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INSTALLATION INSTRUCTIONS MODEL MZC-144 MODULAR ZONE CONTROL (3 ZONES EXPANDABLE TO 12 ZONES) - AND -MODEL MZEM-3 ZONE EXPANSION MODULE (3 ZONES) -AND-MODEL TBM TALK-BACK MODULE -AND-MODEL MZC-RM MODULAR ZONE CONTROL RELAY MODULE

Use this product according to this instruction manual. Please keep this instruction manual for future reference.

NOTE: All CAUTIONS and WARNINGS are identified by the A symbol. All warnings are printed in bold capital letters.

1. <u>APPLICATION INFORMATION</u>:

The Modular Zone Control (MZC-144) is an expandable Zone Control that performs the central control, switching and signaling required to provide selective Zone Paging, Fixed Group Paging, Logical Zone Group, All Call, Background Music Mute, and Page Alert Tone Signaling. The MZC-144 provides 3 separate zones of paging, and can be expanded to 12 zones by installing up to 3 Modular Zone Expansion Modules (MZEM-3). Each MZEM-3 provides a zone group consisting of 3 zones. Each MZEM-3 provides a background music input for its 3 zone group. The Modular Zone Control Relay Module (MZC-RM) provides relay operation of the 3 zones in a fixed group.

The MZC-144 can be combined in a master/remote arrangement to create up to 144 zones of paging and relay control. This is accomplished by using the MZC-CAB cable to daisy chain units together. When the system reaches more than 5 remote units (72 Zones) a MZC-BOOSTER is required to connect the 5^{th} remote unit to the 6^{th} remote unit.

With the optional (centralized) Talk-Back control circuit installed, the MZC-144 can be programmed to accommodate both One Way and Talk-Back paging zones. It can also be programmed to be used with a wide variety of system amplifier configurations, which can include various combinations of 25V/70V/100V central and zone amplifiers and amplified One Way paging speakers.

The MZC-RM provides relay operation of the three (3) zones in a fixed group. The module is capable of either latching or nonlatching operation. Two (2) with Form C contacts and one (1) of either a Normally Open (NO) or Normally Closed (NC) contact. The MZC-RM can be inserted into the MZC-144 in three (3) different locations. This optional module has been designed to work with the MZC-144. The MZC-RM will only allow single zone (relay) activation. Through the use of logical zone groups, the MZC-144 can activate multiple relays during activation of the MZC-RM. Logical zone groups, which can be up to five (5) entries, are defined by the user. When logical zone groups are programmed for use by the MZC-RM, only single zone access codes may be used. Fixed zone group and all call activation will cause no change to the status of the relay outputs.

The MZC-144 is compatible with most EKSU, KSU (1A2), and PBX telephone systems. It connects to either an unused loop start CO port or a 600 ohm low power audio page port. When connected to an unused CO port, DTMF telephones may be used to operate the MZC-144. When connected to a page port, the page port must provide a dry contact closure and transmit DTMF tones.

NOTE: The MZC-144 is not designed for connection to an analog port.

Paging is accessed from any telephone by pressing the CO line button (EKSU & KSU), or dialing the number assigned to paging. Twelve (12) individual zones are selected by dialing 001 thru 012. All Call is selected by dialing 000. The four (4) zone groups are selected for group paging, by dialing 201 thru 204.

When any Zone, Fixed Zone Group, Logical Zone Group or All Call selection is made, a page alert tone will be heard at all the speakers in the selected zone. The tone will also be heard at the paging telephone to provide verification of connection to the selected speakers.

The MZC-144 provides one Fixed Zone Group (3 zones) and can be expanded to 4 Fixed Zone Groups (12 zones), by adding up to 3 plug-in MZEM-3 expansion modules as shown in Table 1 and Figure 1.

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Table 1: Zone Groups					
Group Zones Qty. of MZEM-3					
1	1, 2, 3	0			
2	4, 5, 6	1			
3	7, 8, 9	2			
4	10, 11, 12	3			

Group one (1) of every MZC-144 will always be audio. Groups 2, 3, 4 of each MZC-144 can be audio or a relay (contact closure). For audio operation use MZEM-3, for relay operation use MZC-RM for each additional zone group.

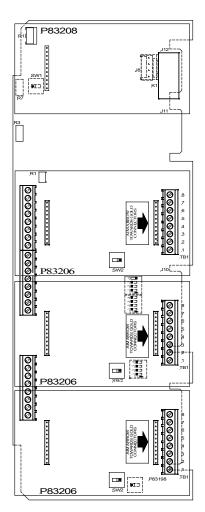
2. INTERFACE INFORMATION:

- The MZC-144 can be connected directly to:
- 1. A telephone for stand alone paging.
- 2. A telephone system's unused CO line/trunk port.
- 3. A telephone system's 600 ohm audio page port (See Figure 12, page 19).

Figure 1 shows the MZC-144 PC Board which includes a built-in zone group 1 (Zones 1, 2, & 3), and illustrates the positions for the optional MZEM-3, MZC-RM and Talk-Back Module (TBM).

ACAUTION: Plugging any Expansion Module in backwards will result in improper operation and failure of the unit.

Figure: 1 PC Board Position of Optional Talk-Back board, Optional MZEM-3 Modules and MZC-RM Modules



- Each zone may be accessed individually by dialing 001 thru 012.
- All zones can be accessed simultaneously for an all call by dialing 000. Each 3 zone group (Fixed Zone Group) can be accessed by dialing 201 thru 204.
- Table 2 illustrates the three digit dial access codes. Logical Zone Groups are also available and are accessed by 301 thru 325. Logical Zone Groups are programmed by you and contain the zones you want in a group. This feature is explained later in the manual under "Programming Instructions" on page 23.

Table 2: Dial Access Codes				
To Access	Dial			
All Zones (All Call)	000			
Zone 1	001			
Zone 2	002			
Zone 3	003			
Zone 4	004			
Zone 5	005			
Zone 6	006			
Zone 7	007			
Zone 8	008			
Zone 9	009			
Zone 10	010			
Zone 11	011			
Zone 12	012			
Zone Group 1 (Zones 1, 2 & 3)	201			
Zone Group 2 (Zones 4, 5 & 6)	202			
Zone Group 3 (Zones 7, 8 & 9)	203			
Zone Group 4 (Zones 10, 11 & 12)	204			

3. <u>AUDIO CONFIGURATION DESCRIPTIONS:</u>

The amplifier type (central or zone) is configured for each zone group as described in Table 3.

Table 3: Amplifier Type Group Configuration Function			
Group Function	Choices - Per Group		
Amplifier Type	 Central Amplifier: 25V/70V/100V audio output switched to One Way and/or Talk-Back speakers with line matching transformers. 		
	 Zone Amplifier: 600 ohm audio input switched to separate zone amplifiers connected to One Way paging speakers with 25V/70V/100V line matching transformers; or switched to PRM- 150 line preamplifiers or connected to One Way paging speaker amplifiers. 		

If any of the zone groups require central amplification, then the choice of one or two central amplifiers is configured for each of those groups, as described in Table 4.

Table 4: 1 or 2 Central Amplifiers Group Configuration Function				
Group Function	Choices - Per Group			
1 or 2 Central Amplifiers	1. One central amplifier for both paging and background music. Paging in any zone will mute music in all zones.			
	2. Two central amplifiers, one for paging and one for background music. For One Way paging, music is muted only in the zone paged. For Talk-Back paging, music is muted in all zones.			

The speech direction function is configured on a per zone basis, as described in Table 5.

Table 5:Speech Direction Zone Configuration Function				
Function	Choices - Per Zone			
Speech	1. One Way paging.			
Direction	2. Talk-Back (optional two-way communication with hands-free reply).			

NOTE: Talk-Back may be chosen only for zones within central amplifier groups and requires the optional Talk-Back module (TBM).

The MZC-144 has Talk Battery output function for stand alone telephone, unused CO line/trunk port, and 600 ohm audio page port.

Depending upon system amplifier configuration, the amplifier functions and background music mute operation will vary, as shown in Table 6.

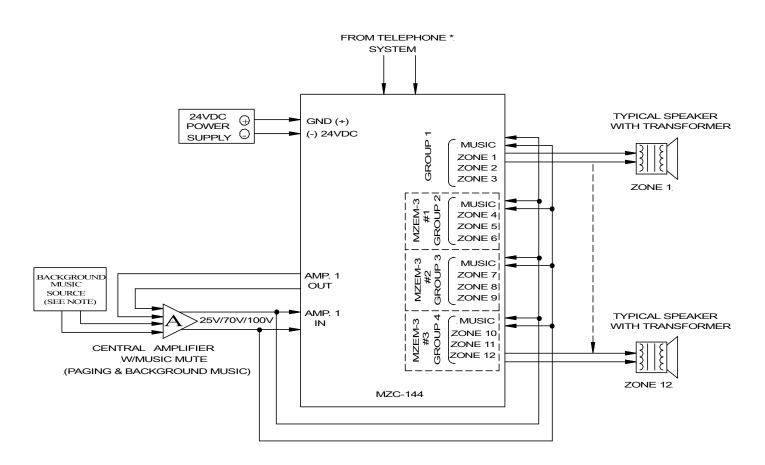
	Table 6:					
Amplifier Configurations, Functions, and Music Mute Operation						
	Amplifier Configuration	Function	Music Mute Operation			
(A)	One (1) Central Amplifier	Paging & Music	Paging any zone will mute music in all zones.			
(B)	Two (2) Central Amplifiers	One for Paging and One for Music	Music is muted only in the paged zone(s).			
(C)	Zone Amplifiers, Line Preamplifiers Speaker Amplifiers	Paging & Music	Music is muted only in the paged zone(s).			
(D)	Mixed (A) & (C) Above	Paging & Music	 Central Amplifier Zones: Paging mutes music in all zones. Zone Amplifier Zones: Music is muted only in the paged zone(s). 			
(E)	Mixed (B) & (C) Above	Paging & Music	Music is muted only in the paged zone(s).			
1. 2. 3.	 The optional Talk-Back function is centrally controlled in the MZC-144, and can be selected per zone for configurations (A) and (B), as well as the (A) and (B) segments of mixed systems (D) and (E). Mixed amplifier configurations (D) and (E) cannot be applied within the same zone group. 					
э.	 When 2 central amplifiers are used, music will be muted in all zones only when a Talk-Back Zone is accessed. 					

4. <u>APPLICATION DIAGRAMS</u>:

The following application diagrams show the seven basic system configurations of the MZC-144 and its companion MZEM-3. All of these configurations are possible with the appropriate configured switch selections. Figures 2, 3, 4, and 5 are typical configurations using central amplifiers. Figure 6 is a typical configuration using amplified speakers. Figures 7 and 8 are typical configurations using zone amplifiers.

Figure 2: One Central Amplifier which has music mute, page input and music input. (One Way Paging and/or Optional Talk-Back)

In this application, the one central amplifier for both paging and background music has music muting and separate inputs (volume controls) for paging and music. The system uses speakers with built-in line matching transformers for both One Way paging, and paging with optional Talk-Back.

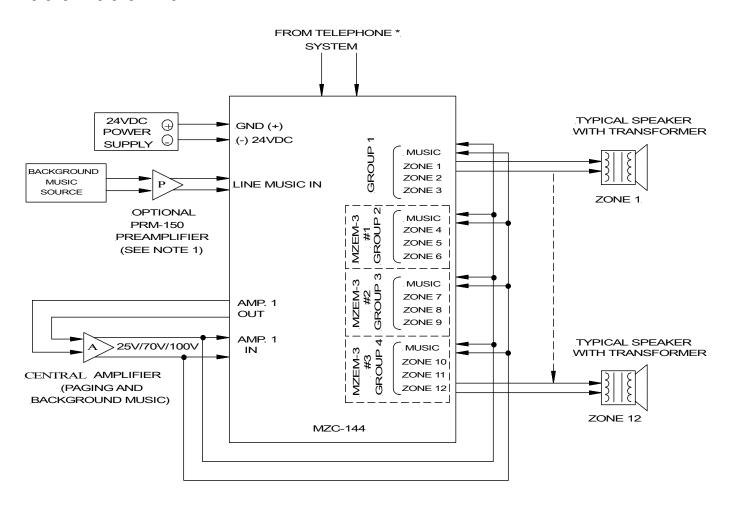


* NOTE: Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections.

- 1. If the central amplifier does not provide music mute, then the background music source is connected as shown in Figure 3.
- 2. In systems with optional Talk-Back paging, install one background music source only as shown. *DO NOT* connect background music source directly to zone group music inputs as improper operation may result.

Figure 3: One Central Amplifier which does not have music mute, and which has only one input. (One Way Paging and/or Optional Talk-Back)

In this application, the one central amplifier for both paging and background music does not provide music muting, and has only one input (one, or no volume control). The system uses speakers with built-in line matching transformers for both One Way paging, and paging with optional Talk-Back.

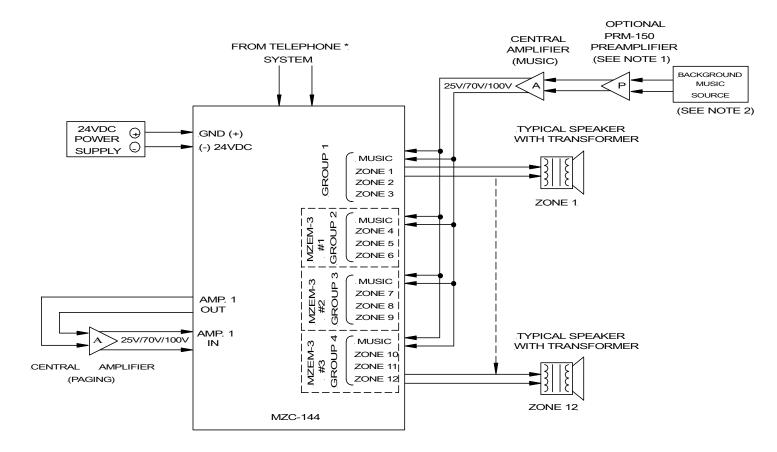


***NOTE:** Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections.

- 1. If the background music source has no volume control, then the optional PRM-150 must be connected between the background music source and the MZC-144 music input, as shown.
- 2. In systems with optional Talk-Back paging, install one background music source only as shown. **DO NOT** connect background music source directly to zone group music inputs as improper operation may result.

Figure 4: Two Central Amplifiers, one for paging and one for background music. (One Way Paging Only)

In this application, two central amplifiers are used, one for paging and one for background music. The system uses speakers with built-in line matching transformers for One Way paging.

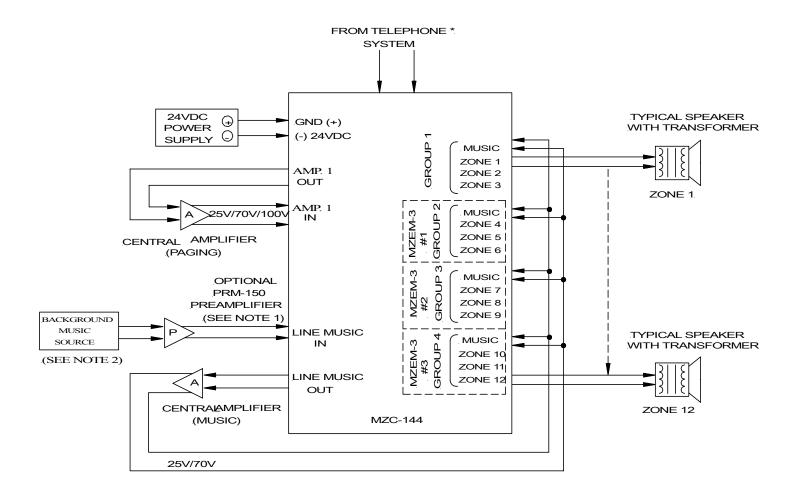


***NOTE:** Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections.

- 1. If both the music central amplifier and the background music source have no volume controls, then a PRM-150 must be connected between the background music source output and the music central amplifiers input.
- 2. Different music sources, each with its associated music amplifier (and optional PRM-150 as required), can be used for different zone groups.

Figure 5: Two Central Amplifiers, one for paging and one for background music. (One Way and/or Optional Talk-Back Paging)

In this application, two central amplifiers are used, one for paging and one for background music. The system uses speakers with built-in line matching transformers for both One Way paging, and paging with optional Talk-Back.

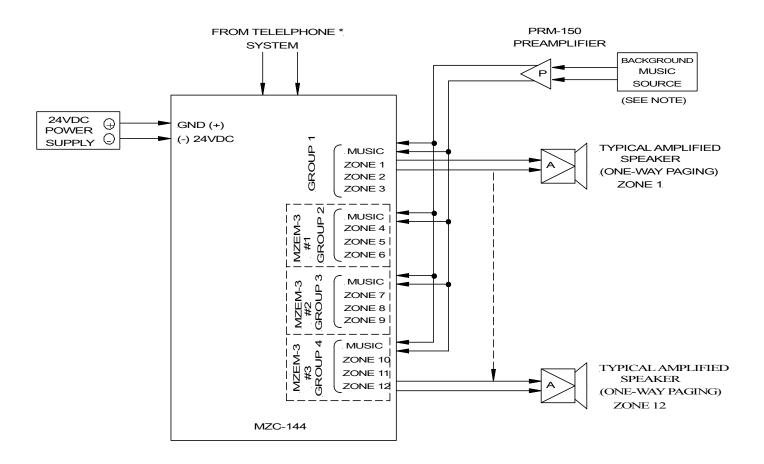


***NOTE:** Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections.

- 1. If both the music central amplifier and the background music source have no volume controls, then a PRM-150 must be connected between the background music source output and the line music input.
- 2. In systems with optional Talk-Back paging, install one background music source only as shown. **DO NOT** connect background music source directly to zone group music inputs as improper operation may result.

Figure 6: Amplified Speakers (One Way Paging)

In this application, amplified speakers are used for One Way paging and for background music. A PRM-150 preamplifier is used with the background music source.

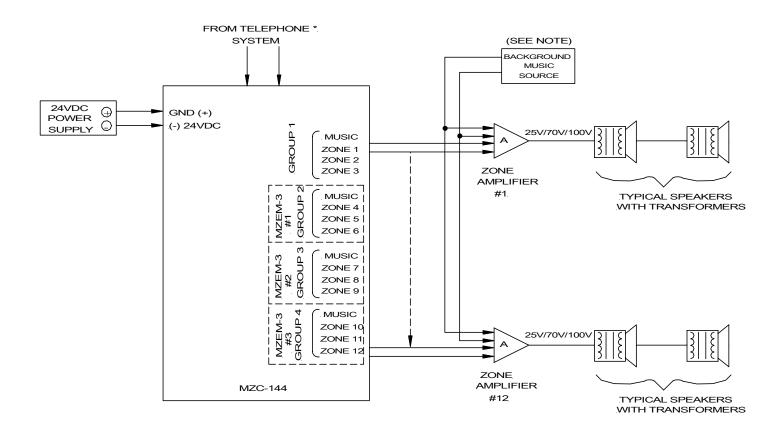


***NOTE:** Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections.

NOTES: One music source can be used for all zone groups, or different music sources can be used for different zone groups.

Figure 7: Zone Amplifiers which have music mute, page inputs and music inputs. (One Way Paging)

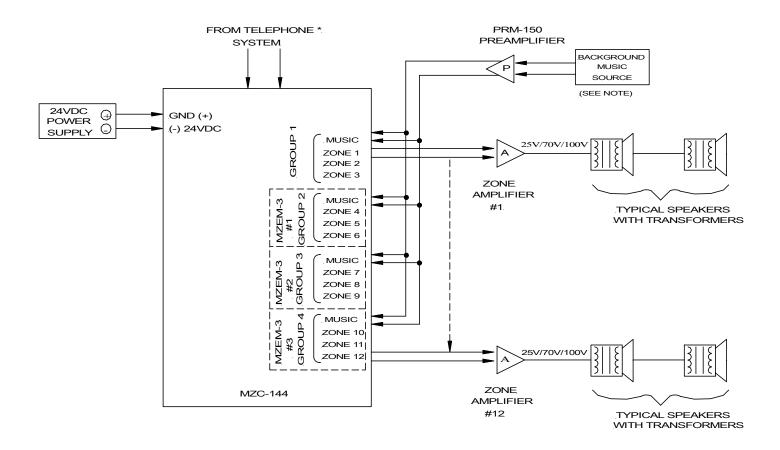
In this application, the zone amplifiers for both One Way paging and background music have music muting, and separate inputs (volume controls) for paging and music. The system uses speakers with line matching transformers.



***NOTE:** Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections. **NOTES:** One music source may be used for all zones, or different music sources can be used for different zones.

Figure 8: Zone Amplifiers which do not have music mute, and which have one input. (One Way Paging)

In this application, the zone amplifiers for both One Way paging and background music do not provide music muting, and have only one input (with or without volume control). The system uses speakers with line matching transformers.



*NOTE: Use Tip CO and Ring CO for stand alone telephone, unused CO line/trunk port, or 600 ohm audio page port connections.

- 1. One music source can be used for all zone groups, or different music sources can be used for different zone groups.
- 2. Existing system renovations and expansions often require different amplifier configurations in different zone groups. For example, an existing central amplifier paging system may be zoned, and then expanded by adding amplified speakers or zone amplifiers. With the appropriate configured switch selections, the following are some examples of mixed system possibilities. Figure 2 and Figure 6; Figure 2 and Figure 7; Figure 2 and Figure 8; Figure 3 and Figure 6; Figure 4 and Figure 6; Figure 4 and Figure 7; Figure 5 and Figure 7; Figure 5 and Figure 8.

CAUTION: In mixed systems, the different amplifier configurations must be installed in different zone groups. It is not possible to mix different amplifier configurations within the same zone group.

Maximum amplifier and speaker capacity for each zone group and the total system is shown in Table 7.

Table 7:Maximum Amplifier and Speaker Capability					
	Maximum Capacity				
Amplifier Configuration	Total System	Each Zone Group			
Central Amplifier(s)	300W @ 100V 250W @ 70V 100W @ 25V	100W @ 100V 70W @ 70V 25W @ 25V (See Note 1)			
Zone Amplifiers or Speaker-Amplifiers	150 Amplifier Inputs	75 Amplifier Inputs (See Note 2)			

NOTES:

- The Zone Control can switch an audio input from a central amplifier of up to 300W @ 100V, 250W @ 70V, or 100W @ 25V. This <u>TOTAL SYSTEM</u> audio input can be distributed among the zone groups provided no single zone group exceeds:
 - (A) 100W @ 100V, leaving 200W for the remaining system groups.

- or -

(B) 70W @ 70V, leaving 180W for the remaining system groups.

- or -

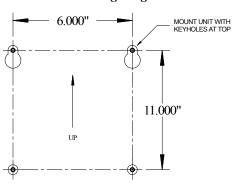
(C) 25W @ 25V, leaving 75W for the remaining groups.

2. The Zone Control can switch its preamplifier audio output to the 600 ohm inputs of up to 150 zone amplifiers or speakeramplifiers. This <u>TOTAL SYSTEM</u> audio output can be distributed among the zone groups provided no <u>SINGLE ZONE</u> exceeds 25 amplifier inputs, which would leave 125 amplifier inputs for the remaining zones.

5. <u>MOUNTING INSTRUCTIONS:</u>

The MZC-144 is designed for indoor surface wall mounting. Remove the MZC-144 cover from the base (containing the PC Board assembly) by removing the (1) screw on the front of the unit. Two keyholes and two circular holes are provided in the base for easy installation. A diagram for mounting screw hole locations is given in Figure 9. Remote units are to be mounted approximately 1/4 inch from the right side of the last unit installed. Recommended screw sizes are #6, #8, or #10 screws. Be sure to use mounting hardware suitable for mounting surface.

Figure 9: Mounting Diagram



6. <u>SPECIFICATIONS:</u>

Table 8:				
Supply Voltage (Nominal)	-24VDC			
Supply Voltage Range	-21.6VDC to -26.4VDC			
Alert Tone Frequency	1100Hz +/-10%			
Alert Tone Duration	500m Sec. +/-10%			
Alert Tone Level	-4dBM +/-3dBM			
Tip and Ring Input Level	-15dBM (0.1Vrms) to +10dBM (2.4Vrms)			
Music Input Level	-15dBM (0.1Vrms) to +10dBM (2.4Vrms)			
Tip and Ring Input Impedance	600 Ohms			
Music Input Impedance	600 Ohms			
Max. Output Level to Amplifier 1	0dBM (0.78Vrms)			
Output Impedance to Amplifier 1	4 Ohms			
Max. Input Level from Amplifier 1	100W @ 25V, 250W @ 70V or 300W @ 100V			
	(Central Amplifier Output) See Note 4			
Audio Output Level (Max Per Zone)				
- Speaker - Amplifier Selected	0dBM (0.78Vrms), 600 Ohms			
Audio Output Level (Max Per Zone Group)	25W @ 25V, 70W @ 70V or 100W @ 100V			
- Central-Amplifier Selected	(Central Amp. Output) See Note 4			
Operating Temperature Range	0 to 49 Degrees C			
Operating Humidity Range	0 to 85% RH			
Off-Hook Detection Sensitivity	1850 Ohms DC Resistance (Max.)			

	* Quantity of MZEM-3 Modules in System			in System
	0	1	2	3
Supply Current (Idle-BGM)	75mA	95mA	115mA	135mA
Supply Current (Nominal-1 Zone Page)	155mA	170mA	210mA	230mA
Supply Current (Maximum-All Call)	220mA	325mA	430mA	535mA

* Optional Talk-Back adds 25mA

7. ZONE ACCESS AND DIALING CODES FOR MASTER:

Table 9:				
Zone Control Access (See Note 1)	Press CO Line Button, Or Dial Number Assigned To Page			
Page Zone 1	Dial 001			
Page Zone 2	Dial 002			
Page Zone 3	Dial 003			
Page Zone 4	Dial 004			
Page Zone 5	Dial 005			
Page Zone 6	Dial 006			
Page Zone 7	Dial 007			
Page Zone 8	Dial 008			
Page Zone 9	Dial 009			
Page Zone 10	Dial 010			
Page Zone 11	Dial 011			
Page Zone 12	Dial 012			
Page Zone Group 1 (Zones 1, 2 & 3)	Dial 201			
Page Zone Group 2 (Zones 4, 5 & 6)	Dial 202			
Page Zone Group 3 (Zones 7, 8 & 9)	Dial 203			
Page Zone Group 4 (Zones 10, 11 & 12)	Dial 204			
Page All Zones (All Call)	Dial 000			

8. <u>ZONE ACCESS AND DIALING CODES FOR REMOTE:</u>

Table 10:					
Zone Control Access (See Note 1)	Press CO Line Button, Or Dial Number Assigned To Page				
Remote 1					
Page Zone 13-24	Dial 013-024				
Page Zone Group 5 (Zones 13, 14 & 15)	Dial 205				
Page Zone Group 6 (Zones 16, 17 & 18)	Dial 206				
Page Zone Group 7 (Zones 19, 20 & 21)	Dial 207				
Page Zone Group 8 (Zones 22, 23 & 24)	Dial 208				
Remote 2					
Page Zone 25-36	Dial 025-036				
Page Zone Group 9 (Zones 25, 26 & 27)	Dial 209				
Page Zone Group 10 (Zones 28, 29 & 30)	Dial 210				
Page Zone Group 11 (Zones 31, 32 & 33)	Dial 211				
Page Zone Group 12 (Zones 34, 35 & 36)	Dial 212				
Remote 11					
Page Zone 133-144	Dial 133-144				
Page Zone Group 45 (Zones 133, 134 &135)	Dial 245				
Page Zone Group 46 (Zones 136, 137 & 138)	Dial 246				
Page Zone Group 47 (Zones 139, 140 & 141)	Dial 247				
Page Zone Group 48 (Zones 142, 143 & 144)	Dial 248				

NOTES:

- 1. All Call is always 000
- 2. Logical Zone Group programming is explained later under "Programming Instructions" on page 23.
- 3. Press CO line button: For EKSU & KSU (1A2) key telephone systems.
- Dial number assigned: For PBX telephone systems.
 4. The MZC-144 can switch a <u>TOTAL SYSTEM</u> central amplifier audio input of up to 300W @ 100V, 250W @ 70V or 100W @ 25V. The <u>TOTAL SYSTEM</u> audio input can be distributed among the zone groups, provided no single zone group exceeds: (A) 100W @ 100V, leaving 200W for the remaining system groups.

(B) 70W @ 70V, leaving 180W for the remaining system groups.

(C) 25W @ 25V, leaving 75W for the remaining system groups.

9. MODEL MZC-RM 3 ZONE RELAY MODULE:

The MZC-RM is a plug-in relay module designed to allow relay control through the MZC-144. The MZC-RM provides a fixed zone group consisting of three relay outputs, two Form C and one selectable (normally open or normally closed) dry contact. Each of the relay outputs is capable of providing a dry contact, rated at 24VDC at 500mA (resistive load). *This device is not intended for high power switching applications. This device is also not intended for security applications*. The MZC-RM is capable of two different modes of operation, non-latching or latching.

The MZC-RM can be plugged into the MZC-144 at three positions. Figure 10 shows the MZC-144 PC Board, and the 3 positions where the MZC-RM expansion module may be inserted. Table 11A and 11B shows the single zone dial access codes for activation of the MZC-144 and the three positions available to the MZC-RM.

The MZC-144 activates one relay at a time on the MZC-RM. This is accomplished through the use of the single zone dialing access codes set forth in Table 11A and 11B. Through the use of logical zone groups, the MZC-144 can activate multiple relays during activation of the MZC-RM. Logical zone groups, which can be up to five entries, are defined by the user. When Logical Zone Groups are programmed for use by the MZC-RM, only single zone access codes may be used. Please note the use of fixed zone group paging and/or an All Call page on the MZC-144 will not be acknowledged by the MZC-RM.

Figure 10: MZC-144 Board and MZC-RM Positions

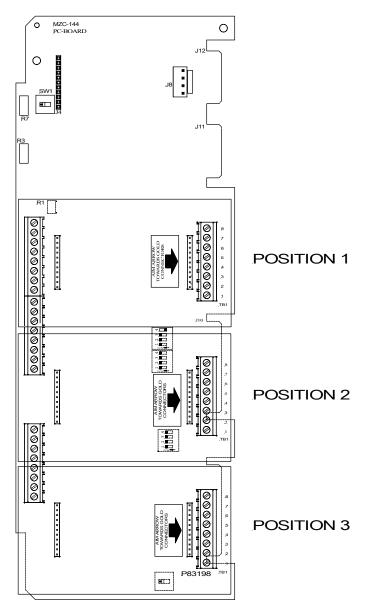


	Table 11A: Single Zone Dial Access Codes						
	Master	Remote 1	Remote 2	Remote 3	Remote 4	Remote 5	
Main*	1/001	13/013	25/025	37/037	49/049	61/061	
Board	2/002	14/014	26/026	38/038	50/050	62/062	
	3/003	15/015	27/027	39/039	51/051	63/063	
	4/004	16/016	28/028	40/040	52/052	64/064	
Position 1	5/005	17/017	29/029	41/041	53/053	65/065	
	6/006	18/018	30/030	42/042	54/054	66/066	
	7/007	19/019	31/031	43/043	55/055	67/067	
Position 2	8/008	20/020	32/032	44/044	56/056	68/068	
	9/009	21/021	33/033	45/045	57/057	69/069	
	10/010	22/022	34/034	46/046	58/058	70/070	
Position 3	11/011	23/023	35/035	47/047	59/059	71/071	
	12/012	24/024	36/036	48/048	60/060	72/072	

Table 11B: Single Zone Dial Access Codes (Continued)						
	Remote 6	Remote 7	Remote 8	Remote 9	Remote 10	Remote 11
Main* Board	73/073	85/085	97/097	109/109	121/121	133/133
	74/074	86/086	98/098	110/110	122/122	134/134
	75/075	87/087	99/099	111/111	123/123	135/135
	76/076	88/088	100/100	112/112	124/124	136/136
Position 1	77/077	89/089	101/101	113/113	125/125	137/137
	78/078	90/090	102/102	114/114	126/126	138/138
	79/079	91/091	103/103	115/115	127/127	139/139
Position 2	80/080	92/092	104/104	116/116	128/128	140/140
	81/081	93/093	105/105	117/117	129/129	141/141
	82/082	94/094	106/106	118/118	130/130	142/142
Position 3	83/083	95/095	107/107	119/119	131/131	143/143
	84/084	96/096	108/108	120/120	132/132	144/144

Legend: Zones/Access Code

Example: 7/007 =Zone 7, dial access code 007

*The MZC-RM does not use these single zone dial access codes.

10. INSTALLATION INSTRUCTIONS:

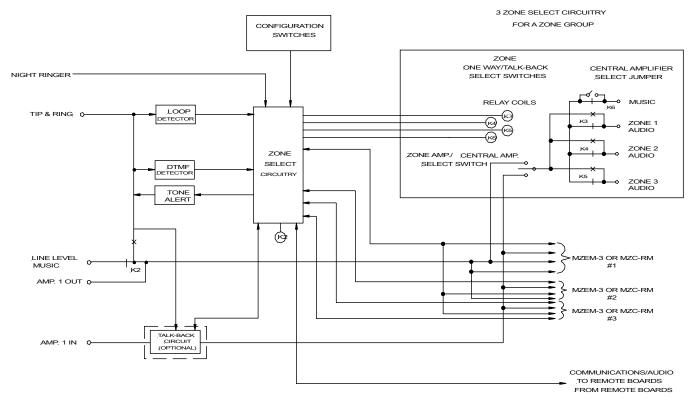
- 1. Remove MZC-144 cover.
- 2. Disconnect power.
- 3. Select the position which the MZC-RM is to be plugged into from Table 11A and 11B (e.g.: if you want the MZC-RM to be zones 7, 8 or 9 on the MZC-144, the MZC-RM would be installed in Position 2 on the MZC-144 board).
- 4. Plug MZC-RM into its selected position (See Figure 10).

CAUTION: Plugging the MZC-RM in backwards can result in improper operation and failure of the unit.

- 5. Set 2 configuration jumpers in accordance with Figure 15.
- 6. Connect relay outputs as required (See Figure 15).
- 7. Re-apply power to unit.
- 8. Re-install MZC-144 cover.

CAUTION: These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC).

Figure 11: Simplified Single Line Block Diagram



11. MASTER WIRING INSTRUCTIONS (SEE FIGURE 12):

- 1. Make sure 24VDC power supply is disconnected from the 115VAC power source.
- 2. Connect tip and ring from:
 - A. Stand along telephone, or
 - B. Telephone system's unused CO line/trunk port, or
 - C. Telephone system's 600 ohm, audio page port (See Figure 13)
- 3. Connect night ringer if used (see Figure 14).
- 4. Connect the background music source to TB2, terminals 3 and 4, on the MZC-144.
- 5. Connect the 24VDC power supply to the (-)24V and GND(+) terminals on TB3, terminals 6 and 5 respectively.
- 6. Connect the zone amplifier, speaker amplifiers, or speakers with transformers to the audio pair for zones 1 thru 12 on TB1 of the MZC- 144 and TB1 of each MZEM-3 module as required.
- 7. If one central amplifier is used for paging and background music:
 - A. Connect the input of central amplifier to AMP1 OUT, terminals 5 and 6 of TB2 on the MZC-144. Connect the output of central amplifier to AMP1 IN, terminals 7 and 8 of TB2 on the MZC-144.
 - B. Connect the output of central amplifier to MUSIC, terminals 1 and 2 of TB1 on MZC-144 and TB1 on MZEM-3 modules, as required.
- If separate central amplifiers are used, one for paging and one or more for background music: A. Connect paging amplifier as described in 7A, above.
 B. Connect output of background music amplifier(s) as described in 7B, above.
- B. Connect output of background music amplifier(s) as described in 7B, above.
- 9. Connect MZC-RM relay outputs as required, see Figure 15.
- 10. Connect the 24VDC power supply to the 115VAC source. When the MZC-144 is used in a Master/Remote configuration make sure that the remote units are powered up prior to or at the same time as the master.

NOTE:

When only one central amplifier is used, background music will be muted in all zones when a page is in progress. When separate central amplifiers are used, background music will be muted in only the paged zone.

12. <u>REMOTE WIRING INSTRUCTIONS (SEE FIGURE 12):</u>

- 1. Make sure 24VDC power supply is disconnected from the 115VAC power source.
- 2. With all of the covers off, connect the MZC-CAB between either J11 to J11 or J12 to J12 from the previous unit to the next unit. This creates a daisy chain of the units. If there are more than five remote units a MZC-BOOSTER is required between the 5th remote unit and the 6th remote unit. See the MZC-BOOSTER instruction sheet (P84034) for wiring instructions.
- 3. Connect the 24VDC power supply to the (-)24V and GND(+) terminals on TB3, terminals 6 and 5 respectively.

NOTE:

Wire in star configuration. **DO NOT** daisy chain the power connections from one unit to the next as improper operation may result.

- Connect the zone amplifier, speaker amplifiers, or speakers with transformers to the audio pair for zones 1 thru 12 on TB1 4. of the MZC-144 and TB1 of each MZEM-3 module as required.
- If one central amplifier is used for paging and background music, connect the output of central amplifier to MUSIC, 5. terminals 1 and 2 of TB1 on MZC-144 and TB1 on MZEM-3 modules, as required.
- If separate central amplifiers are used, one for paging and one or more for background music, connect output of 6. background music amplifier(s) as described in note 5, above.
- Connect the 24VDC power supply to the 115VAC source. When the MZC-144 is used in a Master/Remote configuration 7. make sure that the remote units are powered up prior to or at the same time as the master.

When using multiple power supplies, connect the positive terminals together at the power supplies.

NOTE:

When only one central amplifier is used, background music will be muted in all zones when a page is in progress. When separate central amplifiers are used, background music will be muted in only the paged zone.

13. **DISCONNECTING:**

An MZC-144 page will disconnect upon loss of loop current.

CONFIGURATION SETTING INSTRUCTIONS (SEE FIGURE 12 OR INSIDE OF MZC-144 COVER): 14.

- Verify that the Switch is in the "Talk Battery" position when connected to a telephone systems, unused CO/trunk port, 600 ohm audio page port, or directly to a telephone. Set the Talk-Back Master selector switch, SW2. 1
 - 2. A. Enabled
 - B. Defeated
 - Set the "Zone Amplifier/Central Amplifier" select switches for each group as required. See switch, SW3. 3. A. Central Amplifier
 - B. Zone Amplifier
 - 4. Set the Board Address on selector switch SW4 per the table below.

Table 12: SW4 (1 = ON, 0 = OFF) Board Address					
Position 1234	Effect	Zones			
* 1111	Master	001-012			
0111	Remote1	013-024			
1011	Remote2	025-036			
0011	Remote3	037-048			
1101	Remote4	049-060			
0101	Remote5	061-072			
1001	Remote6	073-084			
0001	Remote7	085-096			
1110	Remote8	097-108			
0110	Remote9	109-120			
1010	Remote10	121-132			
0010	Remote11	133-144			
1100	Not Used	N\A			
0100	Not Used	N\A			
1000	Not Used	N\A			
0000	Not Used	N\A			

5. Set the Max Page Length, if necessary per the table below.

Table 13: SW6 ($1 = ON$, $\theta = OFF$)				
Position	Effect			
* 1 ON	Zone 1, One Way			
1 OFF	Zone 1, Talk-Back			
* 2 ON	Zone 2, One Way			
2 OFF	Zone 2, Talk-Back			
* 3 ON	Zone 3, One Way			
3 OFF	Zone 3, Talk-Back			
4 ON	Two Central Amps			
* 4 OFF	One Central Amp			

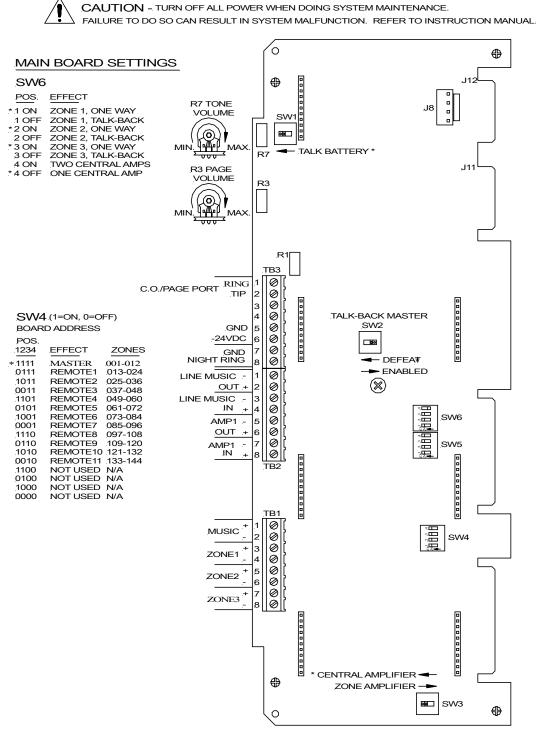
* Denotes factory settings.

NOTE: If the optional Talk-Back Module (TBM) is not enabled, positions 1, 2, and 3 are ignored.

Set the "Central Amplifier" select switch for each group, as required. See switch, SW6. If One Central Amplifier is used for both paging and background music, then the switch should be in the One Central Amplifier. If two or more central amplifiers are used, one for paging and one or more for background music, then the switch should be in the Two Central Amplifier position. If central amplifiers are not used, then the switch should be in the Two Central Amplifier position.

CAUTION: These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC).

Figure 12: Installation, Programming and Volume Adjustment Diagram



* = SHIPPED CONFIGURATION

15. <u>AUDIO PAGE PORT INSTALLATION INSTRUCTIONS:</u>

The MZC-144 can be connected to an audio page port only if the audio page port provides:

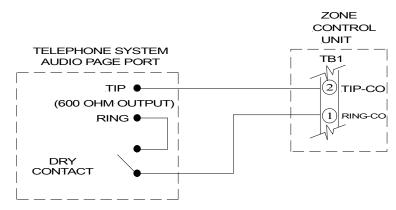
(A) A 600 ohm, low power page output, capable of passing DC loop current.

(B) Transmission of DTMF touch tone.

(C) A dry contact that is normally open, closes when paging and reopens when the page is completed.

If these conditions are met, then connect Tip and Ring as shown in Figure 13.

Figure 13: Connecting to a 600 Ohm Audio Page Port



16. NIGHT RINGER INSTALLATION INSTRUCTIONS:

The Night Ringer works from a dry contact closure through which no more than 10mA of current will be drawn. The dry contact closure will result in the Night Ringer function, an All Call will occur and the alert tone sent out. The alert tone will remain until the dry contact closure opens. This feature will follow the dry contact closure presented between the Night Ring and GND (TB3 Pos. 7 and 8). This feature has a lower priority than paging. Therefore if a page comes in while the Night Ringer is active, the page will take priority.

Figure 14: Night Ringer Installation Instructions

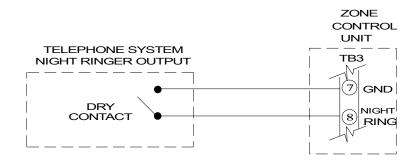
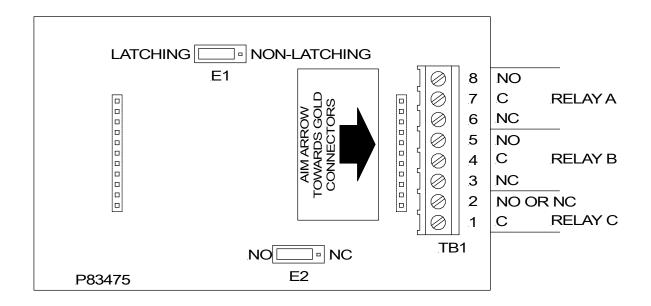


Figure 15: MZC-RM Latching and Non-Latching Installation and Configuration Instructions



E1 Shorting Plug Between Pins

- * 1-2: Latching
 - 2-3: Non-Latching

E2 Shorting Plug Between Pins

- * 1-2: No Contact
 - 2-3: NC Contact
- * Denotes shipped configuration

17. PROGRAMMING INSTRUCTIONS:

The MZC-144 supports the following commands.

- 1. Program a Logical Zone Group.
- 2. Delete a Logical Zone Group.
- 3. Delete all Logical Zone Groups.

Programming a Logical Zone Group:

- 1. Access the MCZ-144.
- 2. Dial a "#11*".
- 3. Dial the Logical Zone Group to be programmed (301-325).
- 4. Dial a "*".
- 5. Dial up to (5) Zones, Fixed Zones or any combination of them. With an "*" separating each of the Zones or Fixed Zones.
- 6. The final step in the programming process is to enter a "#" as an end signal to the MZC-144 and the programming will proceed.
- 7. If the programming is successful, you will hear a long beep then you can program another Logical Zone by repeating steps two through seven.
- 8. If the programming is not successful, there will be three short beeps and the MZC-144 will disconnect.

The following is an example of how to program a Logical Zone Group:

#11*301*001*203*005# - This programs Logical Zone Group 301 with zones 001, 005 and Fixed Zone Group 203.

Deleting a Logical Zone Group:

- 1. Access the MZC-144.
- 2. Dial a "12*".
- 3. Dial the Logical Zone Group to be deleted (301-325).
- 4. Dial a "#".
- 5. If the deletion is successful you will hear a long beep then you can delete another Logical Zone by repeating steps 2 through 5. If the deletion is not successful there will be three short beeps and the MZC-144 will disconnect.

The following is an example of how to delete a Logical Zone Group:

#12*301# - This deletes Logical Zone Group 301.

Deleting <u>All</u> Logical Zone Groups:

CAUTION: This will remove all programmed logical zone groups. At any time during the dialing sequence, the user may hangup and the command will be canceled.

- 1. Access the MZC-144.
- 2. Dial #13*999*999*999#

18. **OPERATING INSTRUCTIONS:**

- 1. Pick up the telephone handset and press the CO line button (EKSU, KSU), or number assigned to paging (PBX) to access the port assigned to paging. (Port to which the MZC-144 has been connected).
- 2. Wait for access tone.
- 3. To initiate:

A. Zone Page, dial "001" thru "012" to select zones 1 thru 12, respectively.

B. Fixed Zone Group Page, dial "201" thru "204" to select zone groups 1 thru 4, respectively.

C. Logical Zone Group Page, dial "301" thru "325" to select logical zone groups 1 thru 25, respectively.

D. All-Call Page, dial "000".

- 4. When paging, background music will be muted. At the conclusion of the page (i.e., phone "hangs-up"), the background music will automatically be restored.
- 5. When any page is initiated, an alert tone is heard both in the telephone receiver, and in all selected zones. Adjust the tone volume control in the MZC-144 to the desired level. Note the minimum setting turns the tone off.
- 6. If Talk-Back is used, adjust the Talk-Back volume control in the MZC-144 to the desired level.
- 7. At the conclusion of the page, simply hang-up the telephone handset; or press the hook switch before dialing the next number.
- NOTE: All call or paging zone group only operates with audio output being selected on the MZC-144 or MZEM3.

If an MZC-RM is utilized, all call or paging zone groups will not work. This module is for relays only.

19. TROUBLE SHOOTING:

Condition		Check			
1.	Zone page or all call page cannot be accessed	 Telephone system must have touch tone (DTMF) dialing. Check presence and polarity of voltage on (-) 24VDC and GND (+) terminals on TB4. Check for the access tone at the beginning of a page by using a telephone connected between TB3 1 and TB3 2. 			
2.	No background music.	 Verify unit has released from last page. Check background music source, and adjust its volume control, as desired. Check presence of line level music input (if used) at terminals on TB1 of MZC- 144 group. Check for presence of music at terminals on TB2 of MZC-144 and TB2 of MZEM-3 modules. If necessary also at speaker amplifier, or central or zone amplifier inputs. 			
3.	No sound or low page volume.	 Check presence and level of audio input at Tip and Ring terminals on TB1 of the MZC-144 and if necessary also at the CO Port. Check presence and level of audio at the zone AUDIO output terminals on TB2 of the MZC-144 and TB1 of the MZEM-3 modules. If necessary also at speaker amplifier inputs, and central or zone amplifier inputs. 			
4.	The page alert tone is too high or too low.	1. Set the page alert Tone Volume Control in the MZC-144 to the desired level.			
5.	Talk-Back does not function properly.	 Check for proper configuration of the zone's One Way/Talk-Back Select Switch. Adjust the Talk-Back Volume Control in the MZC-144. 			
6.	Relay module not providing contact closure.	 Telephone system must have touch tone (DTMF) dialing. Check presence and polarity of voltage on (-) 24VDC and GND (+) terminals on TB4. If the unit is in the Talk Battery configuration, check for the access tone at the beginning of a page by using a telephone connected between TB3 1 and TB3 2. Check background music source, and adjust its volume control, as desired. Check for proper configuration of the MZC-RM feature selectors. 			

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