Mackenzie Laboratories, Inc.

Solid State, User Programmable, Multitrack Playback System

DMR-PD-008
Instruction Manual

Part # 99-20-021
01/09/98, Rev 2.

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Warnings

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Caution: To reduce the risk of electric shock, do not remove the product cover, or back. No user-serviceable parts inside. Refer servicing to qualified service personnel.

This symbol is intended to alert the user of the presence of non insulated "dangerous voltage" within the product enclosure that may constitute a risk of electric shock to persons.

The DMR-PD-008 system is configured for 24VDC operation. There should be no dangerous voltages applied on the system.

Be certain to read all instructions prior to attempting wiring and / or operation of the DMR-PD-008 system. Failure to do so could damage the system.

Unpacking

Each DMR-PD-008 system contains the following list of parts. Please identify each part and notify the factory should any discrepancy exist.

Qty	Part description	Part number
1 -	DMR-PD-008 Digital Audio / Display System	90-63-010
1 -	5 pin, 5mm, Euro style connector (installed on unit)	32-01-207
1-	2 pin, 5mm, Euro style connector (installed on unit, optional)	32-01-208
1-	DMR-PD-008 Instruction manual	99-20-021

OPTIONAL PARTS

Qty	Part description	Part number
1 -	PS-8, 24VDC @ 500mA power supply	40-01-018
1 -	RC-3, 50 pin ribbon to screw terminal, PCB	90-56-060
1 -	Recording key, only with FLASH based systems	

EXPANSION PARTS
All expansion parts shipped with the main system's initial order will be installed by the factory. The user will install any expansion parts if ordered after the main system has shipped.

Qty	Part description	Part number
1-	Audio channel board	90-56-041
	w/ 2 pin, 5mm, Euro style connector (installed on board)	32-01-208
1-	Memory expansion board	90-56-042
1-	1 megabit EPROM	17-02-176
1-	2 megabit EPROM	17-02-196
1-	4 megabit EPROM	17-02-205
1-	1 megabit FLASH EPROM	17-03-194
1-	4 megabit FLASH EPROM	17-03-225

If any shipping damage is apparent, please inform your shipping agent immediately. Mackenzie Laboratories, Inc. cannot warrant damage incurred through incorrect shipping or handling.

Connections

CONNECTOR DESCRIPTION, WIRING
There are six connector types used on the DMR-PD-008. Each is described below.

50 Pin ribbon connector, system control

This plugable connector is the primary I/O port for system control and status. This type of connector is industry standard and is typically wired using 26 gauge solid wire. An optional RC-3 user interface mates to this connector and "breaks out" each wire to a screw terminal.

5 Position, Euro style connector, base power and base audio

The 5 position connector located on the lower, right side of the DMR-PD-008 is used for the base unit's power and audio connections. This is a plugable, polarized connector which can be used with almost any type of wire, from 26 to 14 gauge wire. The connection is loosened by turning the screw counter-clockwise. After the wire is inserted, tighten the connection by turning the screw clockwise. Do not attempt to tighten each position too much as this can damage the connector housing.

2 Position, Euro style connector, expansion audio

The 2 position connectors located on the lower side of the DMR-PD-008 is used for the base unit's expansion audio connections. These are plugable, polarized connectors which can be used with almost any type of wire, from 26 to 14 gauge wire. The connection is loosened by turning the screw counter-clockwise. After the wire is inserted, tighten the connection by turning the screw clockwise. Do not attempt to tighten each position too much as this can damage the connector housing.

RJ11-6 modular jack, serial interface

The six position modular jack is used for the serial communications link on the DMR-PD-008 unit. Make sure that only six pin modular connectors are used to interface with the unit, as four and two pin connectors are smaller and can orient themselves wrong in the jack housing. Six pin modular wire is also required for proper interfacing.

RCA jack, line level audio input

The RCA jack is used as the line level audio input for DMR-PD-008 units which incorporate the field recordability function. This interfaces with any standard RCA cable.

3.5mm mini-jack, microphone input

The mini-jack is used as the microphone level audio input for DMR-PD-008 units which incorporate the field recordability function. This interfaces with any standard, mono mini-jack cable.

Connections

CONNECTOR DESCRIPTION, SYSTEM CONTROL, 50 PIN RIBBON

System control can be obtained using contact closure through this connector. System status is provided by the DMR-PD-008, via relay contacts, through this connector. An external control system could consist of simple switches and LEDs or could be a complex programmable logic controller.

Each signal is described below, with it's position number as shown in Drawing # E1280.

INPUTS

All of the input control signals are configured for ***active low*** initiation. This means that when an input is not active, (i.e.: it is not connected) it will sit at 5 VDC. To activate any particular input the 5 VDC must be grounded through an external contact such as a switch or a relay. (An open collector driver will also work) When the input is grounded, the voltage on the pin will be 0 VDC, the system will see and read the function. For a detailed view of the input circuitry, see Drawing # E1387.

System Ground, Position 26

Start Message Command, Positions 9 through 24

These inputs provide the start commands for each of the possible 16 messages. Activating these in conjunction with the Channel select inputs or the PLI input will effectively change the default setting of the audio channel and / or message priority. See the description of these "special" inputs below for more information on how these work.

Channel Select, Positions 2, 3, 4, 5

Each message, when it is recorded, is given a default audio channel. This means that if the input is activated using just a Start message command, as described above, the audio will play through it's default audio channel. Should any particular audio message need to be routed differently, these Channel select inputs can be used.

Activating, and maintaining, one of these inputs prior to a Start message command will route the selected audio message through the selected audio channel, instead of it's default audio channel. If more than one Channel Select is active prior to the Start Message activation, the message will output to all the channels selected, simultaneously.

Stop, Position 6

The Stop command will halt any currently playing message on all of the audio channels and will clear the queue for each channel as well. Typically this is used to reset the system from an alarm condition.

Connections

CONNECTOR DESCRIPTION, SYSTEM CONTROL, 50 PIN RIBBON

INPUTS, CONTINUED

PLI, Position 7

Each message, when it is recorded, is given a default priority of “1”. This priority can be changed using the serial communications port if necessary. The higher the priority, the faster it will be played, should there be multiple messages in the queue. Should there be a situation where any particular message needs to be played immediately, the PLI input will give them that ability.

When the PLI is activated, and maintained, prior to the Start Message command, the message played will be given a priority of “9” . A priority “9” message will stop any currently playing messages (unless the playing message is also a priority “9”) and will play immediately. After this message is completed all of the messages in the queue which were bypassed will start playing again.

Record, Position 8

If the system has the on-site recording ability, this input is used to signify when to actually start and stop the recording process. A more detailed description of the usage of this input can be viewed in the **On-site Recording** section.

CONNECTOR DESCRIPTION, AUDIO

INPUTS

RCA jack, line level audio input

The RCA jack is used as the line level audio input for DMR-PD-008 units which incorporate the field recordability function. This interfaces with any standard RCA cable.

3.5mm mini-jack, microphone input

The mini-jack is used as the microphone level audio input for DMR-PD-008 units which incorporate the field recordability function. This interfaces with any standard, mono mini-jack cable.

Connections

CONNECTOR DESCRIPTION, SYSTEM CONTROL, 50 PIN RIBBON

OUTPUTS

5 Position, Euro style connector, base power and base audio

The 5 position connector located on the lower, right side of the DMR-PD-008 is used for the base unit's power and audio connections. This is a plugable, polarized connector which can be used with almost any type of wire, from 26 to 14 gauge wire. The connection is loosened by turning the screw counter-clockwise. After the wire is inserted, tighten the connection by turning the screw clockwise. Do not attempt to tighten each position too much as this can damage the connector housing.

2 Position, Euro style connector, expansion audio

The 2 position connectors located on the lower side of the DMR-PD-008 is used for the base unit's expansion audio connections. These are plugable, polarized connectors which can be used with almost any type of wire, from 26 to 14 gauge wire. The connection is loosened by turning the screw counter-clockwise. After the wire is inserted, tighten the connection by turning the screw clockwise. Do not attempt to tighten each position too much as this can damage the connector housing.

CONNECTOR DESCRIPTION, SERIAL CONTROL

OUTPUTS

RJ11-6 modular jack, serial interface

The six position modular jack is used for the serial communications link on the DMR-PD-008 unit. Make sure that only six pin modular connectors are used to interface with the unit, as four and two pin connectors are smaller and can orient themselves wrong in the jack housing. Six pin modular wire is also required for proper interfacing.

Operations
Initial power up

With power off, the power lines should be connected to the plugable terminal strip as shown in the Connections Section of this document. The screw terminals should be tightened firmly, but exerting too much force could damage the connector. There is an Earth ground connection which must be connected to the ***Alarm Panel's Earth Ground***. This connection provides the DMR-PD-008 with transient suppression for all of the control inputs. Without this, the control inputs could be damaged if a large enough voltage spike is encountered on one of the control inputs.

Upon power up, the DMR-PD-008 will verify that all of the inter-workings are functioning properly. Once this has been established, the unit will bring in the previously saved configuration list into active operation. This configuration list includes the memory map, (i.e.: number of messages and their location) dip switch positions and any items which may have been set through the use of the serial communications port. A self check procedure on the inputs, audio channels and the memory section commences next. At this point, the CPU activates the "SYS OK" led, located on the top cover of the system, the Failure relay activates at the same time signaling to the user that the unit is working properly.

The above sequence, depending on system configurations, will take one to two seconds to complete.

NOTE: Do not offer any commands to the DMR-PD-008 during the boot up process, they will be ignored.

If anything out of the ordinary is noticed during the initial power up sequence, turn off power immediately and refer the unit to the factory.

System operation

Description

The DMR-PD-008 is a solid state, user programmable, multiple channel digital audio message repeater designed for use in announcement applications. The system can incorporate 16 messages, four audio channels and has the capability of playing ***any*** message through ***any*** output at ***any*** time. Between the extensive discrete input / output contacts and the serial communications link, complete control as well as system status can be obtained. The product is very flexible and can be upgraded easily in the field. With the on-site recordability option messages can be updated, added, or deleted as necessary.

INPUT

The DMR-PD-008 has a multitude of functions giving the user several different methods of controlling the unit. These methods include discrete contact closure and RS-232 interfaces. Each of these methods are described below.

The most common method of system activation is through use of discrete contact closure. The system inputs provided are:

STANDARD
Start Inputs: 16
Channel selects: 4
Stop: 1
Play Immediate: 1

OPTIONAL
Record: 1

An input is activated when that line is pulled to system ground. For example, to start message 8, START8, pin 24 on the 50 pin ribbon connector must be shorted to GND, pin 26 of the same connector. This contact must be maintained for 100mS for the system to acknowledge it. The contact used to short the input to ground must be capable of sinking 10mA at 5 volts.

Because of the multiple channel function, there are four channel select lines offered. These inputs, when used, route a particular message away from its default channel (described later, but unless otherwise specified each message defaults to channel 1) to the selected channel. In order to play a message to a specific audio channel, the channel select line must be activated, as in the above example, prior to the message selection, 50mS would typically be sufficient. Once a channel is selected, a message may be selected for playing, and that message, or messages, will be routed to channel(s) selected.

System operation

EXAMPLE: To play message 10 through channel 2, perform the following: Short the channel 2 select line, CH 2, Pin 3, to ground. Maintain this contact closure, a momentary contact closure will not work. After the channel 2 select line has been active for 50mS, connect START10, pin 9, to GND, pin 26. Once the start line has been acknowledged by the system, message 10 will play through channel 2.

Multiple channel selects can be activated at the same time should the user want to play a message through more than one audio channel simultaneously. When a message select line is activated the system will first check to see which channel selects are active. it will then route the audio data to each of the channels selected. If a message is currently playing through a selected audio channel it will be stored in queue and will be played according to when it was received and its priority.

The PLI input is used when an Emergency message must be played immediately. When a message is started with the PLI input active, any playing message, with a priority less than 9, will be stopped immediately and the PLI message will be played. Once the PLI message is completed, the interrupted message will be played from its beginning. The PLI input must be activated in a method exactly like that of a channel selection. Prior to a message activation in PLI mode, the channel must be selected and the PLI function must be activated. Once the message has been activated, the PLI input can be released.

The STOP input can be used to abort the entire play sequence for all of the audio channels, this includes currently playing messages as well as messages which are in queue.

OUTPUTS

There are several output signals offered to the user to provide the operational status of the unit. These outputs are given to the user in the form of LEDs and relay contact closures. The specific signals and their description is shown below:

SYSTEM FAILURE - The DMR-PD-008 supervises its own operation in several different fashions. Should an error be detected which could aversely affect the operation of the system, this output will be DEACTIVATED. During normal operation this signal is ACTIVE. Some examples of what types of errors will cause a system failure are: CPU failure, Missing or bad message chip, all audio channels have failed, etc.

SYSTEM ACTIVE - Whenever any of the audio channels are busy, this contact will be ACTIVE. This will be active during message plays, pauses, delays and anything associated with an activated audio channel.

SYSTEM OK – The DMR-PD-008, when all systems are OK , will light this LED. Whenever there is a problem with any part of the system, this LED will go out.

System operation

PLAYING #1-4 - These contacts show the status of any particular audio channel. When a channel is playing, the relay contacts will be active. A green LED, corresponding to the audio channel, on the front of the unit will light whenever an audio channel is active.

ERROR CH #1-4 - Should a problem occur with any of the audio channels, either during a message play or self-check cycle, the contacts corresponding to that particular audio channel will ACTIVATE. A red LED on the front of the unit will light telling the user which channel the failure occurred on. While a channel is in failure, no messages will play. This contact is FORM A, meaning there is only a normally open, single pole contact offered to the user.

DEFINITION - RELAY CONTACT: A FORM C relay contact has two positions, normally open and normally closed. There are three contacts associated with these positions, the normally open, normally closed and common pins. The common pin, is the contact which changes position depending on whether or not the relay is energized. When de-energized, or not active, the common pin will rest on the normally closed contact. When energized the common pin will swing over to the normally open pin and stay until the relay is de-energized.

On the DMR-PD-008, the only contact needing explanation is the SYSTEM FAILURE signal. When the system is OK, this contact is ACTIVE, so during normal operation, the common pin will be shorted to the normally open contact of the relay.

Each relay contact is capable of handling up to 1 amp at 24VDC, non-inductive load. The contact is dry, meaning that there is no voltage or current present on the contacts under no load conditions.

AUDIO SECTION

There are four audio outputs provided with the DMR-PD-008, each individually controllable by the user. The method to route a message to a particular output was explained in the previous section and will not be covered here.

Each output is capable of driving a 600 ohm load up to as high as +4db. The level will be preset at the factory, but may be adjusted in the field. Because of the self-supervision which is required on this unit, if the audio output is turned too low, or is loaded down by an external load of less than 600 ohms, the system may give an audio sense failure. For this reason, only adjust the audio output level when absolutely necessary and do not try to drive less than 600 ohms (i.e. speaker or headphones) without an amplifier between the load and the DMR-PD-008.

Should an error occur on a particular audio channel, the error relay corresponding to that channel will activate and the audio to that channel will be stopped until the fault is cleared. If all of the audio channels fail, the SYSTEM FAILURE contact will de-energize signifying a major fault.

System operation

RS232 CONTROL

Most of the complex control of the DMR-PD-008 unit is only accessible through an RS232 communication link. This link is specified for WYSE50/100 emulation at 9600 baud, 8,1,N. When connected properly, a system prompt will be seen and control can be performed via keyboard. Some of the important commands are listed below. Each command is three characters followed by suffix which specifies how to perform the command.

PLYa,b,c,d - This is the generic play command. This will play message #a, through channel b, for "c" times, with a "d" second pause between the repeated plays. See example:

Example: A PLY6,4,10,5 command will: Play message 6 through channel four, ten times with a five second pause between the repeats.

If no "b" is given the system will default to playing the message through channel 1.
If no "c" is given the system will default to the global PLS setting, described below.
If no "d" is given the system will default to the global PAS setting, described below.
Note: "c" and "d" cannot be entered without "b" being entered.

PLI - This can be used in place of PLY if a message needs to be played immediately. When the PLI command is used, any message currently playing on the audio channel selected will be stopped, pushed back in queue and this message will start playing.

STP- Will stop the currently playing message on all active audio channels.

STPALL - Will stop any currently playing messages and clear the queue for all of the audio channels.

PLS <# [1-15]> - This sets the system to repeat a message up to 15 times for each momentary message activation or RS232 ply command. The system default is 1.

PAS <# [0-127]> - This is a global pause setting which will be inserted between the multiple plays of a message as programmed in the PLS command. Default setting is 1 second.

DLY <# [0-127]> - This is the delay before play command. When set this will delay an activated message for up to 128 seconds before the audio message is output. This is commonly used so that an external tone generator can be used to precede a recorded message play.

MAP - Use this command to find out how many messages are inserted in the system. Numbers 1-16 will be output to the CRT with an asterisk under the numbers in which a message is populated.

System operation

BLD - Whenever a new message is inserted or if a message is removed the BLD command must be used to rebuild the system's memory map. The DMR-PD-008 is programmed to fail should any unwarranted change occur in the memory section. This command forces the system to recognize the new message sequence and store it into memory.

ATT <on/off> - This enables or disables the auto test function. The auto-test verifies the memory status, audio channel status, and general system functionality. Should this be turned off the system will not check itself until an actual message is played.

ARS <on/off> - Enables or disables the Auto restart function. When the system fails and the ARS is on, the system will clear the error after one minute and attempt to continue with what it was doing. If the ARS is off, the system will sit in ERROR condition until the system is manually reset.

VCK <on/off> - This is enables or disables the audio portion of the self test. With this on, the system will check the audio channels to make sure that they are working properly during the self test phase as well as just prior to a message play. VCK will also detect an audio failure during a message play.

DIP SWITCHES

The dip switches give the user the ability to change the default, global settings of the DMR-PD-008 system. The actual settings are described in the Appendix of this document. Whenever the system is reconfigured, all settings programmed into the device will be changed to the settings set up on the dip switches. Some of the settings which can be programmed into the device are as follows:

- Number of plays per activation can be set from 1-4.
- Pause and delay between plays settings can be set from 1-10 seconds.
- Voice check function can be enabled / disabled.
- Auto test function can be enabled / disabled.
- Auto system restart can be enabled / disabled.
- Input supervision can be enabled / disabled.
- Cd3 and Cd4 functions can be enabled / disabled.
- Individual audio channels can be enabled / disabled.

POWER REQUIREMENTS

All of the DMR-PD-008 circuitry functions from an internally regulated 5 or 12 volts. The system's regulator can function up to a maximum of 30 volts before shut down, so as long as a good, clean power supply from 15 - 30 volts is used, the system will function fine.

Message recording, optional

Flash EPROM memory may be used in the memory section, allowing the user to record, or re-record their own audio messages. This option must be selected at the time of purchase. Current units without this option are not field upgradable.

The process to record a message consists of several steps. This is necessary to give the user the ability to listen to the audio message they just recorded, prior to actually over writing existing memories. A key switch enable is also utilized to give a level of security, eliminating the possibility that messages get over written, or erased, inadvertently.

There are two inputs to the DMR-PD-008, microphone and line level. The microphone input is designed to use an off the shelf, low impedance microphone with a mini-jack connector. The line input is a 600 ohm, transformer isolated circuit available through an RCA jack. These inputs are mutually exclusive, so mixing is not an option. The user must watch the level of the line input, it is designed for 0dBm into 600 ohms. If the input is much higher, the system may distort, if the level is too low, the recorded audio may sound noisy.

The recording process is initiated by inserting the key and turning it to the right-most, clockwise position. This will disable normal system operation. At this point the audio source can be started and the Record input activated. When the record input is activated, the system will start recording. When recording, both the yellow and green lights will be lit. At the end of the audio material, the record input can be deactivated, and the system will stop the recording process and the recorded audio will be immediately played back. At this point the yellow LED will go out. **The entire playback must be listened to prior to moving to the next step.** The user should also listen for distortion or noise during this play back. If the playback is acceptable, move the key switch to the center position, arming the Memory download sequence.

When the switch is in the center position, the user can activate a message activation input and the new audio message will be “burned” into the message position activated. If the user wants to program a default audio channel number, other than channel one, the user should maintain a channel select prior to activating the message activation input, starting the “burn” process. Once the “burn” has started, the red record light will blink at a slow rate until the process has completed, at which time both the yellow and red LEDs will go out.

Once the “burn” process has finished, move the key to the left-most position, and the new message can be played by simply activating the message activation input corresponding to the new message.

If a FLASH memory is not populated in the memory location corresponding to the input number selected, the system will do nothing.

If the recording process needs to be aborted, prior to actually starting the “burn” process, move the key switch to the left most position. All recorded data stored in the cache will be erased.

Troubleshooting guide

In case of a problem with the operation of the DMR-PD-008 system, there are several items which should be checked prior to calling the service center for technical help. Please find the symptoms of the problem and follow the checklist for a possible solution.

The system does not seem to power on. (No LEDs are active)

-Is the DC power plugged in?
-Is there power on the DC power cord?
-If plugged in to a power strip, is it powered on?
-Is the system operational? LED board disconnected?

The Fail contact opens during operation.

-Is the connection to the Fail relay secure?
-Is the Input voltage stable?
-Are any of the audio outputs shorted together?
-Has a message been added / removed, without rebuilding the map?
-Is the Input Supervisory Function active?

Messages cannot be started. (Play relay does not activate)

-Is the connection to the Play relay secure?
-Is the System Active LED on?
-Are the start inputs active? (0 volts between start input and input com)
-Are you trying to start a message which is not in memory?
-Is the Stop signal active?

Messages seem to start but no audio is output. (Play relay is active)

-Is the Audio Level potentiometer turned up? (clockwise)
-Verify the audio output connections.
-Is the proper audio channel being listened to?

DMR-PD-008 does not respond to RS-232 communications.

-Is the Power LED on?
-Is the communications protocol correct? (8,1,N - 9600 baud)
-Place a null modem between DMR-PD-008 and Com link.

System will not record. (Lock and Rec LEDs do not activate)

-Is the system Power LED active?
-Is the Key inserted and turned clockwise fully?
-Is the Rec In signal active? (0 volts between Record input and input com)

If, after using this guide, the problem has not been solved, call the service center for technical assistance. Please have the problem which you are experiencing and the steps you have taken to resolve it ready when calling the service department.
Before sending a unit back to the factory for service, call the factory for a return merchandise authorization number (RMA #).

Specifications

AUDIO:

Performance: 12 bit, mono
Dynamic range: 60dB
Frequency response:
High Speed: 50Hz to 6.8kHz, +/-3dB
Low Speed: 50Hz to 3.4kHz, +/-3dB
Total harmonic distortion: <0.1%
Signal to noise ratio: 60dB
Output impedance: 600 ohms
Output level: +4dB maximum, adjustable
Audio channels: Up to four
Playback time: Up to 32 minutes
Connection: Plugable, two position, rising clamp

MEMORY:

Type: EPROM, FLASH EPROM
Package: Dip style, installed in polarized carriers
Size: EPROM : 1,2 or 4 Megabit
FLASH EPROM: 1 or 4 Megabit
Recording time:
High speed = 64kbps = 15 sec / megabit @ 6.8kHz bandwidth
Low speed = 32 kbps = 30 sec / megabit @ 3.4kHz bandwidth

ELECTRICAL:

Control Inputs: Individual message start activations
Message abort
Record control
Play Immediate
Individual channel selects
Input Interface: Directly coupled w/ high speed transient suppression
Sink, 5mA @ 5VDC
Status Outputs: System Active, System OK
Individual Channel Playing and Error
System Locked, Recording, Programming
Output Contacts: Dry, isolated contact closure, Maximum 1Amp @ 24VDC

Input / Output Connection: 50 pin ribbon connector, or
RC3: rising clamp terminal strip, one per input

Communications:
RS232C - 8 data bit, 1 stop bit, no parity, 9600 baud
Emulation: Wyse 50/100
Connection: six position RJ11, center pair

Specifications

POWER:

Input Voltage: 24VDC, +/-10%, 1 Amp maximum

Current consumption: 150mA - 250mA, idle
250mA - 500mA, running

1 amp maximum, startup

Connection: Plugable, five position, rising clamp

Earth ground lug provided for transient (lightning) protection circuitry.

PHYSICAL SPECIFICATIONS:

Weight: 5 lb.
Dimensions: 12" x 12" x 2.5"
Material: 18 gauge, cold rolled steel
Finish: Paint, Black.
Silkscreen: White
Mounting: Six notches for wall mounting

Operating temperature: 0 to 50 Degrees, Celsius

List of abbreviations

DMR-PD-008	- Solid state, multitrack audio repeater system
DC	- Direct current
VDC	- Volts of direct current
mm	- millimeter
LED	- Light emitting diode
Rx	- Receive
Tx	- Transmit
GND	- Ground
REC	- Record
SYS	- System
RST	- Reset
COM	- Communications
RMA	- Return merchandise authorization
dB	- Decibel
Hz	- Hertz
kHz	- Kilohertz
kbps	- Kilobits per second
PCB	- Printed circuit board
mA	- Milliamperes
Kbaud	- Kilobaud

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Appendix

DMR-PD-008

DIP SWITCH CONFIGURATION SETTINGS
08/10/96

Dip Switch Settings, SW2A, as labeled on the PCB

SW1A	SW2A	
ON	ON	= 1 Play
ON	OFF	= 2 Plays
OFF	ON	= 3 Plays
OFF	OFF	= 4 Plays

SW3A	SW4A	.
ON	ON	= 1 Sec. Pause
ON	OFF	= 3 Sec. Pause
OFF	ON	= 5 Sec. Pause
OFF	OFF	= 10 Sec. Pause

SW5A	SW6A	
ON	ON	= 1 Sec Delay
ON	OFF	= 3 Sec Delay
OFF	ON	= 5 Sec Delay
OFF	OFF	= 10 Sec Delay

SW7A ON >> VCK = OFF

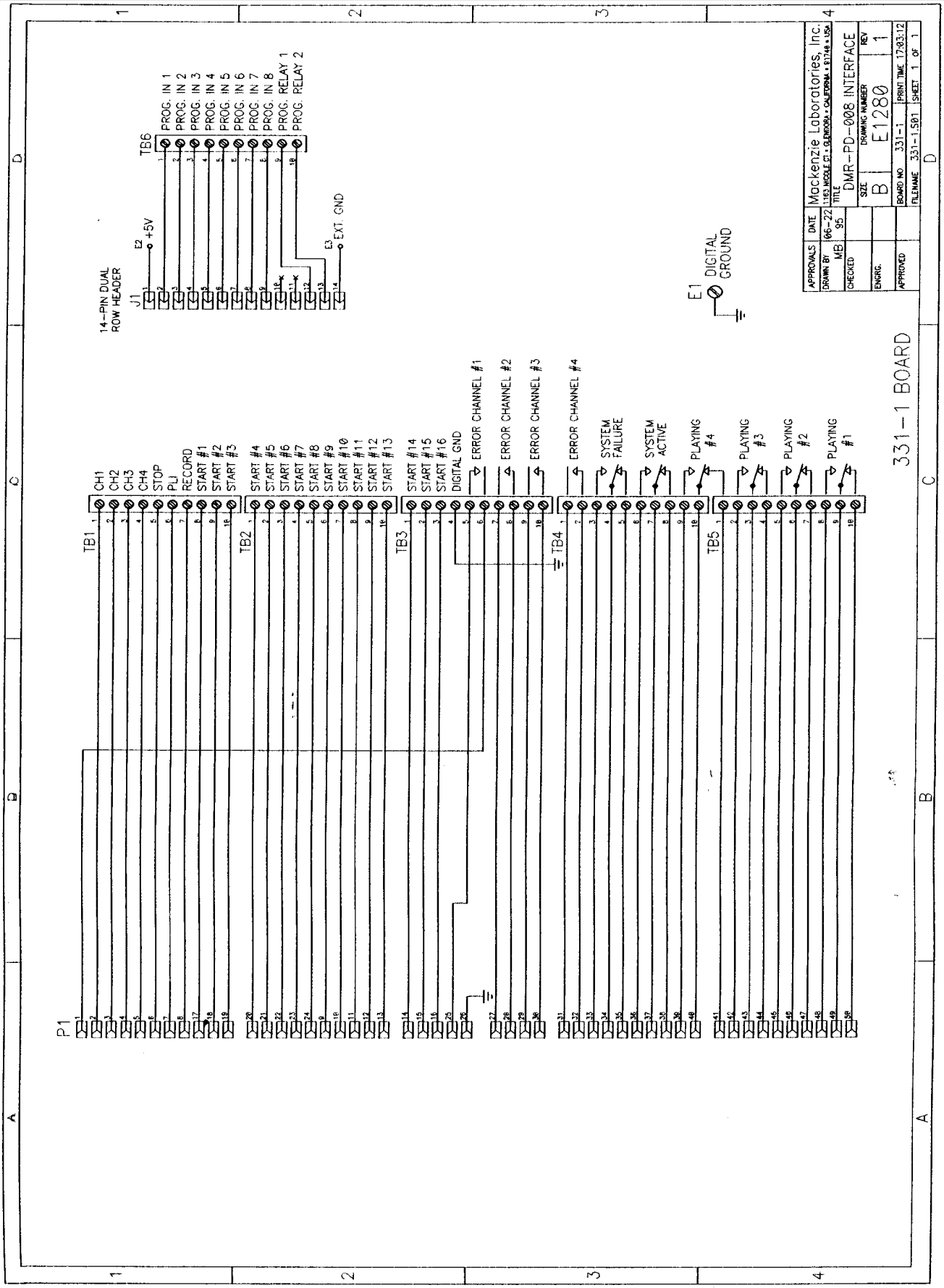
SW8A ON >> ATT = OFF

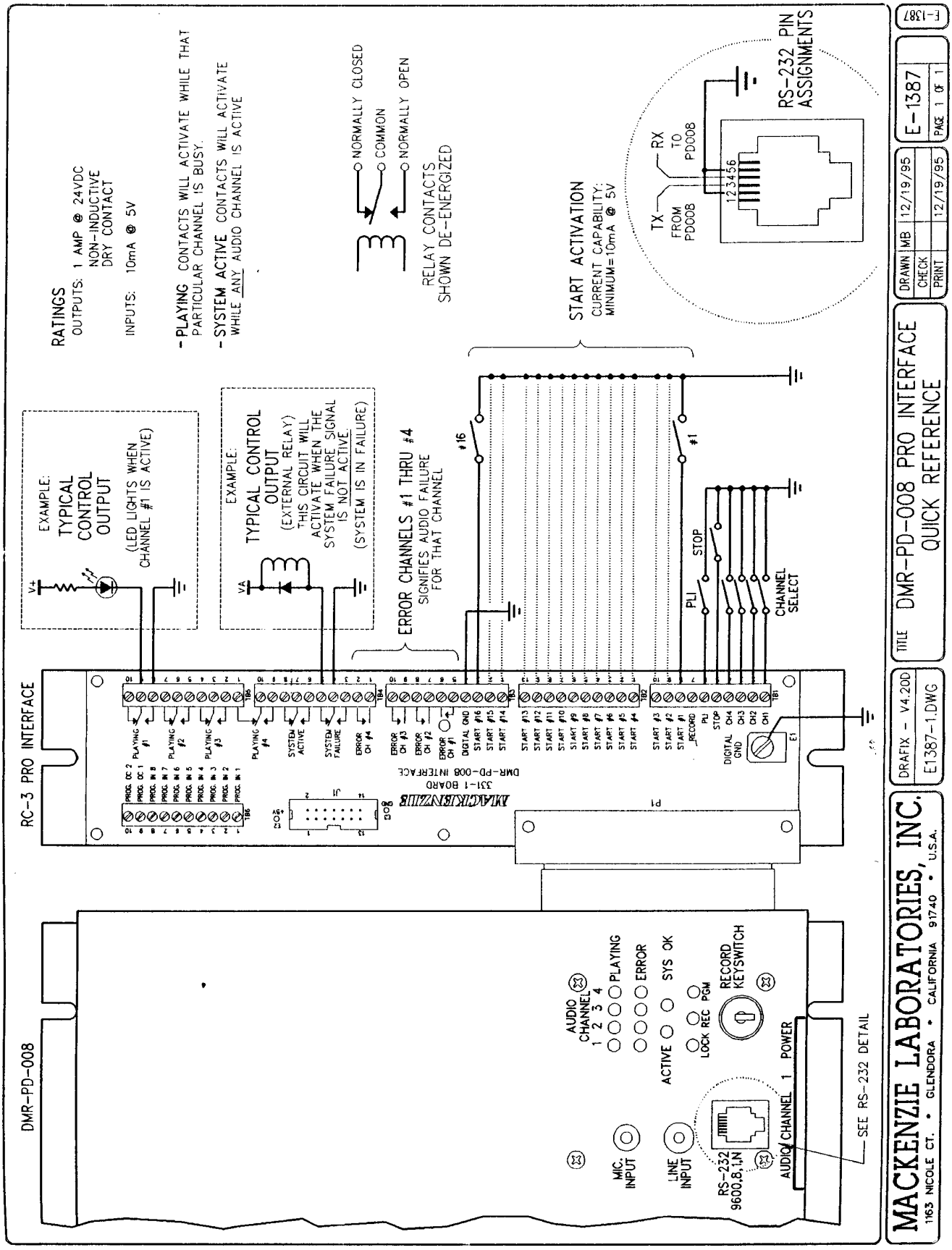
Dip Switch Settings, SW2, as labeled on the PCB

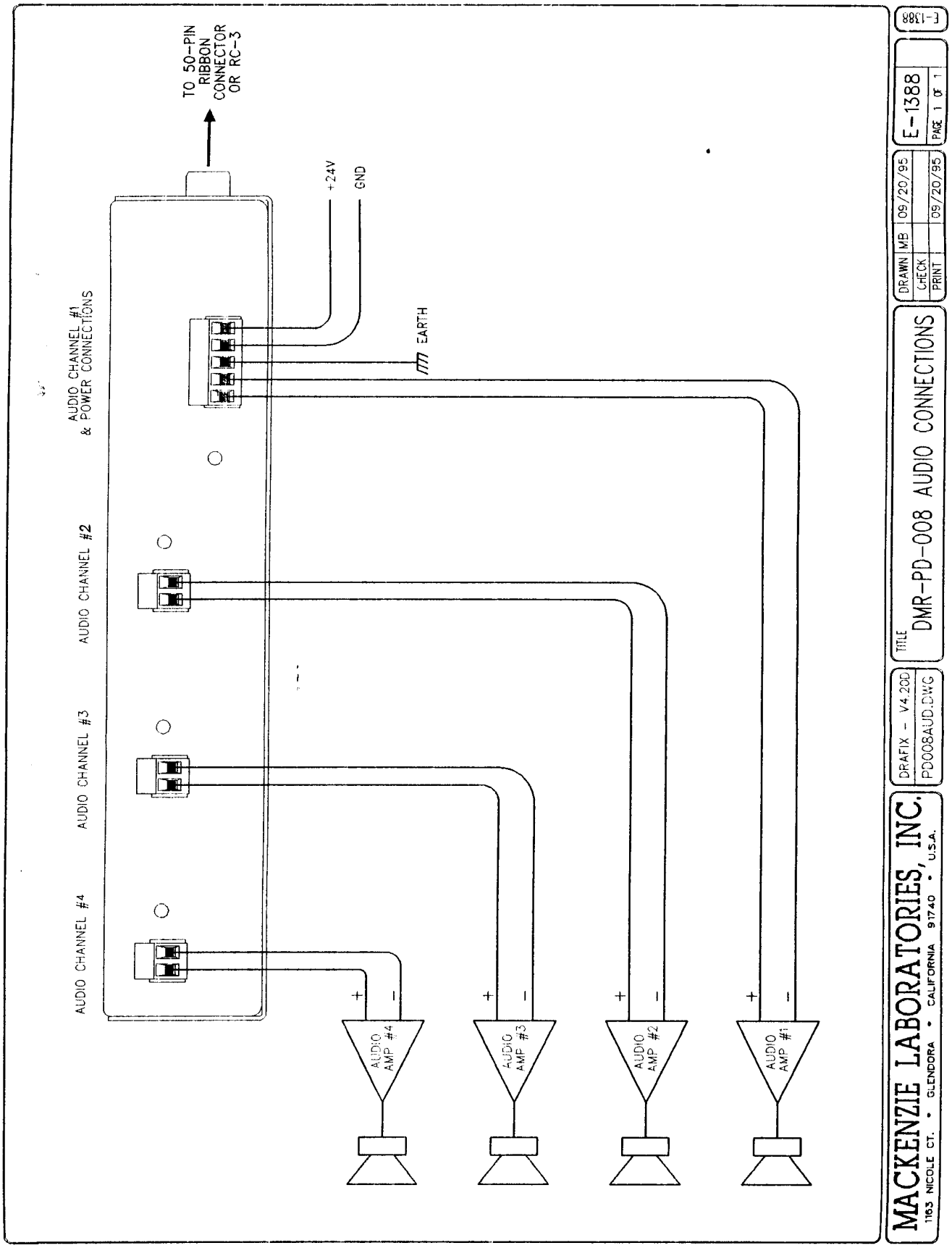
SW1	ON >>	ARS = OFF
SW2	ON >>	Input Supervision = OFF
SW3	ON >>	CD3 = OFF
SW4	ON >>	CD4 = OFF
SW5	ON >>	Channel (1) Disabled
SW6	ON >>	Channel (2) Disabled
SW7	ON >>	Channel (3) Disabled
SW8	ON >>	Channel (4) Disabled

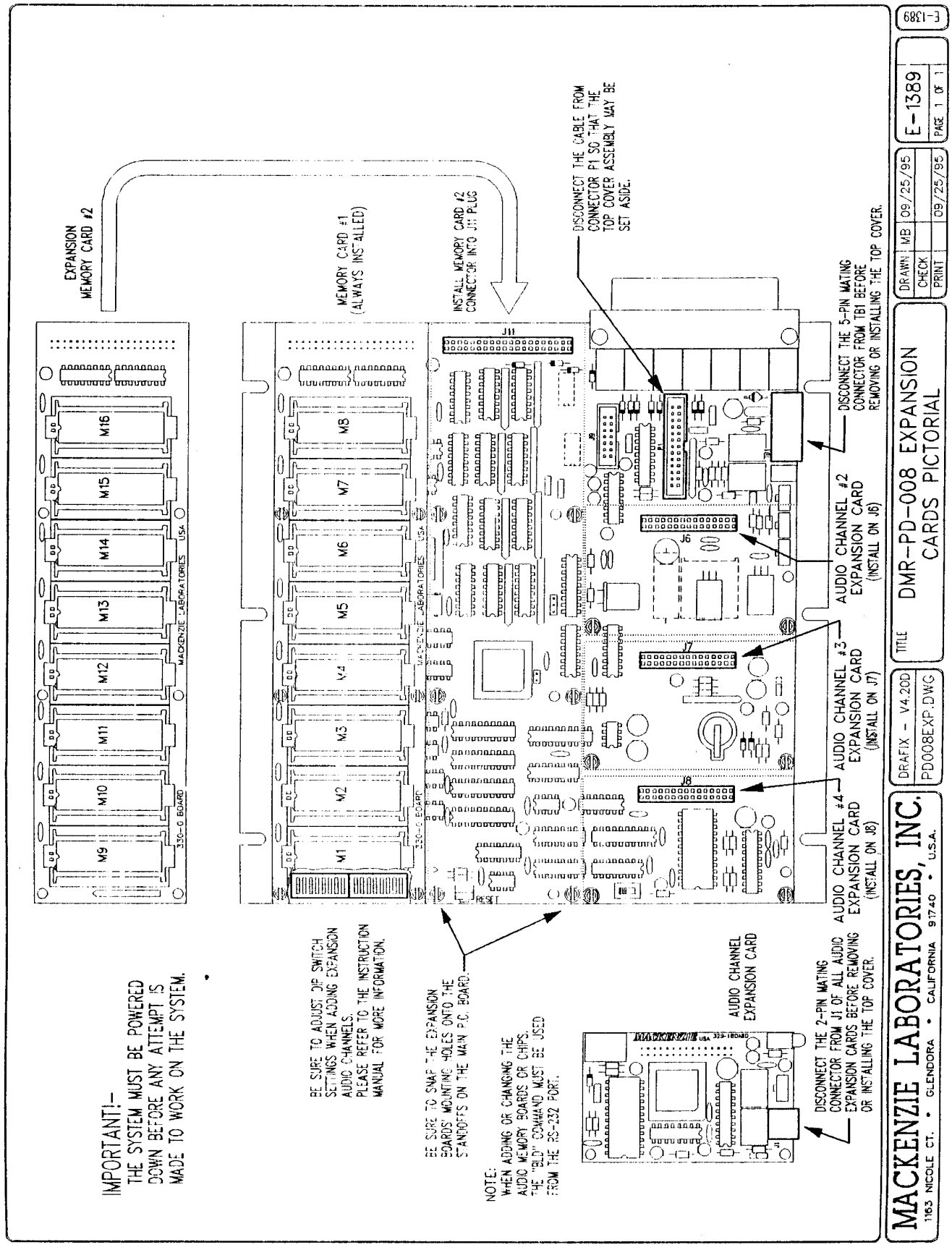
Note: After making changes to the dip switch settings, the reconfiguration switch must be depressed to allow the settings to take effect. Reset the device by pressing the reset pushbutton should follow the reconfiguring the device.

The reconfiguration pushbutton is located on the side of the device where the dip switches are located. It is the button furthest from the dip switches. The Reset pushbutton is located closest to the pushbuttons.


331-1 BOARD
14-PIN DUAL ROW HEADER
J1
TB6
PROG. IN 1
PROG. IN 2
PROG. IN 3
PROG. IN 4
PROG. IN 5
PROG. IN 6
PROG. IN 7
PROG. IN 8
PROG. RELAY 1
PROG. RELAY 2
E2 +5V
E3 EXT. GND
E1 DIGITAL GROUND
TB1
CH1
CH2
CH3
CH4
STOP
PLI
RECORD
START #1
START #2
START #3
TB2
START #4
START #5
START #6
START #7
START #8
START #9
START #10
START #11
START #12
START #13
TB3
START #14
START #15
START #16
DIGITAL GND
ERROR CHANNEL #1
ERROR CHANNEL #2
ERROR CHANNEL #3
TB4
ERROR CHANNEL #4
SYSTEM FAILURE
SYSTEM ACTIVE
PLAYING #4
TB5
PLAYING #3
PLAYING #2
PLAYING #1
P1
Mackenzie Laboratories, Inc.
DMR-PD-008 INTERFACE
DRAWING NUMBER E1280
SIZE B
REV 1
BOARD NO 331-1
FILENAME 331-1.SCH
SHEET 1 OF 1


RATINGS
OUTPUTS: 1 AMP @ 24VDC
NON-INDUCTIVE
DRY CONTACT
INPUTS: 10mA @ 5V
- PLAYING CONTACTS WILL ACTIVATE WHILE THAT PARTICULAR CHANNEL IS BUSY.
- SYSTEM ACTIVE CONTACTS WILL ACTIVATE WHILE ANY AUDIO CHANNEL IS ACTIVE
NORMALLY CLOSED
COMMON
NORMALLY OPEN
RELAY CONTACTS SHOWN DE-ENERGIZED
START ACTIVATION
CURRENT CAPABILITY:
MINIMUM=10mA @ 5V
RS-232 PIN ASSIGNMENTS
TX FROM PD008
RX TO PD008
123456
EXAMPLE: TYPICAL CONTROL OUTPUT
(LED LIGHTS WHEN CHANNEL #1 IS ACTIVE)
EXAMPLE: TYPICAL CONTROL OUTPUT
(EXTERNAL RELAY)
THIS CIRCUIT WILL ACTIVATE WHEN THE SYSTEM FAILURE SIGNAL IS NOT ACTIVE.
(SYSTEM IS IN FAILURE)
ERROR CHANNELS #1 THRU #4
SIGNIFIES AUDIO FAILURE FOR THAT CHANNEL
#16
#1
PLI
STOP
CHANNEL SELECT
RC-3 PRO INTERFACE
DMR-PD-008 INTERFACE
331-1 BOARD
MACKENZIE LABS
P1
J1
DMR-PD-008
AUDIO CHANNEL
1 2 3 4
PLAYING
ERROR
ACTIVE
SYS OK
LOCK REC PGM
RECORD KEYSWITCH
MIC. INPUT
LINE INPUT
RS-232 9600,8,1,N
AUDIO CHANNEL 1 POWER
SEE RS-232 DETAIL
MACKENZIE LABORATORIES, INC.
1163 NICOLE CT. • GLENDORA • CALIFORNIA 91740 • U.S.A.
DRAFIX - V4.20D
E1387-1.DWG
TITLE DMR-PD-008 PRO INTERFACE QUICK REFERENCE
DRAWN MB 12/19/95
CHECK
PRINT 12/19/95
E-1387
PAGE 1 OF 1
E-1387


TO 50-PIN RIBBON CONNECTOR OR RC-3
+24V
GND
EARTH
AUDIO CHANNEL #1 & POWER CONNECTIONS
AUDIO CHANNEL #2
AUDIO CHANNEL #3
AUDIO CHANNEL #4
AUDIO AMP #4
AUDIO AMP #3
AUDIO AMP #2
AUDIO AMP #1
DRAWN MB 09/20/95
CHECK
PRINT 09/20/95
E-1388
PAGE 1 OF 1
TITLE
DMR-PD-008 AUDIO CONNECTIONS
DRAFIX - V4.20D
PD008AUD.DWG
MACKENZIE LABORATORIES, INC.
1163 NICOLE CT. • GLENDORA • CALIFORNIA 91740 • U.S.A.


EXPANSION MEMORY CARD #2
MEMORY CARD #1 (ALWAYS INSTALLED)
INSTALL MEMORY CARD #2 CONNECTOR INTO J11 PLUG
DISCONNECT THE CABLE FROM CONNECTOR P1 SO THAT THE TOP COVER ASSEMBLY MAY BE SET ASIDE.
DISCONNECT THE 5-PIN MATING CONNECTOR FROM TB1 BEFORE REMOVING OR INSTALLING THE TOP COVER.
AUDIO CHANNEL #2 EXPANSION CARD (INSTALL ON J6)
AUDIO CHANNEL #3 EXPANSION CARD (INSTALL ON J7)
AUDIO CHANNEL #4 EXPANSION CARD (INSTALL ON J8)
DISCONNECT THE 2-PIN MATING CONNECTOR FROM J1 OF ALL AUDIO EXPANSION CARDS BEFORE REMOVING OR INSTALLING THE TOP COVER.
AUDIO CHANNEL EXPANSION CARD
BE SURE TO ADJUST DIP SWITCH SETTINGS WHEN ADDING EXPANSION AUDIO CHANNELS. PLEASE REFER TO THE INSTRUCTION MANUAL FOR MORE INFORMATION.
BE SURE TO SNAP THE EXPANSION BOARDS MOUNTING HOLES ONTO THE STANDOFFS ON THE MAIN P.C. BOARD.
NOTE: WHEN ADDING OR CHANGING THE AUDIO MEMORY BOARDS OR CHIPS, THE "BLD" COMMAND MUST BE USED FROM THE RS-232 PORT.
IMPORTANT!- THE SYSTEM MUST BE POWERED DOWN BEFORE ANY ATTEMPT IS MADE TO WORK ON THE SYSTEM.
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1163 NICOLE CT. • GLENDORA • CALIFORNIA 91740 • U.S.A.
DRAFIX - V4.20D
PD008EXP.DWG
TITLE
DMR-PD-008 EXPANSION CARDS PICTORIAL
DRAWN MB 09/25/95
CHECK
PRINT 09/25/95
E-1389
PAGE 1 OF 1
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