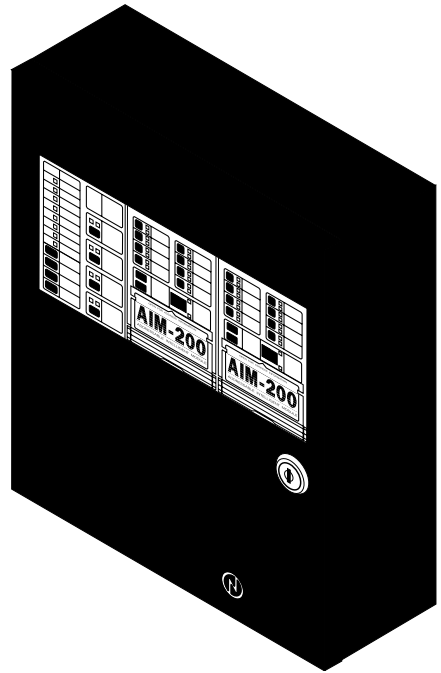
Battery Charger Amp-Hour Range:

MPS-24A (9 - 55 AH)

MPS-24B (6.5 - 17 AH)

NR45-24 (20 - 55 AH)

Appendix A: The CAB-AA Enclosure



The CAB-AA is a backbox and door that provides for the semi-flush mounting of a small System 5000 (up to three modules) between 16-inch-on-center studs. The CAB-AA can also be surfaced-mounted. In addition to the required CPU, the CAB-AA will accept one or two modules, including the AIM-200. The modules mount to rails in the cabinet, eliminating the need for optional chassis assemblies. A recessed mounting location provides for the installation of an AVPS-24 Audio Visual Power Supply or a NIB-96 Network Interface Board underneath the modules. Powering the system from the CAB-AA requires an MPS-24BPCA Main Power Supply, which provides up to 2.0 amps of Notification Appliance power, and a 4000TA Transformer.

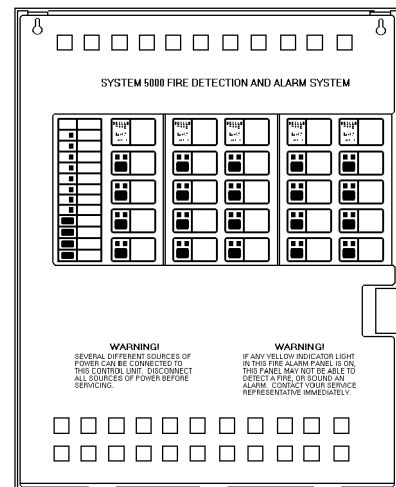
BE-5000AA: The Basic Equipment-5000AA includes the CPU-5000, the MPS-24BPCA, the 4000TA Transformer, and a two-position CPU Ribbon Cable.

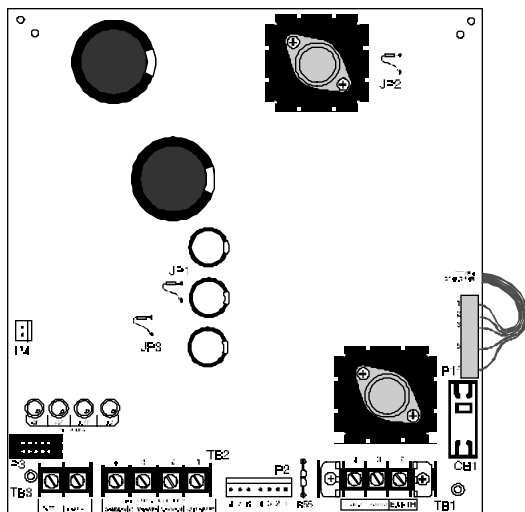
CAB-AA: Backbox (14.5" wide by 17" tall by 5" deep) and door (14.57" wide by 17.25" tall by 1.5 " deep).

DP-AA: Inner Dress Panel covers the backbox area surrounding the modules. Note: The Inner Dress Panel is required for installations in Canada.

System Limitations:

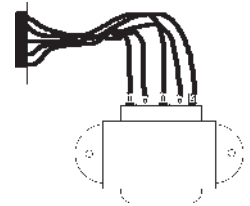
- ✓ Limited power supply capacity (base calculations on MPS-24B).
- ✓ Backbox can hold batteries in the 6.5 to 12 amp-hour range only.
- ✓ Maximum of two modules in addition to CPU.
- ✓ Will support one of the following: AVPS-24, one ARM-4, one UZC-256 OR one NIB-96.
- ✓ No voice evacuation capability.





MPS-24BRB

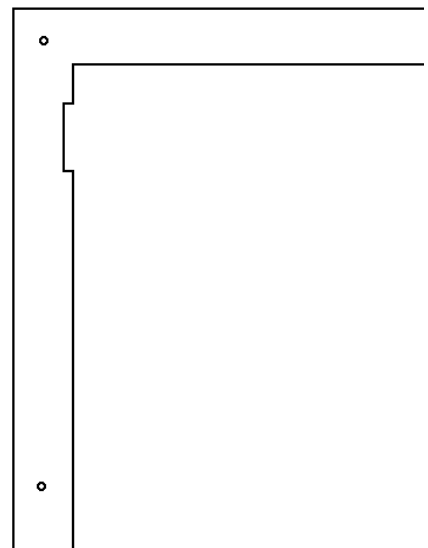
The MPS-24BRB supplies the regulated power needed to run the system's modules. It also supplies up to 2.0 amps of regulated Notification Appliance power, permitting the use of a variety of standard UL listed 24 VDC Notification Appliances. Up to 200 mA of resettable power is available for four wire smoke detectors. The MPS-24BRB contains an integral battery charger capable of charging batteries in the 6.5 to 17 amp-hour range. Includes two sets of battery cables, one for large battery terminals and one for small terminals. **Note:** For reorders, specify an "MPS-24BRB" (for *Replacement Board*). NOTE: For batteries larger than 12AH, order BB-17 battery box.



4000TA Transformer

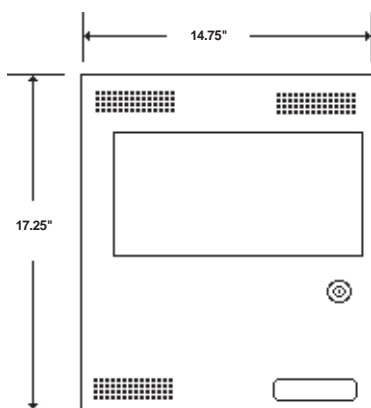
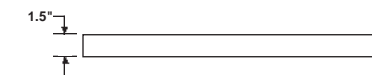
TR-500 Trim Ring

For semi-flush mounting of the CAB-AA cabinet.

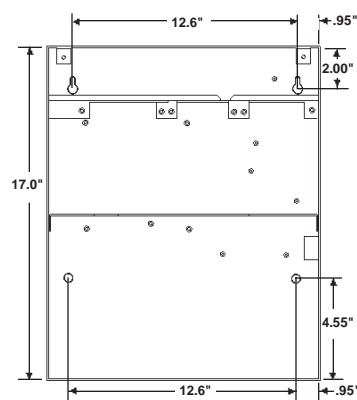
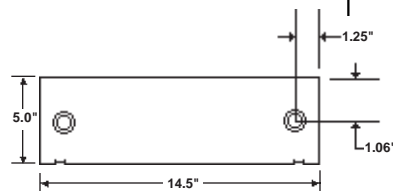


CAB-AA

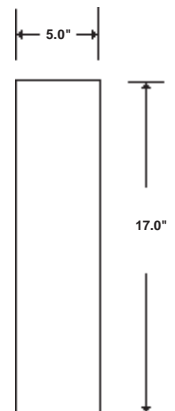
Backbox and Door assembly



Door (05113B)



Backbox (05113)



Side View

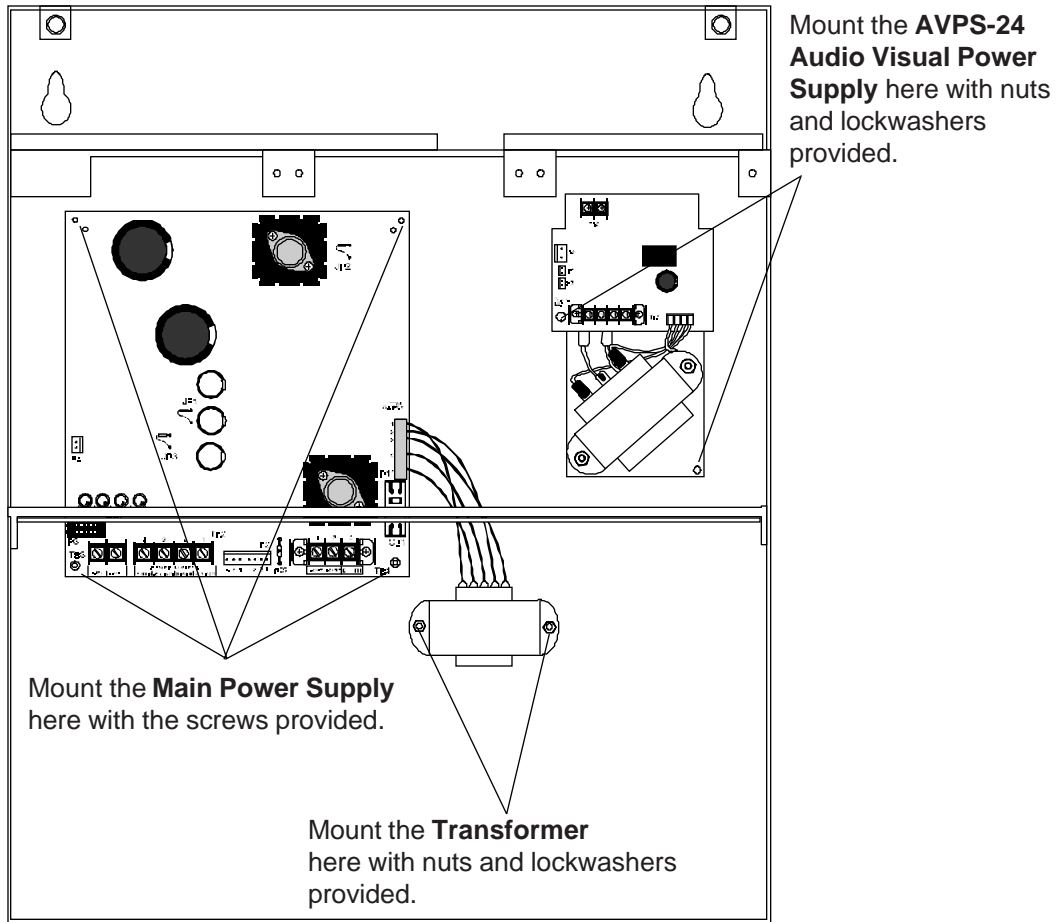


Figure A-1: Mounting Power Supplies

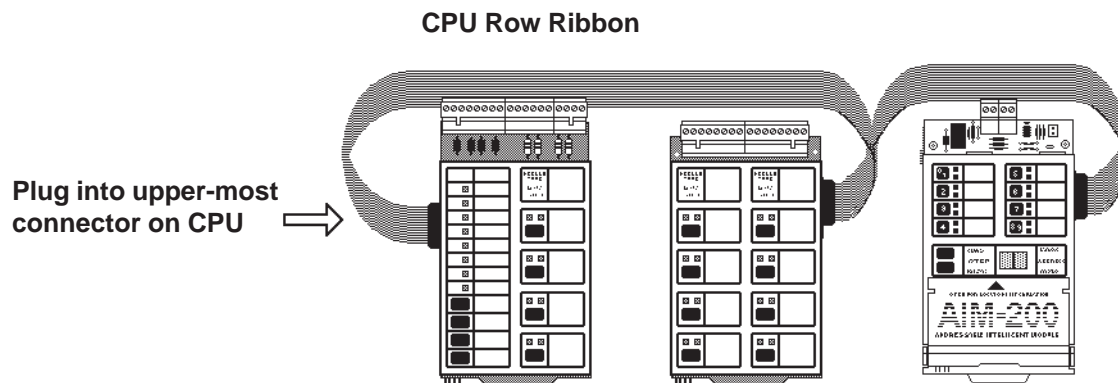
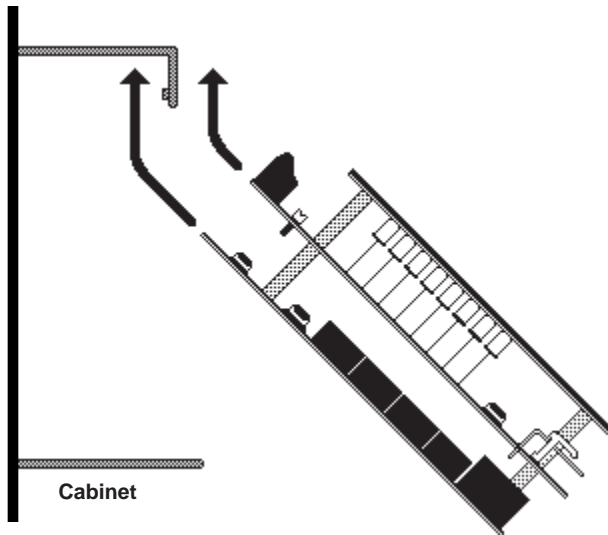


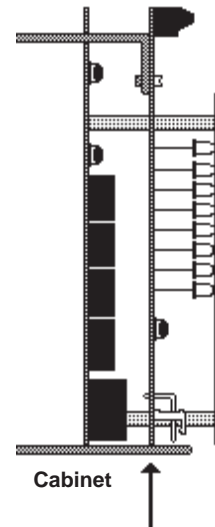
Figure A-2: Connecting the CPU Row Ribbon Cable

Step 1:

Insert the CPU into the left-most cabinet slot, angling the front end of the module into position as shown.

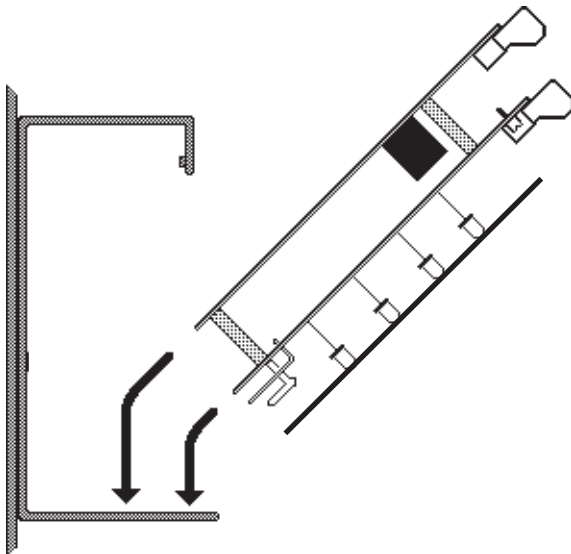
**Step 2:**

Push the back end of the module down into the cabinet and pull down until the upper board engages the slot on the chassis as shown.

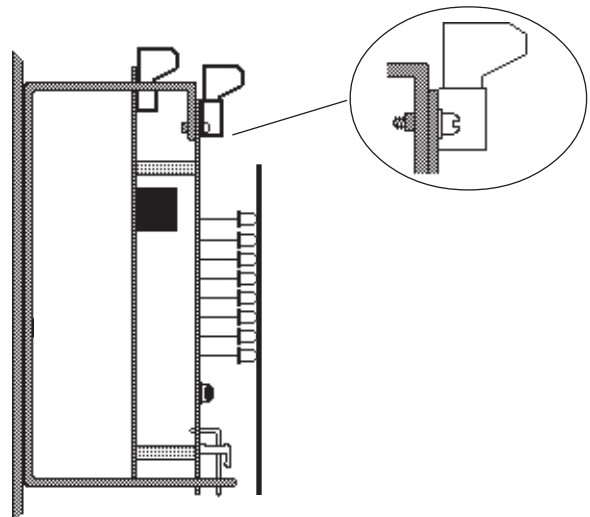
**Step 3:**

Align the module screws with the thread-holes on the chassis and secure in place.

Figure A-3: Mounting the CPU

**Step 1:**

Angle the module into the chassis so that the upper board edge slips into the chassis slot as shown.

**Step 2:**

Push the upper end of the module into the chassis and secure with two module screws.

Figure A-4: Mounting Modules in the Backbox

Figure A-5: Field Wiring the MPS-24BRB

AC Power Requirements:

MPS-24BRB: 120 VAC, 50/60 Hz, 1.8 amps

MPS-24BERB: 220/240 VAC, 50/60 Hz, 0.9 amps

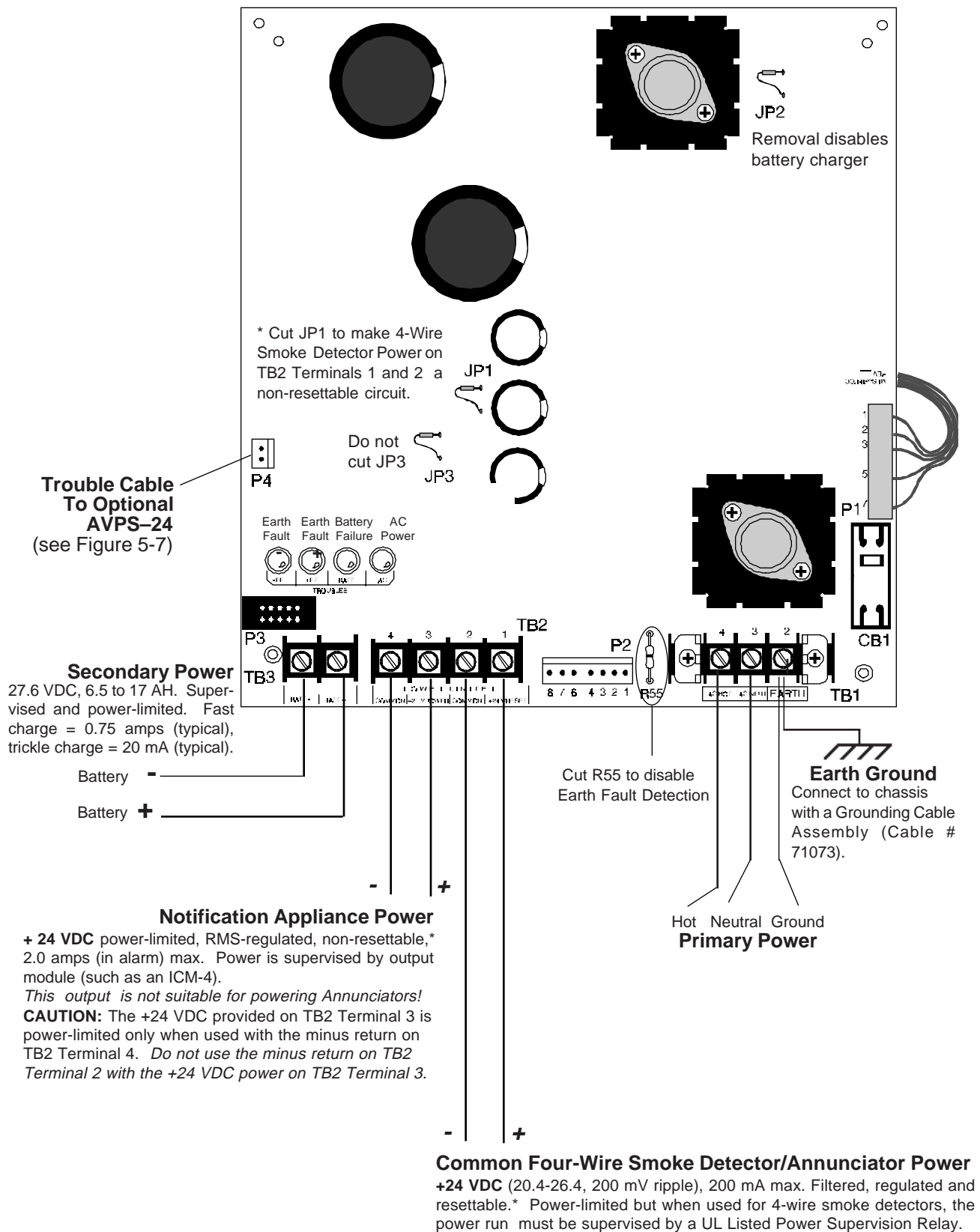
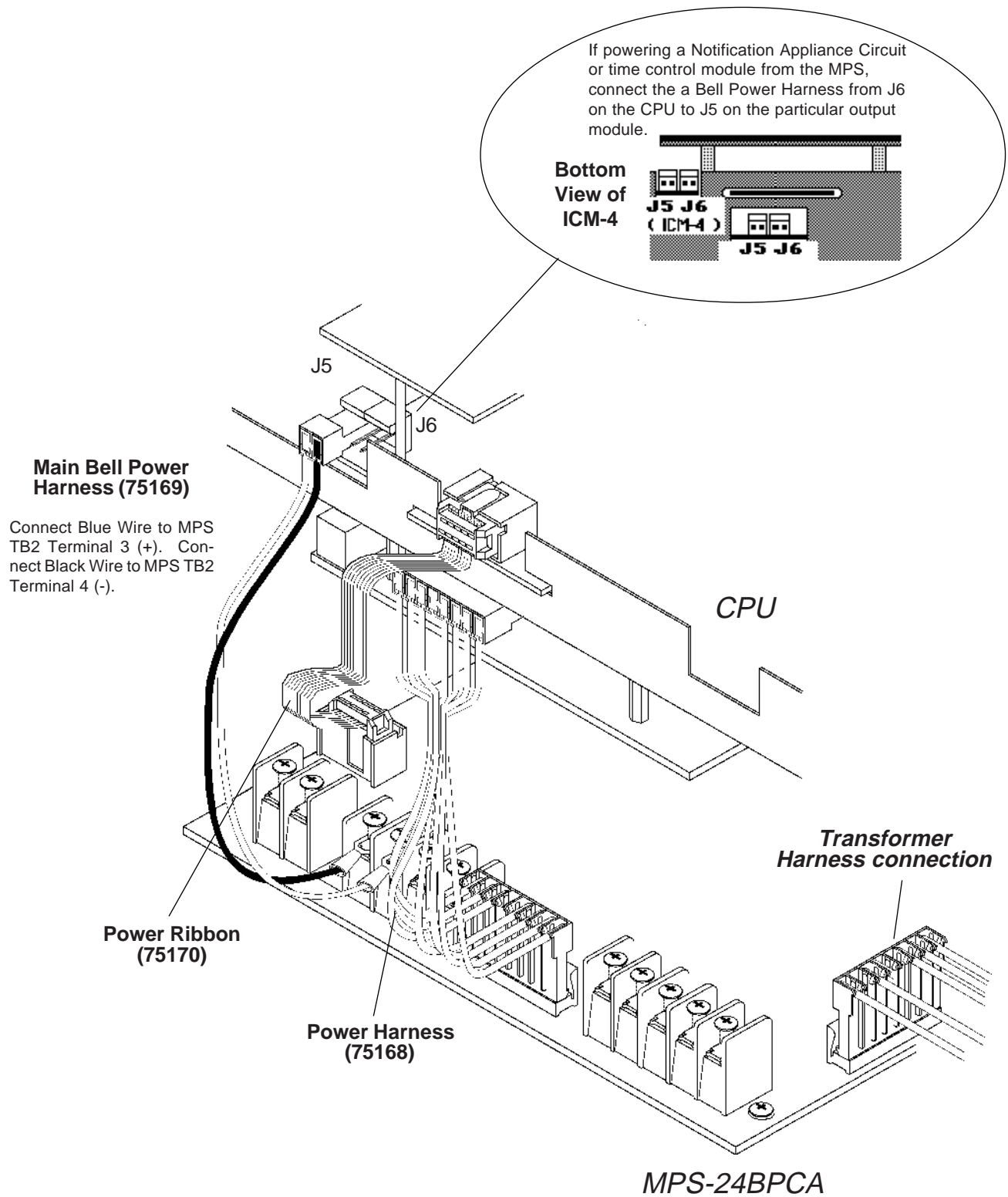


Figure A-6: Harness Connections for the MPS-24BRB



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