AUTOGRAM
CORPORATION

AUDIO CONSOLE

INSTRUCTION MANUAL

972-424-8585 (07/30/01)

Installed in Studio "J" Week of- 7-20-98
Brian D. Heise

AUTOGRAM
CORPORATION

Pacemaker

AUDIO CONSOLE

INSTRUCTION MANUAL

All information contained herein is subject to change and is proprietary to:

AUTOGRAM CORPORATION
1500 CAPITAL AVENUE
PLANO, TEXAS 75074-6110
~~214/424-8585~~
972 424 8585

AUTOGRAM CORPORATION

PACEMAKER SERIES AUDIO CONSOLES

INSTRUCTION MANUAL

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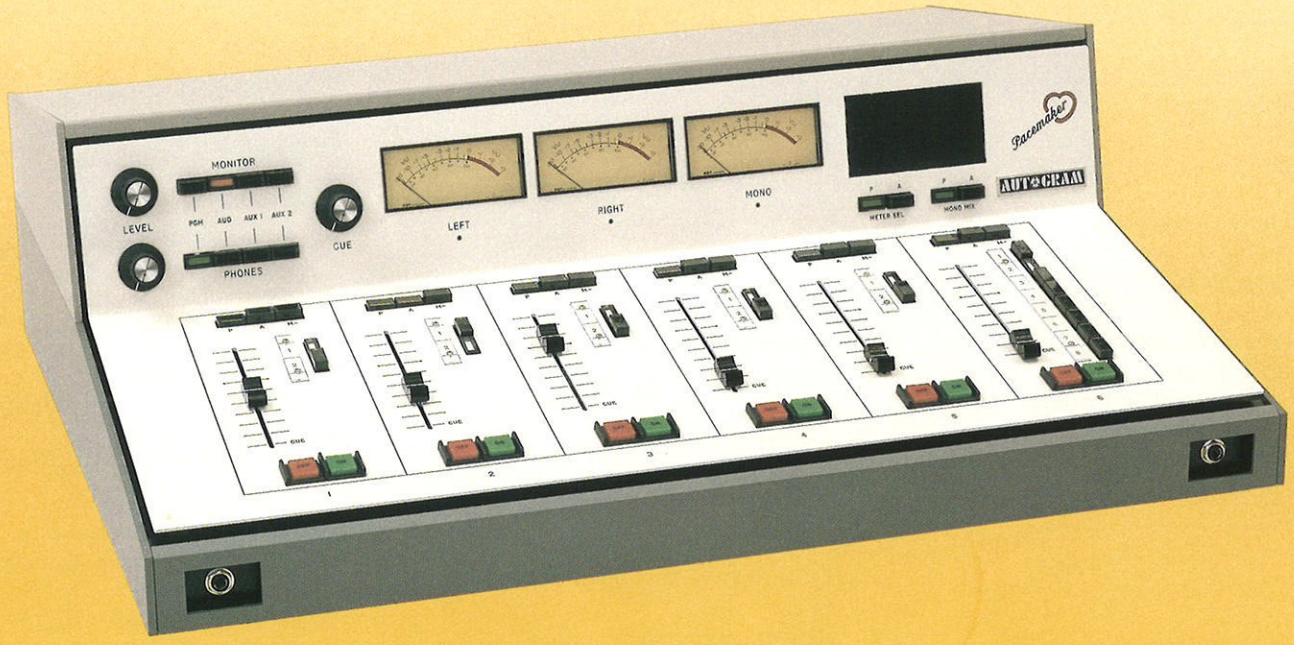
PACEMAKER 618

BUILT WITH INTENSIVE CARE



The new PACEMAKER console by

AUTOGRAM
CORPORATION

Pacemaker 618

Features

- 6 Pots - 5 Dual and 1 with 8 inputs
- Machine control for all inputs
- Legend strip for each input
- VCA level control
- Electronic switching
- No audio transformers
- Penny and Giles linear conductive plastic pots
- Schadow selector switches
- Engraved front panel
- Pluggable miniature terminal strips
- Up to eight patchable microphone preamplifiers
- Easy input level selection
- Optional Autoclock or Autocount

Specifications

Input Characteristics

Sources:

18 stereo inputs
4 or 8 Microphone inputs

Impedances:

Microphone, 150 ohm
High level, 20 k ohm bridge or 600 ohm terminate
External monitor, 20 k or 600 ohm

Levels:

Microphone, –65 to –50 dBm
High level, –10 to +10 dBm
External monitor, –10 to +10 dBm

SNR:

Programs/Monitor, better than –90 dB at +18 dBm out
Headphone/Cue, better than –80 dB at 2 watts

Power Source:

117 or 230 volt ac, 50 - 60 Hz

Mounting & Dimensions:

Table top with bottom or back cable entry

Height:	9.25 inches	(23.49 cm)
Depth:	21.75 inches	(55.25 cm)
Width:	26.62 inches	(67.61 cm)

Output Characteristics

Outputs:

1 Stereo Program
1 Stereo Audition
1 Mix Minus
1 Mono
2 Line Monitor
2 Headphones
1 Cue

Impedances:

Programs/Monitor, 600 ohm balanced or unbalanced
Phone/Cue, 2 watt at 8 ohm

Levels:

Programs/Monitor, +8 dBm nominal
+24 dBm maximum
Headphone/Cue 2 watt at 8 ohm

Frequency Response:

Programs/Monitor, +0.1 dB 20 to 20 kHz
Headphone/Cue, ±0.5 dB 20 to 20 kHz

Distortion:

Programs/Monitor, less than .05% THD and IMD
Headphone/Cue, less than .1% THD and IMD

AUTOGRAM CORPORATION
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PACEMAKER 828

BUILT WITH INTENSIVE CARE

The new PACEMAKER console by

AUTOGRAM CORPORATION

Pacemaker 828

Features

- 8 Pots - 6 Dual and 2 with 8 inputs each
- Machine control for all inputs
- Legend strip for each input
- VCA level control
- Electronic switching
- No audio transformers
- Penny and Giles linear conductive plastic pots
- Schadow selector switches
- Engraved front panel
- Pluggable miniature terminal strips
- Up to eight patchable microphone preamplifiers
- Easy input level selection
- Optional Autoclock or Autocount

Specifications

Input Characterisitics

Sources:
28 stereo inputs
4 or 8 Microphone inputs

Impedances:
Microphone, 150 ohm
High level, 20 k ohm bridge or 600 ohm terminate
External monitor, 20 k or 600 ohm

Levels:
Microphone, -65 to -50 dBm
High level, -10 to +10 dBm
External monitor, -10 to +10 dBm

SNR:
Programs/Monitor, better than -90 dB at +18 dBm out
Headphone/Cue, better than -80 dB at 2 watts

Power Source:
117 or 230 volt ac, 50 - 60 Hz

Mounting & Dimensions:
Table top with bottom or back cable entry
Height: 9.25 inches (23.49 cm)
Depth: 21.75 inches (55.25 cm)
Width: 26.62 inches (67.61 cm)

Output Characteristics

Outputs:
1 Stereo Program
1 Stereo Audition
1 Mix Minus
1 Mono
2 Line Monitor
2 Headphones
1 Cue

Impedances:
Programs/Monitor, 600 ohm balanced or unbalanced
Phone/Cue, 2 watt at 8 ohm

Levels:
Programs/Monitor, +8 dBm nominal
+24 dBm maximum
Headphone/Cue 2 watt at 8 ohm

Frequency Response:
Programs/Monitor, ±0.1 dB 20 to 20 kHz
Headphone/Cue, ±0.5 dB 20 to 20 kHz

Distortion:
Programs/Monitor, less than .05% THD and
IMD
Headphone/Cue, less than .1% THD and IMD

All specifications subject to change without notice.

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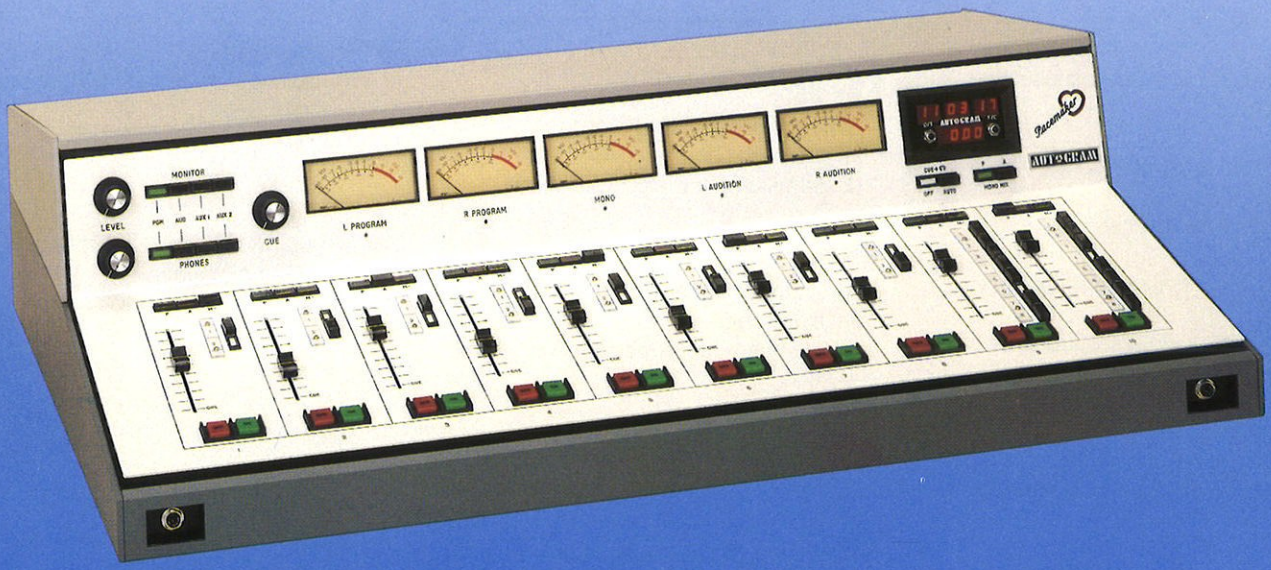
PACEMAKER 1032

BUILT WITH INTENSIVE CARE



The new PACEMAKER console by

AUTOGRAM
CORPORATION

Pacemaker 1032

Features

- 10 Pots - 8 Dual and 2 with 8 inputs each.
- Machine control for all inputs
- Legend strip for each input
- VCA level control
- Electronic switching
- No audio transformers
- Penny and Giles linear conductive plastic pots
- Schadow selector switches
- Engraved front panel
- Pluggable miniature terminal strips
- Up to eight patchable microphone preamplifiers
- Easy input level selection
- Optional Autoclock or Autocount

Specifications

Input Characteristics

Sources:
32 stereo inputs
4 or 8 Microphone inputs

Impedances:
Microphone, 150 ohm
High level, 20 k ohm bridge or 600 ohm terminate
External monitor, 20 k or 600 ohm

Levels:
Microphone, -65 to -50 dBm
High level, -10 to +10 dBm
External monitor, -10 to +10 dBm

SNR:
Programs/Monitor, better than -90 dB at +18 dBm out
Headphone/Cue, better than -80 dB at 2 watts

Power Source:
117 or 230 volt ac, 50 - 60 Hz

Mounting & Dimensions:
Table top with bottom or back cable entry
Height: 9.25 inches (23.49 cm)
Depth: 21.75 inches (55.25 cm)
Width: 34.375 inches (87.31 cm)

Output Characteristics

Outputs:
Stereo Program
1 Stereo Audition
1 Mix Minus
1 Mono
2 Line Monitor
2 Headphones
1 Cue

Impedances:
Programs/Monitor, 600 ohm balanced or unbalanced
Phone/Cue, 2 watt at 8 ohm

Levels:
Programs/Monitor, +8 dBm nominal
+24 dBm maximum
Headphone/Cue 2 watt at 8 ohm

Frequency Response:
Programs/Monitor, ±0.1 dB 20 to 20 kHz
Headphone/Cue, ±0.5 dB 20 to 20 kHz

Distortion:
Programs/Monitor, less than .05% THD and IMD
Headphone/Cue, less than .1% THD and IMD

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PACEMAKER 1644

BUILT WITH INTENSIVE CARE

The new PACEMAKER console by

AUTOGRAM CORPORATION

Pacemaker 1644

Features

- 16 Pots - 14 Dual and 2 with 8 inputs each
- Machine control for all inputs
- Legend strip for each input
- VCA level control
- Electronic switching
- No audio transformers
- Penny and Giles linear conductive plastic pots
- Schadow selector switches
- Engraved front panel
- Pluggable miniature terminal strips
- Up to eight patchable microphone preamplifiers
- Easy input level selection
- Optional Autoclock or Autocount

Specifications

Input Characteristics

Sources:
44 stereo inputs
4 or 8 Microphone inputs

Impedances:
Microphone, 150 ohm
High level, 20 k ohm bridge or 600 ohm terminate
External monitor, 20 k or 600 ohm

Levels:
Microphone, -65 to -50 dBm
High level, -10 to +10 dBm
External monitor, -10 to +10 dBm

SNR:
Programs/Monitor, better than -90 dB at +18 dBm out
Headphone/Cue, better than -80 dB at 2 watts

Power Source:
117 or 230 volt ac, 50 - 60 Hz

Mounting & Dimensions:
Table top with bottom or back cable entry
Height: 9.25 inches (23.49 cm)
Depth: 21.75 inches (55.25 cm)
Width: 43.625 inches (110.81 cm)

Output Characteristics

Outputs:
Stereo Program
1 Stereo Audition
1 Mix Minus
1 Mono
2 Line Monitor
2 Headphones
1 Cue

Impedances:
Programs/Monitor, 600 ohm balanced or unbalanced
Phone/Cue, 2 watt at 8 ohm

Levels:
Programs/Monitor, +8 dBm nominal
+24 dBm maximum
Headphone/Cue 2 watt at 8 ohm

Frequency Response:
Programs/Monitor, ±0.1 dB 20 to 20 kHz
Headphone/Cue, ±0.5 dB 20 to 20 kHz

Distortion:
Programs/Monitor, less than .05% THD and IMD
Headphone/Cue, less than .1% THD and IMD

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ADDENDA SHEET FOR
the
PACEMAKER 1644 AND 618 CONSOLES

The Pacemaker 1644 and 618 are variations to other models.

PACEMAKER 1644

The PM-1644 is similar to the PM-1032 with the exception of 6 additional Dual-Line Input modules and associated faders and switches. All other specifications are identical to the PM-1032.

Please refer to the Pacemaker 1644 specification sheet for more information.

PACEMAKER 618

The PM-618 is similar to the PM-828 except there are only six faders. the first 5 faders have 2 inputs each while the last has 8 inputs for a total of 18 inputs. All other specifications for the PM-618 are identical to the PM-828.

Please refer to the Pacemaker 618 specification sheet for more information.

STATIC ELECTRICITY NOTICE

Static Electricity also known as Electro-Static Discharge (E.S.D) and Electro-Magnetic Interference (E.M.I) can upset the operation of digital based devices. The PACEMAKER SERIES Audio Consoles, because of the extensive use of digital circuitry, can be affected by E.S.D. and E.M.I. Autogram has expended great effort in making the PACEMAKER Console resistant to Static Electricity and External Radio Frequency Energy. However, normal care must be exercised by the installing personnel to insure that the installation is within Standards of Good Engineering Practice.

If Static Electricity is present in the area into which the PACEMAKER Console is to be installed, the customer is advised to use whatever means practical to eliminate the static charges.

Static Electricity can be reduced by installation of commercially available Anti-Static carpets, anti-static treatment of existing carpet, and humidification.

Grounding the console and associated equipment to a firm studio ground system will aid in the reduction of problems associated with R.F.I. as well as helping to dissipate static charges.

Care should be taken to insure that personnel are grounded prior to handling printed circuit boards.

AUTOGRAM PRODUCT WARRANTY

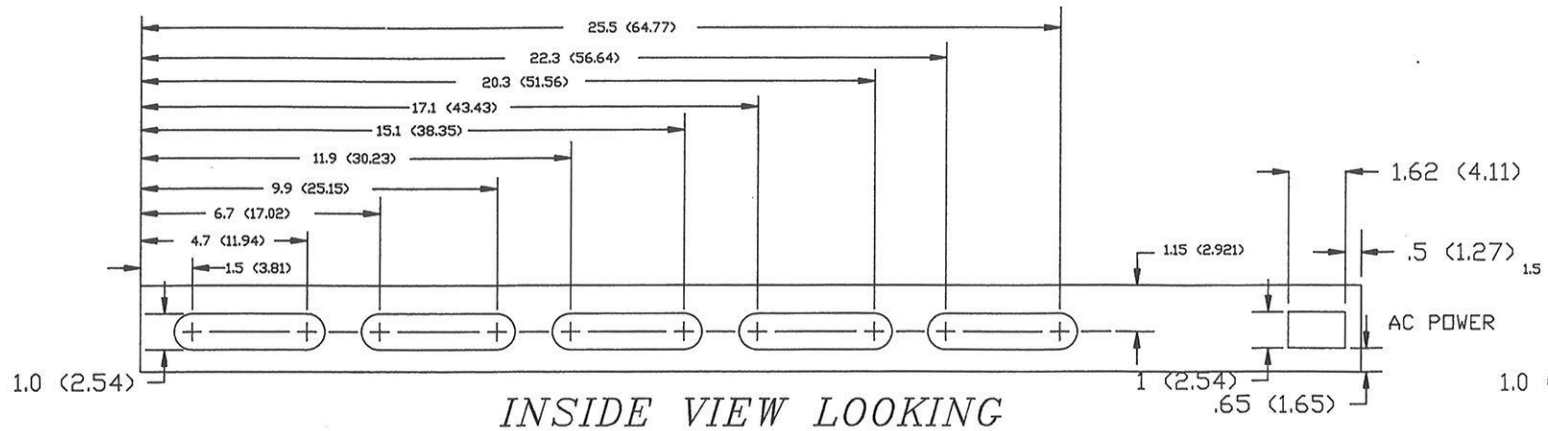
AUTOGRAM warrants that all products manufactured by AUTOGRAM CORPORATION and sold hereunder, will at the date of delivery, meet or exceed all current published specifications for that product and will be free from defects in workmanship and material.

AUTOGRAM agrees to repair or replace equipment of its manufacture which fails to meet the warranty set forth above for two (2) years after delivery with the exception of lamps, fuses, and other expendable items. All major parts, such as, VU meters, attenuators, switches, etc., sold hereunder which are not of AUTOGRAM CORP. manufacture are sold subject to the supplier's warranty.

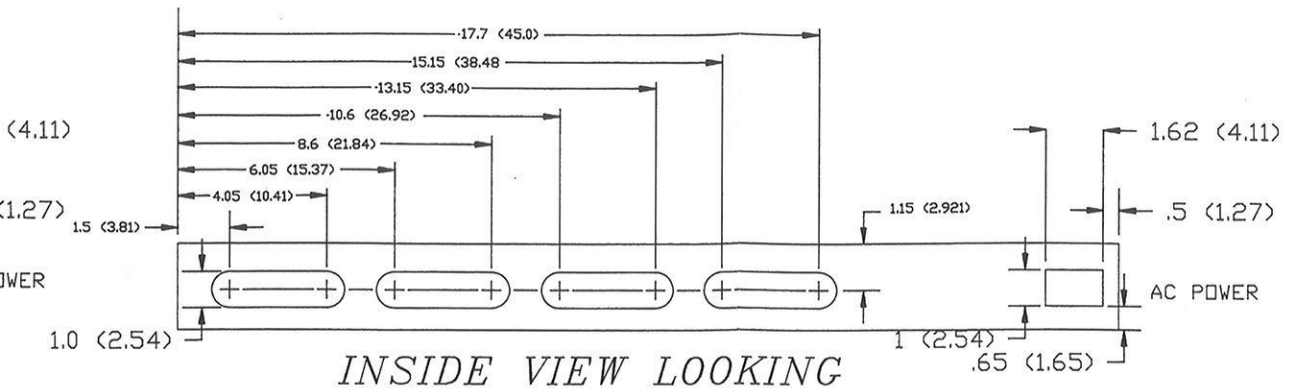
Warranties may not be honored when failure is cased by improper use or abuse, maintenance, repair or alteration by unauthorized persons.

In no event shall AUTOGRAM have any liability for consequential damages, or for the loss, damage, or expenses directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials, or from any other cause.

Parts under warranty must be returned to AUTOGRAM per instructions. Warranted parts will be shipped freight prepaid by UPS regular or by US Mail, First Class. Any other method of shipment, such as AIR EXPRESS, will be shipped freight collect.

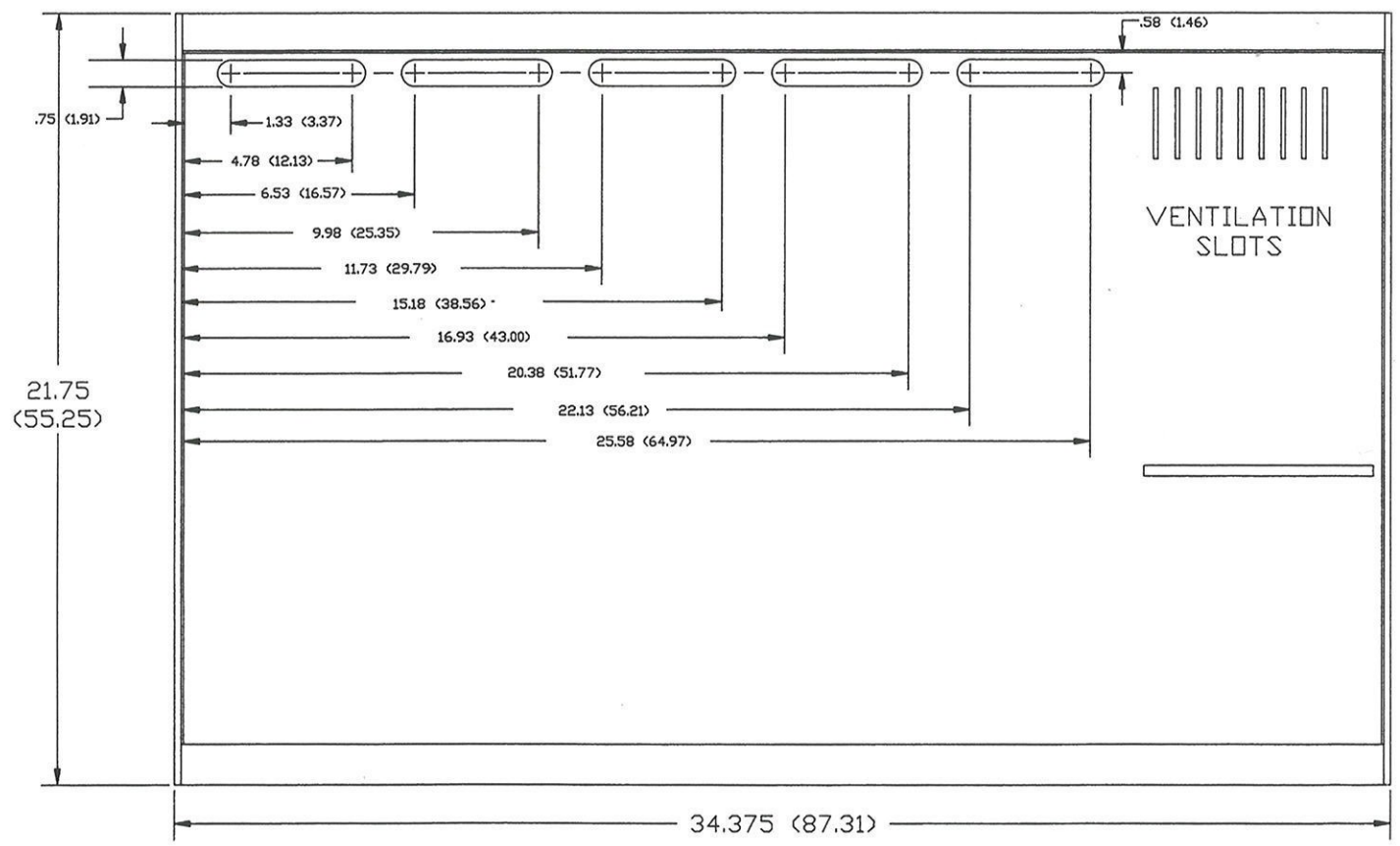


INSIDE VIEW LOOKING OUT REAR OF CONSOLE



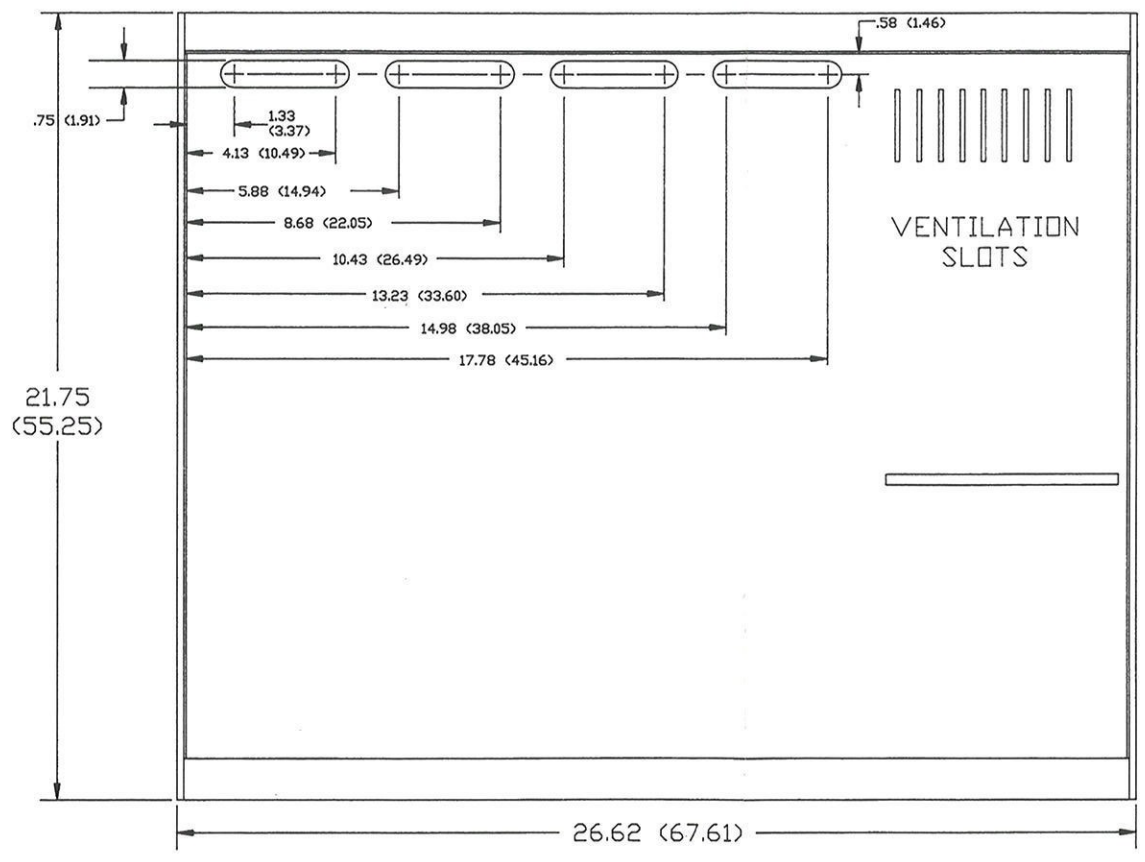
INSIDE VIEW LOOKING OUT REAR OF CONSOLE

WIRING ACCESS LOCATIONS



TOP VIEW

PM 1032 ONLY



TOP VIEW

PM 648, PM 828, PM 618

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 6/7/90

PACEMAKER AUDIO CONSOLE BASE DRAWING

DWG. NO. PM 4001	DRAWN BY: JDL

SECTION 1

INTRODUCTION

The PACEMAKER series represents the perfect blending of current audio systems technology along with cost-effective manufacturing techniques. Taking many features from the R/TV console design along with the renowned quality established in the IC, LC, and AC consoles, the PACEMAKERS will be at home in most audio console applications. The traditional engraved front panel has been retained in the PACEMAKER line.

The PACEMAKER series is made up of four basic units:

1. PM-648, Six channels each having 8 inputs for a total of 48 inputs.
2. PM-828, Eight channels, the first six with 2 inputs each and the last two with eight inputs each for a total of 28 inputs.
3. PM-1032, Ten channels, the first eight with 2 inputs each and the last two with eight inputs each for a total of 32 inputs.
4. PM-618, Six channels, the first five with 2 inputs each and the last with eight inputs for a total of 18 inputs.

The PM-648, PM-828, and PM-618 each have three VU meters (2 selectable between PROGRAM and AUDITION outputs and 1 MONO meter) while the PM1032 has 5 meters (PROGRAM and AUDITION left and right as well as MONO).

COMMON FEATURES

The PACEMAKER consoles have independent plug-in circuit boards for each input and output channel. All wiring to the console is connected by means of miniature plug-in type connectors. Each input may be programmed by means of convenient plug in jumpers to accommodate professional as well as consumer type source equipment. Multi-turn trim pots are standard for each input.

Level control for the input channels is with Penny and Giles "long-throw" conductive plastic attenuators operating in a DC mode controlling Precision Monolithics SSM2122 dual VCAs.

ITT Schadow selector switches are used for bus, metering, and monitoring selection. These selectors switch DC only while the actual audio selecting is done on the various circuit boards using DG-212 high voltage CMOS analog switches.

Compulite lighted pushbuttons are used to turn the individual channels on and off. Associated with each input are two "OPEN COLLECTOR" control outputs:

1. START: A 1 second control pulse which is activated by pressing the "ON" push-button.
2. ENABLE: A continuous control which is "low" as long as the channel is on.

The control outputs are rated at **300 m.a./50 v. DC MAX to GROUND**. An optional relay box is available to interface equipment which cannot use open collector to ground outputs.

The PACEMAKER consoles have independent stereo PROGRAM and AUDITION output channels as well as a front-panel assignable MIX MINUS output along with a selectable MONO output. All output channels are rated at +24 dBm maximum and are electronically balanced. The PROGRAM and AUDITION channels have "patch points" for external audio processing.

A microphone preamplifier board is provided which has 4 independent preamplifiers with electronically balanced inputs and outputs. The preamplifiers are unassigned and may be connected to any high-level console input. An additional microphone preamplifier board may be added to give a total of 8 microphone inputs.

For monitoring, the PACEMAKER consoles utilize a 2 watt per channel stereo headphone amplifier, a 2 watt mono cue amplifier, and a balanced stereo line-level monitor driver amplifier.

NOTE: Monitor amplifiers and Cue speaker are not provided.

Front panel switches are provided for selecting the signals to the headphone and monitor system. Either PROGRAM, AUDITION, or one of two AUXILIARY inputs may be selected. An additional feature is the CTP, "CUE TO PHONES" function. Any main console input may be assigned to the CTP bus thereby automatically placing that source in the left headphone whenever the associated channel is placed in "CUE".

Gain controls for the monitor driver, headphones, and cue amplifiers are mounted on the front panel and provide the DC control voltage for the various monitoring VCAs.

Two universal muting buses connect all input boards with each monitor board as well as the auxiliary general purpose relays in the power supply. Any main input may be assigned to either or both mute buses so that microphones and non-muted sources may be mixed on the same mixer channel.

The power supply is self-contained and may be operated from either 120 or 240 volts AC, 50 or 60 hz. The consoles are normally shipped wired for 120 volts but may be converted to 240 volts by a simple wiring change and replacement of the MOV spike protection device. The AC input as well as all output voltages are protected by fuses.

Provisions are made for installation of an optional AUTOCLOCK or AUTOCOUNT clock/timer unit.

SECTION 2

OPERATION

This section describes the front panel controls as well as the basic operating procedures for all PACEMAKER consoles. Where differences exist, each console will be covered separately. The final portion of this section will discuss the many options available to programming personnel.

FRONT PANEL CONTROLS

Six basic controls for each MIXER channel are available to the operator:

1. OFF — This lighted (RED) push-button switch turns the MIXER **OFF**.
2. ON — This lighted (GREEN) push-button switch turns the MIXER **ON**.
3. PGM — This push-on, push-off (GREEN) switch sends the MIXER audio to the PROGRAM Bus.
4. AUD — This push-on, push-off (RED) switch sends the MIXER audio to the AUDITION Bus.
5. MIX- — This push-on, push-off (YELLOW) switch sends the MIXER audio to the MIX MINUS Bus.
6. SLIDER — This slide control is used to adjust the level of the MIXER audio. A CUE detent position is available to send the audio to the CUE Bus.

PGM, AUD, and MIX - may be turned on at the same time to feed the MIXER audio to the PROGRAM, AUDITION, and MIX MINUS Buses.

The PROGRAM Bus is normally used to feed the transmitter and the AUDITION Bus is used to preview various sources without going ON-AIR. Generally, the MIX MINUS Bus is used to feed a telephone interface unit. By definition, MIX MINUS implies that everything except the telephone input channel is fed to the telephone SEND system. This arrangement will prevent unwanted feed-back and ringing. In practice, the MIX MINUS Bus is simply a Post-Fader switchable MONAURAL mix and could be used for any purpose.

INPUT SELECT SWITCHES

The PACEMAKER consoles use two types of INPUT SELECT switches: **DUAL** (2 inputs) and **MULTI** (8 inputs). The distribution of the switches depends upon the console model. Essentially, the input switch determines what source is controlled by the MIXER. Additionally, remote control (START, etc) will follow the input selected.

OTHER CONTROLS

In addition to the MIXER controls, various other selector switches are located on the front panel:

1. MONITOR — The MONITOR select switches are used to select the audio signal sent to the Monitor speakers. The sources selected may be PGM (Program), AUD (Audition), AUX 1, or AUX 2. Typically, the AUX inputs are used for OFF AIR monitors.

2. PHONES — The PHONES select switches are used to select the audio signal sent to the headphones. The sources selected may be PGM (Program), AUD (Audition), AUX 1, or AUX 2. Typically, the AUX inputs are used for OFF AIR monitors.

3. MONO — The MONO select switches are used to select which bus is fed to the MONO output: PROGRAM or AUDITION. The selected output is displayed on the MONO meter.

ALL PACEMAKERS EXCEPT PM-1032:

4. METER — The METER select switches are used to select either PROGRAM or AUDITION to feed the left and right channel stereo meters.

PACEMAKER PM-1032

5. CTP — The CTP (CUE-TO-PHONES) select switches turn this function OFF or ON (AUTO). The CTP system will operate only if the various circuit boards are programmed.

Three rotary volume controls are also located on the front panel: MONITOR LEVEL, HEADPHONE LEVEL, and CUE LEVEL. These controls set the audio level of the various monitoring systems.

TYPICAL OPERATING PROCEDURES

The following procedures are presented as examples only. The exact operating procedure depends on the operational needs of the user.

Example 1, Compact Disk Input.

First assume the following conditions; then, proceed to operation.
Conditions:

1. Left and right stereo inputs are connected to the input of MIXER Number 1, INPUT number 1.
2. Stereo PROGRAM line is the final output.
3. Audio output is monitored with stereo studio speakers.
4. All mixers are turned OFF.
5. All PGM, AUD, and MIX- switches are OFF.
6. The MONITOR LEVEL control is fully counter clockwise.
7. The MONITOR SELECT switch is set to OFF.
8. All MIXER slide controls are fully down but not in detent (CUE) position.
9. VU METER selector is in PGM.(does not apply to PM-1032)
10. MONO selector is in PGM.

Operation

1. Push INPUT 1 select switch on MIXER 1
2. Press PGM switch on MIXER 1.
3. Press PGM on MONITOR SELECT switch bank.
4. Press the ON switch on MIXER 1. (ON lamp should turn on). (The CD Player will start if connected to remote start circuit; otherwise, manually start the player.
5. Advance MIXER 1 slider until audio peaks on LEFT and RIGHT VU meters are indicating approximately 0 VU.
6. Adjust MONITOR LEVEL control until the sound from the studio speakers is at a comfortable level.

7. Note that the MONO VU meter is reading about the same as the left and right meters. If not, a phasing problem may be suspected.

Example 2, Microphone Input

Assume conditions are the same as in example 1 except that a microphone is connected to MIXER 2, Input 1 and that headphones are plugged into one of the two headphone jacks.

NOTE: In actuality, the microphone is connected to one of the isolated microphone pre-amplifiers which is then connected to the left and right inputs of MIXER 2, Input 1.

Operation

1. Select PGM on the PHONES SELECT switch bank.
2. Select PGM on the MONITOR SELECT switch bank.
3. Push Input 1 select switch on MIXER 2
4. Press the PGM switch on MIXER 2.
5. Press the ON switch on MIXER 2. If all programming options are in place, the MONITOR speakers will mute.
6. While talking into the microphone, advance the slider on MIXER 2 until audio peaks on VU meters indicate approximately 0 VU.
7. Adjust the PHONES LEVEL control until the sound from the stereo headphones is at a comfortable level.

Mono Output

The MONO output can be selected to either PROGRAM or AUDITION; therefore, the MONO output could be used to feed a monaural transmitter on PROGRAM while a stereo transmitter was being fed on AUDITION. The selectable Mono output thus makes simulcasting much simpler.

CUE-TO-PHONES

The CTP (Cue-to-Phones) feature is automatic if the various boards are programmed. When a slider is moved to the CUE position, the CUE program will be heard in the **LEFT** headphone. The **RIGHT** headphone will provide whatever is selected on the PHONES select switch. The headphone volume is adjusted with the PHONES level control. CUE-TO-PHONES is useful for monitoring some source when the Control Room microphone is turned ON thus muting the cue speaker (if this is programmed). Note: any input may be assigned to the CTP monitor so only certain sources can be heard if desired.

SECTION 3

THEORY OF OPERATION

OVERVIEW

Please refer to the associated Block Diagrams following this section as you read through the discussion. Drawing PM 2002 shows the basic audio configuration for the console while drawing PM 2003 is a simplified diagram of the various digital systems and Microphone Pre-amplifier. Drawing PM 2001 is a simplified drawing describing the mute functions. Only one typical Dual and Multi Line Input board is shown for clarity.

AUDIO SYSTEM

The general flow of signal will be discussed and while several boards of a particular type may be used, only one will be covered.

INPUT CIRCUITS

The input scheme (Universal Input Amplifier) used in the PACEMAKER series consoles allows many options when connecting sources to the INPUT Boards and the AUX inputs to the Monitor Board. A programmable attenuator network is used which can be set up to provide 600 ohm termination and 0, 10, or 20 dB of attenuation. Without the terminator, the input impedance is approximately 20k ohms. The first active stage is a balanced to unbalanced converter which acts much like an electronic transformer. This stage, as well as most other amplifiers in the PACEMAKER console, use TL074 low noise J-FET op-amps. Where higher output current is required, the NE5532 op-amp is used. The input stage is configured to be unity gain which gives an output of about 190 mv rms with a -10 dBu input signal and both attenuator jumpers off. There is about 55 mv loss in the input resistors. The next stage is used to provide voltage gain and fine level adjustment. The universal input amplifier is used wherever balanced input circuits are to be connected.

INPUT SELECT SYSTEM

In the Dual and Multi Line Input boards, the output of the universal input amplifier is connected to INPUT select electronic switches which are controlled by the input select switches (mechanical) on the front panel. In the case of the MULTI LINE units, the controlling signals are first converted to BCD and then decoded on the Multi Line Input Board.

VOLTAGE CONTROLLED AMPLIFIER

The output from the input select audio switches are connected to the Voltage Controlled Amplifier (VCA). Capacitive coupling is used here in order to assure no undesired dc offset voltage at the VCA input. The VCA is optimized for a nominal input of 37 ua rms which corresponds to about 1.2 volts rms from the universal input amplifier connected through a 33.2k resistor. One point which should be mentioned here is all resistors used in the PACEMAKER console are precision 1% metal film which are very low noise devices. The VCA used throughout the PACEMAKER console is the PRECISION MONOLITHICS SSM2122 which features full class A performance providing extremely good audio characteristics. Amplification and attenuation are employed to give improved signal to noise ratio. The 0 gain point relates to the calibration point for the front panel sliders (forth mark from top: 12 db gain in hand). Dc control for the channel VCAs is buffered by an op-amp which is configured to give a special "feel" to the sliders.

BUS SELECTION

A current to voltage converter stage follows the VCA and is used to drive the bus select switches. These switches are high voltage CMOS type DG212 which exhibit very low "on" resistance. 10k ohm resistors couple the switches to the Program and Audition mixing buses.

Two mono summing amplifiers are used on the Input Boards: pre-fader, and post-fader. These drive the Cue and Mix-Minus buses respectively. Again, DG-212 electronic switches and 10k mixing resistors employed.

OUTPUT AMPLIFIERS

The console has two OUTPUT amplifier boards which contain the mix amps for each of the program type buses: PROGRAM, AUDITION, and MIX-MINUS/MONO. The mix-amp is a summing node current input circuit which is operated at unity gain with respect to an individual Input Board. The output of the MIX amp is connected to a miniature plug type connector to route to external processing gear. The next stage is used for gain adjustment and buffering to the line driver amplifier.

The line drivers are connected in a bridge configuration to give about +26 dbm into a 600 ohm load; however, the actual drive impedance is very low. The output stage has bypassing for RF protection.

Following each output stage is a balanced to unbalanced converter which is used to provide monitoring, metering, and MONO drive.

A monaural amplifier is located on the OUTPUT board the function of which is determined by the Mother Board position. When plugged into the PROGRAM output position, the monaural output is MIX MINUS. When plugged into the AUDITION position, the monaural output is MONO (switch selected to either PROGRAM OR AUDITION). The output circuitry of the monaural amplifier is similar to the main stereo output.

The Monitor Output Board has a mix amp input stage which receives the signal from the monitoring bus. The monitoring bus audio is provided by the PROGRAM output amplifier, AUDITION output amplifier, or the AUX-1 and AUX-2 universal input amplifiers. Following the input stage is the VCA which is controlled by a dc voltage from the front panel gain control. The output amplifier is identical to that used in the program type output boards. Additionally, the muting buses are brought to the VCA via programmable jumpers which allow selecting mute options.

CUE/PHONES BOARD

The output from the Phones Mix Bus goes to the headphone portion of the CUE/PHONES Board. The input stages of this board consist of a virtual ground buffer, a VCA, and a current to voltage converter. Following the VCA buffer is a driver IC (NE5532) which supplies the current gain needed for the output booster transistors. The output is conservatively rated at 2 watts rms.

The CUE/PHONES Board has another power amplifier resident: the Cue amplifier. The input system of the cue amplifier is identical to that of the headphones with the addition of programmable jumpers to allow the VCA to be muted by either or both of the mute buses. The cue power amplifier is identical to that used for the headphones.

MICROPHONE PRE-AMPLIFIER

The Microphone Pre-amplifier Board uses a SSM-2015 I.C. as a true differential input amplifier. The unit is optimized for a source impedance of 150 ohms. The input circuit is capacitively coupled for use with "phantom-powered" microphones. A programmable jumper selects a shunt resistor in the resistive input network which will provide 10 dB attenuation. A special ferrite filter and associated capacitors provide R.F.I. filtering.

The output from the pre-amplifier is connected to the power stage by means of capacitor which helps prevent DC off-set. The nominal balanced output is -10 dBm.

DIGITAL SYSTEM

Typically, most digital circuitry is located on the INPUT and CONTROL boards; although, various other boards employ some digital switching.

CHANNEL CONTROL

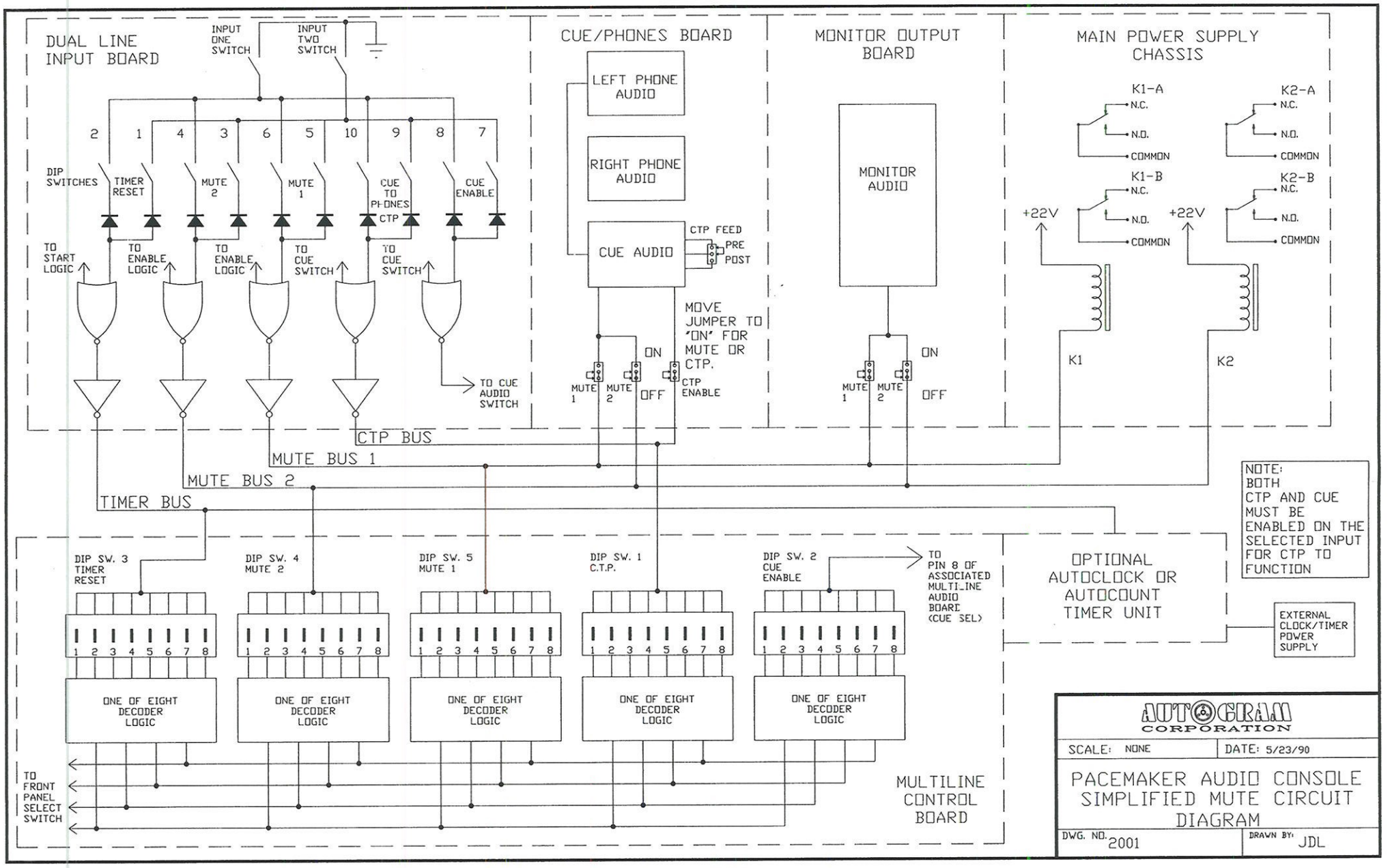
The front panel push-button switches (ON, OFF, PGM, AUD, MIX MINUS) are connected through a ribbon cable to the respective Input or Control Board. When a button is pressed, the associated circuit is pulled down to ground.

INPUT SELECT

In the DUAL LINE Input Board, the input select switches are connected to inverters which drive the electronic switches. In the MULTI LINE Input Board, the input select switches are encoded to BCD by means of a 74HC147 priority encoder and then decoded using a 74HC4051 decoder. This scheme was used to reduce the number of interconnect lines. Following the decoder are the electronic switches to select the audio signals.

CHANNEL LOGIC

A 74HC74 Flip-flop is used to handle the actual logical operations. It is connected to the ON - OFF switches and is used to generate the enable signals. The outputs of the flip-flop are connected to various drivers (via input select logic) to operate lamps and to provide external START and ENABLE controls as well as control for MUTING and TIMER reset.

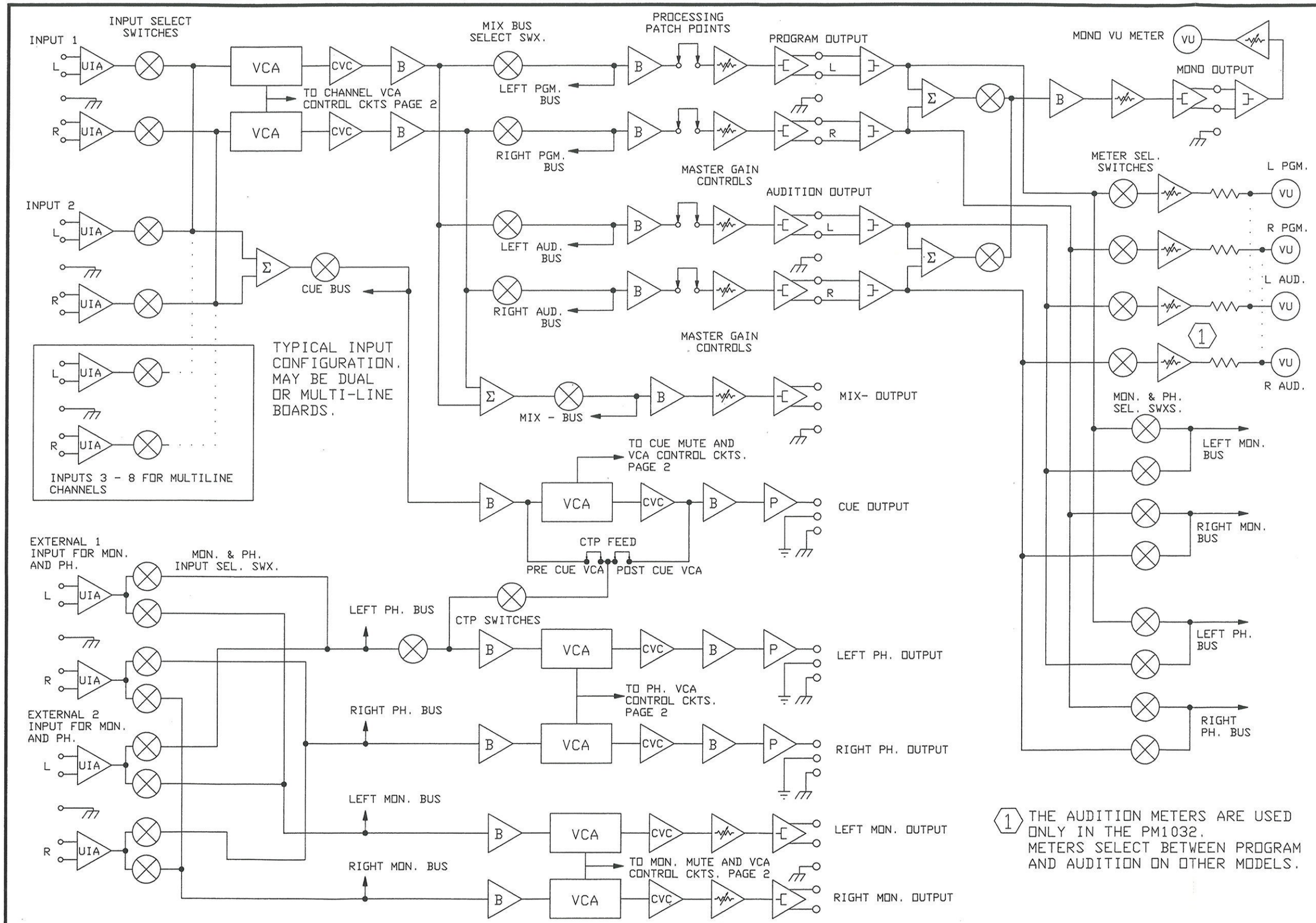


AUTOGRAM CORPORATION

SCALE: NONE	DATE: 5/23/90

PACEMAKER AUDIO CONSOLE SIMPLIFIED MUTE CIRCUIT DIAGRAM

DWG. NO. 2001	DRAWN BY: JDL



1 THE AUDITION METERS ARE USED ONLY IN THE PM1032. METERS SELECT BETWEEN PROGRAM AND AUDITION ON OTHER MODELS.

LEGEND

- UIA — UNIVERSAL INPUT AMPLIFIER STAGE
- B — INVERTING BUFFER AMPLIFIER STAGE
- ADJUSTABLE GAIN AMPLIFIER STAGE
- CVC — CURRENT TO VOLTAGE CONVERTER STAGE
- P — 2 WATT POWER AMPLIFIER STAGE
- UNBALANCED TO BALANCED CONVERTER STAGE
- BALANCED TO UNBALANCED CONVERTER STAGE
- Σ — SUMMING AMPLIFIER STAGE
- PROGRAMMING JUMPER
- VCA — VOLTAGE CONTROLLED AMPLIFIER
- VU — VU METER
- PLUGGABLE BUCHANAN CONNECTOR
- ELECTRONIC SWITCH

AUTOGRAM CORPORATION

SCALE: NONE | DATE: 4-10-90

PACEMAKER AUDIO CONSOLE BLOCK DIAGRAM PAGE 1

DWG. NO. PM2002 | DRAWN BY: JDL

MULTILINE SELECT

PROGRAM
AUDITION
MIX –

TO BUS SELECT SWITCHES PAGE-1

INPUT 1
INPUT 2
INPUT 3
INPUT 4
INPUT 5
INPUT 6
INPUT 7
INPUT 8

EIGHT LINE TO BCD EN-CODER

BCD TO ALL DECODERS

DECODER

MOM. START PULSE

CONT. ENABLE

ON

OFF

ON-OFF LOGIC

N

MUTE TO CHANNEL VCA PAGE-1

SLIDER

DC AMP. FOR SLIDER

N

CONTROL TO CHANNEL VCA PAGE-1

CUE

DECODER

D

TO CUE BUS SELECT SWITCH PAGE-1

DECODER

D

TO CTP SWITCHES PAGE-1

DECODER

D

TIMER RESET

DECODER

D

MUTE BUS 1

DECODER

D

MUTE BUS 2

REPRESENTS 1 OF 8 IDENTICAL UNITS.

D

START O.C. OUTPUT

D

ENABLE O.C. OUTPUT

NOTE: ALL OPEN COLLECTOR OUTPUTS 50V/300MA +DC

DUAL LINE SELECT

PROGRAM
AUDITION
MIX –

TO BUS SELECT SWITCHES PAGE-1

INPUT 1
INPUT 2

INPUT SELECT LOGIC

TO INPUT SELECT SWITCHES

ON

OFF

ON-OFF LOGIC

MOM. START PULSE

CONT. ENABLE

N

MUTE TO CHANNEL VCA PAGE-1

SLIDER

DC AMP. FOR SLIDER

N

CONTROL TO CHANNEL VCA PAGE-1

CUE

SPECIAL FUNCTION LOGIC

TIMER RESET
MUTE 1
MUTE 2
CUE ENABLE
CUE TO PHONES (CTP)

REPRESENTS ONE OF TWO IDENTICAL UNITS

D

START O.C. OUTPUT

D

ENABLE O.C. OUTPUT

NOTE: ALL OPEN COLLECTOR OUTPUTS 50V/300MA +DC

MONITOR SELECT

PROGRAM
AUDITION
EXT. 1
EXT. 2

TO MONITOR SELECT AUDIO SWITCHES

MONITOR GAIN

N

TO MONITOR VCA

TO MUTE BUSES

N

TO MONITOR VCA MUTE PORT

DECODER

TO AUDIO INPUT SELECT SWITCHES ON MULTILINE AUDIO BOARD

PHONES SELECT

PROGRAM
AUDITION
EXT. 1
EXT. 2

TO PHONES SELECT AUDIO SWITCHES

PHONES GAIN

N

TO PHONES VCA

CUE GAIN

N

TO CUE VCA

TO MUTE BUSES

N

TO CUE VCA MUTE PORT

MICROPHONE PREAMPLIFIER

RFI FILTER

BALANCED MIC. PRE AMP

ONE OF FOUR IDENTICAL UNITS

LEGEND

- UNBALANCED TO BALANCED CONVERTER STAGE
- INVERTING BUFFER AMPLIFIER STAGE
- NON-INVERTING BUFFER STAGE
- NOR GATE
- INVERTER
- 8 POSITION DIP SWITCH
- 10 POSITION DIP SWITCH
- DECODER — ONE OF EIGHT DECODER
- OPEN COLLECTOR DRIVER
- PLUGGABLE BUCHANAN CONNECTOR
- PROGRAMMING JUMPER
- LIGHTED PUSHBUTTON SWITCH
- ELECTRONIC SWITCH
- PUSHBUTTON SWITCH

AUTOGRAM CORPORATION

SCALE: NONE | DATE: 4-11-90

PACEMAKER AUDIO CONSOLE BLOCK DIAGRAM PAGE 2

DWG. NO. PM2003 | DRAWN BY: JDL

SECTION 4

INSTALLATION

This section will discuss the installation procedures for the PACEMAKER series consoles. Please refer to the drawings at the end of the section for connection information.

UNPACKING AND INSPECTING THE EQUIPMENT

Remove all packing material an carefully lift the console from the package. Retain the packing list. Inspect the console for damaged or missing components. Check all controls for ease of operation. Any claims for damage should be filed promptly with the transportation agency. If such claims are to be filed, all packing material must be retained.

INSTALLATION

The arrangement of studio and control room facilities determines the location of the console in a particular station. Carefully plan theplacement of equipment and wiring before beginning installation. Placement is not critical but approximately 15.24 cm (6 inches) should be left at the rear of the unit to allow for adequate ventilation. For access to all internal connections, lift the front edge of the unit top and fold back; the front panel can then be pulled forward and down. The top and front panels are held in the fully open position by retaining cables. Approximately 78.74 cm (31 inches) front to back is required for the fully open unit. All source, output, clock/timer, and mute relay wiring is made on miniature pluggable screw-type connectors which are located on the various circuit boards or the power supply chassis.

During installation the following rules should be followed to eliminate grounding problems:

A. Ground input and output cable shields at console end only (except for microphone inputs).

B. Use standard audio shielded twisted pair with insulated cover.

C. Audio leads should be separated from power and control wiring.

D. Use 1- to 2-inch ground strap to connect the console chassis to common studio ground.

BE SURE THAT CABLE SHIELDS DO NOT COME IN CONTACT WITH ANYTHING BUT GROUNDING TERMINALS.

WIRING INSTRUCTIONS

Console location and type of installation determine the position of the input, output, control, and primary power wiring. Refer to the Base Drawings at the beginning of this manual for access hole locations. Openings at the rear and bottom of the console provide access to the various boards for incoming and outgoing leads. If wiring is to enter from the bottom of the console, corresponding holes must be cut through the table top for wiring access.

CONNECT PRIMARY POWER ONLY AFTER ALL OTHER CONNECTIONS ARE MADE.

NOTE

UNLESS OTHERWISE SPECIFIED, THE CONSOLE WAS FACTORY WIRED FOR 120 VOLTS A.C. PRIMARY POWER.

ALL CONTROL OUTPUTS FROM THE DUAL LINE INPUT BOARDS AND CONTROL BOARDS ARE OPEN COLLECTOR TO GROUND RATED AT 50v (+) dc 300 ma MAXIMUM. IF THE INSTALLATION REQUIRES AC OR SOMETHING OTHER THAN A COSURE TO GROUND, AN EXTERNAL RELAY OR SIMILAR DEVICE MUST BE USED.

Please refer to the drawings and charts at the end of this section for connection data for the various boards.

AUTOCLOCK OR AUTOCOUNT INSTALLATION.

If the clock is not mounted in console, do so at this time. Be sure to use the small metal spacers provided with the clock. Refer to the clock/timer manual for mechanical installation using procedures outlined for the AC-8 console. All PACEMAKER consoles are shipped with an attached edge connector for the AUTOCLOCK or AUTOCOUNT units whether or not the clock/timer was ordered in the console. If adding a clock/timer, remove the edge connector shipped with the clock; replace it with the connector attached to the console. Be sure the BLACK and BROWN wires are on the top.

All connections for the AUTOCLOCK /AUTOCOUNT are made on the 10 pin Buchanan type connector located on the right front edge of the PACEMAKER Mother Board. (NOTE: Pin one is nearest the front).

FOR BOTH AUTOCLOCK AND AUTOCOUNT UNITS:

1. Connect + wire from the included Power Pack to pin 1.
2 Connect - wire from Power Pack to pin 2.
3. An external switch may be connected to pin 10 for remote timer reset. Of course the console will automatically reset the timer upon pressing an "ON" switch if the respective timer enable dip switch is turned on. (More on this later.)

FOR AUTOCLOCK ONLY:

4. Connect red (+) wire from temperature probe to pin 5.
5. Connect black (-) wire from temperature probe to pin 4.
6. The console mounted AUTOCLOCK may be either a transmitter or a receiver (for communication to other AUTOCLOCKS). Two programming jumpers located on the console meter board select the mode: Move the jumpers to "T" for transmit or "R" for receive. Connect to pins 7 (+) and 6 (-) on Mother Board for the communications signals.
7. External switches may be connected to pins 8 and 9 for "SET" and F/C respectively. These are also the pins used to connect a TOP-OF-

HOUR sync relay. See AUTOCLOCK manual for details.

BUCHANAN CONNECTOR WIRING

To install wires in the Buchanan type miniature screw-type plug-in connectors: (See drawing on page 4-5)

1. Strip wires about 1/4 inch.
2. Tin stranded wires if desired (this step is not required).
3. Push wire down as far as possible into connector.
4. Tighten screws as much as possible with small screwdriver.

SPECIAL INSTALLATION CONSIDERATIONS

1. Various board options must be programmed by use of the program jumpers and DIP switches. (See Board drawings at the end of this section).
2. Either or both Muting buses may be used. Generally, Mute Bus 1 is used for the control-room microphone, and Mute Bus 2 is used for another studio or auxiliary functions.
5. Any external relays controlled by the "OPEN-COLLECTOR" outputs **MUST** have spike-suppression diodes across the coils.
6. If the device (cart machine,etc.) being controlled by the open collector output has a separate ground terminal for its control circuits, connect this to the ground terminal on the respective control output connector. This is to help isolate conducted static electricity.
7. Connect MONO sources to BOTH left and right inputs. This may be done by connecting to the left channel and simply jumpering to the right. In this manner the source is correct in any input position.

8. **DO NOT GROUND EITHER SIDE OF OUTPUT CHANNELS.** If you require and unbalanced output from Program, Audition, Mix Minus, or Monitor simply connect to either the + or - output terminal. The - terminal will give a phase reversal.

9. When connecting consumer equipment which uses the RCA pin type connector, use standard SHIELDED PAIR audio cable. Connect the red wire to the pin and the black wire to the shell. Connect the shield at the console ONLY.
10. When adjusting the external monitor amplifier, turn the console monitor gain pot to maximum. Adjust the external monitor amplifier gain to the maximum loudness desired.

LIST OF JUMPER/DIPSWITCH OPTIONS

MICROPHONE PRE-AMPLIFIER BOARD

A jumper is provided for each pre-amp to allow 10 dB attenuation.

DUAL LINE INPUT BOARD

INPUT JUMPERS — Set up for input for both left and right channels:

1. 600 ohm termination "ON" or "OFF".
2. Level select. On= 10 dB attenuation.
3. Level select. On= 20 dB attenuation

Note: trimmer pots give about 15 dB of fine adjustment.

DIP SWITCH PROGRAMMING

Controls special functions:

1. TIMER-2, Allows AUTOCLOCK/AUTOCOUNT timer to be reset for input 2 when "ON" button is pressed.
2. TIMER-1, Allows AUTOCLOCK/AUTOCOUNT timer to be reset for input 1 when "ON" button is pressed.
3. MUTE2-2, selects Mute bus 2 to be activated from input 2 when the Mixer is ON.
4. MUTE2-1, selects Mute bus 2 to be activated from input 1 when the Mixer is ON.
5. MUTE1-2, selects Mute bus 1 to be activated from input 2 when the MIXER is ON.
6. MUTE1-1, selects Mute bus 1 to be activated from input 1 when the MIXER is ON.
7. CUE-2, allows the cue to function on input 2 (on= enable)
8. CUE-1, allows the cue to function on input 1.
9. CTP-2, allows CTP (Cue-to-Phones) to function on input 2.
10. CTP-1, allows CTP to function on input 1.
    (NOTE: For CTP to function, the respective CUE dip switch must be enabled, the channel IN CUE, the CTP enable jumper in place on the CUE/PHONES Board, and the CTP front panel switch engaged <PM-1032 only>).

MULTILINE INPUT BOARD

INPUT JUMPERS — Set up for input for both left and right channels:

1. 600 ohm termination "ON" or "OFF".
2. Level select. On= 10 dB attenuation.
3. Level select. On= 20 dB attenuation

Note: trimmer pots give about 15 dB of fine adjustment.

CONTROL BOARD

DIP SWITCH PROGRAMMING

Five 8 position DIP switches provide programming for each of the eight Multi Line inputs. Dip position 1 corresponds to input 1, etc.

DIP SWITCH ONE

CTP BUS, selects which input, if any, will activate the Cue-to-Phones function. ON = enable.
(NOTE: For CTP to function, the respective CUE dip switch must be enabled, the channel IN CUE, the CTP enable jumper in place on the CUE/PHONES Board, and the CTP front panel switch engaged <PM-1032 only>).

DIP SWITCH TWO

CUE, selects which input will allow cue. ON = enable.

DIP SWITCH THREE

TIMER, selects which input will reset the Timer.

DIP SWITCH FOUR

MUTE 2, select which input will activate Mute Bus 2.

DIP SWITCH FIVE

MUTE 1, select which input will activate Mute Bus 1.

MONITOR OUTPUT BOARD

Input set up for AUX 1 and AUX 2 monitoring inputs

INPUT JUMPERS
Set up for input for both left and right channels:
1. 600 ohm termination "ON" or "OFF".
2. Level select. On= 10 dB attenuation.
3. Level select. On= 20 dB attenuation

Note: trimmer pots give about 15 dB of fine adjustment.

MUTE JUMPERS
MUTE BUS 1 OR MUTE BUS 2. Select which Mute Bus will mute monitor.

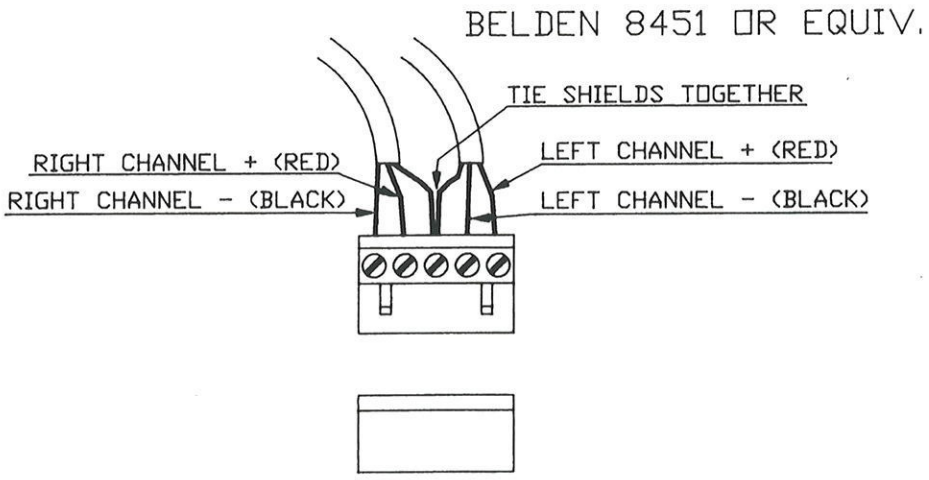
CUE/PHONES BOARD

1. CTP, Enable the CUE TO PHONES function.
2. MUTE BUS 1 or 2, selects which mute bus will mute the CUE speaker (NOT PROVIDED).
3. CTP FEED, selects the feed for the CTP
   PRE, feed is from before cue fader. (NORMAL)
   POST, feed is from after cue fader.

CLOCK/TIMER CONNECTIONS ON MOTHERBOARD

Note: Pin 1 is nearest the front of console.

1	+9 volts
2	Power Ground
3	AUDIO GROUND
4	Temperature Probe -
5	Temperature Probe +
6	Communications -
7	Communications +
8	Set
9	F/C
10	Timer reset



TYPICAL PLUG IN INPUT CONNECTION

MOTHER BOARD POSITION

MODEL	1	2	3	4	5	6	7	8	9
PM-648	MPA	MPA	MLA	MLC	MLA	MLC	MLA	MLC	MLA
PM-828	MPA	MPA	DLI	DLI	DLI	DLI	DLI	DLI	X
PM-1032	MPA	MPA	DLI	DLI	DLI	DLI	DLI	DLI	DLI
PM-618	MPA	MPA	DLI	DLI	DLI	DLI	DLI	X	X

10	11	12	13	14	15	16	17	18
MLC	MLA	MLC	MLA	MLC	PGM AOB	AUD AOB	MOB	CHB
X	MLA	MLC	MLA	MLC	PGM AOB	AUD AOB	MOB	CHB
DLI	MLA	MLC	MLA	MLC	PGM AOB	AUD AOB	MOB	CHB
X	X	X	MLA	MLC	PGM AOB	AUD AOB	MOB	CHB

MLA – 8 LINE AUDIO BOARD
DLI – DUAL LINE INPUT BOARD
MPA – MICROPHONE PRE-AMP BCARD
AOB – AUDIO OUTPUT BOARD
MOB – MONITOR OUTPUT BOARD
MCB – MULTILINE CONTROL BOARD
CHB – CUE / HEADPHONE BOARD

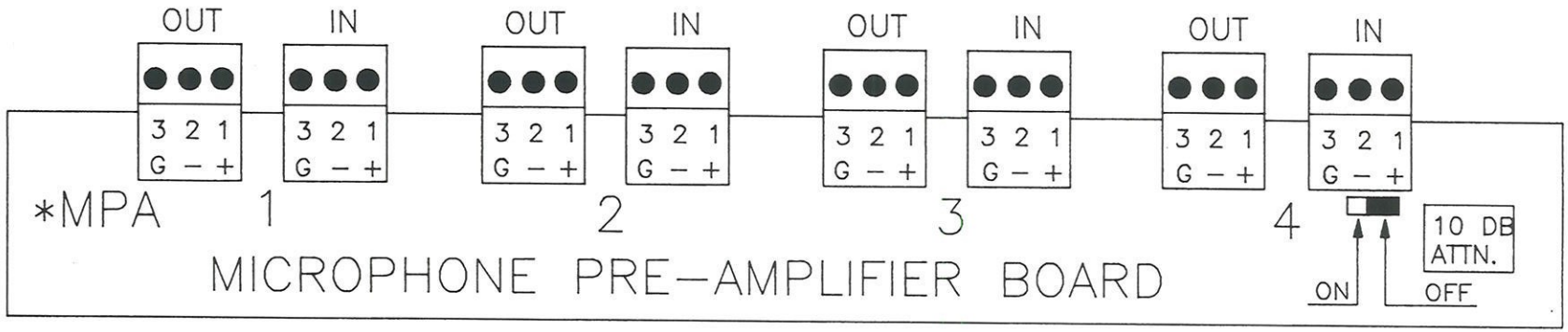
AUTOGRAM CORPORATION

SCALE: NONE | DATE: 6/6/90

BOARD LOCATIONS ON MOTHERBOARD

DRAWN BY: DJW | PAGE 4-6

CONNECTION DIAGRAM



ONLY ONE ATTENUATOR IS SHOWN

MOVING JUMPER TO "ON" WILL REDUCE MICROPHONE LEVEL BY 10 dB.

AUTOGRAM CORPORATION	
SCALE: NONE	DATE: 6/6/90
MICROPHONE PRE–AMP BOARD	
DRAWN BY: DJW	PAGE 4-7

CONTROL OUTPUTS: 300 MA/ 50V +DC MAX ONLY OPEN COLLECTOR TO GROUND

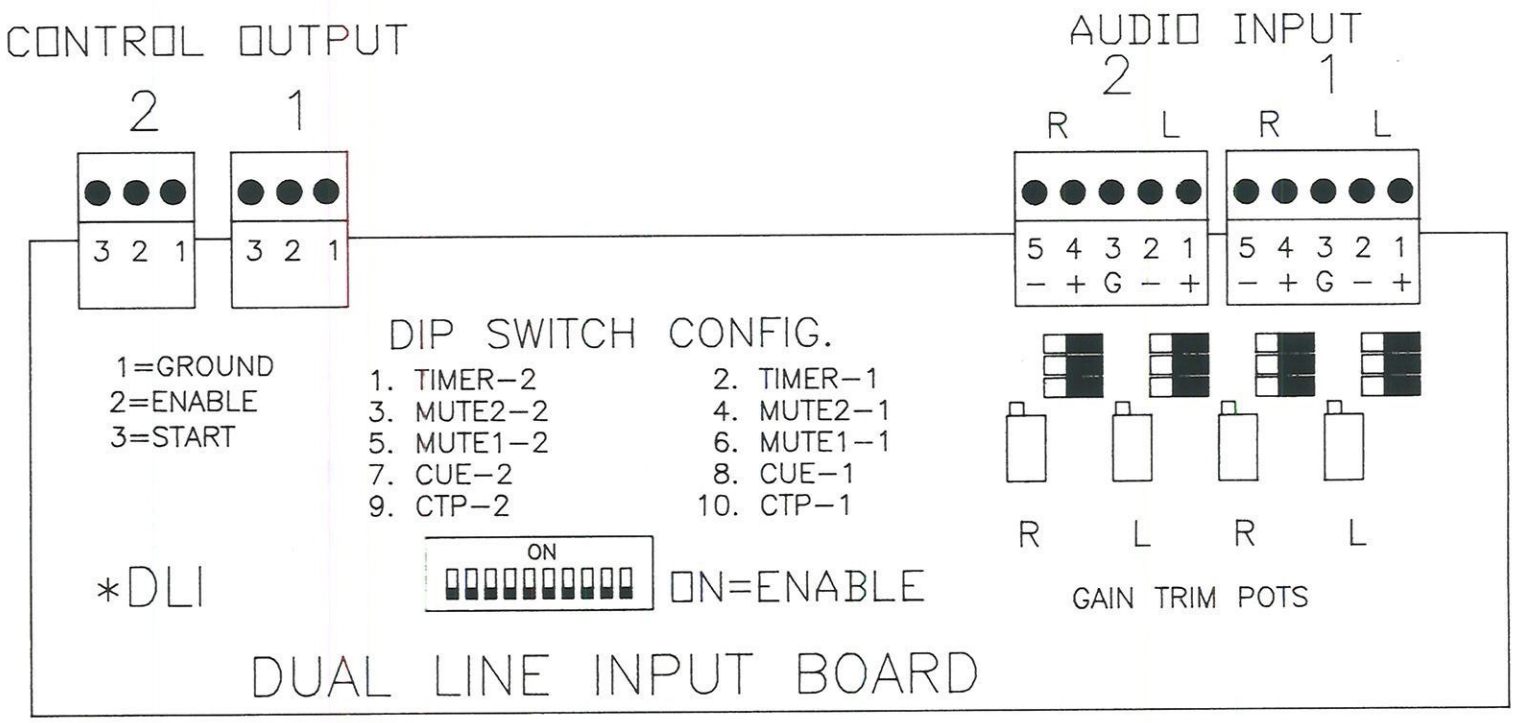
INPUT JUMPERS

ON OFF

TERMINATION

10 DB ATTN.

20 DB ATTN.

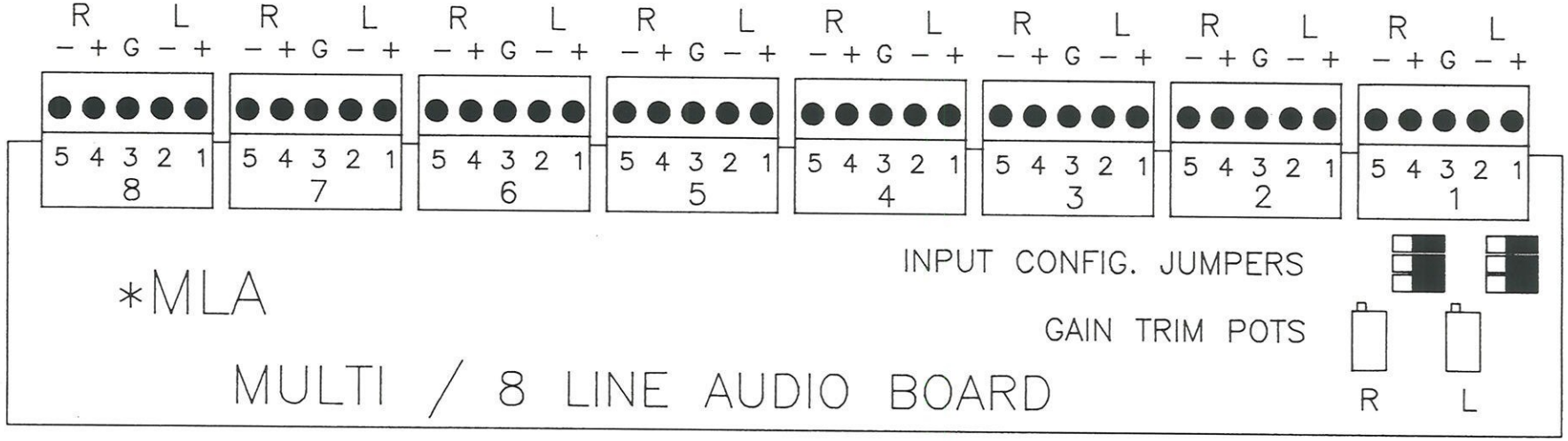


ALL INPUTS SET FOR -10 dBu 20K OHM BALANCED BRIDGING

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 6/7/90
DUAL LINE INPUT BOARD	
DRAWN BY: DJW	PAGE 4-8

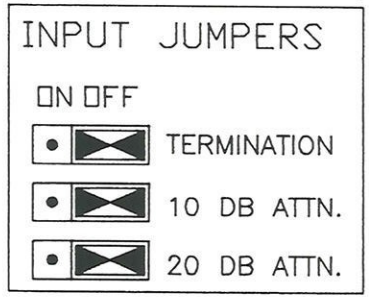
AUDIO INPUTS



*MLA

MULTI / 8 LINE AUDIO BOARD

JUMPERS AND POTS ARE INCLUDED FOR EACH INPUT. ONLY ONE SHOWN

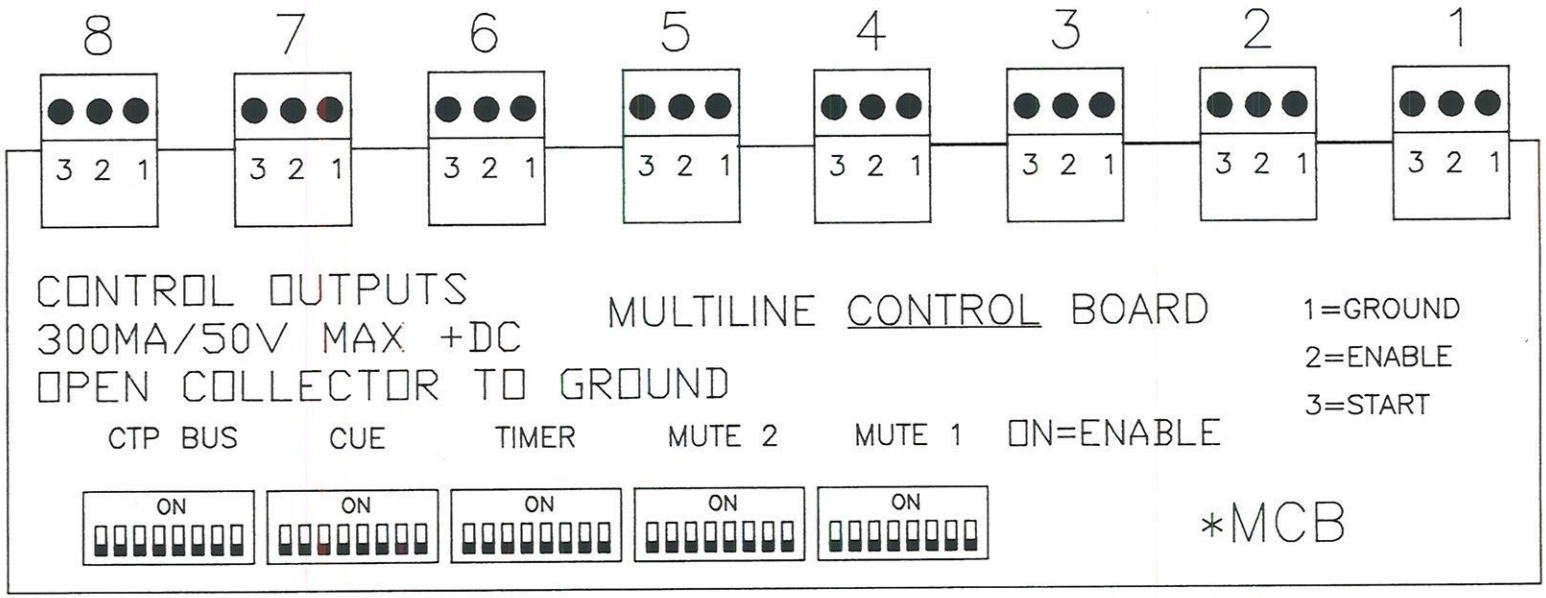


ALL INPUTS SET FOR −10 dBu 20K OHM BALANCED BRIDGING

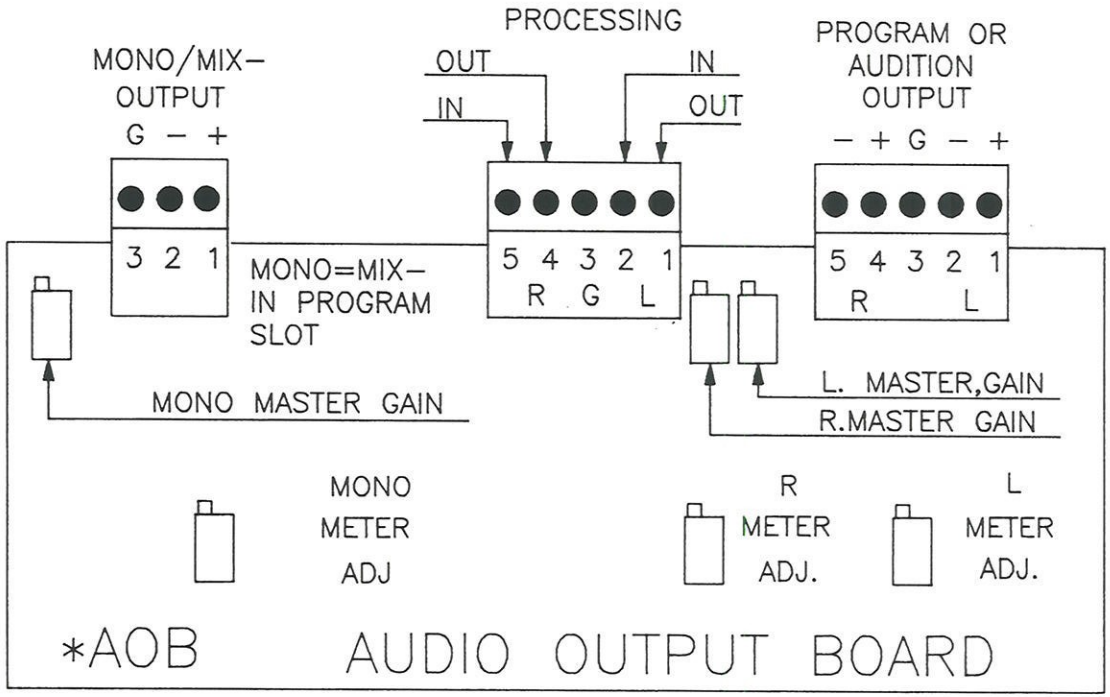
AUTOGRAM CORPORATION

SCALE: NONE	DATE: 6/7/90
MULTI / 8 LINE AUDIO BOARD	
DRAWN BY: DJW	PAGE 4-9

CONTROL OUTPUTS

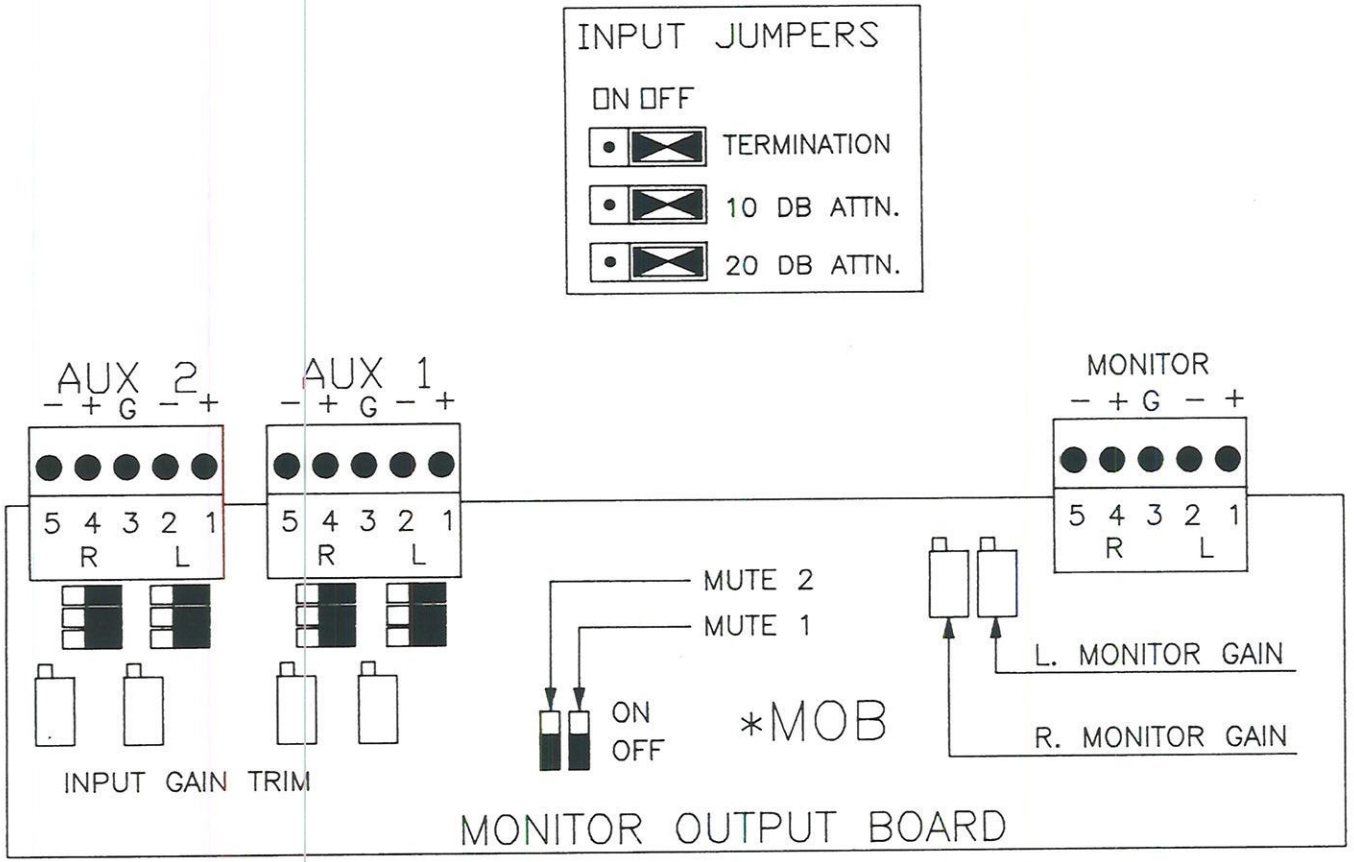


AUTOGRAM CORPORATION	
SCALE: NONE	DATE: 6/7/90
MULTILINE CONTROL BOARD	
DRAWN BY: DJW	PAGE 4-10



THE MONO OUTPUT IS "MIX MINUS" ON THE PROGRAM OUTPUT BOARD AND IS "MONO" ON THE AUDITION OUTPUT BOARD.
THE "MONO" OUTPUT IS SWITCHABLE TO EITHER PROGRAM OR AUDITION BY THE FRONT PANEL MONO SWITCH.

AUTOGRAM CORPORATION	
SCALE: NONE	DATE: 6/7/90
AUDIO OUTPUT BOARD	
DRAWN BY: DJW	PAGE 4-11



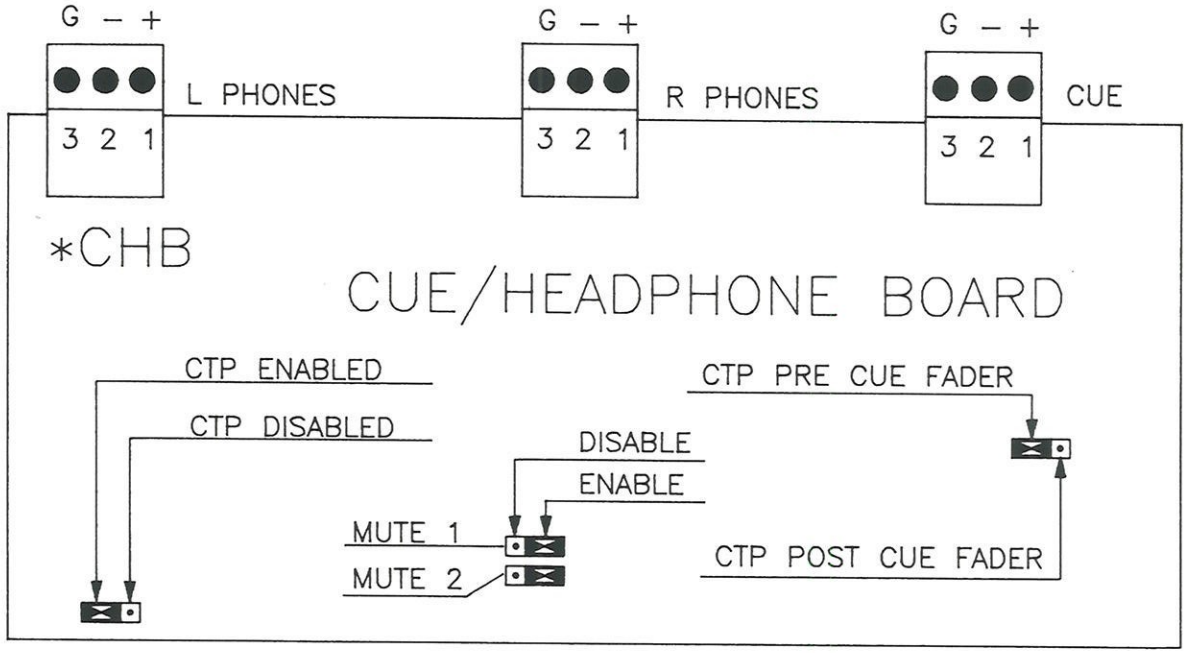
ALL INPUTS SET FOR -10 dBu 20K OHM BALANCED BRIDGING.

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 6/7/90

MONITOR OUTPUT BOARD

DRAWN BY: DJW	PAGE 4-12



CONSOLES ARE SHIPPED WITH MUTES OFF,
CTP ENABLED AND SET TO PRE-FADER.

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 6/7/90

CUE / HEADPHONE BOARD

DRAWN BY: DJW	PAGE 4-13

SECTION 5

PACEMAKER CONSOLE CALIBRATION.

NOTE: NEW CONSOLES HAVE BEEN CALIBRATED FOR -10 dBu INPUT AND +8dBm OUTPUT LEVELS

EQUIPMENT NEEDED.

1. Low distortion audio oscillator with **BALANCED** output.
2. Distortion analyzer with **BALANCED** input and 600 ohm termination.
3. Digital type multi-meter with ac volts capability (true r.m.s. type is preferred).

PROCEDURE.

1. Select a Dual Input Board (Multi Line Input board in PM-648) to be used for the calibration procedure.
2. Remove the selected Board and install on Extender board. Set the input jumpers for both Left and Right channels (on the desired input) to NO termination and -10 dBm range (ALL JUMPERS OFF).
3. Connect the audio oscillator to the selected input. If the oscillator does not have separate connections for both Left and Right channels: connect to the Left channel and jumper to the Right channel.
4. Set the oscillator to 1.0 Khz with sufficient level to produce 245 mv rms (-10dBu) measured at the input terminals with the digital multi-meter.
5. Turn the PROGRAM, AUDITION, and MIX MINUS switches ON.
6. Place the associated slider at the calibrate position (fourth line from top). Turn MIXER ON.
7. Adjust the **LEFT** level trim pot for 1.3 v. r.m.s. as measured on pin 8 of IC U16 (Pin 1 of U19 on MULTI LINE Board).
8. Adjust the **RIGHT** level trim pot for 1.3 v. r.m.s. as measured on pin 7 of 1 of IC U16 (Pin 14 of U19 on MULTI LINE Board.
9. Remove power. Replace Board. Turn on power, push ON switch.
10. Connected the Distortion Analyzer to the Left Channel Program output. Terminate output into 600 ohms.

*****NOTE1: THE DISTORTION ANALYZER MUST HAVE A BALANCED INPUT. THE OUTPUT BOARDS MAY BE DAMAGED IF EITHER + OR - IS GROUNDED. USE A HIGH QUALITY TRANSFORMER IF AN UNBALANCED ANALYZER MUST BE USED.**

11. Adjust the **LEFT** channel PROGRAM master gain control (on Program Output Board) to provide +8 dBm as read on Analyzer. At this time the OUTPUT level may be adjusted to another reference level (+4 dBm, 0 dBm, etc).

12. Connected the Distortion Analyzer to the Right Channel Program output. Terminate output into 600 ohms.

13. Adjust the **RIGHT** channel PROGRAM master gain control (on Program Output Board) to provide +8 dBm as read on Analyzer. At this time the OUTPUT level may be adjusted to another reference level (+4 dBm, 0 dBm, etc).

14. Repeat steps 11-13 for the AUDITION Board, adjusting the Audition master gain controls with the analyzer connected to the respective Audition outputs.

15. Adjust meter calibration trimmers for 0VU on the Left and Right channel VU meters. Adjust both PROGRAM and AUDITION meter trim pots. Use Meter select switch to select PROGRAM and AUDITION signals (not required with PM-1032) Be sure outputs are terminated into 600 ohms when adjusting meters.

16. Connect Analyzer to the MONO output and terminate with 600 ohms. ***Be sure MONO select switch is in PGM.***

17. Adjust the MONO Master gain control for +8 dBm (or another reference level, if desired) as indicated by the analyzer.

18. Adjust the MONO meter calibration trimmer for 0VU on the MONO meter.

19. Connect the Analyzer to the Mix Minus Output. Terminate with 600 ohms.

20. Adjust the Mix - Master Gain Control to give +8 dBm (or another reference level, if desired) as indicated on the analyzer.

21. Push in PGM button on MONITOR Select switch.

22. Turn front panel MONITOR GAIN Control fully clockwise.

23. Connect analyzer to the LEFT Channel MONITOR output.

24. Adjust Left channel MONITOR MASTER GAIN CONTROL (on Monitor output board) to provide +8dBm (or another reference level) as read on the analyzer.

25. Repeat for the right channel.

SECTION 6

DEBUG

The purpose of this section is to aid in trouble shooting the PACEMAKER series consoles.

For the most part, the procedure will be to identify and replace offending circuit boards as board level repair normally requires specialized equipment.

1. Check the connection of the power cord to the AC outlet and power supply.
2. Check the power outlet. Verify the AC voltage is between 110 (220)and 130 (260) volts.
3. Check that the power switch is ON.
4. Make the following measurements on the two 12 pin flat MOLEX connectors on the MOTHERBOARD:

NOTE* Remove the CUE/PHONES BOARD for access. The pin assignment follows the nomenclature on the POWER SUPPLY chassis.

Connect the ground lead of the test meter to chassis.

NOTE* if you have removed the power supply, connect the meter ground to a GND pin as the chassis is floating.

P2 pin 1	+21.5 volts
P2 pin 5	-11.6 volts
P2 pin 8	+11.6 volts
P1 pin 1	-16.5 volts
P1 pin 2	+16.5 volts
P1 pin 3	+5.0 volts
P1 pin 4	+4.6 volts (approx. mute line)
P1 pin 5	+4.6 volts (approx. mute line)
P1 pin 8	-11.6 volts
P1 pin 9	+11.6 volts
P1 pin 11	-11.6 volts
P1 pin 12	+11.6 volts

The above represents the normal status of the power supply. If variations are discovered, check all MOLEX connectors for tightness. It is possible for a component failure on a specific board to cause a fuse to blow or a regulator to shut down. Turn off Power, then remove all boards. Turn on power. Recheck voltages. If voltages are still incorrect, then check associated fuse. If voltages are now correct, replace the boards one at a time until the defective board is found.

Defective components on the front panel may be identified by swapping the ribbon cables to different mixers. Audio sources can also be moved around to help identify problems on the Input Boards.

Using a 1Khz tone and a digital ac voltmeter is very helpful in tracking down specific problems. Test notes are shown on the various schematic diagrams which can give clues to problem areas.

****** BE SURE THAT NEITHER SIDE OF A BALANCED OUTPUT STAGE IS GROUNDED.**

SECTION 7

CIRCUIT BOARD DESCRIPTION

MICROPHONE PREAMPLIFIER BOARD

The Microphone Preamplifier board uses a high quality ultra-low noise integrated circuit amplifier for each of the 4 independent sections. The inputs are true balanced differential with special RFI filtering while the outputs feed -10 dbm balanced (600 ohms) for connecting to external processing or to the desired input channel. A jumper selectable 10 dB pad is available on each preamplifier input to accommodate higher output microphones. Each input is optimized for a 150 ohm source impedance.

DUAL LINE INPUT BOARD

The Dual Line Input Board is not used in the PACEMAKER PM-648 console but is used in the PM-618, PM-828, and PM-1032 models.

Either of two stereo inputs may be selected with complete level programming provided for each. Source levels between -15 and +15dBu balanced or unbalanced may be accommodated.

Other programming functions on the Dual Line Input Board are made on a 10 position DIP switch which allows for independent selection of Cue Enable, CTP, Timer reset, Mute 1, and Mute 2 buses.

TL074 JFET operational amplifiers are used for all audio functions while the level is controlled by a SSM2122 type VCA. Audio switching is performed using DG-212 High Voltage CMOS analog switches and 74HC type devices provide logic operations. Lamp drivers and machine control drivers are ULN2804 Darlington elements. Start (momentary) and Enable (continuous) control outputs are rated at **300ma/ 50v (+) d.c. open collector to GROUND**. For starting devices which require different switching arrangements, a relay or optical isolator will be needed.

MULTI (8) LINE INPUT BOARD

The Multi Line Input Board is used in all versions of the PACEMAKER console. In the PM648, all main inputs are via this board. While functionally equivalent to the Dual Line Input Board, some differences exist: All logic and special function programming switches are moved to the companion Control Board and the number of inputs is expanded to eight.

CONTROL BOARD

The Control Board is designed to be used only in the Mother Board slot adjacent to a Multi Line Input Board. It provides independent functions for each of eight selected inputs. Machine control as well as various programming options are available. Five 8 position DIP switches provide programming for Cue enable, CTP, Timer Reset, Mute Bus 1, and Mute Bus 2 which are assignable to any or all eight inputs. Lamp drivers and machine control drivers are ULN2804 Darlington elements. Start (momentary) and Enable (continuous) control outputs are rated **300ma/ 50v (+) d.c. open collector to GROUND**. For starting devices which require different switching arrangements, a relay or optical isolator will be needed.

AUDIO OUTPUT BOARD

Two identical Audio Output Boards are used in all PACEMAKER consoles: PROGRAM and AUDITION. Each board contains 1 stereo and 1 MONO output. If the board is inserted in the slot allocated for the PROGRAM output channel, the stereo output becomes PROGRAM Out and the MONO output becomes the MIX MINUS output. If the board is inserted in the slot allocated for the AUDITION output channel, the stereo output becomes AUDITION Out and the MONO output becomes the main MONO output which is selectable from the front panel to be either the PROGRAM or AUDITION monaural sum.

The Audio Output Board contains meter buffer amplifiers and the necessary DG212 switches to select various meter configurations. DG212 switches are also located on this board to select the monitor and phones PROGRAM or AUDITION feed.

A Master gain control is provided for each of the electronically balanced outputs and an insertion patch point is available to connect to external processing equipment. The output devices used are NE5532 type operational amplifiers which are connected in a typical balanced bridge configuration.

MONITOR OUTPUT BOARD

The Monitor Output Board provides an electronically balanced output to drive an external (user supplied) monitor power amplifier. A SSM2122 VCA is provided to control the audio level sent to the power amplifier. Programming jumpers are used to select which Mute bus mutes the monitor. Two auxiliary audio inputs are provide to connect air monitors, etc. to the console monitoring system. DG212 switches select the feed of the aux signals to the monitor or headphones. The auxiliary inputs have the input programming similar to the main console inputs.

CUE/PHONES BOARD

The Cue/Phones Board provides power amplifiers for the headphones and an external Cue speaker. The actual source feeding the headphones is selected via the front panel switch which controls the DG212 devices on the PROGRAM, AUDITION, and Monitor output Boards.

Programming jumpers are provided to select various functions:

1. CUE MUTING, mute bus 1 and/or mute bus 2.
2. CTP STATUS, enabled or disabled.
3. CTP FEED, pre Cue fader or post Cue fader.

With the CTP system activated, any selected source (must be assigned to the CTP bus and Cue enabled) will appear in the left headphone when that associated slider is placed in CUE. When the CTP feed is set to pre-fader, this signal will not mute. The CTP level is controlled by the Headphone front panel level only. When the CTP feed is set to post fader, the level is controlled by both the cue level and the headphones level controls and will mute when the cue channel mutes.

MULTI LINE SWITCH INTERFACE BOARD

The Multi Line Switch Interface Board contains the 8 position selector switch and connections for the other components associated with a Multi Line Input Channel. A priority encoder is used to convert the switch selected to BCD which is used to drive the decoders on the Multi Line Input and Multi Line Control Boards.

DUAL LINE SWITCH INTERFACE BOARD

The Dual Line Switch Interface Board contains the 2 position selector switch and connections for the other components associated with a Dual Line Input Channel.

METER BOARD

The Meter Board is produced in two types: 3 meter, and 5 meter. The 5 meter board is used only in the PACEMAKER PM1032 while the 3 meter board is used in the other models. Each board contains the necessary diodes and filtering for the meters as well as interconnects for the clock/timer and the MONO and METER select switches. Two programming jumpers are used to select the communication signal to be connected to an optional AUTOCLOCK. The " T" jumper is used to connect the transmitter while the "R" jumper is used to connect the receiver. When the Meter Board is used in the PM1032 console, the meter select switch becomes the CTP select switch and provides manual defeat of the CTP function.

MONITOR SELECT BOARD

Two Monitor Select Boards are used for both monitor and headphones selection. Additional connections are provided for the level controls for Monitor, Phones, and Cue.

PACEMAKER MOTHER BOARD

One PACEMAKER Mother Board is used in all versions of the consoles, however it is programmed at the factory for the specific model. The slot assignment varies according to the model in use. Connections are available for the ribbon cables to the front panel as well as connections for the timer/clock and the main power supply.

POWER SUPPLY

The power supply for the PACEMAKER consoles is self contained and is identical for all models. The basic voltages provided are regulated by means of LM317 and LM337 type linear regulators. These voltages are:

+ and - 16 volts for all audio circuits except power amplifiers.
+ and - 12 volts for the headphone and cue power amplifiers.
+ 22 volts for the relays and lamps.
+ 5 volts for all logic systems.

SECTION 8

PARTS LISTS AND SCHEMATIC DIAGRAMS

This consists of the parts lists, parts layout drawings, and schematic diagrams for all boards used in the PACEMAKER AUDIO CONSOLES.

AUTOGRAM PACEMAKER DRAWING LIST

DRAWING #	NAME
PM3001	DUAL LINE INPUT BOARD PARTS LAYOUT
PM1001	DUAL LINE INPUT BOARD SCHEMATIC DIAGRAM
PM3002	MULTI LINE INPUT BOARD PARTS LAYOUT
PM1002	MULTI LINE INPUT BOARD SCHEMATIC DIAGRAM
PM3003	AUDIO OUTPUT BOARD PARTS LAYOUT
PM1003	AUDIO OUTPUT BOARD SCHEMATIC DIAGRAM
PM3004	MONITOR OUTPUT BOARD PARTS LAYOUT
PM1004	MONITOR OUTPUT BOARD SCHEMATIC DIAGRAM
PM3005	CUE/PHONES BOARD PARTS LAYOUT
PM1005	CUE/PHONES BOARD SCHEMATIC DIAGRAM
PM3006	CONTROL BOARD PARTS LAYOUT
PM1006	CONTROL BOARD SCHEMATIC DIAGRAM
PM3007	MICROPHONE PRE-AMP BOARD PARTS LAYOUT
PM1007	MICROPHONE PRE-AMP BOARD SCHEMATIC DIAGRAM
PM3008	MAIN POWER SUPPLY BOARD PARTS LAYOUT
PM1008	MAIN POWER SUPPLY SCHEMATIC DIAGRAM
PM3009	8LINE/2LINE SELECT BOARD PARTS LAYOUT
PM1009	8LINE SELECT ASSY. SCHEMATIC DIAGRAM
PM1010	2LINE SELECT ASSY. SCHEMATIC DIAGRAM
PM3011	METER BOARD PARTS LAYOUT
PM1011	METER ASSEMBLY SCHEMATIC DIAGRAM
PM1012	MONITOR/PHONES SELECT SWITCH ASSY. SCHEMATIC DIAGRAM
PM1013	TYPICAL MULTILINE MOTHERBOARD SCHEMATIC DIAGRAM
PM1014	TYPICAL DUAL LINE MOTHERBOARD SCHEMATIC DIAGRAM
PM1015	OUTPUT SECTION MOTHERBOARD SCHEMATIC DIAGRAM

THE FOLLOWING DIAGRAMS ARE LOCATED IN SECTION 3, THEORY

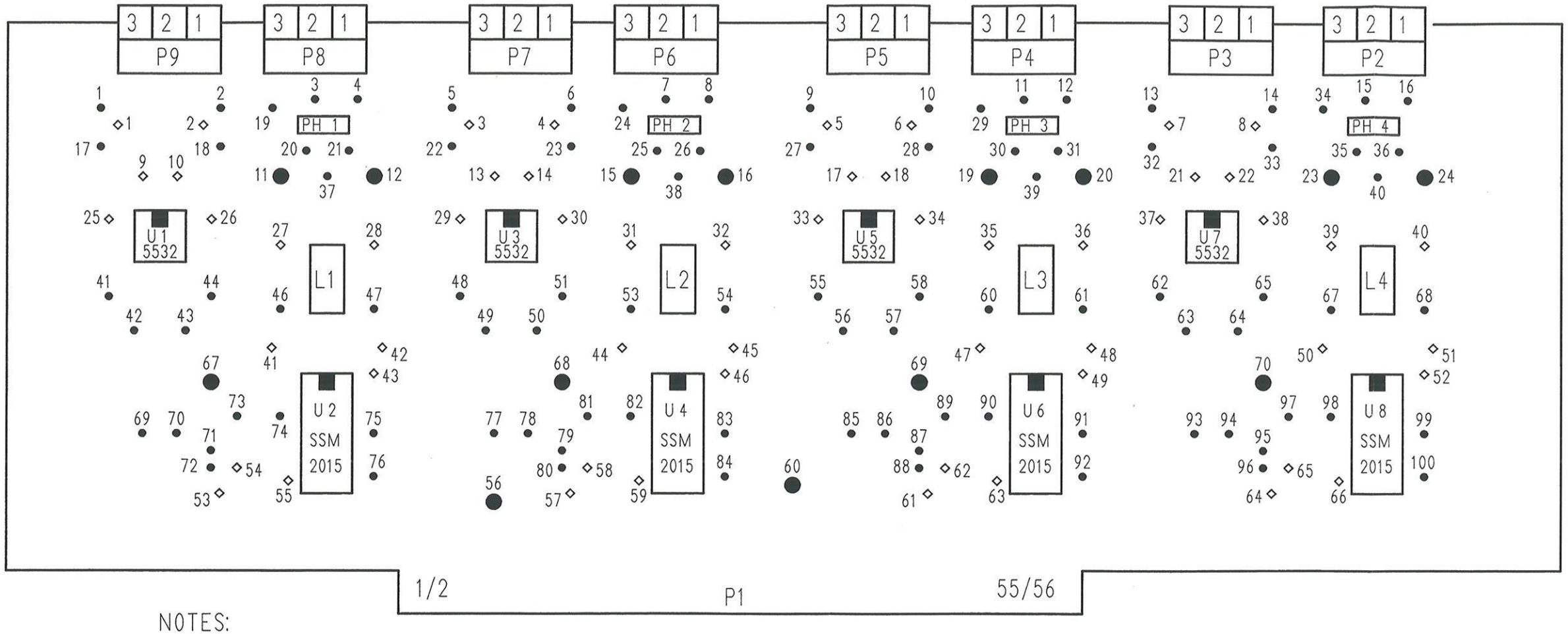
PM2001	SIMPLIFIED MUTE CIRCUIT DIAGRAM
PM2002	BLOCK DIAGRAM PAGE 1
PM2003	BLOCK DIAGRAM PAGE 2

PARTS LIST FOR
MICROPHONE PRE-AMPLIFIER BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
16	C1-8,C27-28,C31-32,C35-36,C39-40	Capacitor, .001uf/50v, monolythic
17	C9-10,C13-14,C17-18,C21-22,C53-54 C57-58,C61-62,C64-66	Capacitor, .1uf/50v, monolythic
8	C11-12,C15-16,C19-20,C23-24	Capacitor, 47uf/50v, electrolytic
12	C25-26,C29-30,C33-34,C37-38,C42, C45,C48,C51	Capacitor, 220pf/50v, monolythic
8	C41,C43,C44,C46-47,C49-50,C52	Capacitor, 10pf/50v, monolythic
4	C55,C59,C63,C66	Capacitor, 47pf/50v, monolythic
2	C56,C60	Capacitor, 100uf/25v, electrolytic
4	L1-L4	Filter, ferrite, VK200
8	P2-9	Connector Assy, 3 pin Buchanan SSB4K03S,SSB4L03S
4	PH1-4	Programmable headers, 3pin
40	R1-2,R5-6,R9-10,R13-14,R41-44, R46-R51,R53-58,R60-65,R67-68,R74, R76,R82,R84,R90,R92,R98,R100	Resistor, 10k, 1%, M.F.,1/4 w
16	R3-4,R7-8,R11-12,R15-16,R20-21, R25-26,R30-31,R35-36	Resistor, 75, 1%, M.F.,1/4 w
8	R17-18,R22,23,R27-28,R32-33	Resistor, 49.9, 1%, M.F.,1/4 w
4	R19,R24,R29,R34	Resistor, 121, 1%, M.F.,1/4 w
4	R37-40	Resistor, 100k, 1%, M.F.,1/4 w
16	R69-72,R77-80,R85-88,R93-96	Resistor, 10, 1%, M.F.,1/4 w
4	R73,R81,R89,R97	Resistor, 30.1k, 1%, M.F.,1/4 w
4	R75,R83,R91,R99	Resistor, 221, 1%, M.F.,1/4 w
4	U1,U3,U5,U7	I.C., NE5532, dual op-amp
4	U2,U4,U6,U8	I.C., SSM2015, balanced pre-amp

Misc. Parts:

4	------	8 pin dip socket
4	------	14 pin dip socket
1	------	Microphone Pre Amp P.C. Board

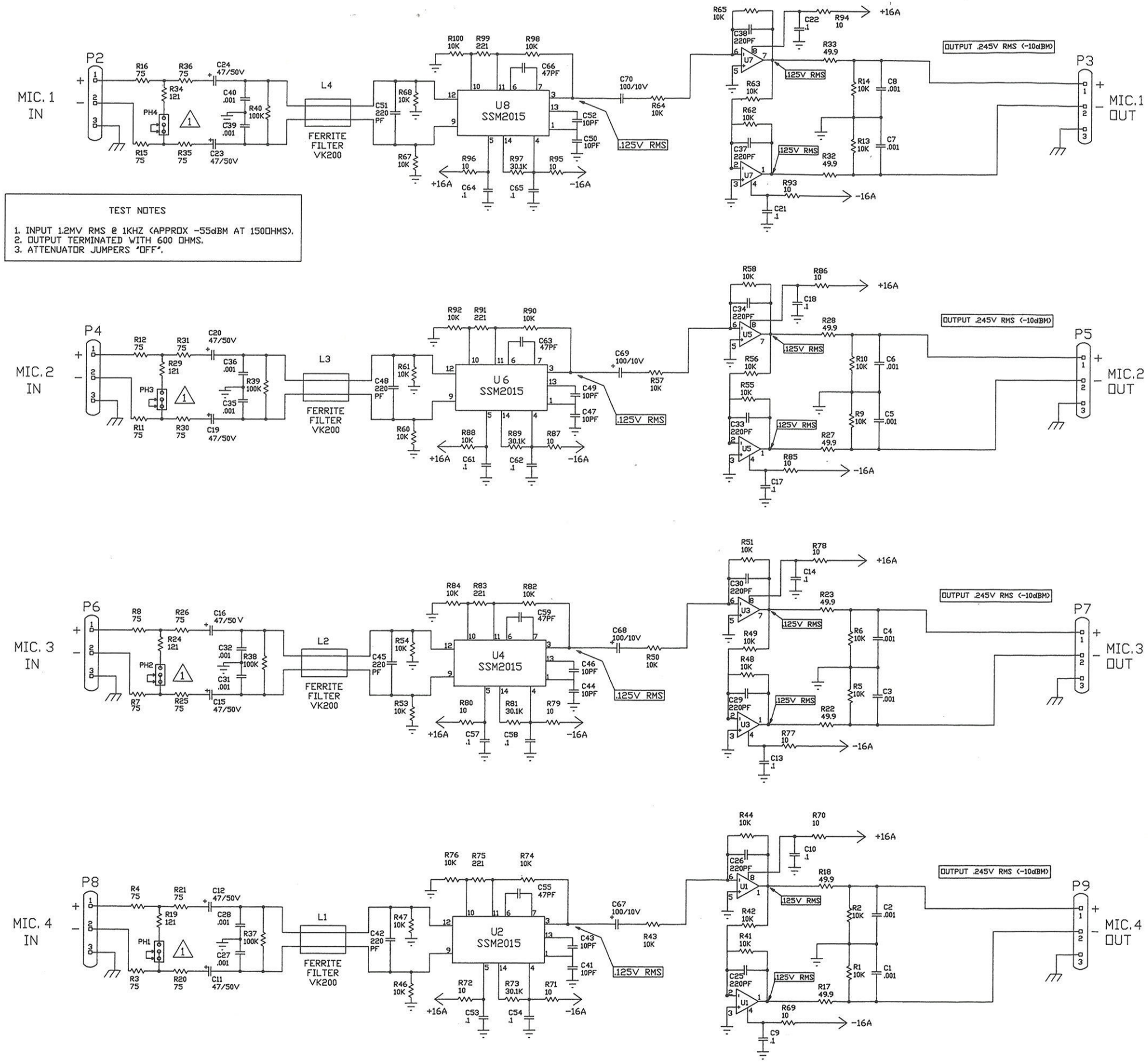


NOTES:

- • RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYIC CAPACITORS

MICROPHONE PRE-AMP PARTS LAYOUT

DRAWING # PM3007



AUTOGRAM CORPORATION	
SCALE: NONE	DATE: 5/23/90
PACEMAKER AUDIO CONSOLE MICROPHONE PRE-AMP BOARD	
DWG. NO. PM1007	DRAWN BY: JDL

PARTS LIST FOR
DUAL LINE INPUT BOARD
PACEMAKER AUDIO CONSOLE

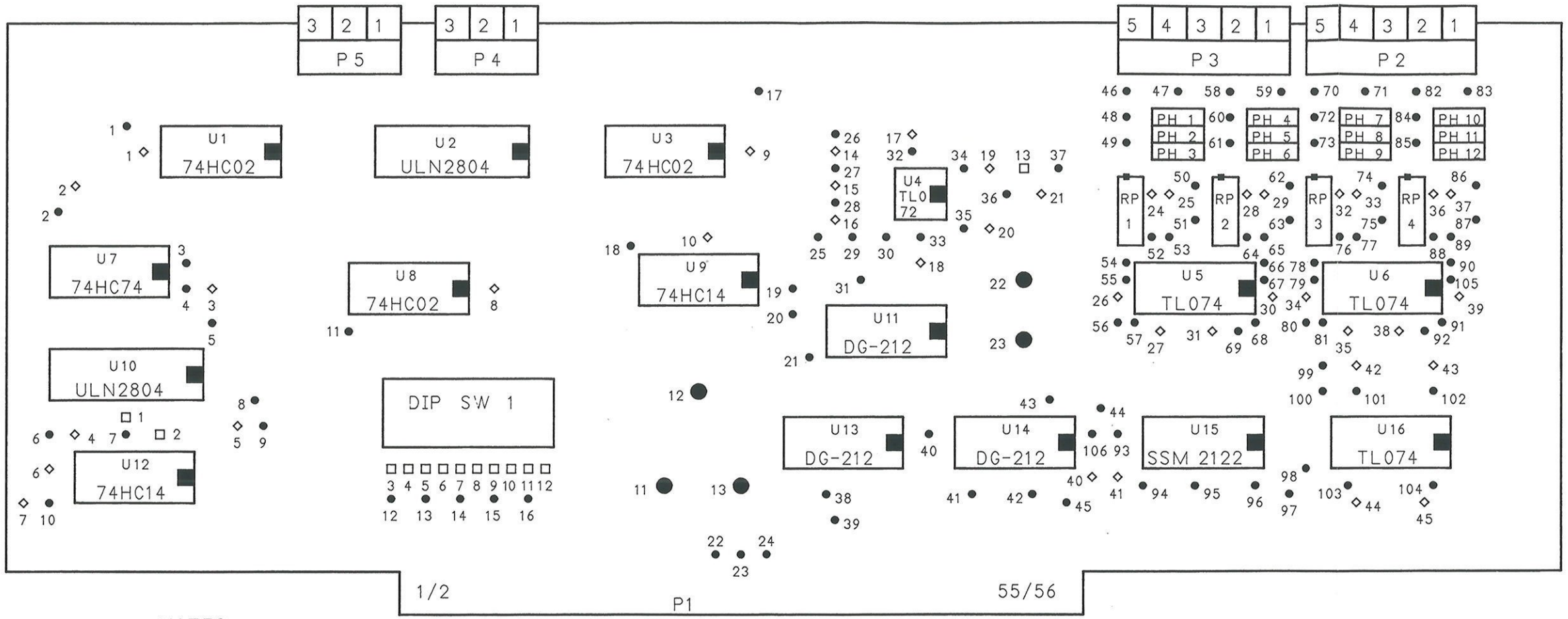
QTY	REFERENCE DESIGNATOR	DESCRIPTION
16	C1-3,C5-10,C14-20	Capacitor, .1uf/50v, monolithic
2	C4,C21	Capacitor, .33uf/16v, tantalum
3	C11-13	Capacitor, 100uf/25v, electrolytic
2	C22,C23	Capacitor, 100uf/10v, electrolytic
8	C24-25,C28-29,C32-33,C36-37	Capacitor, 220pf/50v, monolithic
4	C26,C30,C34,C39	Capacitor, 50pf/50v, monolithic
8	C27,C31,C35,C38,C42-45	Capacitor, 10pf/50v, monolithic
2	C40-41	Capacitor, 2000pf/50v, monolithic
13	D1-13	Diode, 1N914/1N4148
1	DIP-1	DIP Switch, 10 element
2	P2,P3	Connector Assy, 5 Pin Buchanan, SSB4K05S, SSB4L05S
2	P4,P5	Connector Assy, 3 Pin Buchanan, SSB4K03S, SSB4L03S
12	PH1-12	Programmable headers, 3 pin
6	R1,R18-21,R31	Resistor, 1k, 1%, M.F., 1/4 w
36	R2-4,R8,R10-17,R28,R38-42,R45-47, R55-56,R58-59,R67-68,R70-71,R79-80. R82-83,R91,R102,R104,R105	Resistor, 10k, 1%, M.F., 1/4 w
5	R5-6,R9,R23,R23	Resistor, 10, 1%, M.F., 1/4 w
1	R7	Resistor, 1m, 1% M.F., 1/4 w
1	R22	Resistor, 1, 5%, C.F., 1/2w
1	R25	Resistor, 30.1k, 1%, M.F., 1/4 w
1	R26	Resistor, 475, 1%, M.F., 1/4 w
1	R27	Resistor, 100, 1%, M.F., 1/4 w
2	R29,R32	Resistor, 12.1k, 1%, M.F., 1/4 w
2	R30,R33	Resistor, 121k, 1%, M.F., 1/4 w
3	R34,R43,R44	Resistor, 33.2k, 1%, M.F., 1/4 w
3	R35-36,R69	Resistor, 3.92k, 1%, M.F., 1/4 w
13	R37,R52-54,R64-66,R76-78,R88-90	Resistor, 2.21k, 1%, M.F., 1/4 w
4	R48,R60,R72,R84	Resistor, 604, 1%, M.F., 1/4 w
4	R49,R61,R73,R85	Resistor, 100k, 1%, M.F., 1/4 w
4	R50,R62,R74,R86	Resistor, 331, 1%, M.F., 1/4 w
4	R51,R63,R75,R87	Resistor, 1.62k, 1%, M.F., 1/4 w
3	R57,R81,R92	Resistor, 39.2k, 1%, M.F., 1/4 w
2	R93,R106	Resistor, 49.9, 1%, M.F., 1/4 w
2	R94,R96	Resistor, 221, 1%, M.F., 1/4 w
1	R95	Resistor, 150k, 1%, M.F., 1/4 w
4	R97-100	Resistor, 20k, 1%, M.F., 1/4 w
2	R101,R103	Resistor, 43.2k, 1%, M.F., 1/4 w
4	RP1-4	Pot, 10k, multi-turn, 64X Spectrol
3	U1,U3,U8	I.C., 74HC02, NOR
2	U2,U10	I.C., ULN2804, Darlington Driver
1	U4	I.C., TL072, Dual FET op-amp
4	U5-7,U16	I.C., TL074, Quad FET op-amp

PARTS LIST FOR
DUAL LINE INPUT BOARD, Contd.
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
2	U9,U12	I.C., 74HC14, hex inverter
3	U11,U13-14	I.C., DG-212, Analog Switch
1	U15	I.C., SSM2122, V.C.A.

Misc. Parts

1	---------	8 pin dip socket
9	---------	14 pin dip socket
4	---------	16 pin dip socket
2	---------	18 pin dip socket
1	---------	20 pin dip socket
1	---------	Dual Input P.C. Board



NOTES:

- ● RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYTIC CAPACITORS

DUAL LINE INPUT BOARD PARTS LAYOUT

DRAWING # PM3001

TEST LEVEL
245MV@1KHZ (-10dBM)
ALL JUMPERS OFF

P1 EDGE

OFF LAMP 13
ON LAMP 12
OFF SWITCH 11
ON SWITCH 10
CUE SEL 8
CTP 17/18
MUTE-1 21/22
MUTE-2 23/24
TIMER 19/20
SEL-1 1
SEL-2 2
SLIDER 9

ULN2804 U10A, U10B, U10C
74HC14 U9C, U9B
74HC02 U8C
U1= 74HC02 (U1A, U1B, U1C, U1D)
U2= ULN2804 (U2A, U2B, U2C, U2D, U2E, U2F)
U3= 74HC02 (U3A, U3B, U3C, U3D)
U4-TL072 (U4A, U4B)
U5-TL074 (U5A, U5B, U5C, U5D)
U6-TL074 (U6A, U6B, U6C, U6D)
U16-TL074 (U16A, U16B, U16C)
U7 74HC74
U8 74-HC02
U9 74HC14
U11, U13, U14 = DG212
U12 (A, F, E, D)
U15 (VCA) SSM 2122
U14, U13 DG-212

D1 1N914
D2 1N914
D13 1N914

DIP-1: CTP-1, CTP-2, CUE-1, CUE-2, MUTE1-1, MUTE1-2, MUTE2-1, MUTE2-2, TMR-1, TMR-2 → D12, D11, D10, D9, D8, D7, D6, D5, D4, D3

P4: START, ENABLE (1, 2, 3)
P5: START, ENABLE (1, 2, 3)

P3: R 2 L (+ − + −)
P2: R 1 L (+ − + −)

TERM.
-10dB
-20dB

1.2V RMS
1.90MV RMS
U5,U6,U16=TL074

4.80VDC WITH SLIDER AT SET

VCA MUTE
OFF= 2.75VDC
ON= 0VDC

OFF= 1.4VDC
ON= 0VDC

ON =+0.40VDC
OFF=+14.00VDC

ON= 0.0VDC
OFF= 0.66VDC

1.3V RMS WITH SLIDER AT SET

IN CUE= -0.80VDC
AT MAX= +0.06VDC
AT SET= 0.0VDC

IN CUE= -14.50VDC
AT MAX= + 1.15VDC
AT SET= 0.0 VDC

P1 EDGE

53/54	LEFT PROGRAM BUS
49/50	RIGHT PROGRAM BUS
29/30	-16 V BUS
45/46	LEFT AUDITION BUS
41/42	RIGHT AUDITION BUS
27/28	AUD SEL / PGM SEL / M- SEL
25/26	+5V BUS
37/38	MIX-MINUS BUS
33/34	CUE BUS
15/16	DIGITAL GROUND
55/56	CHASSIS GROUND
51/52, 47/48, 43/44, 39/40, 35/36, 31/32	AUDIO GROUND

+16V BUS

NOTES
1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

AUTOGRAM CORPORATION

SCALE: NONE | DATE: 5/22/90

PACEMAKER AUDIO CONSOLE
DUAL LINE INPUT BOARD

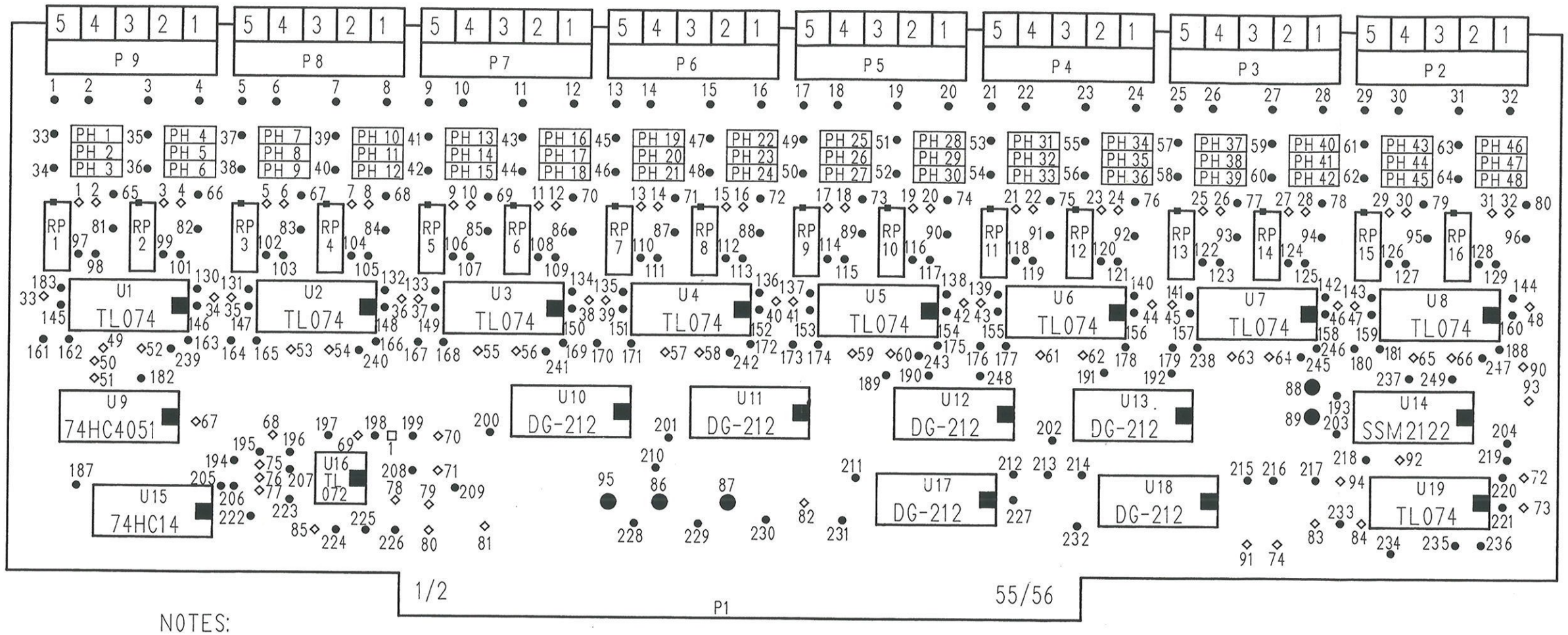
DWG. NO. PM1001 | DRAWN BY: DJW/JDL

PARTS LIST FOR
MULTILINE INPUT (8 LINE AUDIO) BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
32	C1-32	Capacitor, 220pf/50v, monolithic
34	C33-49,C52-66,C84,C92	Capacitor, 50pf/50v, monolithic
19	C50,C51,C67-69,C71,C74-82,C85, C90,C91,C93	Capacitor, .1uf/50v, monolithic
1	C70	Capacitor, .33uf/16v, tantalum
2	C72,C73	Capacitor, 10pf/50v, monolithic
2	C83,C94	Capacitor, 2000pf/50v, monolithic
2	C86-C87	Capacitor, 100uf/25v, electrolytic
3	C88-89,C95	Capacitor, 100uf/10v, electrolytic
1	D1	Diode, 1N914/1N4148
8	P2-9	Connector Assy., 5pin Buchanan SSB4K05S, SSB4L05S
48	PH1-48	Programmable headers, 3pin
75	R1-32,R145-161,R163-164,R166-167, R169-170,R172-173,R175-176,R178-180,R188,R194,R207,R209,R211-212, R214,R218,R227,R231-233,R246	Resistor, 10k, 1%, M.F., 1/4 w
16	R33,R35,R37,R39,R41,R43,R45,R47,R49 R51,R53,R55,R57,R59,R61,R63	Resistor, 604, 1%, M.F., 1/4 w
16	R34,R36,R38,R40,R42,R44,R46,R48,R50	Resistor, 100k, 1%, M.F., 1/4 w
16	R65-80	Resistor, 332, 1%, M.F.,1/4 w
16	R81-96	Resistor, 1.62k, 1%, M.F.,1/4 w
49	R97-99,R101-144,R183,R199	Resistor, 2.21K, 1%, M.F.,1/4 w
16	R162,R165,R168,R171,R174,R177,R181, R238-245,R247	Resistor, 39.2K, 1%, M.F.,1/4 w
3	R182,R229-230	Resistor, 10, 1%, M.F.,1/4 w
12	R187,R189-192,R200-202,R205-206, R210,R248	Resistor, 1k, 1%, M.F.,1/4 w
3	R193,R197,R237	Resistor, 33.2k, 1%, M.F.,1/4 w
3	R195,R208,R224	Resistor, 121k, 1%, M.F.,1/4 w
1	R196	Resistor, 12.1k, 1%, M.F.,1/4 w
2	R198,R226	Resistor, 3.92k, 1%, M.F.,1/4 w
2	R203,R217	Resistor, 49.9, 1%, M.F.,1/4 w
2	R204,R219	Resistor, 221, 1%, M.F.,1/4 w
2	R213,R234	Resistor, 15k, 1%, M.F.,1/4 w
4	R215-216,R235-236	Resistor, 20k, 1%, M.F.,1/4 w
2	R220,R221	Resistor, 43.2k, 1%, M.F.,1/4 w
1	R222	Resistor, 475, 1%, M.F.,1/4 w
1	R223	Resistor, 100, 1%, M.F.,1/4 w
1	R225	Resistor, 30.1k, 1%, M.F.,1/4 w
1	R228	Resistor, 1, 5% C.F., 1/2 w
1	R249	Resistor, 150k, 1%, M.F.,1/4 w
16	RP1-16	Pot, 10k, multi-turn 64X Spectrol

PARTS LIST FOR
MULTI LINE INPUT (8 LINE AUDIO) BOARD Contd.
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
9	U1-8,U19	I.C., TL074, quad FET op-amp
1	U9	I.C., 74HC4051, decoder
6	U10-13,U17-18	I.C., DG212, analog switch
1	U14	I.C., SSM2122, VCA
1	U15	I.C., 74HC14, hex inverter
1	U16	I.C., TL072, dual FET op-amp
Misc. Parts		
1	------	8 pin dip socket
10	------	14 pin dip socket
8	------	16 pin dip socket
1	------	Multiline P.C. Board



NOTES:

- • RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYTIC CAPACITORS

MULTI LINE INPUT BOARD PARTS LAYOUT

DRAWING # PM3002

TEST LEVEL
245 MVP 1KHZ (-10dBM)
ALL JUMPERS OFF

R 8 L — P9 — R 7 L — P8 — R 6 L — P7 — R 5 L — P6 — R 4 L — P5 — R 3 L — P4 — R 2 L — P3 — R 1 L — P2

TERM.
-10dB
-20dB
190MV RMS
1.2V RMS

U10-U13, U17,U18
DG-212

U1-U8, U19
TL074

U16=TL072

4.80VDC WITH SLIDER AT SET POINT

ON= +0.40VDC
OFF= +14.00VDC

IN CUE= -14.50VDC
AT MAX= + 1.15VDC
AT SET= 0.0VDC

ON= 0.0VDC
OFF= +0.66VDC

IN CUE= -0.80VDC
AT MAX= +0.06VDC
AT SET= 0.0VDC

1.3V RMS WITH SLIDER AT SET

NOTES

1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

P1 EDGE

53/54	LEFT PROGRAM BUS
49/50	RIGHT PROGRAM BUS
29/30	-16 V BUS
45/46	LEFT AUDITION BUS
41/42	RIGHT AUDITION BUS
27/28	+16 V BUS
6	AUD SEL
5	PGM SEL
7	MIX- SEL
8	CUE SEL
25/26	+5 V BUS
37/38	MIX- BUS
33/34	CUE BUS
15/16	DIGITAL GROUND
55/56	CHASSIS GROUND
51/52	
47/48	
43/44	AUDIO GROUND
39/40	
35/36	
31/32	

AUTOGRAM CORPORATION

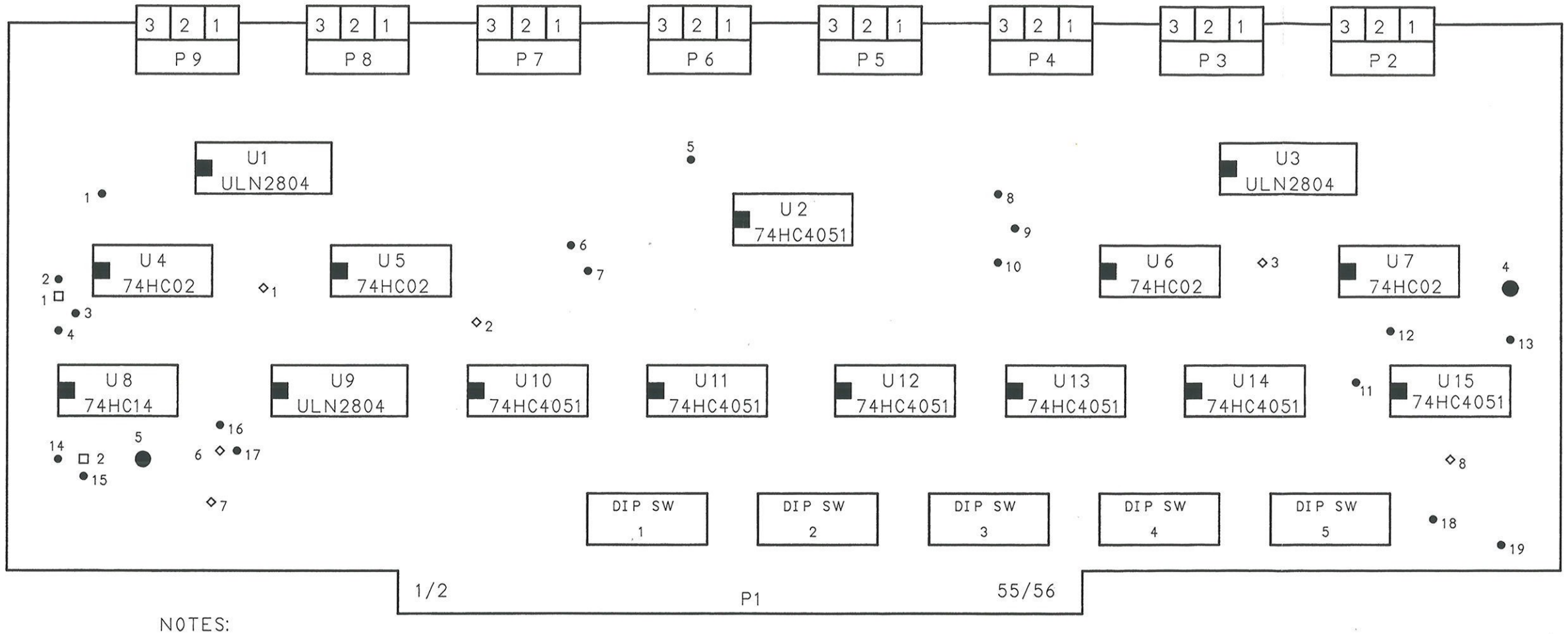
SCALE: NONE | DATE: 5/22/90

PACEMAKER AUDIO CONSOLE
8 LINE AUDIO BOARD

DWG. NO. PM1002 | DRAWN BY DJW/JDL

PARTS LIST FOR
CONTROL BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
6	C1-3,C6-8	Capacitor, .1uf/50v, monolythic
1	C4	Capacitor, 100uf/10v, electrolytic
1	C5	Capacitor, .33uf/16v, tantalum
8	P2-9	Connector Assy, 3 pin Buchanan SSB4K03S,SSB4L03S
2	D1-2	Diode, 1N914/1N4148
14	R1-R13,R16	Resistor, 10k, 1%, M.F.,1/4 w
3	R14,R17-18	Resistor, 10, 1%, M.F.,1/4 w
1	R15	Resistor, 1m, 1%, M.F.,1/4 w
1	R19	Resistor, 1, 5%, C.F.,1/2w
5	S1-5	Dip Switch, 8 element
3	U1,U3,U9	I.C., ULN2804, Darlington driver
6	U2,U10-14	I.C., 74HC4051, decoder
4	U4-7	I.C., 74HC02, NOR
1	U8	I.C., 74HC14, hex inverter
1	U15	I.C., 74HC74, flip-flop
Misc. parts:		
6	------	14 pin dip socket
11	------	16 pin dip socket
3	------	18 pin dip socket
1	------	Control P.C. Board



NOTES:

- ● RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYTIC CAPACITORS

CONTROL BOARD PARTS LAYOUT

DRAWING # PM3006

8 7 6 5 4 3 2 1

START ENABLE GROUND — P9 P8 P7 P6 P5 P4 P3 P2

ALL OUTPUTS OPEN COLLECTOR TO GROUND. +D.C. ONLY 300MA/50V MAX

START BUS
ENABLE BUS

SW8 SW7 SW6 SW5 SW4 SW3 SW2 SW1

EDGE P1

ON LAMP	12
OFF LAMP	13
VCA MUTE	14
SEL 1	1
SEL 2	2
SEL 3	3
SEL 4	4
OFF P.B.	11
ON P.B.	10
CUE SEL (FROM SLIDER)	8
C.T.P.	17/18
CUE SW	9
TIMER	19/20
MUTE 2	23/24
MUTE 1	21/22

U15 74HC74 FLIP-FLOP

D1 1N914
D2 1N914
R15 1MEG
C5 .33/16V TANT.
R4 10K
R1 10K
R3 10K
R12 10K
R7 10K
R6 10K
R10 10K
R13 10K
R9 10K
R5 10K
R8 10K
R19 1.0
C1 .1
C2 .1
C3 .1
C4 100/10V

U8 74HC14

U2 74HC4051 DECODER

EDGE P1
25 26 +5 V VCC BUS
15 16 DIGITAL GROUND

R11 10K
R18 10
C8 .1
R2 10K
R14 10
C7 .1
R16 10K
R17 10
C6 .1

U10 74HC4051 DECODER — DIP SWITCH 1 CTP BUS SELECT
U11 74HC4051 DECODER — DIP SWITCH 2 CUE BUS SELECT
U12 74HC4051 DECODER — DIP SWITCH 3 TIMER RESET BUS SELECT
U13 74HC4051 DECODER — DIP SWITCH 4 MUTE BUS 2 SELECT
U14 74HC4051 DECODER — DIP SWITCH 5 MUTE BUS 1 SELECT

OUTPUT TO 8LINE AUDIO BOARD PIN 8

U4,U5, U6,U7 — 74HC02 QUAD NOR GATE
U8 — 74HC14 HEX INVERTER SCHMITT-TRIGGER
U1,U3,U9 — ULN2804 DARLINGTON DRIVER (OCTAL)

NOTES

1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

AUTOGRAM CORPORATION

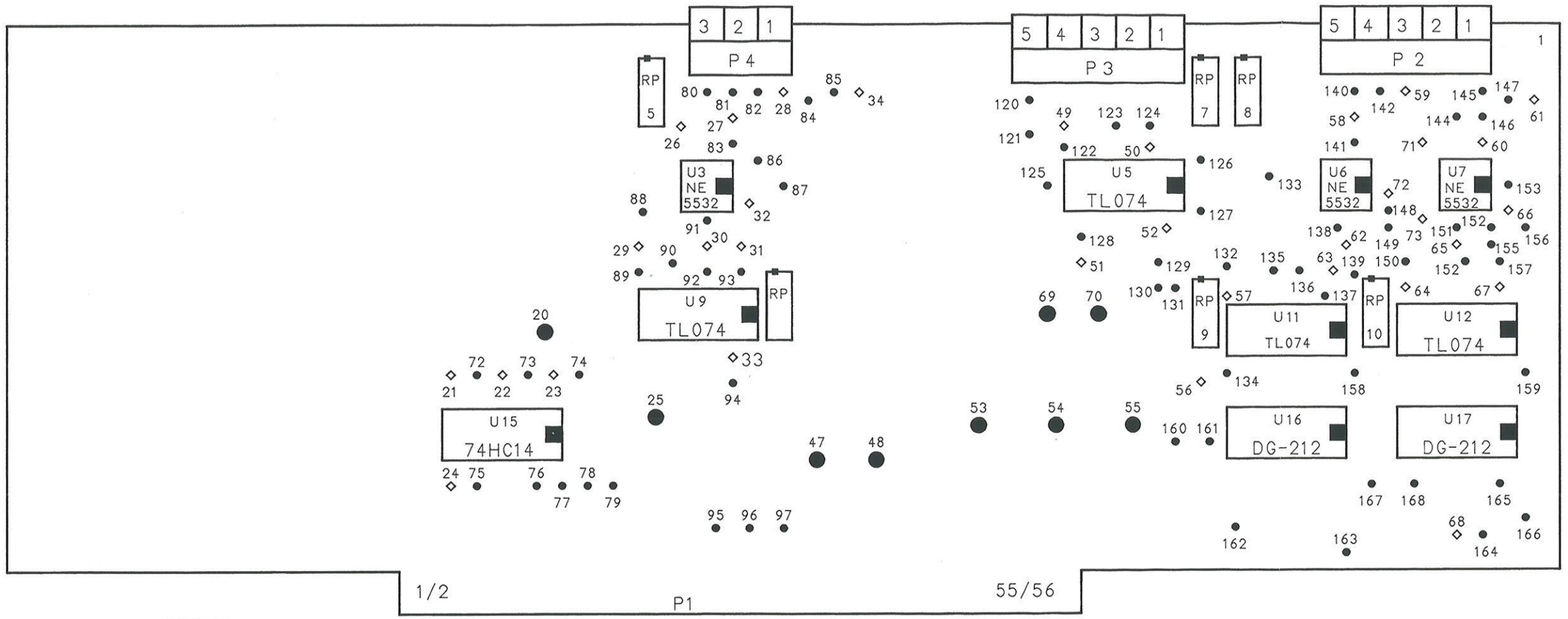
SCALE: NONE | DATE: 1/4/90

PACEMAKER AUDIO CONSOLE CONTROL BOARD

DWG. NO. PM1006 | DRAWN BY: JDL

PARTS LIST FOR
AUDIO OUTPUT BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
6	C20,C25,C46,C48,C69,C70	Capacitor, 100uf/25v, electrolytic
8	C21-24,C26,C32,C71,C73	Capacitor, .1uf/50v, monolithic
18	C27,C29-31,C33,C49-52,C56-58 C60,C62-65,C67	Capacitor, 50pf/50v, monolithic
6	C28,C34,C59,C61,C66,C72	Capacitor, .001uf/50v, monolithic
3	C53-55	Capacitor, 330uf/10v, electrolytic
2	P2,P3	Connector Assy., 5 pin Buchanan, SSB4K05S, SSB4L05S
1	P4	Connector Assy., 3 pin Buchanan, SSB4K03S, SSB4L03S
39	R72-75,R82-R83,R85-86,R89-93,R122, R126-128,R133-134,R136-138,R141-142,R144,R146-147,R148,R151-153, R157,R160.R162-165,R167-168	Resistor, 10k, 1%, M.F.,1/4 w
6	R76-79,R96-97	Resistor, 10, 1%, M.F.,1/4 w
10	R80,R87,R120-121,R130-131,R135, R139,R155,R156	Resistor, 20k, 1%, M.F.,1/4 w
6	R81,R84,R140,R145,R149,R154	Resistor, 49.9, 1%, M.F.,1/4 w
1	R88	Resistor, 4.75k, 1%, M.F.,1/4 w
1	R94	Resistor, 2.74k, 1%, M.F.,1/4 w
1	R95	Resistor, 1, 5% C.F., 1/2w
2	R123,R125	Resistor, 8.06k, 1%, M.F.,1/4 w
4	R124,R129,R132,R150	Resistor, 3.65k, 1%, M.F.,1/4 w
2	R158-159	Resistor, 3.92k, 1%, M.F.,1/4 w
2	R161,R166	Resistor, 100, 1%, M.F.,1/4 w
6	RP5-RP10	Pot, multi-turn, 10k, 64X, Spectrol
3	U3,U6-7	I.C., NE5532, dual op-amp
4	U5,U9,U11-12	I.C., TL074, quad FET op-amp
1	U15	I.C., 74HC14, hex inverter
2	U16-17	I.C., DG-212, analog switch
Misc. Parts:		
3	------	8 pin dip socket
5	------	14 pin dip socket
2	------	16 pin dip socket
1	------	Audio Output/Monitor Output P.C. board



NOTES:

- ● RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYTIC CAPACITORS

AUDIO OUTPUT BOARD PARTS LAYOUT

DRAWING # PM3003

(1) PGM (1) AUD BD

TEST PARAMETERS
1. 245MV RMS @1KHZ INTO ANY HIGH LEVEL INPUT.
2. SLIDER AT SET POINT.
3. ALL ASSOCIATED BUS SELECTS "ON".
4. 600 OHM TERMINATIONS ON OUTPUTS.
5. ALL READINGS ARE FOR +8dBM CONSOLE OUTPUT.

PROCESSING
RIGHT LEFT
P3
1.15V RMS

AUDIO OUTPUT
RIGHT LEFT
P2

EDGE P1

LEFT INPUT 53 54
RIGHT INPUT 49 50
+16 VOLTS 27 28
-16 VOLTS 29 30
+5 VOLTS 25 26
DIGITAL GROUND 15 16
MONO/MIX- IN 45 46
METER SELECT 14
MONITOR SELECT 11
PHONES SELECT 12
MONO SELECT 10

C51 47PF, R128 10K, C55 330/10V, R121 2.74K, 1.4V RMS
R97 10, C48 100/25V, C73 .1, C68 .1, +16V
R96 10, C47 100/25V, C71 .1, C26 .1, C32 .1, -16V
C49 47PF, R122 10K, C54 330/10, R120 2.74K, 1.4V RMS
R95 1, C25 100/25V, C79 .1, +5V (VCC)

RP7 10K LEFT MASTER GAIN
R124 3.65K, C50 47PF, R123 8.06K, R126 10K, 1.2V RMS
C65 47PF, R151 10K, R154 49.9, 1.2V RMS
C56 47PF, R134 10K, R131 20K, R144 10K, R30 20K, 1.2V RMS
C60 47PF, R146 10K, R155 20K, R156 20K, C67 47PF, R157 10K, R152 10K, 1.0V RMS
R145 49.9, 1.2V RMS
C66 .001, R153 10K, C61 .001, R147 10K

RP8 10K RIGHT MASTER GAIN
R129 3.65K, C52 47PF, R125 8.06K, R127 10K, 1.2V RMS
C62 47PF, R138 10K, R149 49.9, C63 47PF, R137 10K, R139 20K, C72 .001, R148 10K, 1.0V RMS
C58 47PF, R141 10K, R133 10K, R135 20K, R136 10K, 1.0V RMS
R140 49.9, 1.2V RMS
C59 .001, R142 10K

MONO/MIX- OUTPUT
P4

C53 330/10V, R89 10K, C29 47PF, R88 4.75K, MONO MASTER GAIN, RP5 10K, 1.4V RMS
C30 47PF, R91 10K, R84 49.9, C34 .001, R85 10K, 1.2V RMS
C27 47PF, R83 10K, R86 10K, R81 49.9, C28 .001, R82 10K
C31 47PF, R93 10K, R87 20K, R80 20K, R92 10K, R90 10K, 1.0V RMS
RP6 10K MONO METER CAL, R94 2.74K, C33 47PF, C20 100/10V, .79V RMS

VCC
R74 10K, R79 10, C23 .1, A
R73 10K, R78 10, C22 .1, B
R72 10K, R77 10, C21 .1, C
R75 10K, R76 10, C24 .1, D

VCC 74HC14 U15 DIGITAL GND
+16V TL074 U5,U9, U11,U12 -16V
+16V NE5532 U6,U7 -16V

U16,U17 DG-212
IN 1 IN 2 IN 3 IN 4
S-4 S-3 S-2 S-1
D-4 D-3 D-2 D-1
+16 -16 VCC DIGITAL GROUND

U17 DG212
R166 100, R164 10K, R167 10K, R165 10K, R168 10K
A B C D

U16 DG212
R161 100, R160 10K, R163 10K, R162 10K
A B C

R159 3.92K, RP10 10K LEFT METER CAL., R150 3.65K, C64 47PF, 2.0V RMS, C69 100/25V
R158 3.92K, RP9 10K RIGHT METER CAL., R132 3.65K, C57 47PF, C70 100/25V, 2.0V RMS

NOTE:
VU METERS WILL NOT BE CALIBRATED IF EITHER OUTPUT BOARD IS REMOVED (DOES NOT APPLY FOR PM1032)

EDGE P1

41 MONO BUS
42
37 LEFT MON BUS
33 LEFT PHONES BUS
55 CHASSIS GROUND
56
51 AUDIO GROUND
52
47 AUDIO GROUND
48
43 AUDIO GROUND
44
1 L MTR
2 AUDIO GROUND
4 AUDIO GROUND
6 AUDIO GROUND
38 R MON BUS
34 R PHONES BUS
39 AUDIO GROUND
40
35 AUDIO GROUND
36
31 AUDIO GROUND
32
3 R MTR
5 MONO MTR

NOTES
1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

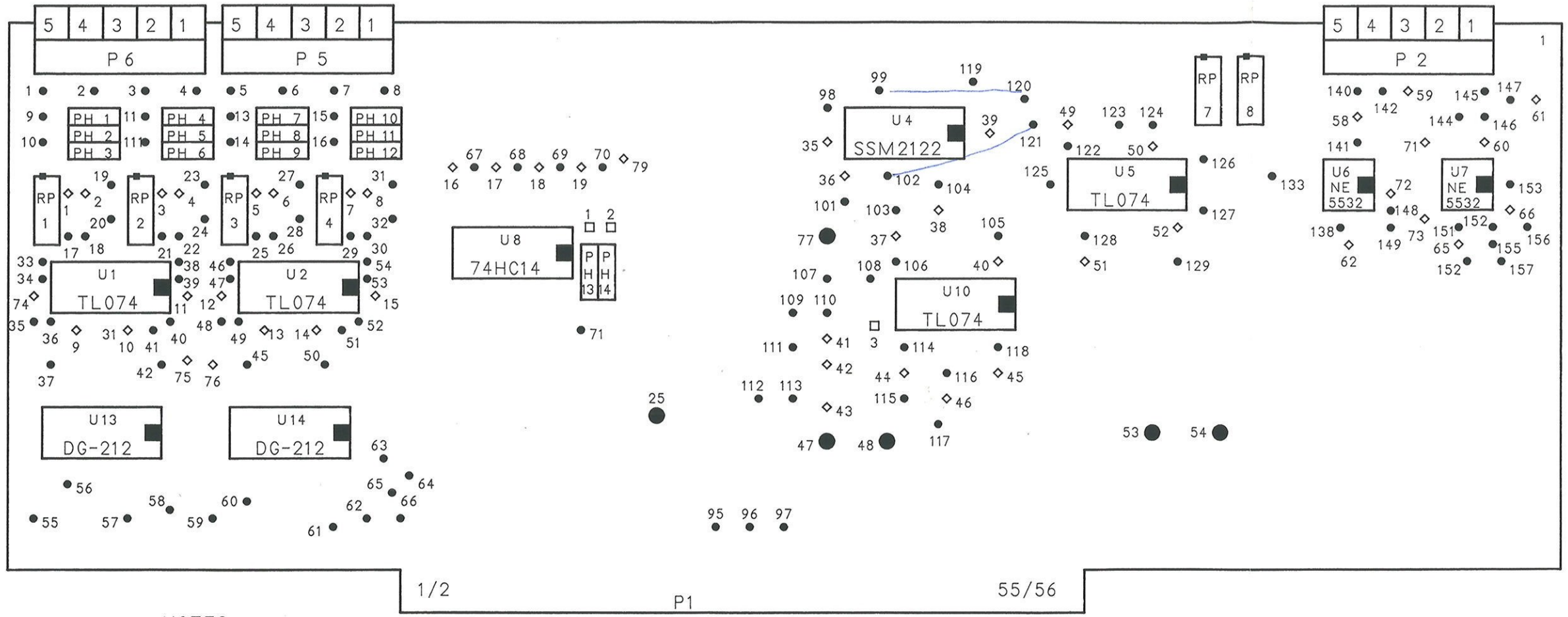
AUTOGRAM CORPORATION
SCALE: NONE DATE: 6/11/90
PACEMAKER AUDIO CONSOLE
AUDIO OUTPUT BOARD
DWG. NO. PM1003 DRAWN BY: JDL

PARTS LIST FOR
MONITOR OUTPUT BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
8	C1-8	Capacitor, 220pf/50v, monolithic
19	C9-15,C40,C45,C49-52,C58,C60,C62, C65-66,C74	Capacitor, 47pf/50v, monolithic
18	C16-19,C37-39,C41-44,C46,C61,C72, C75-76,C78-79	Capacitor, .1uf/50v, monolithic
3	C25,C47,C48	Capacitor, 100uf/25v, electrolytic
2	C35-36	Capacitor, 2200pf/50v, monolithic
1	C59	Capacitor, .001uf/50v, monolithic
1	C77	Capacitor, 1uf/50v, electrolytic
3	D1-3	Diodes, 1N914/1N4148
3	P2,P5-6	Connector Assy, 5 pin Buchanan, SSB4K05S, SSB4L05S
14	PH1-14	Programmable headers, 3pin
52	R1-8,R34-36,R39-41,R47-49,R51-53, R55-62,R67-71,R117,R122,R126-128, R133,R138,R141-142,R144,R146-148, R151-153,R155-157	Resistor, 10k, 1%, M.F.,1/4 w
4	R9,R11,R13,R15	Resistor, 604, 1%, M.F.,1/4 w
4	R10,R12,R14,R16	Resistor, 100k, 1%, M.F.,1/4 w
9	R17-18,R21-22,R25-26,R29-30,R108	Resistor, 2.21k, 1%, M.F.,1/4 w
4	R19,R23,R27,R31	Resistor, 332, 1%, M.F.,1/4 w
4	R20,R24,R28,R32	Resistor, 1.62k, 1%, M.F.,1/4 w
4	R33,R38,R46,R54	Resistor, 1k, 1%, M.F.,1/4 w
4	R37,R42,R45,R50	Resistor, 15k, 1%, M.F.,1/4 w
6	R63-66,R96-97	Resistor, 10, 1%, M.F.,1/4 w
1	R95	Resistor, 1, 5%,C.F., 1/2 w
6	R98,R101,R140,R145,R149,R154	Resistor, 49.9, 1%, M.F.,1/4 w
2	R99,R102	Resistor, 33.2k, 1%, M.F.,1/4 w
1	R100	Resistor, 21.5k, 1%, M.F.,1/4 w
1	R103	Resistor, 3.92k, 1%, M.F.,1/4 w
2	R104,R107	Resistor, 221, 1%, M.F.,1/4 w
2	R105,R118	Resistor, 30.1k, 1%, M.F.,1/4 w
4	R106,R110,R114,R116	Resistor, 121k, 1%, M.F.,1/4 w
1	R109	Resistor, 12.1k, 1%, M.F.,1/4 w
1	R111	Resistor, 9.31k, 1%, M.F.,1/4 w
1	R112	Resistor, 475, 1%, M.F.,1/4 w
1	R113	Resistor, 39.2k, 1%, M.F.,1/4 w
1	R119	Resistor, 150k, 1%, M.F.,1/4 w
2	R120-121	Resistor, 4.74k, 1%, M.F.,1/4 w
2	R123,R125	Resistor, 8.06k, 1%, M.F.,1/4 w
2	R124,R129	Resistor, 3.65k, 1%, M.F.,1/4 w
6	RP1-4,RP7-8	Pot, 10k, multi-turn, 64x, Spectrol
4	U1-2,U5,U10	I.C., TL074, quad FET op-amp
1	U4	I.C., SSM2122, dual VCA
2	U6-7	I.C., NE5532, dual op-amp
1	U8	I.C., 74HC14, hex inverter
2	U13,U14	I.C., DG212, analog switch

PARTS LIST FOR
MONITOR OUTPUT BOARD Contd.
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
Misc. Parts:		
2	------	8 pin dip sockets
5	------	14 pin dip sockets
3	------	16 pin dip sockets
1		Audio Output/Monitor Output P.C. Board



NOTES:

- • RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYTIC CAPACITORS

MONITOR OUTPUT BOARD PARTS LAYOUT

DRAWING # PM3004

TEST PARAMETERS

1. 245MV @1KHZ INTO ANY CONSOLE INPUT
2. SLIDER TO SET POINT
3. ALL BUS SELECTS "ON"
4. MONITOR SELECT SWITCH TO PROGRAM
5. MONITOR GAIN CONTROL AT MAX
6. MONITOR OUTPUT TERMINATED WITH 600 OHMS
7. MUTE SELECTS "OFF"
8. READINGS ARE WITH +8dBM OUTPUT

EDGE P1

LEFT INPUT 53/54 — C55 330/10V — C51 47PF — R128 10K — 1.0V RMS — R121 2.74K — R102 33.2K

MONITOR GAIN 5 — R112 475 — R113 100 — R111 9.31K — R109 12.1K — C43 .1 — C42 .1 — C41 .1 — R110 121K — R103 3.92K — R104 221 — R106 121K — C37 .1 — C38 .1 — R100 21.5K — VCC

MON POT	VALUE
MAX	-.1VDC
MIN	-13.6VDC

MUTE BUS 1 21/22 — PH14 — D2 — U8 — R117 10K — C46 .1 — R116 10K — R114 121K — D3 — R108 2.21K — R107 221 — C77 1/50

MUTE BUS 2 23/24 — PH13 — D1 — R71 10K — D1,D2,D3 1N914 — R115 39.2K — C78 .1

NO MUTE= 0VDC
MUTE= +13.7VDC

U4 V.C.A SSM2122 — R119 150K — +16V — -16V — C39 .1

RP7 10K LEFT MASTER GAIN — C51 47PF — R105 30.1K — R124 3.65K — C50 47PF — R123 8.06K — .76V RMS — R126 10K — 1.2V RMS — C65 47PF — R151 10K — R154 49.9 — 1.0V RMS — R144 10K — C60 47PF — R146 10K — R145 49.9

MONITOR OUTPUT

RIGHT + − P2 LEFT + −

C66 .001 — R153 10K

C61 .001 — R147 10K

RIGHT INPUT 49/50 — C54 330/10V — C49 47PF — R122 10K — R120 2.74K — R99 33.2K

RP8 10K RIGHT MASTER GAIN — C49 47PF — R118 30.1K — R129 3.65K — C52 47PF — R125 8.06K — .76V RMS — R127 10K — 1.2V RMS — C62 47PF — R138 10K — R149 49.9 — 1.0V RMS — R133 10K — C58 47PF — R141 10K — R140 49.9

C72 .001 — R148 10K

C59 .001 — R142 10K

+16 VOLTS 27/28 — R97 10 — C48 100/25V — C73 .1 — C68 .1 — C75 .1 — +16V

-16 VOLTS 29/30 — R96 10 — C47 100/25V — C71 .1 — C26 .1 — C32 .1 — C76 .1 — -16V

+5 VOLTS 25/26 — R95 1 — C25 100/25V — C79 .1 — +5V (VCC)

DIGITAL GROUND 15/16

U13,U14 — DG-212 — IN 1-4 — S-4 S-3 S-2 S-1 — D-4 D-3 D-2 D-1 — +16 — -16 — VCC — DIGITAL GROUND

AUX1 MONSEL 7 — R70 10K — R66 10 — C19 .1 — U8 — E

AUX2 MONSEL 8 — R67 10K — R65 10 — C16 .1 — U8 — G

AUX1 PHSEL 9 — R69 10K — R63 10 — C18 .1 — U8 — F

AUX2 PHSEL 10 — R68 10K — R64 10 — C17 .1 — U8 — H

74HC14 — U8 — VCC — DIGITAL GND

TL074 — U1,U2, U5,U10 — +16V — -16V

NE5532 — U6,U7 — +16V — -16V

AUX INPUT TEST
245MV RMS INPUT
ALL JUMPERS "OFF"

AUX INPUT 2 — R L — P6 — 5 4 3 2 1 — 190MV RMS

R9 604 PH1 — R2 10K — R1 10K — R20 1.61K PH2 — R19 332 PH3 — R10 100K — R18 2.21K — C2 220 PF — C1 220 PF — R17 2.21K — R35 10K — U1 — R34 10K — C74 46PF — RP1 10K — R33 1K — U1 R36 10K — C9 47PF — R37 15K — 1.0V RMS

R11 604 PH4 — R3 10K — R4 10K — R24 1.61K PH5 — R23 332 PH6 — R12 100K — R22 2.21K — C4 220 PF — C3 220 PF — R21 2.21K — R40 10K — U1 — R39 10K — C11 47PF — RP2 10K — R38 1K — U1 R41 10K — C10 47PF — R42 15K — 1.0V RMS

G — 1 9 16 8 — U13 — 11 6 3 14 — 10 7 2 15 — R56 10K — R55 10K — R58 10K — R57 10K

H — 1 9 16 8 — U13 — 11 6 3 14 — 10 7 2 15 — R56 10K — R55 10K — R58 10K — R57 10K

AUX INPUT 1 — R L — P5 — 5 4 3 2 1

R13 604 PH7 — R6 10K — R5 10K — R28 1.61K PH8 — R27 332 PH9 — R14 100K — R26 2.21K — C6 220 PF — C5 220 PF — R25 2.21K — R48 10K — U2 — R47 10K — C12 47PF — RP3 10K — R46 1K — U2 R49 10K — C13 47PF — R45 15K

R15 604 PH10 — R8 10K — TERM. — R7 10K — R32 1.61K PH11 — -10dB — R31 332 PH12 — -20dB — R16 100K — R30 2.21K — C8 220 PF — C7 220 PF — R29 2.21K — R52 10K — U2 — R53 10K — C15 47PF — RP4 10K — R54 1K — U2 R51 10K — C14 47PF — R50 15K

E — 1 9 16 8 — U14 — 11 6 3 14 — 10 7 2 15 — R60 10K — R59 10K — R62 10K — R61 10K

F — 1 9 16 8 — U14 — 11 6 3 14 — 10 7 2 15 — R60 10K — R59 10K — R62 10K — R61 10K

EDGE P1

33	LEFT PH BUS
34	RIGHT PH BUS
37	LEFT MON BUS
38	RIGHT MON BUS
55/56	CHASSIS GROUND
51/52	AUDIO GROUND
47/48	AUDIO GROUND
43/44	AUDIO GROUND
39/40	AUDIO GROUND
35/36	AUDIO GROUND
31/32	AUDIO GROUND

NOTES

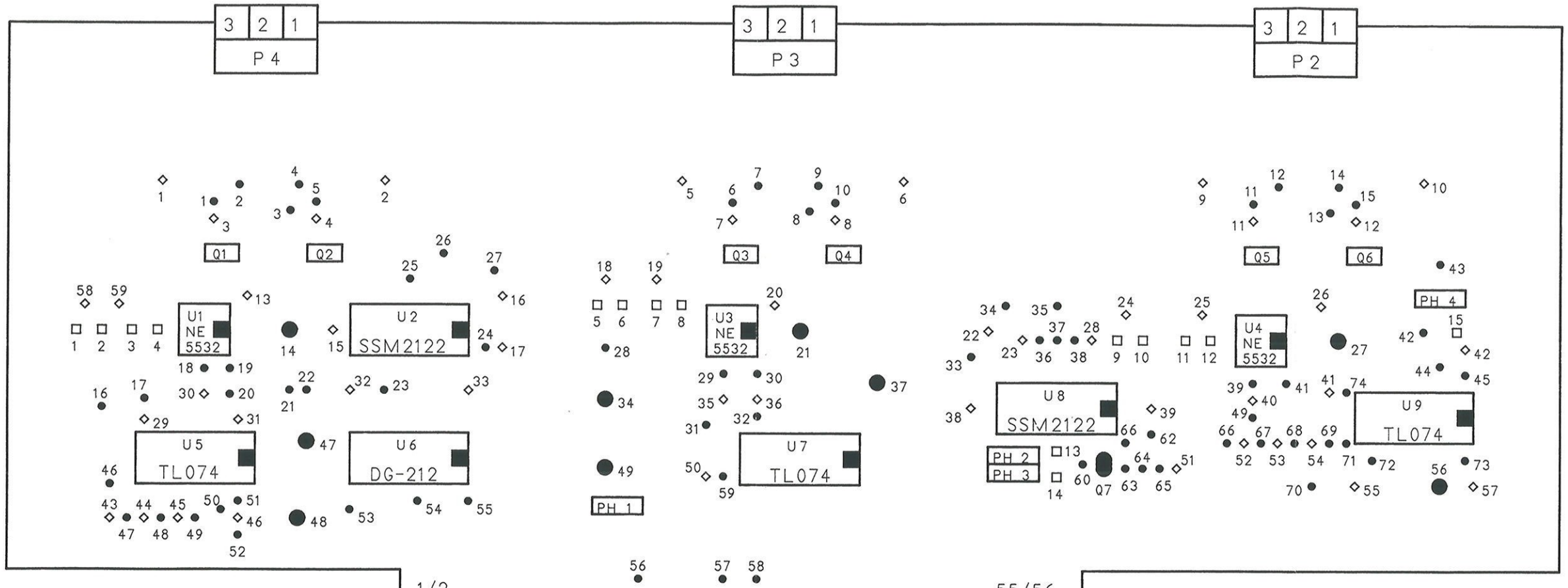
1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

AUTOGRAM CORPORATION

SCALE: NONE — DATE: 5/22/90

PACEMAKER AUDIO CONSOLE MONITOR OUTPUT BOARD

DWG. NO. PM1004 — DRAWN BY: JDL



NOTES:

- ● RESISTORS
- ◇ CAPACITORS
- □ DIODES
- ● ELECTROLYTIC CAPACITOR

CUE/PHONES BOARD PARTS LAYOUT

DRAWING #PM3005

PARTS LIST FOR
CUE/PHONES BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
23	C1-2,C5-6,C9-10,C15,C17,C23,C28, C33,C38-C39,C42-46,C51-55	Capacitor, .1uf/50v, monolythic
6	C3-4,C7-8,C11-12	Capacitor, .001uf/50v, monolythic
3	C13,C20,C26	Capacitor, 150pf/50v, monolythic
6	C14,C21,C27,C34,C47,C49	Capacitor, 100uf/25v, electrolytic
3	C16,C22,C32	Capacitor, 2200pf/50v, monolythic
6	C18-19,C24-25,C58-59	Capacitor, 220pf/50v, monolythic
9	C29-31,C35-36,C40-41,C50,C57	Capacitor, 47pf/50v, monolythic
3	C37,C48,C56	Capacitor, 330uf/10v, electrolytic
15	D1-15	Diode, 1N914/1N4148
3	P2-4	Connector Assy, 3pin Buchanan SSB4K03S,SSB4L03S
4	PH1-4	Programmable headers, 3pin
6	R1,R5-6,R10-11,R15	Resistor, 5.62k, 1%, M.F.,1/4 w
7	R2,R4,R7,R9,R12,R14,R56	Resistor, 1, 5%, C.F., 1/2 w
3	R3,R8,R13	Resistor, 3.65k, 1%, M.F.,1/4 w
13	R16,R20,R31,R40,R53-55,R59-61,R63-64,R73	Resistor, 10k, 1%, M.F.,1/4 w
9	R17-18,R22,R28-29,R32,R35,R39,R43	Resistor, 33.2k, 1%, M.F.,1/4 w
4	R19,R30,R37,R41	Resistor, 20k, 1%, M.F.,1/4 w
2	R21,R62	Resistor, 3.92k, 1%, M.F.,1/4 w
3	R23,R27,R34	Resistor, 49.9, 1%, M.F.,1/4 w
4	R24-25,R36,R38	Resistor, 221, 1%, M.F.,1/4 w
2	R26,R33	Resistor, 150k, 1%, M.F.,1/4 w
2	R42,R44	Resistor, 2.21k, 1%, M.F.,1/4 w
5	R45,R50,R51,R71-72	Resistor, 121k, 1%, M.F.,1/4 w
2	R46,R66	Resistor, 1k, 1%, M.F.,1/4 w
2	R46,R67	Resistor, 100, 1%, M.F.,1/4 w
2	R48,R68	Resistor, 9.31k, 1%, M.F.,1/4 w
3	R49,R65,R69	Resistor, 12.1k, 1%, M.F.,1/4 w
2	R52,R70	Resistor, 21.5k, 1%, M.F.,1/4 w
2	R57-58	Resistor, 10, 1%, M.F.,1/4 w
3	Q1,Q3,Q5	Transistor, TIP110, NPN, darlington
3	Q2,Q4,Q6	Transistor, TIP115, PNP, darlington
1	Q7	Transistor, TIS93, PNP
3	U1,U3,U4	I.C., NE5532, dual op-amp
2	U2,U8	I.C., SSM2122, dual V.C.A.
3	U5,U7,U9	I.C., TL074, quad FET op-amp
1	U6	I.C., DG-212, analog switch

Misc. Parts:

3	------	8 pin dip socket
3	------	14 pin dip socket
3	------	16 pin dip socket

NOTES

1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

TEST NOTES

1. CONSOLE PROGRAM OUTPUT SET FOR +8dBM WITH 1KHZ TONE.
2. PHONE SELECT SWITCH TO PGM.
3. PHONES AND CUE GAIN AT MAXIMUM.
4. CUE MEASUREMENTS MADE WITH SLIDER IN CUE.
5. POWER OUTPUTS TERMINATED WITH 8 OHMS.

EDGE P1

CTP BUS 17/18
CTP DISABLE 19/20
+16V BUS 27/28
-16V BUS 29/30
LEFT HP BUS 33
+5 V (VCC) BUS 25/26
RIGHT HP BUS 34
PHONES GAIN 14
+12 L PHONE 1/2
-12 L PHONE 3/4
L PHONE PWR GND 5/6
+12 R PHONE 7/8
-12 R PHONE 9/10
R PHONE PWR GND 11/12
+12 CUE 41/42
-12 CUE 49/50
CUE PWR GND 53/54
DIGITAL GND 15/16
AUDIO GND 31/32, 35/36, 39/40, 43/44, 47/48, 51/52
CUE BUS 45/46
CUE GAIN 13
MUTE BUS 1 21/22
MUTE BUS 2 23/24

CTP DISABLED ENABLED PH1

U6 DG212

U2 SSM2122 VCA

U8 SSM2122 VCA

U1,U3,U4 NE5532

U5,U7,U9 TL074

U6 DG-212

CTP POST-CUE FADER PH4
CTP PRE-CUE FADER

PDT | VALUE
MAX | +5.0VDC
MIN | 0.0VDC

PDT | VALUE
MAX | 0.0VDC
MIN | -14VDC

MUTED | +13.7VDC
NOT MUTED | 0.0VDC

MUTED | +5V DC
NOT MUTED | 0.0V DC

+12L
-12L
+12R
-12R
+12Q
-12Q
+16
-16
VCC

LEFT HEADPHONE OUTPUT
RIGHT HEADPHONE OUTPUT
CUE OUTPUT

DIGITAL GROUND

AUTOGRAM CORPORATION

SCALE: NONE
DATE: 5/22/90

PACEMAKER AUDIO CONSOLE
CUE/PHONES BOARD

DWG. NO. PM1005
DRAWN BY: JDL

PARTS LIST FOR
8 LINE SELECT BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
4	C1-4	Capacitor, .1uf/50v, monolythic
1	J1	Socket, 16 pin Ribbon, type 511-065-003-016 Carrot
2	J2,J4	Socket, 4 pin Molex, 22-11-2042
1	J3	Socket, 5 pin Molex, 22-11-2052
2	R1,R4	Resistor, 2.21k, 1%, M.F.,1/4 w
3	R2,R3,R5	Resistor, 10, 1%, M.F.,1/4 w
1	R7	Resistor, 1k, 1%, M.F.,1/4 w
1	R6 (A-H)	Resistor array, 10k 9 section
1	S1-8	Switch assy., Interlocked, Schadow, IES5195
1	S9-11	Switch Assy., Schadow, IES1697
1	U1	I.C., 74HC147, encoder
1	U2	I.C., 74HC14, hex inverter

Misc. Parts:

1	------	14 pin I.C. socket
1	------	16 pin I.C. socket
1	------	Select PC Board

PARTS LIST FOR
2 LINE SELECT BOARD
PACEMAKER AUDIO CONSOLE

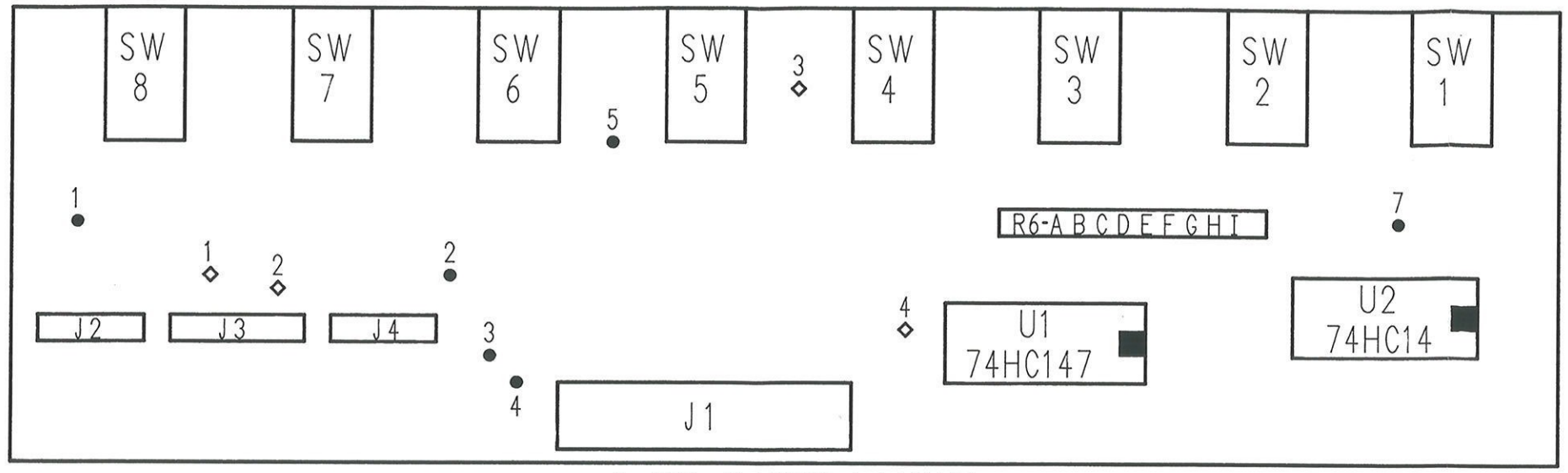
QTY	REFERENCE DESIGNATOR	DESCRIPTION
4	C1-4	Capacitor, .1uf/50v, monolythic
1	J1	Socket, 16 pin Ribbon, type 511-065-003-016 Carrot
2	J2,J4	Socket, 4 pin Molex, 22-11-2042
1	J3	Socket, 5 pin Molex, 22-11-2052
2	R1,R4	Resistor, 2.21k, 1%, M.F.,1/4 w
3	R2,R3,R5	Resistor, 10, 1%, M.F.,1/4 w
1	R7	Resistor, 1k, 1%, M.F.,1/4 w
1	R6 (A-H)	Resistor array, 10k 9 section
1	S1-2	Switch assy., Interlocked, Schadow, IES1698
1	S9-11	Switch Assy., Schadow,, IES1697

Misc. Parts:

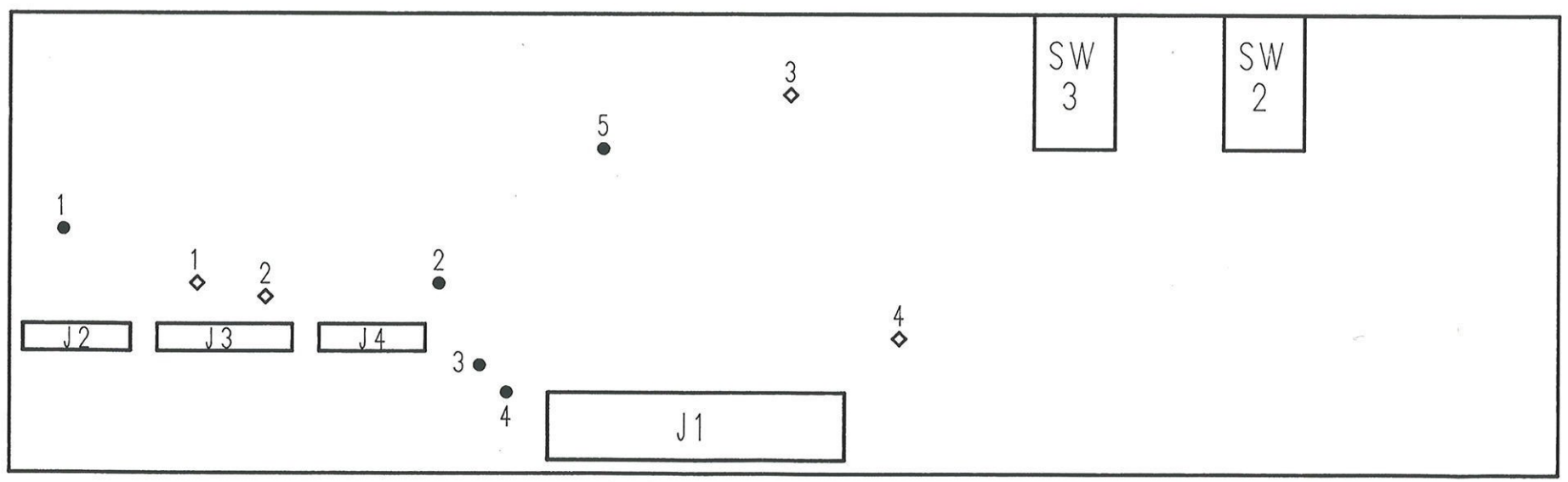
1	------	Select PC Board

Common Parts for 2line and 8line Select Assemblies:

1	------	Fader assy, Penney and Giles, type 3210DUADD
1	------	5 pin plug, Molex, 22013057P
1	------	Slider Assembly Bracket
1	------	On Switch, Compulite 221K11810
1	------	Off Switch, Compulite 221K11810
2	------	4 pin plug, Molex, 22013047



8 SEL PARTS LAYOUT

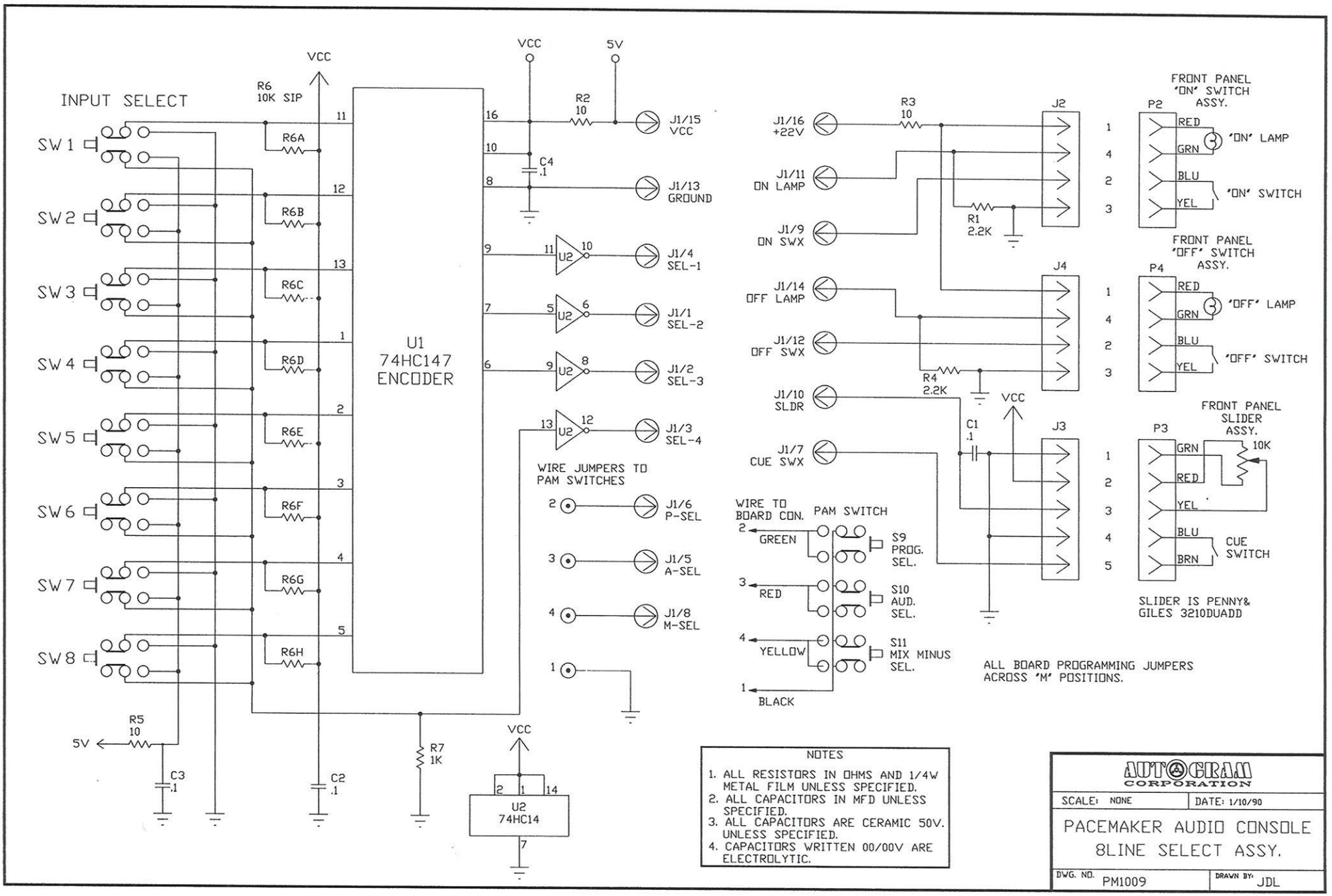


2 SEL PARTS LAYOUT

DRAWING # PM3009

NOTES:

- RESISTORS
- CAPACITORS



NOTES

1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 1/10/90

PACEMAKER AUDIO CONSOLE
8LINE SELECT ASSY.

DWG. NO. PM1009	DRAWN BY: JDL

PARTS LIST FOR
METER BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
5	C1-5	Capacitor, 2200pf/50v, monolythic
*20	D1-20	**Diode, germanium, 1N34
2	J1,J4	Socket, 16 pin ribbon, Carrot 511-065-003-016
2	J2-3	Socket, 4pin, Molex, 22-11-2042
*5	M1-5	Meter, VU, API, 304A
2	PH1-2	Programmable headers, 3pin
*5	R1,R4,R15,R19,R23	Resistor, 15k, 1%, M.F.,1/4 w
*5	R2,R5,R16,R20,R24	Resistor, 2.21k, 1%, M.F.,1/4 w
*5	R3,R6,R17,R21,R25	Resistor, 10, 1%, M.F.,1/4 w
10	R7-14,R19,R22	Resistor, 1k, 1%, M.F.,1/4 w

Misc. Parts:

1	-------	Meter PC Board

Notes:

* These numbers are for PM1032 console. Reduce to 12 diodes and 3 on each of the other marked parts for other models

** The diodes may be contained within the meter.

Associated parts:

2	-------	Switch assy., Mono and Meter/CTP Select, 2pos, interlocking, Schadow type IES 1697
2	P2-3	Plug, 4pin Molex, 2201-3047P

MONITOR/PHONES SELECT BOARD

1	C1	Capacitor, .1uf/50v, monolythic
1	J1	Socket, 10 pin Ribbon, Carrot type 511-065-003-010
2	J2-3	Socket, 4 pin Molex, 22-11-2042
1	S1	Switch assy., 4pos interlocked Schadow, IES1620

Misc. Parts:

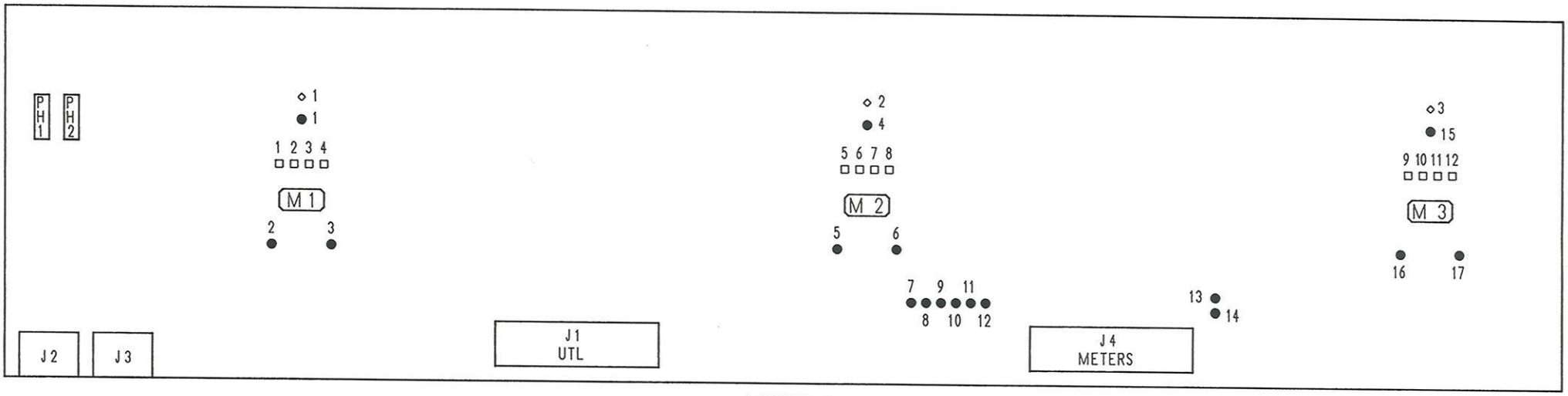
1	-------	Monitor/Phones Select P.C. Board

Associated Parts:

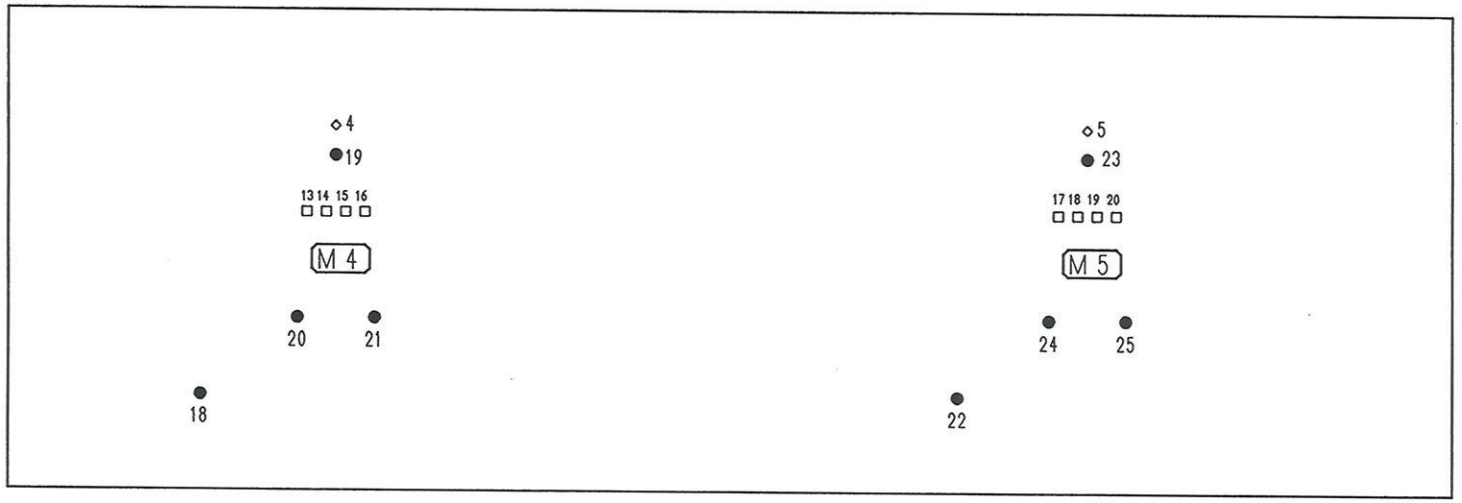
3	-------	Pot, Front Panel, Allen/Bradley JA1N056S103UA
3	-------	Plug, 4pin Molex, 2201-3047P

MOTHER BOARD

18	-------	Edge Conn., 56 pin Micro Plastics 0125-28-DS4
1	-------	10 pin Buchanan Assy SSB4K10/L10
10	-------	10k, resistor array
2	-------	12 pin Molex conn. 26481122
12	-------	Socket, 16 pin ribbon, Carrot 511-065-003-016
2	-------	Socket, 10 pin ribbon, Carrot 511-0650-003-010



METER BOARD PARTS LAYOUT
(PACEMAKER 648 AND 828)



NOTES:
- ● RESISTORS
- ◇ CAPACITORS
- □ DIODES

METER CARD PARTS LAYOUT
(PACEMAKER 1032 - EXTENSION OF ABOVE)

DRAWING # PM3011

L PGM (PM1032 ONLY)

R PGM (PM1032 ONLY)

THIS SECTION USED ONLY ON PM1032

M5 — VU — R23 15K — C5 2200PF — D18 D20 D17 D19 — R25 10 — R24 2.2K — R22 1K

M4 — VU — R19 15K — C4 2200PF — D14 D16 D13 D15 — R21 10 — R20 2.2K — R19 1K

MONO (PM1032)
LEFT (ALL OTHERS)

M3 — VU — R15 15K — C3 2200PF — D10 D12 D9 D11 — RR17 10 — R16 2.2K — R12 1K, R13 1K, R8 1K — 10

LEFT AUD (PM1032)
RIGHT (ALL OTHERS)

M2 — VU — R4 15K — C2 2200PF — D6 D8 D5 D7 — R6 10 — R5 2.2K — R7 1K, R14 1K, R9 1K — 10

RIGHT AUD (PM1032)
MONO (ALL OTHERS

M1 — VU — R1 15K — C1 2200PF — D2 D4 D1 D3 — R3 10 — R2 2.2K — R10 1K, R11 1K — 10

ALL DIODES 1N34

DIODES MAY BE CONTAINED WITHIN METER

JUMPER "10" FOR PM1032, "0" FOR OTHER UNITS

P1 TIMER

XMIT+	11	BLUE	PH1 T	J1/1 COM +
XMIT-	10	PURPLE	PH1 R	J1/2 COM-
REC+	12	GREY	PH2 T	J1/8 GND
REC-	13	WHITE	PH2 R	J1/9 GND
GROUND	S	BROWN		J1/10/GND
			N.C.	J1/11 -16V
			N.C.	J1/12 +16V
SET	8	TAN		J1/3 SET
TEMP +	14	YELLOW		J1/4 TEMP+
TEMP -	15	GREEN		J1/6 TEMP-
F/C	9	PINK		J1/5 F/C
RESET	3	ORANGE		J1/7 TIMER RESET
GROUND	A	BLACK		J1/13 PWR GND
				J1/14 PWR GND
POWER	1	RED		J1/15 TIMER POWER
				J1/16 TIMER POWER

NOTES
1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

PM1032- CTP DISABLE SWITCH
OTHERS- METER SELECT SWITCH

P3: CTP OFF PGM METER; CTP AUTO AUD METER

FRONT PANEL MONO SELECT SWITCH

P2: PGM; AUD

JUMPER '10' FOR PM1032
JUMPER '0' FOR OTHER UNITS

J3: J4/6 CTP DISABLE; J4/13 MTR SEL PGM; J4/1 MTR SEL AUD

J2: J4/11 MONO SEL PGM; J4/2 MONO SEL AUD

LEFT PGM MTR — J4/5
RIGHT PGM MTR — J4/3
LEFT AUD MTR — J4/10
RIGHT AUD MTR — J4/12
MONO MTR — J4/14

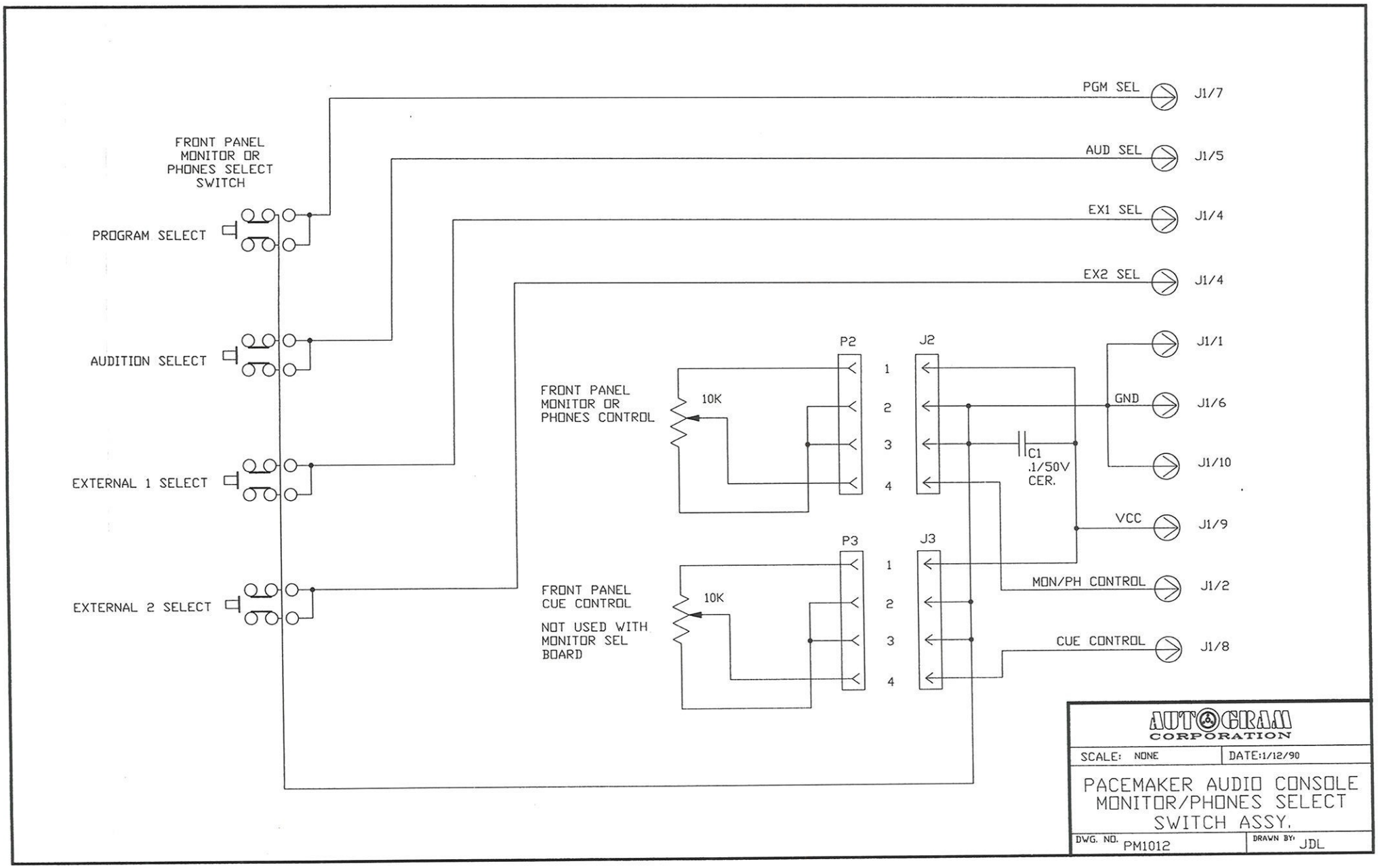
J4/4, J4/6, J4/7, J4/8, J4/9, J4/15

AUTOGRAM CORPORATION

SCALE: NONE | DATE: 1/11/90

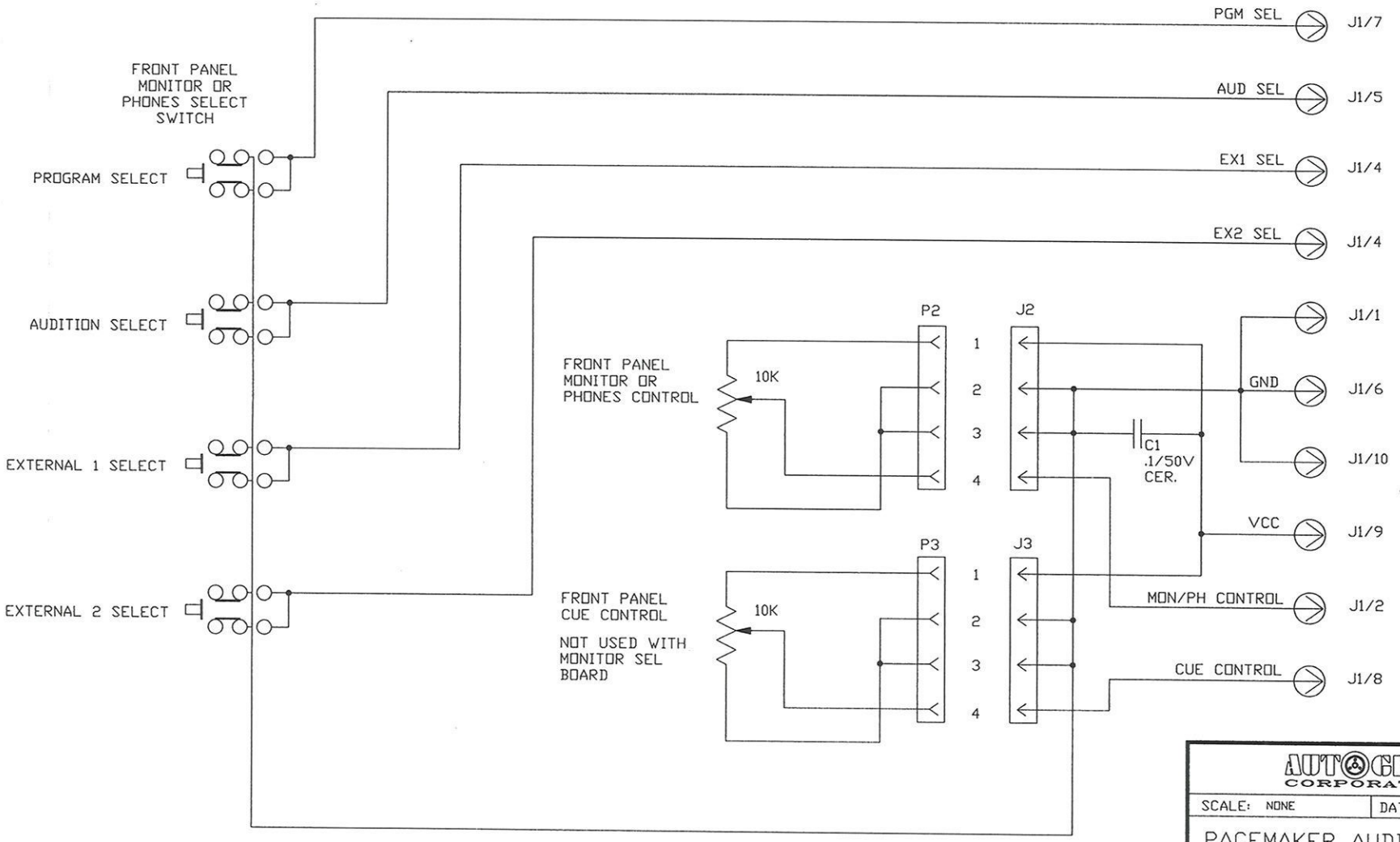
PACEMAKER AUDIO CONSOLE METER ASSEMBLY

DWG. NO. PM1011 | DRAWN BY: JDL


FRONT PANEL
MONITOR OR
PHONES SELECT
SWITCH
PROGRAM SELECT
AUDITION SELECT
EXTERNAL 1 SELECT
EXTERNAL 2 SELECT
PGM SEL
J1/7
AUD SEL
J1/5
EX1 SEL
J1/4
EX2 SEL
J1/4
P2
J2
FRONT PANEL
MONITOR OR
PHONES CONTROL
10K
1
2
3
4
J1/1
GND
J1/6
C1
.1/50V
CER.
J1/10
VCC
J1/9
P3
J3
FRONT PANEL
CUE CONTROL
NOT USED WITH
MONITOR SEL
BOARD
10K
1
2
3
4
MON/PH CONTROL
J1/2
CUE CONTROL
J1/8
AUTOGRAM
CORPORATION
SCALE: NONE
DATE:1/12/90
PACEMAKER AUDIO CONSOLE
MONITOR/PHONES SELECT
SWITCH ASSY.
DWG. NO. PM1012
DRAWN BY: JDL

PARTS LIST FOR
MAIN POWER SUPPLY BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
2	C1-2	Capacitor, 1000uf/50v, electrolytic
4	C3-6	Capacitor, 3300uf/50v, electrolytic
12	C7,C10-12,C15,C17,C20-21,C23-24 C27-28	Capacitor, .1uf/50v, monolythic
12	C8-9,C13-14,C16,C18-19,C22,C25-26 C29-30	Capacitor, 22uf/50v, electrolytic
11	D1-11	Rectifier, 1N4004
4	D12-15	Rectifier, MR-501
4	J1-4	Connector Assy, 3 pin Buchanan SSB4K03S,SSB4L03S
2	K1-2	Relay, DPDT, IDEC RD2N-1UDC-24
2	P1-2	12 pin Molex Assy
4	Q1-2,Q4-5	Regulator, Positive adj., LM317T
2	Q3,Q6	Regulator, Negative adj., LM337T
6	R1-4,R9,R11	Resistor, 1k, 1%, M.F.,1/4 w
1	R5	Resistor, 365, 1%, M.F.,1/4 w
6	R6,R8,R10,R12,R15,R18	Resistor, 121, 1%, M.F.,1/4 w
3	R7,R13,R16	Resistor, 2k, 1%, M.F.,1/4 w
2	R14,R17	Resistor, 5.62k, 1%, M.F.,1/4 w
1	U1	I.C., ULN2804, Darlington driver
Misc. parts:		
2	------	16 pin dip socket
1	------	18 pin dip socket
6	------	3 pin TO220 sockets
1	------	PM Main Power Supply PC Board
POWER SUPPLY CHASSIS PARTS		
1	F1	Fuse, 2.5 amp Slo-Blo,type MDL (115v operation)
(1)	F1	Fuse, 2.5 amp Slo-Blo,type MDL (230v operation)
2	F2,F3	Fuse, 2 amp, type AGC
2	F4,F5	Fuse, 1.5 amp Slo-Blo, type MDL
2	F6,F7	Fuse, 1 amp, type AGC
1	FL1	Filter, IEC, Corcom 3EF1
1	MOV-1	MOV, 130L20 (115vac), 250L20 (230vac)
1	S1	Switch, Marquadt 1801-1102
1	T1	Transformer, power, Leightner 020-0884
Misc. Parts:		
7	-------	Fuse sockets, type HPK, Bussman
1	-------	Pacemaker power supply chassis
1	-------	Pacemaker regulator heat sink

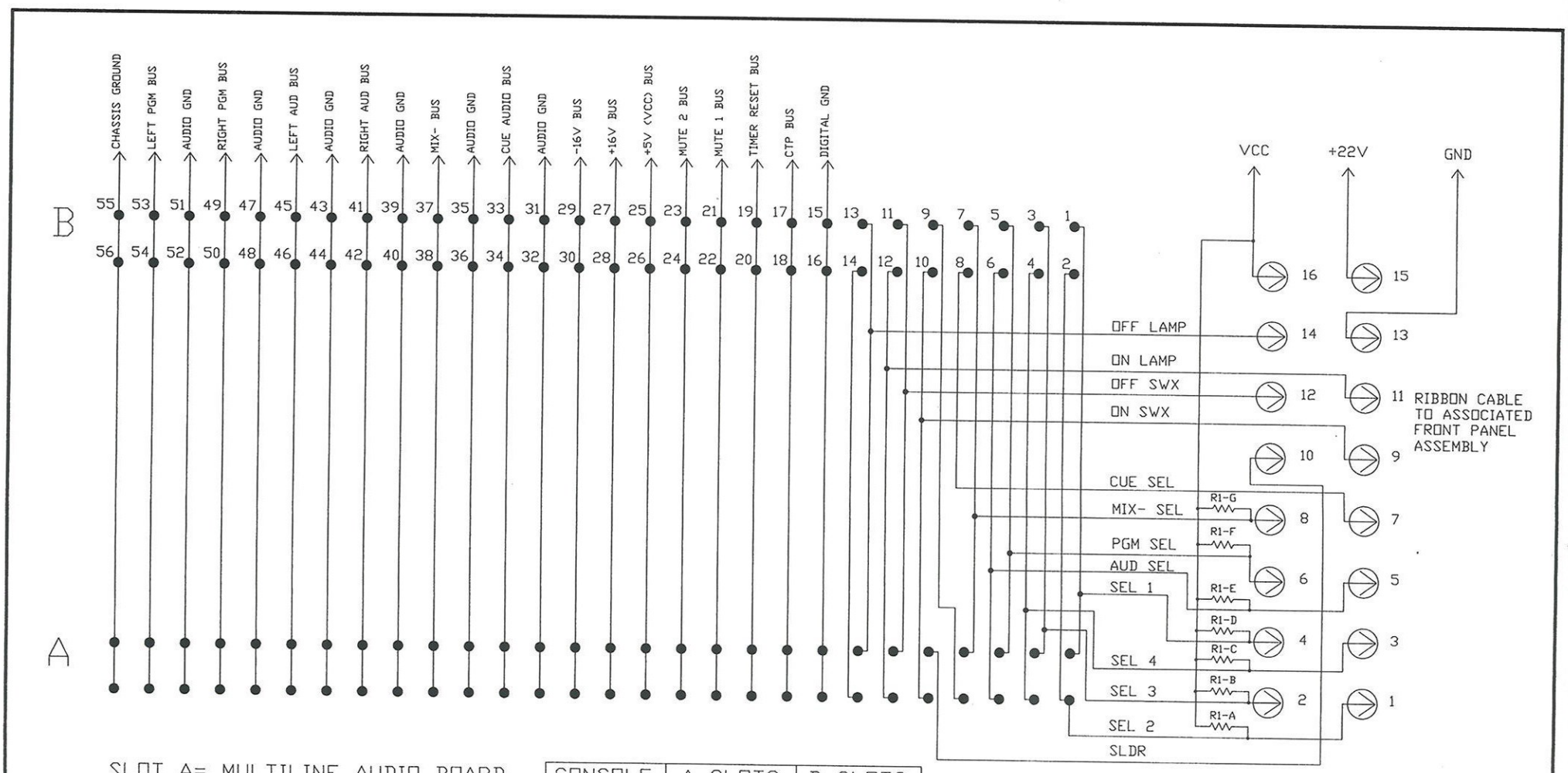


AUTOGRAM CORPORATION

SCALE: NONE	DATE:1/12/90

PACEMAKER AUDIO CONSOLE
MONITOR/PHONES SELECT
SWITCH ASSY.

DWG. NO. PM1012	DRAWN BY: JDL



SLOT A= MULTILINE AUDIO BOARD
SLOT B= CONTROL BOARD

CONSOLE	A SLOTS	B SLOTS
PM 648	3,5,7,9,11,13	4,6,8,10,12,14
PM 828	11,13	12,14
PM1032	11,13	12,14

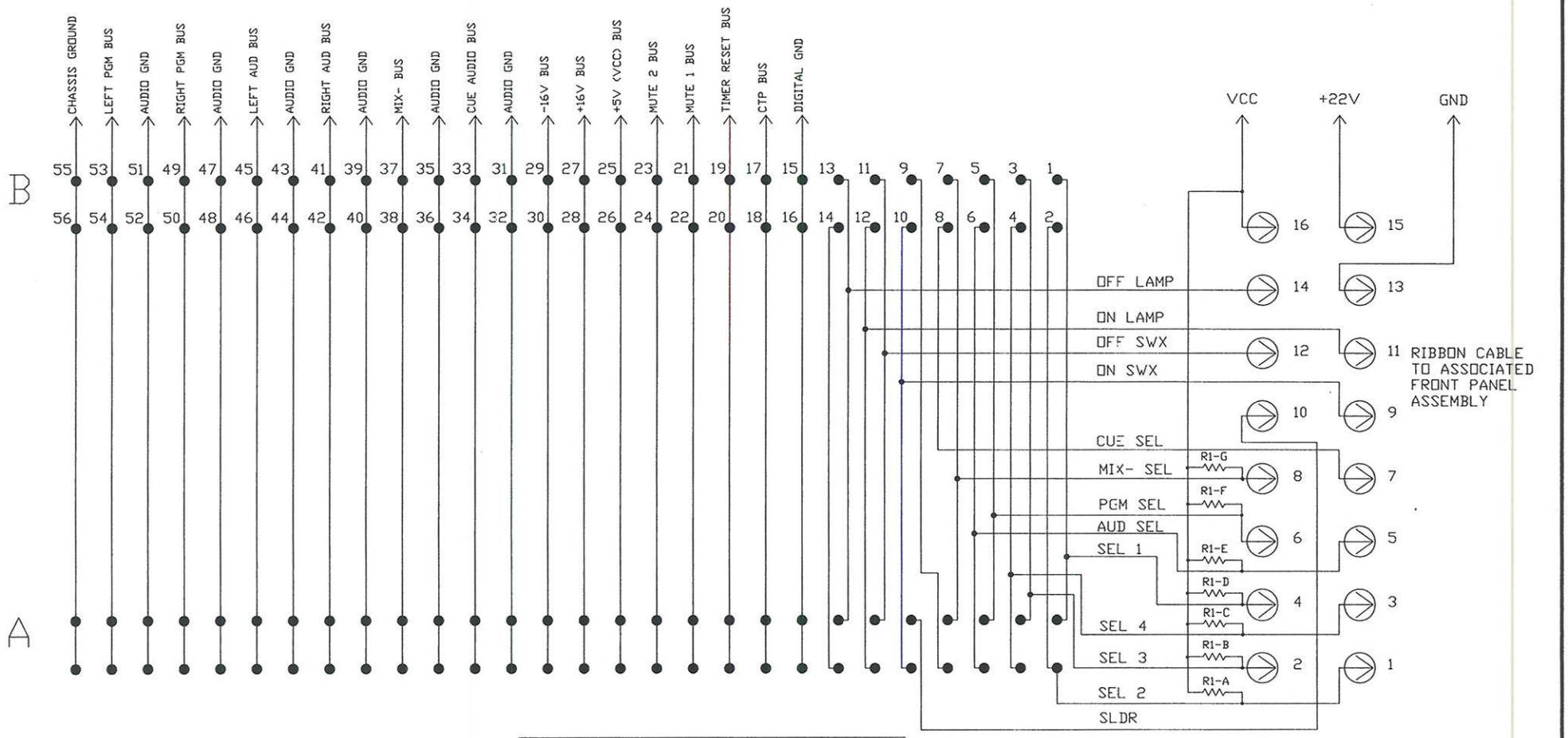
R1=10K SIP

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 1/14/90

PACEMAKER AUDIO CONSOLE
TYPICAL MULTILINE
MOTHERBOARD INTERCONNECT

DWG. NO. PM1013	DRAWN BY: JDL



SLOT A= MULTILINE AUDIO BOARD
SLOT B= CONTROL BOARD

CONSOLE	A SLOTS	B SLOTS
PM 648	3,5,7,9,11,13	4,6,8,10,12,14
PM 828	11,13	12,14
PM1032	11,13	12,14

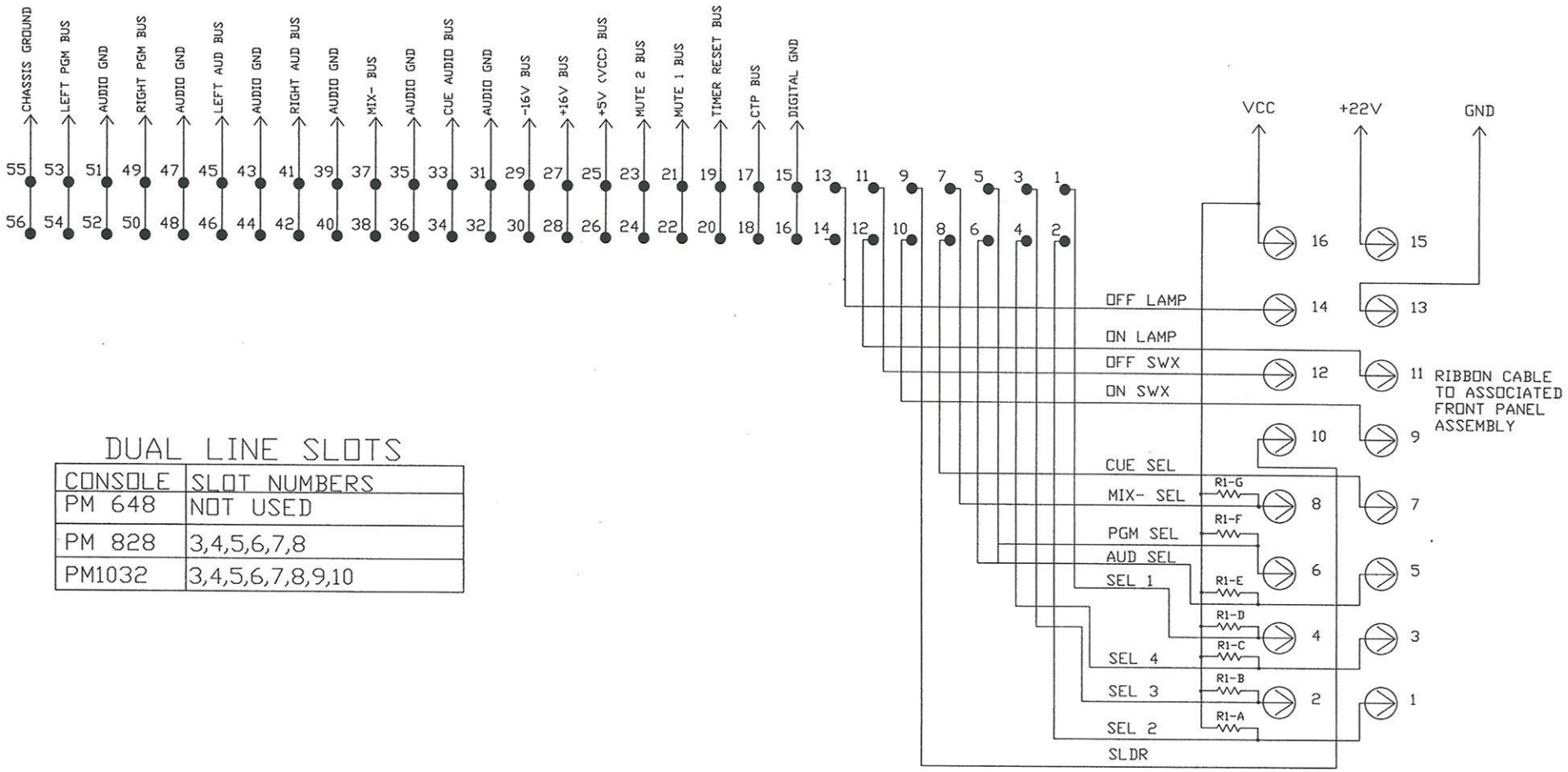
R1=10K SIP

AUTOGRAM CORPORATION

SCALE: NONE	DATE: 1/14/90

PACEMAKER AUDIO CONSOLE
TYPICAL MULTILINE
MOTHERBOARD INTERCONNECT

DWG. NO. PM1013	DRAWN BY: JDL



DUAL LINE SLOTS

CONSOLE	SLOT NUMBERS
PM 648	NOT USED
PM 828	3,4,5,6,7,8
PM1032	3,4,5,6,7,8,9,10

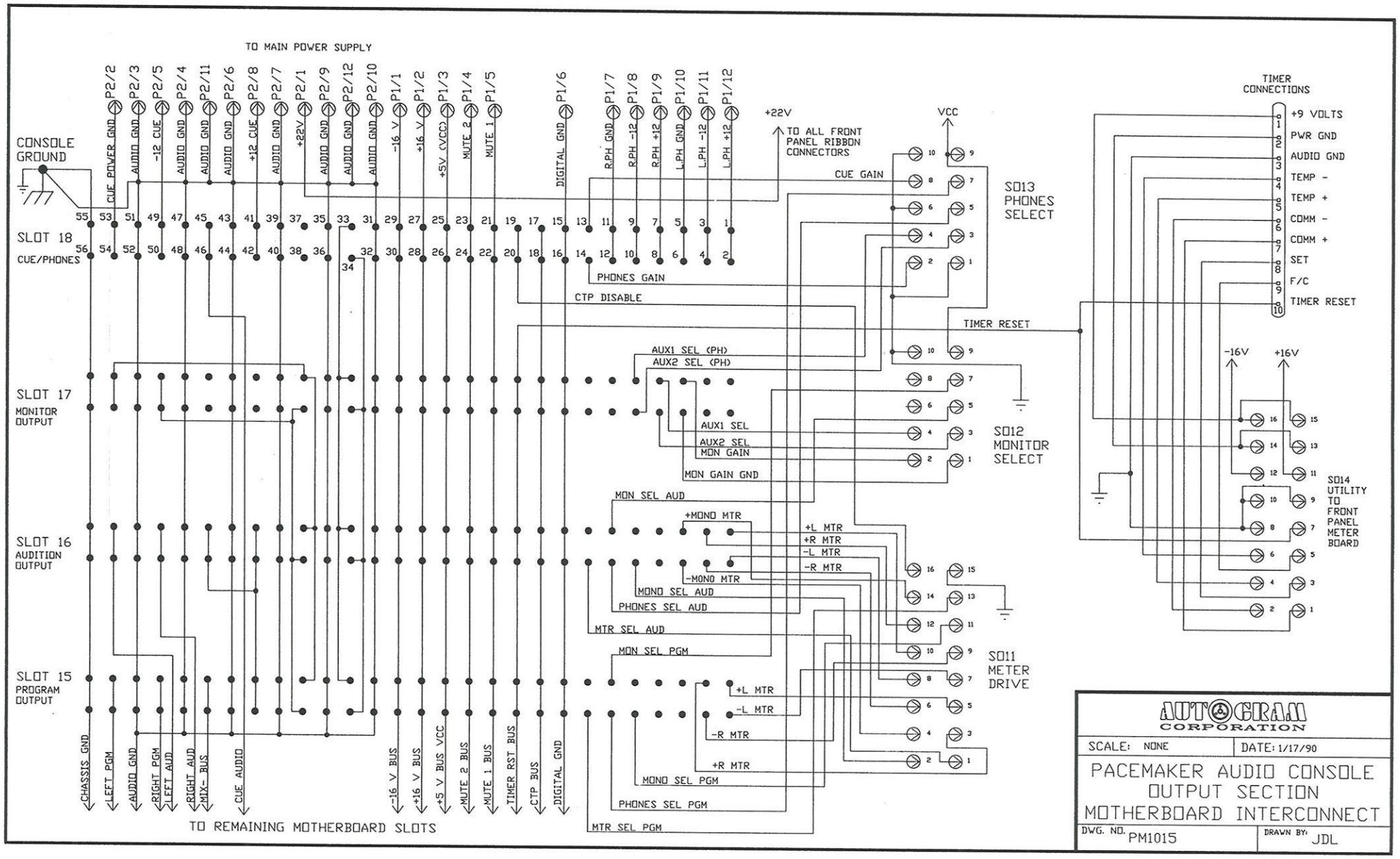
R1=10K SIP

AUTOGRAM CORPORATION

SCALE: NONE | DATE: 1/15/90

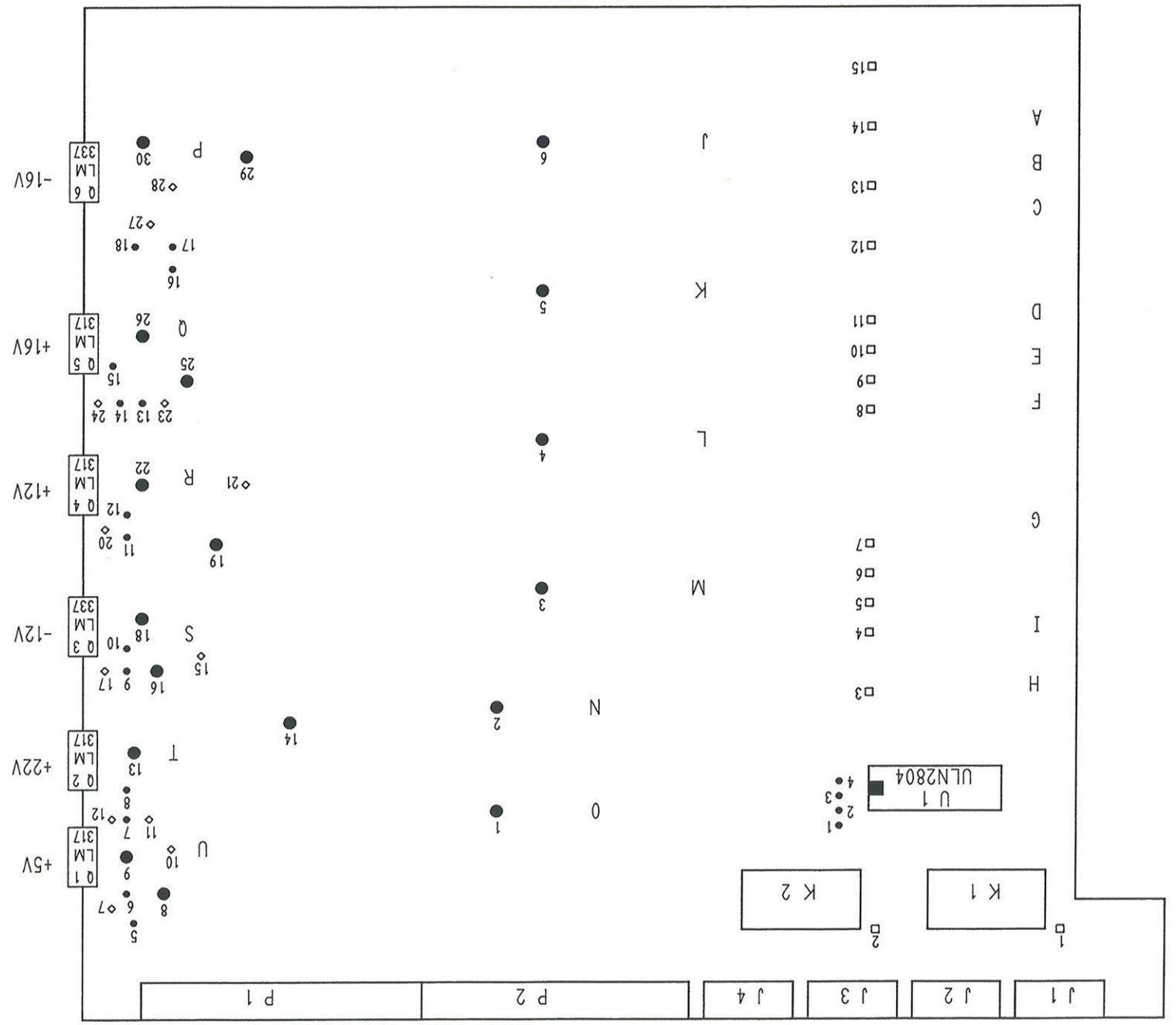
PACEMAKER AUDIO CONSOLE
TYPICAL DUAL LINE
MOTHERBOARD INTERCONNECT

DWG. NO. PM1014 | DRAWN BY: JDL


TO MAIN POWER SUPPLY
CONSOLE GROUND
SLOT 18 CUE/PHONES
SLOT 17 MONITOR OUTPUT
SLOT 16 AUDITION OUTPUT
SLOT 15 PROGRAM OUTPUT
CUE PWR GND P2/2
AUDIO GND P2/3
-12 CUE P2/5
AUDIO GND P2/4
AUDIO GND P2/11
AUDIO GND P2/6
+12 CUE P2/8
AUDIO GND P2/7
+22V P2/1
AUDIO GND P2/9
AUDIO GND P2/12
AUDIO GND P2/10
-16 V P1/1
+16 V P1/2
+5V (VCC) P1/3
MUTE 2 P1/4
MUTE 1 P1/5
DIGITAL GND P1/6
R.PH GND P1/7
R.PH -12 P1/8
R.PH +12 P1/9
L.PH GND P1/10
L.PH -12 P1/11
L.PH +12 P1/12
+22V
TO ALL FRONT PANEL RIBBON CONNECTORS
VCC
CUE GAIN
PHONES GAIN
CTP DISABLE
TIMER RESET
AUX1 SEL (PH)
AUX2 SEL (PH)
AUX1 SEL
AUX2 SEL
MON GAIN
MON GAIN GND
MON SEL AUD
+MONO MTR
-MONO MTR
MONO SEL AUD
PHONES SEL AUD
MTR SEL AUD
MON SEL PGM
MONO SEL PGM
PHONES SEL PGM
MTR SEL PGM
+L MTR
+R MTR
-L MTR
-R MTR
SD13 PHONES SELECT
SD12 MONITOR SELECT
SD11 METER DRIVE
TIMER CONNECTIONS
+9 VOLTS
PWR GND
AUDIO GND
TEMP -
TEMP +
COMM -
COMM +
SET
F/C
TIMER RESET
-16V
+16V
SD14 UTILITY TO FRONT PANEL METER BOARD
CHASSIS GND
LEFT PGM
AUDIO GND
RIGHT PGM
LEFT AUD
RIGHT AUD
MIX- BUS
CUE AUDIO
-16 V BUS
+16 V BUS
+5 V BUS VCC
MUTE 2 BUS
MUTE 1 BUS
TIMER RST BUS
CTP BUS
DIGITAL GND
TO REMAINING MOTHERBOARD SLOTS
AUTOGRAM CORPORATION
SCALE: NONE
DATE: 1/17/90
PACEMAKER AUDIO CONSOLE OUTPUT SECTION MOTHERBOARD INTERCONNECT
DWG. NO. PM1015
DRAWN BY: JDL

PARTS LIST FOR
MAIN POWER SUPPLY BOARD
PACEMAKER AUDIO CONSOLE

QTY	REFERENCE DESIGNATOR	DESCRIPTION
2	C1-2	Capacitor, 1000uf/50v, electrolytic
4	C3-6	Capacitor, 3300uf/50v, electrolytic
12	C7,C10-12,C15,C17,C20-21,C23-24 C27-28	Capacitor, .1uf/50v, monolythic
12	C8-9,C13-14,C16,C18-19,C22,C25-26 C29-30	Capacitor, 22uf/50v, electrolytic
11	D1-11	Rectifier, 1N4004
4	D12-15	Rectifier, MR-501
4	J1-4	Connector Assy, 3 pin Buchanan SSB4K03S,SSB4L03S
2	K1-2	Relay, DPDT, IDEC RD2N-1UDC-24
2	P1-2	12 pin Molex Assy
4	Q1-2,Q4-5	Regulator, Positive adj., LM317T
2	Q3,Q6	Regulator, Negative adj., LM337T
6	R1-4,R9,R11	Resistor, 1k, 1%, M.F.,1/4 w
1	R5	Resistor, 365, 1%, M.F.,1/4 w
6	R6,R8,R10,R12,R15,R18	Resistor, 121, 1%, M.F.,1/4 w
3	R7,R13,R16	Resistor, 2k, 1%, M.F.,1/4 w
2	R14,R17	Resistor, 5.62k, 1%, M.F.,1/4 w
1	U1	I.C., ULN2804, Darlington driver
Misc. parts:		
2	------	16 pin dip socket
1	------	18 pin dip socket
6	------	3 pin TO220 sockets
1	------	PM Main Power Supply PC Board
POWER SUPPLY CHASSIS PARTS		
1	F1	Fuse, 2.5 amp Slo-Blo,type MDL (115v operation)
(1)	F1	Fuse, 2.5 amp Slo-Blo,type MDL (230v operation)
2	F2,F3	Fuse, 2 amp, type AGC
2	F4,F5	Fuse, 1.5 amp Slo-Blo, type MDL
2	F6,F7	Fuse, 1 amp, type AGC
1	FL1	Filter, IEC, Corcom 3EF1
1	MOV-1	MOV, 130L20 (115vac), 250L20 (230vac)
1	S1	Switch, Marquadt 1801-1102
1	T1	Transformer, power, Leightner 020-0884
Misc. Parts:		
7	-------	Fuse sockets, type HPK, Bussman
1	-------	Pacemaker power supply chassis
1	-------	Pacemaker regulator heat sink


NOTES:
• RESISTORS
◇ CAPACITORS
□ DIODES
● ELECTROLYTIC CAPACITORS
MAIN POWER SUPPLY BOARD PARTS LAYOUT
DRAWING # PM3008
J1
J2
J3
J4
P2
P1
K1
K2
U1
ULN2804
+5V
+22V
+12V
-12V
+16V
-16V
LM317
LM337

VOLTAGE SELECTION

*	120VAC	240VAC
F1	2.5A S.B.	1.5A S.B.
MOV	130L20	250L20
JMP1	IN	OUT
JMP2	IN	OUT
JMP3	OUT	IN

T1
LEIGHTNER
020-0884

D1-D11= 1N4004
D12-D15= MR501

TEST PARAMETERS

1. 120 VAC INPUT
2. OUTPUTS NOT LOADED
3. MEASUREMENTS TO GROUND UNLESS NOTED

TB-1

S1
*F1
*JMP1
*JMP2
*JMP3
*MOV1
FL-1
L G N
EMI FILTER
3EF1
CORCOM

F2 2A
F3 2A
F4 1.5A S.B.
F5 1.5A S.B.
F6 1A
F7 1A

+24.8VDC / -24.8VDC — C5 3300/50V, C6 3300/50V — D13 D15 D12 D14 — 17.5 VAC, 17.5 VAC
+18.5VDC / -18.5VDC — C4 3300/50V, C3 3300/50V — D11 D9 D10 D8 — 12.5 VAC, 12.5 VAC
+30VDC — C2 1000/50V — D7 D5 D6 D4 — 22 VAC
+14VDC — C1 1000/50V — D3

LM317 Q5 — +15.2VDC — P1(2) +16 V.
LM337 Q6 — -15.2VDC — P1(1) -16 V.
LM317 Q4 — +10.5VDC — P1(12) +12 L. PHONES, P1(9) +12 R. PHONES, P2(8) +12 CUE
LM337 Q3 — -10.5VDC — P1(11) -12 L. PHONES, P1(9) -12 R. PHONES, P2(5) -12 CUE
LM317 Q2 — +21VDC — P2(1) +22V.
LM317 Q1 — +3.8VDC — P1(3) +5V. VCC

P1(6) GROUND
P1(7) GROUND
P1(10) GROUND
P2(12) GROUND
P2(11) GROUND
P2(10) GROUND
P2(9) GROUND
P2(2) GROUND
P2(3) GROUND
P2(4) GROUND
P2(6) GROUND
P2(7) GROUND
VCC

U1 ULN2804

P1(5) MUTE 1 — R4 1K, R3 1K — K1
P1(4) MUTE 2 — R2 1K, R1 1K — K2

J1 K1-A (3 NC, 1 NO, 5 COM)
J2 K1B (14 NC, 16 NO, 12 COM)
J3 K2A (3 NC, 1 NO, 5 COM)
J4 K2B (14 NC, 16 NO, 12 COM)

K1,K2= IDEC RD2N-1UDC-24
OR EQUIV.

WARNING

RELAY CONTACTS RATED
AT 2 AMPS D.C
30 WATTS A.C.

NOTES

1. ALL RESISTORS IN OHMS AND 1/4W METAL FILM UNLESS SPECIFIED.
2. ALL CAPACITORS IN MFD UNLESS SPECIFIED.
3. ALL CAPACITORS ARE CERAMIC 50V. UNLESS SPECIFIED.
4. CAPACITORS WRITTEN 00/00V ARE ELECTROLYTIC.

⊙ POWER SUPPLY CIRCUIT BOARD CONNECTION

TRANSFORMER WIRE NUMBER

Q1-Q6
REGULATOR PINOUT

PIN	LM317	LM337
1	ADJ.	ADJ.
2	V OUT	V IN
3	V IN	V OUT

TO-220 PKG
1 2 3

CONNECTS TO CONSOLE MOTHERBOARD

AUTOGRAM CORPORATION

SCALE	NONE	DATE	5/23/90

PACEMAKER AUDIO CONSOLE
MAIN POWER SUPPLY

DWG. NO.	PM1008	DRAWN BY:	JDL