



463-248-201

Issue 1

3/1/93

# PagePac® Plus Controller

Installation and Use

## **Notice**

Every effort was made to ensure that the information in this guide was complete and accurate at the time of printing. However, information is subject to change.

Federal Communications Commission (FCC) and Canadian Dept. of Communications Interference Notice  
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and D.O.C. regulations. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will have to correct the interference at his or her own expense. For additional FCC interference, registration, and repair information, see the *Installation Guide*.

## **Trademarks**

PAGEPAC, PAGEPAC PLUS, and AMPLICENTER are a trademark of Harris Corporation.

## **Warranty**

AT&T provides a limited warranty for this product. Refer to "AT&T Limited Warranty and Limitation of Liability" in Appendix A.

## **Ordering Information**

The order number for this book is 463-248-201. To order copies of this book, call 1-800-432-6600 in the U.S. and 1-800255-1242 in Canada. For more information on how to order this and other system reference materials, see "Reference Materials," in "About This Guide." For information on ordering replacement parts, accessories, and other compatible equipment, refer to "Product Ordering Information," in Section 1.

## **Support Telephone Numbers**

AT&T provides a toll-free customer helpline 24 hours a day.

In the U.S., call the AT&T Helpline at 1-800-628-2888 if you need assistance when installing, programming, or using your system. For service or technical assistance in Canada, call one of the following Technical Assistance Centers:

Eastern Canada and Ottawa	1800363-1882
Ontario:	1-800-3874268
Central and Western Canada:	1-800-663-9817

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The following subsections give a summary of the PagePac Plus controller features, system components, and auxiliary equipment.

## About This Guide

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The *PagePac Plus Paging Controller Installation and Use Guide* explains the features of the PagePac Plus Controller, how to install and configure the controller, installation of the PagePac Plus amplicenter, and interface to communication system and other auxiliary equipment. For programming instructions, refer to the *PagePac Plus Programming and Operation Guide*.

It is intended that PagePac Plus be installed by a trained telephone, audio, or electrical installer with basic electronic knowledge. PagePac Plus conforms to common installation practices and preferences found within the Telcom Electrical and Commercial Sound installers manual.

## How to Use This Guide

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- **Overview.** Before beginning hardware installation, review and understand the Zone Map filled out in the *PagePac Plus Programming and Operation Guide*. It determines how the hardware is to be installed and set.  
  
If you are installing the system for the first time, you should read the entire guide before getting started to familiarize yourself with the features.
- **Hardware Configuration.** This section describes and illustrates the various PagePac Plus components (controller, zone expansion units, and Amplicenter amplifiers, D20, D100, and D300).
- **System Installation.** This section provides instructions for mounting the PagePac Plus hardware on a wall or in a standard 19" equipment rack. Complete, detailed instructions for connection and operation with telephone systems, music source, speakers, and any control device inputs or outputs is provided. Hardware switch settings are given for various zone applications. A programming overview is presented.
- **Maintenance and Customer Support.** This section gives some basic troubleshooting tips if a zone does not operate properly after installation and programming. Should a problem arise which requires technical assistance beyond the information provided in this guide, call:  
AT&T Technical Support, 1-800-552-3293  
AT&T National Technical Marketing, 1-800-222-1313  
AT&T National Service Assistance Center, 1-800-628-8888.

# Installation Steps

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1. Determine PagePac Plus features to be used in the facility. Refer to the Zone Map and Zone Configuration Tables filled out in the *Programmer's Guide*.
2. Verify Zone Map information matches facility wiring diagram.
3. Pull cables.
4. Mount the PagePac Plus components [Amplicenter, Controller and Zone Expansion Unit(s)], to either the wall, cabinet or a rack.
5. Make the connection between the Controller and Amplicenter, and Controller and Zone Expansion Unit (if any).
6. Set the DIP switches on the Zone Expansion Unit(s) [if needed].
7. Using the Zone Configuration Table, set the Zone Option Switches on the Controller and the Zone Expansion Unit(s) to the correct settings.
8. Set the Controllers Telephone Mode Selection Switch to the correct position for the host telephone system.
9. If the system is used in the Constant Voltage Distribution Mode (i.e. 70 volt speakers), make connection and set the Amplicenter Telephone Mode Selection Switch to the Dry Loop 600 Ohm position.
10. Connect all necessary feature inputs (microphone, night bell, etc.,).
11. Using the Zone Map Table, connect speakers, remote amps and inputs to the proper zones.
12. Power up the system.
13. Check LED's on PagePac Plus system for proper operation.
14. Make the telephone connection.
15. Perform Programming.
16. Test system:
  - A – Audio paging Zones
  - B – Contact Closure Output Zones
  - C – Contact Closure Input Zones.

*NOTE: The numbers in these steps match the numbers in figure 1-1.*

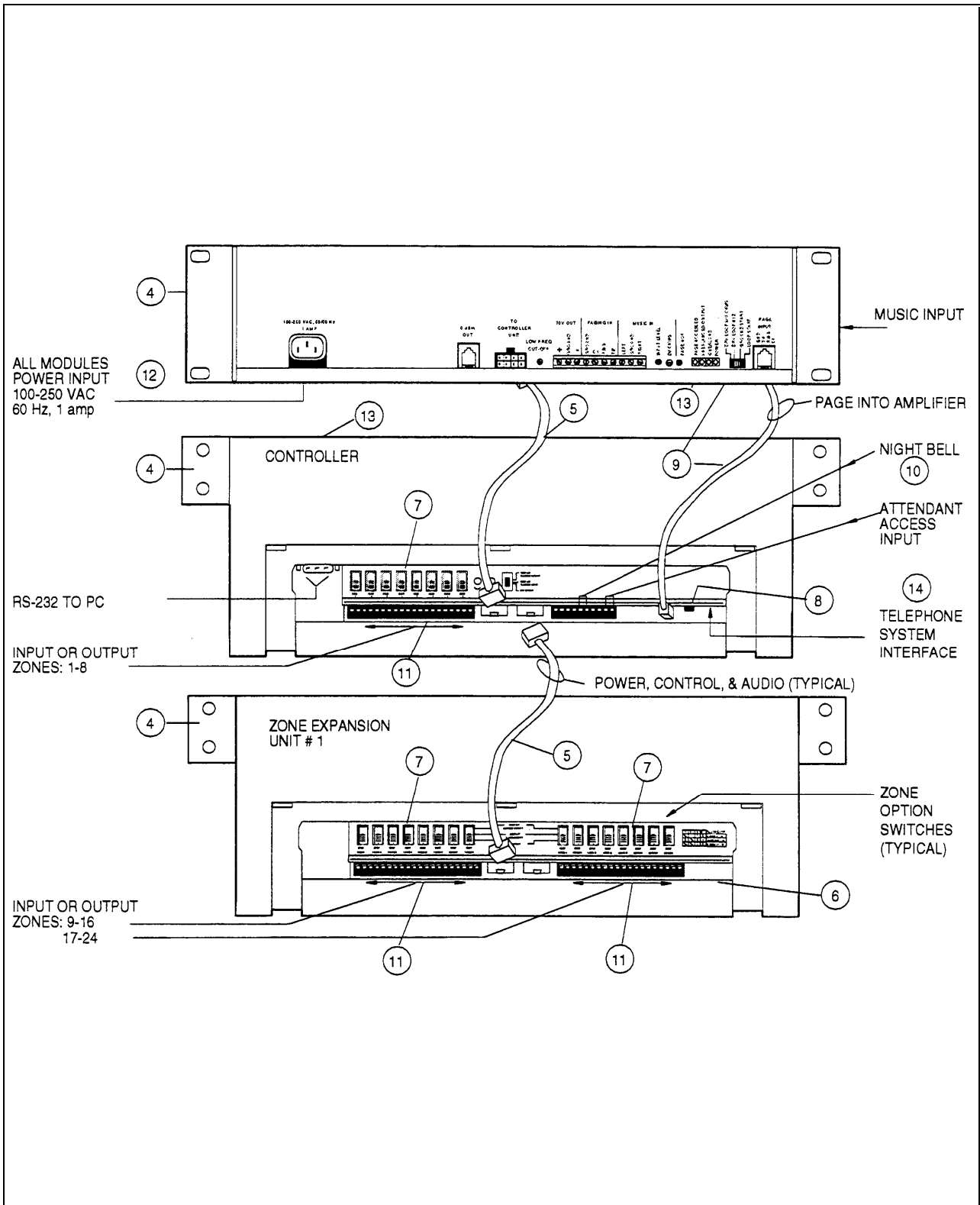


Figure 1-1. Hardware Installation Steps

# Connectivity Chart

The Connectivity chart gives the trunk interface requirements for the host systems listed. This information is then used to set the telephone mode function switch on the PagePac Plus Controller.

Table 1-1. PagePac Plus Connectivity Chart

	System 2000		Merlin Plus		Merlin 206/820		Merlin 1030/3070		Merlin II		Merlin Legend	
Mode	C.O. Line	C.O. Line	Page Port	C.O. Line	Page Module	C.O. Line	Service Module	C.O. Line	Analog Station	C.O. Line	Analog Station	
Loop Start	Yes	Yes Note 1	—	Yes Note 1	—	Yes Note 1	—	Yes Note 1	—	Yes	—	
Ground Start	—	—	—	—	—	—	—	—	—	—	—	
Dry Loop (Hi Z)	—	—	—	—	—	—	—	—	—	—	—	
Dry Loop (600Ω)	—	—	No	—	No	—	No	—	—	—	—	

	Spirit 308/616		Spirit 1224/2448		Partner Plus			Partner II		
Mode	C.O. Line	Page Port	C.O. Line	C.O. Line	Analog Station	Page Port	C.O. Line	Analog Station	Page Port	
Loop Start	Yes	—	Yes	Yes	—	—	Yes	—	—	
Ground Start	—	—	—	—	—	—	—	—	—	
Dry Loop (Hi Z)	—	—	—	—	—	—	—	—	—	
Dry Loop	—	No	—	—	—	Yes Note 2	—	—	Yes Note 2	

Table 1-1. PagePac Plus Connectivity Chart (continuation Page 1)

Mode	System 25			System 75/G1/G3I Definity			System 85/G2		
	C.O. Line	Analog Station	Aux. Port	C.O. Line	Analog Station	Aux. Port	C.O. Line	Analog Station	Aux. Port
Loop Start	Yes	—	—	Yes	—	—	Yes	—	—
Ground Start	Yes	—	—	Yes	—	—	Yes	—	—
Dry Loop (Hi Z)	—	—	—	—	—	—	—	—	—
Dry Loop (600 Ω)	—	—	Yes Note 2	—	—	Yes Note 2	—	—	Yes Note 2

Mode	Comkey 416, 718 1434 and 2152		Horizon			Dimension		
	C.O. Line	Intercom	C.O. Line	Analog Station	Intercom	C.O. Line	Analog Station	Aux. Port
Loop Start	Yes	—	Yes	—	—	Yes	—	—
Ground Start	—	—	Yes	—	—	Yes	—	—
Dry Loop (Hi Z)	—	—	—	Yes	—	—	Yes	—
Dry Loop (600 Ω)	—	No	—	—	No	—	—	Yes Note 2

— Indicates a non applicable connection

NOTES:

- Two pound keys (##) must be pressed for one pound key (#) to be sent to the controller when dialing from a multi-button set.
- A 2 pair RJ-11 cord must be used to interface with the Controller.

## Product Safety Labels

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This guide contains several product safety labels, identified by a ▲

▲ **CAUTION** - Indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.

▲ **WARNING** - Indicates the presence of a hazard that can cause severe or fatal personal injury if the hazard is not avoided.

Carefully read the WARNING label in section 2, Installation. Opening the system units will expose you to hazardous voltages, which can cause severe personal injury or death.

Also, read "Safety Instruction" at the beginning of section 2, Installation.

## Terminology

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This guide uses standard telephony, audio, and electronics terminology used in describing paging features, hardware, and telecommunication system interface.

## Reference Materials

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For PagePac Plus programming instructions, refer to the *PagePac Plus Programming and Operation Guide*. See the *PagePac Plus Amplicenter and Zone Expansion Unit Service Manuals* for specific information on those products.

To order additional reference materials, call the AT&T Customer Information Center:

In the U.S. 1800432-6600

In Canada: 1800255-1242

## How to Comment on This Guide

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A feedback form is located at the end of this guide. If the feedback form is missing, send your comments and recommendations for changes to:

J. Dean  
AT&T  
99 Jefferson Road (Room 2A-25)  
Parsippany, NJ 07054  
FAX: (201) 887-6898

# Shipping Container Contents

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The following items should be found in the PagePac Plus Controller shipping container. If something is missing, notify your local dealer.

- Controller unit, including plastic, snap on cover.
- Mounting hardware (screws and brackets)
- Cables, preterminated, 8-pin modular (18" long)
- Cord, preterminated, RJ11 (18" long)
- Programming Guide
- This Installation Guide

# Ordering Information

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Equipment is available from many AT&T sources. Contact any of the following for sales information and advice on the equipment that would best meet your needs:

AT&T Catalog Sales	1 800 451-2100
AT&T Sales Office	1 800 247-7000
AT&T Phone Center Store	1 800 222-3111
AT&T Authorized Dealer	1 800 247-1212.

# Features and Capabilities

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*NOTE: The Programming and Operation Guide details the features of the controller. Also, refer to the PagePac Plus Amplicenter and Zone Expansion Unit Service Manuals for specific information on those products.*

The following list provides an overview of the features of the PagePac Plus system, illustrated in figure 1-1, along with additional application capabilities.

- Controller—Connects up to 8 zones and controls entire system. Provides easy telco access compatible to all AT&T Communication Systems.
- Zone Expansion Unit—Enables 16 extra zones, up to three units may be connected.
- Amplicenter—The amplicenter amplifies the page in increments of 20 watts (D20), 100 watts (D100), or 300 watts (D300) for a 70V constant voltage distribution system.
- Features—Combines simplicity of use with a wide range of paging system features, including:
  - Attendant (microphone) Access
  - Attendant override for emergency paging
  - Night Bell
  - Password access security codes built-in
  - Priority levels for various access methods built-in (phone, microphones, tones, doors, etc.)
  - Talk-back (2-way paging)
  - Automatic volume control to accommodate paging and talkback clarity
  - Door Phone/ Door Control
  - Remote amplifier Control
  - Switch-closure inputs to enable tones (for example) alarm system interface
  - Switch-closure outputs to turn on (for example) the exterior lighting
  - Background Music
  - Shelf, wall, cabinet, or rack mounting
  - PC or telephone programming access
- Can be re-programmed easily from any telephone in the system, or using a PC.



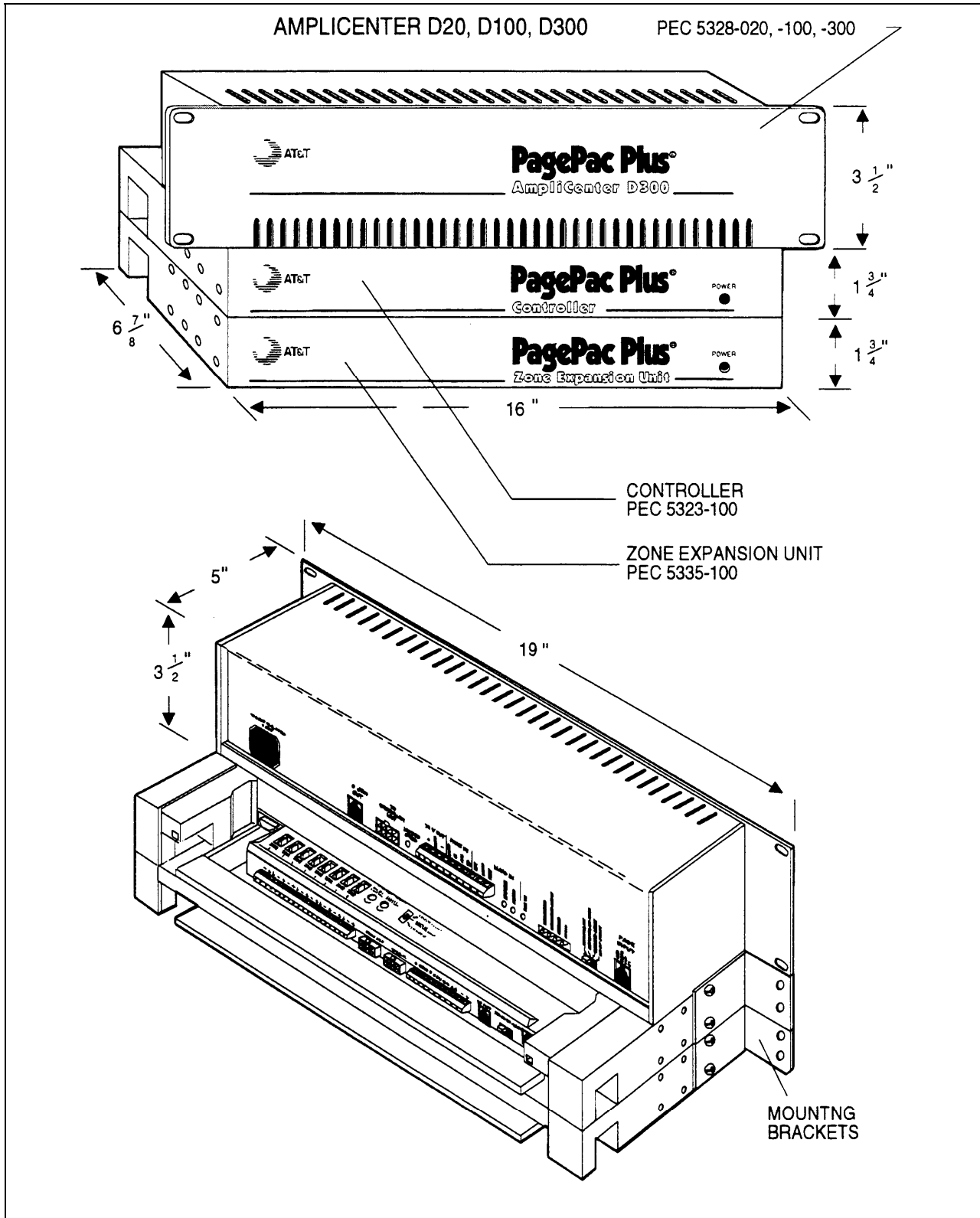


Figure 1-2. PagePac Plus System Components

# Specifications

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Table 1-2. Controller Specifications

<b>Capacities</b>	<ul style="list-style-type: none"> <li>▪ The Controller connects up to 8 zones of audio output (including talkback) and contact closure inputs or outputs.</li> </ul>
<b>Dimensions and Weights</b>	<ul style="list-style-type: none"> <li>▪ 3-1/2" high x 19" wide x 4-1/4" deep (assembled, approx.) 1 lb.</li> </ul>
<b>Switch Fabric</b>	<ul style="list-style-type: none"> <li>▪ Full digital, nonblocking</li> </ul>
<b>Electrical</b>	<ul style="list-style-type: none"> <li>▪ 1 Amp</li> <li>▪ Dissipation of power (30 watts at normal operation)</li> <li>▪ 342 BTU's/hour at peak; 103 BTU's/hour at normal</li> <li>▪ Contact closure output switching capability: 50V at 1 amp</li> </ul>
<b>Temperature Range:</b>	<ul style="list-style-type: none"> <li>▪ 0 to +50 deg. C. operational;</li> <li>▪ -40 to +66 deg. C. storage and shipment</li> </ul>
<b>Humidity Range:</b>	<ul style="list-style-type: none"> <li>▪ 5% to 9% (non-condensing) storage/shipment and operation</li> </ul>
<b>Altitude:</b>	<ul style="list-style-type: none"> <li>▪ sea level to 10,000 ft. operational (1048 to 648 millibars);</li> </ul>
<b>(air pressure)</b>	<ul style="list-style-type: none"> <li>▪ 40,000 ft. max. shipment</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>▪ Locate in an area free of excess moisture, corrosive gases, dust, and chemicals.</li> </ul>
<b>Interconnect Cable (power, audio, and control signal from Controller)</b>	<ul style="list-style-type: none"> <li>▪ 8-position, 5 Amp contact rating, locking, keyed, 22AWG wire, housing material 94V-2, U.L. and C.S.A. listed, providing 70.7 Vrms (4), common ground, +15 VDC and -28 VDC</li> </ul>

# 2

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The PagePac Plus Controller can be installed to operate in several different ways: as a constant-voltage 70.7 volt distribution system, a multi-controller system, or a hybrid system. In any of the configurations, a PagePac Plus amplicenter D20, D100, or D300 is required and the interconnection between the control unit and the amplicenter must be made. See “Example System Setup.”

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## Power

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Two DC voltages derived from the PagePac Plus D-series amplicenter (required) via the interconnect cable (provided with the Controller) are the source for all power required by the PagePac Plus control unit and any attached Zone Expansion Units (optional).

The front panel Power On LED on the controller lights steady to indicate power is on and the unit is operating properly. A blinking indicator means that the unit is malfunctioning or that the unit is in reset.

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## Tone Generator

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The PagePac Plus controller has the ability to generate several distinctive tones such as siren, chime, dial tone, error tone, confirmation tones, beeps, and night bell. These tones may be sent to either the paging amplicenter or to the telephone interface.

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## Circuit Protection

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Complete thermal and short circuit protection with automatic reset.

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## Mounting

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Capable of mounting into a EIA 19" cabinet, free standing rack, or wall mounting. Refer to the Installation chapter.

# Approvals

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Domestic and international approvals:

- UL813, UL1459, paragraph 2.1,
- FCC, Part 15, Class A (see Section 5)
- FCC, Part 68,
- CSA 225,
- DOC.

## Controls, Indicators, Switches and Connectors

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### LED Indicators

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The PagePac Plus Controller has three LED indicators that are useful for installation and troubleshooting purposes.

Front panel— Single LED indicates the unit's power status: solid green indicates the unit has power, and blinking green indicates that the unit is in reset mode. A blinking power LED may indicate the need to power down and power up again, or that there is not enough DC power to the controller (from the Amplicenter).

Rear panel— (see figure 1-2) Two LEDs are adjacent to the eight zone option switches. The green LED lights to indicate that the *Telephone Access* interface is successfully being accessed by the telephone equipment. The yellow LED lights to indicate that the paging microphone successfully accessed the *Attendant Access* interface.

### Connectors

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You have access to controls and connections on the back panel, which is covered with a snap-fit, removable lid (see figure 3-4).

The following items describe all back panel functions illustrated in figure 2-1:

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## Amplicenter:

1. AC Power in; 115VAC or 230VAC at 50 or 60 Hz
2. 0dBm out, control and audio for remote amplifier
3. DC Power and 70V audio out to controller
4. Bass (low frequency) control adjustment
5. 70V out; paging in (redundant to item #9); music in
6. Level adjustments: Music level, Music "ducking" (mute level), VOX sensitivity level
7. LEDs: green – page accessed, red – unbalanced output, red – overload, green – power on
8. Telephone system mode switch: Dry loop 600 ohms, Dry Loop Hi Z, ground start, and loop start
9. From controller item #16 RJ11 connector (in constant voltage distribution system) audio and control

## Control Unit:

10. DB9 connector for the RS-232 port, which is used to connect a PC computer for programming (optional) or PC monitoring
11. Zone option 3-position zone slide switches: set to 70V audio out, contact closure input, or contact closure output
- 11A. Zone connector for zones 1-8, plus, minus, and ground terminals
12. LEDs: Yellow – attendant access active, Green – tele. access active
13. DC Power and 70V audio from D-series Amplicenter
14. DC Power, control, and audio 70V output to next expansion Unit
15. 10 position connectors: (pins 1/2) 600 ohm, (pins 3/4) 0dB out for additional controller and remote amplicenters, (pins 5/6) night bell input, (pins 7/8) control closure for attendant access input, (9/10) audio source (mic) attendant access input
16. Audio and control to Amplicenter RJ11 jack, item #9
17. Telephone mode switch: Dry Loop, station access, ground start, and loop start
18. Telephone system interface for PBX, KTS, or Centrex; standard RJ 11 connector

## Zone Expansion Unit:

19. Zone connector for expansion zones: plus, minus, and ground terminals
- 19A. Zone option 3-position zone slide switches: set to 70V audio out, control closure in, or control closure out
20. From controller: power, control, and audio or previous expansion unit
21. To Additional expansion unit: power, control, and audio
22. DIP switch to be set when zone expansion unit(s) are used

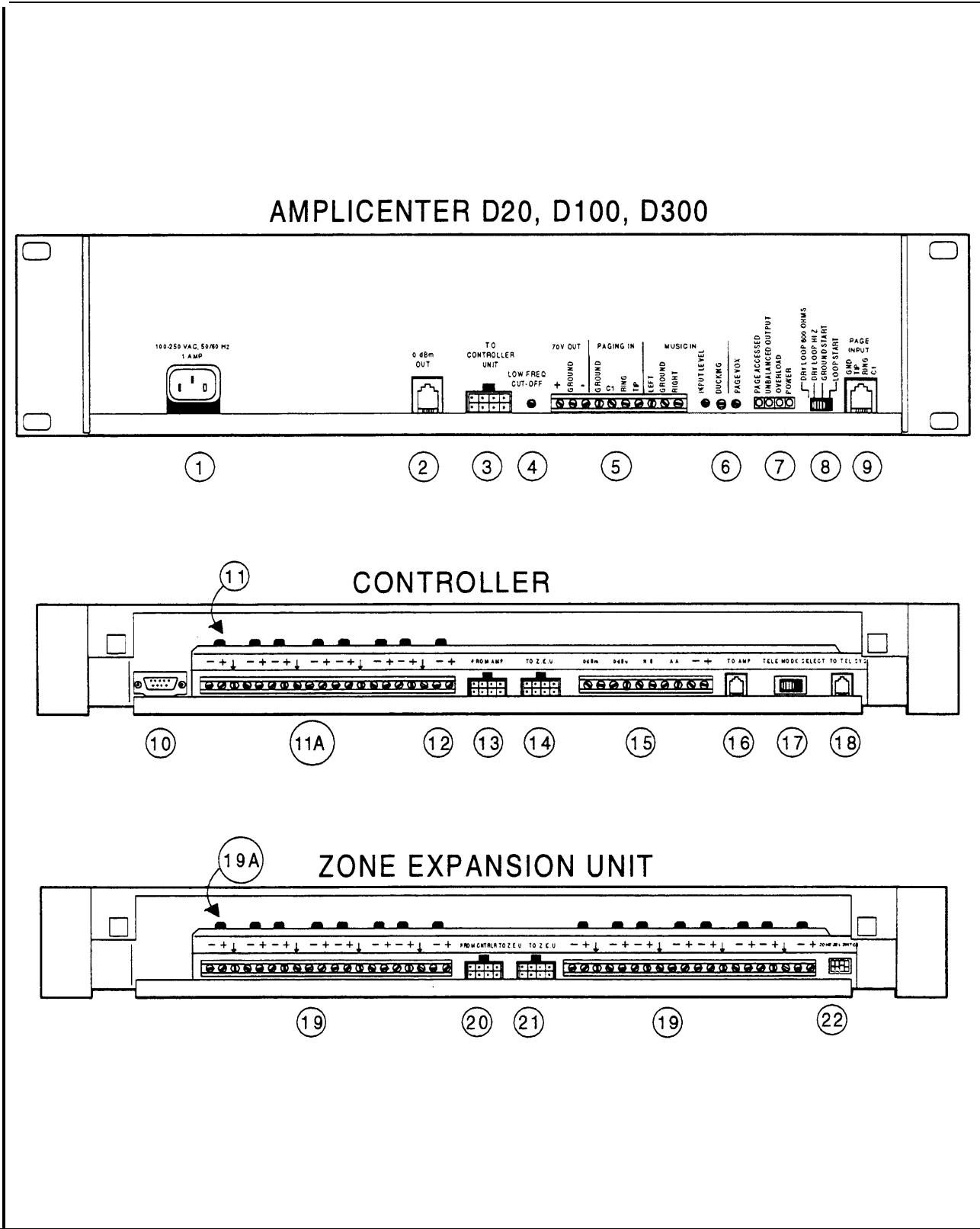


Figure 2-1. Amplifier, Controller, and Zone Expansion Unit Back Panels

# Auxiliary Equipment

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- Your PagePac Plus Controller is compatible with numerous peripheral products and speakers which can be utilized to meet your facility requirements
- PagePac Plus Amplicenters D20, D100, and D300. P/N PEC 5328-20, -100, -300
- PagePac Plus Zone Expansion Units. Up to three maximum for 56 dial access zones. P/N PEC 5335-100
- IBM compatible (DOS) personal computers (software compatibility for PagePac Plus programming), and null modem cable
- All AT&T 70V speakers and horns
- Doorphone 70V speakers and auxiliary door strikeplates
- Any device that requires a contact closure to activate or gives a signal contact closure to the PagePac Plus controller to perform an act.
- AT&T single and multizone microphones
- Ambient level controllers, messaging systems, feedback or speech processing units, music sources, etc.



# 3

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This section provides complete instructions for mounting the PagePac Plus controller on a wall or in a standard EIA 19" cabinet or equipment rack. It also illustrates, in detail, all interface requirements to: telephone systems, music source, speakers, auxiliary equipment, and any control inputs or outputs. Switch settings are given for each zone application type.

## Important Safety Information

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Always follow these basic safety precautions when using the system:

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. DO NOT block or cover the ventilation slots and openings. They prevent the product from overheating. DO NOT place the product in a separate enclosure or cabinet, unless proper ventilation is provided.
4. Never spill liquid on the product or drop objects into the ventilation slots and openings. Doing so may result in serious damage to the components.
5. Repair or service must be performed by a factory authorized repair facility.
6. The product is provided with a UL-CSA approved, 3-wire ground type plug. This is a safety feature. DO NOT defeat the safety purpose of the grounding type plug. DO NOT staple or otherwise attach the AC power supply cord to building surfaces.
7. DO NOT use the product near water or in a wet or damp place (such as a wet basement).
8. DO NOT use extension cords. Install product within six feet of a grounded outlet receptacle.

## Additional Safety Instruction for Installation Personnel

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1. DO NOT install telephone wiring during a lightning storm.
2. DO NOT install telephone jacks in a wet location unless the jack is specifically designed for wet locations.
3. Never touch uninsulated wires or terminals, unless the line has been disconnected at the paging or controller interface.
4. Use caution when installing or modifying paging or control lines.
5. The PagePac Plus control unit, Amplicenter, and optional Zone Expansion Unit(s), must be securely wall mounted or installed in a standard 19" EIA equipment rack or cabinet.



### **CAUTION:**

*If any wiring from the paging system leaves the building premises, you must install AT&T 503A1 IROB protectors.*

## Example System Setup

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### 70 Volt Constant Voltage Distribution System

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This example system illustrated in figure 3-1 gives you a quick overview to a traditional 70 volt installation.

This is the “traditional” paging system configuration. When the system is configured as a constant-voltage distribution system, the 70V amplicenter audio output is routed via the PagePac Plus controller to any zone that is optioned for audio.

Make sure that the controller unit has its external function mode slide switches set for proper operation (detailed later in this section) and is correctly programmed to configure each paging or control zone (Refer to the *Programming and Operation Guide*).

### Controller System

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This example system illustrated in figure 3-2 gives an overview to a controller installation.

In this configuration, the Controller sends 0dBm audio to the Amplicenter(s). Many remote audio Amplicenters and amplified speakers can be controlled in this mode as well as other ancillary equipment requiring an audio output or a switch closure, or both.

### Hybrid System

---

In this configuration (figure 3-3) the features of the Constant-Voltage Distribution System and the features of the controller system will be combined. The controller will route the 70V audio to the proper audio zone and also have the ability to control remote amplicenters with zones selected as control closures.

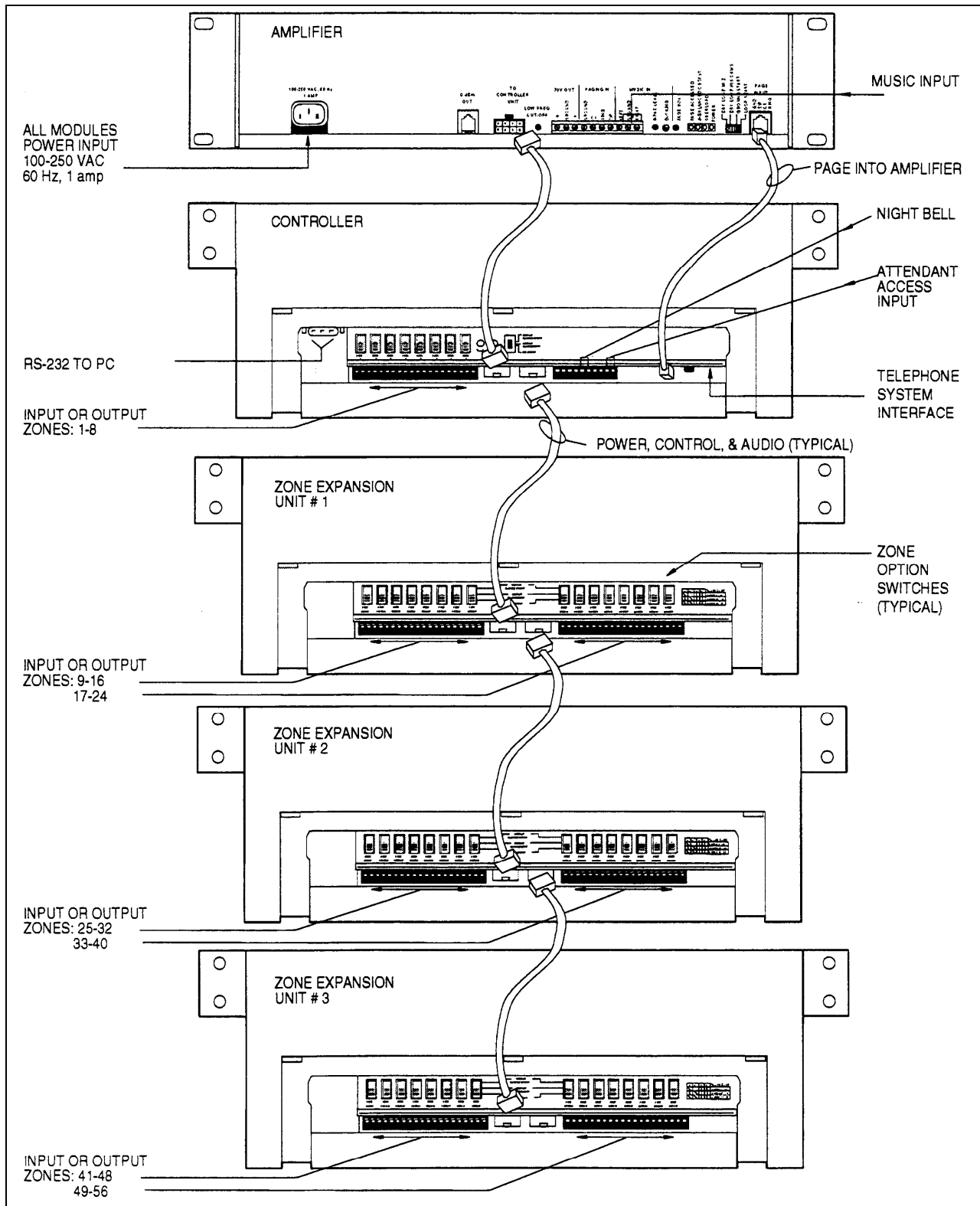


Figure 3-1. 70 Volt Constant Voltage Distribution System Setup

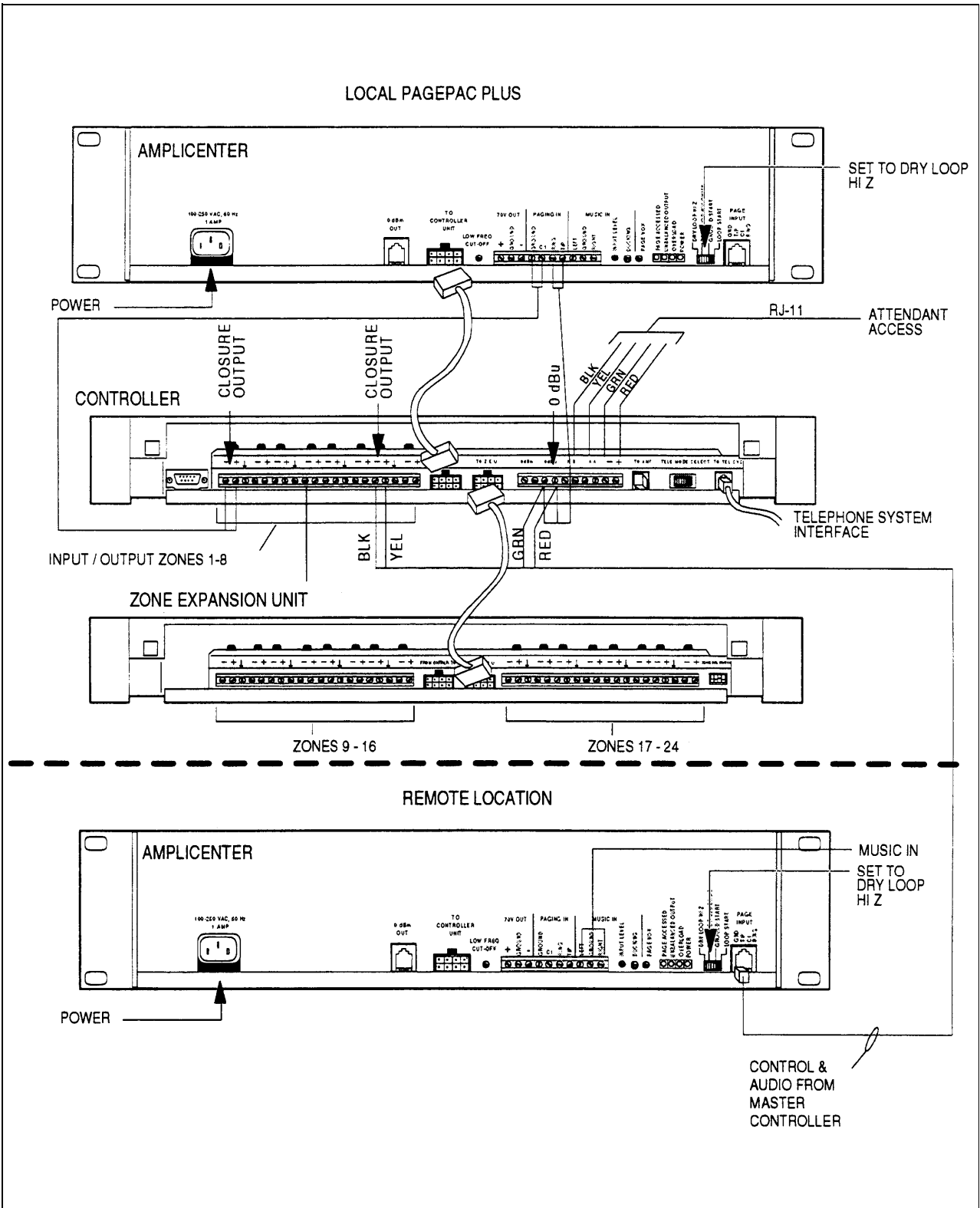


Figure 3-2. Controller System Setup

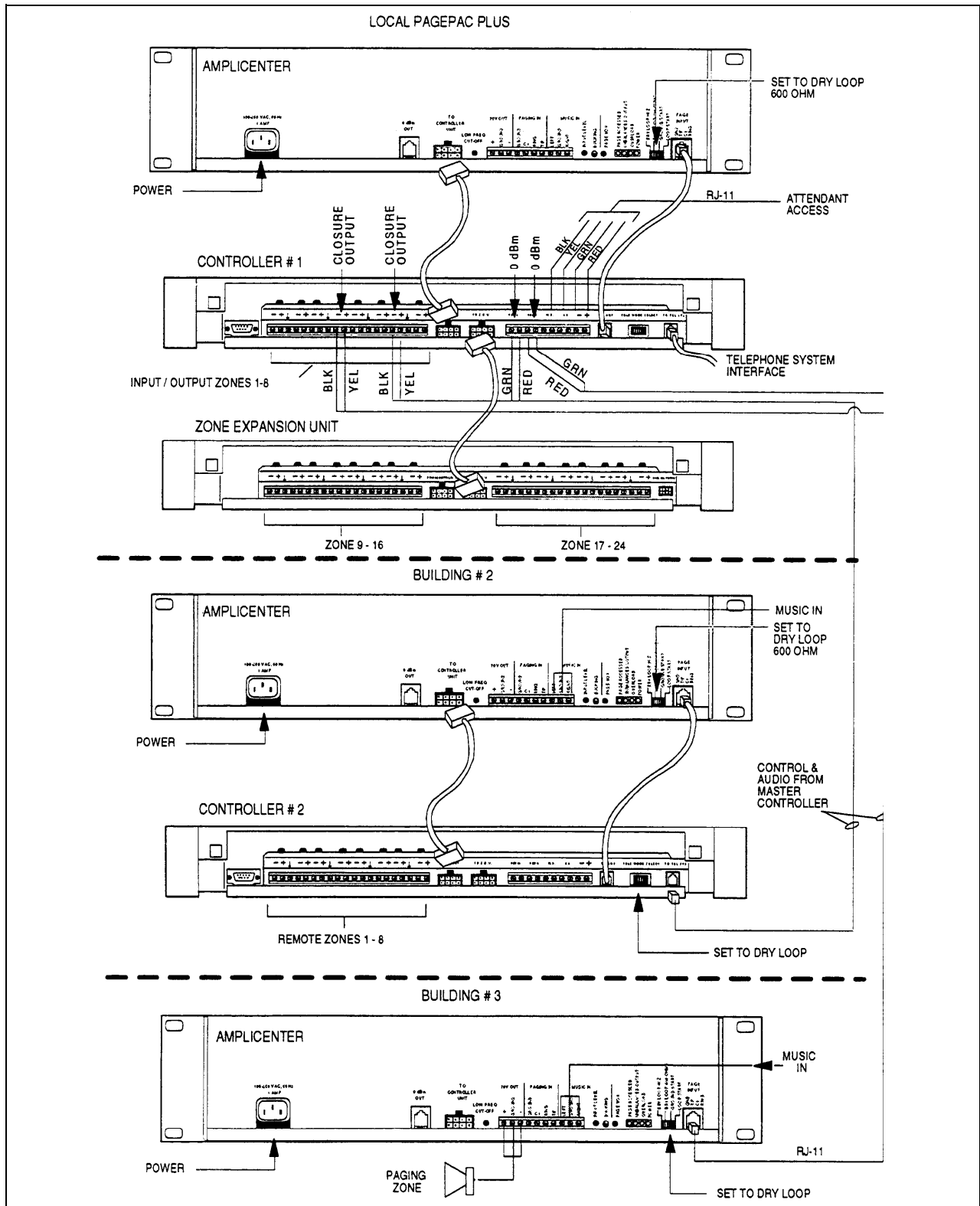


Figure 3-3. Hybrid System Setup

# Mounting PagePac Plus Components

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The PagePac Plus components consist of the

- Controller unit,
- Amplicenter, and
- Zone Expansion Unit(s), optional

All PagePac Plus components must be securely wall mounted or installed in a standard 19" EIA cabinet or equipment rack (Mounting hardware provided for rack mounting).

Figure 3-4 illustrates a wall mounted configuration. Figure 3-5 illustrates a rack mounted arrangement.

*NOTE: If zone expansion units are to be installed, for ease in installation, you should first label each as 7, 2, and 3, and set their DIP switches according to the instructions in this section. Refer to the subsection called "Switch Settings" later on in this section.*

For ease of installation, it is recommended (not mandatory) that the PagePac Amplicenter be mounted above the control unit as illustrated in this section.

## Tools Required

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The following tools are required for the installation of the system hardware and cabling.

- Phillips screwdriver (small and large)
- Standard screwdriver (small and large)
- Wire strippers (24 Awg -12 Awg)
- Telephone test set
- Tone out circuit tester
- Portable 70V speaker with 3 feet cable attached
- Volt-Ohm Meter





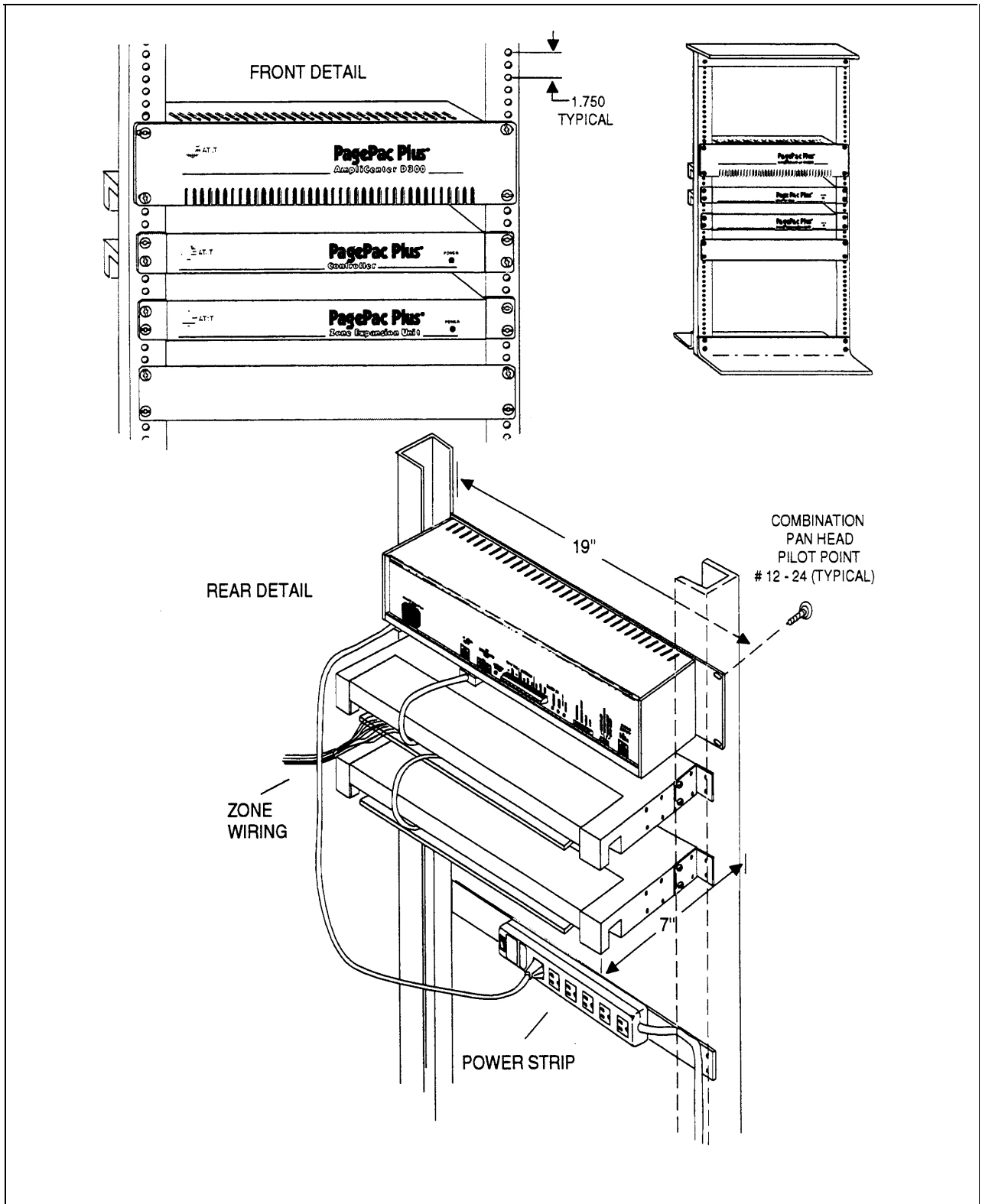


Figure 3-5. Rack Mounted Hardware

# Zone Configurations

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With the Zone Map dial codes and configuration tables (from the Programming and Operation Guide) filled out, and the PagePac Plus amplicenter, controller, and optional zone expansion unit(s) mounted, installation of the cabling and interface to the units can proceed. Each zone controlled by the PagePac Plus can be used for a

- speaker or doorphone paging zone
- a contact closure to control a remote device
- a signal (contact closure) input to the controller to activate an action (i.e., from security alarm or a doorbell from the speaker phone)

## Speaker Connections

---

Using common industry standard procedures or accepted practices of AT&T for telephone equipment, mount speakers for each paging zone and run the appropriate cable for 70 volt speaker systems.

*NOTE: If paging zones use the talkback feature, cabling must be shielded and grounded at the PagePac Plus connector, not the speaker.*

If there are long speaker runs, it is recommended to use a larger gauge solid wire. Recommended cable size is 24-22 AWG for 20-watts, 18-20 AWG for 100-watts, and 16-18 AWG for 300-watts.

## Paging Zone Connections

---

The zone connectors on the controller and zone expansion units can accommodate up to two 22 AWG wires or four 24 AWG wires per zone output.

Figure 3-6 shows how zones #1 through #8 are hooked up to the controller unit. It also shows options using connector blocks and solderless, punchdown blocks.

The three position mode function slide switch is set to the forward (70V audio out), center (contact closure input), or back position (contact closure output) to accommodate that zone's function. See the "Switch Settings" subsection.

Each optional zone expansion unit accommodates an additional 16 control and paging zones, and zones are connected in the same manner as the controller. A maximum of three Zone Expansion Units can be used which provide a total of 56 paging zones.

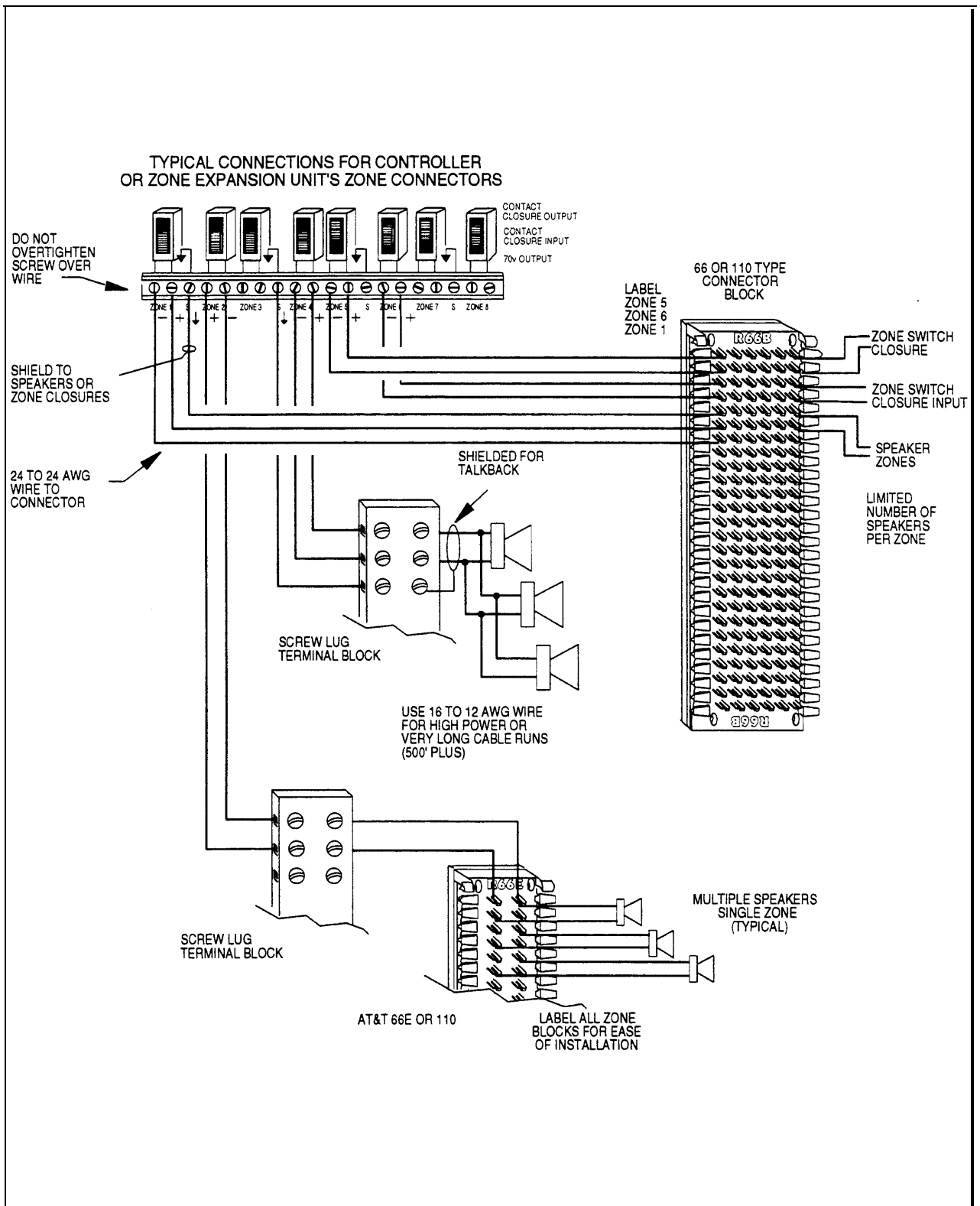


Figure 3-6. Speaker Zone Wiring to Controller

# Contact Closure Zone Connections

---

The contact closure input and output and signal zone connect to the controller and zone expansion units are same as with the paging zone speaker hookups. Refer to figure 3-7. The major difference is the mode function slide switch, behind the screw down zone connector, is set to either Contact Closure Output (back setting) or Contact Closure Input (mid setting), not 70V output (paging signal). Refer to the subsection called "Switch Settings."

The output contact closure contacts are rated at 120VAC or 50VDC at 1 amp. It is recommended to have this output control a low voltage relay.

The input signal is a normally open circuit which is momentarily closed (i.e., pushbutton switch). The input signal sets off a preprogrammed tone to a particular zone(s).

*NOTE: To ensure proper operation of all zones, it is very important to connect the zone cabling in sequence on controller and each unit. Remember, start at your left and work to the right, not skipping any zones. Refer to the connectors on previous illustrations.*

Each optional zone expansion unit accommodates an additional 16 control and paging zones, and zones are connected in the same manner as the controller. A maximum of three zone expansion units can be used which provide a total of 56 paging zones.

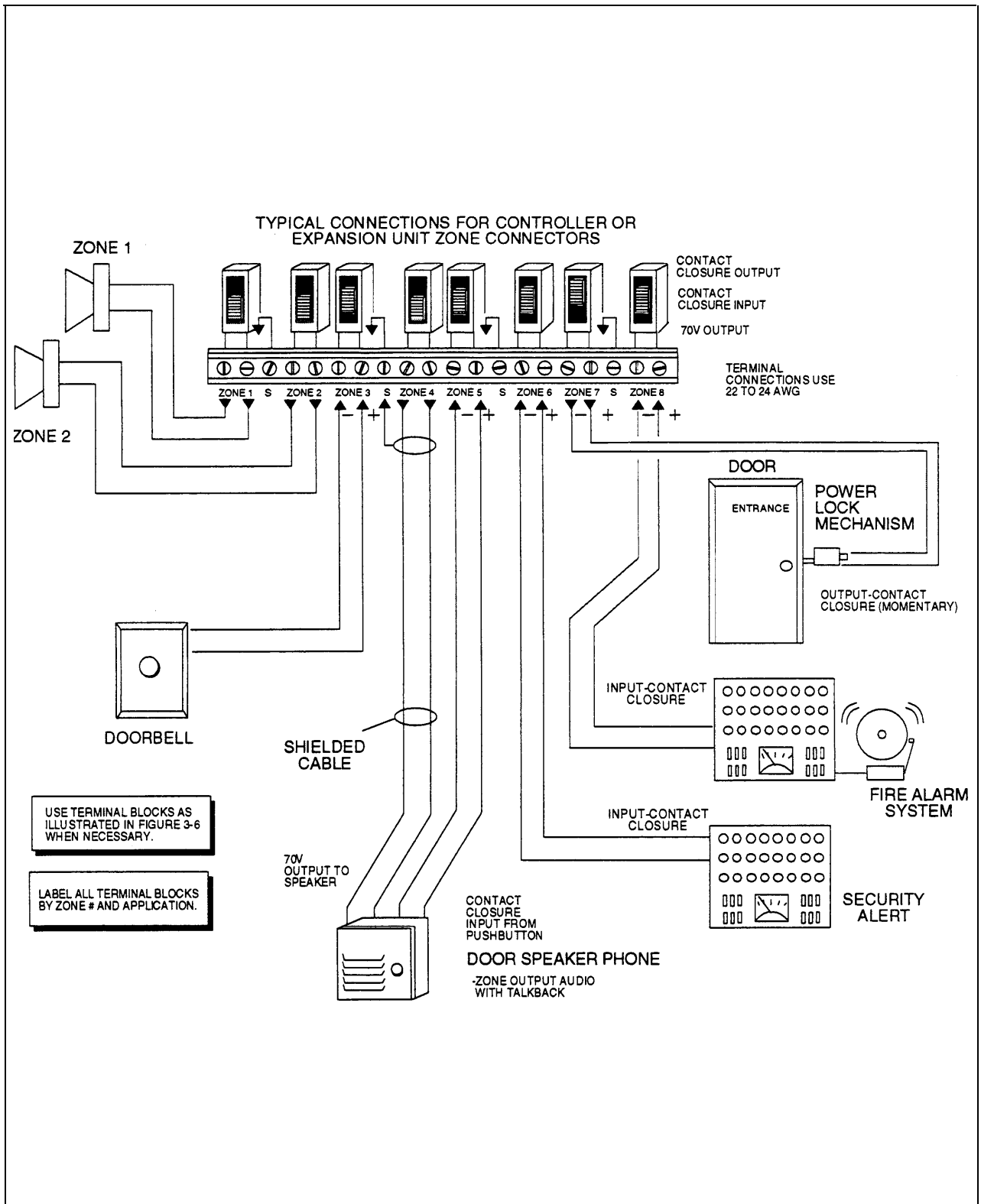


Figure 3-7. Contact Closure Zone Wiring to Controller

# Switch Settings

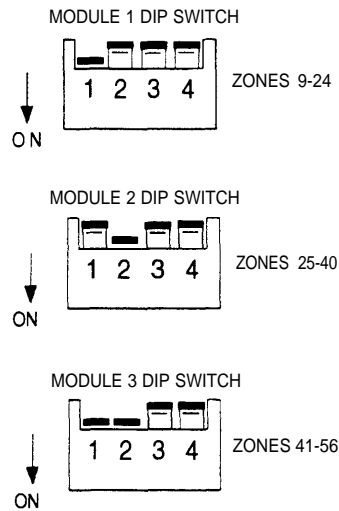
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Although the PagePac Plus Controller unit is software programmed, it must also have certain switches set for proper operation. When the controller is powered up, it scans these switches to determine the hardware configuration currently in place.

## DIP Switch

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A DIP switch is located within each zone expansion unit installed. If there are no zone expansion units, you need not worry about setting this switch. The following illustration shows the proper switch settings for each expansion unit installed. You must first remove the unit cover to access this switch.



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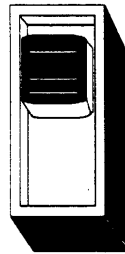
## Mode Function Switch

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For each zone used, no matter what its function, this switch needs to be set to one of three settings for proper zone operation. The controller has eight switches for zones 1-8. Each subsequent zone expansion unit has switches for zones 9-24, 25-40, and 40-56. The switch setting options are as follows.

*NOTE: The Zone Option switches must be set before the PagePac Plus system is powered up, and therefore before programming commences.*

*If the last in a series of zones is not utilized, the switch position does not matter.*



CONTACT CLOSURE OUTPUT

CONTACT CLOSURE INPUT

70V OUTPUT

---

## Interconnection Considerations

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The hardware installation configuration may have these impacts on programming and use of the PagePac Plus system:

Setting correct addresses for zones

Each zone mode function slide switch must be set for that zone's intended operation. Zone expansion units must have their DIP switches set according to the number of units used (3 maximum). Refer to the subsection entitled "Switch Settings"

70 Volt Constant-Voltage Distribution System, Controller System, or Hybrid Configuration

Whether the PagePac Plus system is configured as a 70 volt Constant-Voltage Distribution System, a Controller System, or as a Hybrid system, has no bearing on programming and using the system. See "Example System Setup" in the Installation section.

Attendant Console or Microphone Mode

Is an attendant console or microphone connected to the PagePac Plus controller? If yes, the Attendant Access paging receives highest priority by default.

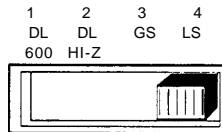


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## Telephone Mode

Be sure the telephone interface mode switch on the rear of the PagePac Plus unit has been set correctly, matching the telephone system connect of your choice or your facility. However, whichever mode is selected has no bearing on programming or using the PagePac Plus controller.

The default priority for telephone access is 4. The telephone input can access *any* zone or zone group to output audio paging or to trigger a contact closure switch action. Programming can also be accomplished via telephone DTMF access.



1. Dry loop, 600 ohms
2. Dry loop, Hi Z
3. Ground start
4. Loop start

Rotary (pulse dial) or DTMF Touchtone phones can connect via telephone page access, however, only DTMF tones can program the system.

## Night Bell

Night bell connections to and from your PBX or KTS can be accomplished in several ways.

An EKTS telephone system, where Night Bell input is wired to one of the eight PagePac Plus onboard zones, it must be considered an input zone and configured as such.

With a PBX system that produces a ring voltage output, the Night Bell connection is NOT wired to one of the eight input zones, but to another connector on the rear of the PagePac Plus (adjacent to the Attendant Access connections. Refer to figure 2-1).

In this latter case, Night Bell is treated like Attendant Access, Telephone Interface, or Music inputs are treated, i.e., as “default” inputs that need not have any of the eight PagePac Plus onboard zones reserved and configured for them.

## Music Input

Is a music source connected to your PagePac Plus Amplicenter? Which zones do you wish background music to be heard in? You can adjust the music volume level, ducking level (volume of music while voice page is active), bass level, and voice volume level (for voice paging) on the PagePac Plus amplicenter.

---

## Computer Monitor Logging

Is a PC computer connected to the RS-232 port of the PagePac Plus controller for the purpose of logging paging activities? If so, you will want to program the controller to send signals to it, and turn ON/OFF the Attendant Access, Telephone Access, and Night Bell signals that would trigger the monitor to log the event.

## Zone Option Switches

The 8 Zone Option switches on the rear of the PagePac Plus unit MUST be set to match the zone option to be programmed. The slide switch for each zone must be manually set to Contact Closure (to switch on/off a device, such as a door security lock, remote amplifier, etc.), Input, or Audio Output, depending on the programmed mode selected for each zone. See Zone Map and Zone Configuration Tables, (to be filled out in the *Programming and Operation Guide*). *The Zone Option switches must be set before the PagePac Plus system is powered up, and therefore before programming commences.*

## Zone Expansion Unit Option Switches

The 16 Zone Option switches on the Zone Expansion unit must also be configured to match the intended zone mode. It is recommended that the paging zone decisions be made and diagramed prior to beginning programming. See Zone Map and Zone Configuration Tables, in the *Programming and Operation Guide*. The Zone Option switches must be set prior to system power-up.

---

## Communication System Interface

The telephone interface has four possible modes of operation to accommodate a variety of systems. They are as follows:

- Dry loop, 600 ohms
- Dry loop, Hi Z
- Ground start
- Loop start

Set the Telephone Mode Selection switch on the PagePac Plus controller unit to the type trunk circuit provided by your host equipment. Refer to figure 1-2.

---

The **Dry Loop 600 ohm** is a four wire interface consisting of a dry input with a 600 ohm impedance and a control pair. The page input is activated when the control pair receives a contact closure from the host equipment, connecting C1 to ground. The Dry Loop page input can also be activated by the presence of Page Input audio signals that exceed a set threshold. This threshold is set by the Page VOX adjustment; clockwise rotation lowers the threshold and makes it more sensitive. Adjust by experimentation to account for various line loss and noise. This feature is beneficial for (amplified) microphone sources that don't have a Music/Page control contact, or for Remote Amplicenters connected by leased pairs so that another pair is not required for Music/Page switching control.

The **Dry Loop Hi Impedance** is used to interface with parallel multiple inputs. Input impedance is 100K ohms, otherwise, the same as 600 ohm dry loop operation.

The **Ground Start** mode is a two wire interface with the talk battery being supplied by the PagePac Plus controller unit and has a 600 ohm input impedance. When a trunk is accessed, a momentary ground is sent to the ring-side of the pair by the host equipment, loop current is detected and the tip-side pair is closed. Disconnect supervision of the ground start mode is accomplished by monitoring the loop current.

The **Loop Start** mode is two wire interface with the talk battery being supplied by the PagePac Plus controller unit and has a 600 ohm input impedance. Disconnect supervision of the loop start mode is accomplished by monitoring the loop current.

## Connector

---

The page input cord that connects the telephone system to the PagePac Plus has a standard 4-wire RJ-11 type connector. The other end of the cord, depending on the host system, may have a special 25-pair connector, spade-tip leads, or an RJ-11 type plug.

The page input cord conductors are usually color-coded and are connected to the host system as follows.

1. Connect black wire to the paired dry contact control lead ground.
2. Connect yellow wire to the paired dry contact control lead C1.
3. Connect red wire to system ring R.
4. Connect green wire to system tip T.

## Music Source Interface

---

The PagePac Plus amplicenter has a screw strip connector that ties down the cabling from the music source. Refer to figure 1-2. This audio source can be from a CD player, AM, FM, or commercial radio, tape player, or other audio device. Screw pot adjustments next to the input connector control input and ducking levels.

Since most music sources are stereo, left and right channel inputs are combined in the Amplicenter. Monophone sources can be connected to either LEFT or RIGHT input with the other not connected.

## Programming Overview

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The PagePac Plus Controller unit can be programmed by two methods, by telephone using DTMF tones, or by using a PC through the RS-232 serial port on the PagePac Plus controller. A quick reference card for telephone programming, along with detailed programming instructions, can be found in the *Programming and Operation Guide*.

## Zone Map

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The Zone Map is to be filled out by your system administrator or the person responsible for programming your PagePac Plus system (located in the Programming and Operation Guide). It assists in identifying the zones, both inputs and outputs, of your particular system.

## Testing System

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With all zones wired and connected to the controller and zone expansion units (if any), testing of each zone may begin. It is recommended to refer to figures 3-6 and 3-7 which identify back panel connectors.

The following steps may be modified by another person going to each zone area and listening, talking back, and testing control inputs first hand.

### CAUTION:

*Be careful not to short out any audio output contacts during this procedure as the controller and amplicenter may go into overload as indicated by the overload LED. A distorted or inaudible page will result.*

### CAUTION:

*Before testing, ensure proper cable installation between PagePac Plus components. Compare to example setup in figure 3-4.*

---

## Apply AC Power

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Power to the PagePac controller, amplicenter, and zone expansion units, is through a single power cord connected to the amplicenter. There is no power switch.

Connect the 115 VAC modular connector to the back of amplicenter and then to the outlet socket. *Do not defeat the third wire ground circuit.*

## Audio Paging Zones

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1. Adjust the Low Frequency Cut-Off control. This control attenuates low frequency bass so that horns and small speakers are not over-driven and distorted by excessive bass energy. Cut-off frequency is continuously adjustable from 50Hz (full CCW rotation) to 400 Hz (full CW rotation).
2. The Page VOX sensitivity is turned fully counter-clockwise if the Dry Loop feature is not used.
3. Adjust Music Input level. Clockwise rotation will increase the level. Listen and set to a comfortable level.
4. Using a telephone from the host system, dial the paging access code. Speak into the telephone in a normal manner. Your voice should be heard from all connected speakers. The Amplicenter Page Input has an automatic level control (ALC) which keeps loud talker's and normal talker's output at the same level. Beware of paging from a telephone directly under a loudspeaker; feedback howl can occur. (An anti-feedback speech processing unit or a record/playback delay unit can solve this if it will be a problem for the users.
5. Re-adjust Music Input level to the desired loudness relative to Paging loudness.
6. Some loudspeaker taps may have to be re-adjusted to get even coverage at all locations. Be sure that final speaker tap setting totals do not exceed the power rating of the Amplicenter.
7. The Paging output is limited to a nominal 70 Volts rms by the ALC. In a properly designed system, sound loudness is normally adjusted by selection of appropriate speakers and their individual tap settings for a 70 Volt input. However, circumstances such as a long term change in ambient noise may call for reducing the loudness of all speakers en-mass. This output level can be attenuated by an overall Amplicenter output level control setting. This setting is accomplished remotely from any host system phone that dials DTMF.

---

Dial the paging access code.

When you have cut-thru, dial  **[#] [#] [#] [#]** followed by:

<b>DTMF digit</b>	<b>Output Attenuation</b>
8	0 dB
7	-3 dB
6	-6 dB
5	-9 dB
4	-12 dB
3	-15 dB
2	-18 dB
1	-21 dB

**NOTES:**

The PagePac Plus Controller must be configured to pass DTMF signals to that zone in order for this to work. Also, MERLIN multi-button sets require pressing  **[#]** twice for every # sent; therefore a string of eight  **[#]** s must be pressed before the level setting digit is registered.

The DTMF tones will be heard from the loudspeakers during this adjustment.

The setting is retained in memory during power black-outs for 24 hours minimum, 1 week typical.

The maximum Amplicenter power rating is reduced by the attenuation level; i.e. total speaker load impedance may not be less than 250 ohms for the D20, 50 ohms for the D100, or 16.7 ohms for the D300.

The 0dBm output is also attenuated proportionally to the 70V output.

8. Adjust Music Ducking level. This feature allows music to continue to be heard during a Page, but at a reduced level. The range is from less than -40 dB (full CCW) to -6 dB (full CW).

---

## Contact Closure Output Zones

---

Use the following steps to test each contact closure output zone.

1. Clip a buzzer and light circuit tester (or equivalent testing device) across the two output terminals of the controller or zone expansion unit for that particular zone.
2. Using a telephone from the host system, dial the control zone extension. Enter the appropriate access code for the zone being tested, if any.
3. The tester should indicate a circuit closure.
4. Repeat steps 1 through 3 for each contact closure output zone at the controller and zone expansion units.

---

## Contact Closure Input Zones

---

Use the following steps to test each contact closure input zone.

**⚠CAUTION:**

*Be careful not to short out any audio output contacts during this procedure as the controller and amplicenter may go into overload as indicated by the overload LED. This causes the system to cease paging.*

1. Connect a local speaker with clips to the output zone used for audio paging chime or tone at the output terminal strip.
2. Short out the terminals of the input contact closure zone on the controller or zone expansion unit terminal strip.
3. Listen for the chime or tone from the local speaker.
4. If audio routing is enabled, immediately calling the controller from a telephone or attendant console should allow communication with the contact closure source (i.e., doorphone with pushbutton).

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# Maintenance and Customer Support

# 4

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Your PagePac Plus system is designed to provide trouble-free performance without any special maintenance procedures. To reduce the risk of accidental damage:

- Keep the system units in an area free of dust, smoke, and moisture, and do not block their air vents.
- Keep the rear of the units neat. Strap down cable runs and avoid excess loose wires and debris that could cause short circuits.

## In Case of Difficulty

---

If you have a problem with your system, you may be able to solve it yourself by following the appropriate troubleshooting procedure described in this section. If you still need help, call the Helpline toll-free number 24 hours a day:

United States: 1 800 628-2888

Canada:

Eastern Canada and Ottawa: 1 800 363-1882

Ontario: 1 800 387-4268

Central and Western Canada: 1 800 663-9817

If you call, have the following information ready so that the representatives can better help you:

- The kind of system you have (for example, PagePac Plus and with a D-300 Amplicenter).
- The kind of host telephone system to which the PagePac Plus is connected.
- A history of the problem.

## Power Failure Operation

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The PagePac Plus will operate with the host telephone system if both are connected to an uninterruptable power supply (UPS). If the host system is Centrex, no local power is required except for the PagePac Plus.

## Common Problems

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Some common problems encountered when the paging system is not operating are described below. Check each item in the order listed.

1. No power to PagePac Plus system
2. Host system failure
3. Host system page port failure
4. A hardwire disconnect between host system and PagePac Plus system
5. PagePac system switch settings tampered with
6. Controller failure

If the problem has not been resolved by checking the preceding items, follow the steps described in the Troubleshooting subsection, next.

## Troubleshooting

---

The following table describes various problems that could occur, possible causes for each problem, and procedures you can follow to try to solve the problem.

Table 4-1. Troubleshooting

Problem	Corrective Action
<b>No music source connected to the input, but there is noise on the output in the music mode.</b>	Turn the Music Input volume control to the full counter clockwise position (down).
	Check programming option to see if music is disabled to the zone(s).
<b>No music heard with a music source connected to the input.</b>	Check the volume control level.
	A higher priority in the PagePac Plus Controller is active.
	Check the input and output connections.
	Check the programming options to see if music has been enabled to the zone(s).
<b>Music volume is low when the volume control on the PagePac Amplicenter is set to maximum.</b>	Check the DTMF volume control level in PagePac Amplicenter.
	Check the speaker tap settings.
<b>Unable to adjust the DTMF volume control in the PagePac Amplicenter.</b>	Enable the “Pass DTMF to the Output” programming option for the zone used to adjust the volume.
<b>Night Bell is not active when it is intended to be activated with a Ring voltage.</b>	The input voltage level is too low or missing (50V or greater).
	Make sure that the input connections are to pins 5 and 6 of J3.
	A higher priority in the PagePac Plus Controller is active.
<b>Zone optioned as an “contact closure input” is not functioning.</b>	Check the connections to the zone selected as the input zone.
	Check the zone option switch, make sure that the switch is in the middle position.
	Verify using an ohmmeter that a contact closure is being provided from the host equipment.
	A higher priority in the PagePac Plus Controller is active.
	Check the programming options for the proper settings.
<b>No “Phone System Enabled” LED lit when the host system is attempting to access the PagePac Plus Controller.</b>	Verify that the Telephone Mode Selection Switch is in the proper position for the application.
	Check all the connections to J4 on the PagePac Plus Controller.
<b>Relay chatter when Tip and Ring is connected to the PagePac Plus Controller.</b>	Verify that the Telephone Mode Selection Switch is in the proper position for the application.

Table 4-1. Troubleshooting (*Continued*)

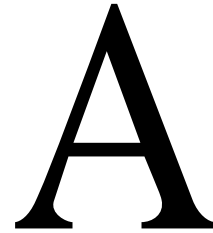
Problem	Corrective Action
<b>When using the PagePac Plus Controller in the Page Port mode and a busy tone is returned when attempting to access the PagePac Plus Controller.</b>	Verify that the Telephone Mode Selection Switch is in the "DL" position for this application.
	Verify that Attendant Access is not active.
<b>The PagePac Plus Controller is not getting accessed in the Ground Start mode.</b>	Verify that the host telephone system's ground is connected to Pin 8 of J3 on the PagePac Plus Controller or Pin 2 on the RJ-11 jack, J4.
	Verify that the Telephone Mode Selection Switch is set to the "GS" position for this application.
	Tip and Ring may be reversed (the Ring is always more negative than the Tip).
<b>The PagePac Plus Controller answers a station call, then immediately hangs up.</b>	Verify that the Telephone Mode Selection Switch is set to the "SA" position for this application. (not "GS").
<b>Dial tone or confirmation tone is sent to the speaker when the PagePac Plus Controller has not been accessed.</b>	The Telephone Mode Selection Switch's position may have been changed while the Tip and Ring was connected. Verify and correct.
<b>Contact closure output is not functioning.</b>	Check the connections to the zone selected as the output zone.
	Check the zone option switch, make sure that the switch is in the back position.
	Verify using an ohmmeter that a contact closure is being provided from the controller.
	A higher priority in the PagePac Plus Controller is active.
	Check the programming options for the proper settings.
<b>Attendant Access is not functioning.</b>	Check the connection to the controller back panel, pins 7, 8, 9 and 10 of J3.
	Verify using an ohmmeter that a contact closure is being provided from the host equipment.
<b>No pre-announce tone is sent to the output, but it is desired.</b>	Check the programming options for the proper settings.
<b>No pre-announce or confirmation tone is sent to the output or the telephone, but it is desired.</b>	Check the programming options for the proper settings.

Table 4-1. Troubleshooting (*Continued*)

Problem	Corrective Action
<b>Power LED not on.</b>	Verify power cord is connected at both ends.
	Using a voltmeter, check for AC Voltage at the wall outlet.
	Defective controller. Return for repair.
<b>Low Volume on the output.</b>	Adjust DTMF gain control in the PagePac Plus Amplicenter.
<b>Talk-back does not work.</b>	Check the zone option switch, make sure that the switch is in the 70 volt position.
	Check programming options for the proper settings.
	Check the Telephone Mode Selection Switch on the PagePac Plus Amplicenter. Make sure that it is the Dry Loop, 600 Ohm Mode.
<b>Noisy Talk-back</b>	Check the wire to see if shielded cable was used.
	Make sure shield for cable is only tied to the controller end.
	Change cable to shielded if needed.
	Remove shield at the speaker end.
<b>Remote Amplifier not receiving audio.</b>	Check audio connections on pins 3 and 4 of J3.
	Check the zone option switch, make sure that the switch is in the Contact Closure Output position.
<b>Distorted, garbled, or raspy sound from all speakers connected to Amplicenter</b>	Failed Amplicenter. Return unit for repair.
	Music input level too high. Turn down.
	Shorted circuited speaker leads. Separate.
	Speaker transformer failed to a short. Replace.
<b>Page Access LED won't go off.</b>	Page VOX too sensitive. Adjust.
	C1 lead in-advertently grounded. If Loop start and Ground start, check that only 2 wires (tip and ring) are connected by the modular plug cord.

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# FCC Statement/Registration and Warranty Information



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## FCC Statement (Part 68)

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Component registration for the PagePac Plus Controller has been applied for from the Federal Communications Commission (FCC) in accordance with Part 68 of its Rules.

Registered equipment may not be used with Coin Telephone Lines. Equipment may be used with Party Lines in areas where state tariffs permit such connections and when equipment is adaptable for such service.

If trouble is experienced, the equipment should be disconnected (unplugged) from the interface to determine if this equipment, the host equipment, or the telephone line is the trouble source. If this equipment is determined to be malfunctioning, it should not be reconnected until repairs are effected.

Connection to host equipment is via a 6-position modular jack (74D Connecting Block). Equivalent connections may be used. This equipment is designated to be installed in a foolproof manner. Permission of the host equipment owner, who may determine the means of connection, is required for connection.

Repairs to this equipment, other than routine repairs, as stated in this guide can be made only by the manufacturer or its authorized agents.

If the equipment causes harm to the telephone network, the local telephone company may temporarily discontinue your service and, if possible, notify you in advance. If advance notice is not practical, you will be notified as soon as possible. You will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC.

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The local telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. If they do, you will be given adequate notice in writing to allow you an opportunity to maintain uninterrupted telephone service.

## FCC Registration (Part 15)

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### Radio Frequency Interference

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The PagePac Plus Controller generates and uses radio frequency energy and if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. Testing is being conducted for compliance with the limits for a Class B device in accordance with the specifications in Subpart J of Part 15 of the FCC Rules. This testing is designed to provide reasonable protection against such interference. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the PowerMate unit off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the radio or TV receiving antenna.
- Relocate the PowerMate unit with respect to the radio or TV receiver or vice-versa.
- Plug the PowerMate unit into a different outlet so that it and the radio or TV receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet, "How To Identify and Resolve Radio-TV Interference Problems," helpful. This booklet was prepared by the Federal Communications Commission (FCC) and is available from the U.S. Government Printing Office, Washington, DC 20402. Stock order No. 004-000-00345-4.

## Limited Warranty and Limitation of Liability

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AT&T warrants to you that the product will be free from defects in material and workmanship when title passes to you. If you notify AT&T that the product has failed to operate as warranted within one year of the date title passes to you, AT&T will, at its option, repair or replace the component or components of the product that failed to operate as warranted. Any repair or replacement components may be new or refurbished and will be provided on an exchange basis. If AT&T determines that the product cannot be replaced, AT&T will refund the purchase price to you.

If you purchased the product directly from AT&T, AT&T will perform warranty repair on your premises in accordance with the terms and conditions of AT&T's "Business Day" or "Around-the-Clock" warranty plans. The details of AT&T's warranty plans may be obtained from AT&T. If you purchased the product from an authorized dealer, you will be covered by AT&T's authorized dealer warranty plan during the warranty period. Contact your authorized dealer for details of AT&T's authorized dealer warranty plan. **AT&T's obligation to repair, replace or refund as set forth above is your exclusive remedy.**

The limited warranties provided above do not cover damages, defects, malfunctions or product failures caused by:

- Failure to follow AT&T's installation, operation or maintenance instructions;
- Unauthorized modification or alteration of the product or its components;
- Product abuse, misuse or the negligent acts of persons not under the reasonable control of AT&T;
- Actions of third parties and acts of God other than power surges (e.g., lightning).

This limited warranty applies only to the product purchased directly from AT&T or purchased directly from an authorized AT&T dealer. This limited warranty does not apply to products purchased or operated outside the United States.

You may be required to provide AT&T with proof of purchase before AT&T will perform any warranty repair or provide any warranty replacements.



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## Installation and Maintenance Information

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There are several types of installation and maintenance plans available from AT&T and/or your dealer. Please call your AT&T sales representative or authorized dealer for details.

For warranty service, contact your AT&T representative or authorized dealer.

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