
PRODUCTIONMIXER
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PRODUCTIONMIXER



Technical Manual

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PRODUCTIONMIXER BROADCAST CONSOLE TECHNICAL MANUAL

1.0 GENERAL INFORMATION

This chapter contains an introduction to the Productionmixer Broadcast Console Technical Manual, an overview of the Productionmixer's features, specifications and warranty information.

1.1 INTRODUCTION

Congratulations on your decision to join the growing ranks of Pacific Recorders & Engineering Corporation (PR&E) broadcasters. PR&E is in the business of supplying the finest audio systems to the world's leading broadcast facilities. Your decision to go with PR&E means that you expect more than simple working hardware. Please be assured that it is our strong desire to provide each of our customers with the kind of products, systems, documentation and support that we would specify if we were in your position.

We invite your comments and suggestions for improvement of this document, and of all our services. By constant attention to our customer's needs, we will continue to earn our reputation for excellence, and to refine our understanding of the requirements of the marketplace.

This manual is designed to provide the information required to understand, install, operate, and maintain the Productionmixer Broadcast Console. It is assumed that the reader has a working knowledge of audio control consoles, systems, and installation practices. The Productionmixer is a sophisticated console with an extensive range of features and capabilities. To obtain the maximum benefit of the console's capabilities, it is strongly recommended that the Installation, Operation, and Equipment Description chapters of this manual be read thoroughly prior to installing the unit.

Each Productionmixer is specifically configured to the customer's requirements, thoroughly tested, and "burned-in" prior to packing for shipment. Should you encounter any difficulty during installation or initial operation, we recommend that you contact PR&E for assistance.

1.2 OVERVIEW

The Productionmixer Broadcast Production Console is designed with the capacity to accomplish almost any type of stereo audio control and production task in a radio broadcast facility. The highest quality components and circuit designs are used throughout the Productionmixer, and the gain structure of the console has been designed so that normal operation is easily achieved without any danger of internal clipping (when operating the amplifiers at optimum signal to noise conditions).

The Productionmixer incorporates all of the on-air functions of the highly popular Radiomixer while

adding impressive multitrack and stereo production capabilities, such as 3 band parametric equalizers on all inputs, stereo sends, and expanded communication facilities.

The Productionmixer is currently being produced in two mainframe sizes, which will accommodate 20 or 28 input modules. The input modules accept the range of input levels normally found in broadcast operations, without the use of external pads or amplifiers. A patch point is provided for each input position after the input amplifier and before the fader. This is the optimum point at which to insert external processing devices such as limiters and equalizers.

All console inputs and program outputs are balanced, for best noise rejection and simplified system grounding. When properly installed using the information contained in this manual, the Productionmixer is free of internal pops, clicks and RFI.

The separately packaged power supply is fully regulated, and is protected with a magnetic circuit breaker, as well as electronic safeguards against excessive current and line voltage fluctuations. The power supply provides four separate voltage outputs. Two of these outputs (± 16 volts) are used to power the audio circuitry. The third output (+13 volts) is used to power the logic control circuitry, lamps and relays. The fourth output (+48 volts) is used for the phantom powering of condenser microphones connected to the Microphone Input Modules.

1.3 SPECIFICATIONS

Following is a list of specifications for the Productionmixer Broadcast Console:

MICROPHONE INPUTS

Source Impedance	150 ohms.
Input Impedance	30K ohms minimum, balanced.
Input Level Range	Adjustable from -70 dBu to -35 dBu.
Input Headroom	Greater than 30 dB above nominal input.

HIGH LEVEL INPUTS

Source Impedance	600 ohms or less.
Input Impedance	Greater than 40K ohms, balanced.
Input Level Range:	
Line Input Module	Adjustable from -12 dBu to +9 dBu.
Patch Return Inputs	Nominal -10 dBu.
Monitor Inputs	Fixed at the system operating reference level (+4 dBu or +8 dBu).
Input Headroom	Greater than 30 dB above nominal input.

MAIN OUTPUTS

Load Impedance	600 ohms minimum.
Source Impedance	80 ohms, balanced.
Nominal Output Levels:	
Program and Monaural	+4 dBm to +8 dBm, adjustable.
Telephone Mix-Minus	Nominal 0 dBu.
Tape Mix-Minus	Fixed at the system operating reference level (+4 dBu or +8 dBu).
Maximum Output Levels:	
Program and Monaural	+26 dBm, 600 ohm load.
Telephone Mix-Minus	+24 dBm, 600 ohm load.
Tape Mix-Minus	+24 dBm, 600 ohm load.

MONITOR OUTPUTS

Main Outputs:	
Load Impedance	600 ohms or greater.
Source Impedance	40 ohms, unbalanced.
Output Level	0 dBu nominal, +20 dBu maximum.
Headphone Outputs:	
Load Impedance	8 ohms or greater.
Source Impedance	100 ohms.
Output Level	0 dBu nominal, +20 dBu maximum.

FREQUENCY RESPONSE

Mic Input to Program Output	+0 dB, -0.7 dB, from 20 Hz to 20 kHz.
Line Input to Program Output	+0 dB, -0.7 dB, from 20 Hz to 20 kHz.

NOISE

Microphone Input Amplifier	-128 dBu equivalent input noise, 150 ohm source, 20 kHz bandwidth.
Line Input Amplifier	-88 dBu equivalent input noise, 600 ohm source, 20 kHz bandwidth.
Output Noise with one microphone ON, fader at 0 dB, input sensitivity at -50 dBu	75 dB below output, reference +8 dBu, 150 ohm source, 20 kHz bandwidth.
Output Noise with one line ON, fader at 0 dB, input sensitivity at +8 dBu	80 dB below output, reference +8 dBu, 600 ohm source, 20 kHz bandwidth.

Output Noise with no input channels ON

82 dB below output, reference +8 dBu, 20 kHz bandwidth.

DISTORTION, T.H.D.

Mic Input to Program Output

Less than 0.01%, 20 Hz to 20 kHz, -32 dBu input, +24 dBm output into a 600 ohm load, 80 kHz meter bandwidth.

Line Input to Program Output

Less than 0.01%, 20 Hz to 20 kHz, +24 dBu input, +24 dBm output into a 600 ohm load, 80 kHz meter bandwidth.

DISTORTION, I.M.D.

Mic Input to Program Output

Less than 0.01%, -32 dBu input, +24 dBm output into a 600 ohm load.

Line Input to Program Output

Less than 0.01%, +24 dBu input, +24 dBm output into a 600 ohm load.

BUS CROSSTALK

Program-1 to Program-2

Less than -85 dB at 1 kHz;
Less than -75 dB at 20 kHz.

Program-2 to Program-1

Less than -85 dB at 1 kHz;
Less than -75 dB at 20 kHz.

STEREO SEPARATION

Program Outputs

Less than -80 dB at 1 kHz;
Less than -60 dB at 20 kHz.

POWER REQUIREMENTS

Fully configured Productionmixer-12
Fully configured Productionmixer-20
Fully configured Productionmixer-28

350 watts @120 VAC, $\pm 8\%$, 50/60 Hz.
425 watts @120 VAC, $\pm 8\%$, 50/60 Hz.
500 watts @120 VAC, $\pm 8\%$, 50/60 Hz.

NOTES:

- A) These specifications are for the basic signal paths, per channel, with 600 ohm loads connected to the program outputs.

- B) 0 dBu corresponds to an amplitude of 0.775 volts RMS regardless of the impedance of the circuit. It is the same voltage value as 0 dBm measured in a 600 ohm circuit. This enables convenient level measurement with meters calibrated for 600 ohm circuits.
- C) Noise specifications are for one fully loaded Productionmixer-20. Noise specifications are based upon a 20 kHz measurement bandwidth; the use of a meter with 30 kHz bandwidth will result in a noise measurement increase of approximately 1.7 dB.

Pacific Recorders & Engineering Corporation reserves the right to change specifications without notice or obligation.

1.4 WARRANTY INFORMATION

This product carries a manufacturer's warranty which is subject to the following guidelines and limitations:

- A) Except as expressly excluded hereinafter, Pacific Recorders & Engineering Corporation ("Seller") warrants equipment of its own manufacture against faulty workmanship or the use of defective materials for a period of one (1) year from date of shipment to Buyer. The liability of the Seller under this Warranty is limited to replacing, repairing or issuing credit (at the Seller's discretion) for any equipment, provided that Seller is promptly notified in writing within five (5) days upon discovery of such defects by Buyer, and Seller's examination of such equipment shall disclose to its satisfaction that such defects existed at the time shipment was originally made by seller, and Buyer returns the defective equipment to Seller's place of business in Carlsbad, California, packaging and transportage prepaid, with return packaging and transportage guaranteed.
- B) Equipment furnished by Seller but manufactured by another shall be warranted only to the extent provided by the other manufacturer.
- C) Thermal filament devices such as lamps and fuses are expressly excluded from this warranty.
- D) The warranty period on equipment or parts repaired or replaced under warranty shall expire upon the expiration date of the original warranty.
- E) This Warranty is void for equipment which has been subject to abuse, improper installation, improper operation, improper or omitted maintenance, alteration, accident, negligence (in use, storage, transportation or handling), operation not in accordance with Seller's operation and service instructions, or operation outside of the environmental conditions specified by Seller.
- F) This Warranty is the only warranty made by Seller, and is in lieu of all other warranties, including merchantability and fitness for a particular purpose, whether expressed or implied, except as to title and to the expressed specifications contained in this manual. Seller's sole liability for any equipment failure or any breach of this Warranty is as set forth in subparagraph A) above; and Seller shall not be liable or responsible for any business loss or interruption, or other consequential damages of any nature whatsoever, resulting from any equipment failure or breach of this warranty.

2.0 INSTALLATION

This chapter provides instruction in the proper installation of the Productionmixer Broadcast Console. Included are sections outlining general installation guidelines, cable preparation, mainframe configuration, grounding and shielding, power connection, patch point connection, audio and logic connection, remote control capabilities, and module internal option switches.

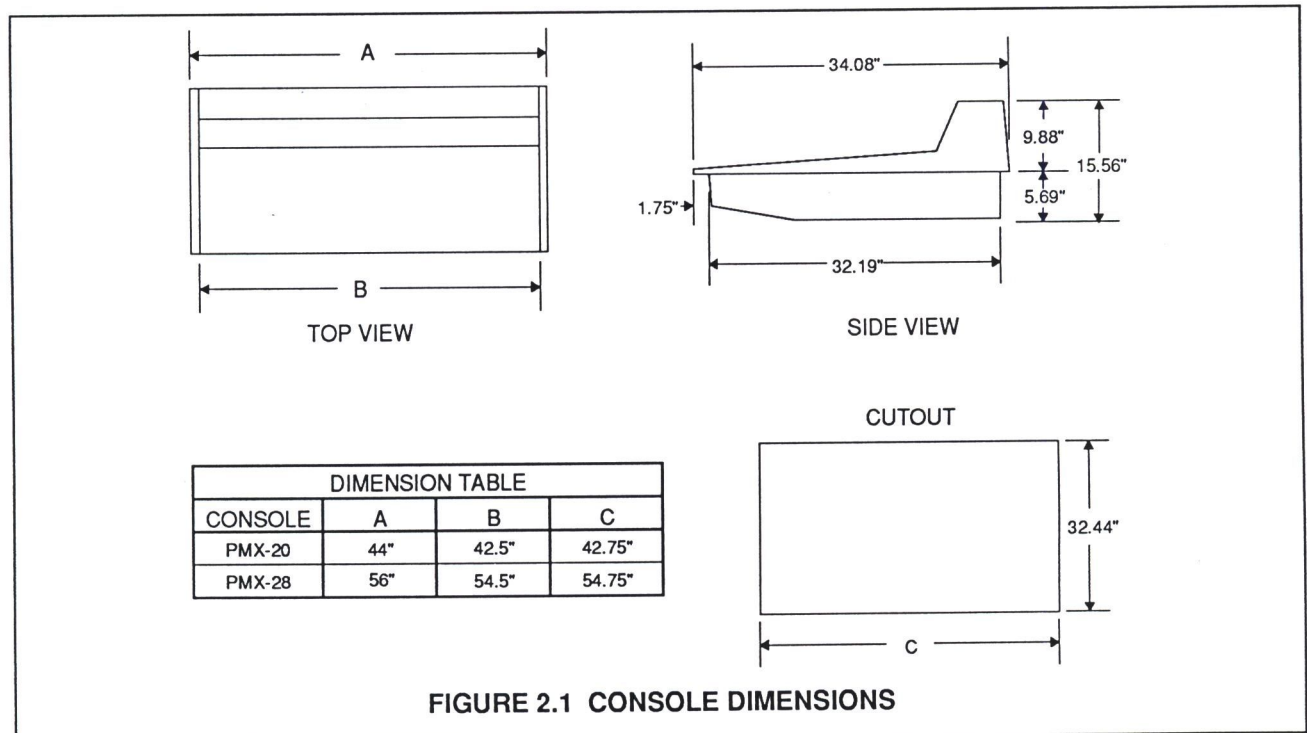
2.1 GENERAL GUIDELINES

The Productionmixer should be carefully unpacked and inspected for any shipping damage. If the inspection reveals any damage, file a claim with the delivering carrier. The packing material should be kept as evidence of mishandling, as well as to allow return of the equipment to the factory, if necessary.

Included with the console are the tool and spare parts kits (reference Sections 6.4 and 6.5), and the appropriate connector kit, which contains all of the Molex connector housings and pins necessary to prepare the audio input/output and logic cables, as described in Section 2.2.

The console mainframe is installed by setting it into a cutout in the work surface of the studio cabinetry (console and cutout dimensions are provided in Figure 2.1). Prior to installing the mainframe, a final check should be made to confirm that the cutout dimensions are correct. Also, be sure that the cabinetry is in its proper position and leveled, as it is unlikely that the cabinetry can be moved, squared or leveled once the weight of the Productionmixer has been added.

NOTE: The cabinetry in which the Productionmixer is to be mounted must be of sufficiently sturdy construction to support the console.



The mainframe is supported by the hardwood end panels, and is actually suspended between these two panels, with the front hardwood piece serving only as trim molding.

NOTE: Care should be taken to avoid locating the console within six feet of any intense electromagnetic hum fields, such as those produced by large power transformers and motors. Likewise, cables to and from the console should be routed to achieve maximum practical distance from AC mains power wiring. Particular attention should be paid to some of the low-cost, supposedly “professional”, power amplifiers which have appeared in the marketplace. In many cases the low cost has been partially achieved through the use of small core power transformers operating at or on the edge of saturation. While these units may operate to their own specifications, the electromagnetic fields they radiate may impair the performance of the Productionmixer or neighboring equipment such as tape recorders, cassette decks and cartridge machines.

Signal, logic, and power connections are made to the connector panel located on the underside of the mainframe (reference Figure 2.6).

The power supply is usually installed in the console support cabinetry using 7-inch EIA standard rack rails. Adequate ventilation must be provided for the proper dissipation of heat. The power supply is designed for convection cooling by the two rectifier/regulator heat sinks located on opposite sides of the chassis. Large heat sinks were chosen over the use of fans to eliminate the problems of dust circulation, noise, and potential mechanical failure associated with fan cooling.

Install legend strips by sliding them into the tops of the legend panels. Monitor legend strips are .62 inch wide by 2.85 inches high (15.75 mm by 72.5 mm); Remote Line Selector legend strips are .62 inch wide by 3.83 inches high (15.75 mm by 97.5 mm). Vertical switch spacing is .49 inch (12.5 mm).

Setting the console clock requires the use of the small magnet tool (PR&E #90-151) to operate the Hall-effect switches located immediately behind the clock's front panel lens. These switches are centered beneath the three pairs of digits, as shown in Figure 2.2.

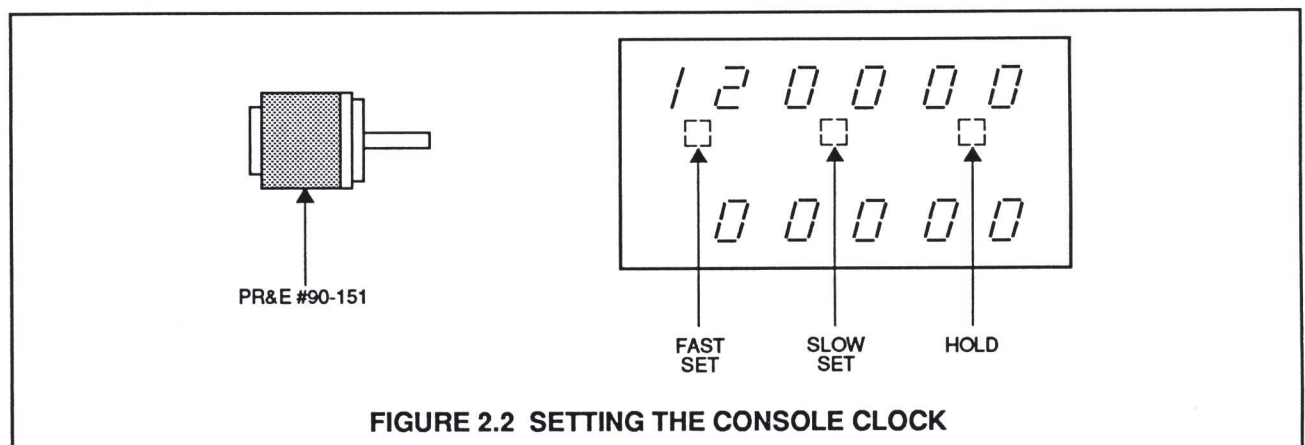


FIGURE 2.2 SETTING THE CONSOLE CLOCK

To adjust the clock, place the end of the adjusting magnet against the panel in the appropriate area. Use the FAST SET switch to advance the hours, and the SLOW SET switch to advance the minutes. The HOLD switch will cause the hours, minutes and seconds to stop and hold at their current setting.

2.2 CABLE PREPARATION

Before beginning the installation, a plan should be drawn up showing how the system will be interconnected (use the module pin-out information contained in Section 2.7). All cables and connectors should be tagged with numbers and/or legends, and logged.

Only unspliced (preferably new) cables should be used in connecting the mainframe. Audio connections should be made with two-conductor stranded insulated foil shielded cable with drain wire. The cable used should be equivalent to Belden types 8451, 9451, or 8761.

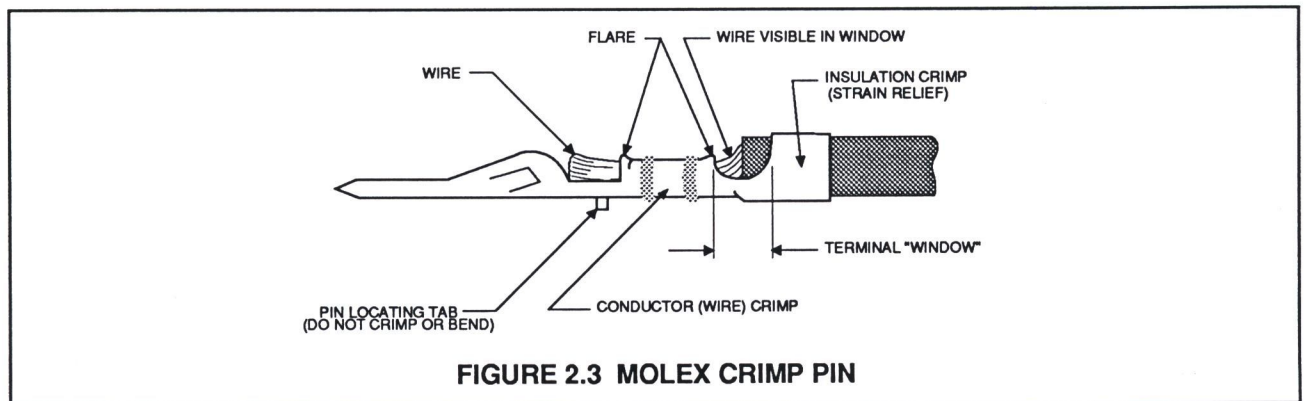
Strip the cable insulation jacket and foil shield back about 1-1/2 inches, and sleeve the shield drain wire with heat-shrink tubing, leaving about 3/16 inch of the wire exposed. Then, strip the insulation of each signal wire back about 3/16 inch, and sleeve the shield (at cable ends) with heat-shrink tubing.

NOTE: It is very important to sleeve the shield drain wire and the shield (at cable ends) with heat-shrink tubing. This is the only means of assuring an installation according to recommended grounding procedures.

The Molex pins are designed so that the short tab “ears” are crimped onto the stripped wire to make the electrical connection, while the long “ears” are crimped over the insulated section of the wire to help support the connection.

In order to crimp, insert the short ears of the Molex crimp pin into notch “B” of the crimping tool (PR&E #70-3), with the ears pointing toward the letter “B”. Insert the wire into the terminal so that the stripped portion is between the short crimp ears, and the insulation is between the long crimp ears. Crimp the short ears.

Now place the long ears of the pin into tool notch “A”, with the ears pointing toward the letter “A”. Crimp the long ears over the insulated section of wire. See Figure 2.3 for an example of a properly crimped Molex pin.



NOTE: When using Molex Crimping Tool #HTR-1719-C (PR&E #70-5), place a pin into slot “B” with the long ears on the “B” side of the tool and pointing toward the letter “B”. Place the wire into the tool from the “B” side, and then crimp the pin.

Logic control cables should be fabricated in a similar manner using 22 gauge multiple conductor, non-shielded, jacketed cable. The number of conductors required will be determined by application.

Once the pins are crimped, they may be inserted and locked into the nylon connector housing in accordance with the pin-out diagrams contained in section 2.7. A click can be felt indicating that the locking ears on the pin have set. If a pin is inserted in the wrong connector position, or it is desired to make a circuit change, use the connector pin extractor tool (PR&E #70-4) to release the pin and press it out of the connector housing.

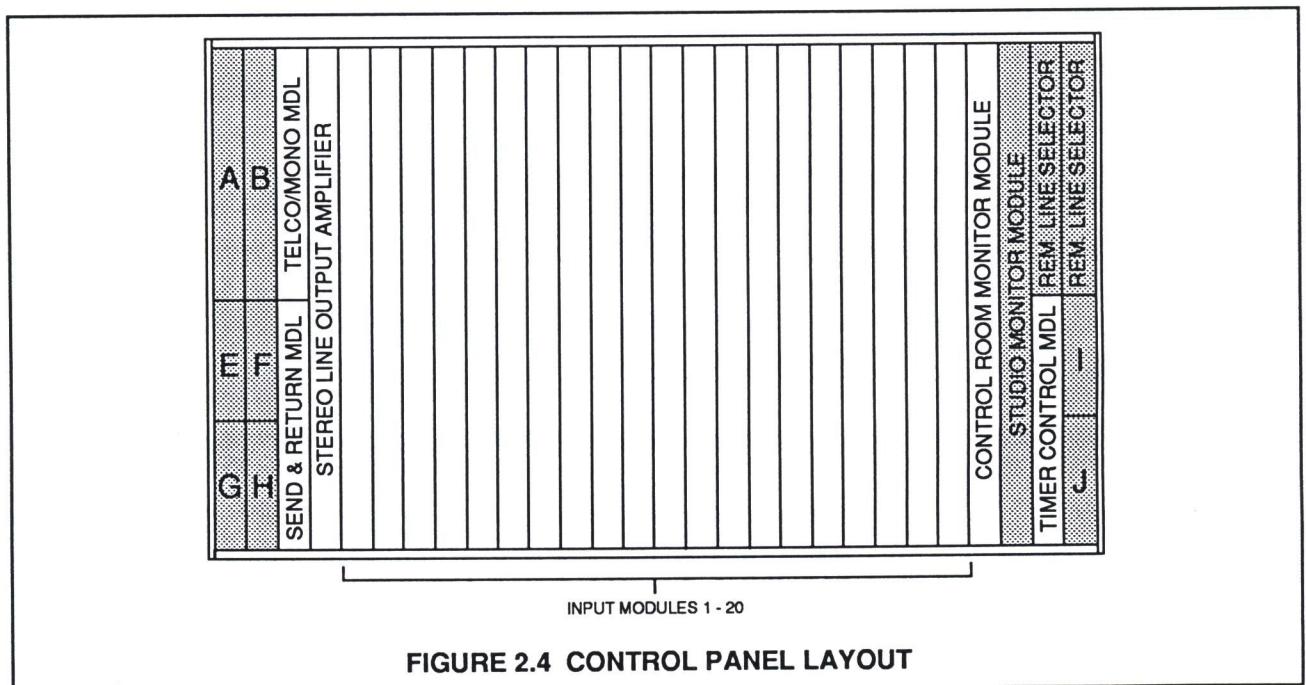
2.3 MAINFRAME CONFIGURATION

Each Productionmixer mainframe is factory configured to the customer's order by the installation of microphone input, line input and other modules in their specified and/or dedicated locations. This section contains descriptions of the Productionmixer mainframe's control panel, meter panel and connector panel.

2.3.1 Control Panel

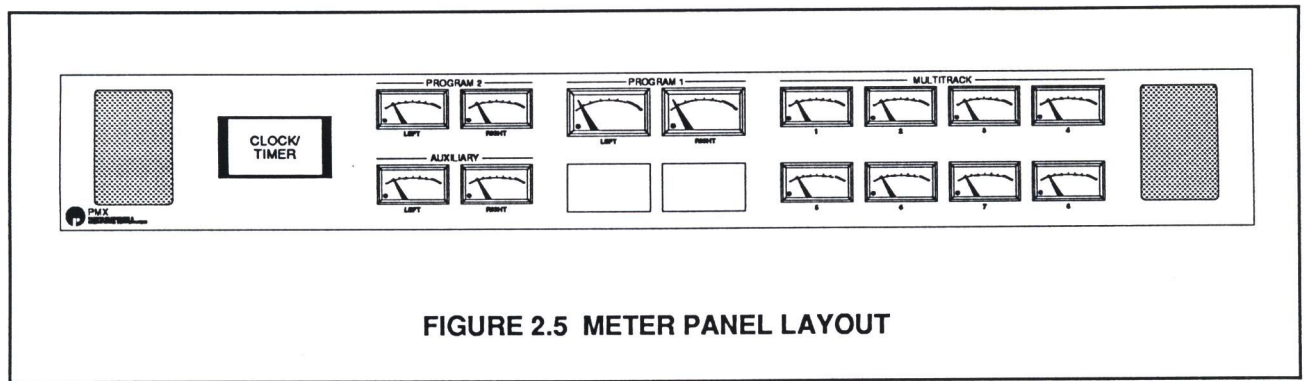
Figure 2.4 illustrates the control panel layout of the 20-input Productionmixer mainframe. The positions identified by module names are dedicated to those modules only, and will not accept any other type of plug-in module. The positions indicated by shading are "optional", and blank panels will be installed in these positions when no modules are present. The control panel layout of the 28-input Productionmixer mainframe is identical, except for the eight additional input module positions.

NOTE: The "optional" module positions labeled A through J are provided for the installation of machine remote control panels. The remote control panel cable assemblies are routed to corresponding REMOTE CONTROL cutouts on the connector panel (reference Figure 2.6).



2.3.2 Meter Panel

Figure 2.5 illustrates the meter panel layout for the Productionmixer's 28-input mainframe size. Separate sets of VU meters are provided for monitoring PROGRAM 1 and PROGRAM 2. The shaded position is occupied by the console Cue speakers.

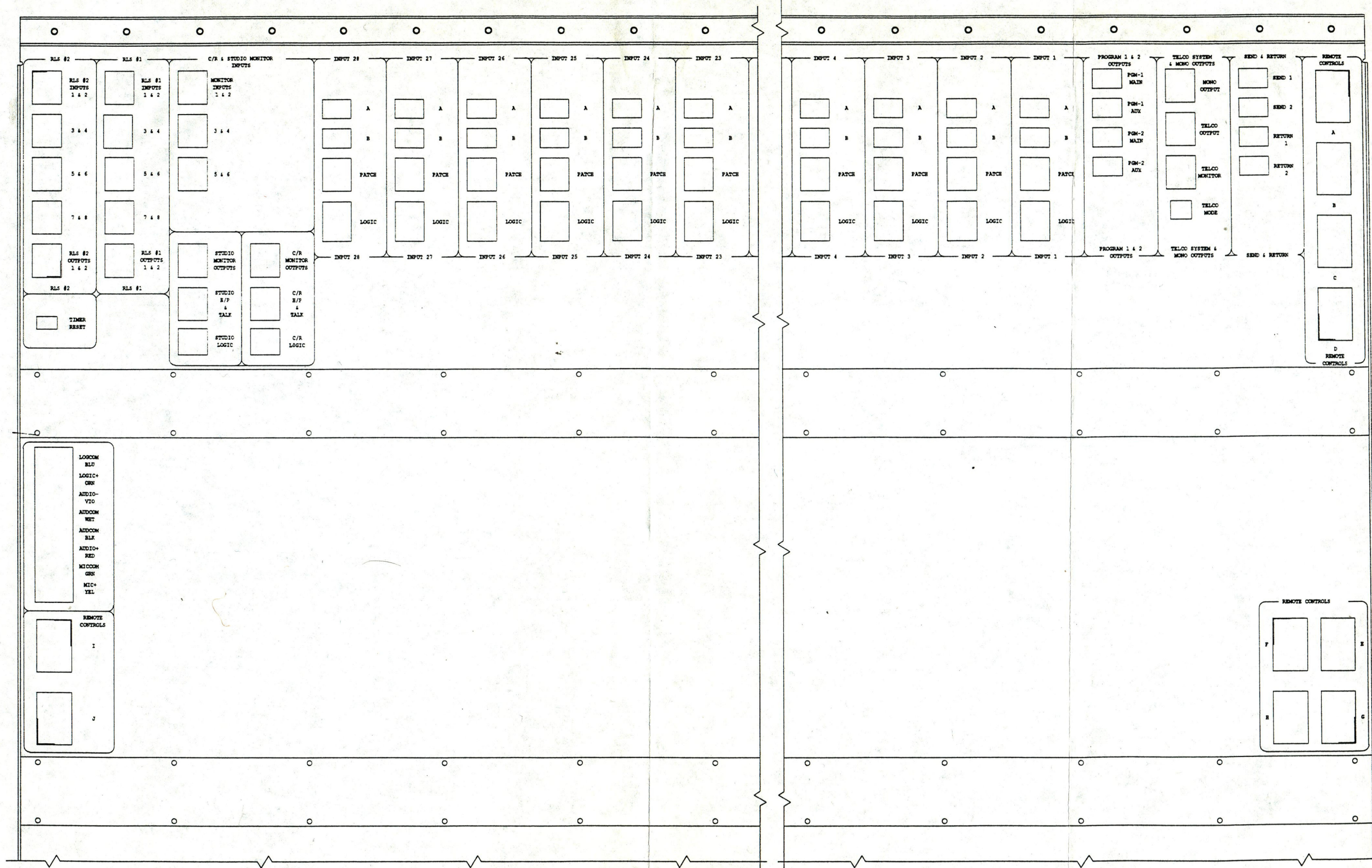


2.3.3 Connector Panel

Figure 2.6 (on the following page) illustrates the Molex connector panel for the Productionmixer-28 console, and is intended to provide the installer with a map to the location of the various groups of connectors on the panel. As a general rule, the connectors for any given module are located on the panel below that module's position in the mainframe.

The cutouts labeled REMOTE CONTROLS are provided for the insertion of the 24-pin Molex connectors which accompany the optional machine remote control panels.

NOTE: Audio and logic pin assignment information is provided in Figure 2.6 as a quick reference only. It is highly recommended that the complete information contained in Section 2.7 be used when connecting the console.



2.4 GROUNDING AND SHIELDING

Grounding in modern broadcast consoles is more critical than with older devices of more limited band-pass capabilities. Achieving low system ground impedance with a small piece of equipment is relatively easy. However, the problem becomes progressively more difficult as the system becomes larger. In designing the Productionmixer, much thought was given to system grounding requirements and the elimination of DC path ground loops.

The shield pins on each console connector are connected directly to the console mainframe ground, and the only location where the console mainframe ground meets the console's "audio common" point is the power terminal strip on the console mainframe. Therefore, the station's "technical ground" should be connected to either of the two screw terminals labeled "AUDIO COMMON" on the console power terminal strip.

NOTE: Do not connect the station's "technical ground" to any terminals on the power supply terminal strip.

A preferred method of connecting the line shields in a system is to connect **both** ends of every shield to **all** affiliated equipment. However, this method is only satisfactory if every component shares a common earth ground. This can be accomplished using isolated ground receptacles tied to the station's "technical ground".

If isolated ground receptacles are not available when grounding the Productionmixer, observe the following guidelines:

- A) Shields of cables connecting the console to auxiliary equipment should be connected at the console end only, and should not be terminated to the ground of the auxiliary equipment.
- B) Ensure that the auxiliary equipment is connected to a "clean" ground by its power cord assembly, or by the addition of a separate ground wire connected between the chassis of the auxiliary equipment and the station's "technical ground".

NOTE: Buzz pickup is generally electrostatic, due to capacitive pickup between an audio line and a power line. When shielded lines are used this should be no problem, unless the audio lines are run in the same wire-way or area as a power line. Radio-frequency interference can also manifest itself as a buzz in the program audio. RF interference is minimized by the extensive RF bypassing and ground-plane techniques used in the Productionmixer, and the shielded lines external to the unit.

2.5 POWER CONNECTION

The power outlet for the Productionmixer power supply should be assigned to the Productionmixer exclusively. Confirm that the outlet supplies 120 VAC, $\pm 8\%$, 50/60 Hz, and that the voltage does not sag under a load of up to 5 amperes. The third pin "U-ground" on the power connector must be left intact and connected to a properly installed three-way AC outlet. For safety, the "U-ground" wire is connected to the chassis of the power supply and the cores of the power transformers.

WARNING: Do not defeat the safety ground in any way. To do so may provide a potentially dangerous condition to the operator.

NOTE: The DC outputs of the power supply are not referenced to the power supply chassis and, therefore, are completely floating from the AC safety ground.

The AC mains cord should be kept away from low level audio wiring to avoid the possibility of inducing hum into that wiring. Also, even though the power transformers were designed for very low radiated magnetic fields, the power supply should not be placed unnecessarily close to tape playback units or other sensitive equipment.

Console connection to the power supply is made with the supplied six foot multi-conductor cable. This cable carries only regulated DC power, and will not radiate hum into adjacent audio wiring. The cable is color-coded, and the corresponding color names are printed adjacent to the terminals on the console and the power supply.

Should it be necessary to install the power supply at a distance further than permitted by the supplied cable, it is recommended that a new cable be made rather than splicing a longer length to the existing cable. Cable lengths up to twenty feet may be fabricated using 14 gauge wire. Cables longer than 20 feet are not recommended.

It is very important to check and double check the power supply connections prior to turn-on. An error in wiring could result in damage to the power supply and/or console circuitry. Once the power supply is turned on, the meter lamps will illuminate. Use an accurate DC voltmeter to verify the operating voltages at the terminal strip on the bottom of the console.

NOTE: For information on the Redundant Power Supply Coupler Unit (PR&E #99-818), see Section 8.2.

2.6 PATCH POINT CONNECTION

Each Productionmixer input module features an audio PATCH connector. These connectors provide the ideal point to connect external processing equipment such as equalizers, limiters, filters, etc. A patch bay system may also be connected to provide a very flexible processing/patching facility.

The output at each patch point is unbalanced, and designed to operate into low-impedance (600 ohm or higher) loads. The patch return is balanced, 40K ohm impedance.

The level at all patch points is -10 dBu nominal. This level was determined to provide optimum headroom within the console, as well as a good compatibility match with currently available processing equipment. See Section 2.7 for pin assignment.

2.7 AUDIO AND LOGIC CONNECTION

Good wiring practice calls for care in making each connection and in neatness of cable layout. Complete information relative to module input, output and logic terminations is contained in the connection reference drawings included in this section.

A standard connection theme is used throughout all PR&E console designs - the use of 3, 6, and 12 pin Molex connectors for audio wiring. The Standard pin-out sequence is as follows:

Pin #1	Shield of monaural or left channel signal pair.
Pin #2	Low of monaural or left channel signal pair.
Pin #3	High of monaural or left channel signal pair.
Pin #4	Shield of right channel signal pair.
Pin #5	Low of right channel signal pair.
Pin #6	High of right channel signal pair.
Pin #7	Shield of left channel signal pair.
Pin #8	Low of left channel signal pair.
Pin #9	High of left channel signal pair.
Pin #10	Shield of right channel signal pair.
Pin #11	Low of right channel signal pair.
Pin #12	High of right channel signal pair.

This system of pin assignment takes advantage of the three pin per row design of the Molex connectors. As viewed from the top of the connector panel, the shields are always connected to the left pins, the low wires (black) to the center pins and the high wires (red) to the right pins. While this inspection will not indicate if a connector is in the correct position, it will verify proper shield and polarity connection.

Each Productionmixer input module offers a comprehensive set of logic functions, as outlined in Section 2.8. These functions are brought out from each of the module positions to the 15-pin Molex connectors labeled LOGIC, and are designed to drive interface relays and/or opto-isolators to control auxiliary equipment.




Fabrication of interface systems is straightforward. However, should the installer prefer to use prefabricated units, interface devices and cable assemblies are available from PR&E to control most professional grade tape decks, cartridge machines and turntables. Information on these interfaces is provided in Chapter 8.

NOTE: The logic functions are referenced to the console logic power supply, and, as such, should never be directly connected to auxiliary equipment control logic power supplies and/or grounds.


The Productionmixer uses "common" or "ground" switching for all of its control inputs, thus preventing the possibility of defective remote controls shorting out the logic power supply.

Connection of the control circuitry requires an understanding of the logic nomenclature and symbols. These are outlined below:

Control Outputs:

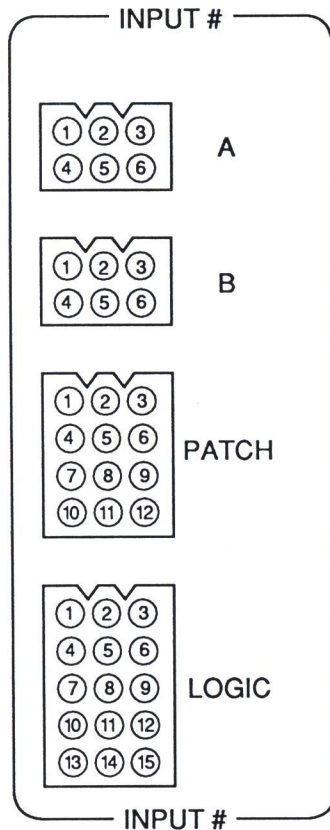
Tally (light)		Provides a +12 VDC continuous source when activated.
Pulse		Provides a +12 VDC pulse source when activated.
Sink		An open collector that provides a connection to LOGIC COMMON when activated.

Control Inputs:

Control		
	ON	A line above the word indicates that the function is activated when a connection to LOGIC COMMON is made.

NOTE: When connecting Microphone Input and Stereo Line Input Module logic, it may be desirable to have separate logic control for **both** "A" and "B" inputs. This can be accomplished by wiring the logic connector in a "Y" configuration, as described in Sections 2.8.1 and 2.8.2, respectively.

2.7.1 Microphone Input Module Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Microphone A	A	1	2	3
-No Connection-	"	4	5	6
Microphone B	B	1	2	3
-No Connection-	"	4	5	6
Patch Send	PATCH	1	2	3
-No Connection-	"	4	5	6
Patch Return	"	7	8	9
-No Connection-	"	10	11	12

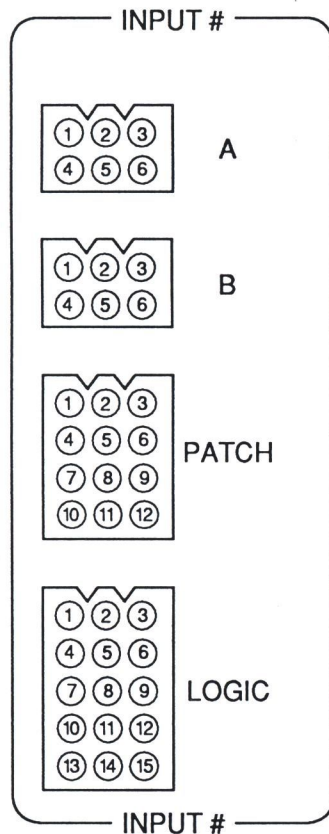
NOTES:

- The Patch Send is unbalanced; the Patch Return is balanced.
- The PATCH connector must be wired so that the Patch Send is connected through to the Patch Return. If no external processing or patch bay equipment is connected, a mating connector with jumpers from pins #2 to #8 and #3 to #9 must be installed.

LOGIC PIN ASSIGNMENT	
Function	Pin Number
"A" Logic Common	1
Logic +12 VDC	2
ON	3
OFF	4
ON Tally	5
OFF Tally	6
COUGH	7
TALK TO CONTROL ROOM	8
-No Connection-	9
-No Connection-	10
-No Connection-	11
-No Connection-	12
-No Connection-	13
-No Connection-	14
"B" Logic Common	15

NOTE: Consult Section 2.8.1 when connecting Microphone Input Module remote controls.




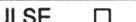

2.7.2 Stereo Line Input Module Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Input A/Left	A	1	2	3
Input A/Right	"	4	5	6
Input B/Left	B	1	2	3
Input B/Right	"	4	5	6
Patch Send/Left	PATCH	1	2	3
Patch Send/Right	"	4	5	6
Patch Return/Left	"	7	8	9
Patch Return/Right	"	10	11	12

NOTES:

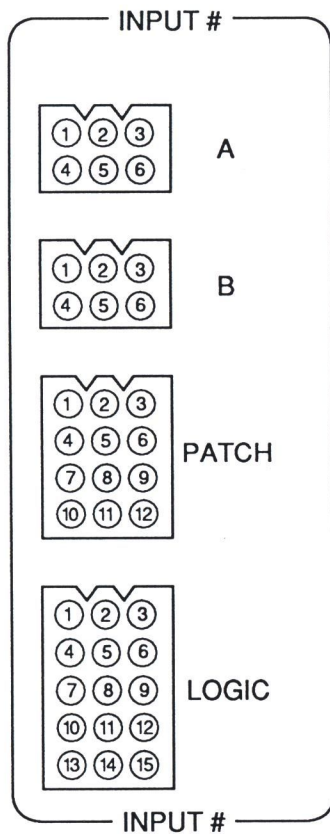
- When connecting a monaural line level source (such as a Telco hybrid) to a Stereo Line Input Module, connect the signal to the left input channel, and insert jumpers between pins #1 and #4, #2 and #5, and #3 and #6.
- The Patch Sends are unbalanced; the Patch Returns are balanced.
- The PATCH connector must be wired so that the Patch Sends are connected through to the Patch Returns. If no external processing or patch bay equipment is connected, a mating connector with jumpers from pins #2 to #8, #3 to #9, #5 to #11 and #6 to #12 must be installed.

LOGIC PIN ASSIGNMENT	
Function	Pin Number
"A" Logic Common	1
Logic +12 VDC	2
ON	3
OFF	4
ON Tally 	5
OFF Tally 	6
READY	7
AUDIO RESET TO OFF	8
CUE	9
START PULSE 	10
STOP PULSE 	11
CUE Tally 	12
-No Connection-	13
-No Connection-	14
"B" Logic Common	15

NOTES:

- Consult Section 2.8.2 when connecting Stereo Line Input Module remote controls.
- On Stereo Line Input Modules assigned as Telco hybrid inputs, connect the ON Tally control outputs to the Telco Mix Module's ON Tally Inputs, as shown in Section 2.8.5.

2.7.3 Multitrack Input/Output Module Connection

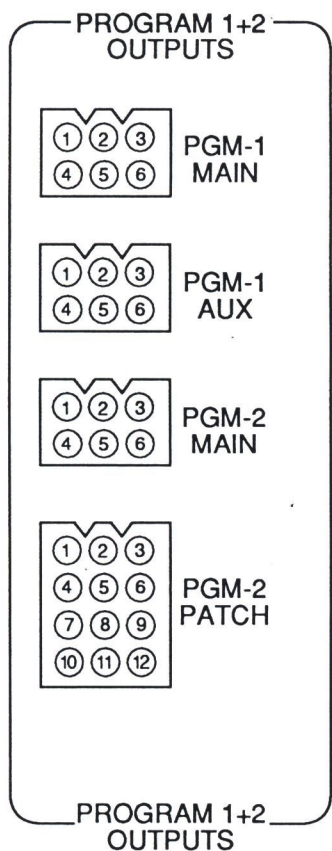


AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
From Tape	A	1	2	3
No Connection	"	4	5	6
To Tape	B	1	2	3
No Connection	"	4	5	6
Patch Send	PATCH	1	2	3
No Connection	"	4	5	6
Patch Return	"	7	8	9
No Connection	"	10	11	12

NOTES:

- The Patch Send is unbalanced; the Patch Return is balanced.
- The PATCH connector must be wired so that the Patch Send is connected through to the Patch Return. If no external processing or patch bay equipment is connected, a mating connector with jumpers from pins #2 to #8 and #3 to #9 must be installed.

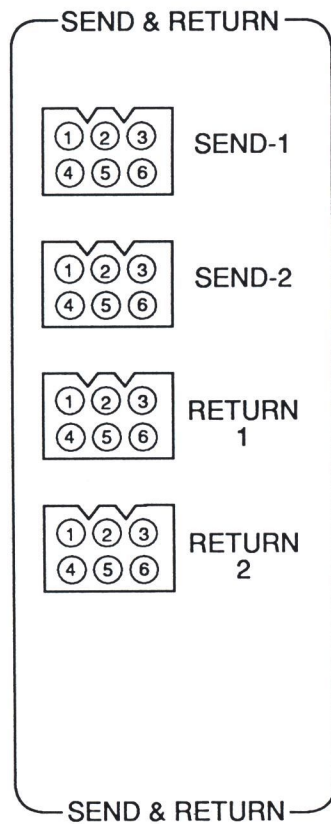
2.7.4 Stereo Line Output Amplifier Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Program 1 Main Output/Left	PGM-1 MAIN	1	2	3
Program 1 Main Output/Right	"	4	5	6
Program 1 Aux Output/Left	PGM-1 AUX	1	2	3
Program 1 Aux Output/Right	"	4	5	6
Program 2 Main Output/Left	PGM-2 MAIN	1	2	3
Program 2 Main Output/Right	"	4	5	6
Program 2 Patch Send/Left	PGM-2 PATCH	1	2	3
Program 2 Patch Send/Right	"	4	5	6
Program 2 Patch Return/Left	"	7	8	9
Program 2 Patch Return/Right	"	10	11	12

NOTE: The Main and Auxiliary outputs are balanced.

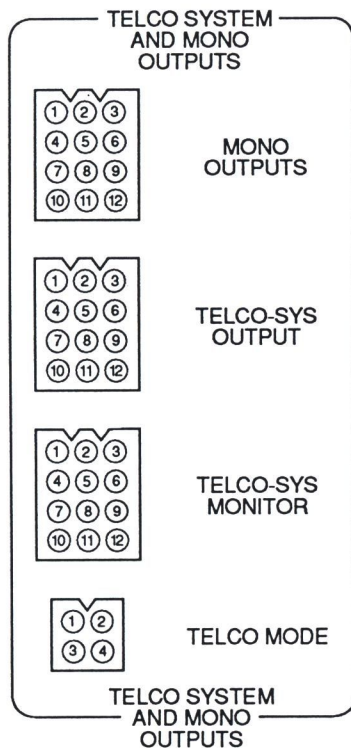
2.7.5 Send & Return Module Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Send-1 Output/Left	SEND-1	1	2	3
Send-1 Output/Right	"	4	5	6
Send-2 Output/Left	SEND-2	1	2	3
Send-2 Output/Right	"	4	5	6
Return-1 Input/Left	RETURN-1	1	2	3
Return-1 Input/Right	"	4	5	6
Return-2 Input/Left	RETURN-2	1	2	3
Return-2 Input/Right	"	4	5	6

NOTE: All send outputs are balanced.

2.7.6 Telco Mix/Monaural Output Module Connection



AUDIO PIN ASSIGNMENT				
Signal	Connector	Pin Number		
		Shield	Low	High
Main Mono Output	MONO OUTPUTS	1	2	3
Monitor Mono Output	"	4	5	6
Auxiliary Mono Output 1	"	7	8	9
Auxiliary Mono Output 2	"	10	11	12
To Caller 1	TELCO-SYS OUT	1	2	3
To Caller 2	"	4	5	6
To Tape - Mixed	"	7	8	9
To Tape - Callers	"	10	11	12
To Tape Monitor - Mixed	TELCO-SYS MON	1	2	3
To Tape Monitor - Callers	"	4	5	6
Telco Monitor, Fixed	"	7	8	9
Telco Monitor, Variable	"	10	11	12

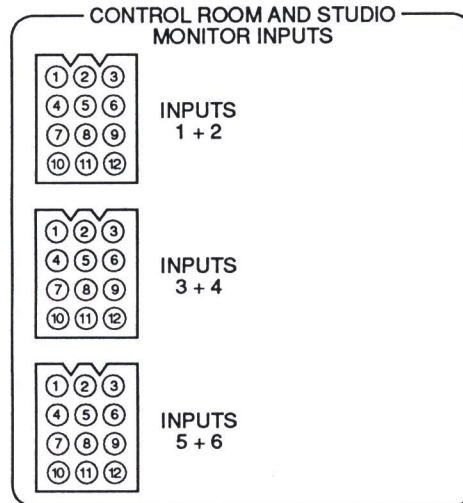
NOTES:

- Monaural amplifier outputs are balanced.
- Connect the To Caller 1 and To Caller 2 outputs to their respective telco hybrids.
- The To Tape - Callers and To Tape Monitor - Callers outputs are identical, and are caller only outputs.
- The To Tape - Mixed and To Tape Monitor - Mixed outputs are identical, and consist of all line and mic input modules assigned to the OFF LINE MIX. Callers may be added to these outputs by means of an internal option switch (reference Section 2.9.3).
- The Telco Monitor outputs are caller only outputs. Line input modules assigned to OFF LINE MIX may be added to these outputs by means of an internal option switch (reference Section 2.9.5).

LOGIC PIN ASSIGNMENT	
Function	Pin Number
Telco 1 Logic Common	1
Telco 1 ON Tally Input	2
Telco 2 Logic Common	3
Telco 2 ON Tally Input	4

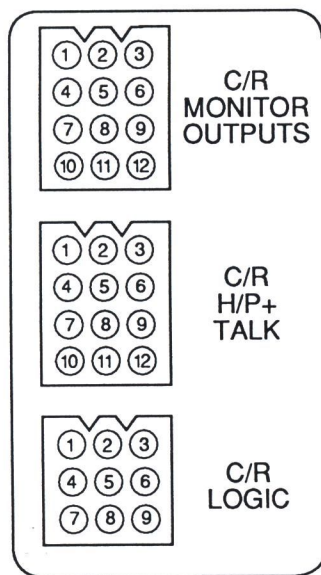
NOTE: The On Tally Inputs are connected to the ON Tally control outputs of those Stereo Line Input Modules assigned as Telco hybrid inputs (i.e., Telco Input 1 and Telco Input 2), as shown in Section 2.8.3. These inputs control the switching status of the Telco System when the Telco Mix Module AUTO SELECT button is engaged, as described in Section 3.6.

2.7.7 Monitor Module Input Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Input 1/Left	INPUTS 1+2	1	2	3
Input 1/Right	"	4	5	6
Input 2/Left	"	7	8	9
Input 2/Right	"	10	11	12
Input 3/Left	INPUTS 3+4	1	2	3
Input 3/Right	"	4	5	6
Input 4/Left	"	7	8	9
Input 4/Right	"	10	11	12
Input 5/Left	INPUTS 5+6	1	2	3
Input 5/Right	"	4	5	6
Input 6/Left	"	7	8	9
Input 6/Right	"	10	11	12



2.7.8 Control Room Monitor Module Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Main Monitor Output/Left	C/R MON OUT	1	2	3
Main Monitor Output/Right	"	4	5	6
Direct Monitor Output/Left	"	7	8	9
Direct Monitor Output/Right	"	10	11	12
Headphone Output/Left	C/R H/P+TALK	1	2	3
Headphone Output/Right	"	4	5	6
Talk To C/R Output	"	7	8	9
Auxiliary CUE Input	"	10	11	12

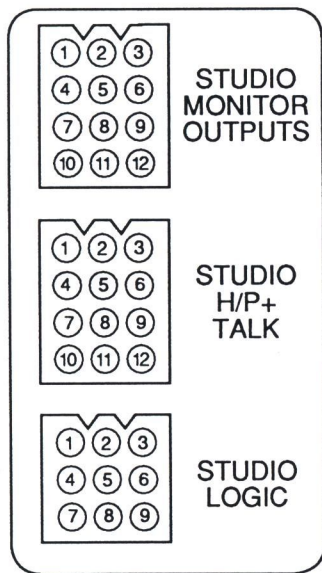
NOTES:

- The Direct Monitor Output consists only of the source selected on the eight-station Monitor Input switch.
- The Talk To C/R Output consists of any Talk To Control Room signals, and is provided for connection to self-contained headphone and/or monitor systems, if desired.
- The Auxiliary CUE Input is a line level input provided for the connection of an external source (such as a two-way transceiver, EBS receiver, etc.) to the console CUE system, if desired. This input may or may not follow the muting status of the Control Room monitors, as determined by an internal option switch (reference Section 2.9.6).

LOGIC PIN ASSIGNMENT	
Function	Pin Number
Logic Common	1
Logic +12 VDC	2
-No Connection-	3
DIM C/R	4
MUTE C/R	5
TALK TO C/R Command 	6
-No Connection-	7
C/R WARNING Tally 	8
-No Connection-	9

NOTE: Consult Section 2.8.4 when connecting Control Room Monitor Module remote controls.



2.7.9 Studio Monitor Module Connection



AUDIO PIN ASSIGNMENT				
Signal	Connector	Pin Number		
		Shield	Low	High
Main Monitor Output/Left	STU MON OUT	1	2	3
Main Monitor Output/Right	"	4	5	6
Direct Monitor Output/Left	"	7	8	9
Direct Monitor Output/Right	"	10	11	12
Headphone Output/Left	STU H/P+TALK	1	2	3
Headphone Output/Right	"	4	5	6
Talk to Studio Output	"	7	8	9
-No Connection-	"	10	11	12

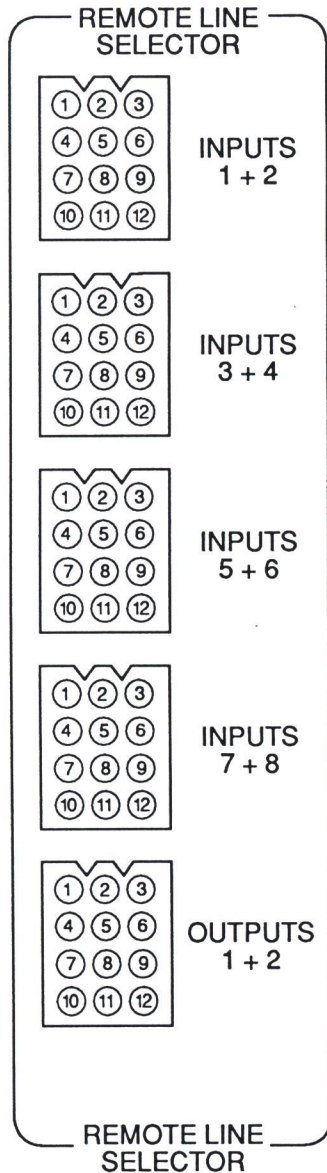
NOTES:

- The Main Monitor Output may be fixed or variable, as determined by an internal option switch (reference Section 2.9.7).
- The Direct Monitor Output consists only of the source selected on the eight-station Monitor Input switch.
- The Talk To Studio Output consists of any Talk To Studio signals, and is provided for connection to self-contained headphone and/or monitor systems, if desired.

LOGIC PIN ASSIGNMENT	
Function	Pin Number
Logic Common	1
Logic +12 VDC	2
-No Connection-	3
-Not Used-	4
MUTE STUDIO	5
TALK TO STUDIO Command 	6
-No Connection-	7
STUDIO WARNING Tally 	8
-No Connection-	9

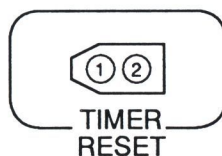
NOTE: Consult Section 2.8.5 when connecting Studio Monitor Module remote controls.


2.7.10 Remote Line Selector Connection



AUDIO PIN ASSIGNMENT				
		Pin Number		
Signal	Connector	Shield	Low	High
Input 1/Left	INPUTS 1+2	1	2	3
Input 1/Right	"	4	5	6
Input 2/Left	"	7	8	9
Input 2/Right	"	10	11	12
Input 3/Left	INPUTS 3+4	1	2	3
Input 3/Right	"	4	5	6
Input 4/Left	"	7	8	9
Input 4/Right	"	10	11	12
Input 5/Left	INPUTS 5+6	1	2	3
Input 5/Right	"	4	5	6
Input 6/Left	"	7	8	9
Input 6/Right	"	10	11	12
Input 7/Left	INPUTS 7+8	1	2	3
Input 7/Right	"	4	5	6
Input 8/Left	"	7	8	9
Input 8/Right	"	10	11	12
Output 1/Left	OUTPUTS 1+2	1	2	3
Output 1/Right	"	4	5	6
Output 2/Left	"	7	8	9
Output 2/Right	"	10	11	12

2.7.11 Timer Reset Connection



LOGIC PIN ASSIGNMENT	
Function	Pin Number
Logic Common	1
RESET EXTERNAL TIMER Command 	2

NOTE: This output is provided for the control of an external "slave" timer.

2.8 MODULE REMOTE CONTROL CAPABILITIES

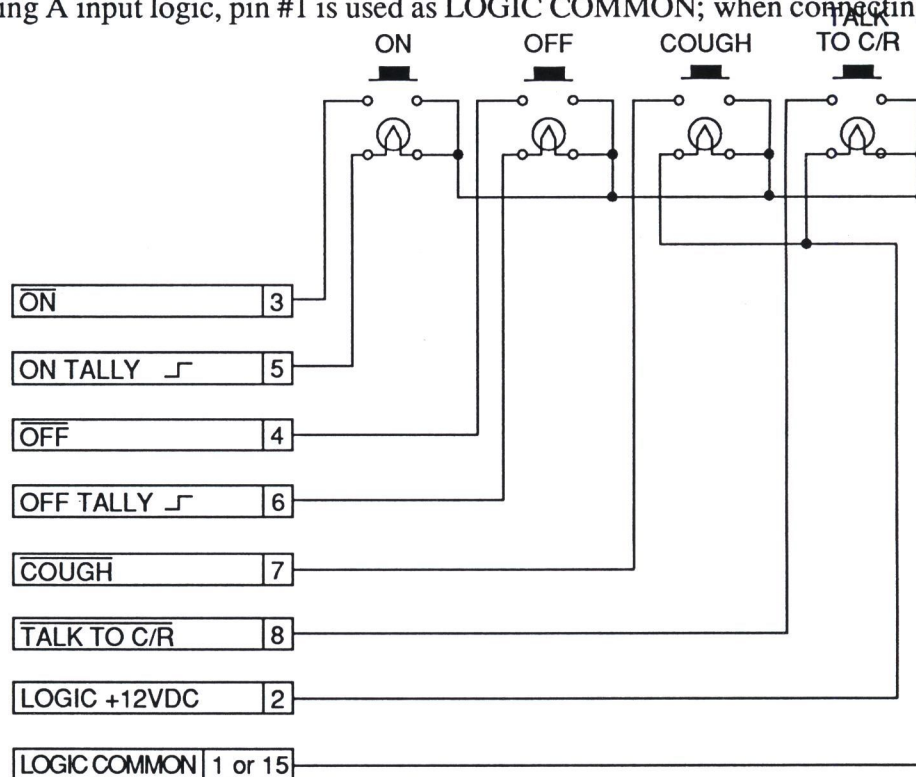
This section outlines Productionmixer module remote control capabilities. Included are descriptions of Microphone Input, Stereo Line Input, Telco Mix/Monaural Output, Control Room Monitor, and Studio Monitor Module remote controls.

2.8.1 Microphone Input Module Remote Control

There are two methods of connecting Microphone Input Module remote controls - single input, which allows for the logic connection of one microphone (either A or B), or dual input, which allows for the simultaneous logic connection of two microphones (one A and one B). Both configurations are described in this section.

SINGLE INPUT CONFIGURATION

The schematic below illustrates the full remote control capability of the Microphone Input Module's A and B inputs. The single input configuration allows for the logic connection of either the A or B input. When connecting A input logic, pin #1 is used as LOGIC COMMON; when connecting B input logic,



NOTES:

- A) Button switches are momentary-action.
- B) Lamps are 12-14 volt, 80 mA.
- C) When COUGH and TALK TO CONTROL ROOM tallies are connected as shown above, switch lamps will be illuminated at all times.

pin #15 is used as LOGIC COMMON.

The TALK TO CONTROL ROOM command routes the microphone signal to the Talk To Control Room bus, regardless of the ON/OFF status of the module. When the module is ON, this command functions much like the COUGH command in that it will take the microphone off-air as well.

DUAL INPUT CONFIGURATION

In the dual input configuration, separate logic wiring for both A and B inputs is connected simultaneously, and is enabled for these respective inputs by the module A/B selector. This is accomplished by wiring the single logic connector in a “Y” configuration, using the Productionmixer A/B Logic “Y” Cable (PR&E #99-580). In this configuration, the single logic connector becomes two (one A and one B), with each fully capable of accommodating microphone logic connection per the schematic on the previous page.

Connect A input microphone logic to connector J1, and B input microphone logic to connector J2, as



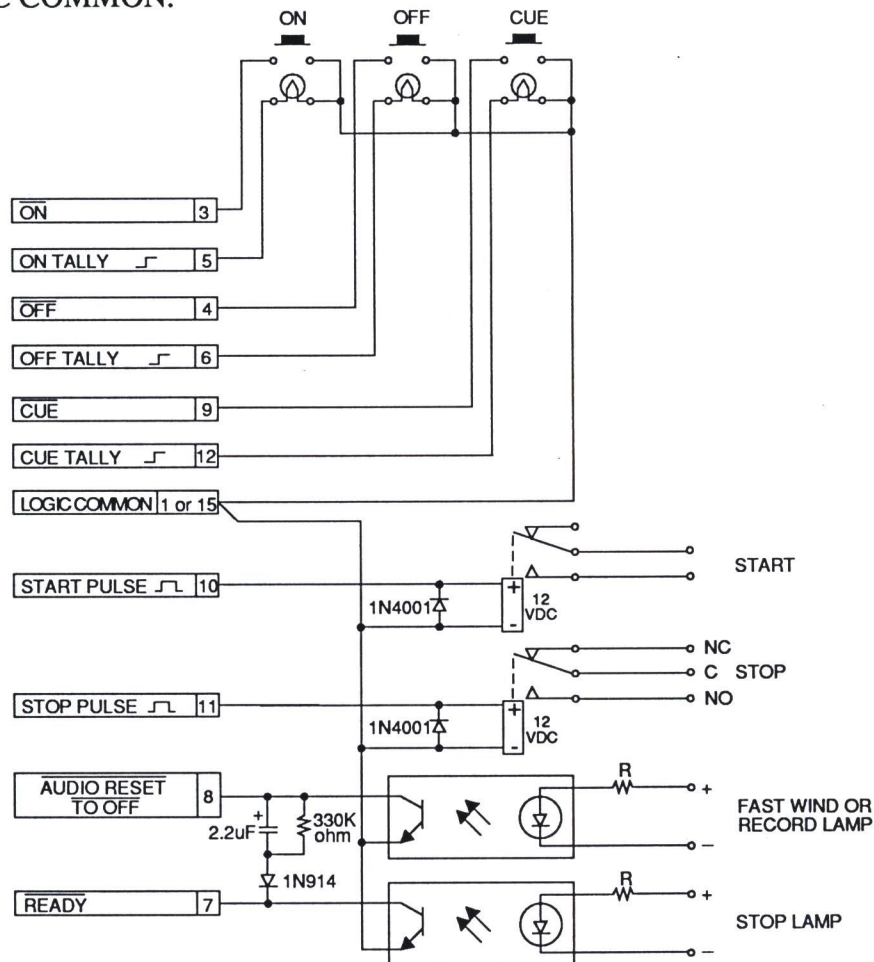
defined in Section 8.4.17.

2.8.2 Stereo Line Input Module Remote Control

There are two methods of connecting Stereo Line Input Module remote controls - single input, which allows for the logic connection of one source (either A or B), or dual input, which allows for the simultaneous logic connection of two sources (one A and one B). Both configurations are described in this section.

SINGLE INPUT CONFIGURATION

The schematic below illustrates the full remote control and machine interface capability of the Stereo Line Input Module's A and B inputs. Typical applications include providing cartridge input ON and OFF buttons at co-host or news turret positions, and ON, OFF and CUE buttons adjacent to turntables and tape recorders. The single input configuration allows for the logic connection of either the A or B input. When connecting A input logic, pin #1 is used as LOGIC COMMON; when connecting B input logic, pin #15 is used as LOGIC COMMON.



NOTES:

- Button switches are momentary-action.
- Lamps are 12-14 volt, 80 mA.
- Relays are 12 volt DC, 100 mA maximum.
- Opto-isolators are Motorola MCT-2 or equivalent.

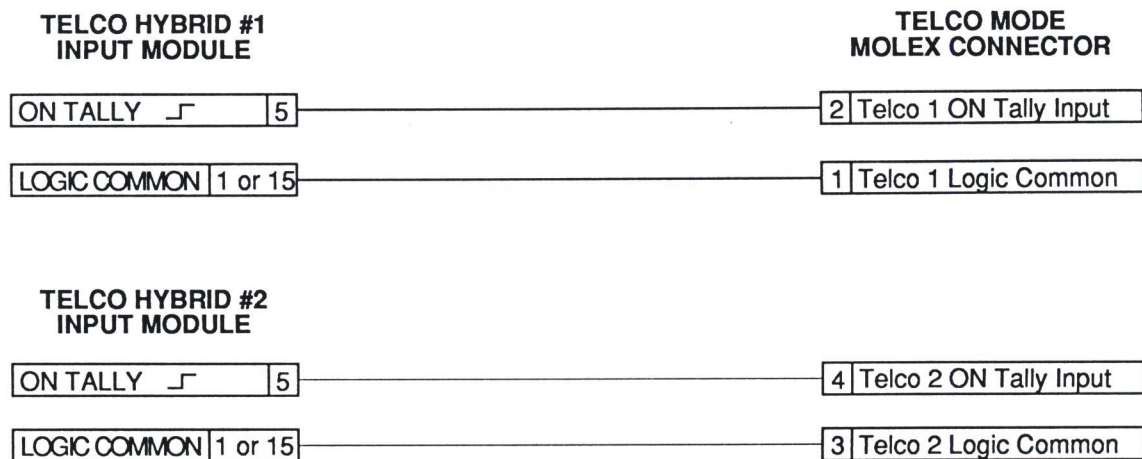
DUAL INPUT CONFIGURATION

In the dual input configuration, separate logic wiring for both A and B inputs is connected simultaneously, and is enabled for these respective inputs by the module A/B selector. This is accomplished by wiring the single logic connector in a “Y” configuration, using the Productionmixer A/B Logic “Y” Cable (PR&E #99-580). In this configuration, the single logic connector becomes two (one A and one B), with each fully capable of accommodating source logic connection per the schematic on the previous page.

Connect A input source logic to connector J1, and B input source logic to connector J2, as defined in Section 8.4.17.

2.8.3 Telco Mix Module Remote Control

The Telco Mix Module is equipped with a logic function which allows the system to toggle between on-air (PGM 1) and off-air (OFF LINE MIX) operation, as determined by the ON/OFF status of the Stereo Line Input Modules assigned as Telco hybrid inputs. This function is controlled by the ON Tally control outputs of these modules, which are connected to the TELCO MODE logic connector as shown below. If the "A" input is the Telco input, pin 1 is used as logic common and if the "B" input is Telco, pin 15

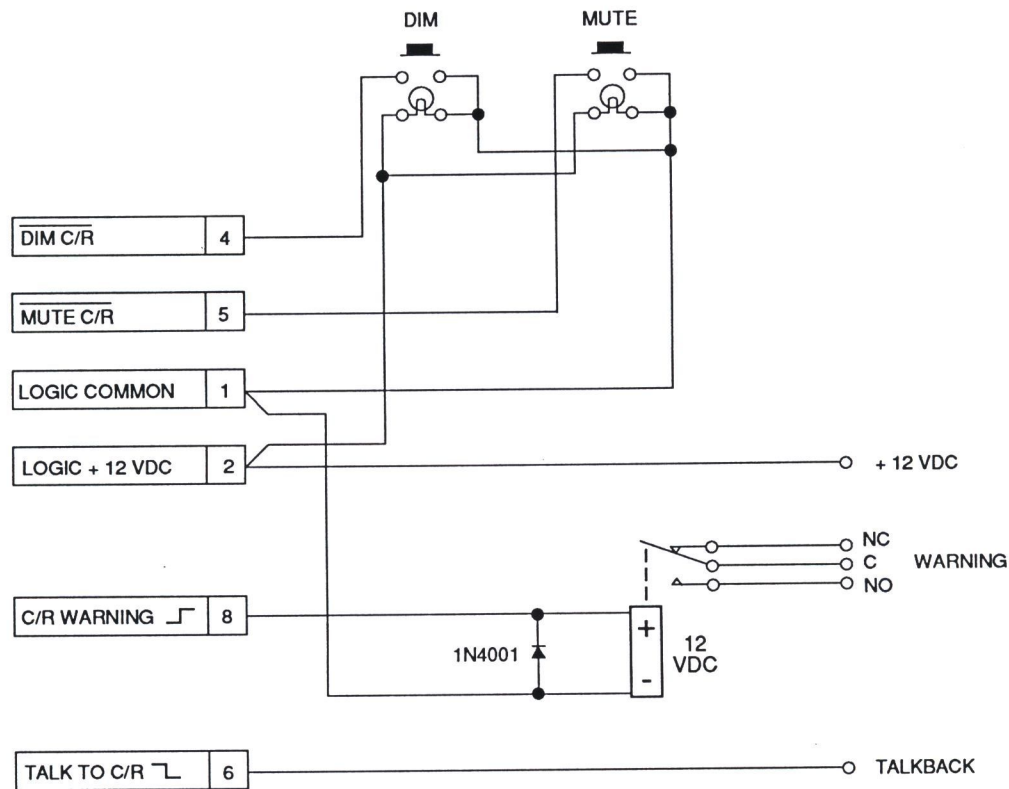


is used as logic common.

When the Telco Mix Module AUTO SELECT button is engaged, and the connected Stereo Line Input Modules are OFF, the Telco System remains in the OFF LINE MIX mode and the selected OFF LINE MIX input signals are fed to the callers. Once either input module is turned ON, the Telco System automatically toggles to the PGM 1 mode, and the selected PROGRAM 1 input signals are fed to both callers. Telco System operation is explained in greater detail in Section 3.4.

2.8.4 Control Room Monitor Module Remote Control

The schematic below illustrates the full remote control capability of the Control Room Monitor Module.



NOTES:

- A) Button switches are alternate-action.
- B) Lamps are 12-14 volt, 80 mA.
- C) Relay is 12 volt DC, 100 mA maximum.
- D) When DIM and MUTE tallies are connected as shown above, switch lamps will be illuminated at all times.

While it is unlikely that a "typical" installation will utilize all of these facilities, it is important to understand what is available, along with the potential applications.

The DIM C/R control input may be used to remotely control the dim function of the Control Room Monitor Module. Typical applications include equipping the Control Room door with a "door open" switch, or a telephone set with an "off-hook" switch to automatically dim the Control Room speakers whenever the door opens or the telephone is picked up.

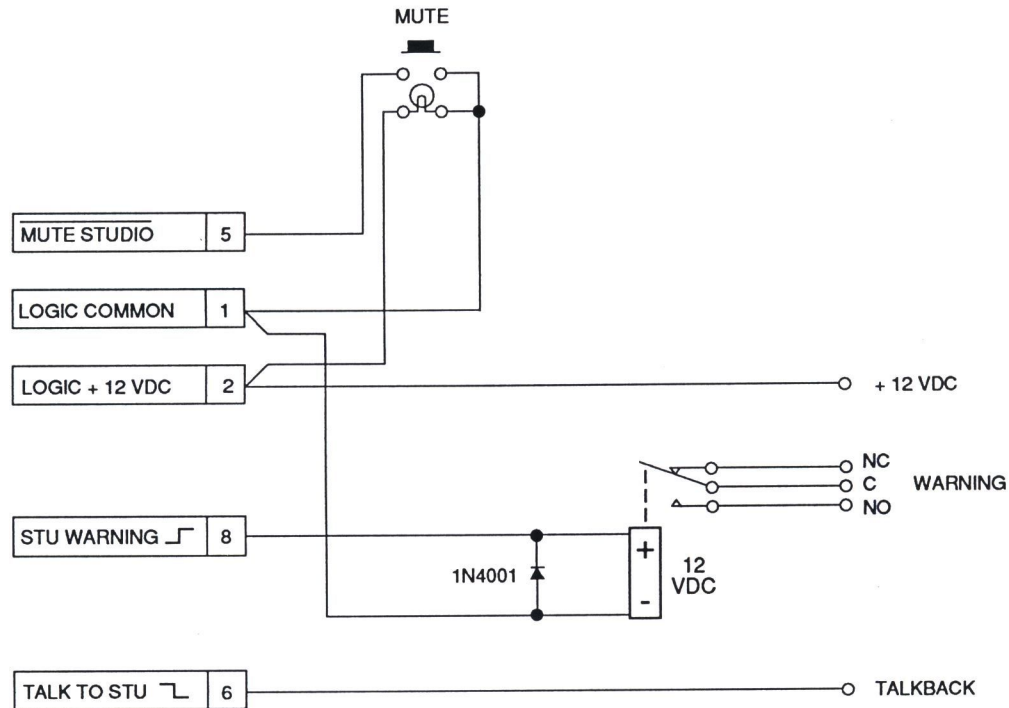
The MUTE C/R control input may be used to remotely control the mute function of the Control Room Monitor Module. Typical applications include operations where two "on-air" consoles are used in the same room, such as a second console for news and/or sports programming.

The C/R WARNING tally is a 12 VDC, 100 mA (maximum), source output for connection to a magnetic or solid-state relay unit for driving the Control Room entry warning light(s).

The TALK TO C/R control output is a current-sinking open collector, which is active (low) whenever the Control Room is receiving Talkback from another location. This command is intended for connection to active, self-contained, headphone and monitor systems, and is used to switch the Talk to Control Room signals into the headphone and monitor circuits. Such headphone and/or monitor systems are usually

provided to co-host and news positions in a Control Room.

2.8.5 Studio Monitor Module Remote Control



NOTES:

- A) Button switch is alternate-action.
- B) Lamp is 12-14 volt, 80 mA.
- C) Relay is 12 volt DC, 100 mA maximum.
- D) When the MUTE tally is connected as shown above, the switch lamp will be illuminated at all times.

The schematic below illustrates the full remote control capability of the Studio Monitor Module.

While a "typical" installation may not utilize all of the Studio Monitor Module's logic facilities, it is important to understand what is available, along with the potential applications.

The MUTE STUDIO control input may be used to remotely control the mute function of the Studio Monitor Module. A typical application would be to provide a host with a Monitor Mute button in those installations where a monitor volume control is not provided in the Studio itself.

The STUDIO WARNING Tally command is a 12 VDC, 100 mA (maximum), source output for connection to a magnetic or solid-state relay unit for driving the Studio entry warning light(s).

The TALK TO STUDIO control output is a current-sinking open collector, which is active (low) whenever the Studio is receiving Talkback from another location. This command is intended for connection to active, self-contained, headphone and monitor systems, and is used to switch the Talk to Studio signals into the headphone and monitor circuits. Such headphone and/or monitor systems are

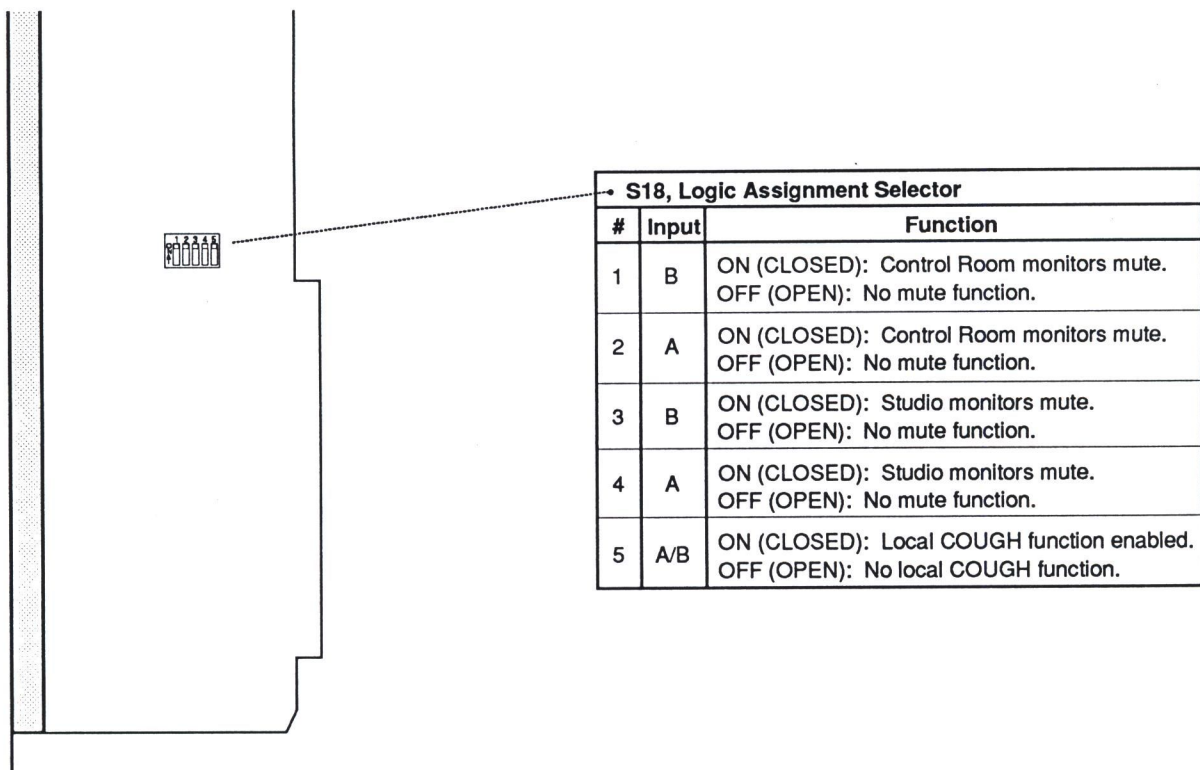
usually provided to the host and co-host.

2.9 MODULE INTERNAL OPTION SWITCHES

Some Productionmixer modules are equipped with internal option switches, which can be set to enable or disable selected module functions. This section provides the location of these switches on the module printed circuit assemblies, and their functions. Included are descriptions of the Microphone Input, Stereo Line Input, Telco Mix/Monaural Output, and Control Room and Studio Monitor Module option switches.

2.9.1 Microphone Input Module Option Switch

The illustration below provides the location of the Microphone Input Module internal option switch, and



defines its functions.

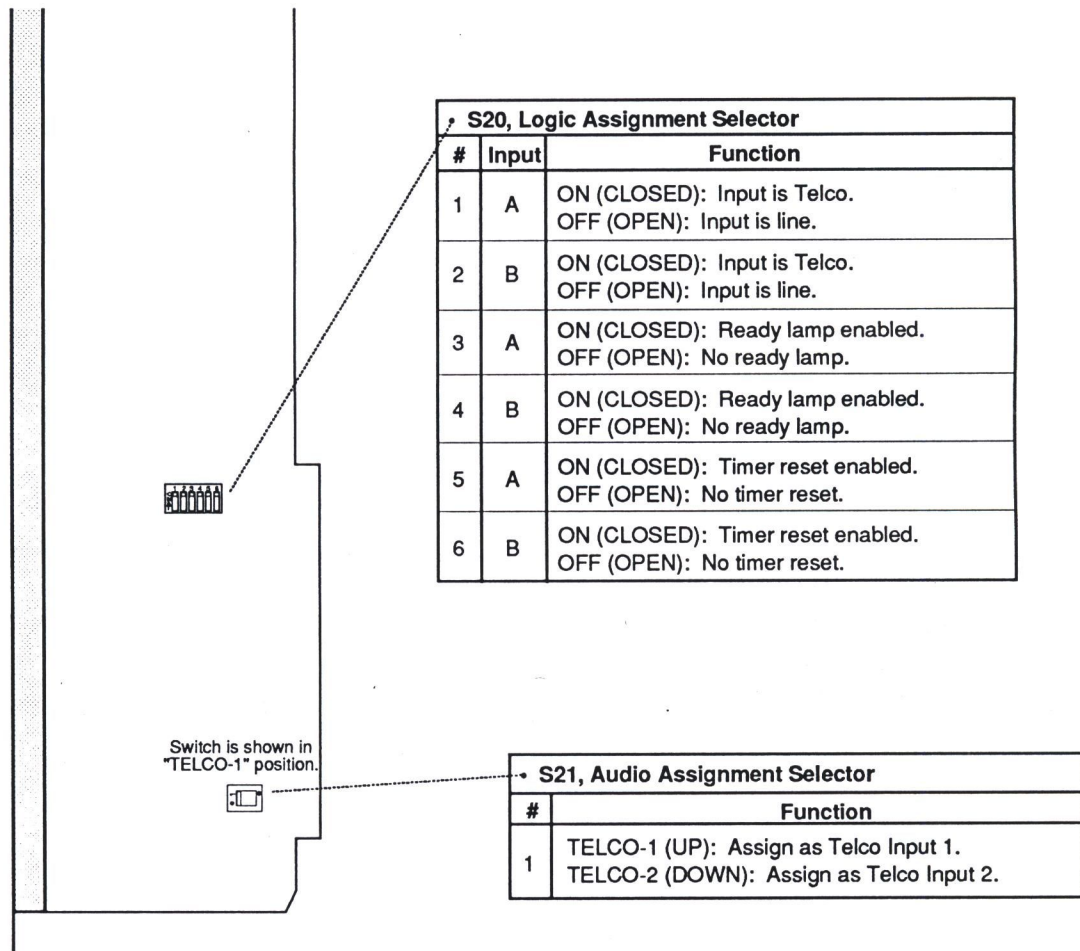
Switch S18 is a five-station switch. Stations 1 through 4 determine Control Room and Studio monitor mute status. When mute is selected, the Control Room or Studio monitors mute whenever the module is turned ON.

NOTE: There is a 50 millisecond delay in microphone turn-on to allow room reverb to decay off-mic.

Station 5 enables the local cough function for both inputs, allowing the module ON button to function as a COUGH button. When this function is enabled and the module is turned ON, the ON button mutes channel audio whenever it is held depressed.

2.9.2 Stereo Line Input Module Option Switches

The illustration below provides the locations of the Stereo Line Input Module internal option switches,



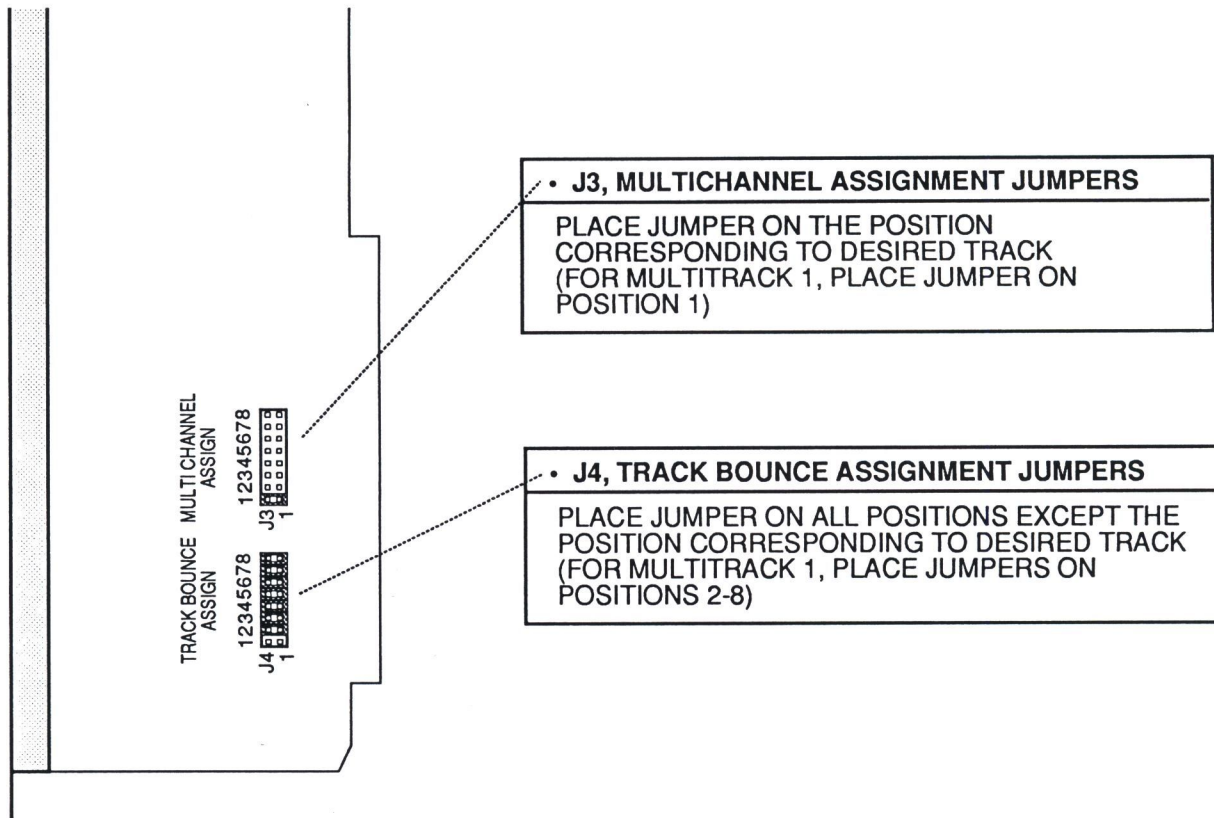
and defines their functions.

When a telephone hybrid is connected to a module input (A or B), station 1 or 2 of switch S20 assigns that input as a Telco Input. Once this is accomplished, switch S21 determines whether it is assigned as Telco Input 1 or Telco Input 2. Input modules being used as Telco inputs must be assigned in this manner in order to maintain Telco System mix-minus integrity (i.e., the caller does not hear himself). This assignment prevents caller audio from being fed back to the originating telephone hybrid.

Ready lamp and timer reset status for each input is determined by stations 3 through 6 of switch S20. When the ready lamp function is enabled, the module OFF lamp functions as a ready lamp, following the status of the connected machine's (cart, tape, etc.) ready status indicator. When the timer reset function is enabled, the console timer will reset whenever the input module is turned ON.

2.9.3 Multitrack Input/Output Module Configuration Jumpers

The illustration below provides the location of the Multitrack Input/Output Module internal configuration jumpers, and defines their functions.

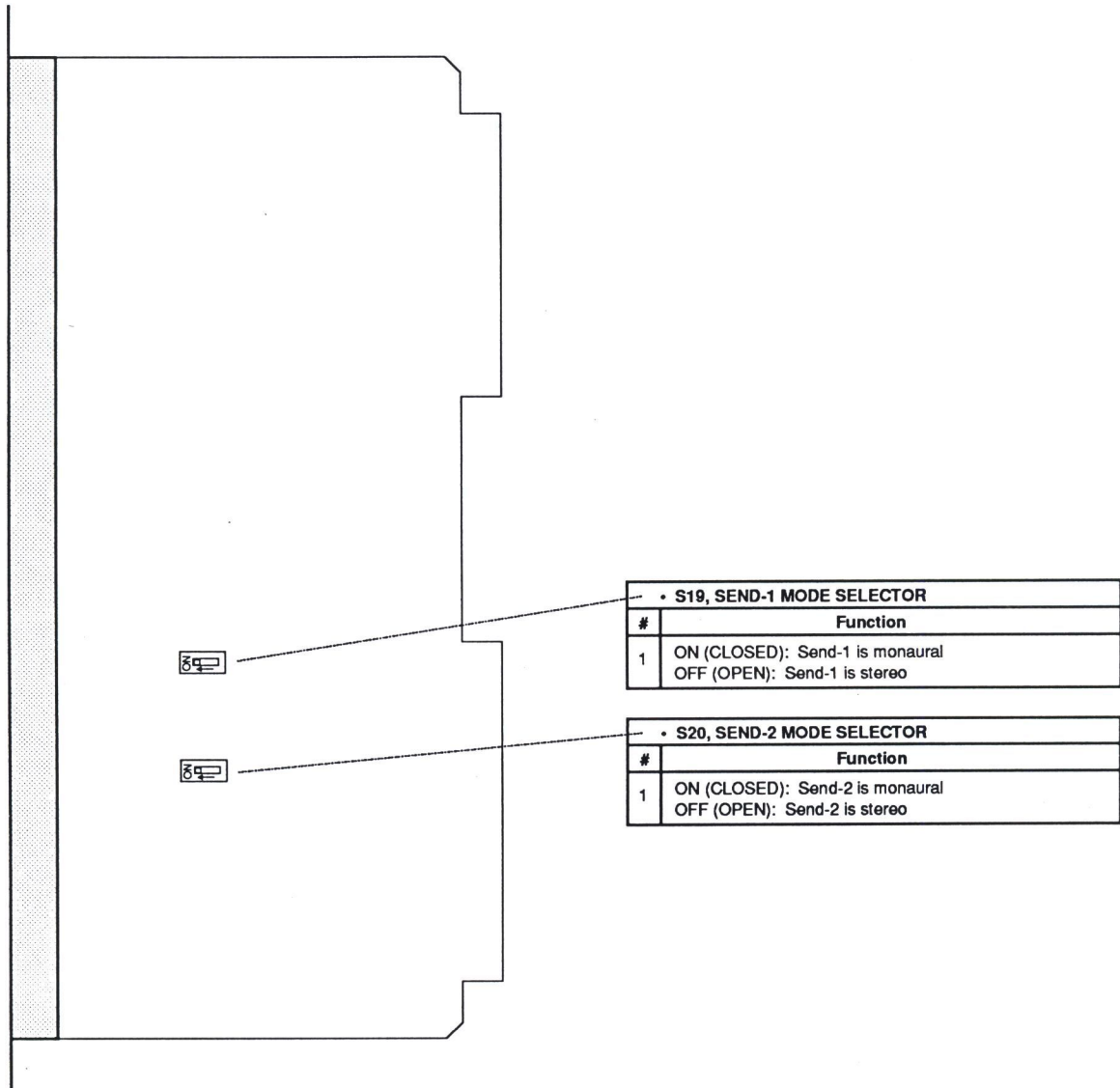


Assigning a multitrack module to the appropriate summing bus is accomplished the jumper plug J3 on the PC assembly. Thesecond jumper plug, J4, prevents the possibility of round-robin feedback caused by assigning a multitrack assembly to its own track on the front panel.

A jumper must be connected to one of the Multichannel Assignment positions and missing from the Track Bounce Assignment position of the corresponding number.

2.9.4 Send & Return Module Option Switches

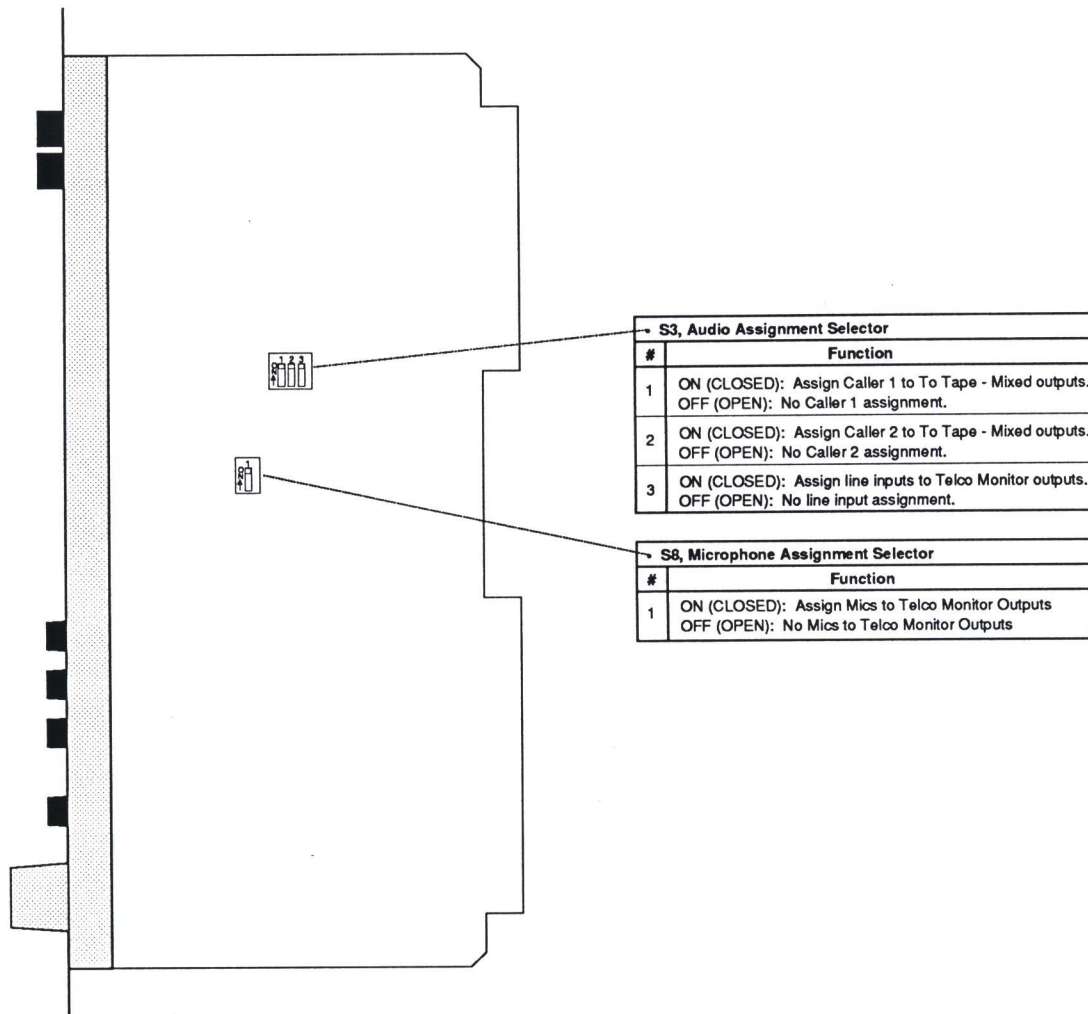
The illustration below provides the location of the Send & Return Module internal option switches, and defines their functions.



Switches S19 and S20 allow the send outputs to be either stereo or monaural (L+R sum). For much of the current digital processing equipment, the stereo mode would be desired. Some units, however, contain a monaural input stage which will require mono audio.

2.9.5 Telco Mix/Monaural Output Module Option Switches

The illustration below provides the location of the Telco Mix/Monaural Output Module internal option



switches, and defines their functions.

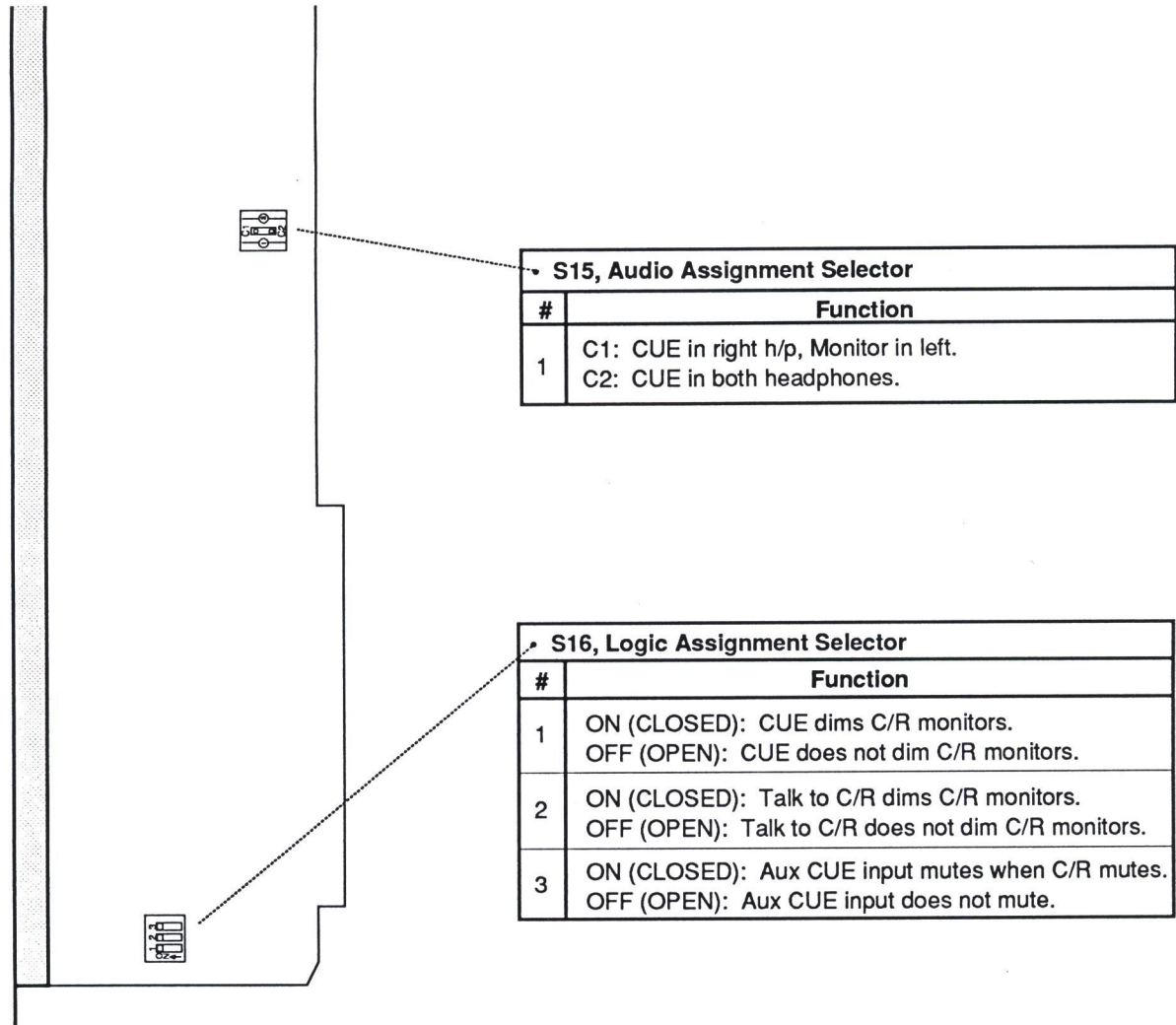
Switch S3 is a three-station switch. Stations 1 and 2 allow for the assignment of Caller 1 and/or Caller 2 to the To Tape - Mixed and To Tape Monitor - Mixed outputs of the module.

Station 3 allows for all Line Input Modules assigned to OFF LINE MIX to be added to the Telco Monitor Outputs.

Switch S8 allows for all Microphone Input Modules assigned to be added to the Telco Monitor Outputs. If this switch is closed, depression of the Telco CUE button will mute the Control Room speakers.

2.9.6 Control Room Monitor Module Option Switches

The illustration below provides the locations of the Control Room Monitor Module internal option switches, and defines their functions.



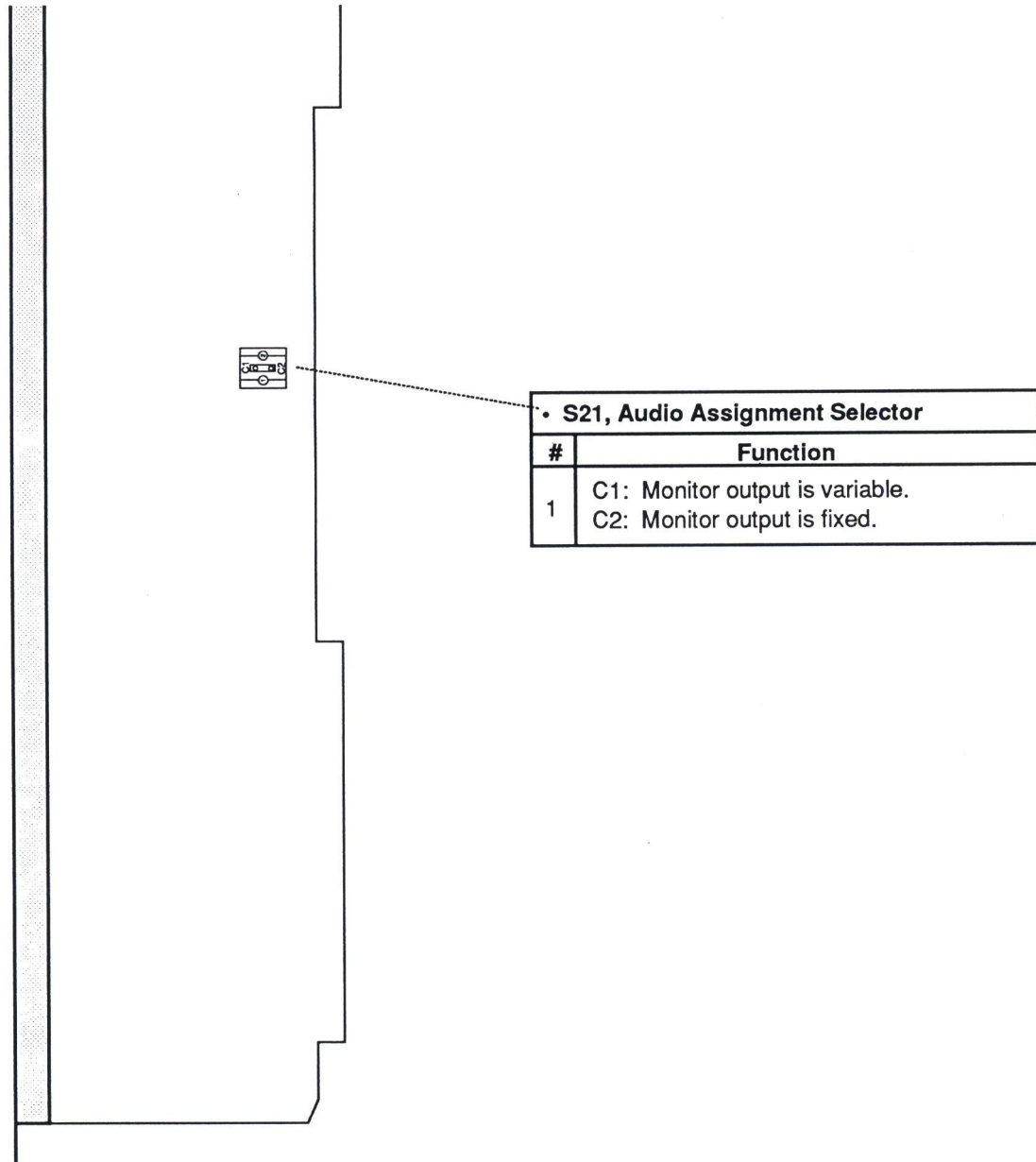
Switch S15 determines the CUE monitor mode of the console headphones when the module front panel AUTO CUE button is engaged. With S15 in the MONITOR position (C1), the left headphone monitors the Control Room Monitor source, while the right headphone monitors CUE audio. With S15 in the CUE position (C2), both headphones monitor CUE audio.

Switch S16 is a three-station switch. Station 1 determines whether the Control Room monitors dim when the console CUE system is activated. Station 2 determines whether the Control Room monitors dim when the Control Room is receiving Talkback. Station 3 determines whether or not the Auxiliary CUE

Input mutes when the Control Room monitors are muted.

2.9.7 Studio Monitor Module Option Switch

The illustration below provides the location of the Studio Monitor Module internal option switch, and

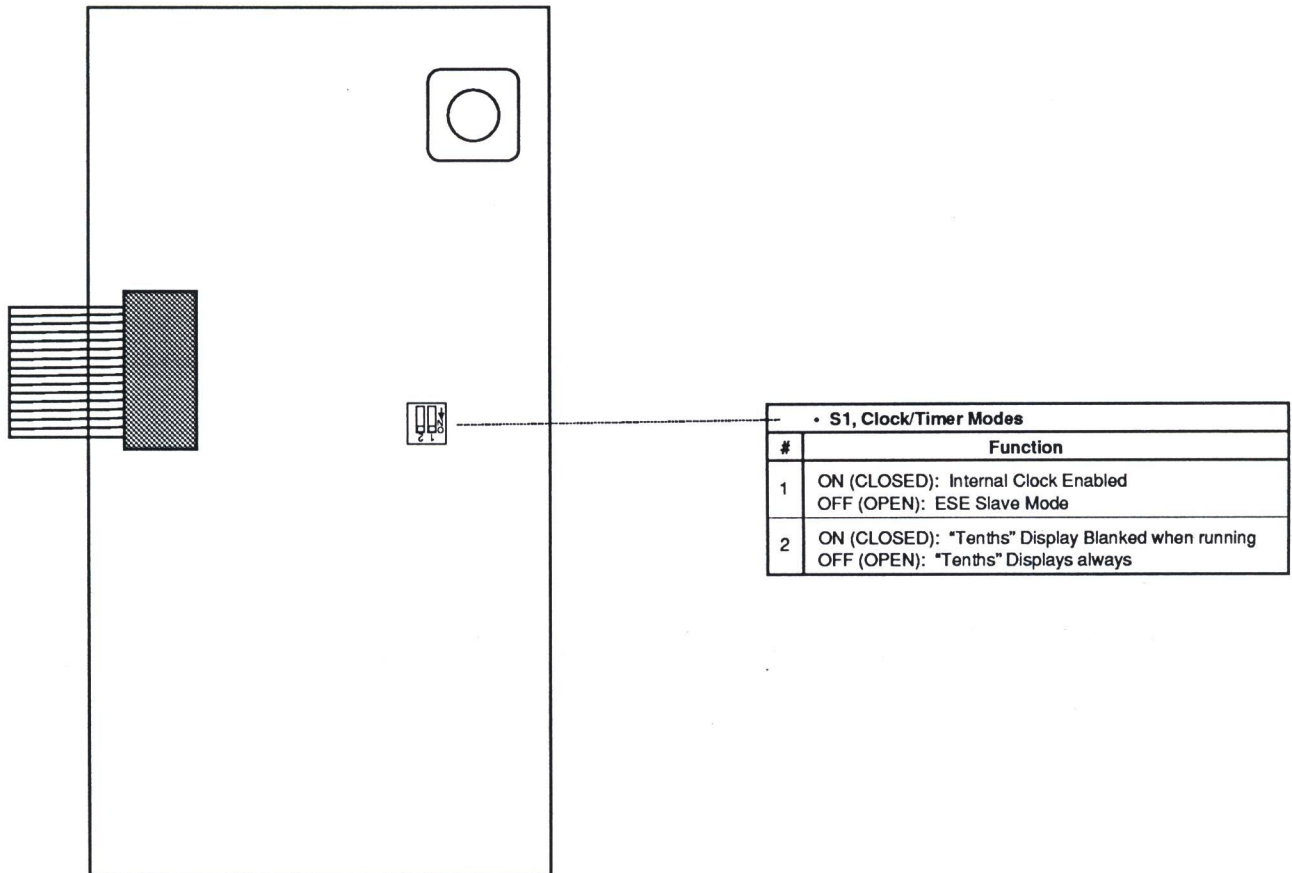


defines its function.

Switch S21 determines if the Main Studio Monitor Output is fixed or variable (variable monitor output levels are controlled by the Studio Monitor Module front panel MONITOR level control).

2.9.8 Clock/Timer Mode Switch

The illustration below provides the location of the Clock/Timer internal option switch and defines its functions.

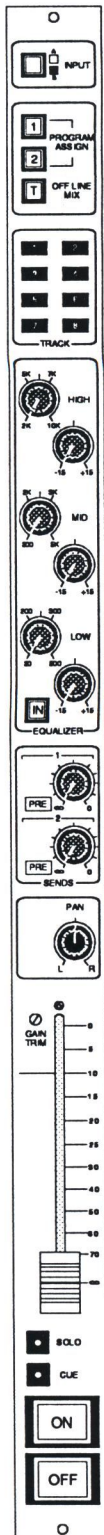


Switch S1 is a 2 station switch. Station 1 determines if the clock is to be used as an ESE slave or a stand-alone clock. Station 2 enables or disables the "tenths" display on the timer while it is running.

3.0 OPERATION

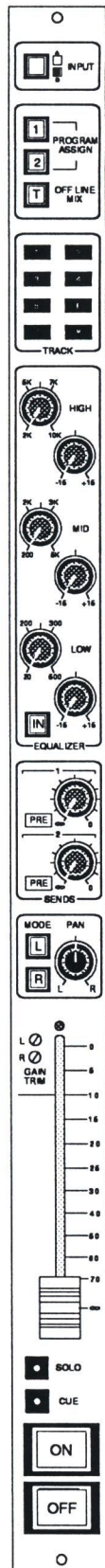
This chapter describes Productionmixer module operation. Each section contains an illustration of the module's front panel controls, accompanied by descriptions of the function(s) of each.

3.1 MICROPHONE INPUT MODULE



- The INPUT button selects between microphones connected to the A and B inputs of the module.
 - The PROGRAM ASSIGN buttons provide the ability to assign the module input to any combination of the PROGRAM 1 and PROGRAM 2 output buses.
 - The OFF LINE MIX button provides the ability to assign the module input to the Telephone System off line mix.
- NOTE:** When the input module OFF LINE MIX button is engaged, the input signal is sent to the Telephone System regardless of the ON/OFF status of the module.
- The parametric EQ has individual gain and frequency controls for each of the three bands. The left control tunes the operating frequency while the right knob adjusts the amount of boost and cut. The “auto-Q” feature of this circuit continuously increases the “Q” of the equalizer with increasing boost and cut.
 - The SEND rotary level controls with PRE-fader buttons provide the ability to assign the pre- or post-fader microphone signal to the two stereo Send buses. Sends are only active when the module is ON.
 - The PAN control allows positioning of the microphone signal in the stereo image.
 - The recessed GAIN TRIM control adjusts the microphone preamplifier gain for both inputs.
 - The mixing fader is a stepless, infinite resolution control with a reference line at the 10 dB point. This reference is the nominal position for a properly adjusted input level to achieve “0” VU on the console meters.
 - The electronic alternate-action SOLO button routes the input signal (after the fader and pan controls) to the console SOLO monitoring and automatic metering systems. The LED illuminates to tally its ON status.
 - The electronic alternate-action CUE button with LED indicator routes the pre-fader signal to the console CUE speaker and automatic metering systems. The LED is illuminated whenever the CUE button is engaged.
 - The ON button turns the module on and initiates the appropriate muting commands as programmed during installation. In addition, the ON button may be optionally set to provide a momentary cough function when held depressed (reference Section 2.9.1)
 - The OFF button turns the module off and cancels the muting commands.

3.2 STEREO LINE INPUT MODULE

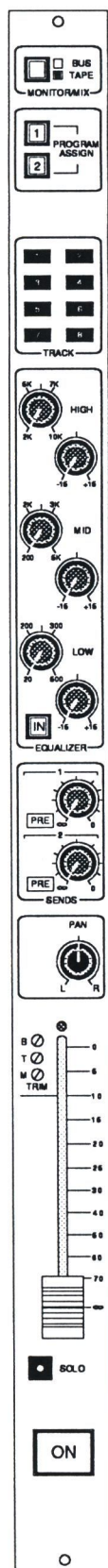


- The INPUT button selects between microphones connected to the A and B inputs of the module.
- The PROGRAM ASSIGN buttons provide the ability to assign the module input to any combination of the PROGRAM 1 and PROGRAM 2 output buses.
- The OFF LINE MIX button provides the ability to assign the module input to the Telephone System off line mix.

NOTE: When the input module OFF LINE MIX button is engaged, the input signal is sent to the Telephone System regardless of the ON/OFF status of the module.

- The parametric EQ has individual gain and frequency controls for each of the three bands. The left control tunes the operating frequency while the right knob adjusts the amount of boost and cut. The “auto-Q” feature of this circuit continuously increases the “Q” of the equalizer with increasing boost and cut
- The SEND rotary level controls with PRE-fader buttons provide the ability to assign the pre- or post-fader microphone signal to the two stereo Send buses. Sends are only active when the module is ON.
- The INPUT MODE switch determines the module mode as follows: with both buttons disengaged, the mode is stereo; pressing the L button alone sends the left source to both channels; pressing the R button alone sends the right source to both channels; and pressing both buttons sums the left and right input signals and sends the monaural result to both channels.
- The recessed L and R GAIN TRIM controls adjust the gain of the left and right preamplifiers.
- The mixing fader is a stepless, infinite resolution control with a reference line at the 10dB point. This reference is the nominal position for a properly adjusted input level to achieve “0” VU on the console meters.
- The electronic alternate-action SOLO button routes the input signal (after the fader and pan controls) to the console SOLO monitoring and automatic metering systems. The LED illuminates to tally its ON status.
- The electronic alternate-action CUE button with LED indicator routes the pre-fader signal to the console CUE speaker and automatic metering systems. The LED is illuminated whenever the CUE button is engaged.
- The ON button turns the module on and initiates machine start and timer reset commands, as programmed during installation.
- The OFF button turns the module off and initiates machine stop commands. In addition, the OFF tally may be set to act as a machine ready status indicator (reference Section 2.9.2).

3.3 MULTITRACK INPUT/OUTPUT MODULE



- The BUS/TAPE button selects between the Bus and Tape modes of the module. In the Bus mode, the track VU meter displays the module To Tape output signal level. In the Tape mode, the track VU meter displays the From Tape input signal level. The module mode also determines whether the To Tape (Bus mode) or From Tape (Tape mode) signal is fed to the console 2-MIX, Send and SOLO buses.
- The PROGRAM ASSIGN buttons provide the ability to assign the module input to any combination of the PROGRAM 1 and PROGRAM 2 output buses.
- The parametric EQ has individual gain and frequency controls for each of the three bands. The left control tunes the operating frequency while the right knob adjusts the amount of boost and cut. The “auto-Q” feature of this circuit continuously increases the “Q” of the equalizer with increasing boost and cut
- The SEND rotary level controls with PRE-fader buttons provide the ability to assign the pre- or post-fader microphone signal to the two stereo Send buses. Sends are only active when the module is ON.
- The INPUT MODE switch determines the module mode as follows: with both buttons disengaged, the mode is stereo; pressing the L button alone sends the left source to both channels; pressing the R button alone sends the right source to both channels; and pressing both buttons sums the left and right input signals and sends the monaural result to both channels.
- The BUS GAIN TRIM control adjusts the level of the module To Tape output, the TAPE GAIN TRIM control adjusts the level of the module From Tape input (to match the output level of the tape recorder). The METER GAIN TRIM control adjusts the calibration level of the track VU meter.
- The mixing fader is a stepless, infinite resolution control with a reference line at the 10dB point. This reference is the nominal position for a properly adjusted input level to achieve “0” VU on the console meters.
- The electronic alternate-action SOLO button routes the input signal (after the fader and pan controls) to the console SOLO monitoring and automatic metering systems. The LED illuminates to tally its ON status.
- The electronic alternate-action ON button turns the module on and off. When on, the module routes the To Tape or From Tape signal (depending on the module mode) to the assigned output and the Send buses and the button is fully illuminated to indicate its on status. When off, the button is dimly illuminated.



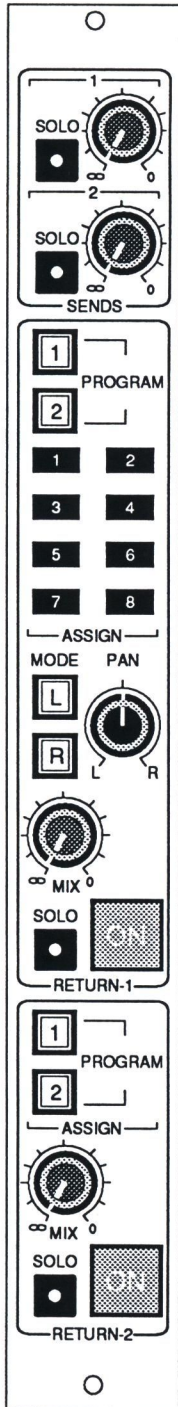
3.4 STEREO LINE OUTPUT AMPLIFIER



- This module provides two separate sets of recessed controls, one for PROGRAM 1 and one for PROGRAM 2, which function identically. The L and R VU controls adjust the console meter levels. The L and R GAIN controls adjust the gain of the line output distribution amplifiers.
- The mixing fader is a stepless, infinite resolution control with a reference line at the 10 dB point. This fader controls the level of the PROGRAM-2 output and is inserted or defeated by the PGM-2 FADER button.



3.5 SEND & RETURN MODULE



- The two rotary SEND OUTPUT controls adjust the master Send levels. The SOLO buttons route the pre-fader SEND mix bus signals to the SOLO monitoring and automatic metering systems.

RETURN-1 CONTROLS

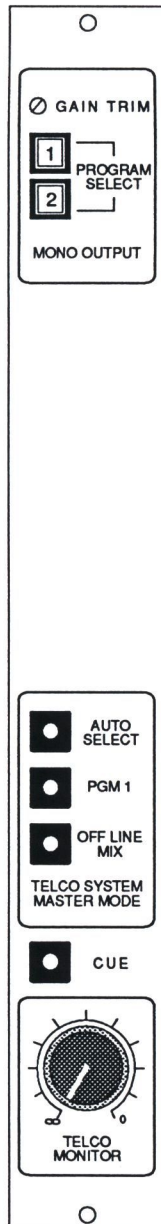
- The OUTPUT ASSIGNMENT buttons provide the ability to assign the stereo Return signal to any combination of the PROGRAM or MULTITRACK buses.
- The INPUT MODE switch functions identically to that found on the Stereo Line Input Module.
- The PAN control may be used to adjust the left-right balance of a stereo Return signal, or to position a monaural or sum mode signal in the left-right stereo image.
- The MIXing fader is a stepless, infinite resolution control.
- The electronic alternate-action SOLO button routes the Return signal to the console SOLO monitoring and automatic metering systems. The SOLO LED illuminates to tally its ON status.
- The electronic alternate-action ON button turns the Return circuitry ON and OFF.

RETURN-2 CONTROLS

NOTE: The Return-2 controls function identically to the Return-1 controls described above, except that there are no Return-2 TRACK assignment buttons, input MODE switching, or PAN.

3.6 TELCO MIX/MONAUURAL OUTPUT MODULE

The Telco Mix/Monaural Output Module consists of two separate sections, Telco Mix and Monaural Output, which function independently. This section contains a figure illustrating the module's front panel controls, along with a description of the function(s) of each. Also contained in this section is a description of Telco System operation.



MONAUURAL OUTPUT SECTION

- The recessed GAIN TRIM control adjusts the gain of the monaural line output distribution amplifier.
- The PROGRAM SELECT buttons allow for the selection of any combination of the PROGRAM 1 and PROGRAM 2 output buses to be summed as the monaural output.

TELCO MIX SECTION

- The three TELCO SYSTEM MASTER MODE buttons with LED indicators allow for the assignment of the Telco System as follows:

PGM 1 - Feeds PROGRAM 1 to the callers.

OFF LINE MIX - Feeds all selected OFF LINE MIX input signals to the callers.

AUTO SELECT - Automatically switches the Telco System between the PGM 1 and OFF LINE MIX modes, as determined by the ON/OFF status of the caller's input module(s).

- The electronic alternate-action CUE button with LED indicator routes the pre-fader Telco Monitor Output signal to the console CUE speaker. The LED is illuminated whenever the CUE button is engaged.
- The TELCO MONITOR level control adjusts the level of the Variable Telco Monitor Output.

TELCO SYSTEM OPERATION

The Productionmixer Telco System has two separate and switchable modes, one for on-air (PGM 1) and one for off-air (OFF LINE MIX) operation. In both modes, Caller 1 and Caller 2 mix-minus integrity is maintained throughout the Telco System (i.e., the caller does not hear himself).

When placing callers on-air, select the PGM 1 mode to feed the callers PROGRAM 1 audio. This allows the callers to hear and interact with everything that is being broadcast on-air (such as music, microphones, commercials, traffic reports, remote feeds, etc.).

When recording or conversing with callers off-air (i.e., contest call recording, speaker phone operation, etc.), select the OFF LINE MIX mode to feed the callers only those inputs that are necessary for off-air operation (such as operator and guest microphones, contest carts, etc.). This mode allows for off-air conversation with the callers exclusive of PROGRAM 1 operation.

Each mode is configured independently, using the controls provided on the Telco Mix and console input modules, as described below.

On-Air (PGM 1) Telco Operation

The Productionmixer is configured to allow on-air Telco operations to take place on the PROGRAM 1 bus. In this mode, assign all Microphone and Stereo Line Input Modules which are to be incorporated into the PROGRAM 1 signal, including those being used as Telco hybrid inputs, to the PROGRAM 1 bus (note that PROGRAM 1 feeds are only active when the input modules are turned ON). Select PGM 1 on the Telco Mix Module to feed the callers PROGRAM 1 audio. Turn the Telco hybrid input module ON to place the caller on-air.

NOTE: Caller 1 and Caller 2 mix-minus integrity is maintained throughout the Telco System (i.e., the caller does not hear himself).

Off-Air (OFF LINE MIX) Telco Operation

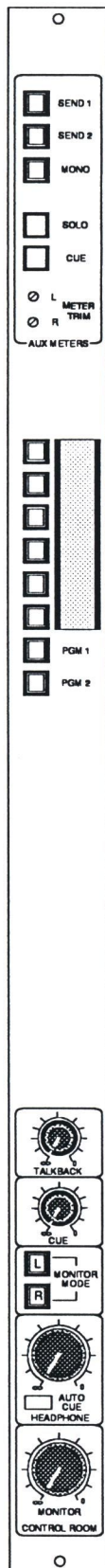
In this mode, assign all desired Microphone and Stereo Line Input Modules, including those being used as Telco hybrid inputs, to the OFF LINE MIX bus (note that OFF LINE MIX feeds are always active, regardless of the ON/OFF status of the module). Select OFF LINE MIX on the Telco Mix Module to feed the callers OFF LINE MIX audio.

NOTE: Caller 1 and Caller 2 mix-minus integrity is maintained throughout the Telco System (i.e., the caller does not hear himself).

Telco System AUTO SELECT

The Telco System is also equipped with an AUTO SELECT function, which allows the system to toggle between the two modes of operation automatically, as determined by the ON/OFF status of the Stereo Line Input Modules being used as Telco hybrid inputs. This function is connected as defined in Section 2.8.3, and is enabled by engaging the Telco Mix Module AUTO SELECT button.

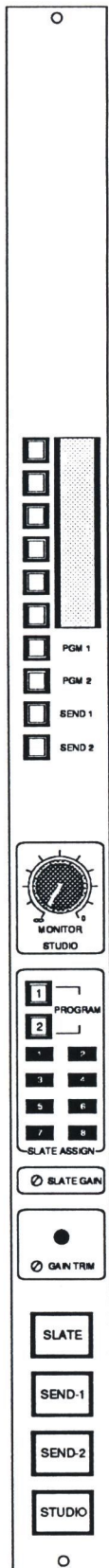
3.7 CONTROL ROOM MONITOR MODULE



- The three-station METER SOURCE switch selects the source to be fed to the AUXILIARY meters, SEND-1, SEND-2, or the Monaural output.
 - The SOLO and CUE tallies illuminate to indicate when either function is engaged somewhere in the console, and the SOLO or CUE level is displayed on the AUXILIARY meters. If a CUE and a SOLO are activated simultaneously, the SOLO will take priority.
 - The eight-station MONITOR INPUT switch selects the monitor source from the PROGRAM 1 or PROGRAM 2 bus, or any one of six external sources.
- NOTE:** Legend strip dimensions are provided in Section 2.1.
- The TALKBACK control adjusts the level of Talkback communication received in the Control Room via the console CUE speaker.
 - The CUE control adjusts the level of the console CUE speaker.
 - The MONITOR MODE switch determines the module monitor mode as follows: with both buttons disengaged, the mode is stereo; pressing the L button alone sends the left source to both monitors; pressing the R button alone sends the right source to both monitors; and pressing both buttons sums the left and right input signals and sends the monaural result to both monitors.
 - The HEADPHONE control adjusts the level of the console operator's headphones.
 - The headphone AUTO CUE button enables the Automatic Cue switching system for the console operator's headphones. With the AUTO CUE button disengaged, the headphones follow the MONITOR SOURCE switch. With the AUTO CUE button engaged, whenever an input module CUE button is depressed, the operator's headphones switch from stereo monitor to one of two selectable modes - monitor in the left headphone and CUE in the right, or CUE in both headphones. Which mode is determined by an internal option switch (reference Section 2.9.4).
 - The MONITOR level control adjusts the level of the Variable Control Room Monitor Output.



3.8 STUDIO MONITOR MODULE

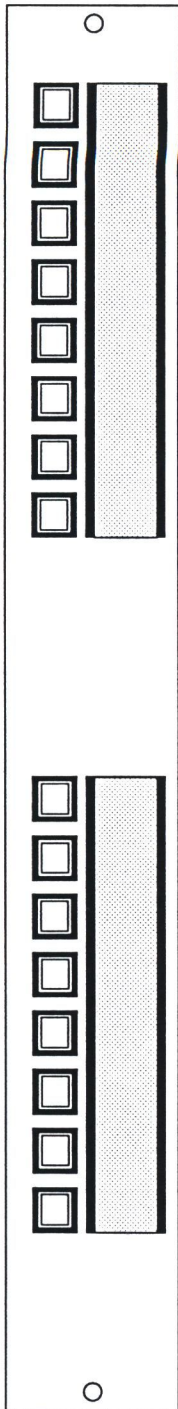


- The ten-station MONITOR INPUT switch selects the monitor source from PROGRAM 1 or PROGRAM 2, SEND-2, SEND-2, or any one of six external sources.

NOTE: Legend strip dimensions are provided in Section 2.1.

- The MONITOR level control adjusts the level of the Variable Studio Monitor Output.
- The SLATE ASSIGN buttons route a mix of the talkback microphone audio and the 30 Hz slate tone to either of the PROGRAM buses or any of the MULTITRACK buses.
- The built-in electret microphone is the Control Room Talkback source.
- The recessed SLATE OSC GAIN TRIM control adjusts the level of the built-in 30 Hz slate tone oscillator.
- The recessed MIC GAIN TRIM control adjusts the level of the Talkback microphone.
- Depressing the SLATE button sends the 30 Hz slate tone and the output of the Talkback microphone to the destination selected by the SLATE ASSIGNMENT switches.
- The three Talkback buttons provide communication from the electret microphone to the studio or either of the two send buses.

3.9 REMOTE LINE SELECTOR



- This module consists of two eight-station selector switches which can select from any of the eight common Remote Line Selector inputs. The stereo output of each switch is then brought out to the connector panel for routing to console input positions, tape recorder inputs, etc. Productionmixer can accommodate up to two of these modules.

NOTE: Legend strip dimensions are provided in Section 2.1.

3.10 TIMER CONTROL PANEL



- When the maintained-action AUTO RESET button is engaged, the timer will reset and restart whenever a Stereo Line Input Module with the timer reset function enabled (reference Section 2.9.2) is turned ON. The LED illuminates when the button is engaged.
- The RESET button resets the timer to zero.
- The HOLD button will hold the timer display at the present time count while the running time count continues internally. Releasing the HOLD button will display the running time count.
- The START button starts the timer.
- The STOP button stops the timer.

EQUIPMENT
DESCRIPTION

4.0 EQUIPMENT DESCRIPTION

This chapter describes the various components incorporated in the Productionmixer and its associated modules. Included are sections describing the mainframe, Microphone Input Module, Stereo Line Input Module, Telco Mix/Monaural Output Module, Stereo Line Output Amplifier, Control Room Monitor Module, Studio Monitor Module, Remote Line Selector, Timer Control Panel, and power supply assembly.

Mainframe and module circuitry information is provided in the console block diagram and the module schematics and printed circuit assembly (PCA) drawings located in Chapter 7 of this document.

4.1 MAINFRAME

All of the Productionmixer's interconnections are accomplished through a single mother board. The input modules plug into edge connectors mounted on the top side of the mother board, while the Molex connectors are mounted on the underside of the mother board.

The mother board contains virtually no components other than the connectors themselves, thereby isolating most of the active components to removable modules. This design approach minimizes system "down time" and greatly enhances troubleshooting by providing the option of simply replacing any defective module with a "spare" module, per the procedure outlined in Section 6.2.

For an overview of the console circuitry, and the relationship of the various modules, see the Productionmixer functional block diagram and the mother board schematic, located in Sections 7.1 and 7.2, respectively.

4.2 MICROPHONE INPUT MODULE

The Microphone Input Module accommodates a wide range of input levels to permit the use of all contemporary microphones. The input preamplifier is an active differential design configured on a plug-in board, and its gain is adjustable over the nominal input level range of -70 dBu to -35 dBu by means of the front panel GAIN TRIM control. The modules have been set-up at the factory to allow for phantom powering of condenser microphones connected to either of the two inputs (reference Section 5.1).

The A/B INPUT selector allows for the selection of microphones connected to the A or B inputs of the module, and the PROGRAM ASSIGN buttons provide the ability to assign the module to either or both of the console output buses. The module may also be assigned to the OFF LINE MIX system for Telco operations. The PAN control allows for positioning of the signal in the stereo image. The fader controls a differential-mode VCA and associated circuitry, which maintains optimum headroom throughout the control range.

The 3-band quasi-parametric equalizer with auto-Q, has separate controls for gain and frequency. The gain circuitry employs auto-Q which automatically increases the "Q" of the filter with larger amounts of boost or cut. Two Send controls are provided for sending either pre- or post-fader audio to the Send

mix amplifiers. The Sends are only active when the module is ON.

The CUE button routes the pre-fader signal to the console CUE system and the auxiliary VU meters while the SOLO button routes the post-fader, post-pan signal to the Control Room Monitor system and auxiliary VU meters. Activation of Cue, Solo, or Module On will mute the Control Room Monitor loudspeakers if the Microphone is in the control room.

The logic connector makes it possible to utilize standard PR&E remote control panels and cable assemblies. Remote control of module ON and OFF, COUGH and TALK TO CONTROL ROOM functions is provided (reference Section 2.8.1).

A five station internal DIP switch controls muting functions for the Control Room or Studio monitors, depending on microphone location, and enables the local cough function (reference Section 2.9.1). The mute circuitry incorporates an automatic 40 millisecond delay before the microphone is turned on, allowing room reverb to decay off mic.

For circuitry information, refer to the Microphone Input Module schematic and the PCA drawing located in Sections 7.3 and 7.4, respectively.

4.3 STEREO LINE INPUT MODULE

The Stereo Line Input Module accommodates nominal input levels from -12 dBu to +9 dBu. Left and right GAIN TRIM controls adjust module input sensitivity.

The A/B INPUT selector allows for the selection of stereo sources connected to the A or B inputs of the module, and the PROGRAM ASSIGN buttons provide the ability to assign the module to either or both of the console output buses. The module may also be assigned to the OFF LINE MIX system for Telco operations.

The INPUT MODE selector determines the signal mode. When both the L and R switches are released, the mode is stereo; when the L is depressed, the left input signal is sent to both channels; when the R is depressed, the right input signal is sent to both channels; and when both buttons are depressed, a monaural sum of the left and right input signals is sent to both channels.

The 3-band stereo-tracking quasi-parametric equalizer with auto-Q, has separate controls for gain and frequency. The gain circuitry employs auto-Q which automatically increases the "Q" of the filter with larger amounts of boost or cut. Two stereo Send controls are provided for sending either pre- or post-fader audio to the Send mix amplifiers. The Sends are only active when the module is ON.

The CUE button routes the stereo pre-fader signal to the console CUE system and the auxiliary VU meters while the SOLO button routes the post-fader, post-pan signal to the Control Room Monitor system and auxiliary VU meters. The fader controls a stereo pair of differential-mode VCAs and associated circuitry, which maintain optimum headroom throughout the control range.

The logic connector makes it possible to utilize standard PR&E remote control panels and cable assemblies. In addition to the remote control of module ON, OFF and CUE functions, machine START and STOP output commands and READY and AUDIO RESET (to OFF) control inputs are also provided (reference Section 2.8.2).

A six station internal DIP switch (S11) enables the ready lamp and timer reset functions of the module, as well as assigning the A or B input to the Telco Mix System (when the input is coming from a telephone hybrid). An additional DIP switch (S8) assigns a Telco Mix System input to either Telco Mix Bus #1 or #2 (reference Section 2.9.2). For a more complete description of Telco Mix System operation, see Section 3.6.

For circuitry information, refer to the Stereo Line Input Module schematic and the PCA drawing located in Sections 7.5 and 7.6, respectively.

4.4 MULTITRACK INPUT/OUTPUT MODULE

Each Multitrack Input/Output Module is assigned to a single console Multitrack mix bus, and connected to the corresponding track input and output of a multitrack tape machine (4 or 8 tracks). The module has two modes of operation, Bus and Tape, which are selected by means of the front panel BUS/TAPE selector.

In the Bus mode, the track VU meter displays the module To Tape output signal level. In the Tape mode, the track VU meter displays the From Tape input signal level. The module mode also determines whether the To Tape (Bus mode) or From Tape (Tape mode) signal is fed to the Program outputs, Send and SOLO buses.

NOTE: As long as a signal appears on the Multitrack mix bus that the module is assigned to, the To Tape signal is being fed to the multitrack recorder, regardless of the mode or ON/OFF status of the module.

The 3-band quasi-parametric equalizer with auto-Q, has separate controls for gain and frequency. The gain circuitry employs auto-Q which automatically increases the “Q” of the filter with larger amounts of boost or cut. The Send level controls with PRE-fader buttons provide the ability to assign the pre-or post-fader signal to the two console Send circuits. The Sends are only active when the module is ON, and consist of the To Tape or From Tape signal, depending on the module mode.

The SOLO button routes the post-fader To Tape or From Tape signal, depending on the module mode, to the console SOLO monitoring and automatic metering systems, and the ON button turns the module on and routes the To Tape or From Tape signal to the console Program buses and the module Send circuitry.

Two internal jumper assemblies determine the bus assignment of the Multitrack Module (Reference Section 2.9.3). One jumper assembly assigns the module to the appropriate summing bus while the other assembly de-assigns the module from the appropriate track

button (preventing the possibility of round-robin feedback caused by assigning a module to itself).

For circuitry information, refer to the Multitrack Input/Output Module schematic and the PCA drawing located in Sections 7.7 and 7.8, respectively.

4.5 STEREO LINE OUTPUT AMPLIFIER

The Stereo Line Output Amplifier contains the mixing and distribution amplifiers for both console PROGRAM outputs, as well as the buffer amplifiers for the PROGRAM 1 and PROGRAM 2 VU meters. The module supplies four active balanced distribution outputs, one Main and one Auxiliary, for each PROGRAM bus, with each output capable of supplying up to +26 dBm.

Front panel PROGRAM 1 and PROGRAM 2 GAIN controls have sufficient range to adjust output amplifiers for +4 dBm or +8 dBm operating levels. There are also front panel gain trim controls for adjusting console VU meter levels.

The fader controls a stereo pair of differential-mode VCAs and associated circuitry, which maintain optimum headroom throughout the control range. The fader circuit is only active on the Program-2 amplifier, and may be engaged and defeated with the front panel PGM-2 FADER button.

For circuitry information, refer to the Stereo Line Output Amplifier schematic and the PCA drawing located in Sections 7.9 and 7.10, respectively.

4.6 SEND & RETURN MODULE

The Send & Return Module contains the two Send and two stereo Return circuits. The Send portion of the module contains the mixing and output amplifiers for the effects/foldback channels. Each Send is equipped with a master level control and a SOLO button which assigns the Send output signal to the Control Room Monitor module for monitoring and automatic metering.

Each Send is equipped with an internal DIPswitch which sums the L+R Send audio to provide a monaural output if desired (Reference Section 2.9.4).

The Return signals may be assigned either of the Program buses, with Return-1 having the additional capability of assignment to any or all of the Multitrack buses. Both Return circuits are equipped with level, SOLO, and ON/off controls. Return-1 also contains MODE and PAN functions.

For circuitry information, refer to the Send & Return Module schematic and the PCA drawing located in Sections 7.11 and 7.12, respectively.

4.7 TELCO MIX/MONAUROAL OUTPUT MODULE

The Telco Mix/Monaural Output Module consists of two independent sets of circuitry. The Monaural Output section supplies four summed PROGRAM 1 or PROGRAM 2 monaural outputs, as determined

by the front panel PROGRAM SELECT buttons. Each active balanced output is capable of supplying up to +26 dBm, and the front panel GAIN TRIM control has sufficient range to adjust output amplifiers for +4 dBm or +8 dBm operating levels.

The Telco Mix section sums caller and selected input module signals and produces six unique outputs: To Caller 1; To Caller 2; To Tape - Mixed; To Tape - Callers; and Telco Monitor, Fixed and Variable. The To Tape and Telco Monitor outputs are versatile, and are described in detail in Section 2.7.6. In addition, there are two To Tape Monitor outputs, which are identical to the To Tape outputs and allow for the connection of an additional tape machine, monitor system, etc.

The To Caller 1 and To Caller 2 outputs are routed to the telephone hybrids, and may consist of either the PROGRAM 1 or OFF LINE MIX signals, plus any caller except the caller himself (i.e., mix-minus).

The Telco Mix section is also equipped with a logic function which allows the system to toggle between on-air (PGM 1) and off-air (OFF LINE MIX) modes of operation, as determined by the ON/OFF status of the Stereo Line Input Modules assigned as Telco hybrid inputs (reference Section 2.8.3). The PGM-1 and OFF LINE MIX operating modes can best be understood by reviewing the Telco System Operation description contained in Section 3.6.

For circuitry information, refer to the Telco Mix/Monaural Output Module schematic and the PCA drawing located in Sections 7.13 and 7.14, respectively.

4.8 CONTROL ROOM MONITOR MODULE

The Control Room Monitor Module allows for the monitoring of PROGRAM 1, PROGRAM 2, or up to six external sources, as determined by the monitor selector. The module is also equipped with level controls for both TALKBACK and CUE. The TALKBACK level control adjusts the level of Talkback communication received via the console CUE speaker only. Headphone Talkback levels are adjusted by the front panel HEADPHONE control.

The headphone AUTO CUE button enables the Automatic Cue switching system for the console operator's headphones. The Automatic Cue mode is then engaged whenever a module CUE button is pressed, switching the console operator's headphones from stereo monitor to one of two modes - monitor in the left headphone and CUE in the right, or CUE in both headphones, as determined by a module internal option switch (reference Section 2.9.6).

The MONITOR MODE switch selects the monitor and headphone modes of the module. When both the L and R switches are released, the mode is stereo; when the L is depressed, the left source signal is sent to both channels; when the R is depressed, the right source signal is sent to both channels; and when both buttons are depressed, a monaural sum of the left and right source signals is sent to both channels. The MONITOR level control adjusts the volume of the Control Room monitors.

The AUX METERS switching section of the module provides the signal source to the AUXiliary meters. Either the SEND-1, SEND-2, or MONO outputs can be selected for level display. When a CUE or SOLO button has been depressed on a module, the appropriate indicator will illuminate and the auxiliary VU

meters will display the level of the selected source. If CUE and SOLO have both been selected, the SOLO signal will be displayed on the meters.

For circuitry information, refer to the Control Room Monitor Module schematic and PCA drawing located in Sections 7.15 and 7.16, respectively.

4.9 STUDIO MONITOR MODULE

The Studio Monitor Module was designed for applications where a separate voice booth or Studio is required, and provides for the monitoring of PROGRAM-1, PROGRAM-2, SEND-1, SEND-2, or up to six external sources, as determined by the monitor selector. It also provides Talkback and Slate facilities, allowing the Control Room to talk to the Studio and to add Slate commentary to a tape recording by means of the built-in electret microphone.

Pressing any of the three module TALKBACK buttons (SEND-1, SEND-2, or STUDIO) routes the Talkback microphone to the appropriate destination and dims the Control Room monitors. Talkback microphone gain is adjusted by the front panel GAIN TRIM control. Depressing the SLATE button sends a mix of the Talkback microphone and the 30 Hz slate oscillator to the destinations determined by the SLATE ASSIGN buttons and mutes the Control Room monitors. The SLATE signal can be assigned to either of the Program buses or any of the multitrack buses.

When the Main Studio Monitor Output is selected as variable by the module internal option switch (reference Section 2.9.7), the MONITOR level control adjusts the volume of the Studio monitors.

For circuitry information, refer to the Studio Monitor Module schematic and PCA drawing located in Sections 7.17 and 7.18, respectively.

4.10 REMOTE LINE SELECTOR

The dual Remote Line Selector provides for selection of up to eight stereo input signals switched to two outputs. Typical applications include use as a line pre-selector ahead of an input or monitor module. The output of the selector is routed to a rear panel connector for user connection to the appropriate line or monitor input position.

The module consists of two eight-station stereo selector switches fed from eight common stereo remote inputs. The switch used is equipped with a mechanical lockout mechanism to prevent pushing two or more buttons simultaneously.

For circuitry information, refer to the Remote Line Selector schematic located in Section 7.19.

4.11 TIMER CONTROL PANEL

The Timer Control Panel is mounted in the far right position of the console mainframe, and controls the reset, hold, start and stop functions of the console timer. There is also an AUTORESET function, which allows the timer reset function to be controlled by the console timer reset bus. When this function is

engaged, the button LED will be illuminated, and the timer will reset whenever a Stereo Line Input Module with the timer reset function enabled (reference Section 2.9.2) is turned ON.

For circuitry information, refer to the Timer Control Panel schematic located in Section 7.20.

4.12 CLOCK/TIMER ASSEMBLY

The clock/timer assembly used in the Productionmixer uses a microprocessor and some very flexible software to control clock and timer functions. There is a DIPswitch which can be set to blank the “tenths” display on the timer and another DIPswitch which will allow the clock to be configured as an ESE slave or a stand-alone clock. If the clock is in the ESE slave mode and the ESE master fails for any reason, the microprocessor keeps time by automatically switching to its free running clock and flashes an LED on the display to indicate the failure. The internal clock is accurate to within 3 seconds per month due to the use of a crystal oven to stabilize the crystal frequency.

For circuitry information, refer to the Clock/Timer schematic and PCA drawing located in Section 7.21 and 7.22, respectively.

4.13 POWER SUPPLY ASSEMBLY

The regulated power supply is installed in the rack in the console support cabinetry. The supply uses three integrated circuits and plug-in, adjustable regulators to provide the required bi-polar audio and mono-polar logic supply voltages.

The power supply assembly provides the power for all audio and logic circuits in the Productionmixer. The design employs a straightforward regulator design. The logic, audio and phantom power supplies are protected against AC mains faults by a magnetic circuit breaker. This circuit breaker also functions as the main power switch for the supply. The power supply is protected against load faults by power and current limiting internal to the IC regulators.

For circuitry information, refer to the schematic located in Section 7.23.

5.0 OPTIONS AND MODIFICATIONS

This chapter describes available Productionmixer options and modifications. Included are sections describing phantom microphone powering and +4 dBu to +8 dBu conversion.

5.1 PHANTOM MICROPHONE POWERING

The Productionmixer is equipped with a +48 volt "phantom" power supply for the powering of condenser microphones connected to the Microphone Input Modules. All necessary modifications to the Microphone Input Modules have been accomplished at the factory (see note below), so condenser microphones may be connected just like any other microphone.

NOTE: For "phantom" powering of microphones connected to either the A or B input, a jumper wire has been installed between points E4 and E5 on the Microphone Input Module PC assembly (reference the schematic located in Section 7.3).

5.2 OUTPUT LEVEL CONVERSION (+4 dBu to +8 dBu)

All consoles are set for a +4 dBu output level at the time of factory test, unless a +8 dBu level is specified at the time of order. In order to convert a +4 dBu console operating level to +8 dBu, it will first be necessary to modify the Control Room and Studio Monitor, and the Telco Mix/Monaural Output Module PCAs as follows:

1. On the Control Room Monitor Module PCA, install 26.7K ohm, 1% resistors (PR&E #1-2672; provided in the spare parts kit) at R65 and R86. Also install 43.2K ohm, 1% resistors (PR&E #1-4322) at R47 and R48.
2. On the Studio Monitor Module PCA, install 26.7K ohm, 1% resistors (PR&E #1-2672; provided in the spare parts kit) at R12 and R24.
3. On the Telco Mix/Monaural Output Module PCA, remove 68.1K ohm, 1% resistors R5 and R26.
4. On the Send & Return Module PCA, remove R22, R26, R29, and R33. Also install 13.3K ohm, 1% resistors (PR&E #1-1332) at R69, R70, R71, and R72.

Once these changes have been made, align the console to the +8 dBu operating level in accordance with the following procedures:

OUTPUT AMPLIFIERS

Apply a 1 kHz test signal at -10 dBu (600 ohm source) to the Patch Return of a Stereo Line Input Module.

Turn the input module ON and set the fader at the 10 dB reference level. Adjust PROGRAM 1 and PROGRAM 2 left and right output amplifier GAIN TRIM controls for a +8 dBu output into 40K ohm bridging load. Adjust left and right VU meter GAIN TRIM controls for a 0 VU meter reading.

MICROPHONE INPUT MODULES

Apply a 1 kHz test signal at -50 dBu (150 ohm source) to the module input. Set the fader at the -10 dB reference mark. Adjust module GAIN TRIM controls for a +8 dBu console output into a 40K ohm bridging load.

LINE INPUT MODULES

Apply a 1 kHz test signal at +8 dBu (600 ohm source) to both the left and right module inputs. Set the fader at the -10 dB reference mark. Adjust module GAIN TRIM controls for a +8 dBu console output into a 40K ohm bridging load.

TELCO INPUT/MONAUURAL OUTPUT MODULE

Apply a 1 kHz test signal at -10 dBu (600 ohm source) to the Patch Return of a Stereo Line Input Module. Turn the input module ON and set the fader at the 10 dB reference level. Select PROGRAM 1 as the MONO OUTPUT source. Adjust the GAIN TRIM control for a +8 dBu monaural output into a 40K ohm bridging load.

6.0 MAINTENANCE AND ALIGNMENT

This chapter contains sections describing routine maintenance, troubleshooting, level alignment, the installation and servicing tool kit, the spare parts kit, and replacement parts for the Productionmixer.

6.1 ROUTINE MAINTENANCE

Routine maintenance is usually limited to checking button switches for proper operation and keeping panel surfaces clean. The panel surfaces are finished with a baked polyurethane paint and may be cleaned with a weak solution of dishwashing detergent. The procedures for checking power supply voltages, lamp replacement, button replacement, and collet knob removal are described below.

NOTE: The Penny & Giles faders used in Productionmixer input modules (PR&E #24-136) are not field serviceable.

6.1.1 Checking Power Supply Voltages

The Productionmixer power supply is designed to provide very low noise power to the console. Each output should be within 0.5 volts of its specified DC voltage. The outputs should also be checked periodically for ripple and noise using a sensitive AC voltmeter. The reading should be less than 350 microvolts RMS.

6.1.2 Lamp Replacement

NOTE: When replacing a lamp, replace it with an identical type. Do not substitute lamps of different voltage or current ratings.

Meter lamp replacement is accomplished by squeezing the mounting ears on the lamp socket to remove the socket from the rear of the lamp bracket assembly. Replace the wedge based lamp with PR&E #12-22, and re-install the socket in the lamp bracket assembly.

Module ON, OFF and TALKBACK lenses are removed by hand by lifting them straight up out of the switch housing, and are unique in that they unseat and withdraw the lamp with them. Install the wedge based replacement lamp (PR&E #12-20) into the socket in the switch housing, and re-install the lens.

Remote control panel switches are EAO series 31, and the procedure for lamp replacement is as follows:

1. Remove the lens by using the tong-shaped EAO Lens Removal Tool (PR&E #70-40) to grasp the top and bottom of the lens and pull it straight out of the button housing.

NOTE: Failure to use this tool will probably result in damage to the lens' molded retaining notches.

2. Remove the defective lamp using the rubber EAO Lamp Removal Tool (PR&E #70-41).
3. Install the replacement 14 volt, .08 amp lamp (PR&E #12-51) into the switch, and carefully snap the lens back into the body of the switch.

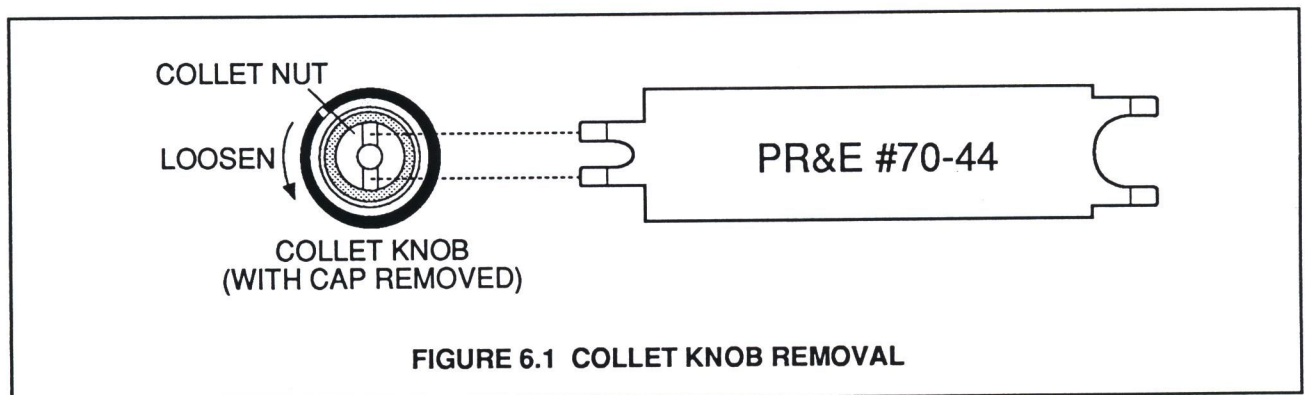
6.1.3 Button Replacement

The square “winkey” button caps can be removed by applying even pressure to the back of the cap to dislodge it from the switch shaft. This can be accomplished using a two-prong device, such as a needlenose pliers. It may take considerable force to remove the button, so exercise caution. Carefully snap the replacement button onto the switch shaft.

6.1.4 Collet Knob Removal

The knobs used for the module’s rotary controls are attached to the pot and switch shafts with collets instead of set screws. The machined brass collets provide the advantages of true alignment and concentricity with the axis of rotation, no set screws to score the shaft, the ability to clutch slip when excessive force is applied, and no holes in the side of the knob for the set screws. To remove a collet knob, carefully pry off the top cap of the knob using a thin blade or similar tool, then use the appropriate end of PR&E tool #70-44 to loosen the nut on the collet (as shown in Figure 6.1).

Once the nut is loosened, the collet should release from the shaft. This nut should not need to be removed unless the collet refuses to release.



6.2 TROUBLESHOOTING (MODULE REMOVAL)

The modular construction of the console greatly enhances troubleshooting, since module substitution will usually isolate any problem.

NOTE: An important feature when troubleshooting the Productionmixer is that modules may be removed or inserted with power applied to the console.

To remove a module from the mainframe, remove the black button head retaining screws from the top and bottom of the module, and the silver button head screws from the module face. Screw the Module Pull/Extractor Tools (PR&E #70-43) into the holes vacated by the silver button head screws, and then use both hands to extract the module from the mainframe.

Once the module at fault has been identified, it is recommended that the schematic and PCA drawing for the module in question be referred to when troubleshooting that module. Use the appropriate optional extender board (PR&E #99-766 for input modules; PR&E #99-767 for the telco and output amplifier modules; and PR&E #99-768 for the line selector and monitor modules) or standard bench service techniques to isolate the problem.

NOTE: Most of the analog and logic components are socketed for ease of replacement.

WARNING: The CMOS logic devices are susceptible to destruction from static discharge while being handled. It is recommended that considerable caution be exercised when working with these parts.

6.3 LEVEL ALIGNMENT

All consoles are set for a +4 dBm output level unless another nominal output level is specifically requested. It is very important that the test levels are maintained exactly as specified to avoid a build-up of tolerance errors. The GAIN TRIM controls on the output amplifiers should not require trimming unless components which affect amplifier gain have been replaced.

Always set the mixing fader at the -10 dB reference mark before adjusting input module GAIN TRIM controls. This will ensure that the optimum gain structure (i.e. dynamic range, headroom and signal to noise ratio) is maintained. Input module GAIN TRIM controls should always be adjusted so that the input accommodates the signal level of the source equipment.

Productionmixer modules were level aligned at the time of factory test using the following procedures:

OUTPUT AMPLIFIERS

Apply a 1 kHz test signal at -10 dBu (600 ohm source) to the Patch Return of a Stereo Line Input Module. Turn the input module ON and set the fader at the 10 dB reference level. Adjust PROGRAM 1 and PROGRAM 2 left and right output amplifier GAIN TRIM controls for a +4 dBu output into 40K ohm bridging load. Adjust left and right VU meter GAIN TRIM controls for a 0 VU meter reading.

MICROPHONE INPUT MODULES

Apply a 1 kHz test signal at -50 dBu (150 ohm source) to the module input. Set the fader at the -10 dB reference mark. Adjust module GAIN TRIM controls for a +4 dBu console output into a 40K ohm bridging load.

LINE INPUT MODULES

Apply a 1 kHz test signal at +4 dBu (600 ohm source) to both the left and right module inputs. Set the fader at the -10 dB reference mark. Adjust module GAIN TRIM controls for a +4 dBu console output into a 40K ohm bridging load.



TELCO INPUT/MONAUURAL OUTPUT MODULE

Apply a 1 kHz test signal at -10 dBu (600 ohm source) to the Patch Return of a Stereo Line Input Module. Turn the input module ON and set the fader at the 10 dB reference level. Select PROGRAM 1 as the MONO OUTPUT source. Adjust the GAIN TRIM control for a +4 dBu monaural output into a 40K ohm bridging load.

TALKBACK LEVELS

The Studio Monitor Module Talkback microphone GAIN TRIM control is set for a level of 0 dBu at the Studio Monitor output using a voice speaking at a “normal” level. This level may be readjusted as required upon completion of the installation.

6.4 TOOL KIT

The following installation and servicing Tool Kit (PR&E #76-725) is provided with each console:

<u>DESCRIPTION</u>	<u>PR&E#</u>
MOLEX connector pin crimp tool	70-3
MOLEX connector pin extractor tool	70-4
EAO nut wrench for series 31 button switch	70-39
EAO lens removal tool for series 31 button switch	70-40
EAO lamp removal tool for series 31 button switch	70-41
PR&E module pull/extractor tool (2)	70-43
Wrench for collet knobs	70-44
Magnet assembly for setting clock	90-151

6.5 SPARE PARTS KIT

The following Spare Parts Kit (PR&E #76-723) is supplied with each console. This initial kit is excluded from the limited warranty, and is provided to support initial installation only.

<u>DESCRIPTION</u>	<u>QTY</u>	<u>PR&E#</u>
Diodes		
1N4001	2	11-7
1N914B	2	11-13
Zener, 5.6 V, 1N4734A	2	11-41
Zener, 8.2 V, 1N4738A	2	11-42
Integrated Circuits		
Dual D flip-flop, 4013	2	21-43
Hex Inverter, 4584	2	21-46
Op Amp, Dual, LF353	2	20-32

<u>DESCRIPTION</u>	<u>QTY</u>	<u>PR&E#</u>
Op Amp, Dual, 8-pin, 5532	2	20-53
Op Amp, DIP, 5534	2	20-28
Quad, 2-input, Nor, 4001	2	21-61
Quad, 2-input, Nand, 4093	2	21-4
Voltage Controlled Attenuator, 1001	1	20-79
Lamps		
14V, .08A, 658	4	12-20
14V, .08A, 73	4	12-22
14V, .08A, 386	2	12-51
Resistors		
13.3K ohm, 1/8W, 1%	6	1-1332
26.7K ohm, 1/8W, 1%	6	1-2672
43.2K ohm, 1/8W, 1%	4	1-4322
68.1K ohm, 1/8W, 1%	4	1-6812
Transistors		
FET, J-174	2	9-5
NPN, PN2222 or 2N2222	2	7-25
PNP, MPS-A63	2	8-4
Voltage Regulators		
Variable, 100mA, POS TL317C	2	20-72
Variable, 1.5A, Pos., LM317T	1	20-49
Variable, LT1038	1	20-76

This kit should provide sufficient support spares for the initial operating period. It is recommended that this kit be replenished and kept on hand for service use.

In applications where any system "down-time" is unacceptable, it is recommended that the following modules be kept on hand as spares:

<u>DESCRIPTION</u>	<u>PR&E#</u>
Power Supply Assembly	99-892
Microphone Input Module	99-821
Stereo Line Input Module	99-823
Multitrack Input/Output Module	99-822
Stereo Line Output Amplifier	99-827
Send & Return Module	99-825
Telco Mix/Monaural Output Module	99-829
Control Room Monitor Module	99-826

6.6 REPLACEMENT PARTS

The components used are, wherever possible, standard items of general availability. However, should difficulty be encountered locating any of the items, PR&E maintains a stock of replacement parts.

The power supply transformer, "winkeye" button switches, Penny & Giles faders, engraved button caps, and VU meters are all manufactured or modified to custom design specifications, and are, therefore, available only from PR&E.

Following is a partial list of parts and assemblies used in the Productionmixer and its associated modules, and the PR&E part number for easy reference:

<u>DESCRIPTION</u>	<u>PR&E#</u>
Blank Panels	
6-inch Length	80-1104
12-inch Length	80-1105
24-inch Length	80-1258
Button Caps, Non-Indicating	
Rectangular, White	25-771
Rectangular, White, "PRE"	25-771-1
Rectangular, Black, "1"	25-770-1
Rectangular, Black, "2"	25-770-2
Rectangular, Black, "3"	25-770-3
Rectangular, Black, "4"	25-770-4
Rectangular, Black, "5"	25-770-5
Rectangular, Black, "6"	25-770-6
Rectangular, Black, "7"	25-770-7
Rectangular, Black, "8"	25-770-8
Button Caps, Illuminating	
Rectangular, Red, "ON"	25-2-1
Rectangular, Yellow, "OFF"	25-5-1
Rectangular, White "Track X"	25-125-CU
Rectangular, White, "STUDIO"	25-125-14
Rectangular, White, "SEND-1"	25-125-12
Rectangular, White, "SEND-2"	25-125-13
Rectangular, Orange, "SLATE"	25-121-1
Square, Red, "ON"	25-127-1
Square, White (SOLO Indicator)	25-118
Square, Yellow (CUE Indicator)	25-116
Button Caps, Self-Indicating ("Winkeye")	
Square, Blk-Org	25-769
Square, Blk-Org, "1"	25-769-3
Square, Blk-Org, "2"	25-769-4
Square, Blk-Org, "L"	25-769-9
Square, Blk-Org, "R"	25-769-10
Square, Blk-Org, "T"	25-769-11
Square, Blk-Org, "IN"	25-769-8

DESCRIPTION**PR&E#****Capacitors**

Ceramic Disc, .001 μ F, 1,000V	62-1
Electrolytic, 10 μ F, 25V, NP	60-84
Electrolytic, 10 μ F, 100V	60-41
Electrolytic, 22 μ F, 16V	60-55
Electrolytic, 22 μ F, 25V	60-85
Electrolytic, 22 μ F, 25V, Axial	60-11
Electrolytic, 22 μ F, 63V, Low Leak	60-97
Electrolytic, 100 μ F, 16V, NP	60-82
Electrolytic, 100 μ F, 63V	60-53
Electrolytic, 470 μ F, 100V	60-40
Electrolytic, 1000 μ F, 50V	60-98
Electrolytic, 27,000 μ F, 50V, Low Leak	60-102
Electrolytic, 57,000 μ F, 25V, Low Leak	60-101
Metalized Polyester, .0022 μ F, 400V	63-26
Metalized Polyester, .01 μ F, 400V	63-4
Metalized Polyester, .022 μ F, 250V	63-9
Metalized Polyester, .047 μ F, 250V	63-6
Metalized Polyester, .068 μ F, 100V	63-25
Metallized Polyester, .1 μ F, 100V	63-7
Metallized Polyester, 2.2 μ F, 50V	63-24
Monolythic, .01 μ F, 50V	62-4
Monolythic, .1 μ F, 50V	62-5
Monolythic, 1 μ F, 50V	62-6
Tantalum, 1.5 μ F, 35V	65-3
Tantalum, 10 μ F, 20V	65-6
Tantalum, 33 μ F, 35V	65-18
Trimmer, 3-40pF	68-2

Circuit Breaker

For Power Supply	30-53
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Connector Kits

20-input	76-820-2
28-input	76-820-3

Cue Speaker, 3X5, 2 Watt, 16 Ohm

23-10

Diodes

1N4001	11-7
1N4003	11-8
1N4004	11-17
1N914B	11-13
MR750, 50V, 6A	11-19
Zener, 5.6V, 1N4734A	11-41
Zener, 8.2V, 1N4738A	11-42
Zener, 51V, 1N4757A	11-21

Diode Bridge, 100V, 25A, MDA-2501

11-15

<u>DESCRIPTION</u>	<u>PR&E#</u>
DIP Switches	
1 DPDT	26-11
1 SPDT	26-14
3 SPST	26-9
5 SPST	26-17
6 SPST	26-2
Displays	
7-segment, Green	12-65
7-segment, Yellow	12-54
Fader, Single Element, 10K, Linear Taper	24-136
Function Modules	
Instrumentation Input	95-123
Microphone Preamplifier	95-270
Output Amplifier	95-119
Fuse, 1/8A, 240V	30-7
Heatsink with Two Mating Positions	80-1288
Indicator, EAO Series 19	25-135
Insulator for TO-3	31-15
Integrated Circuits	
Bi-Cont., 12 Stages, 4060	21-2
Microcontroller, clock/timer, 12 hour version (Standard)	21-122-1
Microcontroller, clock/timer, 24 hour version (Export)	20-122-2
Dual D flip-flop, 4013	21-43
Hex Inverter, 4584	21-46
Photo Coupler, Dual	29-8
Photo Coupler, Single, AC Input	29-9
Op Amp, Dual, LF353	20-32
Op Amp, Dual, 8-pin, 5532	20-53
Op Amp, DIP, 5534	20-28
OpAmp, Dual, 8-pin, RC4227	20-80
Quad, 2-input, Nor, 4001	21-61
Quad, 2-input, Nand, 4093	21-4
Quad, 2-input, Nand, MM74C00N	21-12
Switch, Digital, Hall Effect, 3019	21-44
Triple, 3-input, NAND, MM74C10N	21-16
Up/Down Cont., 6 Dec., MK50397-DIP	21-9
Voltage Controlled Attenuator, 1001	20-79
IC Sockets	
8-pin	16-108
14-pin	16-114
18-pin	16-118
16-pin	16-116
24-pin	16-124
40-pin	16-140



DESCRIPTION**PR&E#****Knobs**

11 mm, Grey, With Black Base Indicator

90-327-1

21 mm, Grey

32-138

Knob Caps

Black (for 11 mm knob)

32-121

Orange (for 11 mm knob)

32-127

Yellow (for 11 mm knob)

32-126

Red (for 11 mm knob)

32-125

Blue (for 11 mm knob)

32-123

Grey (for 11 mm knob)

32-124

Red (for 21 mm knob)

32-139

Lamps

14V, .08A, For Honeywell On/Off switches

12-20

14V, .08A, VU Meter lamps

12-22

14V, .08A, For EAO Series 31 switches

12-51

12V, .06A, For EAO Series 19 indicators

12-46

LED, Red, Diffused, 20mA

12-7

Meter Assembly, 3.5 inch

99-772

Meter Assembly, 2.5 inch

99-846

Microphone Assembly, 3-Pin Wafer

90-637

Modules

Control Room Monitor

99-826

Microphone Input

99-821

Multitrack Input/Output

99-822

Output Amplifier

99-827

Remote Line Selector

99-758

Send & Return Module

99-825

Stereo Line Input

99-823

Studio Monitor

99-824

Telco Mix/Monaural Output

99-829

Module Extender Boards

Input, Multitrack, Program Output Modules

99-841

Control Room and Studio Monitor Modules

99-842

Telco Mix/Mono Output Module

99-767

Send & Return Module

99-844

PC Assemblies

Clock/Timer Display

95-895

Mother Board, Left

95-835

Mother Board, Right

95-834

Mother Board, Middle I/O

95-836

Mother Board, Middle Bus

95-837



<u>DESCRIPTION</u>	<u>PR&E#</u>
Potentiometers	
Single, 10K, CW Log, 1/8 inch shaft, wired	24-98
Single, 10K, CW Log, 1/4 inch shaft, wired	24-111
Dual, 10K, CW Log, 1/4 inch shaft, wired	24-101
Dual, 5K, CW Log, 1/4 inch shaft, P&G rotary fader	24-129
Single, 10K, Linear, 1/8 inch shaft, PC mount, w/detent	24-144
Dual, 10K, Linear, 1/8 inch shaft, PC mount, w/detent	24-145
Single, CW Log, 1/8 inch shaft, PC mount	24-146
Dual, CW Log, 1/8 inch shaft, PC mount	24-147
Dual, CCW Log, 1/8 inch shaft, PC mount	24-148
Quad, CCW Log, 1/8 inch shaft, PC mount	24-149
Power Cable, 125V, 10 A	30-13
Relay, DPDT, 12VDC, 30mA, Polarized	28-10
Resistor-Inductor Assembly, 40μH	90-91
Shield, Dual Capacitor	80-525
Spare Parts Kit	76-723
Switches	
1-station, Pushbutton, Momentary, Honeywell On/Off Switch	25-102
1-station, Pushbutton, Momentary, EAO Series 31 Rectangular	25-119
1-station, Pushbutton, Momentary, EAO Series 31 Square	25-126
1-station, Push-Push, 2PDT	25-757
1-station, Push-Push, 4PDT	25-775
1-station, Push-Push, 6DPT	25-801
8-station, 12.5 mm, 4PDT, Interlock	25-805
10-station, 12.5 mm, 4PDT, Interlock	25-812
Maintained, Illuminated, Yellow Hi-Brite	25-807
Momentary, Non-Illuminated	25-808
Momentary, Illuminated, Yellow Hi-Brite	25-806
Technical Manual	75-27
Tool Kit	76-725
Transformers	
Power for Audio & Logic Supplies	48-117
Power for Microphone Supply, 88V, 120mA	48-7
Transistors	
FET, J-174	9-5
NPN, LM394H	10-2
NPN, MJE181	7-1
NPN, MPS-U45	7-7
NPN, PN3642-5	7-12
NPN, TIP112	7-23
NPN, MPSA06	7-24
NPN, PN2222 or 2N2222	7-25
PNP, MJE171	8-1
PNP, MPS-A63	8-4

<u>DESCRIPTION</u>	<u>PR&E#</u>
PNP, 2N3638A-5 or PN 3638A	8-8
Trimpots	
Multi-Turn, Cermet, 1K	24-135
Multi-Turn, Cermet, 2K	24-137
Multi-Turn, Cermet, 10K	24-96
Multi-Turn, Cermet, 20K	24-82
Multi-Turn, Cermet, 1,000K	24-138
Single-Turn, Cermet, 1K	24-51
Voltage Regulators	
Variable, 100mA, Positive, TL317C	20-72
Variable, 1.5A, Positive, LM317T	20-49
Variable, LT1038	20-76
VU Meters	
3.5 inch, type R32F, w/Rear Zero Adjust	46-12
2.5 inch, type R22F, w/Rear Zero Adjust	46-11

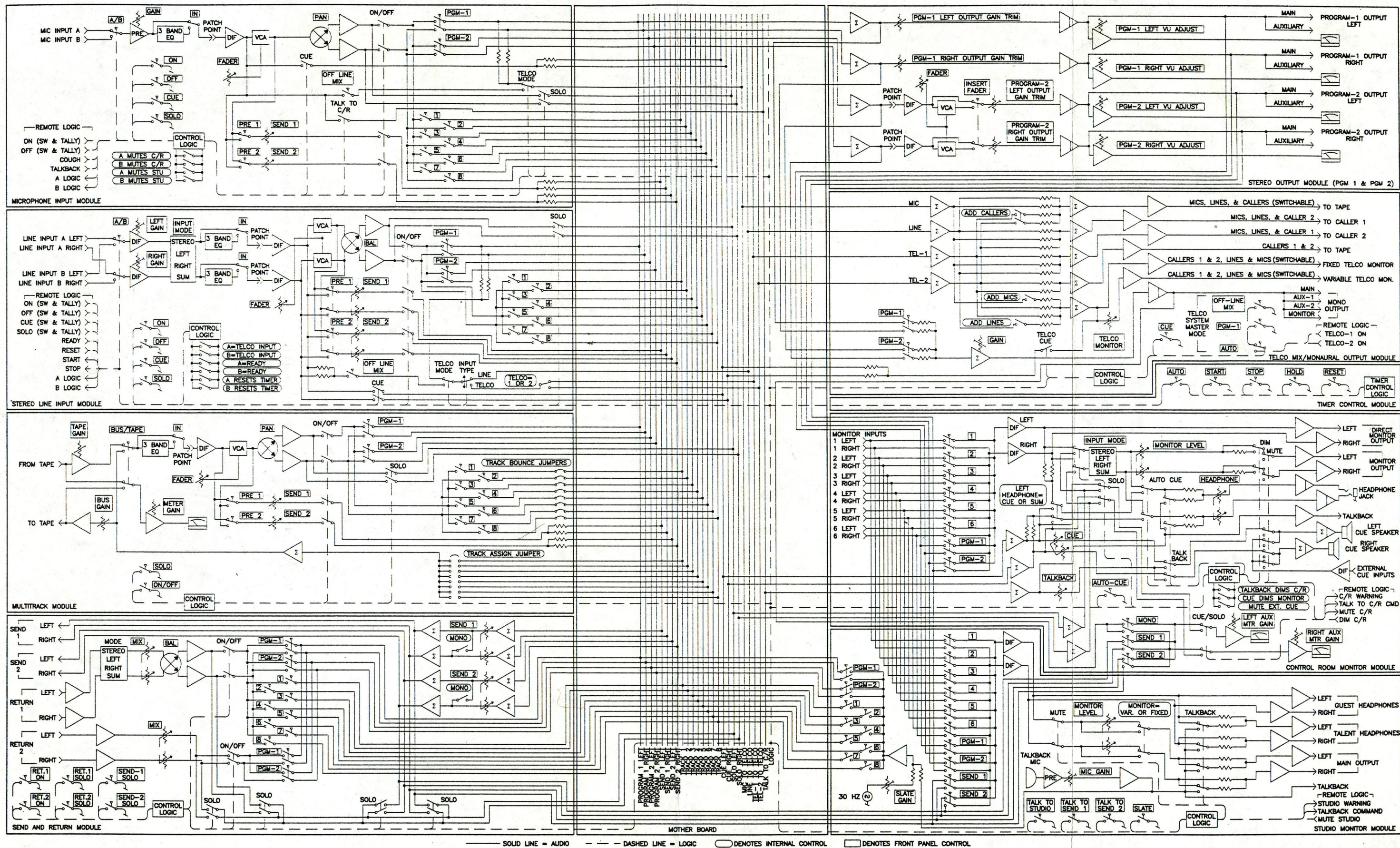


7.0 DRAWINGS AND SCHEMATICS

This chapter is made up of the following drawings and schematics:

- 7.1 Productionmixer Functional Block Diagram
- 7.2 Mother Board Schematic
- 7.3 Microphone Input Module Schematic
- 7.4 Microphone Input Module PCA Drawing
- 7.5 Stereo Line Input Module Schematic
- 7.6 Stereo Line Input Module PCA Drawing
- 7.7 Multitrack Input/Output Module Schematic
- 7.8 Multitrack Input/Output Module PCA Drawing
- 7.9 Stereo Line Output Amplifier Schematic
- 7.10 Stereo Line Output Amplifier PCA Drawing
- 7.11 Send & Return Module Schematic
- 7.12 Send & Return Module PCA Drawing
- 7.13 Telco Mix/Monaural Output Module Schematic
- 7.14 Telco Mix/Monaural Output Module PCA Drawing
- 7.15 Control Room Monitor Module Schematic
- 7.16 Control Room Monitor Module PCA Drawing
- 7.17 Studio Monitor Module Schematic
- 7.18 Studio Monitor Module PCA Drawing
- 7.19 Remote Line Selector Schematic
- 7.20 Timer Control Panel Schematic
- 7.21 Clock/Timer Schematic
- 7.22 Clock/Timer PCA Drawing
- 7.23 Power Supply Assembly Schematic
- 7.24 Instrumentation Amplifier Function Module Schematic
- 7.25 Output Amplifier Function Module Schematic
- 7.26 Microphone Preamplifier Function Module Schematic
- 7.27 Console Meter Panel Cable Schematic
- 7.28 Console VU Meter Cable Schematic
- 7.29 Console Headphone Cable Schematic

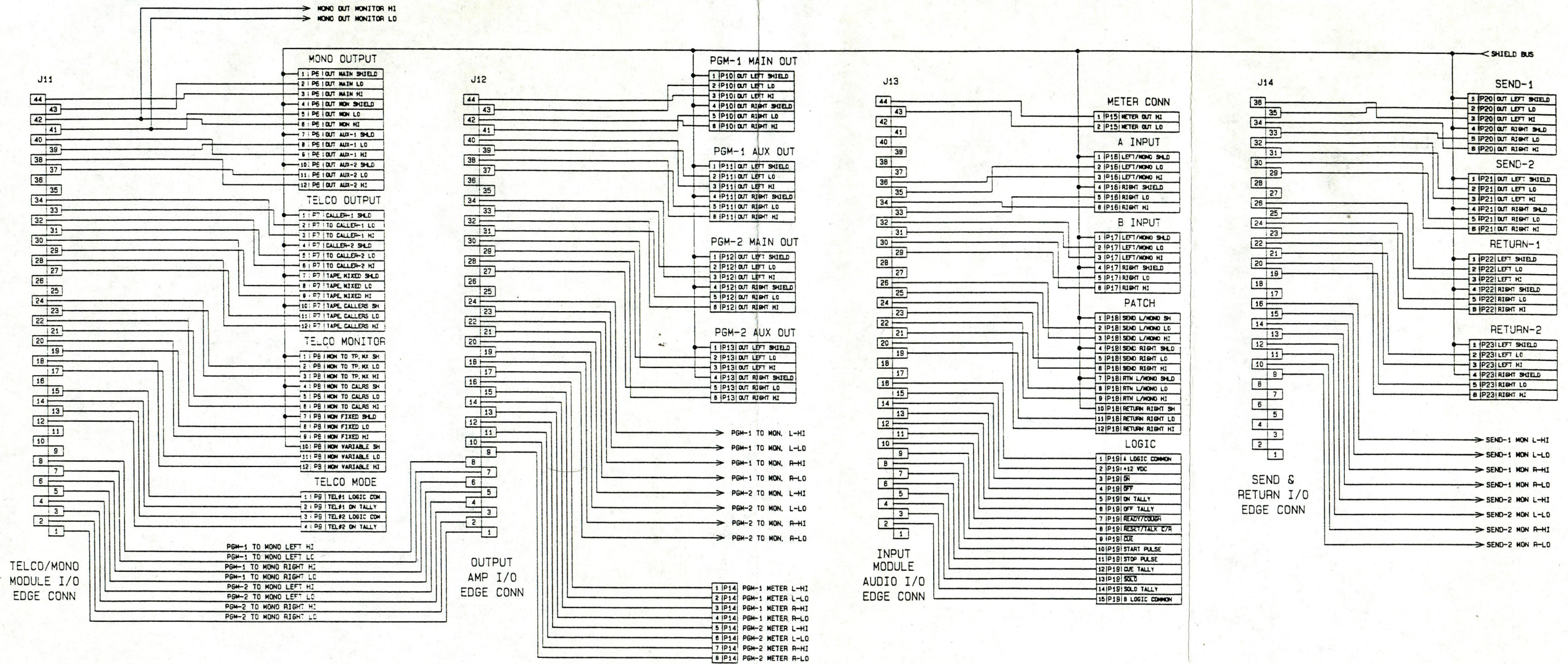
NOTE: On PR&E schematics, capacitor values are in microfarads (μF), unless otherwise specified, and resistors are 1/4 watt, 5%, unless otherwise specified.

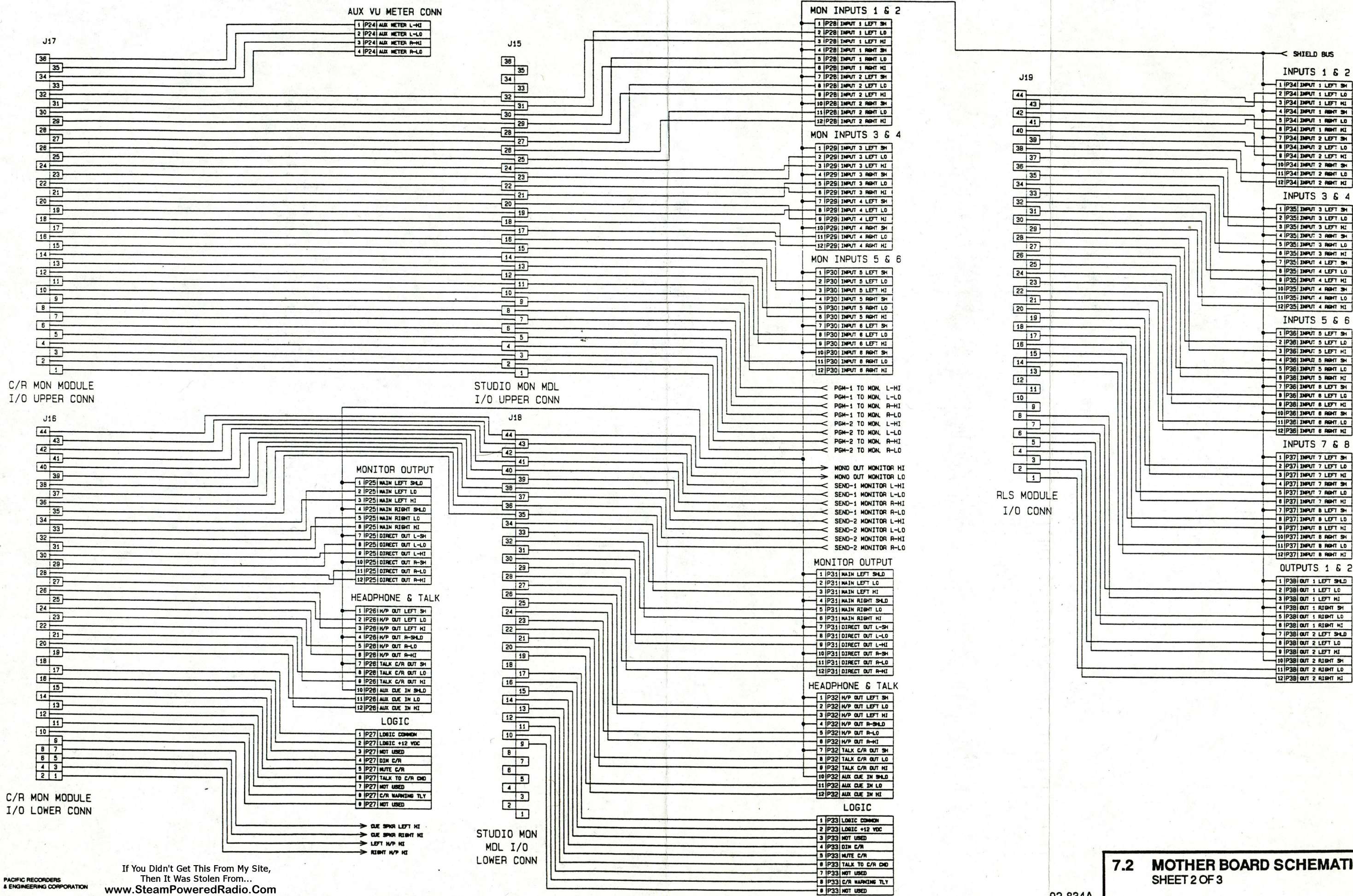


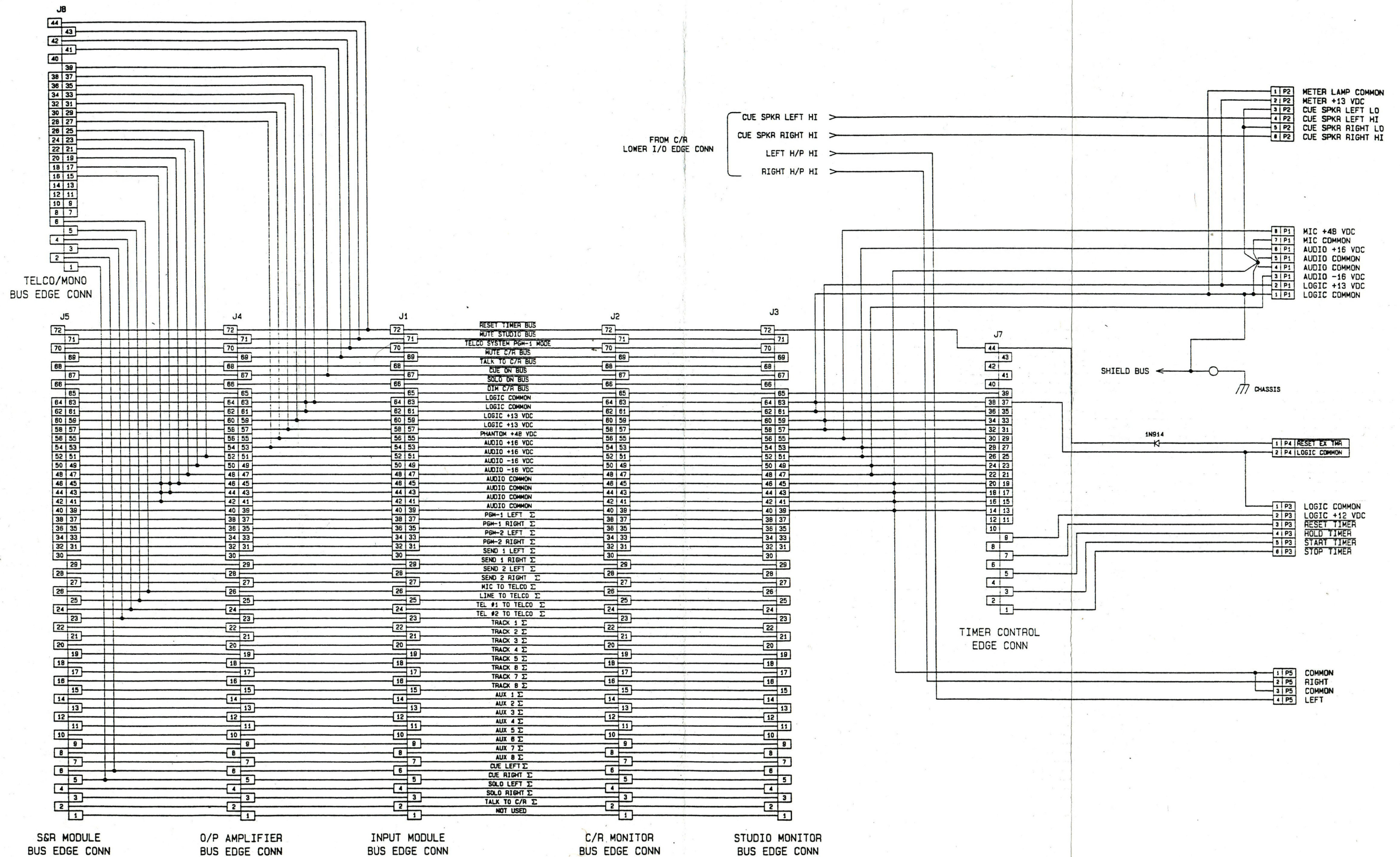
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7.1 PRODUCTION MIXER FUNCTIONAL BLOCK DIAGRAM

93-820B





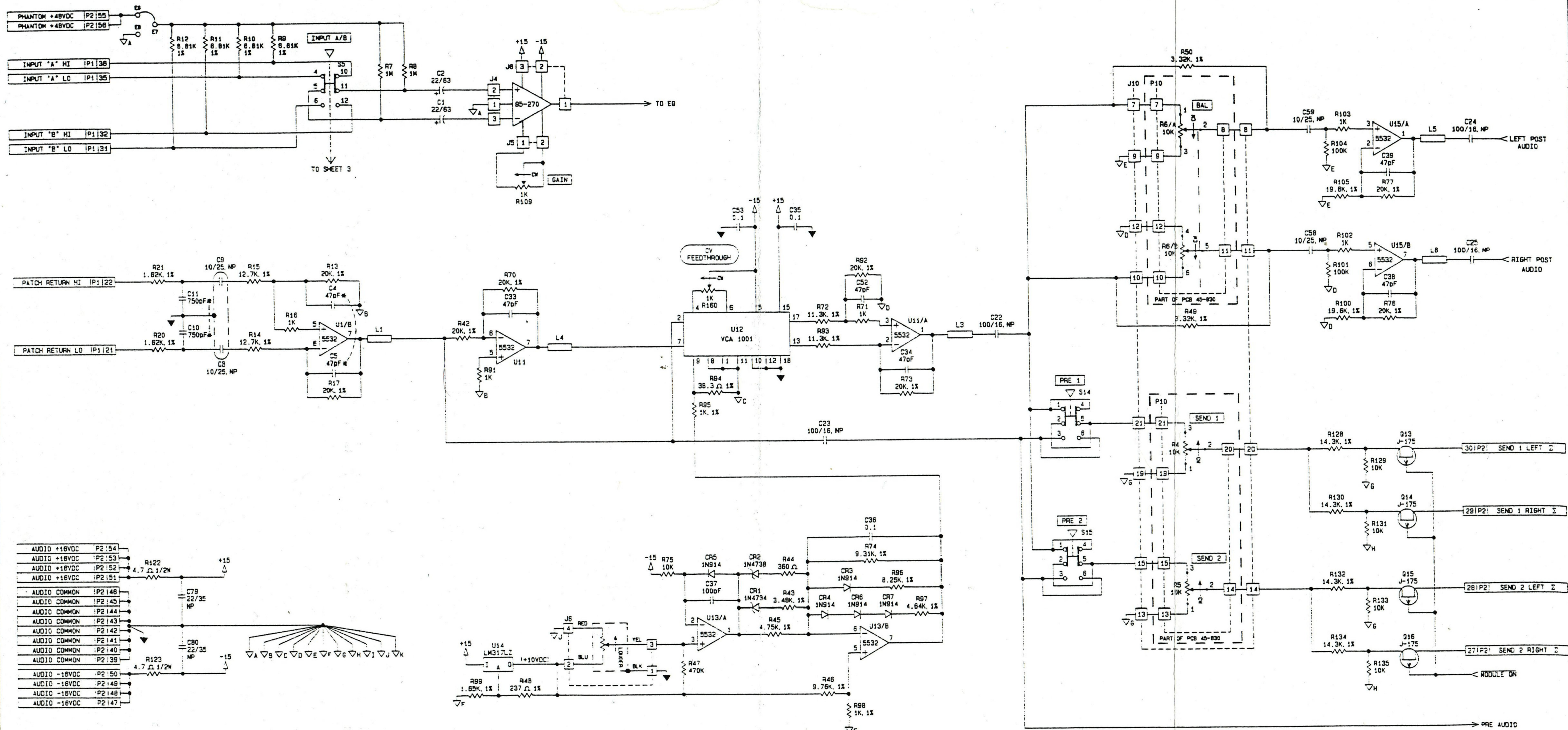


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7.2 MOTHER BOARD SCHEMATIC

SHEET 3 OF 3

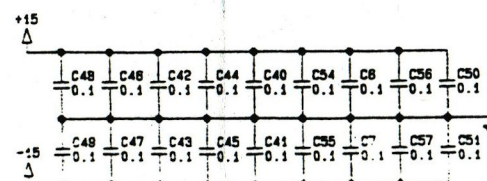
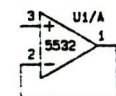
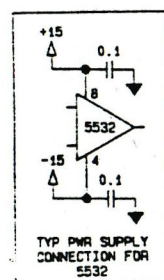
92-834A

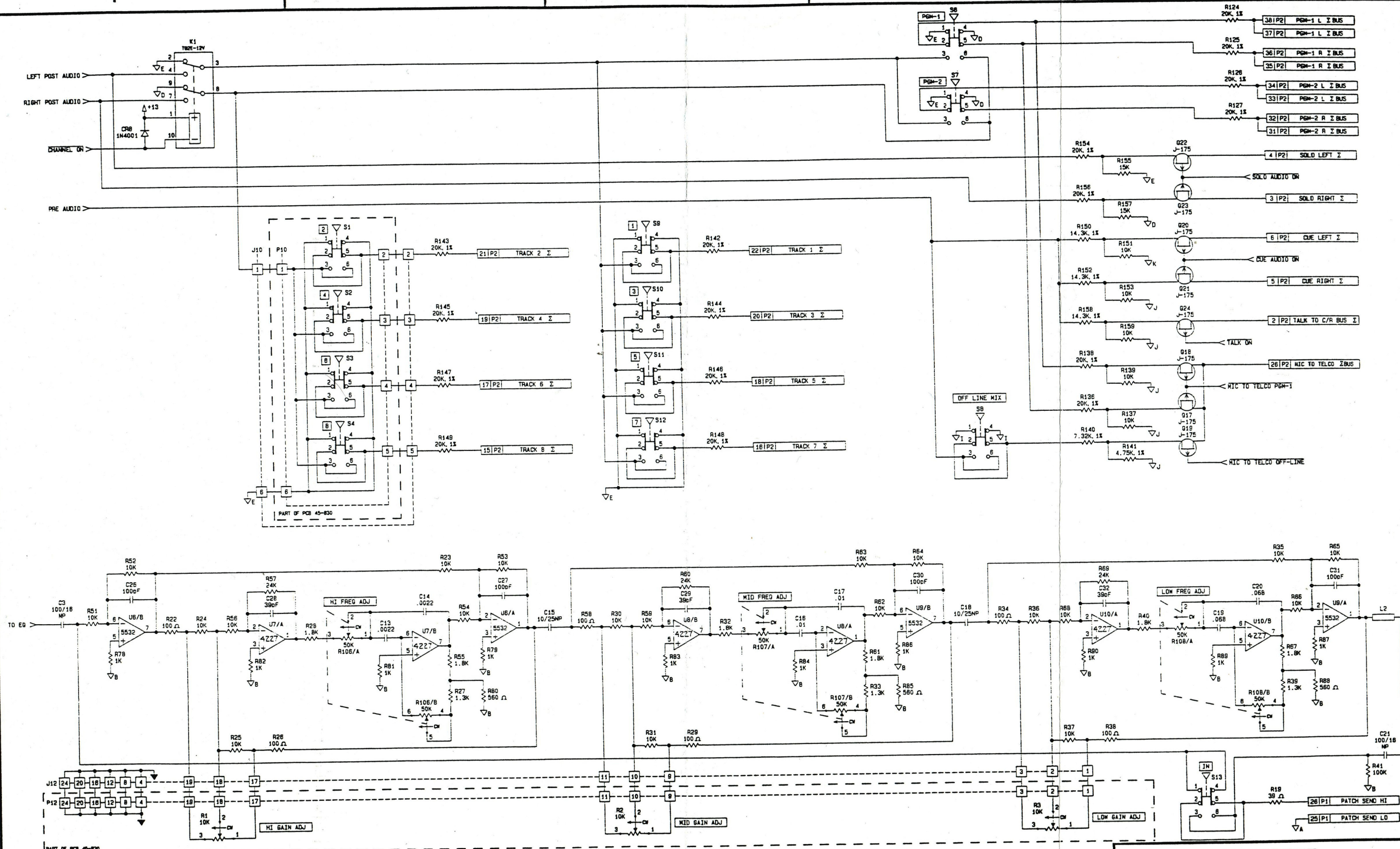


7. FOR PCA SEE DRAWING 95-821 LATEST REV.
 6. INDICATES FRONT PANEL COMPONENTS.
 5. INDICATES PCB MOUNTED COMPONENTS NOT ACCESSIBLE FROM FRONT PANEL.
 4. *---* INDICATES MATCHED PAIR.
 3. NP=NONPOLARIZED
 2. ALL CAPACITORS ARE MEASURED IN MICROFARADS.
 1. ALL RESISTORS ARE 1/4W. 5%.

NOTES UNLESS OTHERWISE SPECIFIED.

GROUND LEGEND	
	AUDIO COMMON
	GND PLANE
	LOGIC COMMON
	CHASSIS GND

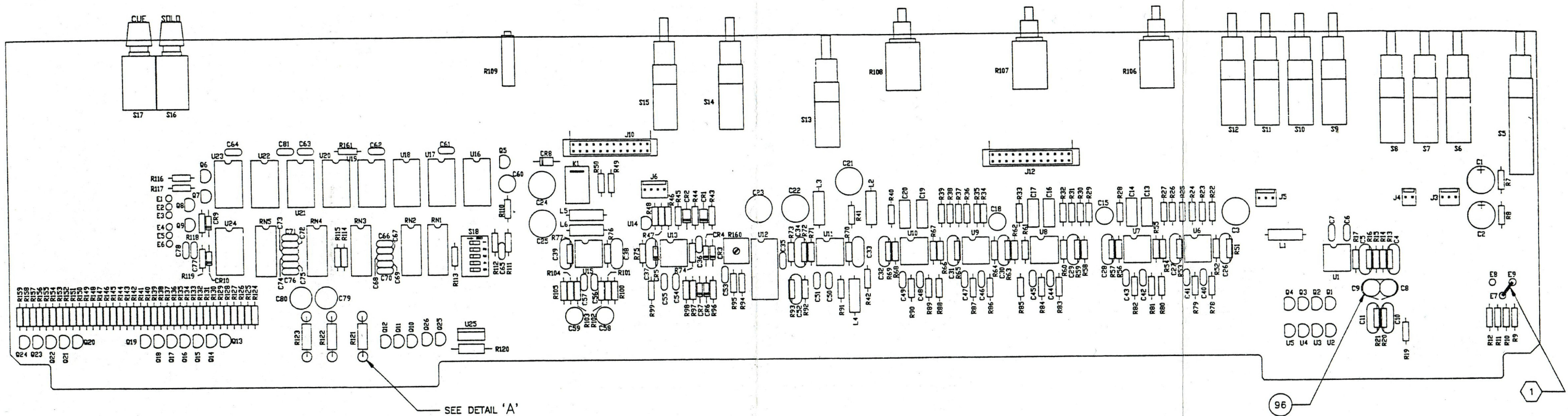




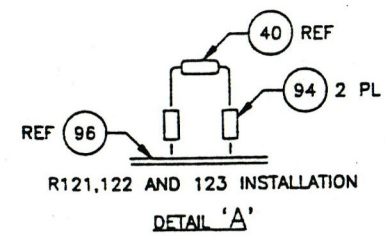
7.3 MICROPHONE INPUT MODULE SCHEMATIC

SHEET 2 OF 3

92-821B

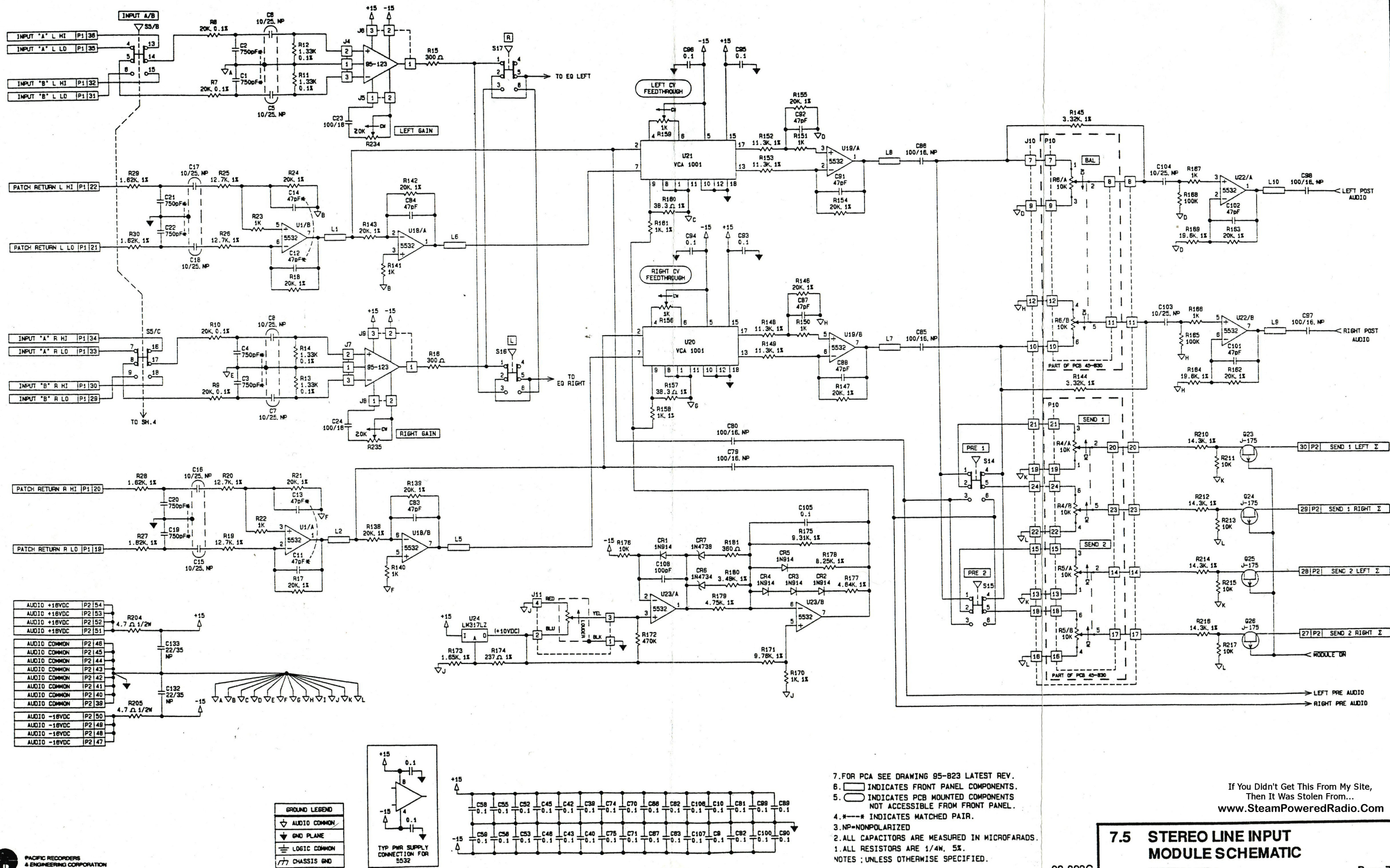


5. FOR SCHEMATIC DIAGRAM SEE DWG. 92-821 LATEST REV.
 4. PRIOR TO WAVE SOLDERING MASK HOLES FOR S5-17, R106-109, E1-6 AND E8.
 3. —•—•— INDICATES MATCHED PAIRS.
 2. ○ INDICATES ITEMS LISTED ON THIS DRAWING.
 1. ○ INDICATES ITEMS LISTED ON SEPERATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.

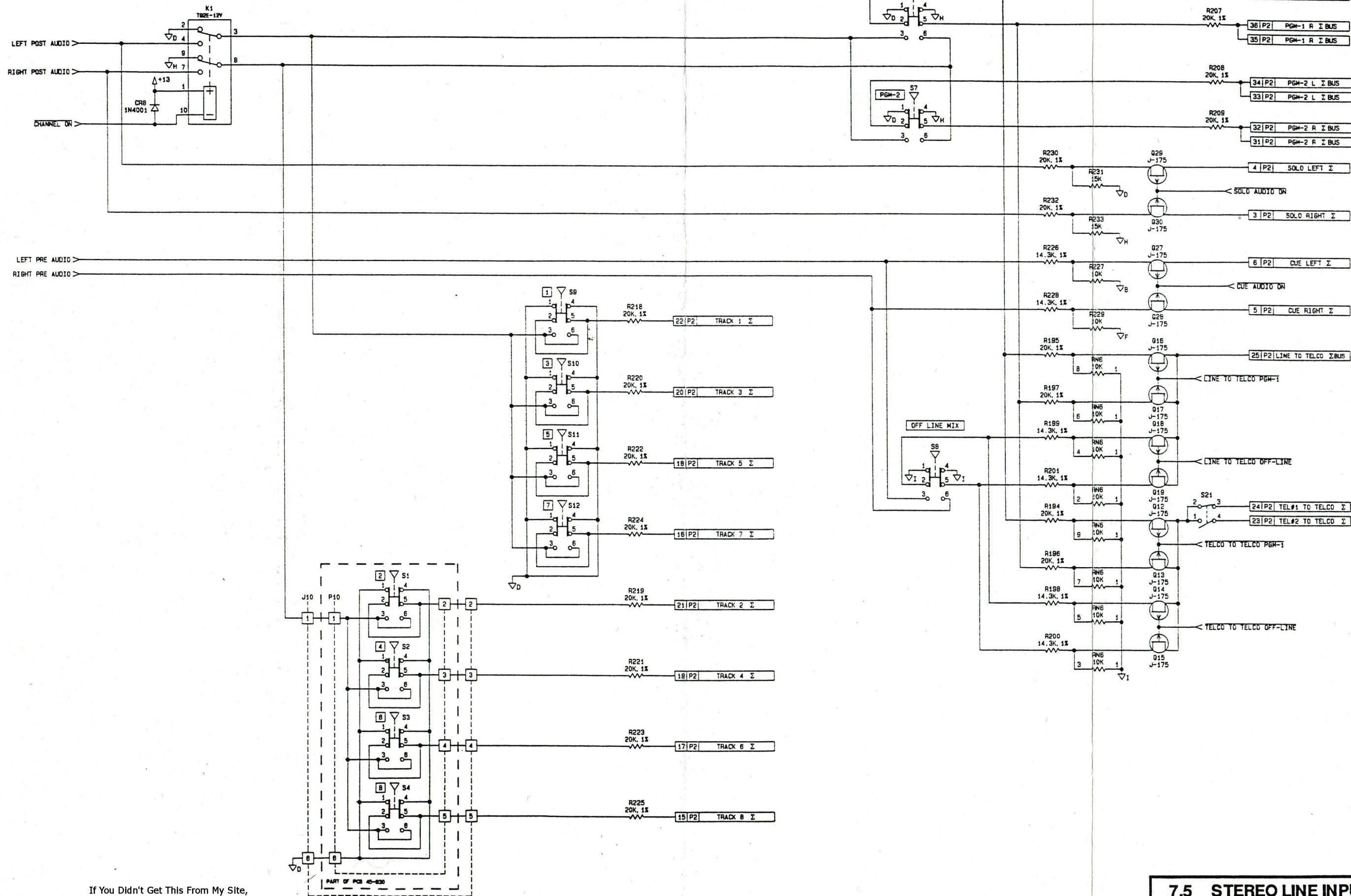


7.4 MICROPHONE INPUT MODULE PCA DRAWING

95-821A



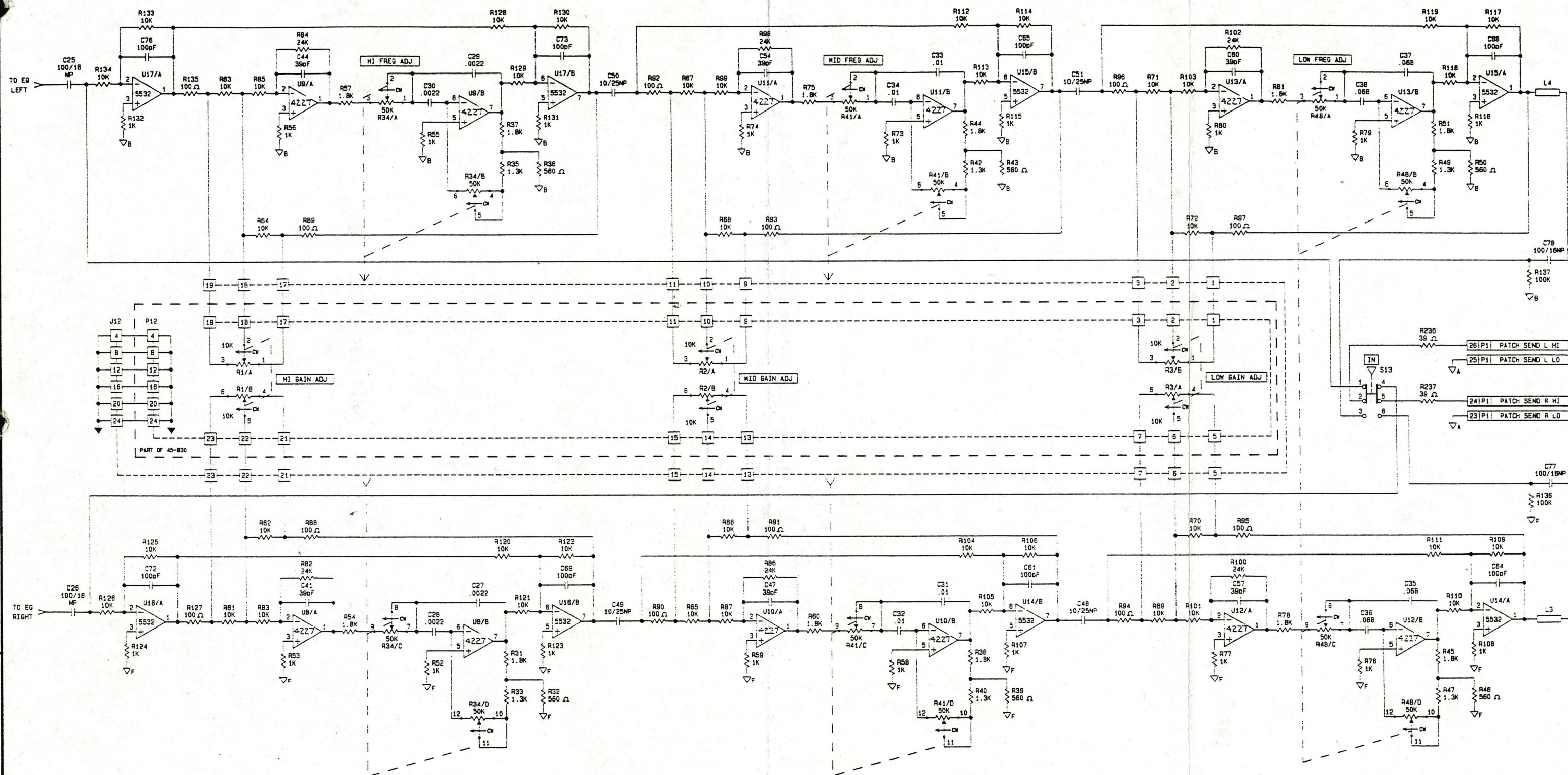
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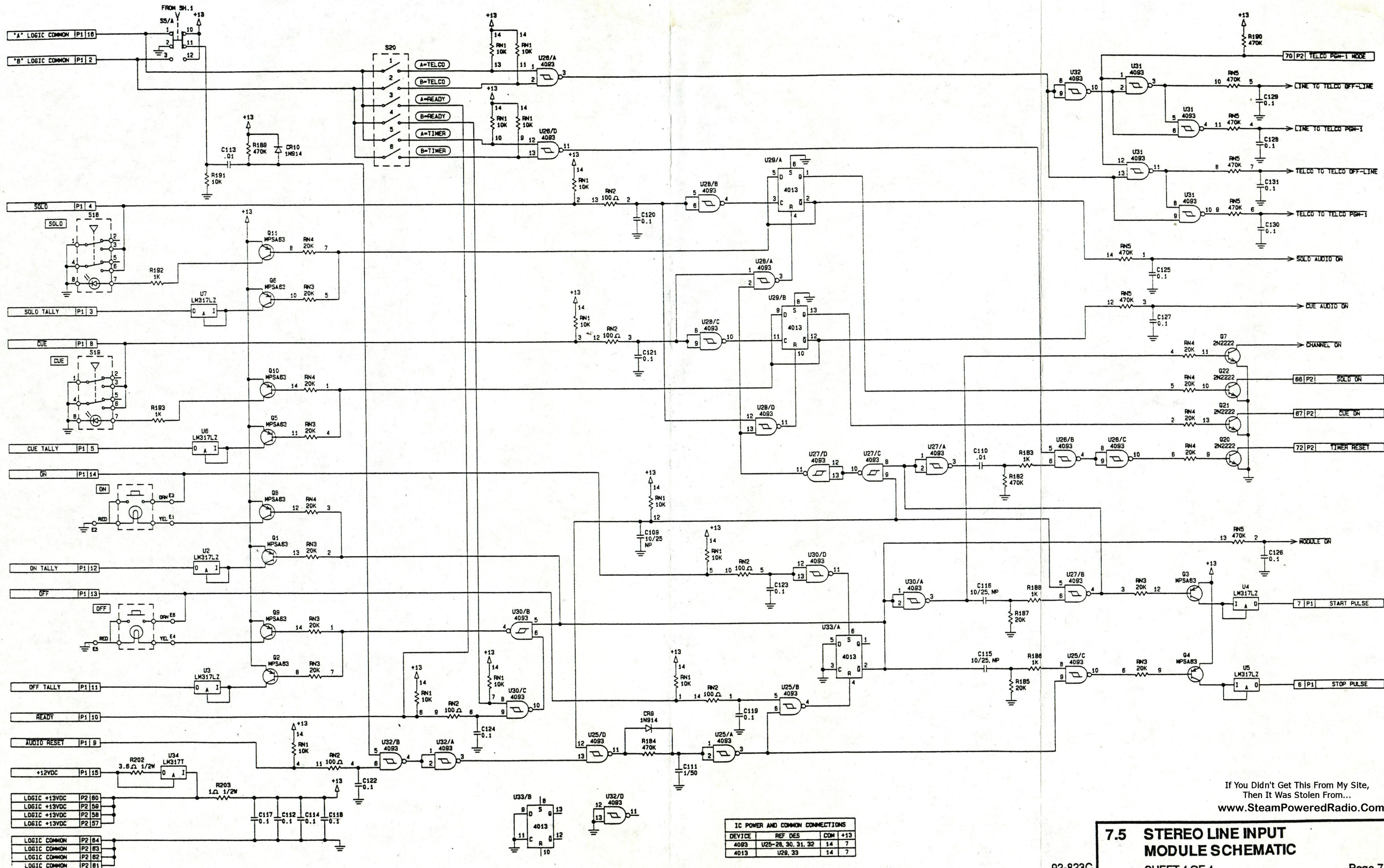


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92-823C

**7.5 STEREO LINE INPUT
MODULE SCHEMATIC**
SHEET 2 OF 4





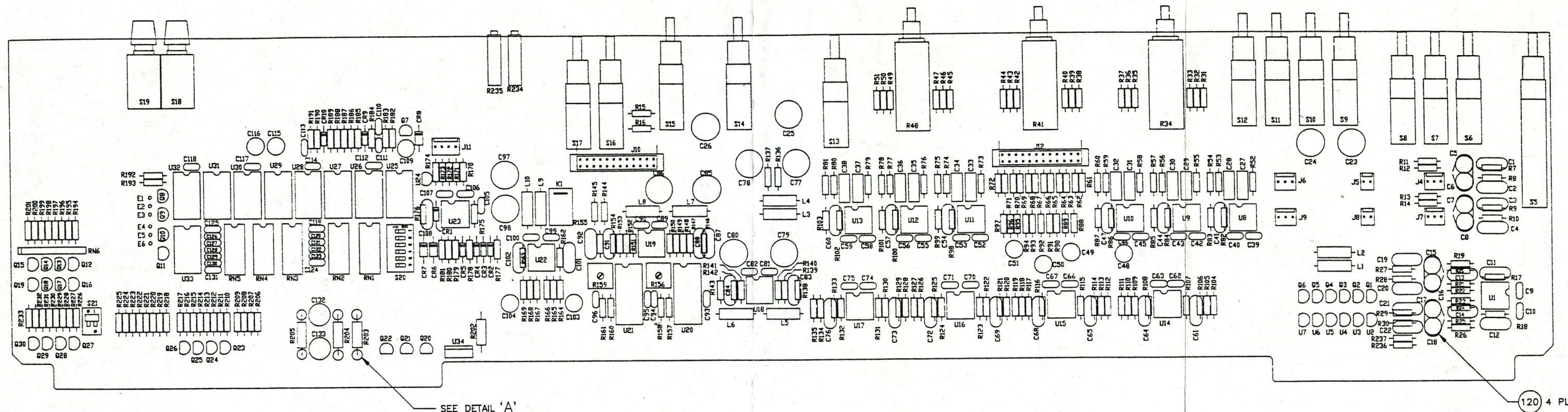
IC POWER AND COMMON CONNECTIONS			
DEVICE	REF DES	COM	+13
4093	U25-28, 30, 31, 32	14	7
4013	U29, 33	14	7

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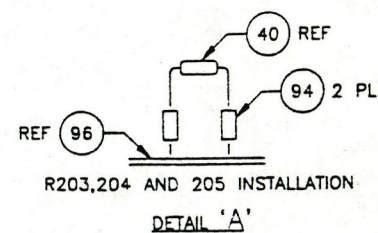
7.5 STEREO LINE INPUT MODULE SCHEMATIC

92-823C

SHEET 4 OF 4

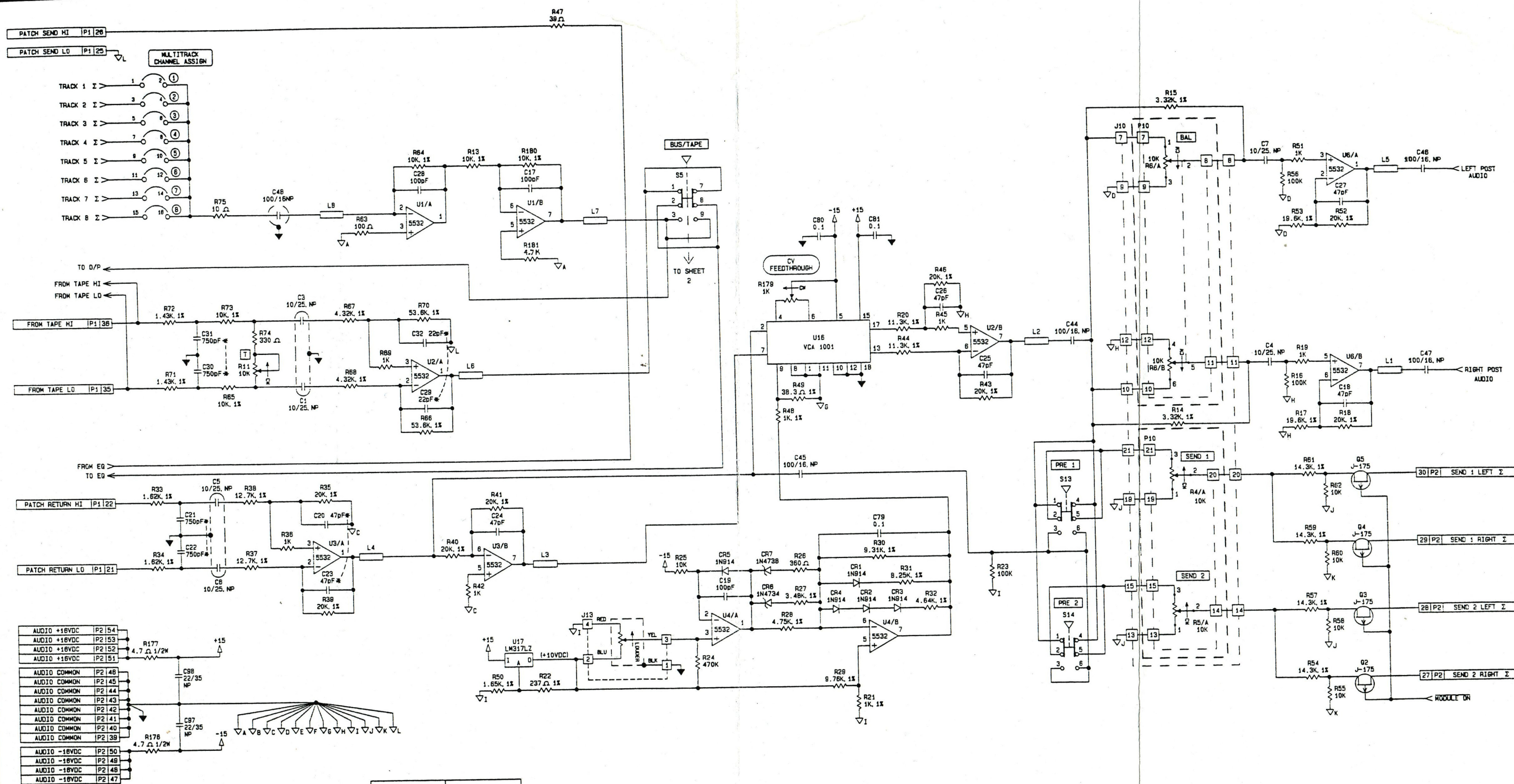


5. FOR SCHEMATIC DIAGRAM SEE DWG. 92-823 LATEST REV.
 ⚠️ PRIOR TO WAVE SOLDERING MASK HOLES FOR S5-19, R34,41,48,234,235 AND E1-6.
 3. •---• INDICATES MATCHED PAIRS.
 2. ○ INDICATES ITEMS LISTED ON THIS DRAWING.
 1. ○ INDICATES ITEMS LISTED ON SEPERATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.



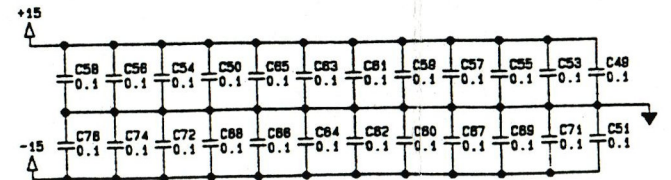
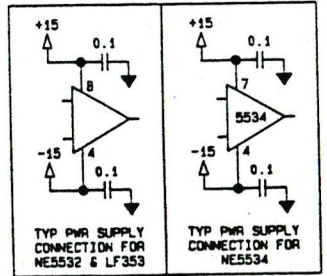
7.6 STEREO LINE INPUT MODULE PCA DRAWING

95-823A



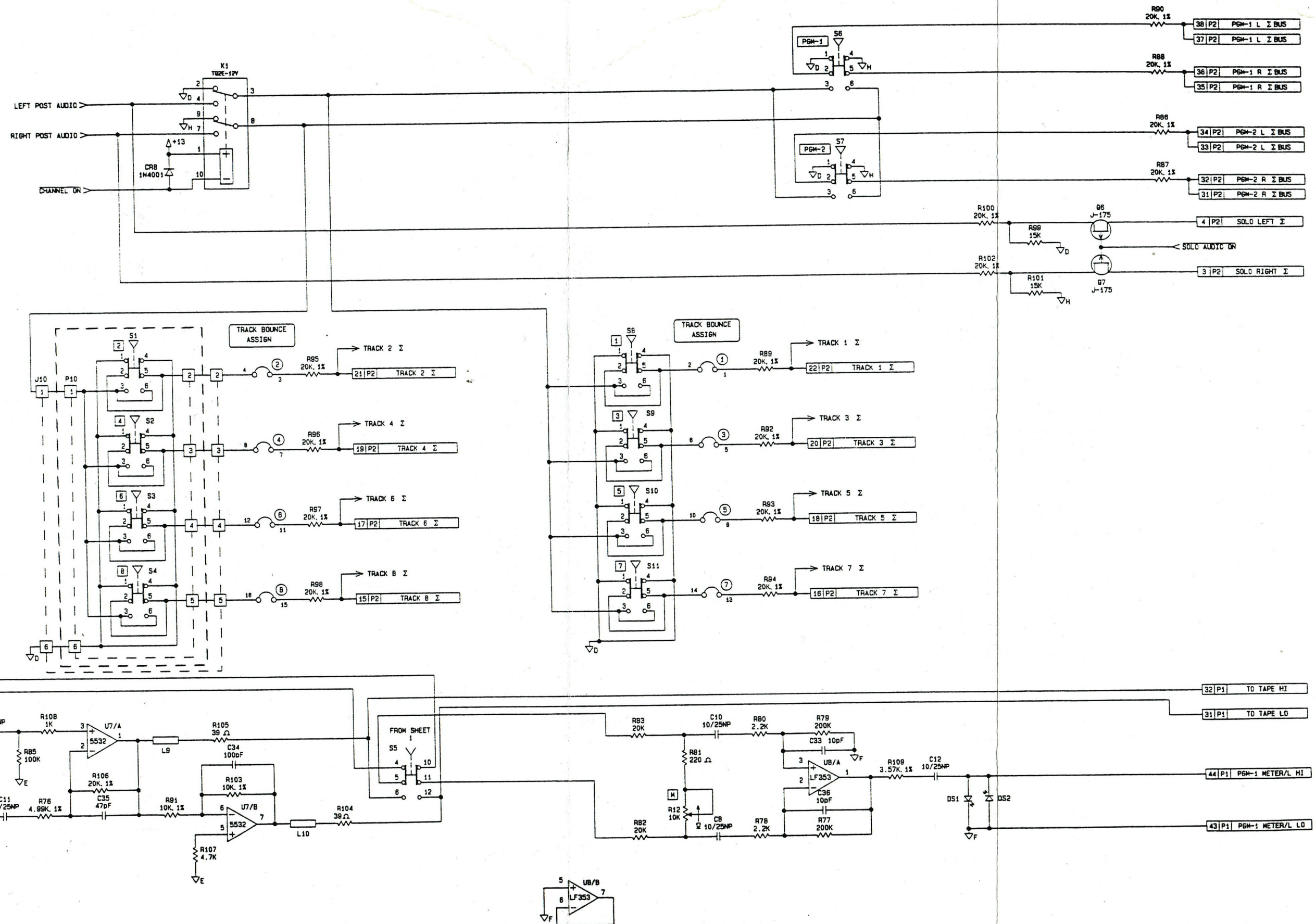
7. FOR PCA SEE DRAWING 95-B22 REV 1.
 6. INDICATES FRONT PANEL COMPONENTS.
 5. INDICATES PCB MOUNTED COMPONENTS NOT ACCESSIBLE FROM FRONT PANEL.
 4. *-* INDICATES MATCHED PAIR.
 3. NP=NONPOLARIZED
 2. ALL CAPACITORS ARE MEASURED IN MICROFARADS.
 1. ALL RESISTORS ARE 1/4W, 5%.
 NOTES: UNLESS OTHERWISE SPECIFIED.

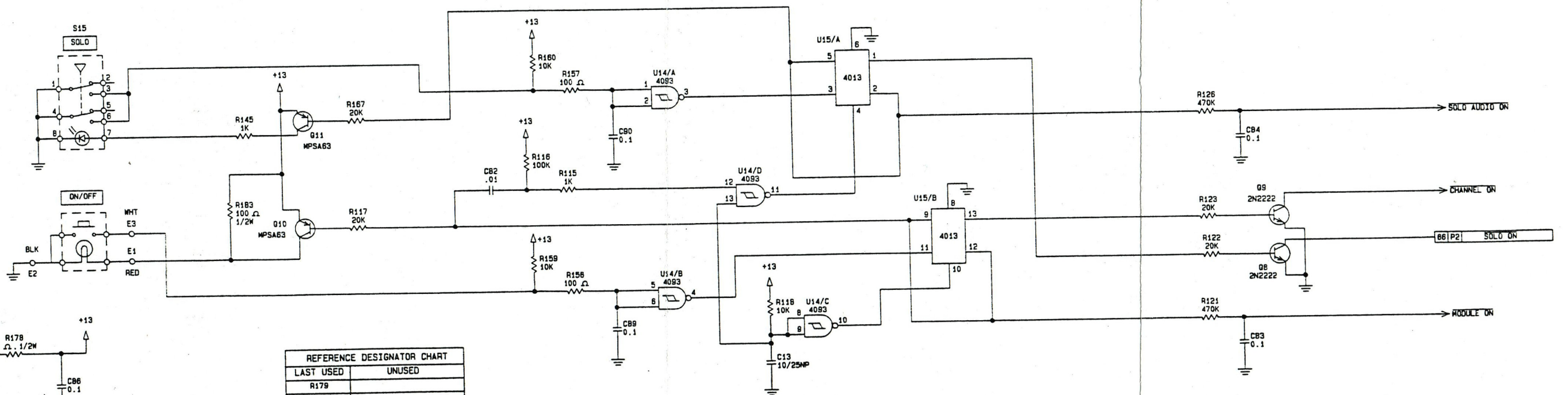
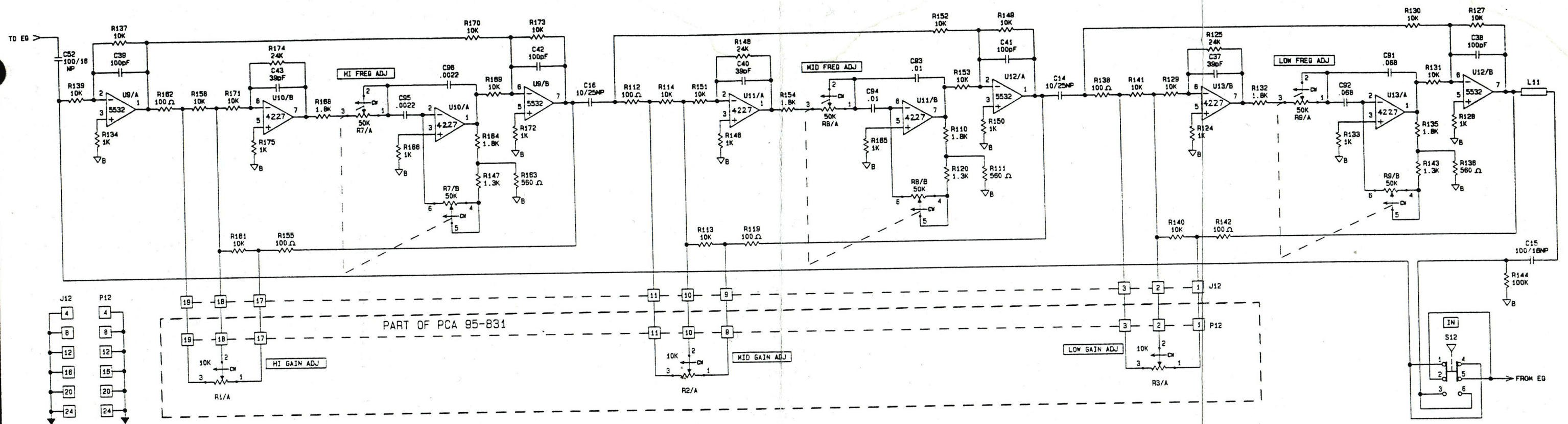
GROUND LEGEND
AUDIO COMMON
GND PLANE
LOGIC COMMON
CHASSIS GND



7.7 MULTITRACK INPUT/OUTPUT MODULE SCHEMATIC SHEET 1 OF 3

92-822A





REFERENCE DESIGNATOR CHART	
LAST USED	UNUSED
R179	
C98	C2, 70, 73, 75, 77, 78, 85, 87, 88
U17	
C98	
L10	
Q11	Q1
S15	
J13	J1, 2, 5-10, 11
K1	
DS2	

LOGIC +13VDC	P2 80
LOGIC +13VDC	P2 59
LOGIC +13VDC	P2 58
LOGIC +13VDC	P2 57
LOGIC COMMON	P2 84
LOGIC COMMON	P2 83
LOGIC COMMON	P2 82
LOGIC COMMON	P2 81

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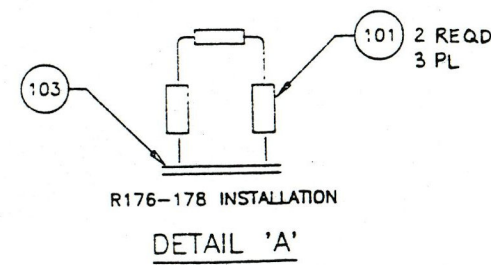
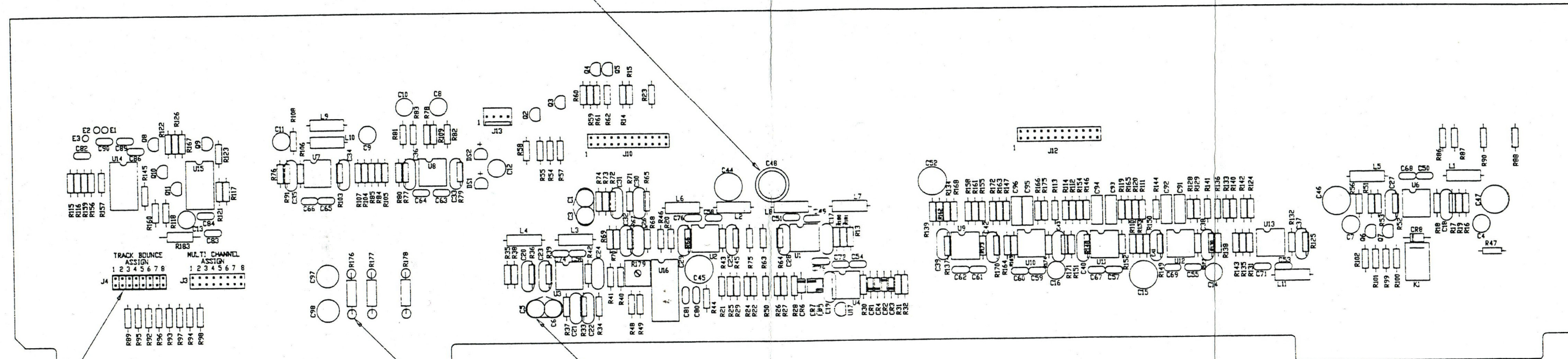
7.7 MULTITRACK INPUT/OUTPUT
MODULE SCHEMATIC
SHEET 3 OF 3

92-822A

Page 7-16

415 975 5573

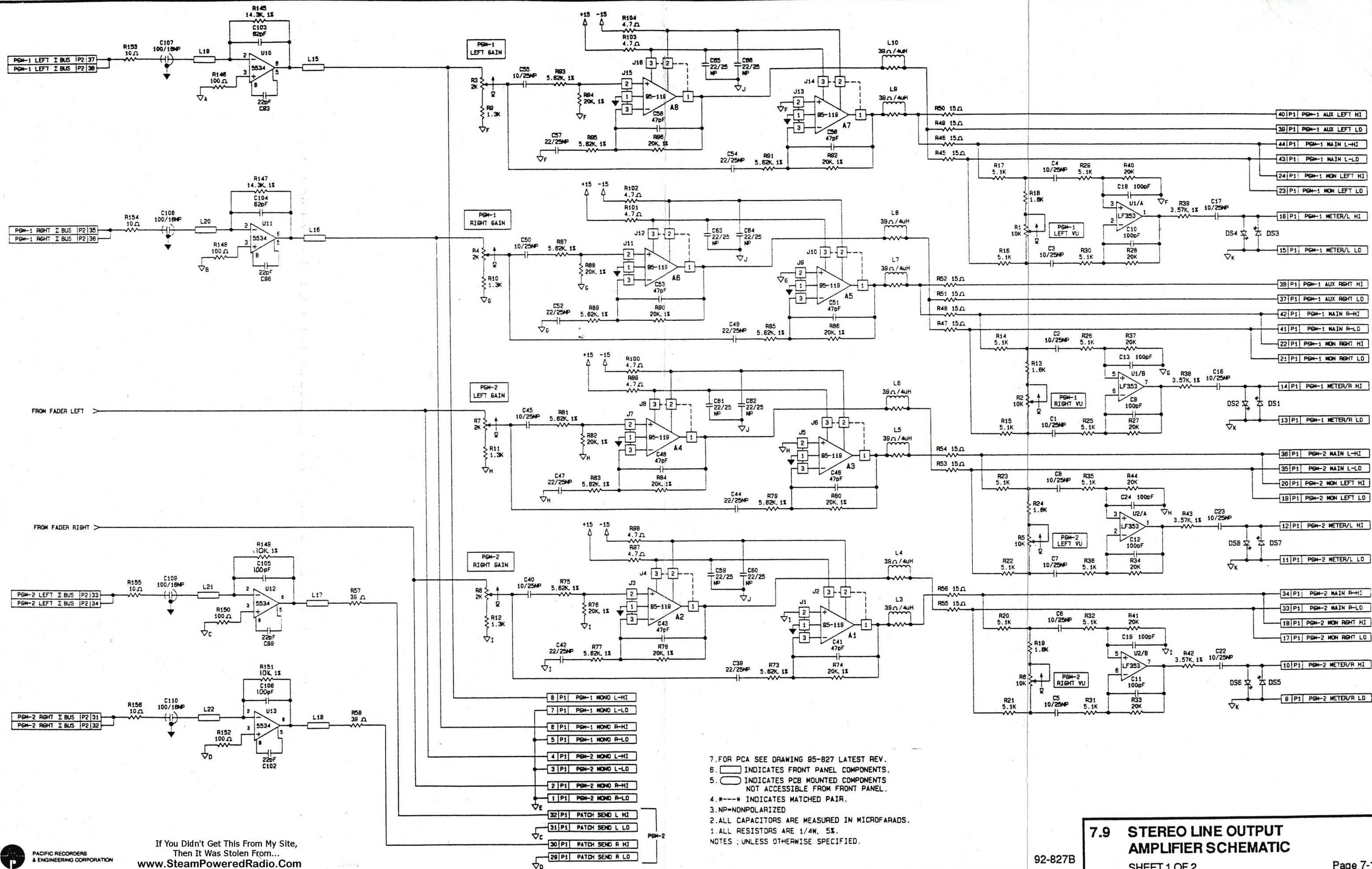
3/3



- 5 FOR SCHEMATIC DIAGRAM SEE DWG. 92-822 LATEST REV.
- 4 PRIOR TO WAVE SOLDERING MASK HOLES FOR S5-15, R7-12 AND E1-3.
- 3 ——— INDICATES MATCHED PAIRS.
- 2 ○ INDICATES ITEMS LISTED ON THIS DRAWING.
- 1 ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
- NOTES: UNLESS OTHERWISE SPECIFIED.

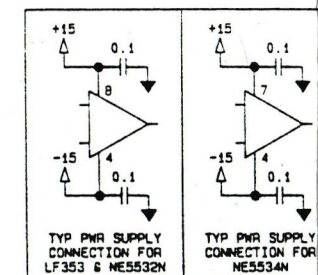
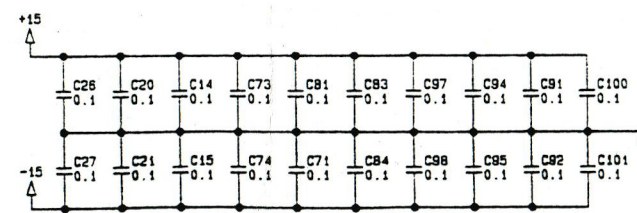
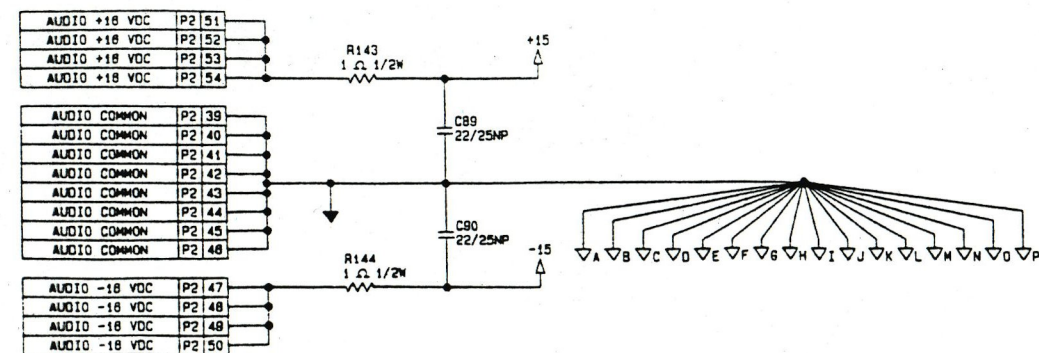
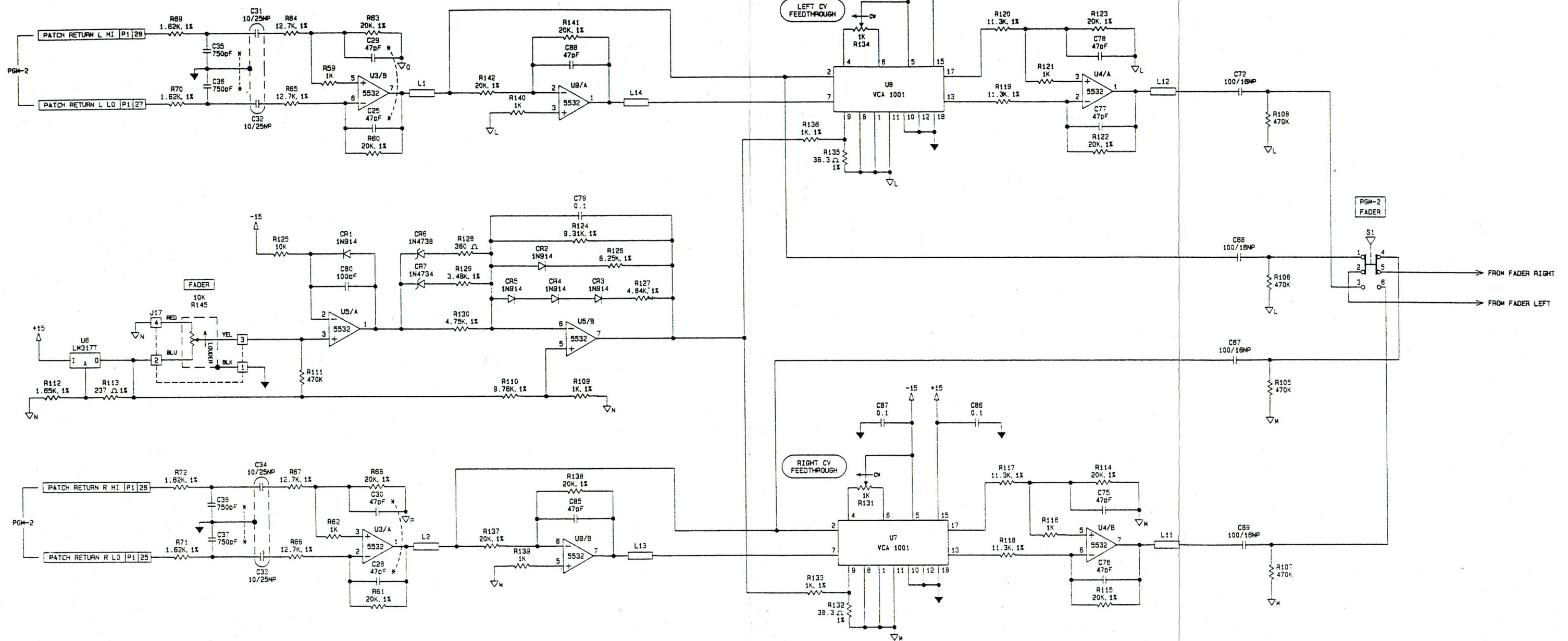
7.8 MULTITRACK INPUT/OUTPUT MODULE PCA DRAWING

95-822A



7.9 STEREO LINE OUTPUT AMPLIFIER SCHEMATIC

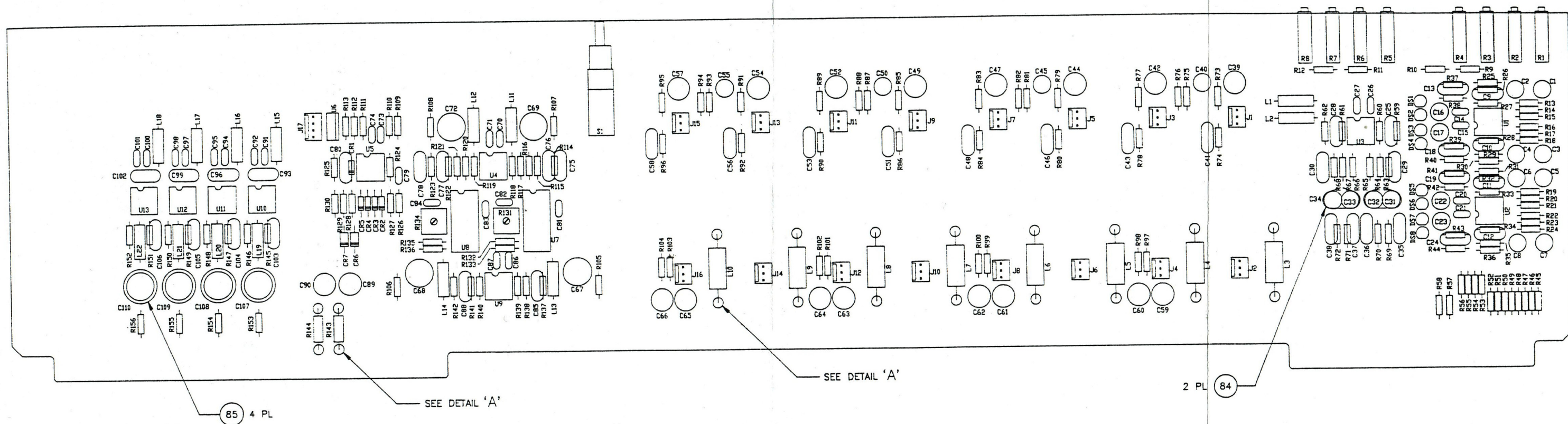
SHEET 1 OF 2



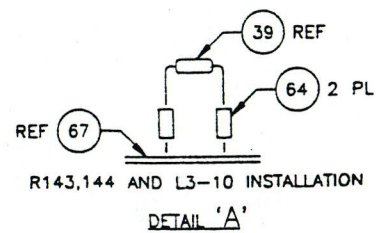
GROUND LEGEND	
	AUDIO COMMON
	GND PLANE
	LOGIC COMMON
	CHASSIS GND

REFERENCE DESIGNATOR CHART	
LAST USED	UNUSED
R156	
C110	
U13	
DS8	
L22	
J17	

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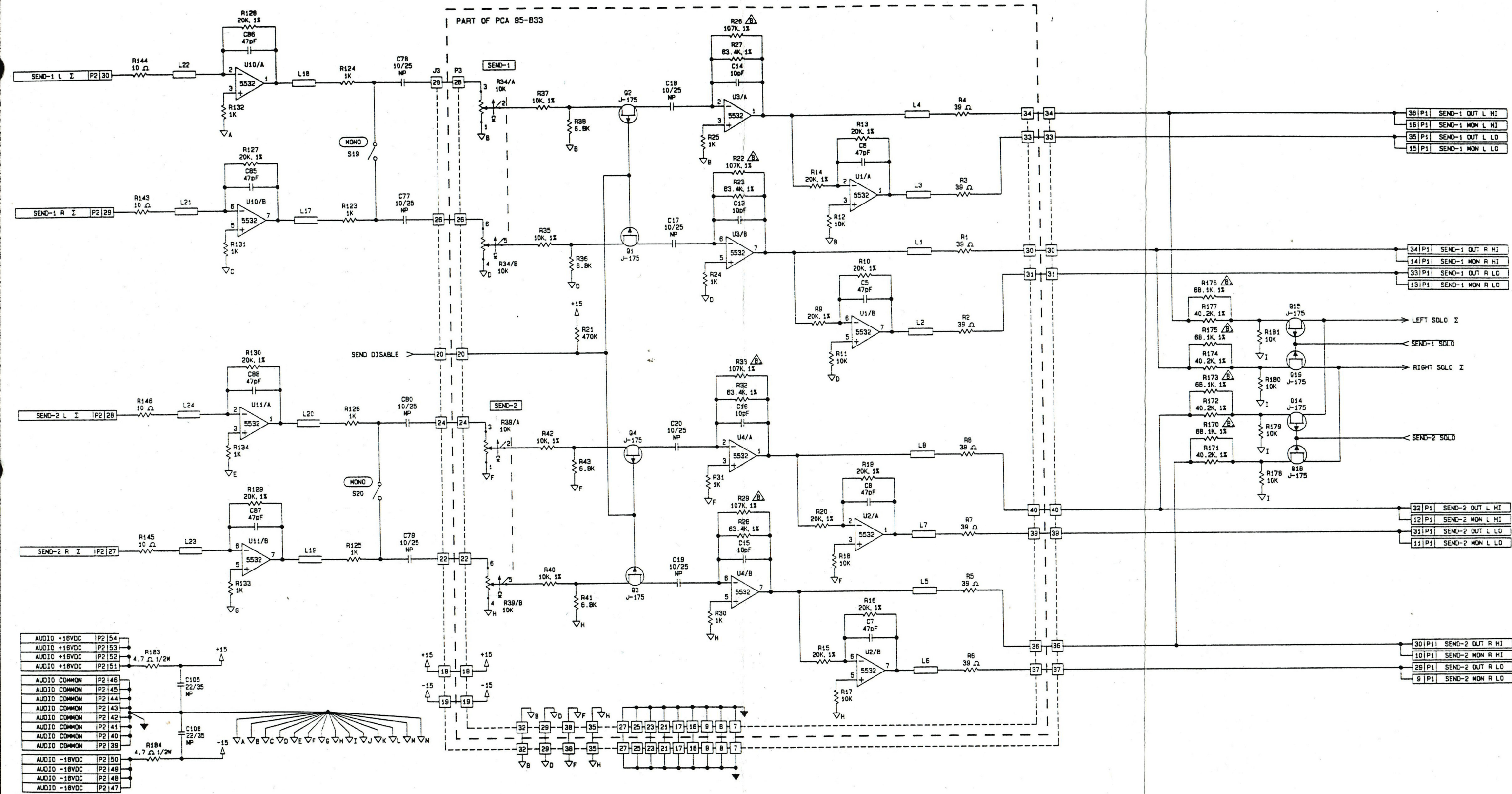
5. FOR SCHEMATIC DIAGRAM SEE DWG. 92-827 LATEST REV.
 4. PRIOR TO WAVE SOLDERING MASK HOLES FOR S1 AND R1-8.
 3. --- INDICATES MATCHED PAIRS.
 2. ○ INDICATES ITEMS LISTED ON THIS DRAWING.
 1. ○ INDICATES ITEMS LISTED ON SEPERATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.



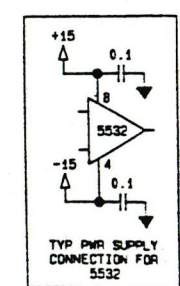
7.10 STEREO LINE OUTPUT AMPLIFIER PCA DRAWING

95-827A

PART OF PCA 95-B33

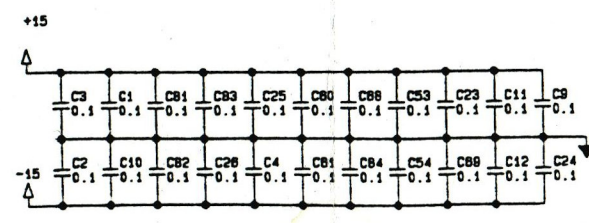


- AUDIO +15VDC P2154
- AUDIO +15VDC P2153
- AUDIO +15VDC P2152
- AUDIO +15VDC P2151
- AUDIO COMMON P2146
- AUDIO COMMON P2145
- AUDIO COMMON P2144
- AUDIO COMMON P2143
- AUDIO COMMON P2142
- AUDIO COMMON P2141
- AUDIO COMMON P2140
- AUDIO COMMON P2139
- AUDIO -15VDC P2150
- AUDIO -15VDC P2149
- AUDIO -15VDC P2148
- AUDIO -15VDC P2147



REFERENCE DESIGNATOR CHART	
LAST USED	UNUSED
R184	
C108	
U17	
L24	
S20	
Q20	
CR7	
K2	

GROUND LEGEND	
↓	AUDIO COMMON
⬇	GND PLANE
⬇	LOGIC COMMON
⬇	CHASSIS GND



- FOR PCA SEE DRAWING 95-B25 LATEST REV.
- REMOVE FOR +B.
- ADD FOR +B.
- INDICATES FRONT PANEL COMPONENTS.
- INDICATES PCB MOUNTED COMPONENTS NOT ACCESSIBLE FROM FRONT PANEL.
- INDICATES MATCHED PAIR.
- NP=NONPOLARIZED
- ALL CAPACITORS ARE MEASURED IN MICROFARADS.
- ALL RESISTORS ARE 1/4W, 5%.
- NOTES: UNLESS OTHERWISE SPECIFIED.

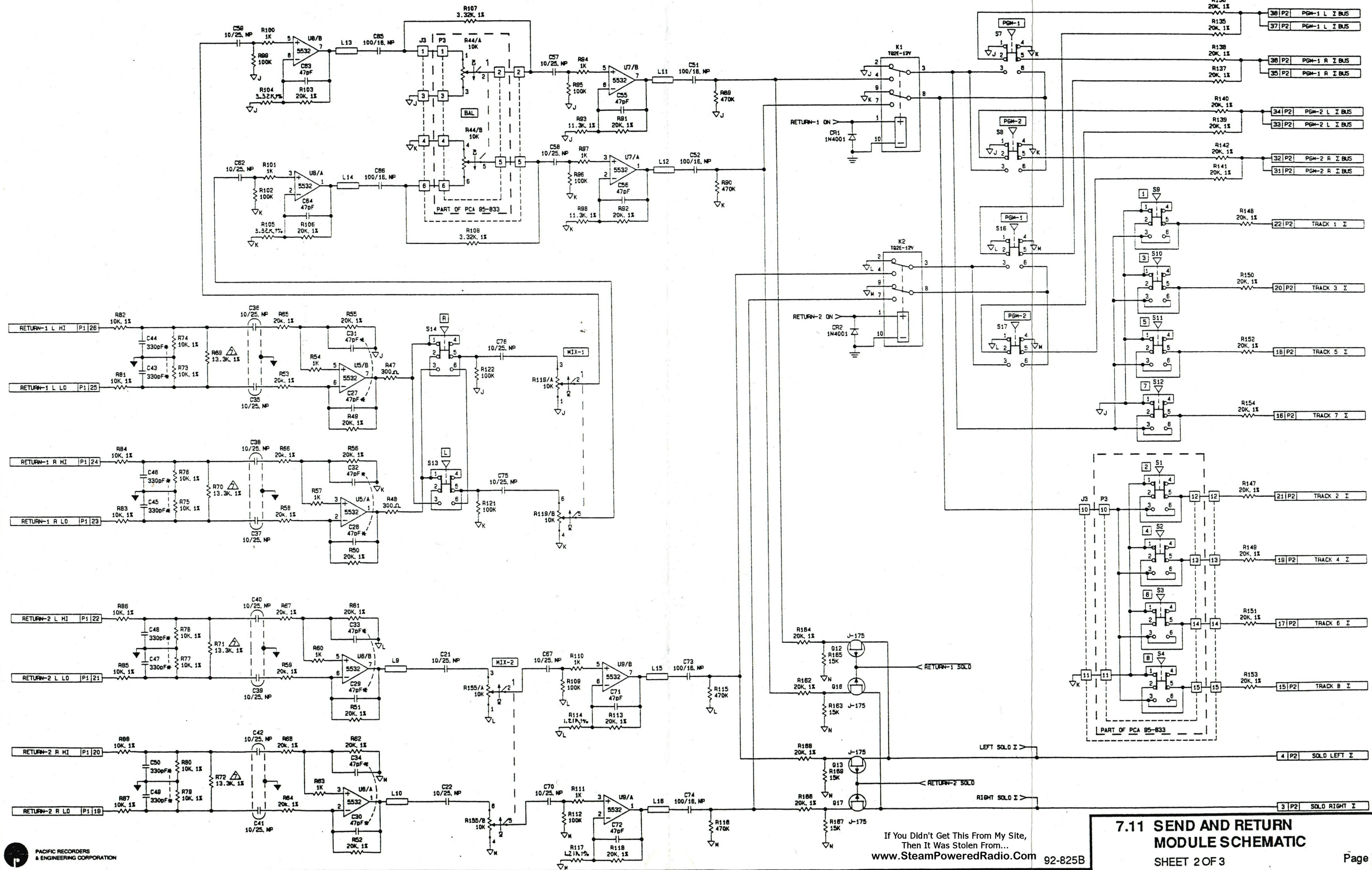
92-825B

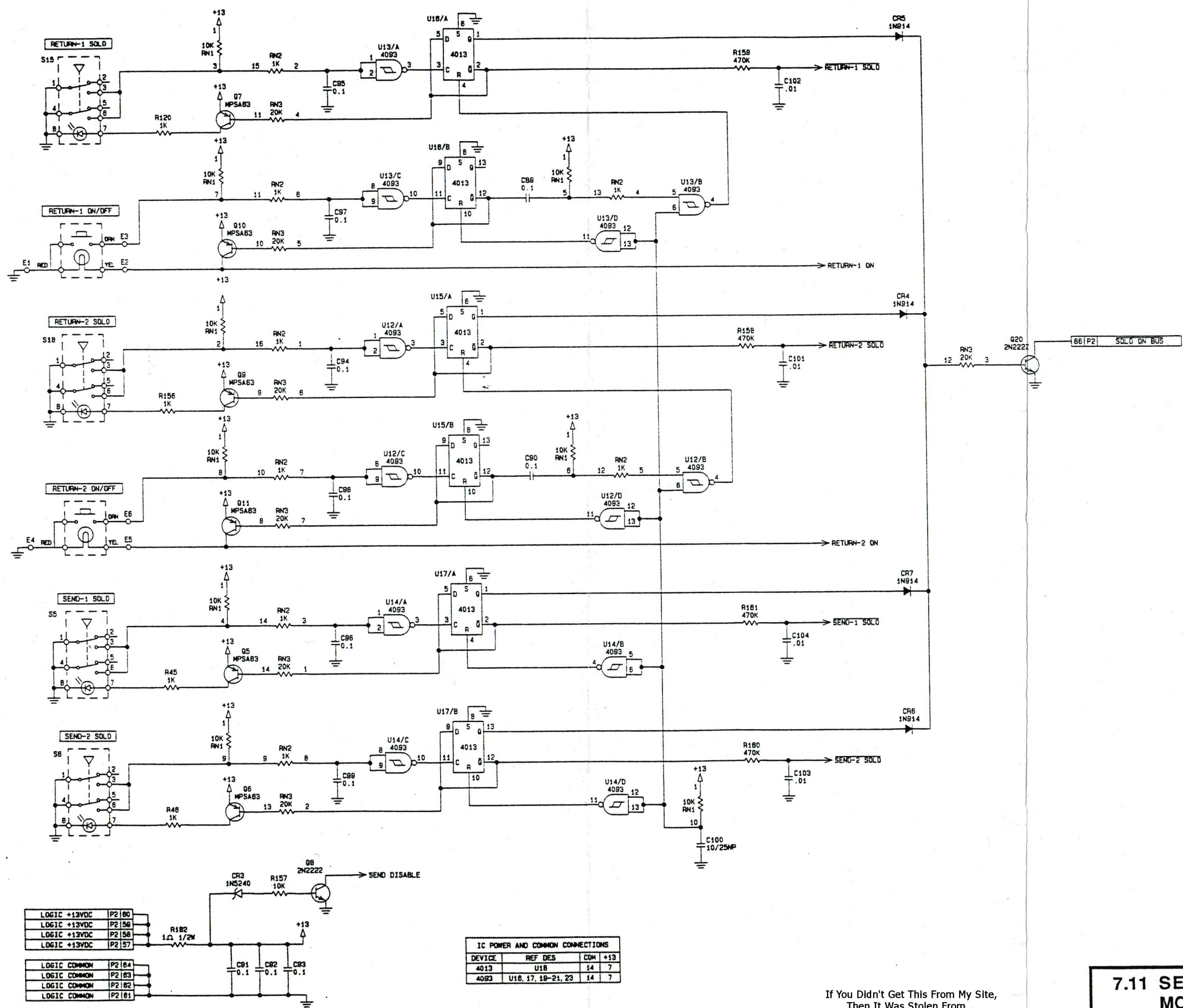
7.11 SEND AND RETURN MODULE SCHEMATIC

SHEET 1 OF 3

Page 7-21

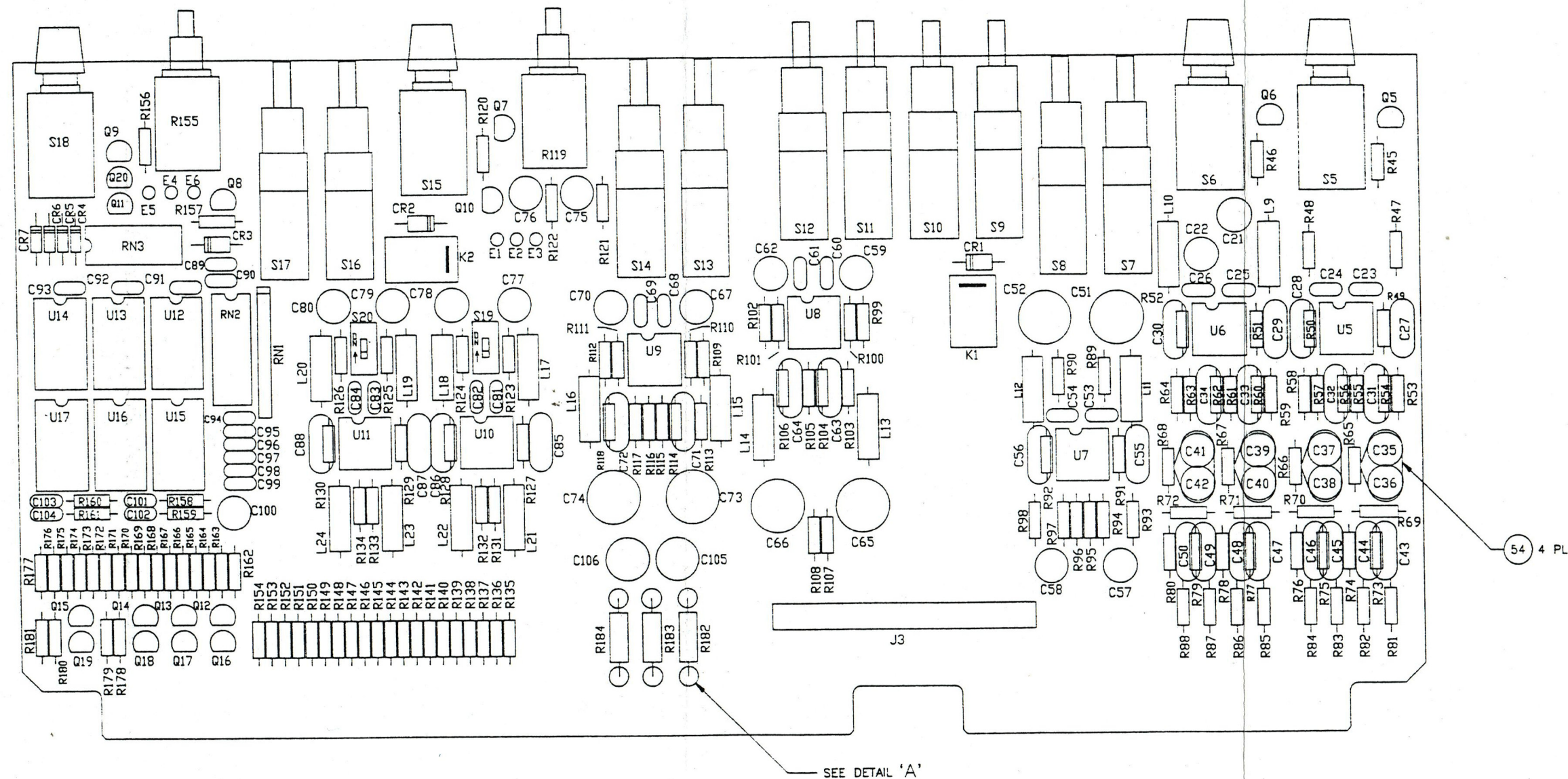
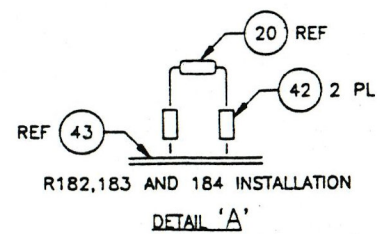
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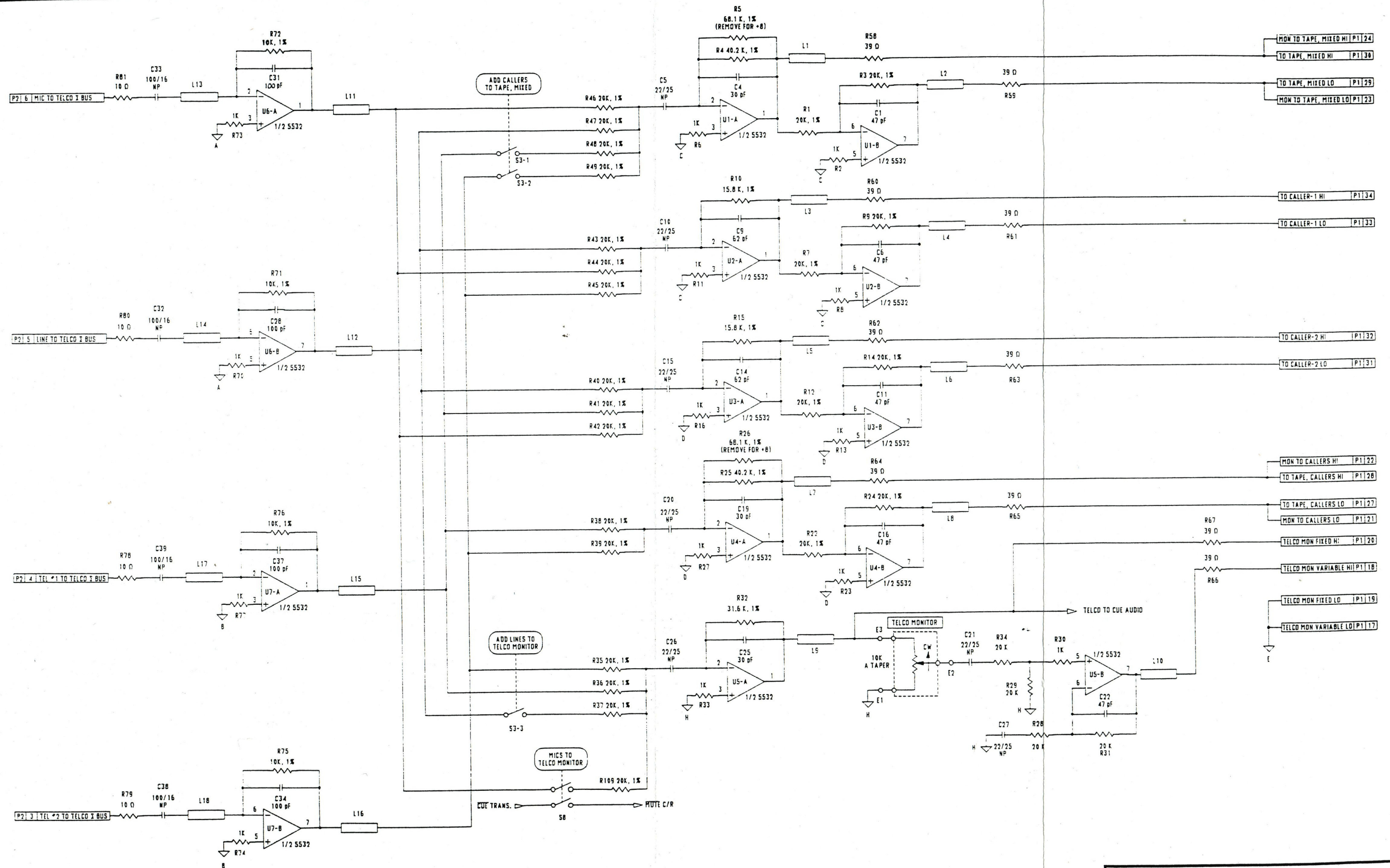
If You Didn't Get This From My Site,
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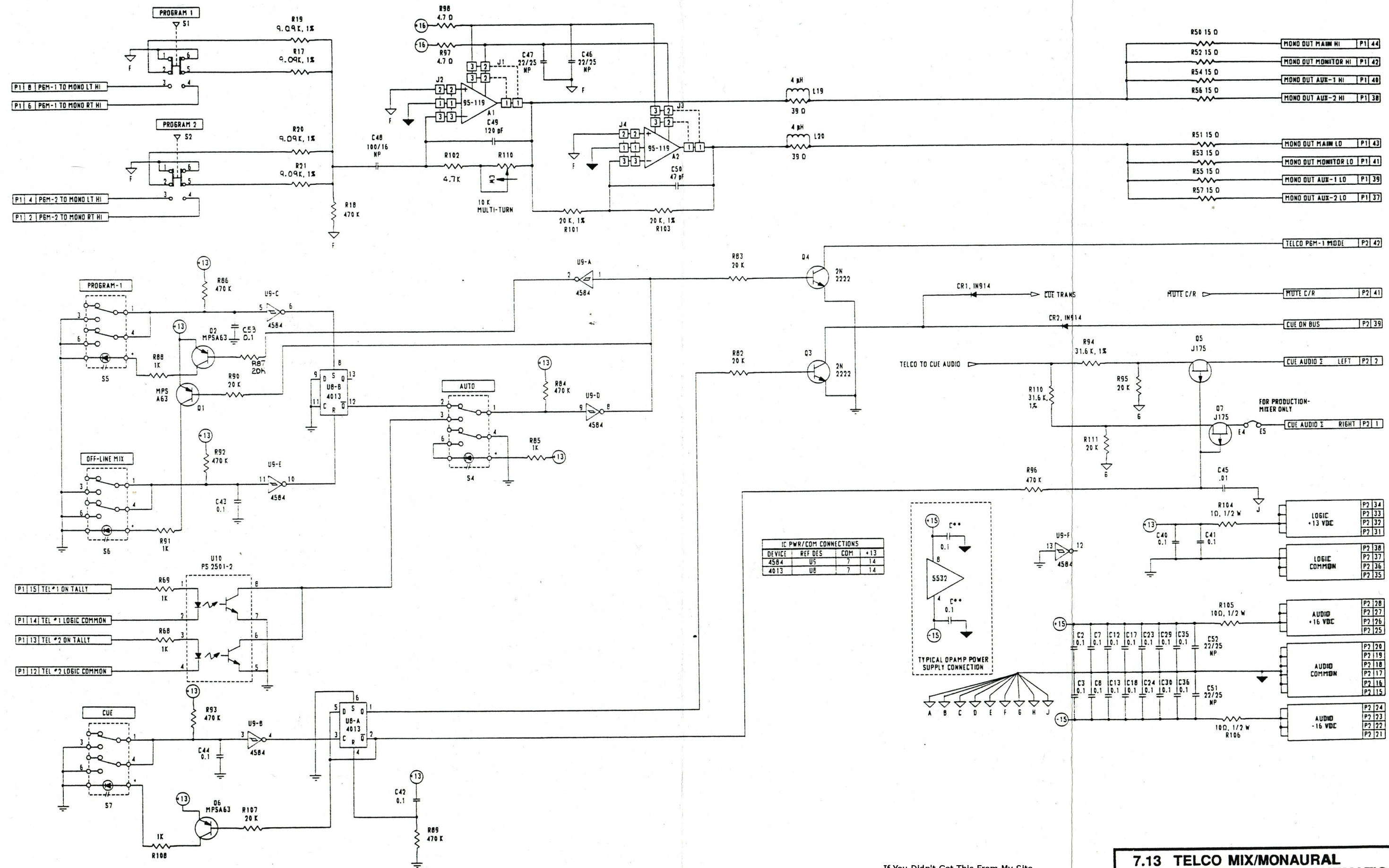
6. R69 THRU R72: CUSTOMER INSTALLS FOR +B3B OPTION.
 5. FOR SCHEMATIC DIAGRAM SEE DWG. 92-825 LATEST REV.
 4. PRIOR TO WAVE SOLDERING MASK HOLES FOR S5-18, R119, 155 AND E1-6.
 3. ----- INDICATES MATCHED PAIRS.
 2. ○ INDICATES ITEMS LISTED ON THIS DRAWING.
 1. ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.



7.12 SEND & RETURN MODULE PCA DRAWING

95-825A

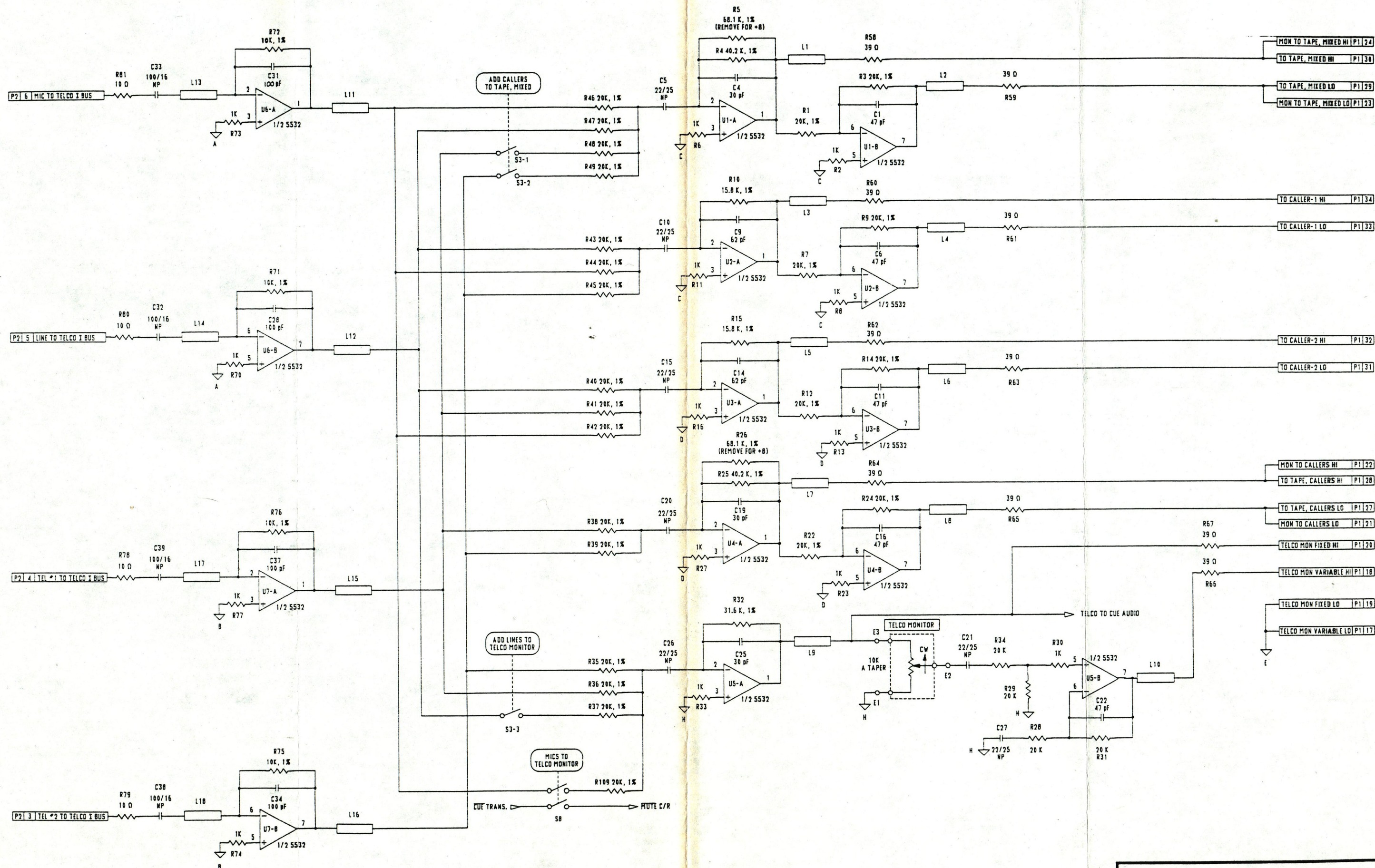




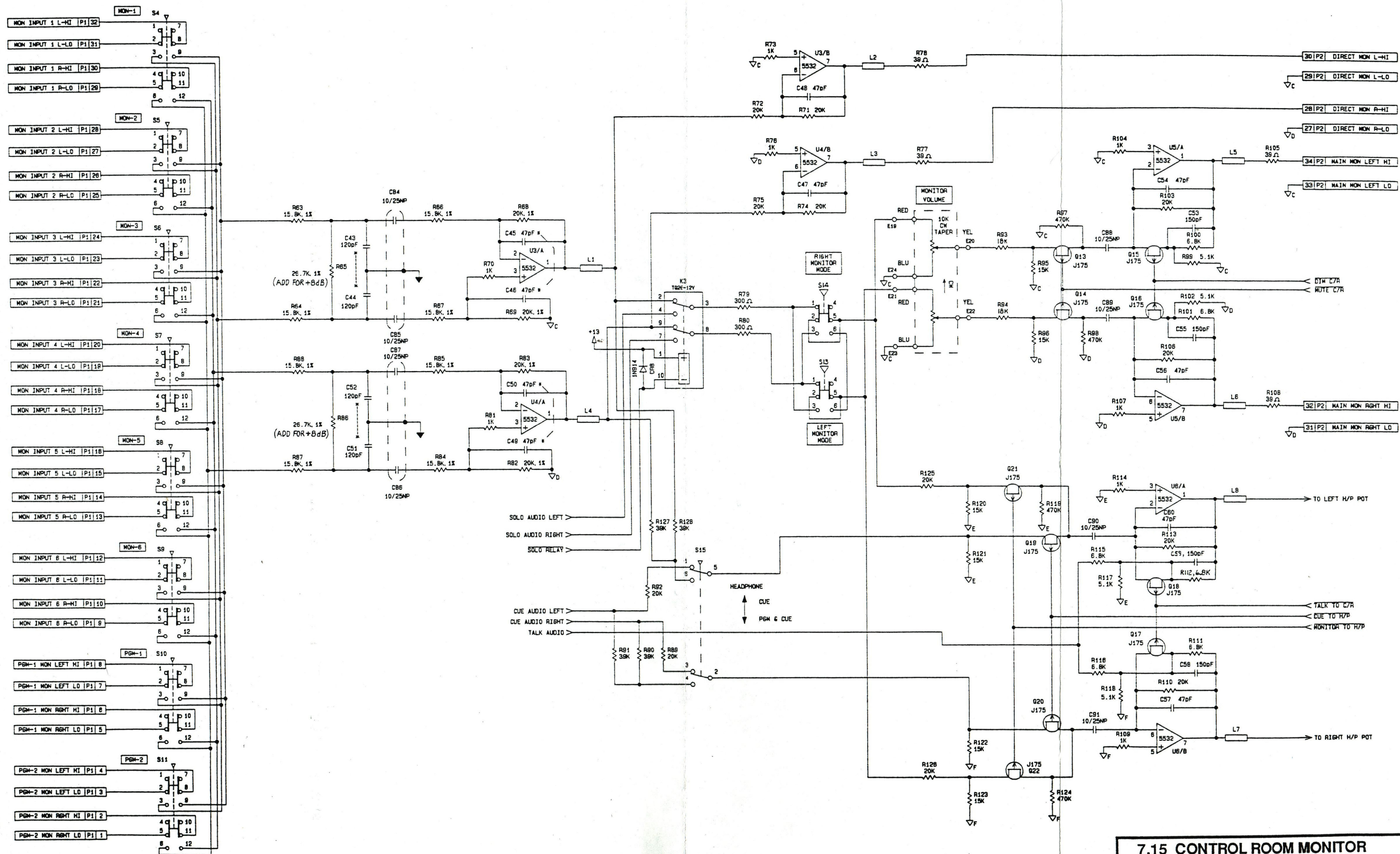
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92-754E

7.13 TELCO MIX/MONAUROAL OUTPUT MODULE SCHEMATIC SHEET 2 OF 2



7.14 TELCO MIX/MONAUROAL
OUTPUT MODULE PCA DRAWING



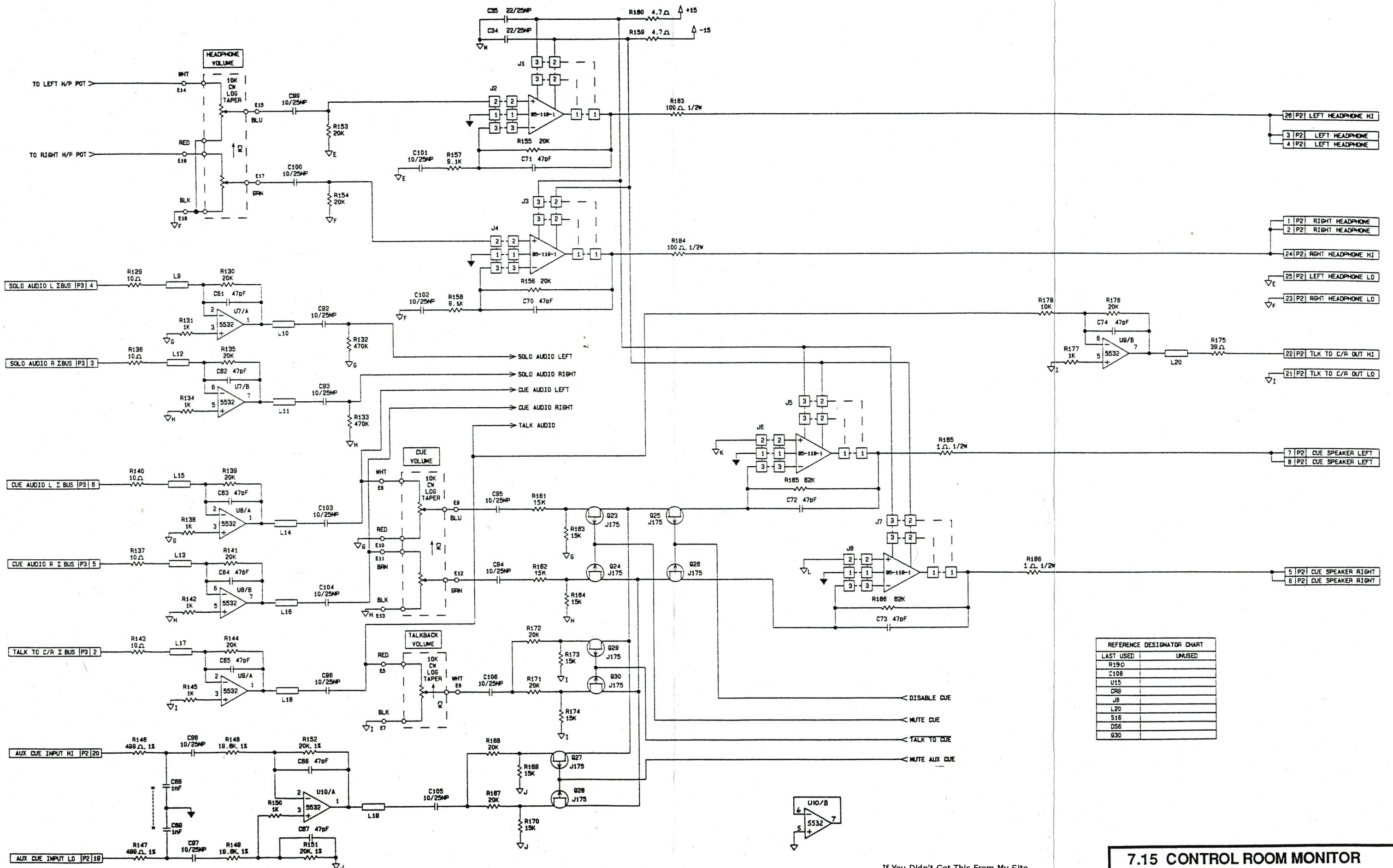
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7.15 CONTROL ROOM MONITOR MODULE SCHEMATIC

92-826B

SHEET 2 OF 3

Page 7-29



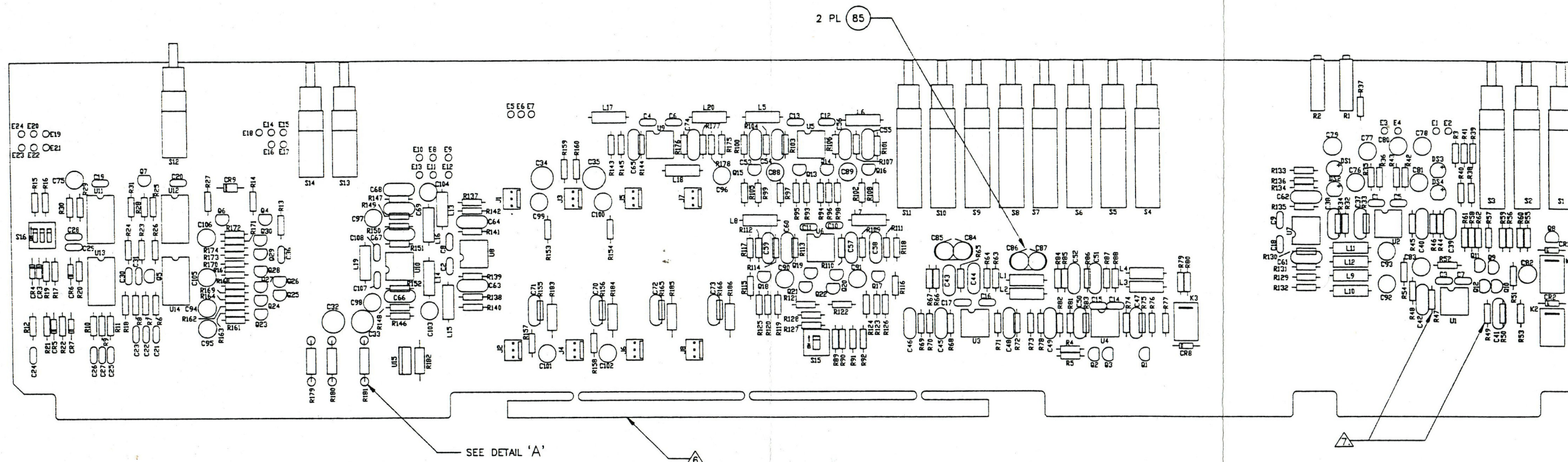
REFERENCE DESIGNATOR CHART	
LAST USED	UNUSED
R19D	
C108	
U15	
CR9	
JB	
L20	
S16	
DS6	
Q30	

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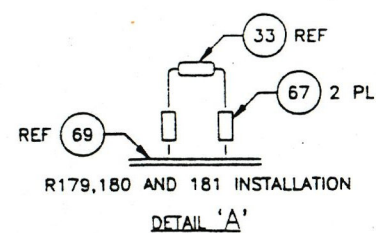
92-826B

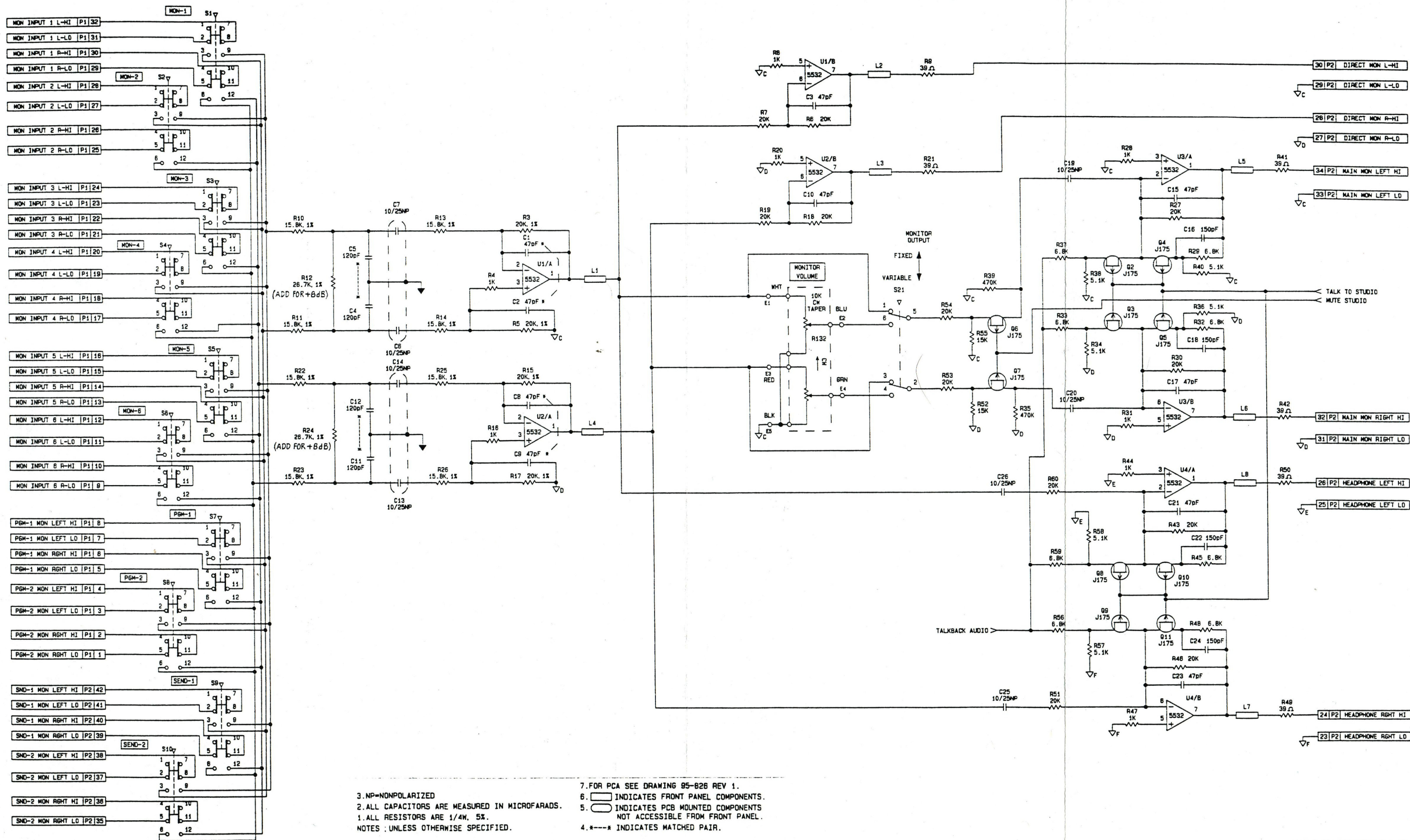
7.15 CONTROL ROOM MONITOR MODULE SCHEMATIC

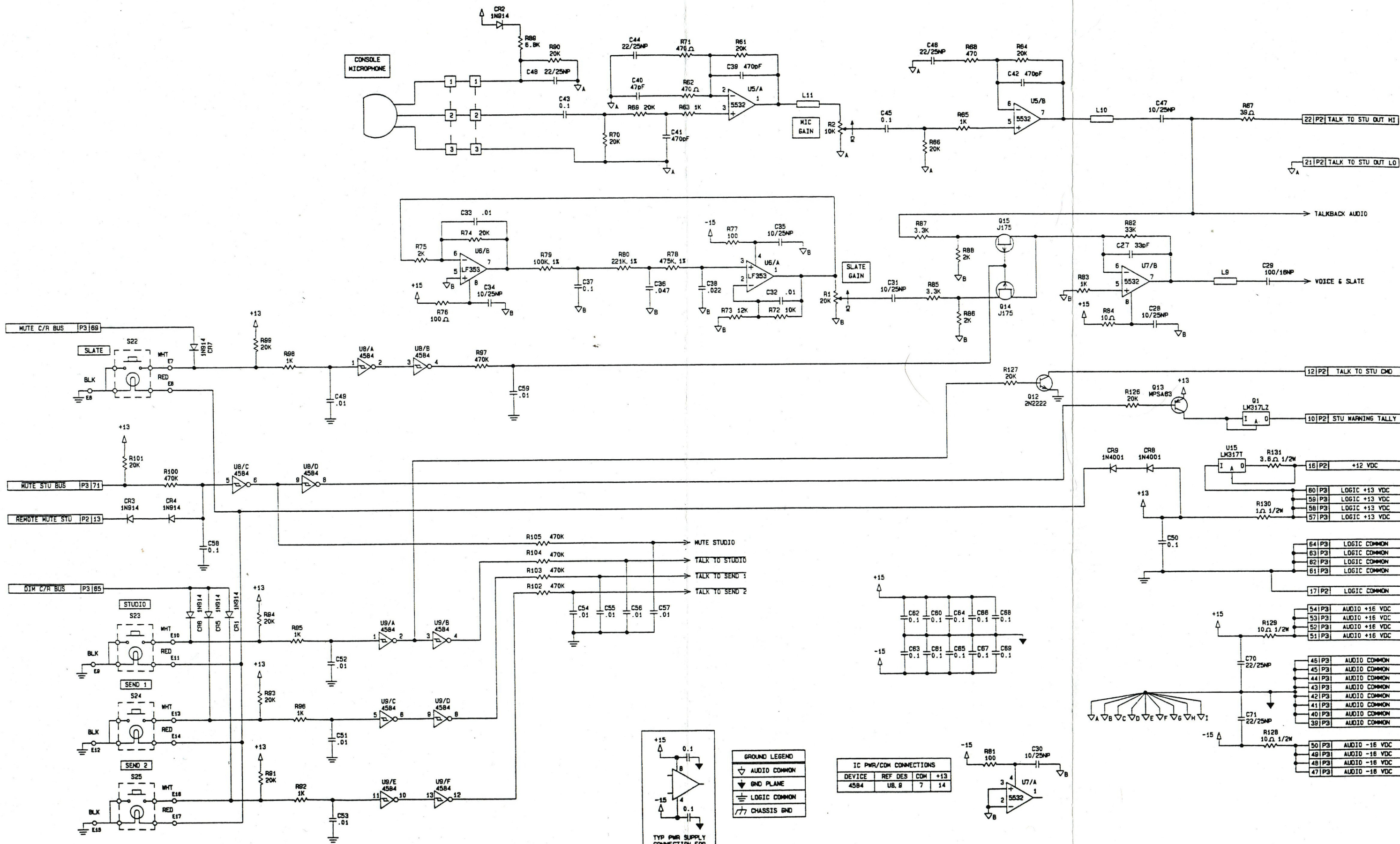
SHEET 3 OF 3



- ▲ CUSTOMER INSTALLS FOR +8dB OPTION.
 ▲ BREAK AWAY AND DISCARD.
 5. FOR SCHEMATIC DIAGRAM SEE DWG. 92-826 LATEST REV.
 4. PRIOR TO WAVE SOLDERING MASK HOLES FOR S1-14, R1,2 AND E1-23.
 3. *---* INDICATES MATCHED PAIRS.
 2. ○ INDICATES ITEMS LISTED ON THIS DRAWING.
 1. ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.

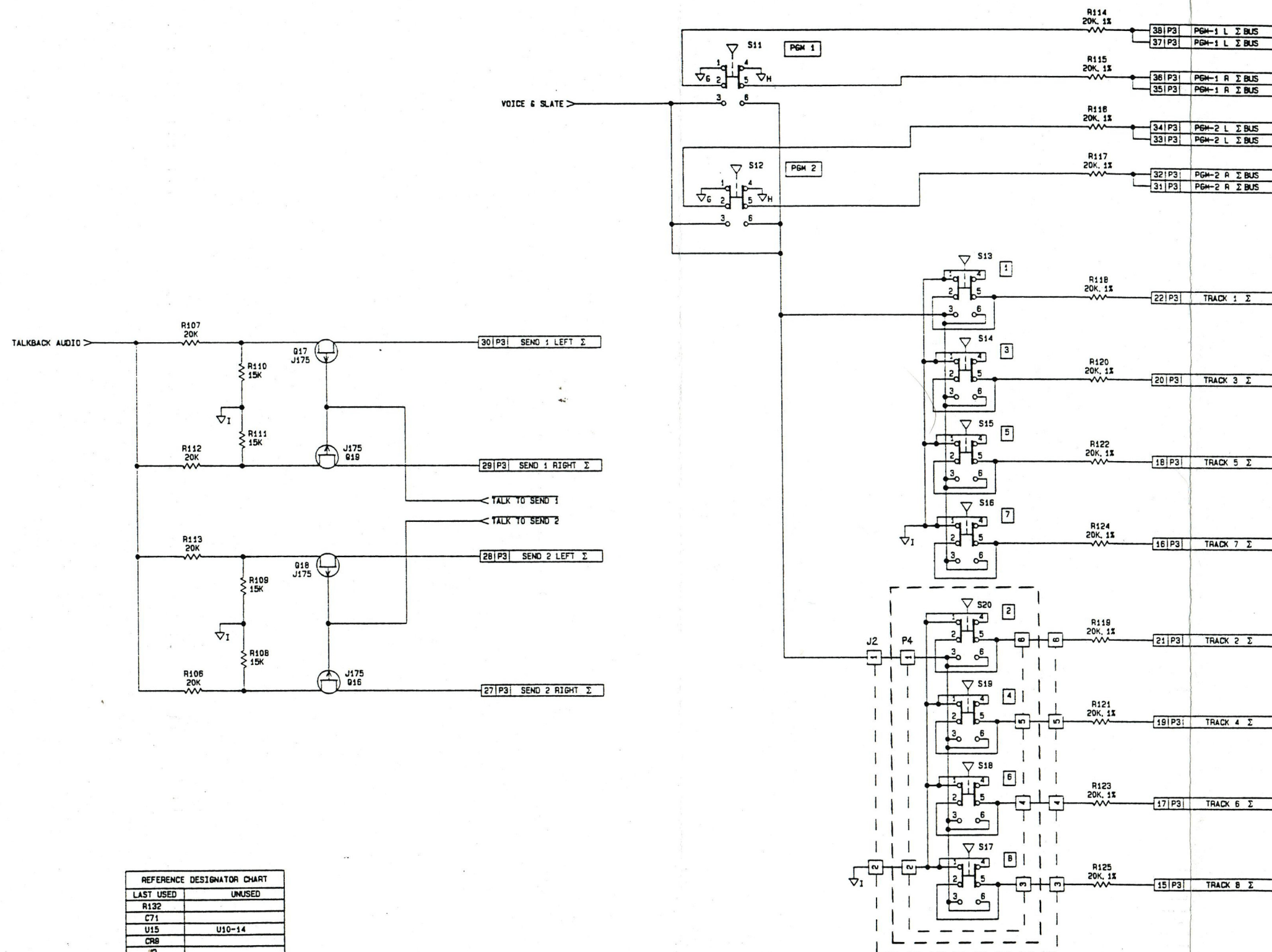


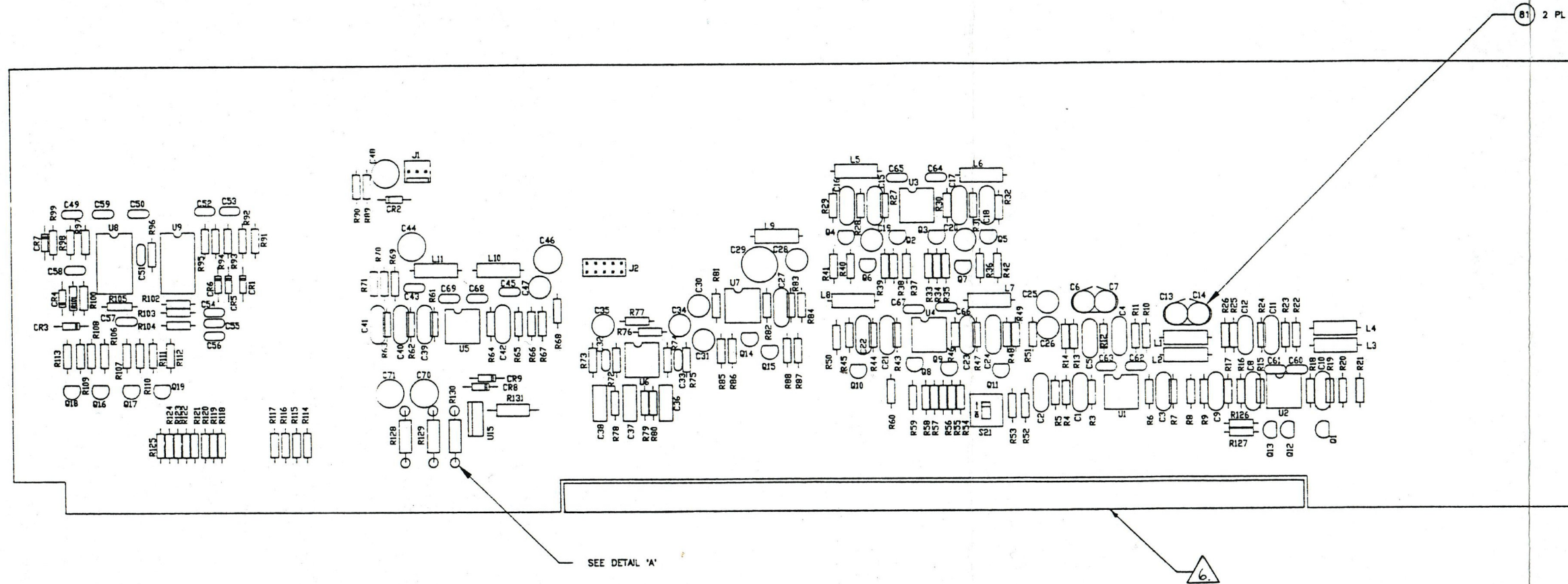




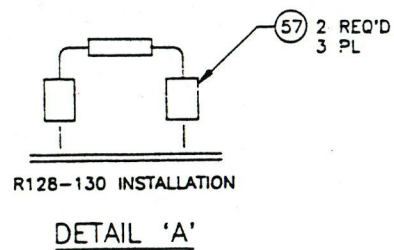
7.17 STUDIO MONITOR MODULE SCHEMATIC

SHEET 2 OF 3





SEE DETAIL 'A'

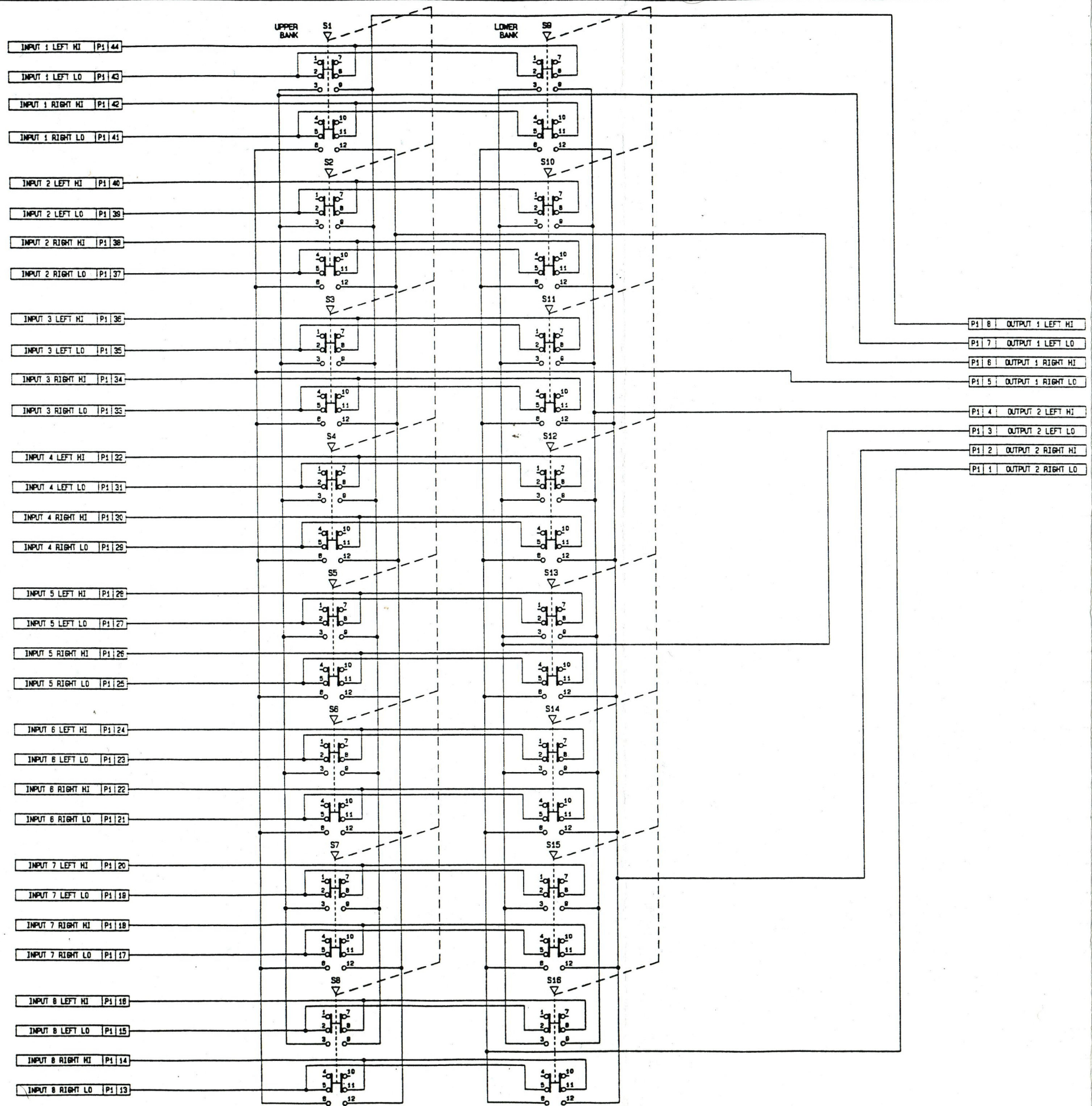


- △ BREAK AWAY AND DISCARD.
 △ PRIOR TO WAVE SOLDERING MASK HOLES FOR S1-S16, R1,2 AND E1-17.
 4 FOR SCHEMATIC DIAGRAM SEE DWG 92-824 LATEST REV.
 3 - - - - INDICATES MATCHED PAIRS.
 2 ○ INDICATES ITEMS LISTED ON THIS DRAWING.
 1 ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.

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7.18 STUDIO MONITOR MODULE PCA DRAWING

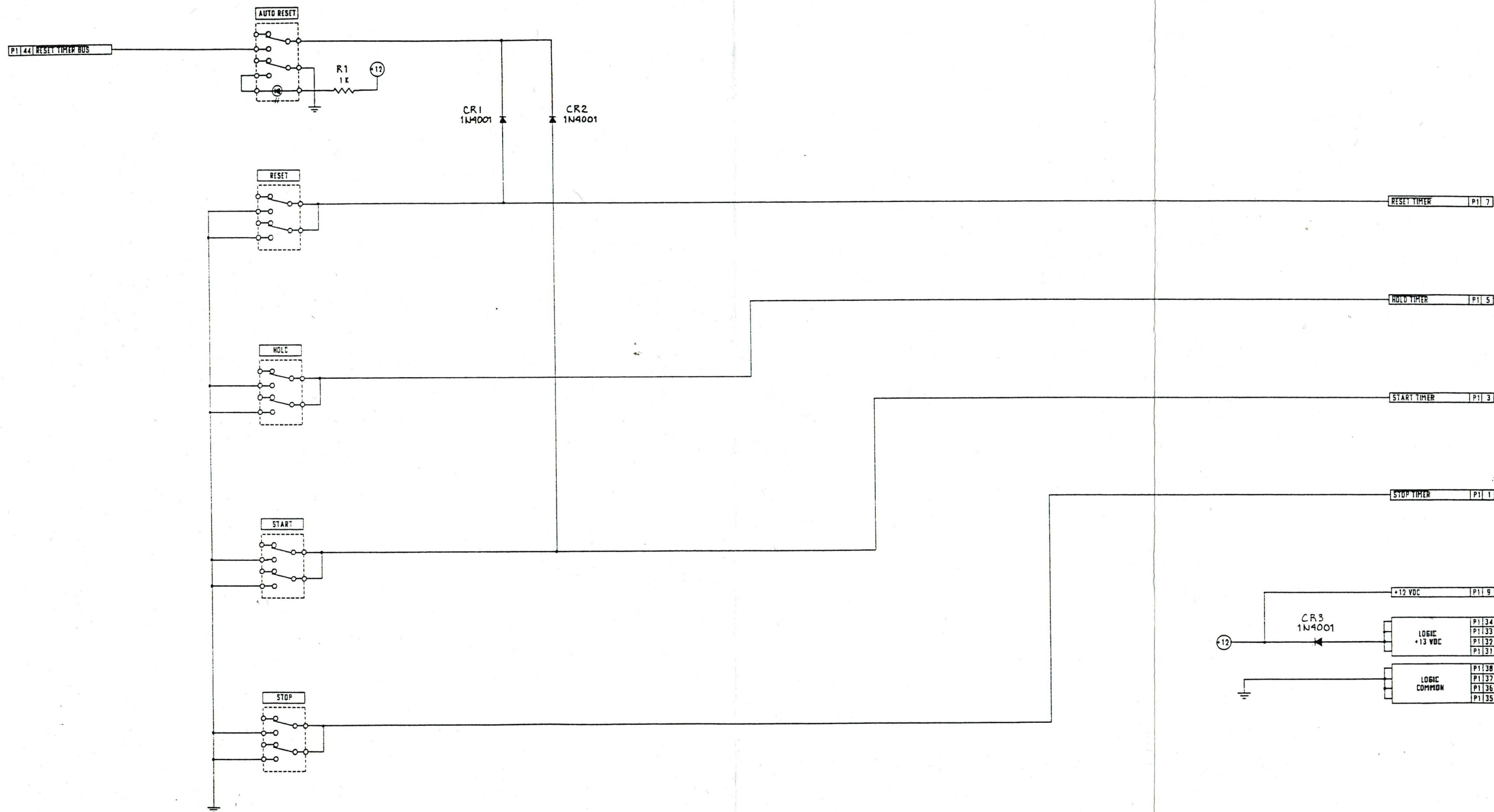
95-824A



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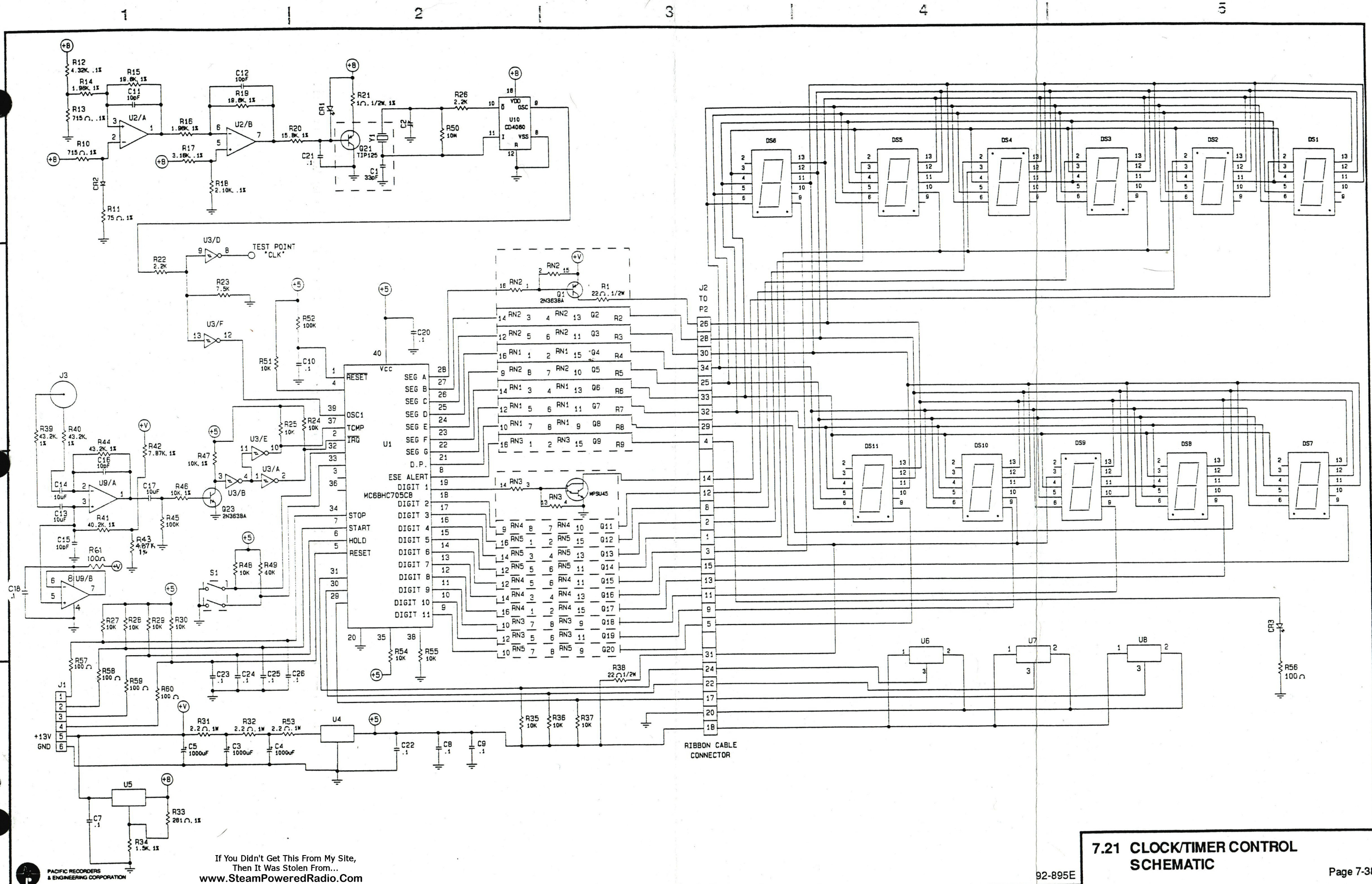
7.19 REMOTE LINE SELECTOR SCHEMATIC

92-758A



**7.20 TIMER CONTROL PANEL
SCHEMATIC**

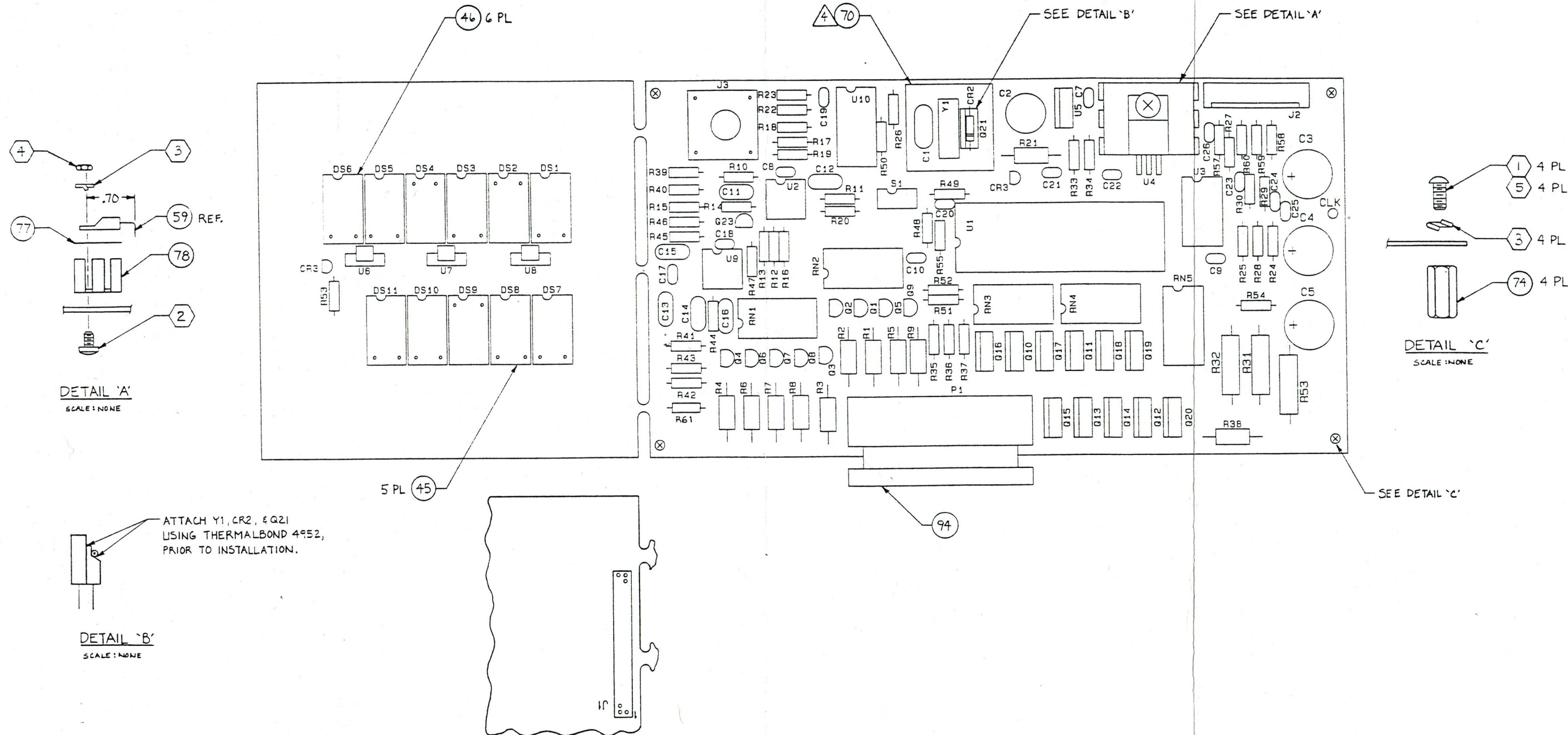
92-759B



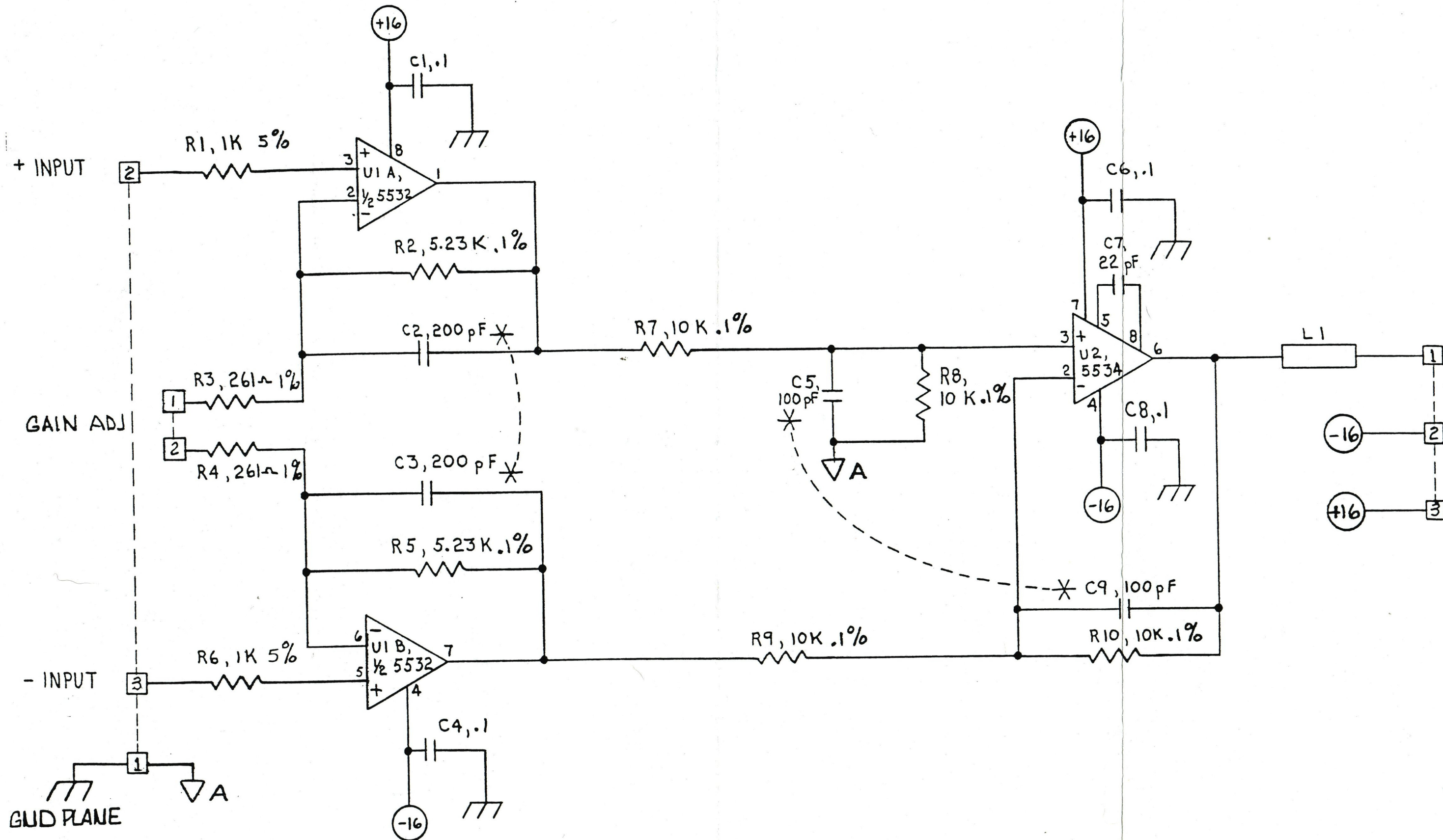
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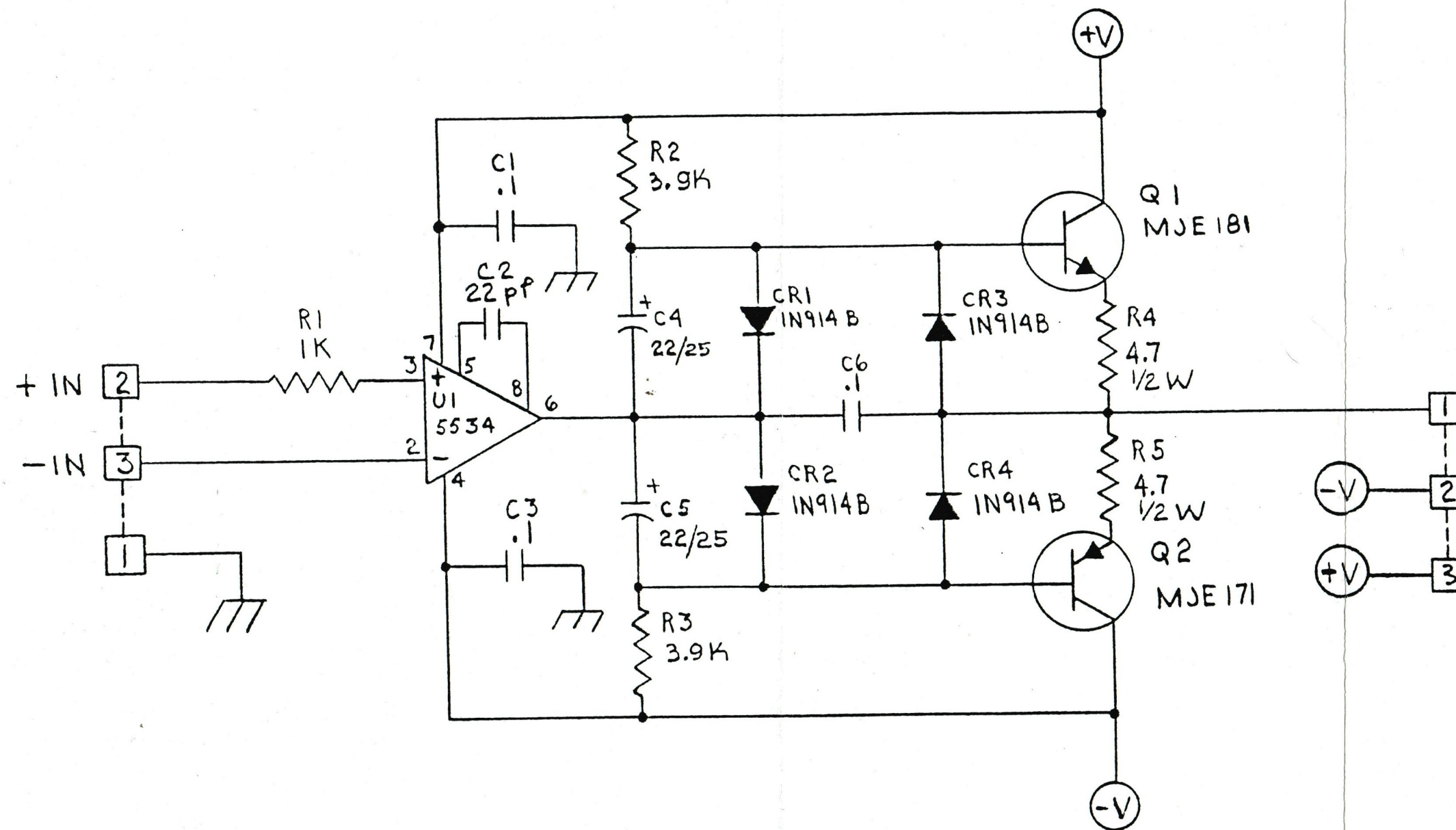
7.21 CLOCK/TIMER CONTROL SCHEMATIC

92-895E



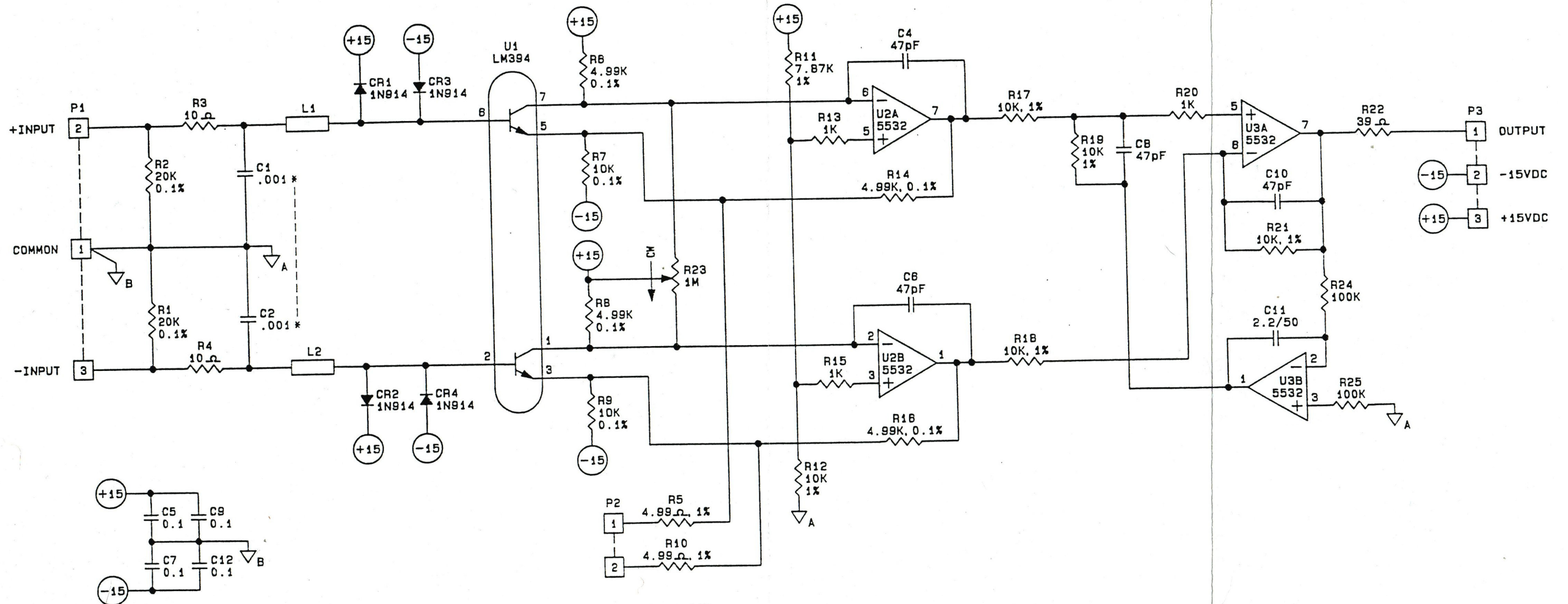
4 GLUE ITEM 70 TO COMPONENT SIDE USING 5 SPARINGLY.
 3. FOR SCHEMATIC DIAGRAM SEE DNG. 82-895
 2. O INDICATES ITEMS LISTED ON THIS DRAWING.
 1. O INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
 NOTES: UNLESS OTHERWISE SPECIFIED.



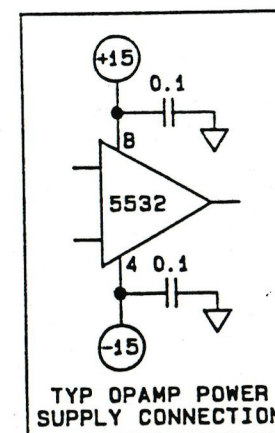


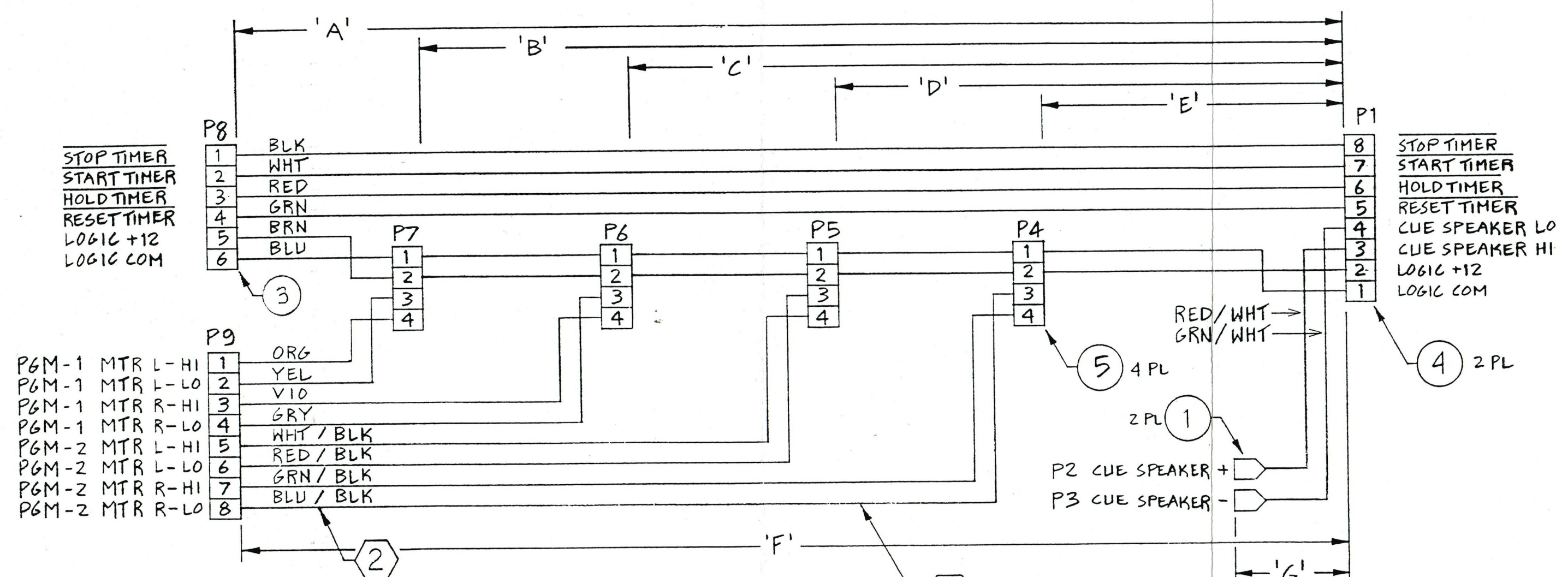
**7.25 OUTPUT AMPLIFIER
FUNCTION MODULE SCHEMATIC**

92-119C



5. FOR PCA SEE DRAWING 95-270 LATEST REV.
 4. *---* INDICATES MATCHED PAIR.
 3. NP=NONPOLARIZED.
 2. ALL CAPACITORS ARE MEASURED IN MICROFARADS.
 1. ALL RESISTORS ARE 1/4W, 5%.
- NOTES: UNLESS OTHERWISE SPECIFIED.





LENGTH CHART							
DASH	'A'	'B'	'C'	'D'	'E'	'F'	'G'
-1	45.00	39.00	33.00	26.00	20.00	60.00	20.00
-2	53.00	47.00	41.00	32.00	26.00	71.00	20.00
-3	59.00	53.00	47.00	38.00	32.00	83.00	26.00

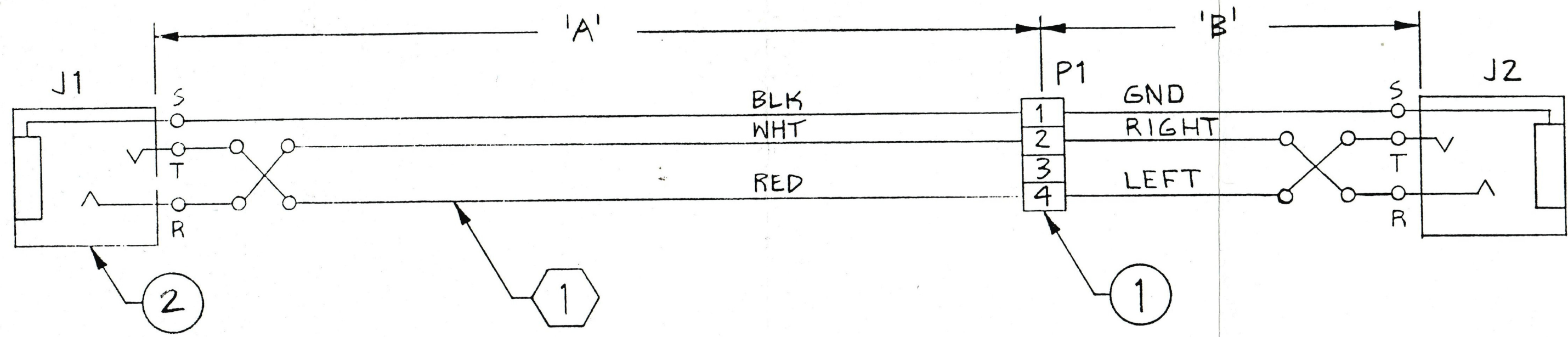
- 4 INDICATE P#^S ON CONNECTORS AS NOTED.
- 3 IDENTIFY BY BAG & TAG.
- 2 ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
- 1 ⬡ INDICATES ITEMS LISTED ON THIS DWG.

NOTES: UNLESS OTHERWISE SPECIFIED.

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7.27 CONSOLE METER PANEL
CABLE SCHEMATIC





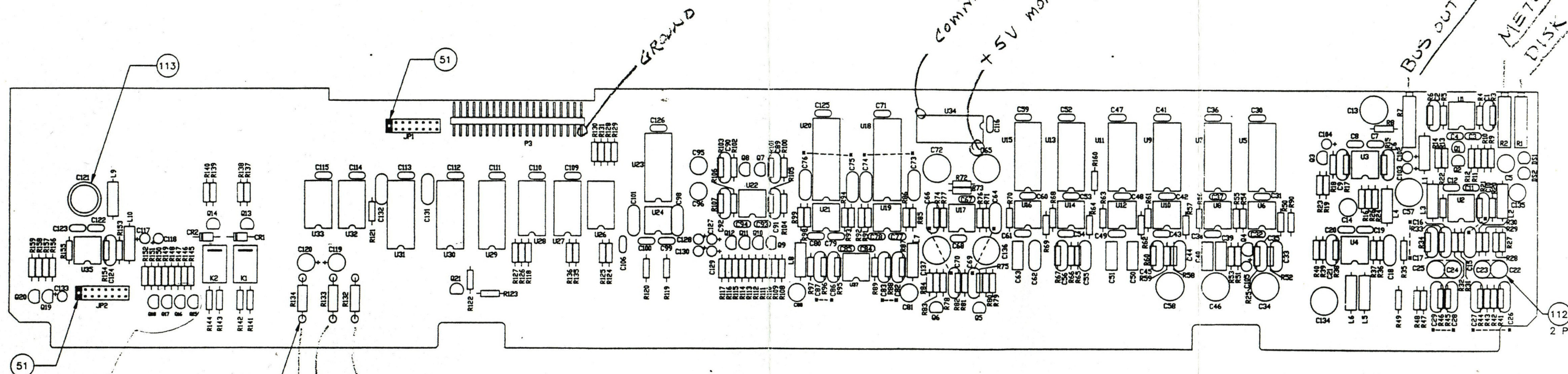
LENGTH CHART		
DASH	'A'	'B'
-1	33.00	3.00
-2	45.00	3.00
-3	57.00	3.00

- NOTES:
1. ○ INDICATES ITEMS LISTED ON THIS DWG.
 2. ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
 3. IDENTIFY BY BAG & TAG.
 4. INDICATE P & J #'S ON CONN. AS NOTED.

**7.29 CONSOLE HEADPHONE
CABLE SCHEMATIC**

1. TURN ON BUS
2. SET METER TO READ 0VU.
3. TURN OFF BUS
4. MONITOR "A" INPUT ON ADX AUDIO CARDS
5. SET BUS OUTPUT FOR +6dBm
6. SET ADX TO RECORD + ADJUST DIST FOR 0VU.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
1		PROTO RELEASE		
A		PRODUCTION RELEASE ECO 3440		
B		SEE ECO 3482		
D		SEE ECO 3501		



9-5 FETs

6 PL 83

+12VDC

+16VDC

-16VDC

U32, U33 = 21-114

U31 = 21-131

U29, 30, 34 = 21-133

24-26 = TRIM POTS (X3)

28-30 = K1, K2 RELAYS

U1-U4, U17, U35, 237 = 20-53

U6, 8, 10, 14, 16, 19, 21, 22, 24 = 20-80

U5, 7, 11, 13, 15, 23 = 20-86

U18, U20 = 20-87

U26 = 21-46

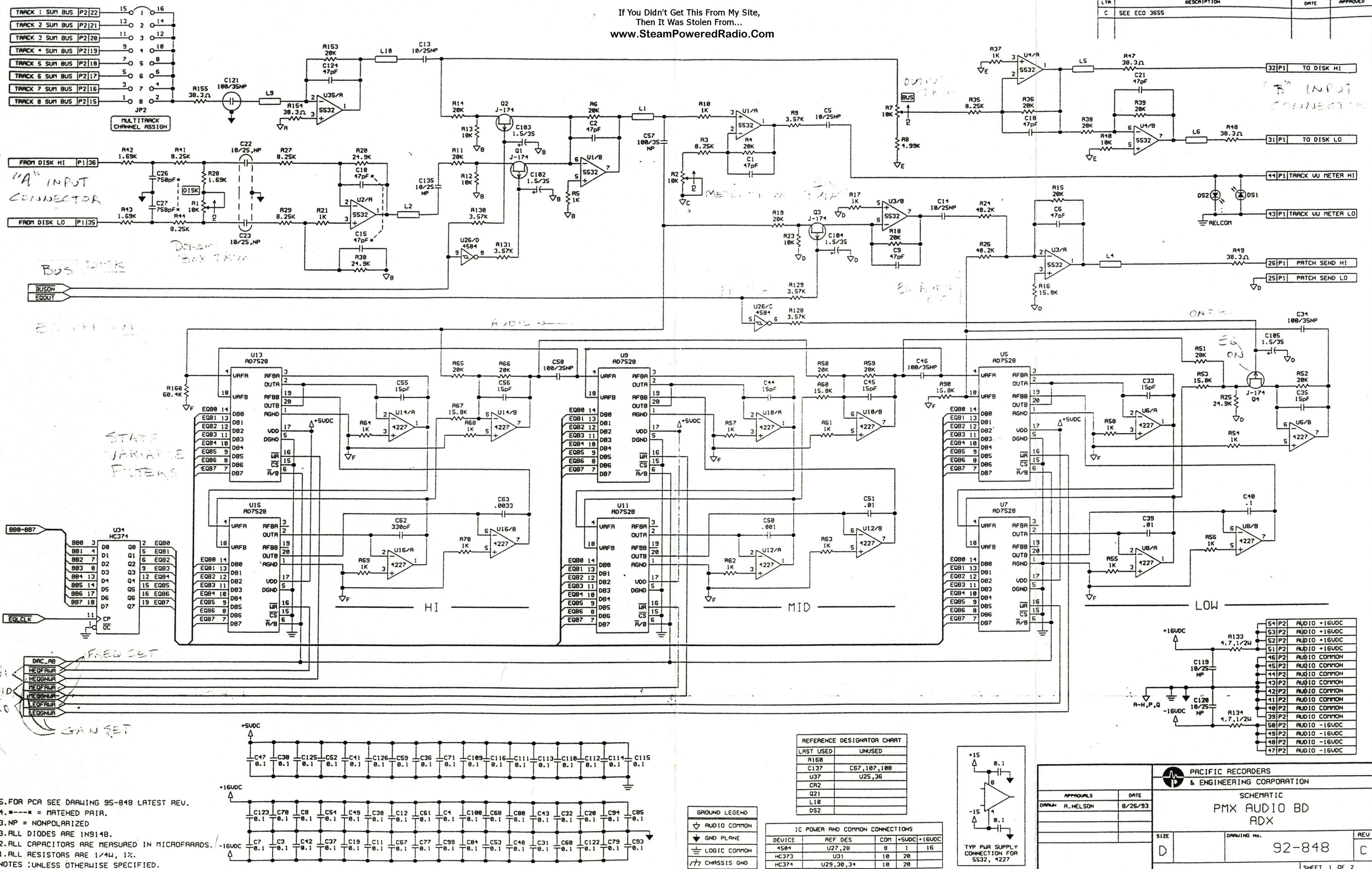
U27, U28 = 21-66

4. FOR SCHEMATIC DIAGRAM SEE DWG. 92-848 LATEST REV.
3. --- INDICATES MATCHED PAIRS.
2. ○ INDICATES ITEMS LISTED ON THIS DRAWING.
1. ○ INDICATES ITEMS LISTED ON SEPARATE PARTS LIST.
- NOTES: UNLESS OTHERWISE SPECIFIED.

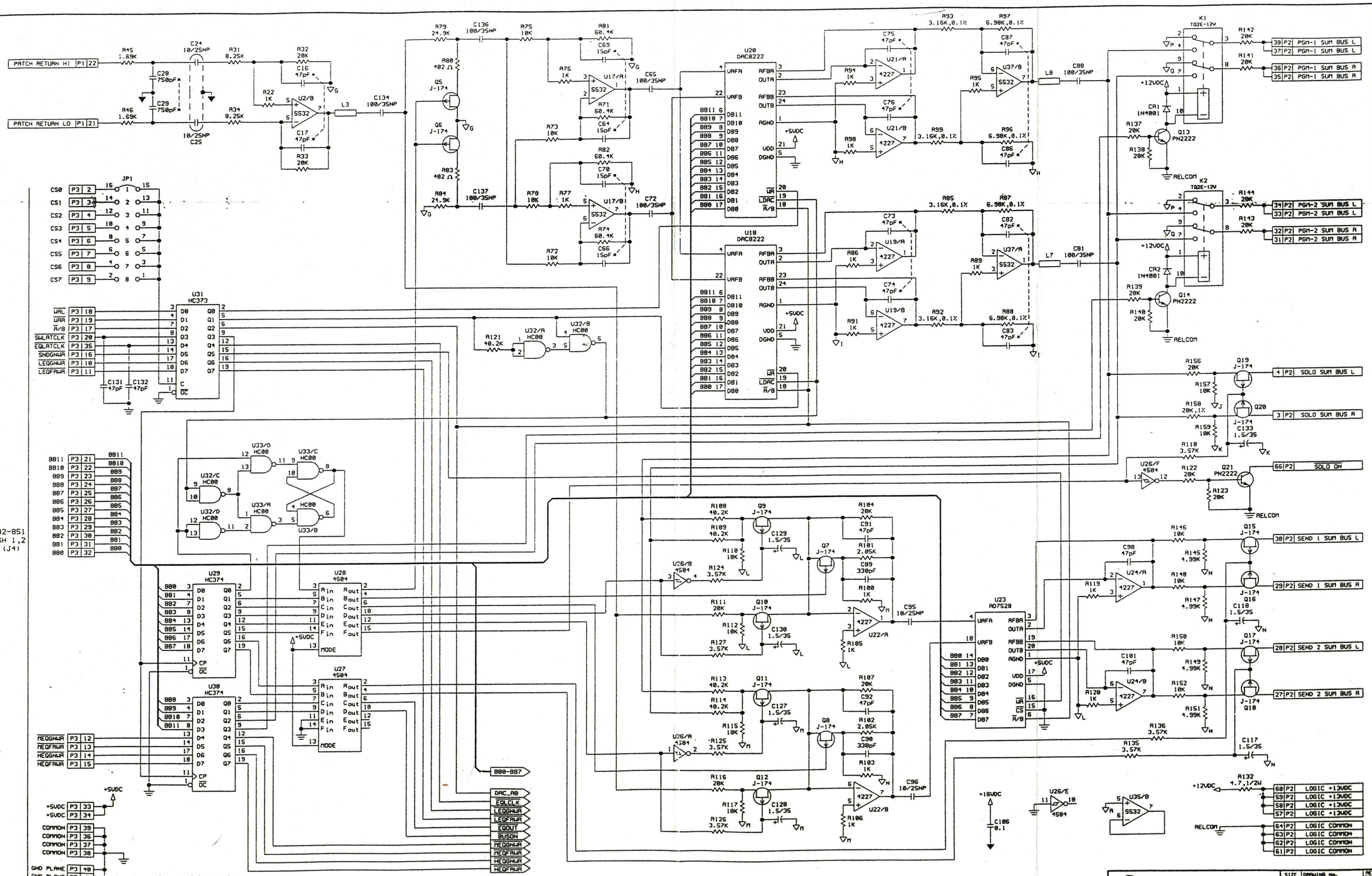
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CONTRACT NO.		PACIFIC RECORDERS & ENGINEERING CORPORATION	
APPROVALS	DATE	PCA	
DRAWN R. NELSON	5/21/92	PMX MODULE BD, ADX	
CHECKED			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		95-848	D
DO NOT SCALE DRAWING		SCALE NONE	SHEET 1 OF 1

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5. FOR PCA SEE DRAWING 95-848 LATEST REV.
4. ---X = MATEHD PAIR.
3. NP = NONPOLARIZED
3. ALL DIODES ARE 1N914B.
2. ALL CAPACITORS ARE MEASURED IN MICROFARADS
1. ALL RESISTORS ARE 1/4W, 1%.
NOTES :UNLESS OTHERWISE SPECIFIED.



92-851
SH 1,2
(J4)

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8.0 ACCESSORIES

This chapter contains descriptions of the various Productionmixer console accessories. Included are sections describing tape machine remote control panels, the Redundant Power Supply Coupler Unit, and logic interfaces. Section 8.4 contains schematics for the accessories described in this chapter. Contact PR&E for further details and price information.

8.1 TAPE MACHINE REMOTE CONTROL PANELS

There are two tape machine remote control panels available for use in the Productionmixer mainframe - one for cart recorders (PR&E #99-761-X) and one for cassette and reel-to-reel tape recorders (PR&E #99-760-X). Both consist of five momentary-action switches, and both are mounted in the mainframe positions labeled A through D, as shown in Figure 2.4.

Tape machine remote control panels operate in conjunction with input module remote controls, and connection to cart and tape recorders is accomplished by means of a “Y” cable located at the recorder, as shown in Figure 8.1. Pre-fabricated remote control “Y” cables for most commercial cart and tape machines are available from PR&E.

8.1.1 Cart Recorder Remote Control Panel

The cart recorder remote control panel (PR&E #99-761-X) can control the record, tertiary cue tone, secondary cue tone, play and stop functions of a connected cart recorder. For a schematic showing rear panel Molex connector pin assignment, and an illustration of the panel controls, see Section 8.4.

Presently, there are five different versions of this panel available from PR&E: #99-761-0, for use with cart machines with no lamp tallies; #99-761-1, for use with cart machines with 5 volt lamp tallies; #99-761-2, for use with cart machines with 14 volt lamp tallies; #99-761-3, for use with cart machines with 28 volt lamp tallies; and #99-761-4, for use with cart machines with a 5 volt record tally only.

8.1.2 Cassette And Tape Recorder Remote Control Panel

The cassette and reel-to-reel tape recorder remote control panel (PR&E #99-760-X) can control the record, forward, rewind, play and stop functions of a connected cassette or tape recorder. For a schematic showing rear panel Molex connector pin assignment, and an illustration of panel controls, see Section 8.6.

Presently, there are five different versions of this panel available from PR&E: #99-760-0, for use with tape machines with no lamp tallies; #99-760-1, for use with tape machines with 5 volt lamp tallies; #99-760-2, for use with tape machines with 14 volt lamp tallies; #99-760-3, for use with tape machines with 28 volt lamp tallies; and #99-760-4, for use with tape machines with a 5 volt record tally only.

8.2 REDUNDANT POWER SUPPLY COUPLER UNIT

The Redundant Power Supply Coupler Unit (PR&E #99-818) is used whenever redundant power is desired. When two power supplies are connected to the unit, the power supply voltages are diode-coupled, with the highest of the two voltages being supplied to the console. If there is a voltage failure, redundant power is instantaneously supplied to the console, and the Remote Power Fail Indicator on the coupler unit is illuminated.

The unit should be installed adjacent to the two console power supplies, and connected with the two prefabricated cables supplied. The connections to the supplies and to the console are made to the heavy-duty barrier strips on the rear of the coupler. The cables are color-coded, and the corresponding color names are printed adjacent to the terminal strips.

NOTE: The high-current diodes used in the coupler have very low forward voltage drop and, therefore, do not add significantly to the heat dissipation of the power supply system. However, the second power supply in a redundant system does add approximately 50 watts of heat, due to the excitation current consumed by the power transformers.

8.3 LOGIC INTERFACES

PR&E recommends the use of logic interface electronics between the console and any piece of auxiliary equipment to protect the console from hazardous voltages, and to prevent ground loops, such as those which occur when control circuitry is referenced to a different ground or power supply.

A variety of different interfaces is manufactured by PR&E to accommodate most types of cart, tape and cassette machines, turntables, and compact disc players. Cable assemblies connecting the console to the interface, and the interface to the auxiliary equipment are also produced by PR&E. For complete interface information, including all standard machine cable assemblies and machine "Y" cables, contact PR&E.

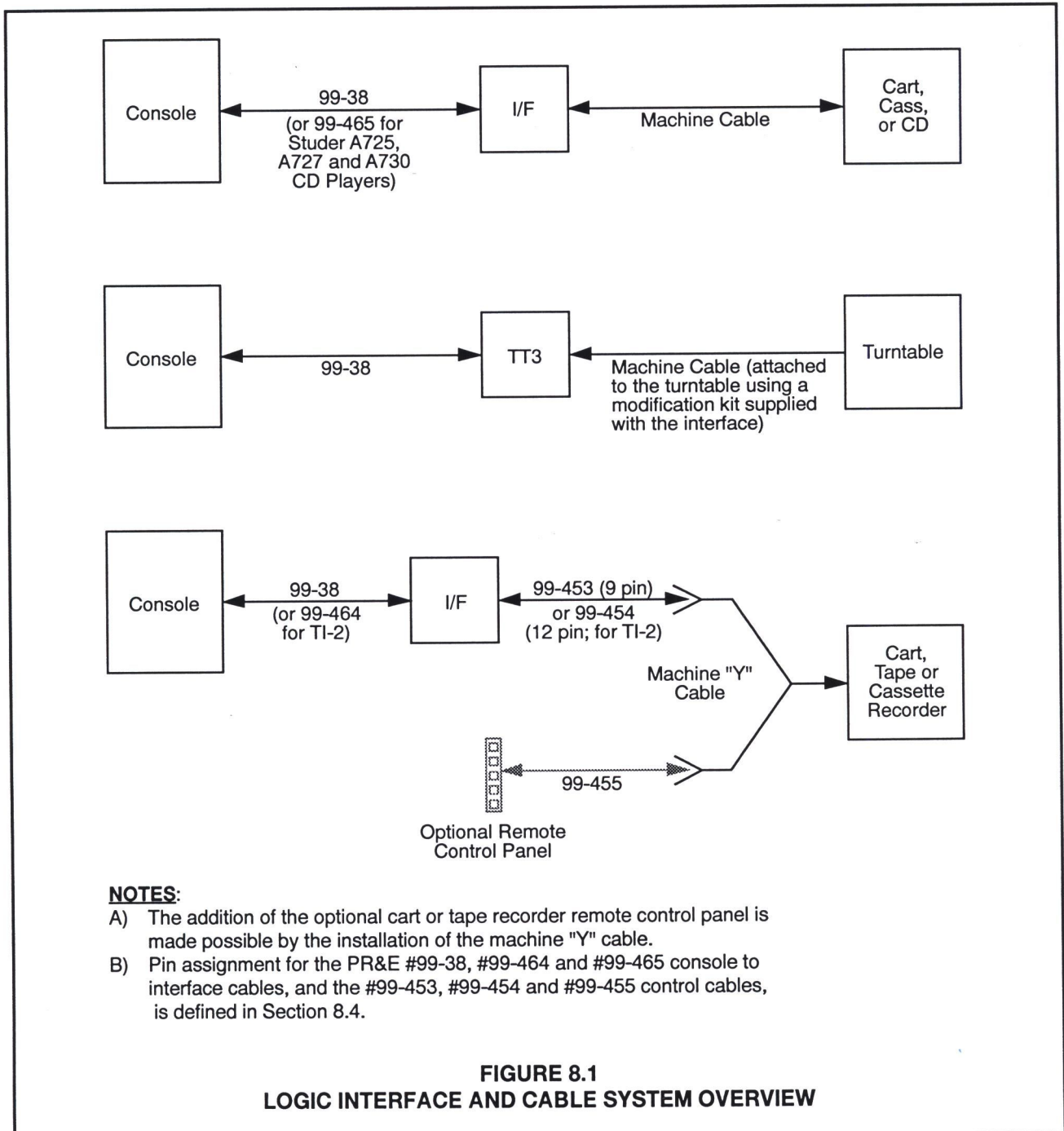
The table below provides a listing of the various interfaces described in this section, as well as their part numbers and a general description of their use.

Interface	PR&E P/N	For Use With
TCI-2A	99-165	PR&E TOMCAT, Micromax cart machines
CI-2	99-125-0	Cart machines, CD players and cassette machines w/12-28 V lamp tallies
CI-2 (5V)	99-125-1	Cart machines, CD players and cassette machines w/5 V lamp tallies
TI-2	99-111	Reel to reel tape machines w/12-28 V lamp tallies
TT-3	99-110	Turntables
WL-2	99-143	Studio and Control Room warning lights
Dual Relay	99-419	General purpose switching, mute contacts
Cassette Skimmer	99-410	Cassette recorders

Section 8.4 contains schematics of these interfaces, and diagrams of the three console to interface cables:

PR&E #99-464 (for use with the TI-2 Tape Interface; PR&E #99-465 (for use with the CI-2 Cart Interface when interfacing Studer A725, A727 and A730 compact disc players); and PR&E #99-38 (for use with all other interfaces).

While there are three console to interface cables, there is a variety of interface to machine cables, each with a configuration dependent upon the individual machine being connected. When a machine "Y" cable is used in an installation, only the "Y" cable (not the extender or remote control panel connecting cables) is machine dependent. Figure 8.1 provides an overview of the logic interface and cable system.



8.3.1 TCI-2A Cartridge Interface

The TCI-2A Cartridge Interface (PR&E #99-165) was specifically designed for use with PR&E TOMCAT and Micromax cart machines. Each TCI-2A can accommodate up to three reproducers or recorder/reproducers. For a schematic of this interface, as well as a diagram of the console to interface cable (PR&E #99-38), see Section 8.4.

NOTE: If you already have TCI-2 interfaces for TOMCAT, they may be modified slightly to work with both TOMCAT and Micromax cart machines, as follows:

1. Replace resistors R1, R3, R5, R7 and R9 with 750 ohm, 1/2 watt resistors (PR&E #3-751).
2. On the component side of the PC board, cut the trace going to J4 pin 4.
3. Add an insulated jumper wire between J4 pin 1 and the trace that previously went to J4 pin 4 (which was cut in step 2).
4. Verify that resistor R14 is a 10M ohm, 1/4 watt resistor (PR&E #2-106).

8.3.2 CI-2 Cartridge Interface (+12 to +28 Volt Logic)

The CI-2 Cartridge Interface (PR&E #99-125-0) was designed for use with those commercial cart machines which use +12 to +28 volt logic. The CI-2 uses dry relay contacts for start and stop functions, and also serves as a capable logic interface for CD players and cassette machines. The CI-2 also routes machine status indicator feedback to the console module “OFF” lamp, mimicking machine READY, PAUSE or STOP indicators.

Each CI-2 can accommodate up to three machines. For a schematic of this interface, as well as a diagram of the console to interface cable (PR&E #99-38), see Section 8.4.

8.3.3 CI-2 Cartridge Interface (+5 Volt Logic)

The CI-2 Cartridge Interface (PR&E #99-125-1) was designed for use with those commercial cart machines which use +5 volt logic feedback. Its function is identical to the CI-2 Interface for +12 to +28 volt logic. For a schematic of this interface, as well as a diagram of the console to interface cable (PR&E #99-38), see Section 8.4.

8.3.4 TI-2 Tape Interface

The TI-2 Tape Interface (PR&E #99-111) was designed for use with those commercial reel to reel tape machines which use +12 to +28 volt logic. Each TI-2 accommodates one machine. For a schematic of this interface, as well as a diagram of the console to TI-2 interface cable (PR&E #99-464), see Section 8.4.

NOTE: This interface may also be used with cartridge machines. In this event, use console to interface

cable #99-38 if the replay lockout function is desired.

8.3.5 TT-3 Turntable Interface

The TT-3 Turntable Interface (PR&E #99-110) was designed for use with most commercial turntables. Each TT-3 can accommodate up to two turntables. For a schematic of this interface, as well as a diagram of the console to interface cable (PR&E #99-38), see Section 8.4.

8.3.6 WL-2 Warning Light Interface

The WL-2 Warning Light Interface (PR&E #99-143) is an opto-isolated switched AC relay designed to illuminate external studio and/or control room warning lights. This interface has two inputs (STUDIO and CONTROL ROOM), which are activated by 12 volt DC commands. Each input has a corresponding AC output. For a schematic of this interface, see Section 8.4.

NOTE: The WL-2 inputs are polarity sensitive, and will not work unless connected correctly.

8.3.7 Dual Relay Interface

The Dual Relay Interface (PR&E #99-419) consists of two separately controlled relays, which can be used for audio or control circuitry. For a schematic of this interface, see Section 8.4.

8.3.8 Cassette Skimmer Interface

The Cassette Skimmer Interface (PR&E #99-410) is used to create cassette recordings of selected console microphone inputs. One to four Microphone Input Modules may be connected to the skimmer, which will toggle up to two cassette tape machines from the pause mode into the record mode the instant a connected mic module is turned ON. When the mic module is turned OFF, the cassette tape machines toggle from the record mode into the pause mode. In this way, a recording of a personality or personalities may be created for later review.

NOTE: When the mic module is turned OFF, there is a one-second delay in the cassette machine toggling from the record mode to the pause mode. This allows for the recording of the voice-to-music transition.

Another method of controlling this interface is to connect the Control Room Monitor Module MUTE command to the cassette skimmer. When this is accomplished, the tape machine will be placed in record whenever a Microphone Input Module in the Control Room is turned ON.

For a schematic of this interface, see Section 8.4.

8.4 ACCESSORY SCHEMATICS

This section contains schematics for the various accessories described in this chapter, as follows:

- 8.4.1 Cart Recorder Remote Control Panel
- 8.4.2 Cassette and Tape Recorder Remote Control Panel
- 8.4.3 Power Supply Coupler Unit
- 8.4.4 TCI-2A Cartridge Interface
- 8.4.5 CI-2 Cartridge Interface
- 8.4.6 TI-2 Tape Interface
- 8.4.7 TT-3 Turntable Interface
- 8.4.8 WL-2 Warning Light Interface
- 8.4.9 Dual Relay Interface
- 8.4.10 Cassette Skimmer Interface
- 8.4.11 #99-38 Console To Interface Cable
- 8.4.12 #99-464 Console To TI-2 Interface Cable
- 8.4.13 #99-465 Console to CI-2 Interface Cable (for Studer A725, A727 and A730 CD Players)
- 8.4.14 #99-453 Control Cable, 9-Pin Male To Male
- 8.4.15 #99-454 Control Cable, 12-Pin Male To Male
- 8.4.16 #99-455 Control Cable, 24-Pin Male To Male

NOTE: On PR&E schematics, capacitor values are in microfarads (μF), unless otherwise specified, and resistors are 1/4 watt, 5%, unless otherwise specified.

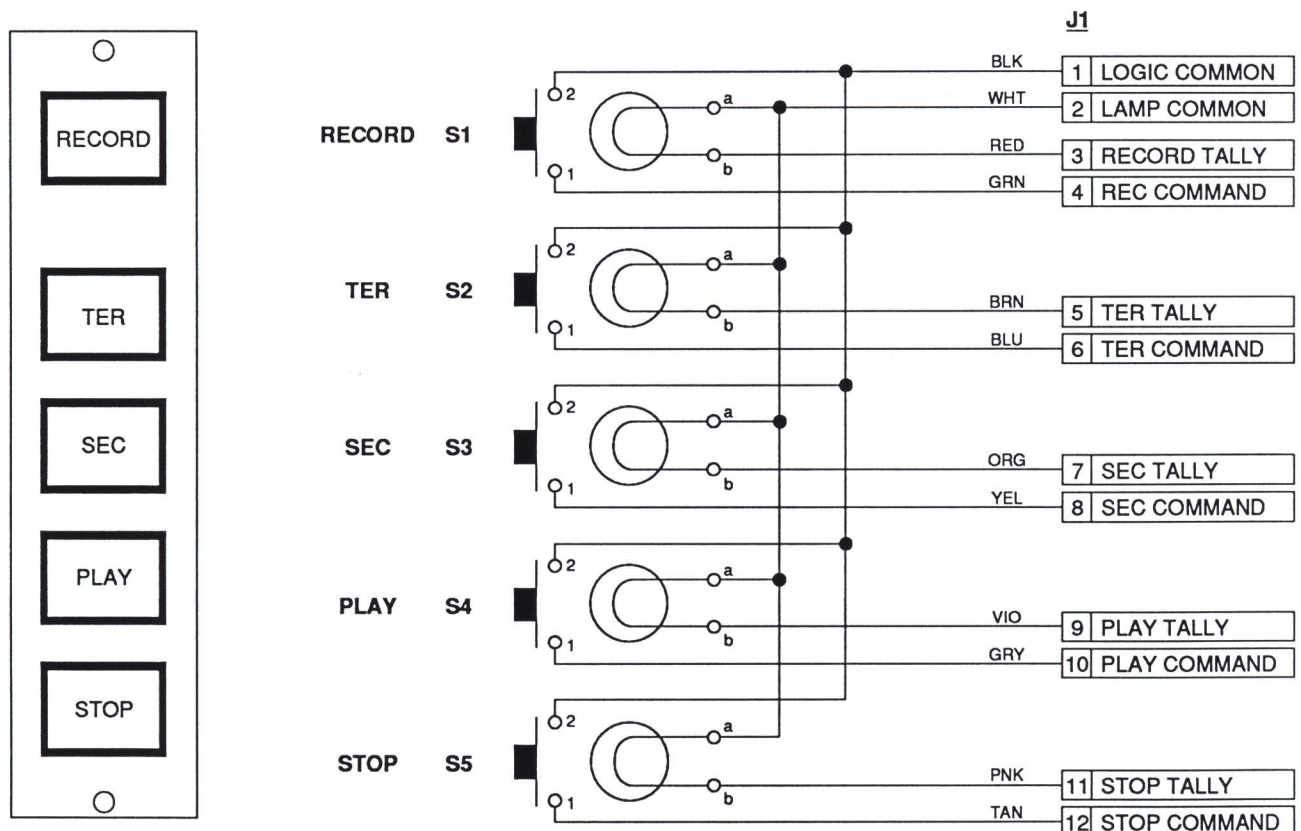
J1: HOUSING: 24-PIN FEMALE MOLEX #03-06-1242 (PR&E #15-715)
 TERMINALS: FEMALE MOLEX #02-06-1103 (PR&E #15-2)

S1-5: SWITCH: EAO #31-423 (PR&E #25-119)

LAMPS: FOR -1: 5V, #7348 (PR&E #12-64)
 FOR -2: 14V, #386 (PR&E #12-51)
 FOR -3: 28V, #388 (PR&E #12-52)

LENSES: RECORD (PR&E #25-120-1); TER (PR&E #25-121-3); SEC (PR&E #25-121-2):
 PLAY (PR&E #25-123-1); STOP (PR&E #25-122-1)

CABLE TYPE: 12-CONDUCTOR, BELDEN #8457 OR EQUIVALENT



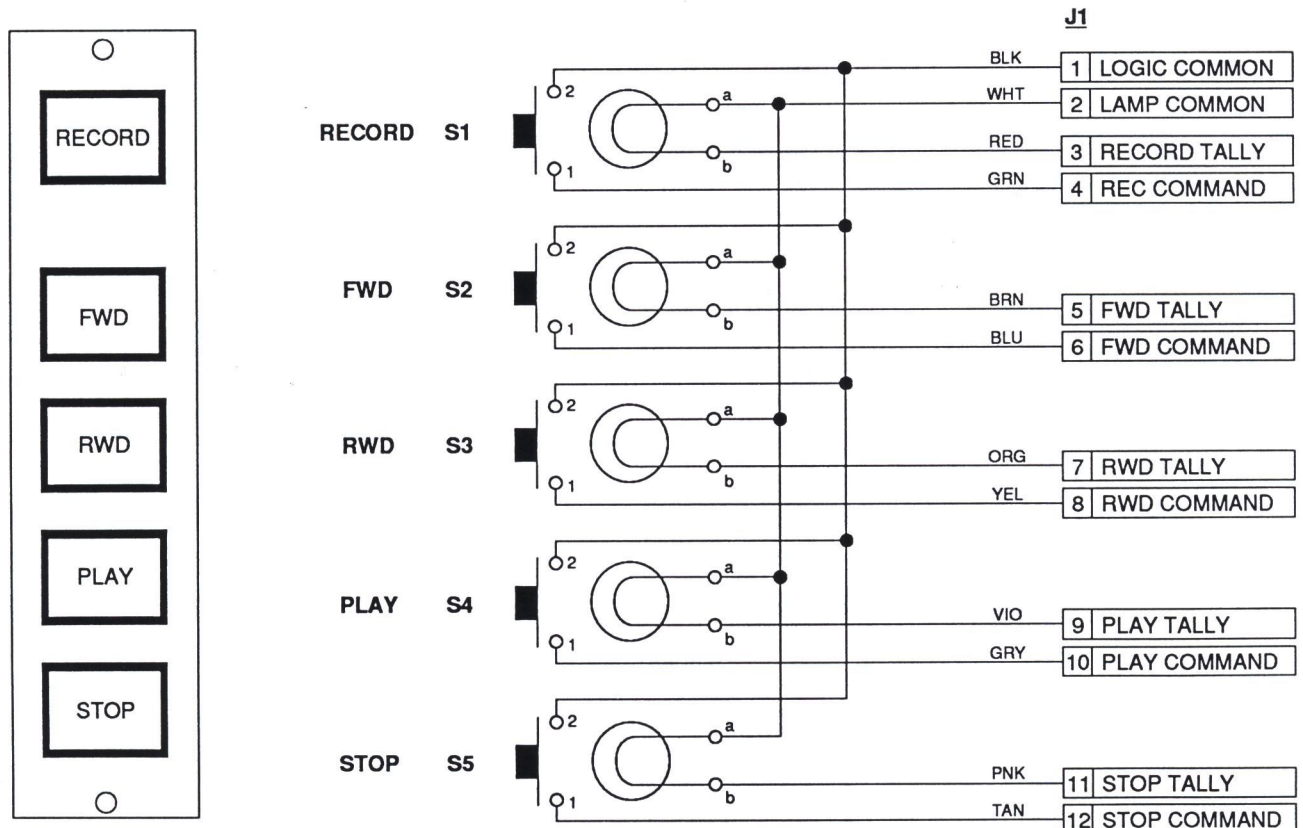
J1: HOUSING: 24-PIN FEMALE MOLEX #03-06-1242 (PR&E #15-715)
 TERMINALS: FEMALE MOLEX #02-06-1103 (PR&E #15-2)

S1-5: SWITCH: EAO #31-423 (PR&E #25-119)

LAMPS: FOR -1: 5V, #7348 (PR&E #12-64)
 FOR -2: 14V, #386 (PR&E #12-51)
 FOR -3: 28V, #388 (PR&E #12-52)

LENSES: RECORD (PR&E #25-120-1); FWD (PR&E #25-125-6); RWD (PR&E #25-125-7):
 PLAY (PR&E #25-123-1); STOP (PR&E #25-122-1)

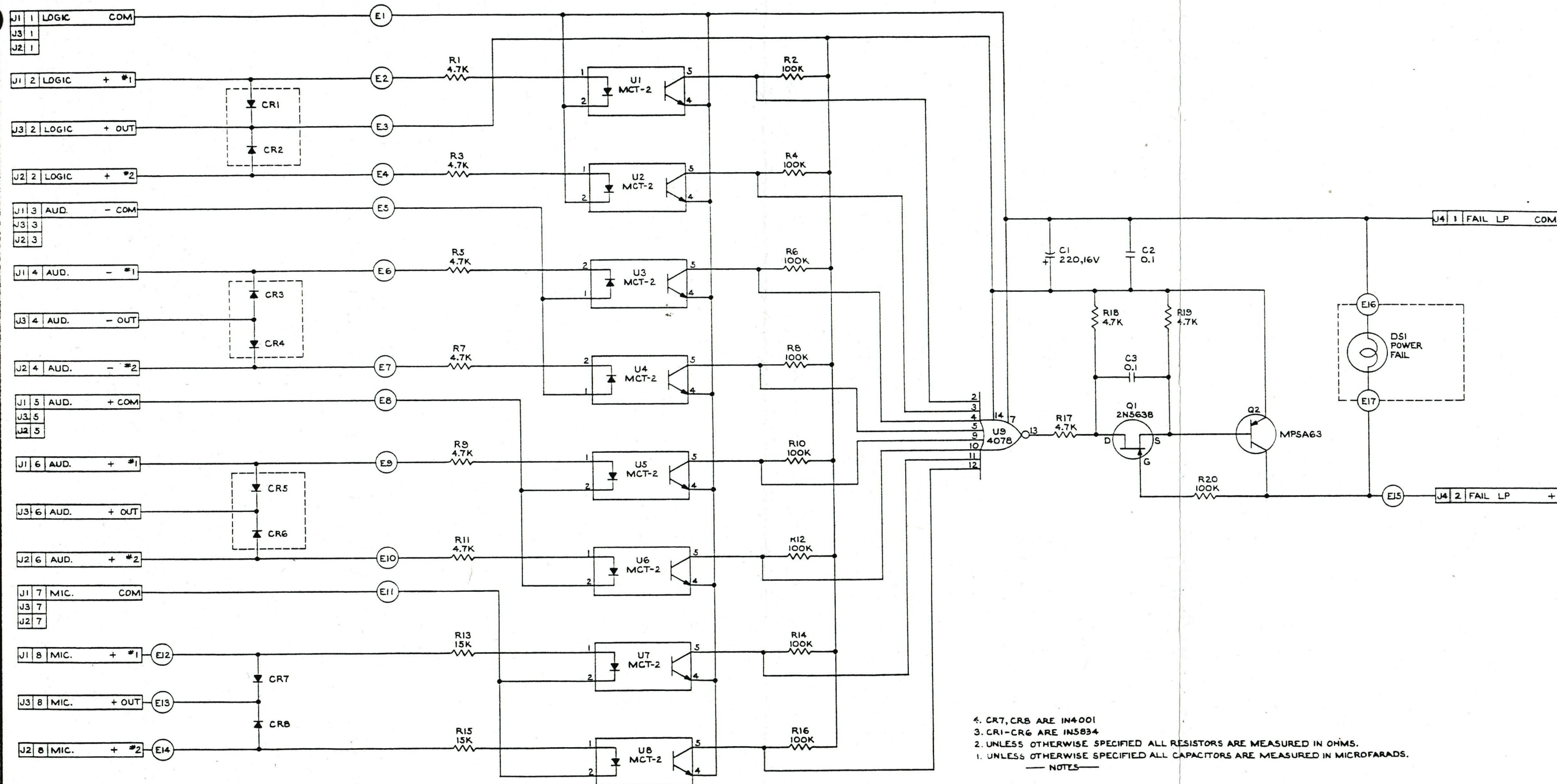
CABLE TYPE: 12-CONDUCTOR, BELDEN #8457 OR EQUIVALENT



8.4.2 CASSETTE AND TAPE RECORDER REMOTE CONTROL PANEL (PR&E #99-760-X)

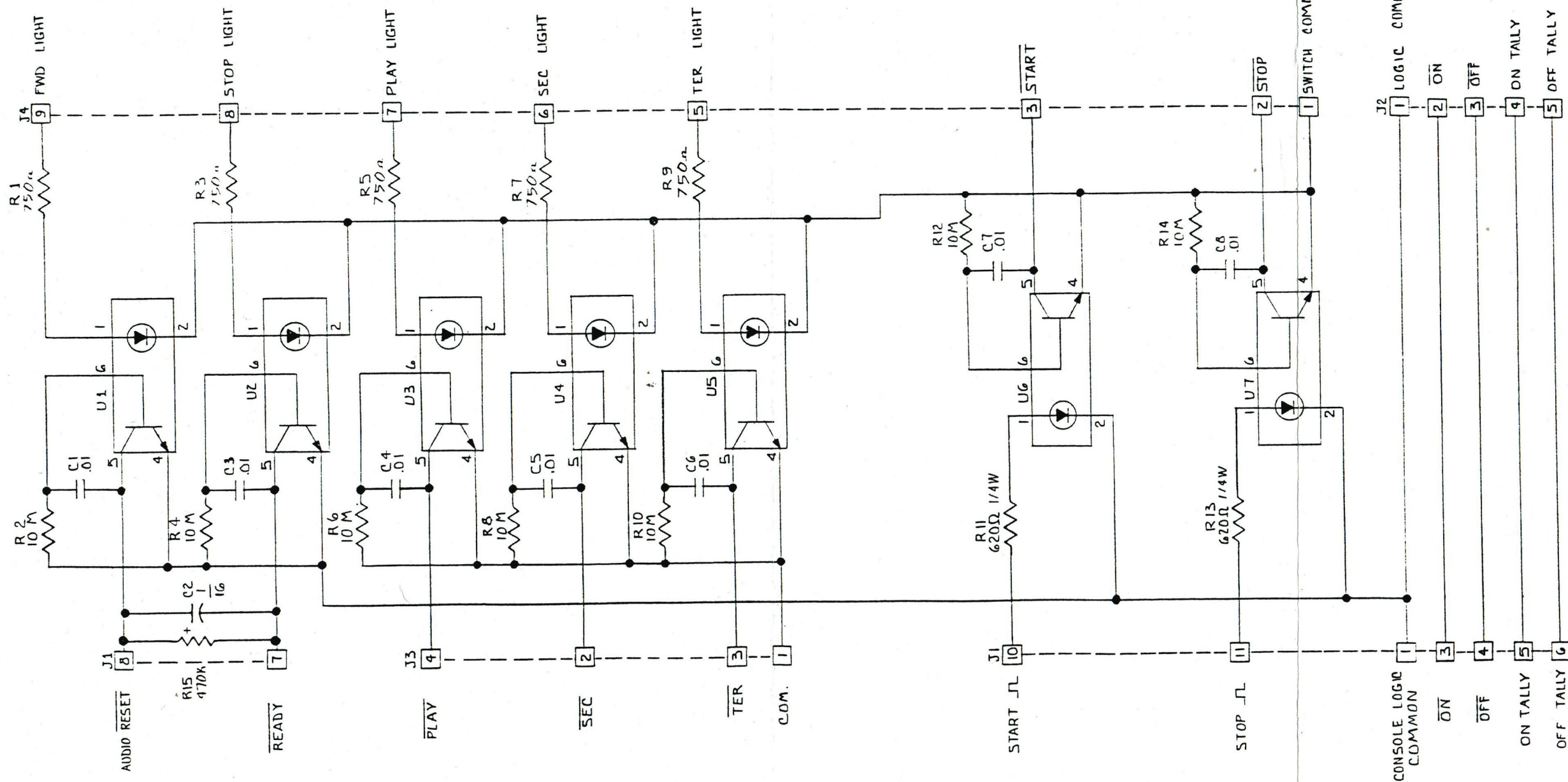


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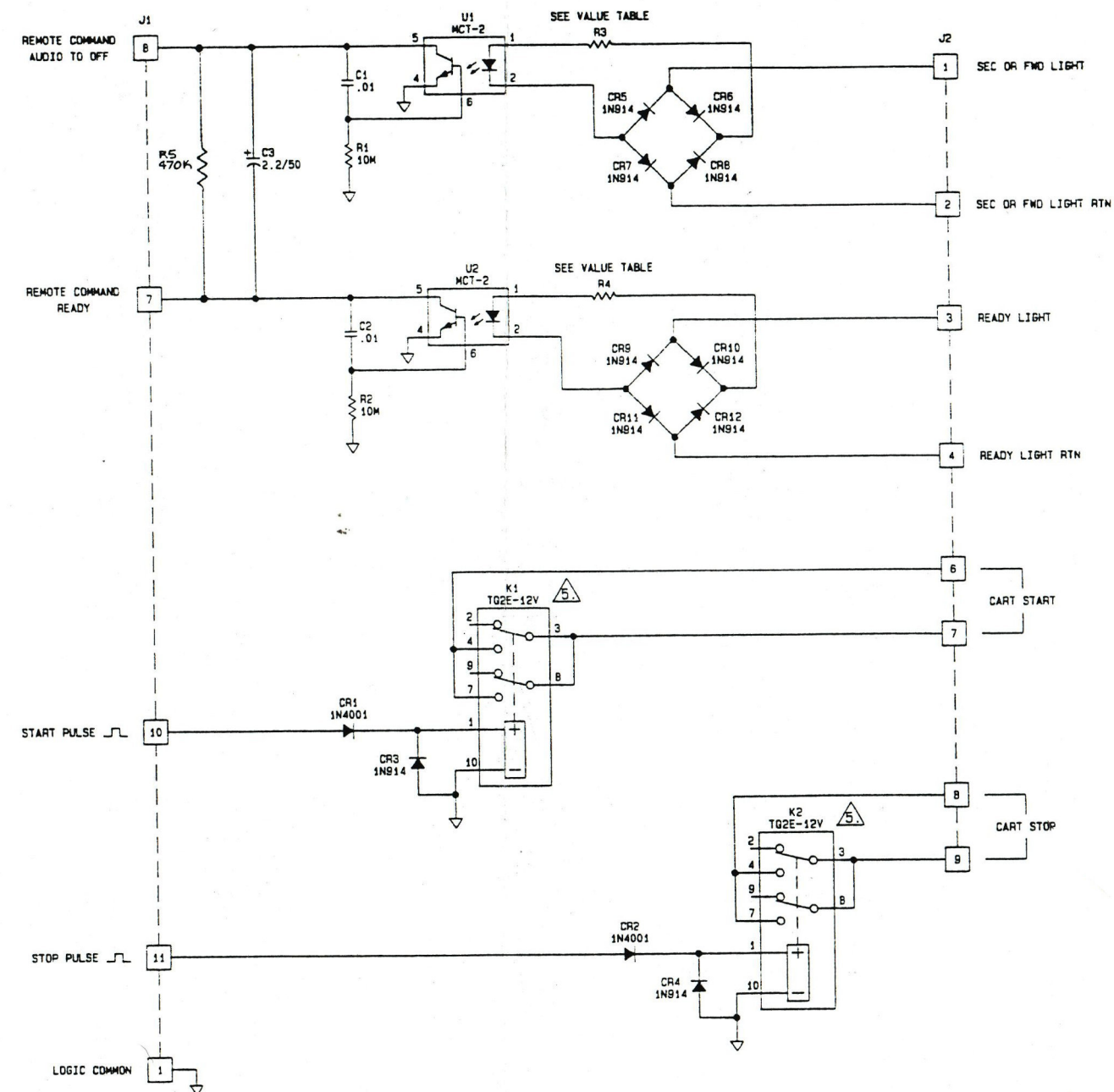


8.4.3 POWER SUPPLY COUPLER UNIT

92-818A



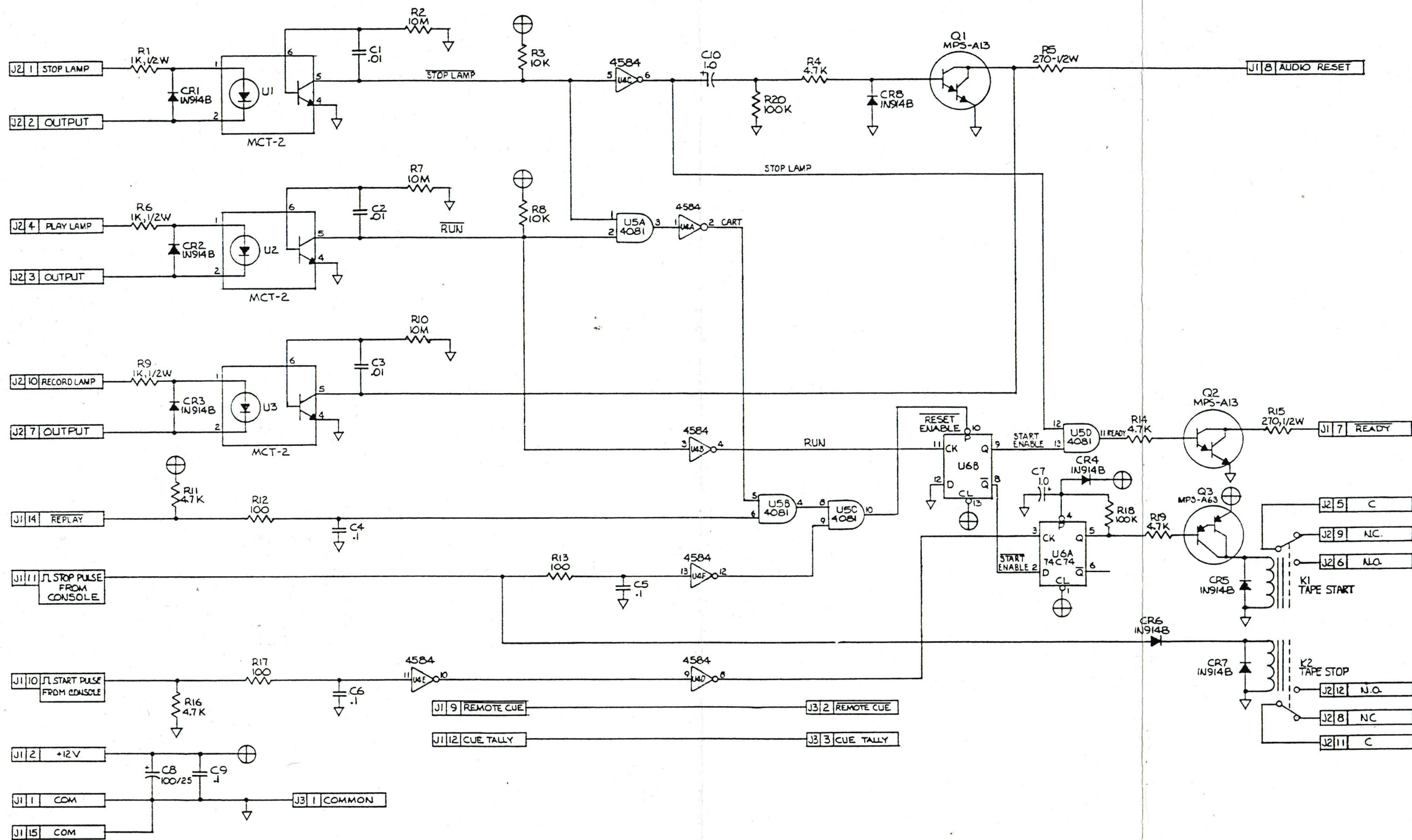
2. U1 THRU U7 ARE TYPE MCT-2.
 1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4 W, 5%,
 ALL CAPACITORS ARE MEASURED IN MICROFARADS
 — NOTES —



- △ PC BOARDS WITH REV A & B USES AZ 530-09-2 RELAYS.
 4. FOR PCA SEE DRAWING 90-170 LATEST REV.
 3. NP=NONPOLARIZED
 2. ALL CAPACITORS ARE MEASURED IN MICROFARADS.
 1. ALL RESISTORS ARE 1/4W, 5%.
 NOTES: UNLESS OTHERWISE SPECIFIED.

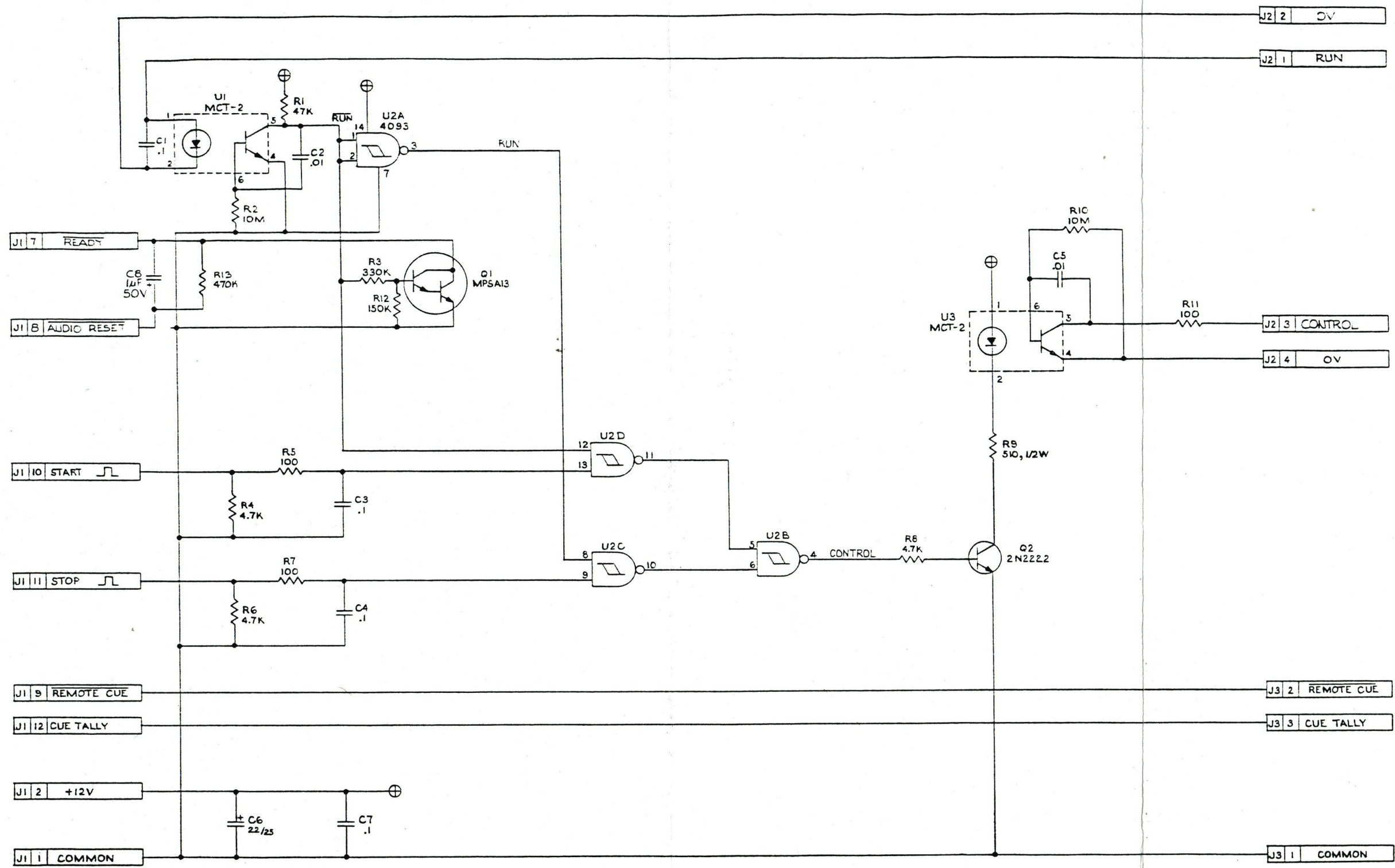
VALUE TABLE			
DASH No	REF DES	VALUE	
90-125-0	R3	1K	1/2W
	R4	1K	1/2W
90-125-1	R3	100Ω	1/4W
	R4	100Ω	1/4W

8.4.5 CI-2 CARTRIDGE INTERFACE



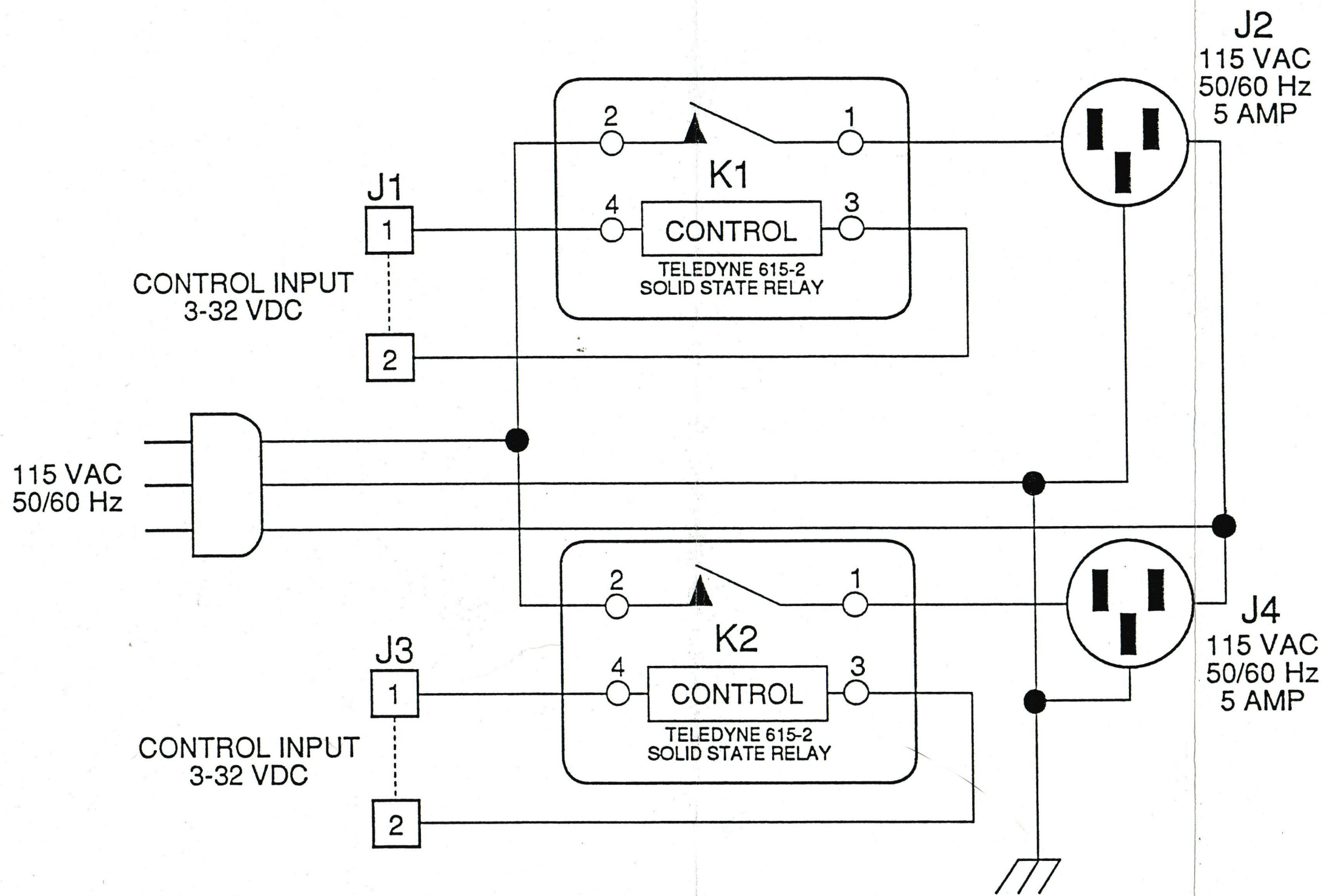
8.4.6 T1-2 TAPE INTERFACE

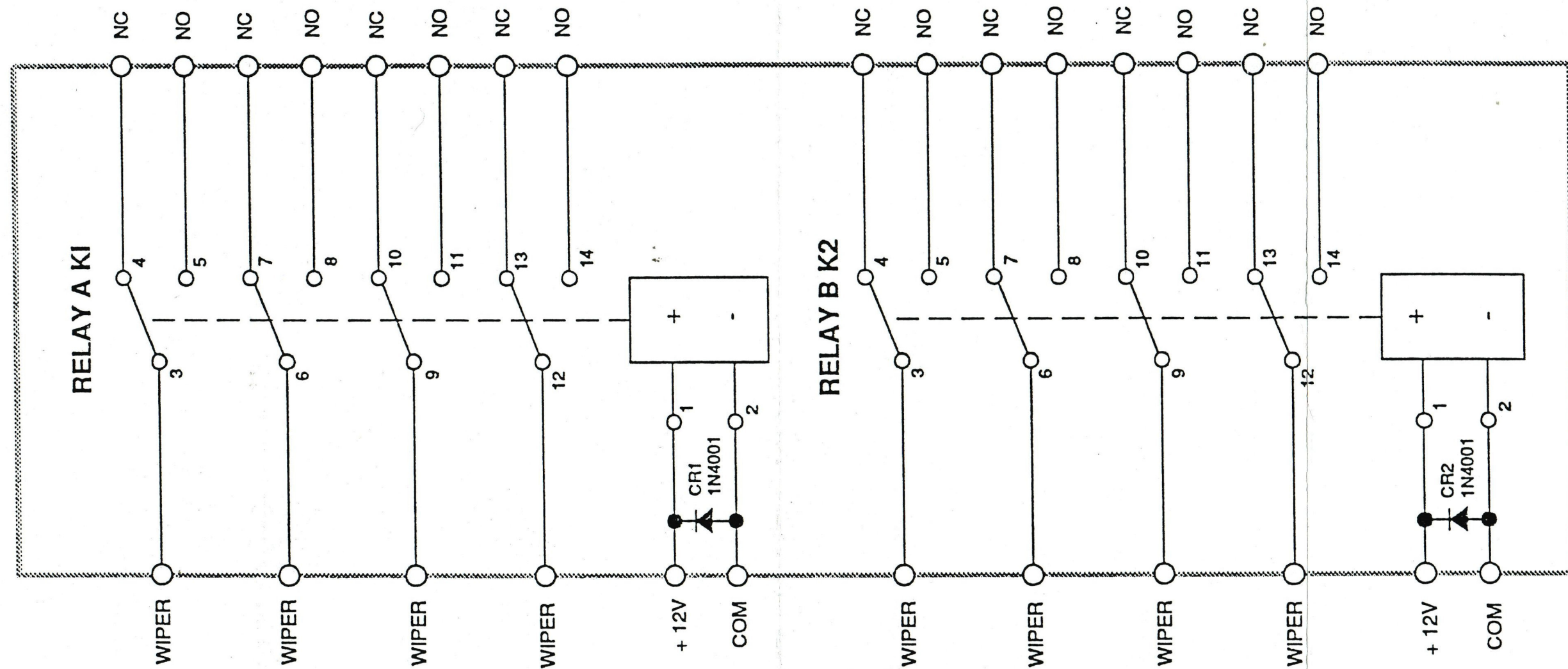
90-167A



2. ALL CAPACITORS ARE MEASURED IN MICROFARADS
 1. ALL RESISTORS ARE MEASURED IN OHMS, 1/4W, 5%
 NOTES: UNLESS OTHERWISE SPECIFIED

8.4.7 TT-3 TURNTABLE INTERFACE



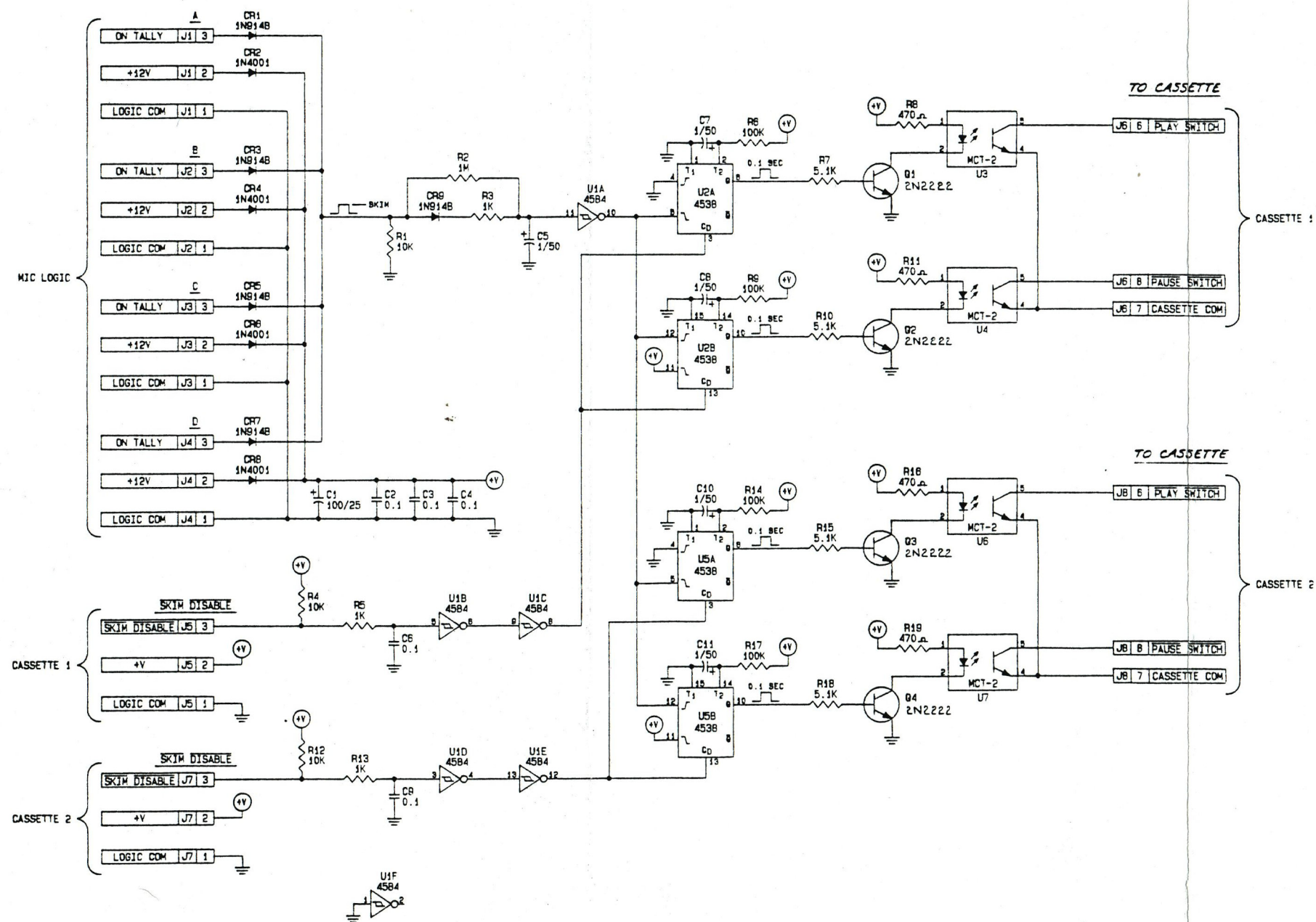


8.4.9 DUAL RELAY INTERFACE



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4. FOR PCA SEE DRAWING 85-410 LATEST REV.
 3. +V = 11.4V.
 2. ALL CAPACITORS ARE MEASURED IN MICROFARADS.
 1. ALL RESISTORS ARE 1/4W. 5%.

NOTES: UNLESS OTHERWISE SPECIFIED.

REF	DES	PIN No.
U1	14	7
U2 U5	16	8

P1, P2: HOUSING: 15-PIN MALE MOLEX #03-06-2152 (PR&E #15-607)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

CABLE TYPE: 15-CONDUCTOR, BELDEN #8458 OR EQUIVALENT

CABLE LENGTH: DASH LEVEL X 3 FEET

P1	P2	WIRE COLOR
1	1	BLK
2	2	WHT
3	3	RED
4	4	GRN
5	5	ORG
6	6	BLU
7	7	WHT/BLK
8	8	RED/BLK
9	9	GRN/BLK
10	10	ORG/BLK
11	11	BLU/BLK
12	12	BLK/WHT
13	13	RED/WHT
14	14	GRN/WHT
15	15	BLU/WHT



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**8.4.11 #99-38 CONSOLE TO INTERFACE
CABLE**

P1, P2: HOUSING: 15-PIN MALE MOLEX #03-06-2152 (PR&E #15-607)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

CABLE TYPE: 15-CONDUCTOR, BELDEN #8458 OR EQUIVALENT

CABLE LENGTH: DASH LEVEL X 3 FEET

P1	P2	WIRE COLOR
1	1	BLK
2	2	WHT
3	3	RED
4	4	GRN
5	5	ORG
6	6	BLU
7	7	WHT/BLK
8	8	RED/BLK
9	9	GRN/BLK
10	10	ORG/BLK
11	11	BLU/BLK
12	12	BLK/WHT
13	13	RED/WHT

JUMPERS		
P1 14	P1 15	WHT JUMPER
P2 14	P2 15	WHT JUMPER

P1, P2: HOUSING: 15-PIN MALE MOLEX #03-06-2152 (PR&E #15-607)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

CABLE TYPE: 4 CONDUCTOR, BELDEN #8458 OR EQUIVALENT

P1*	P2*	WIRE COLOR
1	1	BLK
5	10	WHT
7	7	RED
8	8	GRN

***NOTE** : P1 IS THE CONSOLE CONNECTOR; P2 IS THE INTERFACE CONNECTOR.

P1, P2: HOUSING: 9-PIN MALE MOLEX #03-06-2092 (PR&E #15-604)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

CABLE TYPE: 9-CONDUCTOR, BELDEN #9423 OR EQUIVALENT

CABLE LENGTH: DASH LEVEL X 3 FEET

P1	P2	WIRE COLOR
1	1	BLK
2	2	WHT
3	3	RED
4	4	GRN
5	5	BRN
6	6	BLU
7	7	ORG
8	8	YEL
9	9	VIO



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**8.4.14 #99-453 CONTROL CABLE,
9-PIN MALE TO MALE**

P1, P2: HOUSING: 12-PIN MALE MOLEX #03-06-2122 (PR&E #15-605)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

CABLE TYPE: 12-CONDUCTOR, BELDEN #8457 OR EQUIVALENT

CABLE LENGTH: DASH LEVEL X 3 FEET

P1	P2	WIRE COLOR
1	1	BLK
2	2	WHT
3	3	RED
4	4	GRN
5	5	BRN
6	6	BLU
7	7	ORG
8	8	YEL
9	9	VIO
10	10	GRY
11	11	PNK
12	12	TAN

P1, P2: HOUSING: 24-PIN MALE MOLEX #03-06-2242 (PR&E #15-807)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

CABLE TYPE: 25-CONDUCTOR, BELDEN 8458 OR EQUIVALENT

CABLE LENGTH: DASH LEVEL X 3 FEET

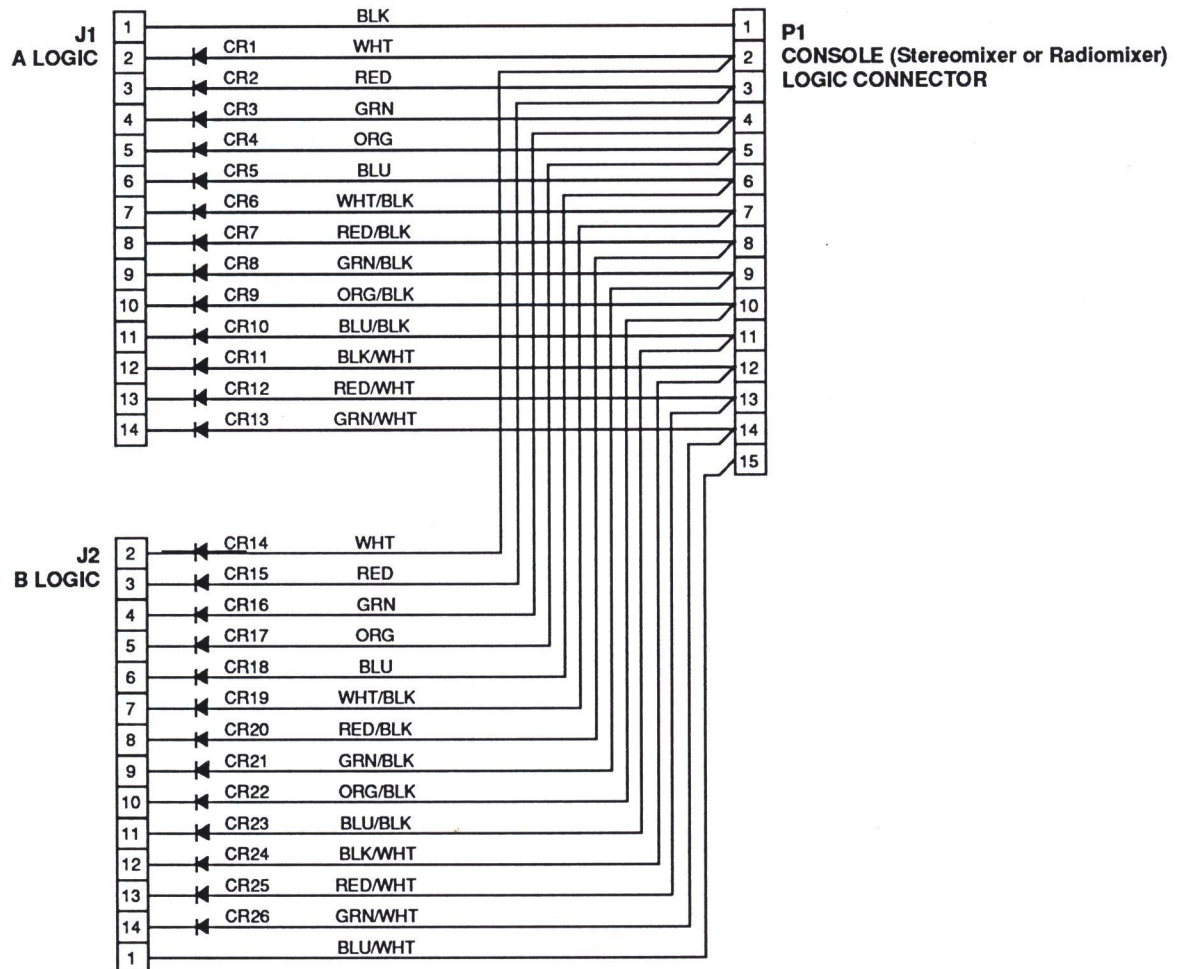
P1	P2	WIRE COLOR
1	1	BLK
2	2	WHT
3	3	RED
4	4	GRN
5	5	ORG
6	6	BLU
7	7	WHT/BLK
8	8	RED/BLK
9	9	GRN/BLK
10	10	ORG/BLK
11	11	BLU/BLK
12	12	BLK/WHT
13	13	RED/WHT
14	14	GRN/WHT
15	15	BLU/WHT
16	16	BLK/RED
17	17	WHT/RED
18	18	ORG/RED
19	19	BLU/RED
20	20	RED/GRN
21	21	ORG/GRN
22	22	BLK/WHT/RED
23	23	WHT/BLK/RED
24	24	RED/BLK/WHT

P1: HOUSING: 15 PIN MALE MOLEX #03-06-2152 (PR&E #15-607)
TERMINALS: MALE MOLEX #02-06-2103 (PR&E #15-3)

J1,J2: HOUSING: 15 PIN FEMALE MOLEX #03-06-1152 (PR&E #15-712)
TERMINALS: FEMALE MOLEX #02-06-1103 (PR&E #15-2)

CABLE TYPE: 15 COND., BELDEN #8458

DIODES: 1N4002 (PR&E #11-26)



NOTE: THE PR&E PART NUMBER FOR THIS ASSEMBLY IS 99-580.



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8.4.17 A/B LOGIC "Y" CABLE