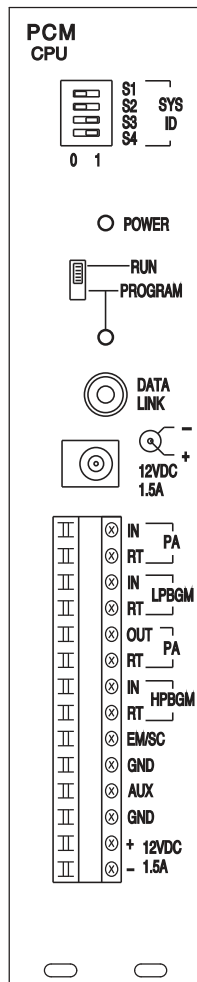




Bogen Model PCMCPU

*Central Processing Module for
Bogen's PCM2000 Zone Paging System*



FCC Required Statements

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Requirements

This equipment is component registered with the Federal Communications Commission (FCC) in accordance with Part 68 of its rules. In compliance with the rules, be advised of the following:

1. The Federal Communications Commission (FCC) has established Rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin lines.
2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.
3. The telephone company may make changes in its technical operations and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.
4. If the telephone company requests information on what equipment is connected to their lines, inform them of:
 - (a) The telephone number that this unit is connected to,
 - (b) The ringer equivalence number [1.3B]
 - (c) The USOC jack required [RJ11C], and
 - (d) The FCC Registration Number [US:CD2PA13BTAMB2]

Items (b) and (d) are indicated on a label affixed to the unit. The ringer equivalence number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

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PCMCPU

Section 1

Overview

Description

The Bogen Model PCMCPU is the microprocessor module for the Bogen PCM Zone Paging System. One module is required per assembly (up to three PCMZPM zone modules). The PCMCPU module provides power, data and audio connections for the PCM system.

The PCMCPU module is connected to other PCM modules electrically through internal cables. Modules are mechanically joined by sliding together interlocking tabs and securing with a screw on the rear panel. The system is designed to be wall-mounted with the modules side by side like books on a shelf, the PCMTIM is far left, the PCMCPU is first from left and the (first) PCMZPM module is on the right. (Arrange as shown in illustration on page 7.)

The PCMCPU module includes a set of DIP switches that set the System ID, a POWER LED, a PROGRAM/RUN switch, a DATA LINK RCA jack (used to connect to satellite systems), power in jack/terminals, and audio connections for PA, low-power BGM, high-power BGM, emergency/shift change trigger and auxiliary contacts.

PCM2000 System

Minimum system configuration consists of three modules:

PCMCPU, PCMTIM, and PCMZPM provides 3 Zones of paging. To this, you can add up two additional PCMZPM modules to a maximum of 9 zones. If more than 9 zones are required, satellite assemblies can be added to bring total capacity to 99 zones. Also a talkback module (PCMTBM) can be added for 2-way communications. The PCM2000 system provides the following features and functions:

Voice Channel

- Up to 99 zones of paging (in 3 zone increments) and sub-zone group paging (up to 32 zone groups, each with up to 99 zones)
- Override paging (using loop start or contact closure)
- Talkback paging (centrally-amplified zones only)
- High-powered central paging (can be combined with Low Power Paging)
- Low-power paging to amplified speakers (can be combined with High-Power Paging)
- Privacy beep on talkback zones
- Pre-announce tone

PCMCPU

Background Music (BGM)

- Low-power distributed (buffered for up to 50 amplified speakers)
- High-power, using dedicated BGM amplifier
- High-power using a single paging/BGM amplifier
- BGM disable to individual zones
- Local BGM input on each individual zone module

Signaling

- Night ringer (90V or contact closure activation)
- Code calling (2 types - echo & pattern)
- Emergency/shift change tone (tone and duration selectable)

Other Features

- DTMF setting of all operating parameters
- External C-form relay contacts
- Relay driver output per zone
- Non-volatile memory for setup data (no backup battery required)
- Talk/Talkback selection per zone
- Setup tone to assist in volume setting, etc.

Specialized Features

- PCMTBM Modules provide time-triggered signaling with built-in, real-time clock
- PCMTBM Module provides talkback paging

PCMCPU

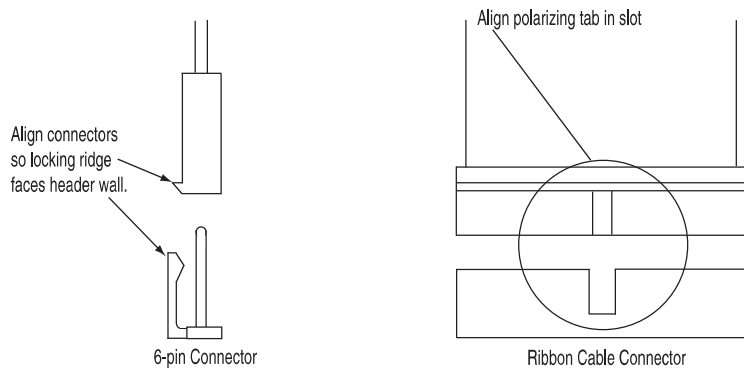
Section 2

Installation

Assembling Modules

To assemble modules together, place them side by side starting with the left most module of the assembly (for master system assembly, PCMCPU). Plug the ribbon cable connector into its header (see drawing for orientation). Then plug the 6-pin connector onto its header.

NOTE: It is very important to check for proper orientation of this connector (see illustration).



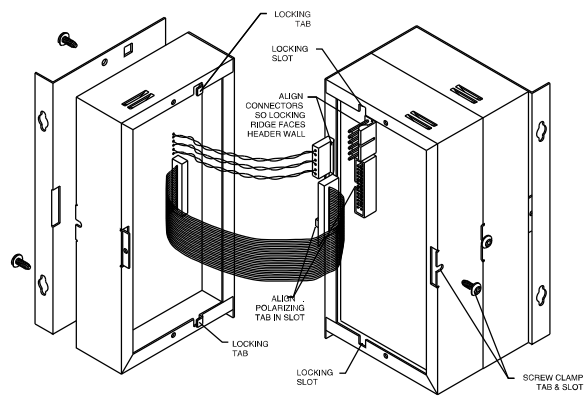
NOTE: If the 6-pin connector is installed backwards, the power light on this module (and possibly the entire assembly) will not light when powered up. Correct this by separating the modules and locating the reversed 6-pin connector.

Place the modules close together and dress the connector cables away from the sheet metal so that they will not get pinched. Push the two units together while aligning the locking tabs on the top and bottom sides of the left unit with the locking slots on the right unit. At this point the left unit will be positioned slightly ahead of the right unit. Now slide the left unit back against the right unit until the faces of both units are even. Secure the two units together by tightening a screw into the screw clamp tab in the back of the unit.

NOTE: It is usually easier to run the screw in and out of the screw clamp tab, to cut a thread, before assembling the units together.

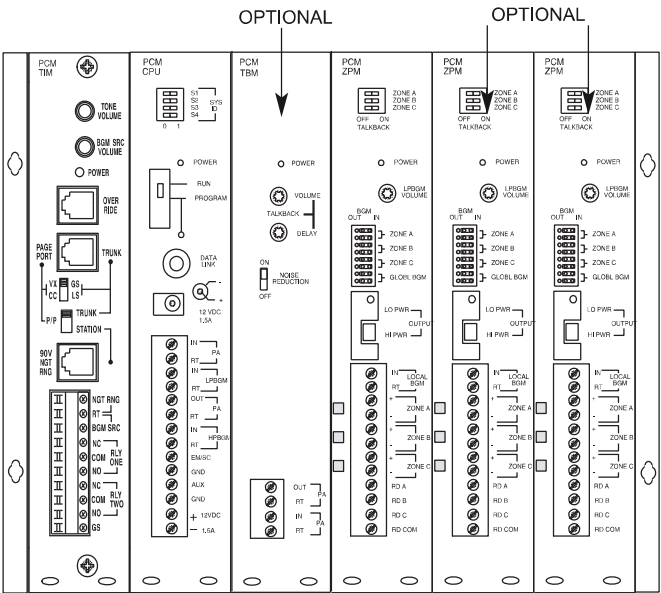
PCMCPU

Repeat the procedure for the rest of the modules to be included in the assembly.



The figure below shows the correct sequence of modules for a maximum assembly. If certain modules are not used, remove them and maintain the order shown for the rest of the modules.

NOTE: PCMTIM and PCMTBM are not used in satellite unit.



PCMCPU

Power

The PCM system requires 12V DC 1.5A. Use the PCMPS2 power supply. Plug the power supply into the POWER jack on the PCMCPU module. Power can also be connected to the 12V DC terminals on the connector block.

System ID

For a system with no satellites, set SYS ID DIP switches on PCMCPU module to the position shown. See section on System Expansion in this manual for additional information on setting system IDs in expanded systems.

Zone #s		DIP Setting For SYS ID					
		S1	S2	S3	S4		
Master	1 - 9	0	0	0	0	0	1

Program/Run Switch

The Program/Run switch must be set to the PROGRAM position during system programming and the RUN position during normal operation. Refer to the instructions included with the PCMTIM module for programming instructions.

Audio Connections

Centralized amplifier connections are made to the screw terminals marked PA IN and PA OUT on the PCMCPU module. Connect PA IN and RT (return) to the audio input on the paging amplifier. Connect the high-power (70V) output of the amp to the PA OUT and RT terminals.

Low-Power BGM

Connect BGM source to the LPBGM IN & RT terminals (Connect signal ground or shield to RT terminals and the hot to IN). This provides low-level BGM signals to the PCMZPM modules with LO PWR OUTPUT selected. This input is unbalanced.

High-Power BGM

Connect BGM source to the input of a 70V amplifier. Connect the high-power (70V) output of the amplifier to the HPBGM IN & RT terminals (amplifier common should connect to RT). This provides high-power background music signal to the PCMZPM modules with HI PWR OUTPUT selected.

Emergency/Shift Change Trigger

External input control is available to trigger a tone signal from the PCM2000 over the paging system. Shorting EM/SC to the GND terminal will produce a user-programmed tone into a preselected group of zones. See Programming section of the PCMTIM manual for information on programming the EM/SC feature.

AUX/GND Contacts

These contacts are used to synchronize with an external master clock. Shorting these terminals resets the real time clock in the PCMTBM module to a user preset time. See the PCMTIM manual Programming section for further information on this function.

Section 3

System Expansion

Concept

In situations where it is necessary to extend beyond 9 zones of paging, satellite systems and a master must be used. Each satellite system is responsible for the specific group of zones as determined by the setting of its SYS ID DIP switches. The master system transmits its commands on the Data Link bus to all satellites at the same time, but only the specifically addressed satellite responds.

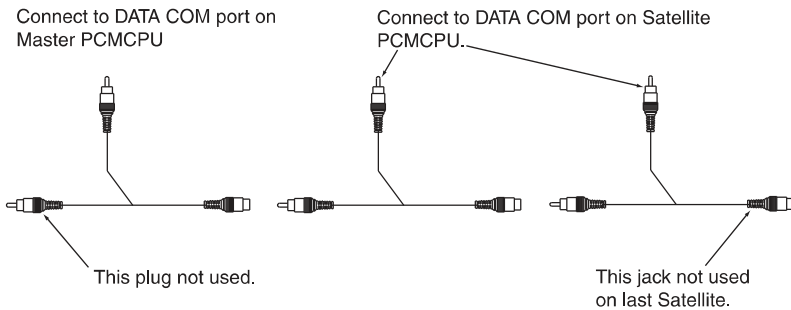
NOTE: A satellite system consists of 1 PCMCPU module and 1 to 3 PCMZPM modules. PCMTIM and PCMTBM modules are not used and will not work in a satellite system.

Audio Wiring

Audio wiring is daisy-chained from one assembly to another. The illustration on page 15 shows the daisy chain audio wiring between system assemblies (wiring to the BGM sources is only done on the master system). The same wiring scheme is used between adjacent assemblies.

Data Link Wiring

The DATA LINK ports of the system's PCMCPU modules are connected using RCA cables. For a system with one satellite, a standard male-to-male RCA cable can be used. For systems with more than one satellite, the recommended interconnecting cable consists of a single female RCA connector with two male RCA connectors (see illustration below). It is also recommended that the distance between adjacent satellite systems does not exceed 3 feet, and that all DATA LINK connections are securely made and well seated. Bad connections will result in operational failures and/or inconsistent operation.



PCMPCPU

System ID

Once the satellite systems have been wired together, the satellite ID numbers can be assigned. The ID for the master system (the one which has the PCMTIM module) must be set to zero (all SYS ID switches set to "0"). Although satellite systems can be numbered in any order, it is best to number them sequentially, starting with "1" and following the way in which they are daisy-chained together. The table below shows the SYS ID switch settings for the available satellite numbers and the zones that each satellite is responsible for. After satellites have been numbered, you may want to mark the actual zone numbers for each zone in the white area to the left of the zone terminal screws. Use an indelible felt-tip marker. The lowest numbered zone in the satellite system is the top zone in the PCMZPM module adjacent to the PCMPCPU module. The highest zone in the satellite is the bottom zone in the last PCMZPM module.

After satellite systems have been wired and ID numbers assigned, the system can be powered up. If it is necessary to change the ID number of a satellite after the system has been powered, you must remove and then reapply power TO THAT SATELLITE after changing switch settings.

Satellite Zones & SYS ID Switch Positions

DIP Setting For SYS ID						
	Zone #'s	S1	S2	S3	S4	
Master	1 - 9	0	0	0	0	S1 S2 S3 S4 SYS ID
Satellite	1	10 - 18	1	0	0	0
	2	19 - 27	0	1	0	0
	3	28 - 36	1	1	0	0
	4	37 - 45	0	0	1	0
	5	46 - 54	1	0	1	0
	6	55 - 63	0	1	1	0
	7	64 - 72	1	1	1	0
	8	73 - 81	0	0	0	1
	9	82 - 90	1	0	0	1
	10	91 - 99	0	1	0	1
1 = On 0 = Off						

Section 4

Paging System Assemblies: Applications and Illustrations

Introduction

The examples and illustrations shown on the following pages are typical paging system configurations. For improved clarity, these illustrations show the modules separated from each other. In actual systems, all modules in an assembly are physically connected.

One-Way Paging System with Satellites

The illustration on the next page shows the wiring between different assemblies in a system with satellites for one-way paging. Four pairs of audio wires are daisy-chained between adjacent assemblies. These pairs are for the high-power paging and background music (PA OUT and RT and HPBGM IN and RT), and the low-power paging and background music (PA IN and RT & LPBGM IN and RT).

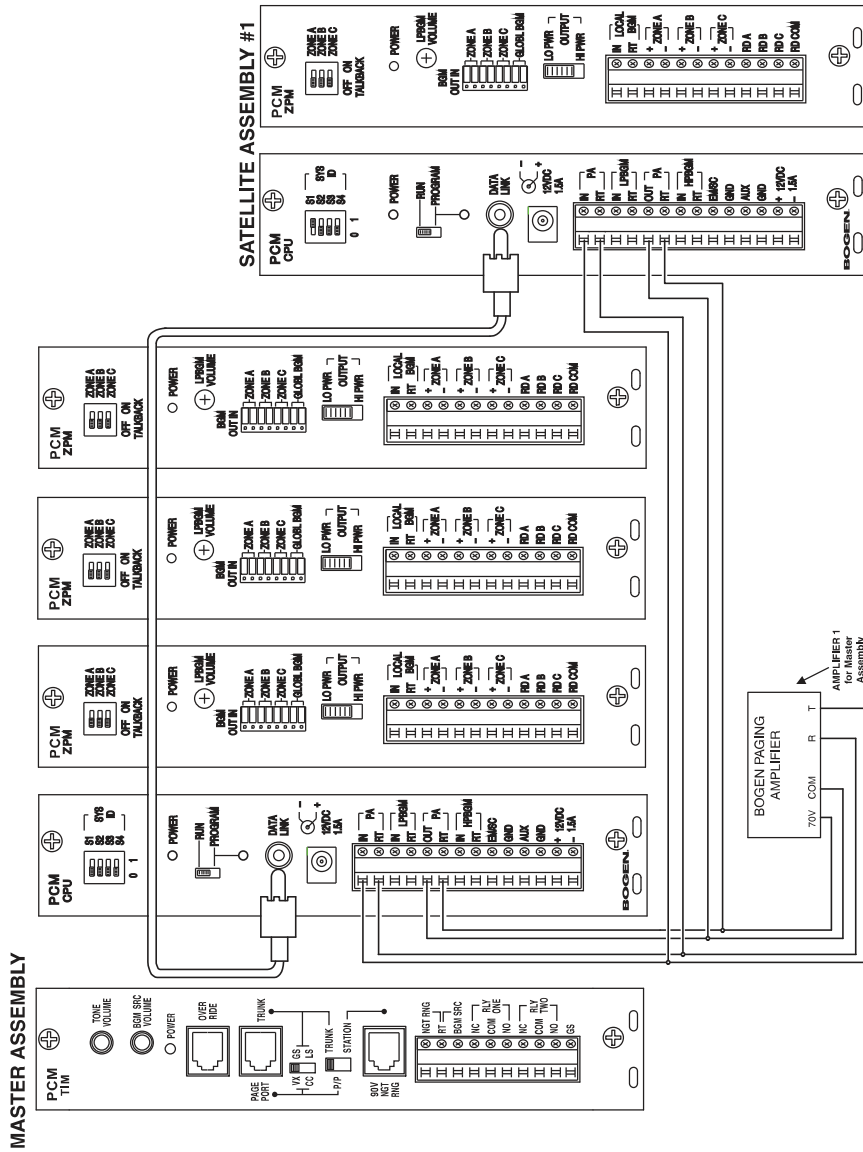
If a system is only using one type of paging, either all high-power or all low-power, only two pairs of wires are needed to connect assemblies together. An all low-power system would need only PA IN and RT and LPBGM IN and RT. Likewise, in an all high-power system, the only inter-assembly wiring needed would be PA OUT and RT and HPBGM IN and RT. The centralized high-power amplifier would still connect to PA IN and RT and PA OUT and RT.

The DATA LINK RCA cable is also daisy-chained between assemblies. See the section on Data Link wiring for suggested RCA cable types and wiring techniques for multiple assembly systems. Although this diagram shows wiring between the master and a satellite, the same wiring connections would exist between adjacent satellite assemblies up to the maximum system of 10 satellites. Two stranded wires can be clamped in each of the terminals to simplify wiring and eliminate wiring splices.

NOTE: The Bogen PCM Configuration Guide contains more detailed information on applications. It can be downloaded at:
www.bogen.com/products/pdfs/telephonepagepdfs/PCM2000c.pdf

PCMCPU

One-Way Paging System with Satellites



PCMCPU

Two-Way Talkback Paging System with Satellites

Information relative to connecting the system to the telephone system can be found in the instructions supplied with the PCMTIM module.

The illustration on the next page shows the wiring for a PCM2000 system with satellites using talkback. This configuration is essentially the same as the one-way system described previously, 4 pairs of wires connect between all adjacent PCM2000 assemblies. The main difference between the one-way configuration (previous example) and this configuration, is that the centralized high-power amplifier is connected to the PCMTBM module instead of the PCMCPU. All other wiring is the same for these two configurations.

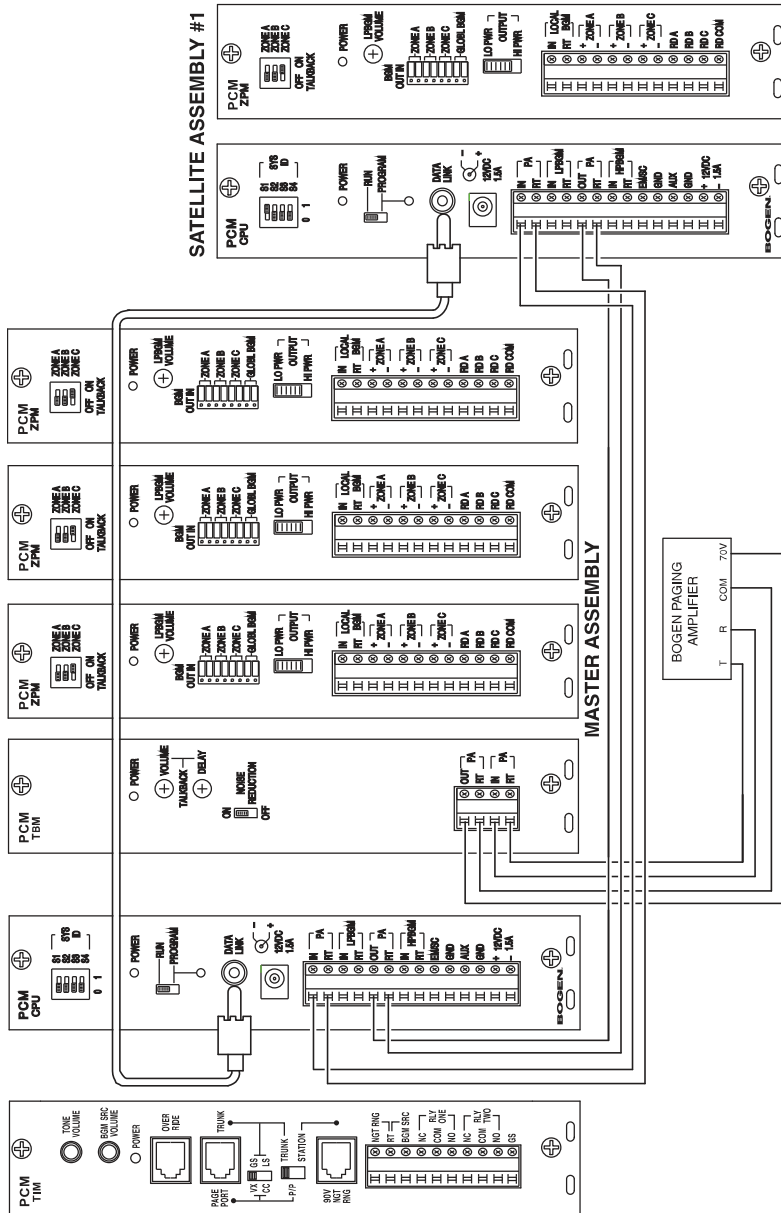
CAUTION: *DO NOT connect the Paging Amp to the CPU Module when using a PCMTBM Module.*

The PCMZPM DIP switches for TALKBACK must be set to ON to enable talkback. Talkback is only available in high-power zones with passive speakers.

NOTE: The PCMTBM module uses high gain amplifiers to provide the talkback for speaker to amplifier. When using high-power BGM to provide uninterrupted BGM in zones not being paged, some of this signal will leak into the talkback path and be heard in the telephone receiver. One method to reduce this effect is to use the 25V output of the paging amp and high-power BGM source instead of the typical 70V output. Also reducing the amount of treble from the BGM source helps reduce leakage.

NOTE: The Bogen PCM Configuration Guide contains more detailed information on applications. It can be downloaded at:
www.bogen.com/products/pdfs/telephonepagepdfs/PCM2000c.pdf

Two-Way Talkback



3-Zone System with One-Way Paging & Single Amp BGM

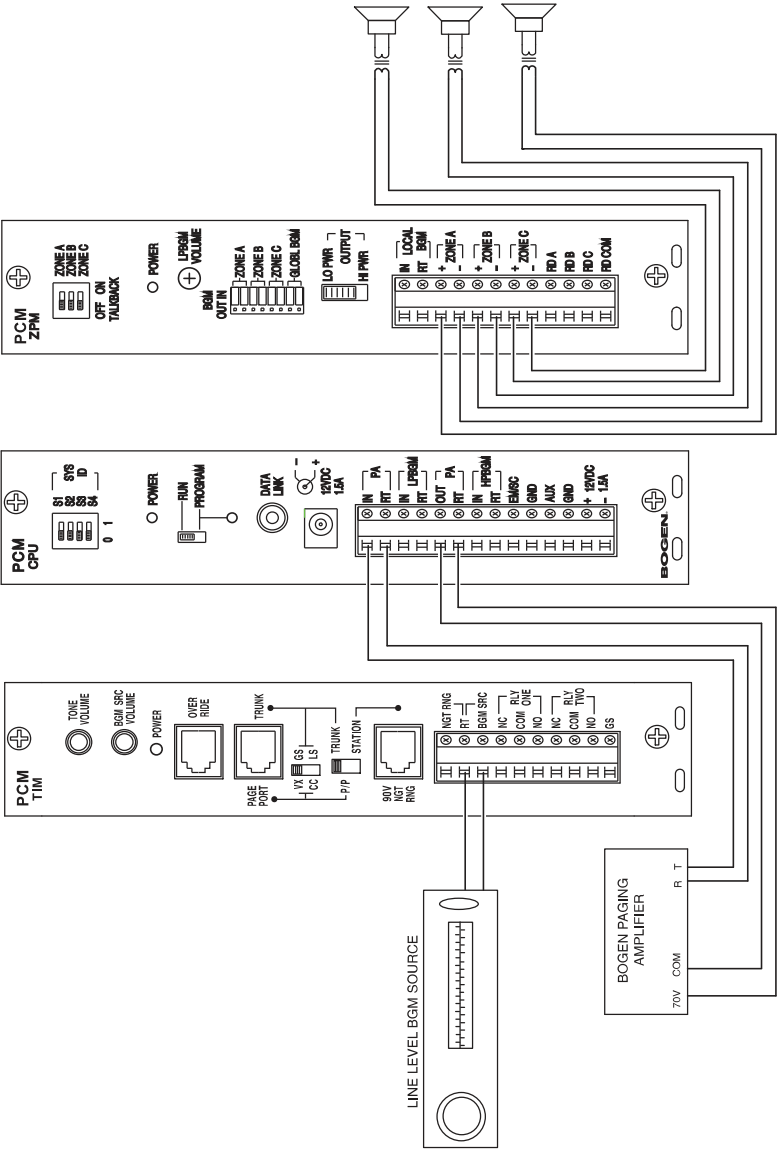
The application illustrated on the next page shows the simplest PCM2000 system configuration. A single amplifier supplies both paging and BGM to passive speakers. As a result, BGM is lost in all zones when a page is made (this feature must be enabled. See "1 Amp BGM" in the Programming section of the PCMTIM manual).

Connect the low-level BGM source to the PCMTIM terminals marked BGM SRC IN and RT. Connect the paging amplifier's input to the terminals marked PA IN and RT. Connect the paging amplifier's output to the terminals marked PA OUT and RT. The OUTPUT switch on the PCMZPM must be in the HI PWR position for this application.

Connect the passive speakers to the PCMZPM zone terminals. The GLOBL BGM jumpers should be in the IN position. The jumpers for any zone that is to have BGM should also be in the IN position. Set the paging level using the amplifier's volume control and the BGM level using the BGM SRC VOLUME control on the PCMTIM.

NOTE: The Bogen PCM Configuration Guide contains more detailed information on applications. It can be downloaded at:
www.bogen.com/products/pdfs/telephonepagepdfs/PCM2000c.pdf

3-Zone System



6-Zone System with One-Way Paging With Mixed High-Power & Low- Power Zones and Local BGM

In the application illustrated on the next page, both high-power passive speakers and low-power amplified speakers are used in the same system. Two separate sources are used to supply BGM. In this configuration, background music will not be interrupted in all zones not being paged.

The right-most PCMZPM module is set for high-powered paging, and its OUTPUT switch is in the HI PWR position. Only passive speakers may be connected to this module. This module is also being supplied by a local background music source. Note that the BGM source is amplified; the same type of signal that the paging amplifier produces. The high-power BGM source is wired to the module's LOCAL IN and RT terminals, and the GLOBL BGM jumpers have been moved to the OUT column.

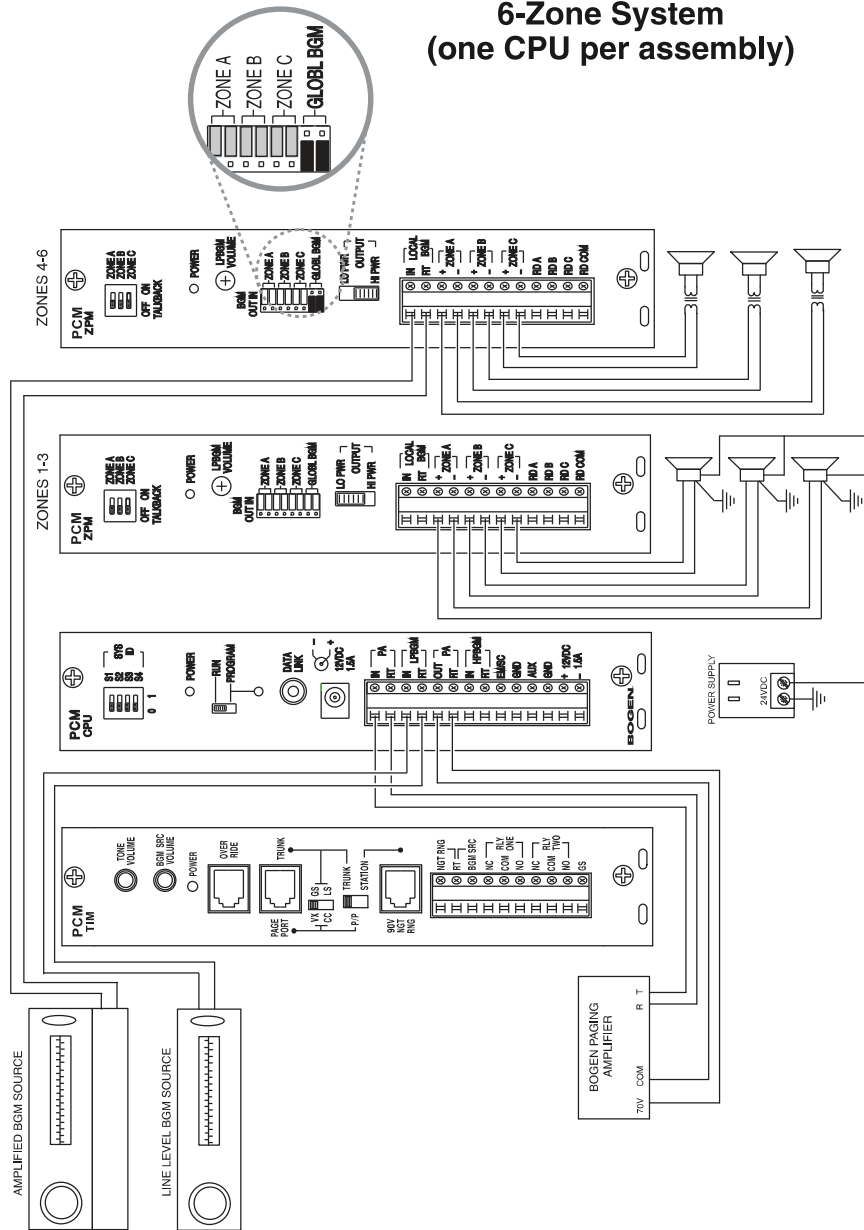
The other PCMZPM module is set for low-power paging. Its OUTPUT switch is in the LO PWR position. Background music is being supplied to the low-power amplified speakers by another low level BGM source. The BGM source is connected to the LPBGM terminal, which supplies BGM to all low-power PCMZPM modules having their GLOBL BGM jumpers in the IN column.

The centralized paging amplifier's input is connected to the PA IN & RT terminals. The amplifier's output is connected to the PA OUT & RT terminals.

NOTE: The Bogen PCM Configuration Guide contains more detailed information on applications. It can be downloaded at:
www.bogen.com/products/pdfs/telephonepagepdfs/PCM2000c.pdf

PCMCPU

6-Zone System (one CPU per assembly)



PCMCPU

9-Zone System With Talkback, Single Amp BGM and Mixed High- & Low-Power Zones

In the application illustrated on the next page, low-power paging is supplied to amplified speakers, and talkback or regular paging is supplied for high-power zones equipped with passive speakers. A single amplifier is used to supply both paging and BGM to the passive speakers (this feature must be enabled. See "1- Amp BGM" in the Programming section of the PCMTIM manual). Because of this, the BGM to all high-power zones will be lost when a page is made. In zones using amplified speakers, BGM will not be lost when a page in another zone is made.

The centralized paging amplifier is connected to the PCMTBM module when using talkback paging, instead of the PCMCPU, as in regular paging situations. Connect the amplifier's input to the PCMTBM terminals marked PA IN & RT. Connect the amplifier's output to the PCMTBM terminals marked PA OUT & RT. The BGM source in this case is a low-level source with its output going to two sets of terminals. Wire the BGM source to the PCMTIM terminals marked BGM SRC IN & RT and also to the PCMCPU terminals marked LPBGM IN & RT.

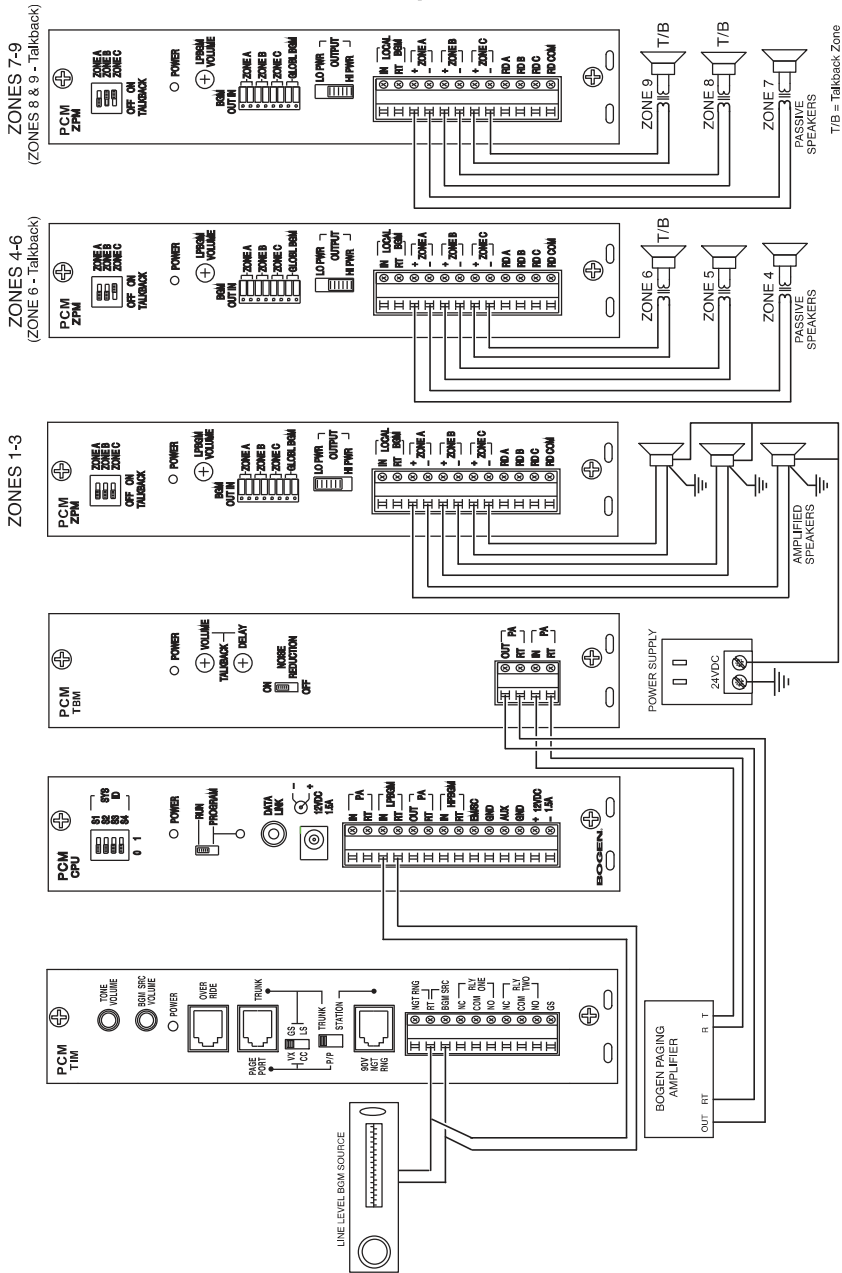
IMPORTANT: DO NOT connect the Paging Amp to the CPU Module when using a PCMTBM Module.

CAUTION: The PCMZPM Module connected to the self-amplified speaker must have its Output Switch set to **LO PWR**. DO NOT mix self-amplified and passive speakers on the same PCMZPM.

Set the paging level in the high-power zones using the volume control of the central amplifier. Use the volume control on each amplified speaker to set the page level in the low-power zones. The LPBGM VOLUME control on the PCMZPM module will adjust the BGM level in low-power zones. Use the BGM SRC VOLUME control on the PCMTIM module to adjust the BGM level in the high-power zones. The GLOBL BGM jumpers must be in the IN column in order for the PCMZPM module to receive background music. To enable talkback in a high-power zone, set the PCMZPM module's TALKBACK DIP switch for the desired zone to ON. Follow the recommendations in the PCMTBM manual to adjust talkback quality.

NOTE: The Bogen PCM Configuration Guide contains more detailed information on applications. It can be downloaded at:
www.bogen.com/products/pdfs/telephonepagepdfs/PCM2000c.pdf

9-Zone System



Notes

Notes

Limited Warranty, Exclusion of Certain Damages

The **Bogen PCMCPU Central Processing Module** is warranted to be free from defects in material and workmanship for two (2) years from the date of sale to the original purchaser. Any part of the product covered by this warranty that, with normal installation and use, becomes defective (as confirmed by Bogen upon inspection) during the applicable warranty period, will be repaired or replaced by Bogen, at Bogen's option, provided the product is shipped insured and prepaid to: Bogen Factory Service Department, 50 Spring Street, Ramsey, NJ 07446, USA. Repaired or replacement product will be returned to you freight prepaid. This warranty does not extend to any of our products that have been subjected to abuse, misuse, improper storage, neglect, accident, improper installation or have been modified or repaired or altered in any manner whatsoever, or where the serial number or date code has been removed or defaced.

THE FOREGOING LIMITED WARRANTY IS BOGEN'S SOLE AND EXCLUSIVE WARRANTY AND THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY. BOGEN MAKES NO OTHER WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED AND EXCLUDED TO THE MAXIMUM EXTENT ALLOWABLE BY LAW.

Bogen's liability arising out of the manufacture, sale or supplying of products or their use or disposition, whether based upon warranty, contract, tort or otherwise, shall be limited to the price of the product. **IN NO EVENT SHALL BOGEN BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF DATA OR LOSS OF USE DAMAGES) ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF PRODUCTS, EVEN IF BOGEN HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSSES.** Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

Products that are out of warranty will also be repaired by the Bogen Factory Service Department – same address as above or call 201-934-8500. The parts and labor involved in these repairs are warranted for 90 days when repaired by the Bogen Factory Service Department. All shipping charges in addition to parts and labor charges will be at the owner's expense. All returns require a Return Authorization number. For most efficient warranty or repair service, please include a description of the failure.

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