

INSTRUCTION MANUAL

250 Series
Audio Consoles

1 November 1981

IM No. 597-0018



BROADCAST ELECTRONICS INC.

IMPORTANT INFORMATION

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Claims for loss or damage will not be honored without proper notification of inspection by the carrier.

TECHNICAL ASSISTANCE AND REPAIR SERVICE

Technical assistance is available from Broadcast Electronics by letter or prepaid telephone or telegram. Equipment requiring repair or overhaul should be sent by common carrier, prepaid, insured and well protected. Do not mail equipment. We can assume no liability for inbound damage, and necessary repairs become the obligation of the shipper. Prior arrangement is necessary. Contact Customer Service Department for a Return Authorization.

FOR TECHNICAL ASSISTANCE

Phone (217) 224-9600 Customer Service

WARRANTY ADJUSTMENT

Broadcast Electronics, Inc. warranty is included in the Terms and Conditions of Sale. In the event of a warranty claim, replacement or repair parts will be supplied F.O.B. factory. At the discretion of Broadcast Electronics, the customer may be required to return the defective part or equipment to Broadcast Electronics, Inc. F.O.B. Quincy, Illinois. Warranty replacements of defective merchandise will be billed to your account. This billing will be cleared by a credit issued upon return of the defective item.

RETURN, REPAIR AND EXCHANGES

Do not return any merchandise without our written approval and Return Authorization. We will provide special shipping instructions and a code number that will assure proper handling and prompt issuance of credit. Please furnish complete details as to circumstances and reasons when requesting return of merchandise. All returned merchandise must be sent freight prepaid and properly insured by the customer.

REPLACEMENT PARTS

Replacement and Warranty Parts may be ordered from the address below. Be sure to include equipment model and serial number and part description and part number.

Broadcast Electronics, Inc.
4100 N. 24th St., P.O. Box 3606
Quincy, Illinois 62305
Tel: (217) 224-9600
Telex: 25-0142
Cable: BCST ELECT QUI

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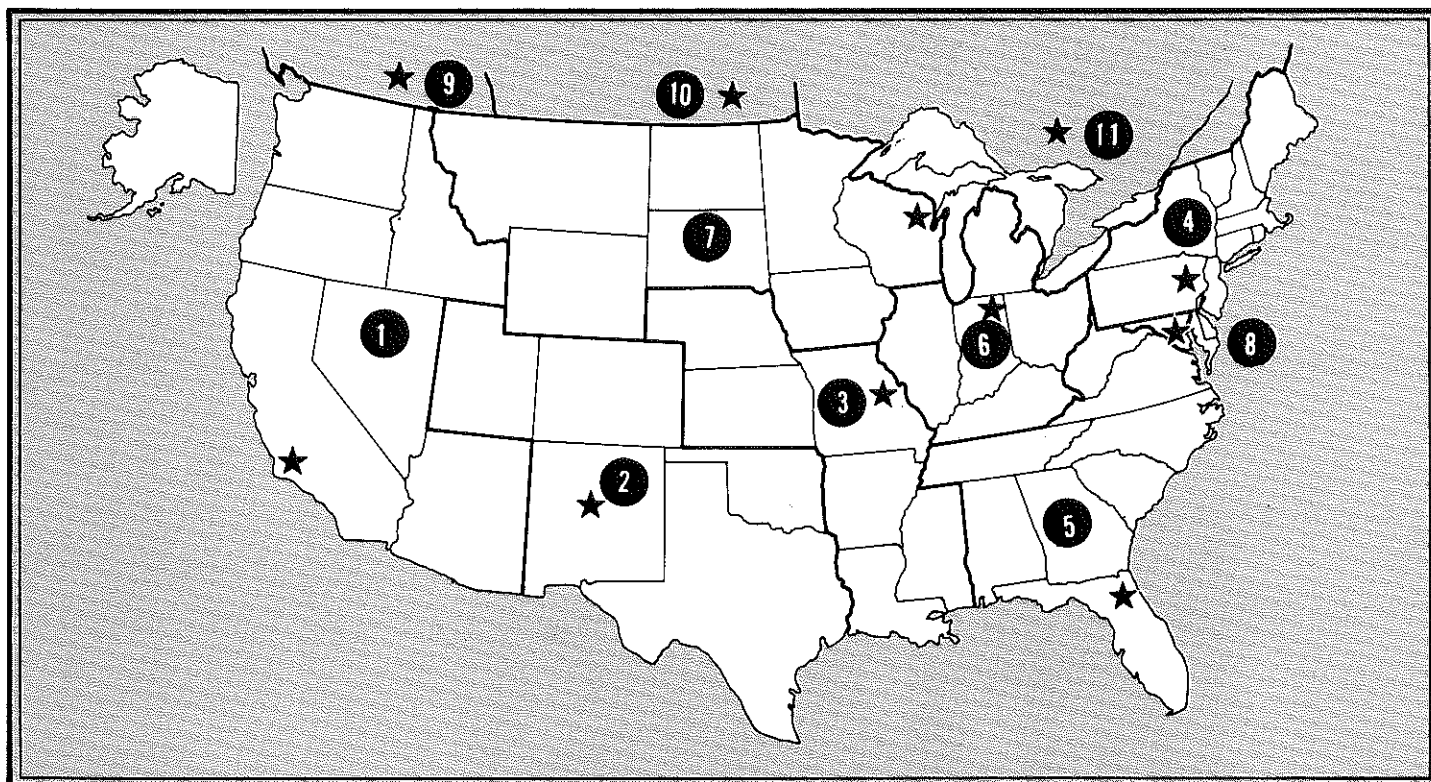
MODIFICATIONS

Broadcast Electronics, Inc. reserves the right to modify the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

AUTHORIZED SERVICE CENTERS

• Equipped to serve you with Broadcast Electronics parts and repairs—both in and out of warranty

• Regional depots reduce parts delivery time and repair turn-around time



UNITED STATES

1. Riggins Electronics
3272 E. Willow St.
Long Beach, CA 90815
Ph: (213) 598-7007

States Covered:

Alaska
Arizona
California
Hawaii
Nevada
Oregon
Washington

2. Dyma Engineering
213 Pueblo Del Sur
Box 1697
Taos, NM 87571
Ph: (505) 758-8686

States Covered:

Colorado
New Mexico
Oklahoma
Texas
Utah

3. TV Engineering Corporation
580 Goddard Ave.
Chesterfield, MO 63017
Ph: (314) 532-4700

States Covered:

Arkansas Missouri
Kansas Mississippi
Louisiana Nebraska

4. Radio Systems Design
5131 West Chester Pike
Edgemont, PA 19028
Ph: (215) 356-4700

States Covered:

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Maine
Massachusetts
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
Vermont

5. Southeast Electronics
1125 Rosselle St.
P. O. Box 41308
Jacksonville, FL 32203
Ph: (904) 356-3007

States Covered:

Alabama
Florida
Georgia
North Carolina
South Carolina
Tennessee
Virginia
West Virginia

6. Allied Broadcasting Equipment
635 South E. St.
Richmond, IN 47374
Ph: (317) 962-8596

States Covered:

Illinois
Indiana
Kentucky
Michigan
Ohio

7. Electronic Industries
19 East Irving Ave.
Oshkosh, WI 54902
Ph: (414) 235-8930

States Covered:

Iowa
Minnesota
Montana
North Dakota
South Dakota
Wisconsin
Wyoming

8. Midwest Telecommunications
4720-B Boston Way
Lanham (Wash., D.C.) MD 20801
Ph: (301) 577-4903

States Covered:

District of Columbia
Delaware
Maryland

CANADA

9. Nortec West, Ltd.
325 West Fifth Avenue
Vancouver V5Y 1J6,
B.C., Canada
Ph: (604) 872-8525

Provinces Covered:

British Columbia
Yukon Territory

10. Nortec West, Ltd.
7056B Farrell Road
Calgary, Alta., Canada
Ph: (403) 252-8141

Provinces Covered:

Alberta
Manitoba
NW Territory
Saskatchewan

11. J-Mar Electronics, Ltd.
6 Banigan Drive
Toronto M4H 1E9,
Ontario, Canada
Ph: (416) 421-9080

Provinces Covered:

New Brunswick
Nova Scotia
Ontario
Quebec

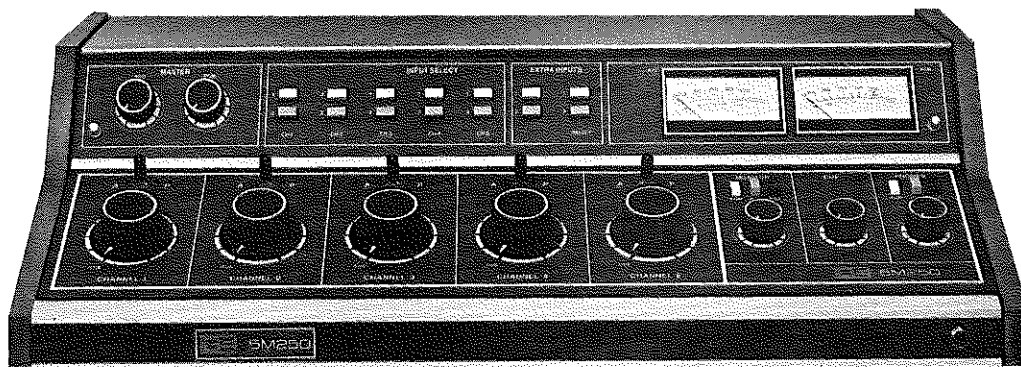


BROADCAST ELECTRONICS INC.

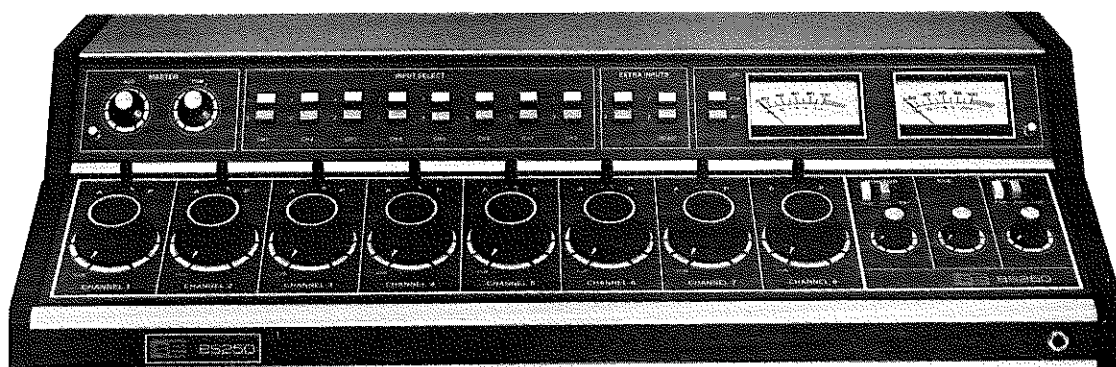
4100 N. 24th ST. • P.O. BOX 3606 • QUINCY, IL 62301

TELEX 250142 • CABLE: BCST ELECT QUI • PHONE 217-224-9600

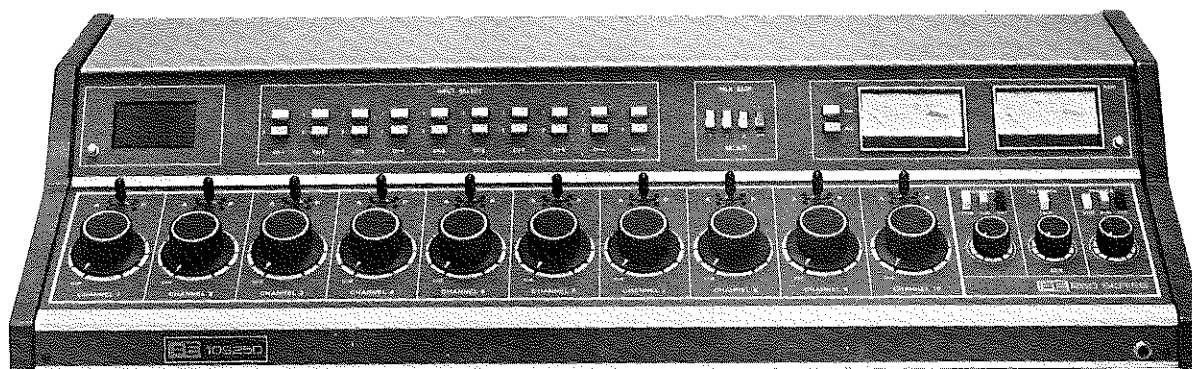
INSTRUCTION MANUAL
250 SERIES
AUDIO CONSOLES



5M250



8S250



10S250

ORDERING INFORMATION

MODEL	PART NO.	DESCRIPTION
5M250	938-0541	5-Mixer Deluxe Monophonic Console Step Type Attenuators, Dual Channel
5S250	938-0540	5-Mixer Deluxe Stereophonic Console Step Type Attenuators, Dual Channel
8M250	938-0841	8-Mixer Deluxe Monophonic Console Step Type Attenuators, Dual Channel
8S250	938-0840	8-Mixer Deluxe Stereophonic Console Step Type Attenuators, Dual Channel
10M250	938-1041	10-Mixer Deluxe Monophonic Console Step Type Attenuators, Dual Channel
10S250	938-1040	10-Mixer Deluxe Stereophonic Console Step Type Attenuators, Dual Channel

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SECTION I GENERAL INFORMATION

1-1. INTRODUCTION

This section contains a general description of the Broadcast Electronics 250 Series Audio Consoles.

1-2. EQUIPMENT DESCRIPTION

The Broadcast Electronics 250 Series Audio Consoles provide 5, 8, and 10 mixer devices in monophonic and stereophonic configurations. Each console represents an economical yet superior performing console designed to switch and mix multiple audio sources in AM, FM, and TV broadcast installations, CATV systems, recording studios, and other facilities. All of the consoles are designed with features that are most needed to provide operating flexibility, installation simplicity, and service convenience.

All amplifiers are mounted on plug in circuit boards. Integrated circuits are used extensively. All preamplifiers are identical and each preamplifier may be preset to accept either balanced or unbalanced, high-level or low-level inputs.

A cue detent position is installed on all mixers, in the extreme counter clockwise position. In stereophonic consoles, both the left and right channels are fed to the cue system. All stereophonic consoles will accept monaural inputs to the left channel and can be used to feed a monaural signal to both the left and right channels.

All consoles are designed for dual channel operation with the audition and program channels identical in operating specifications. (In certain models the audition output amplifier is optional. However, all wiring is in place so this capability may be added at a later date with a plug-in circuit board). A third output is available as an option in the stereo models; a monophonic signal derived from both stereophonic program channels.

The switching of signals to the audition or program channel is accomplished electronically with field effect transistors. The FET's provide excellent isolation when off and fast acting mixing when on.

Built-in amplifiers are provided for up to 3 monitor speakers. These outputs are connected through relays which can be activated to mute the speaker when used next to a live microphone. Separate contacts are provided on the relay for controlling a studio "on-the-air" light.

Separate amplifiers drive a cue speaker and headphone system. An internal cue speaker and connections for an external speaker are provided. Both a front panel headphone jack and parallel external phones connection is incorporated.

For ease in installation and interconnection, most connections are made to screw terminals. All terminals are labeled for quick identification. Since all connections are made inside the cabinet, wiring is protected from dirt, tampering, or accidental damage.

Table 1-1. Electrical and Physical Specifications

PARAMETER	MODEL NO.	DESCRIPTION
No. of Mixers and Inputs	5M250 & 5S250 8M250 & 8S250 10M250 & 10S250	5 Mixers, 10 Inputs 8 Mixers, 16 Inputs 10 Mixers, 20 Inputs
Mixer Type	All 250 Models	Step Attenuator
Line Input	All 250 Models	54 k Ohm, Balanced Bridging, -20 dBm minimum, +20 dBm maximum
Mic. Input	All 250 Models	150 Ohms, Balanced, -65 dBm minimum, -38 dBm maximum
<u>Output</u>		
Level	All 250 Models	600 Ohm Balanced, +8 dBm for zero VU, +18 dBm maximum
Frequency Response	All 250 Models	± 0.5 dB, 30 Hz to 20 kHz
Distortion	All 250 Models	0.05% THD and IM at +18 dBm Output 30 Hz to 20 kHz
Noise	All 250 Models	70 dB below +18 dBm Output with -50 dBm Input to any low level input 20 kHz bandwidth
<u>Monitor</u>		
Output Level	All 250 Models	8 Watts per channel
Frequency Response	All 250 Models	± 0.75 dB, 50 Hz to 20 kHz
Distortion	All 250 Models	0.75% or less, 30 Hz to 20 kHz, at rated output and load
Cue	All 250 Models	1.0 Watt at 8 Ohms
Headphone	All 250 Models	1.0 Watt RMS per channel
Muting Relays	All 250 Models	3 Muting Relays
VU Meters	5M250 & 8M250 5S250 & 8S250 10M250 & 10S250	1 PGM/1 AUD L PGM/AUD & R PGM/AUD L PGM/AUD & R PGM/AUD

Table 1-1. Electrical and Physical Specifications

PARAMETER	MODEL NO.	DESCRIPTION
Power Requirements	All 250 Models	115 Vac, 50/60 Hz (230 Vac, 50/60 Hz optional)
Dimensions	5M250 & 5S250	29 W x 15.75 D x 8.25 H (inches) 73.66 W x 40.0 D x 20.96 H (centimeters)
	8M250 & 8S250	33 W x 15.75 D x 8.25 H (inches) 83.82 W x 40.0 D x 20.96 H (centimeters)
	10M250 & 10S250	39 W x 15.75 D x 8.25 H (inches) 88.9 W x 40.0 D x 20.9 H (centimeters)
Weight (Packed)	5M250 & 5S250 8M250 & 8S250 10M250 & 10S250	55 pounds (25 kilograms) 60 pounds (27.3 kilograms) 69 pounds (31.3 kilograms)

SECTION II INSTALLATION

2-1. INTRODUCTION

This section contains information required for installation and preliminary checkout of the Broadcast Electronics 250 Series Audio Consoles.

2-2. UNPACKING

The equipment becomes the property of the customer when the equipment is delivered to the carrier. Carefully unpack the console. Perform a visual inspection to determine that no apparent damage has been incurred during shipment. All shipping materials should be retained until it is determined that the unit has not been damaged. Claims for damaged equipment must be promptly filed with the carrier or the carrier may not accept the claim.

The contents of the shipment should be as indicated on the packing lists. If the contents are incomplete, or if the unit is damaged electrically or mechanically, notify both the carrier and Broadcast Electronics, Inc.

2-3. INSTALLATION

Installation of the console requires the following three steps:

A. Determine the physical location of the console in relation to other associated equipment. Specifically, requirements for operator convenience, cable access, and electrical interconnection must be considered. General information on planning the console installation is contained in paragraph 2-4. (See Figures 2-1 and 2-2).

B. Each individual installation requires special interconnections and jumpers. This data is described in paragraph 2-6.

C. Several adjustments must be accomplished prior to equipment operation. Refer to paragraph 2-22.

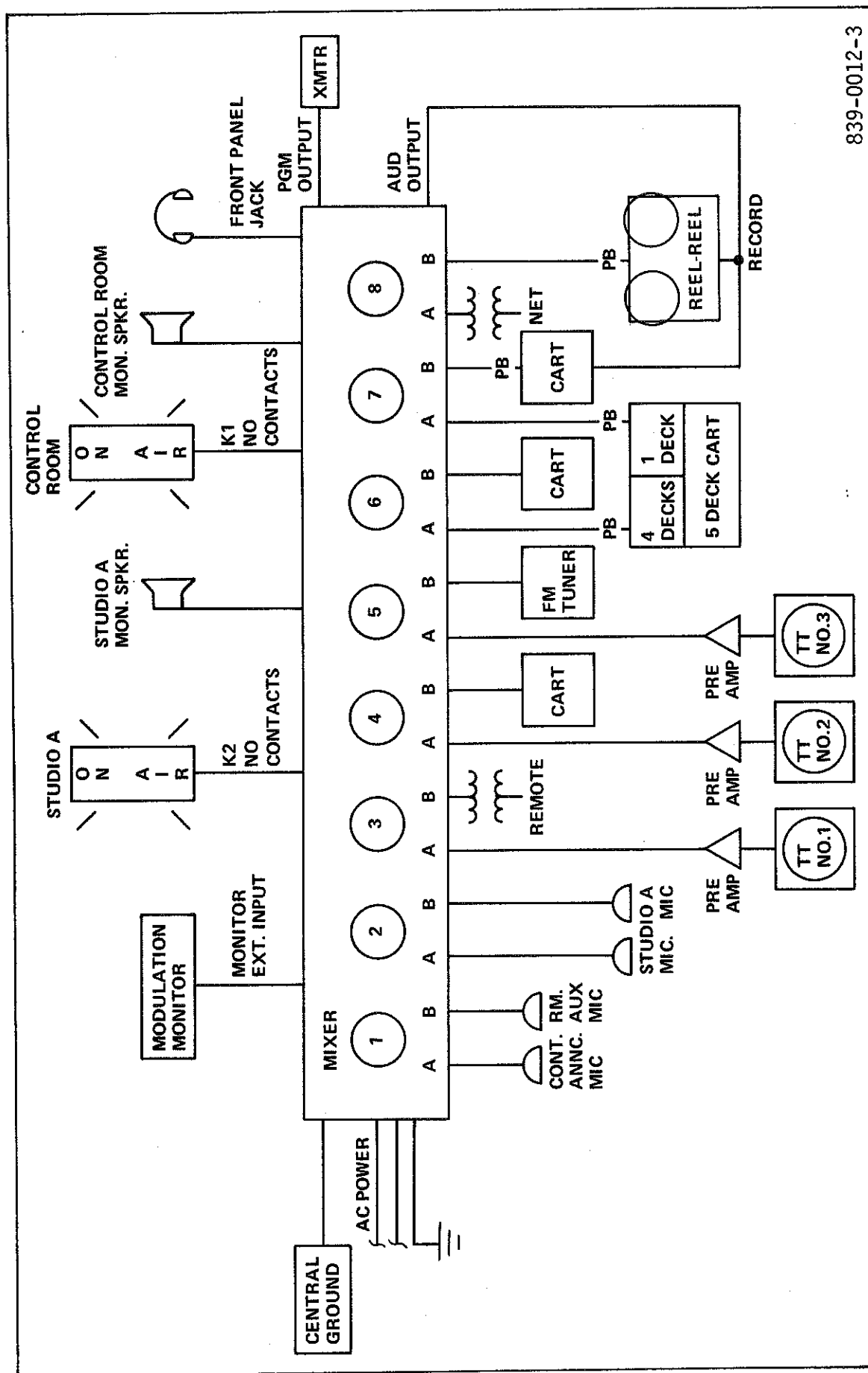
2-4. GENERAL INFORMATION

All Broadcast Electronics 250 Series Audio Consoles are intended for desk-top mounting. All connections are made inside the console cabinet. Cable access is provided through cut-outs located in the bottom of the cabinet. If mounted flush on a table top, machine openings are required in the table top beneath the console (see Figures 2-3 through 2-8).

2-5. ASSIGNMENTS OF INPUTS AND OUTPUTS. Electrically, the most important consideration in assigning the mixer inputs is the level of the source signal. Both inputs to a mixer must be the same level class (microphone or line).

In stereophonic consoles, the inputs may be monophonic or stereophonic, however both inputs to a single mixer must be either monophonic or stereophonic. One input cannot be monophonic and the other input stereophonic.

Input sources used simultaneously (mixed), cross-faded, or used in a rapid sequence should all be on separate mixers. Conversely, two inputs rarely used in conjunction with each other may be assigned to the same mixer.



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Figure 2-1. Representative Studio Employing a Monophonic Audio Console

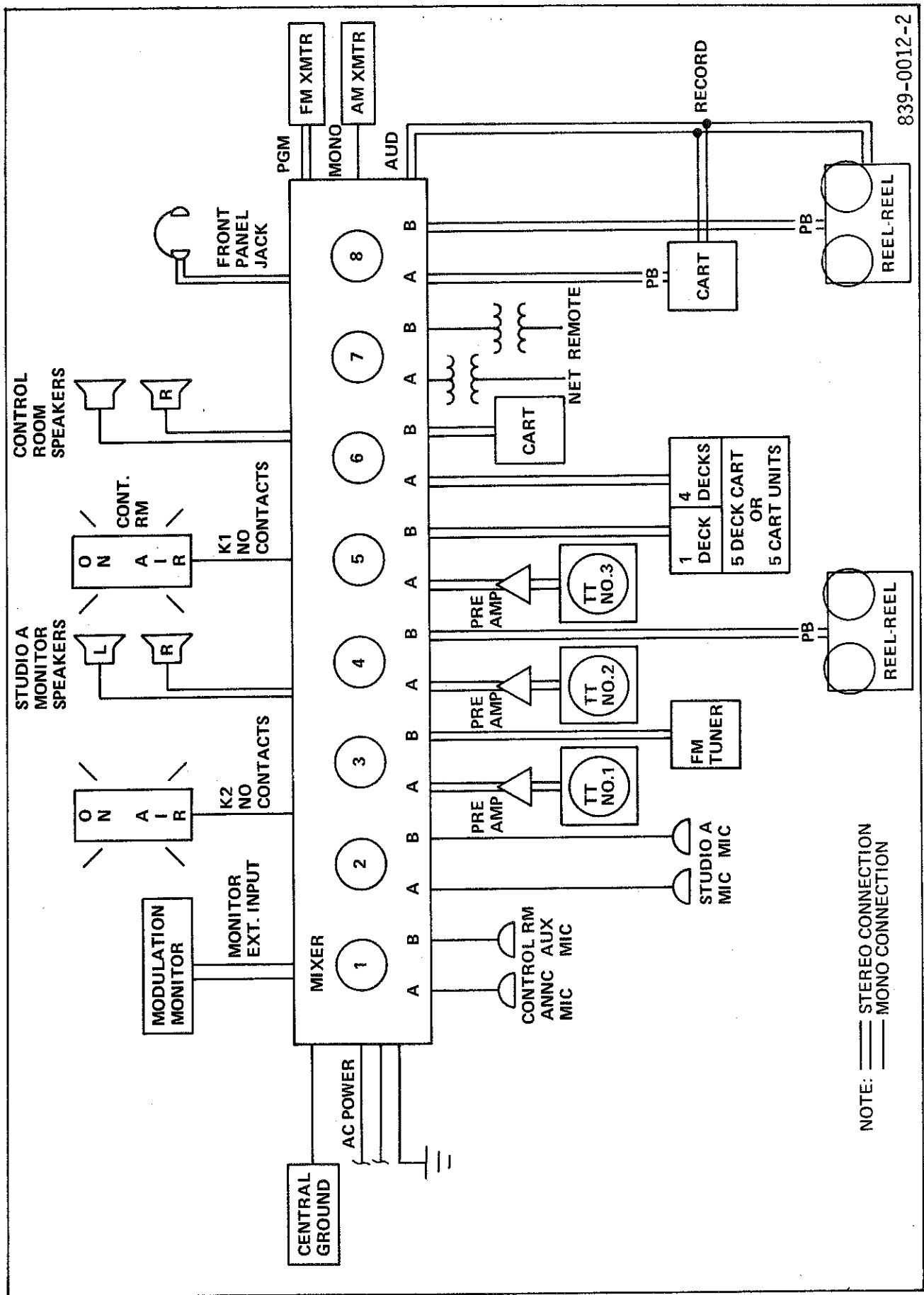


Figure 2-2. Representative Studio Employing a Stereophonic Audio Console

The audition and program output lines are identical in performance and may be used as required.

2-6. INPUT WIRING

CAUTION

ENSURE ALL POWER TO THE CONSOLE IS DE-ENERGIZED BEFORE PROCEEDING.

2-7. GENERAL. Audio connections to the console should be wired with two-conductor shielded cable. Separate as far as possible cables carrying different signal levels. Separate microphone cables from high-level cabling and all inputs from the speaker wiring.

Similarly, run audio and power cables as far apart as possible. Use the appropriate type wiring for power cables. If practical, wire power connections with shielded cable to prevent ac coupling with the audio cables.

2-8. GROUNDING. The most important consideration in ensuring good noise performance of the installation is grounding and shielding of the various interconnections.

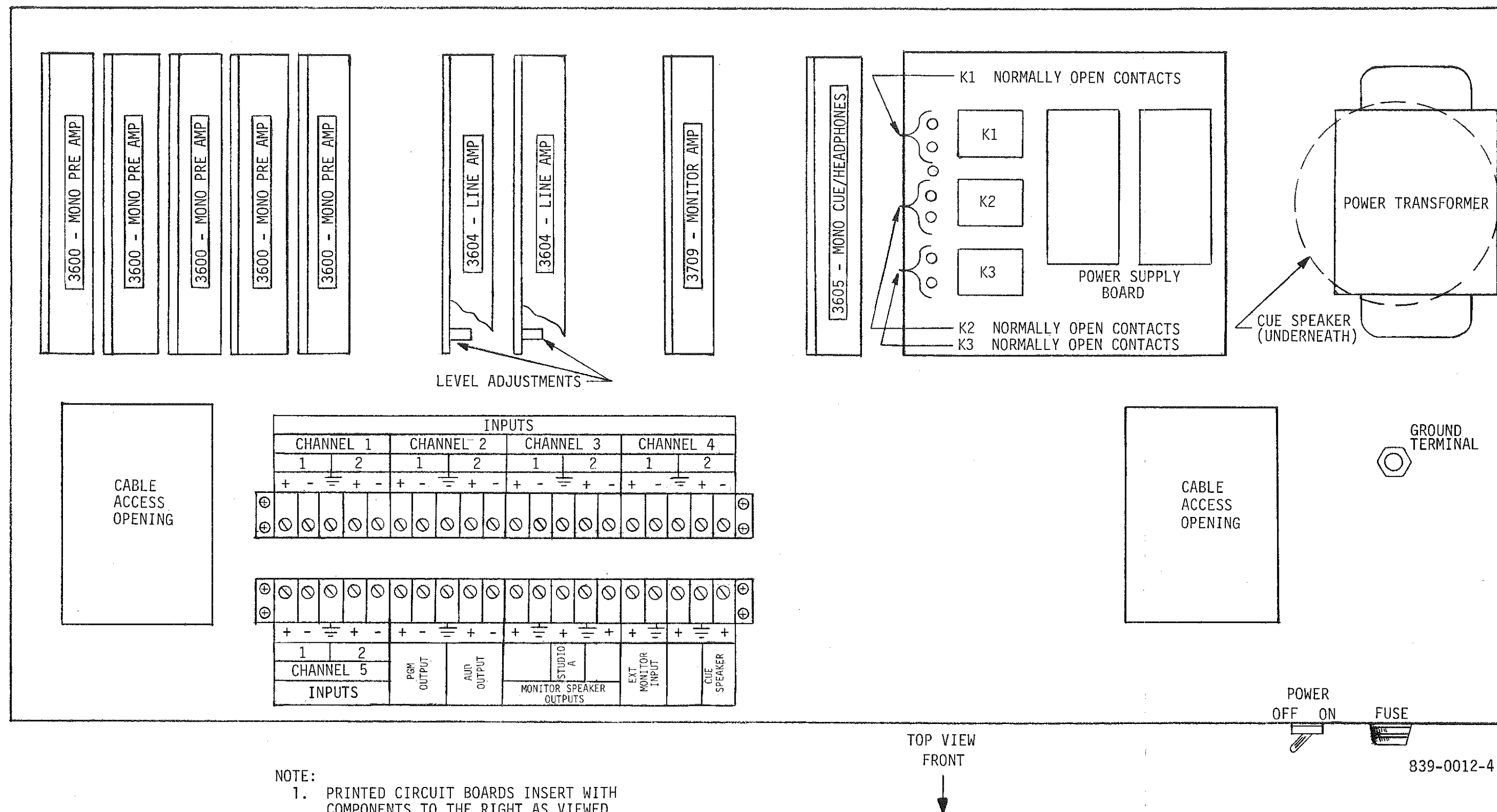
It is necessary to achieve a good ground for the console itself. This should be a central earth ground. If possible, connect the console to the transmitter RF ground. Alternately a power line earth ground or earth-grounded plumbing connection may be used. The console ground should be connected with a braided grounding strap.

Grounding of the signal shields must be executed so as to avoid ground loops (unintended signal paths through shields and grounds). To prevent ground loops, ground the shields at one end of the cable only. Generally, this is done at the console end. However, it may be best to ground the shield at the signal source.

Particular care must be exercised to avoid unintended grounds in patch panels, through external switching arrangements, through uninsulated (case grounded) jacks on associated equipment, or from racks and cabinets.

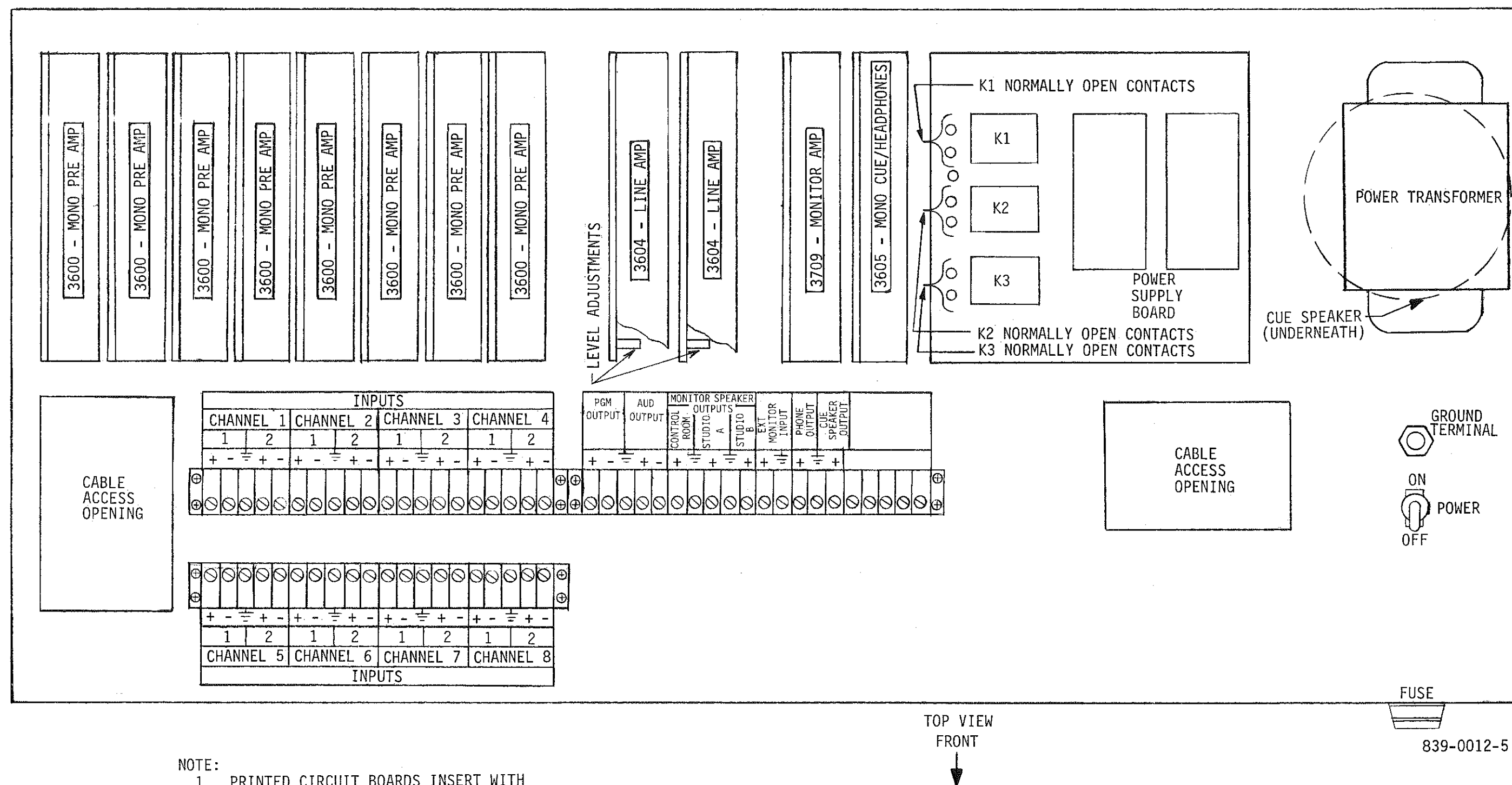
2-9. TERMINATIONS. A proper load or termination for transformer coupled equipment is necessary to ensure proper frequency response and levels. Each program output requires a 600 Ohm termination. For example, sources requiring a 600 Ohm termination but which have no external 600 Ohm load should have a low-wattage 620 Ohm resistor installed across the source at the console terminals.

2-10. INPUTS TO STEREOPHONIC CONSOLES. Normally, consoles are shipped from the factory with the inputs wired to accept stereophonic programming. Any input to a 250 Series stereophonic console may be wired to accept a monophonic input by changing the jumper configuration on the preamplifier circuit board (refer to Figure 2-7).



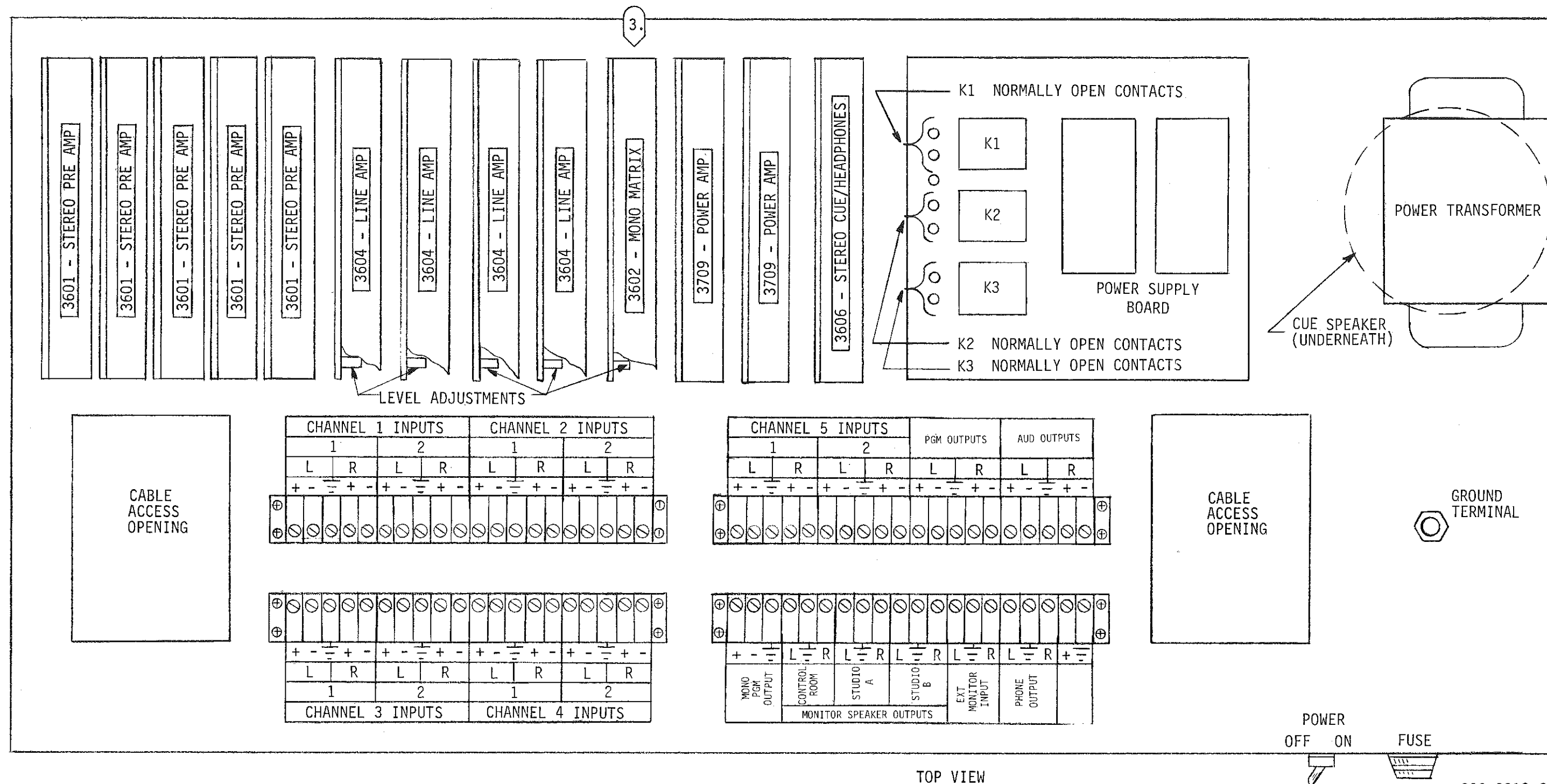
- NOTE:
1. PRINTED CIRCUIT BOARDS INSERT WITH COMPONENTS TO THE RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.
 2. PREAMPLIFIER CIRCUIT BOARDS ARE NUMBERED FROM LEFT TO RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.

FIGURE 2-3. 5M250 CONSOLE CHASSIS



- NOTE:
1. PRINTED CIRCUIT BOARDS INSERT WITH COMPONENTS TO THE RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.
 2. PREAMPLIFIER CIRCUIT BOARDS ARE NUMBERED FROM LEFT TO RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.

FIGURE 2-4. 8M250 CONSOLE CHASSIS

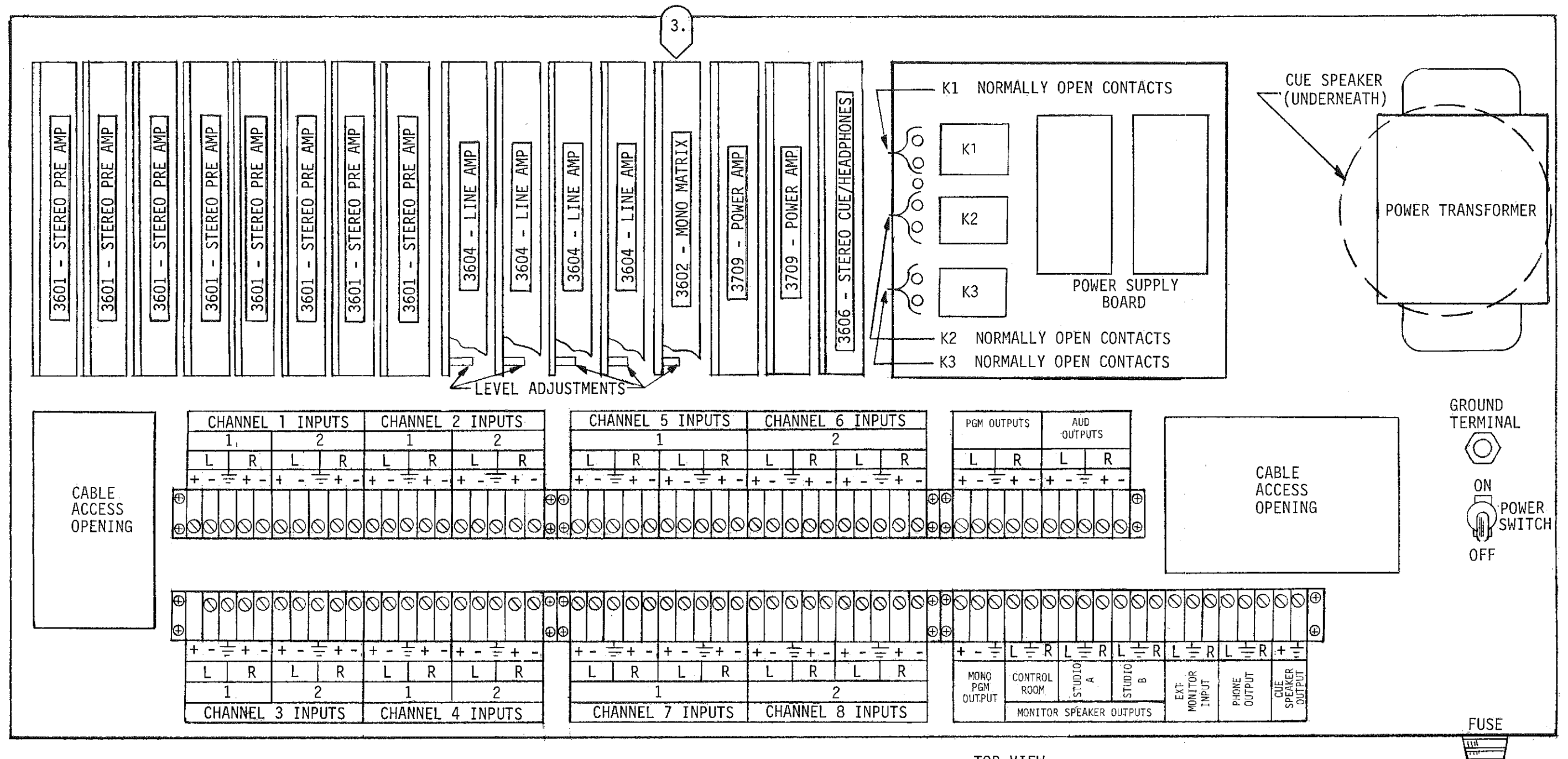


NOTE:

1. PRINTED CIRCUIT BOARDS INSERT WITH COMPONENTS TO THE RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.
2. PREAMPLIFIER CIRCUIT BOARDS ARE NUMBERED FROM LEFT TO RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.

3. OPTIONAL

FIGURE 2-5. 5S250 CONSOLE CHASSIS

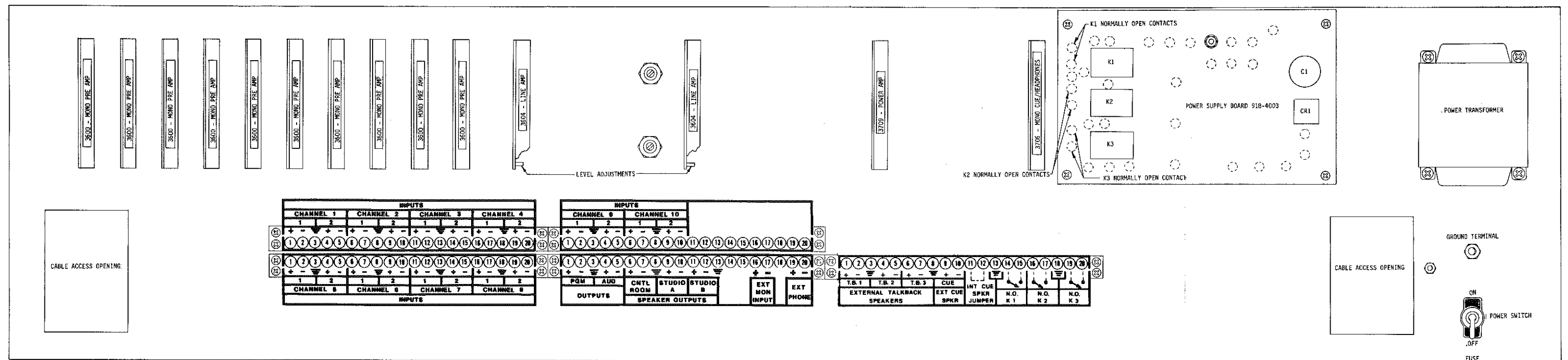


NOTE:

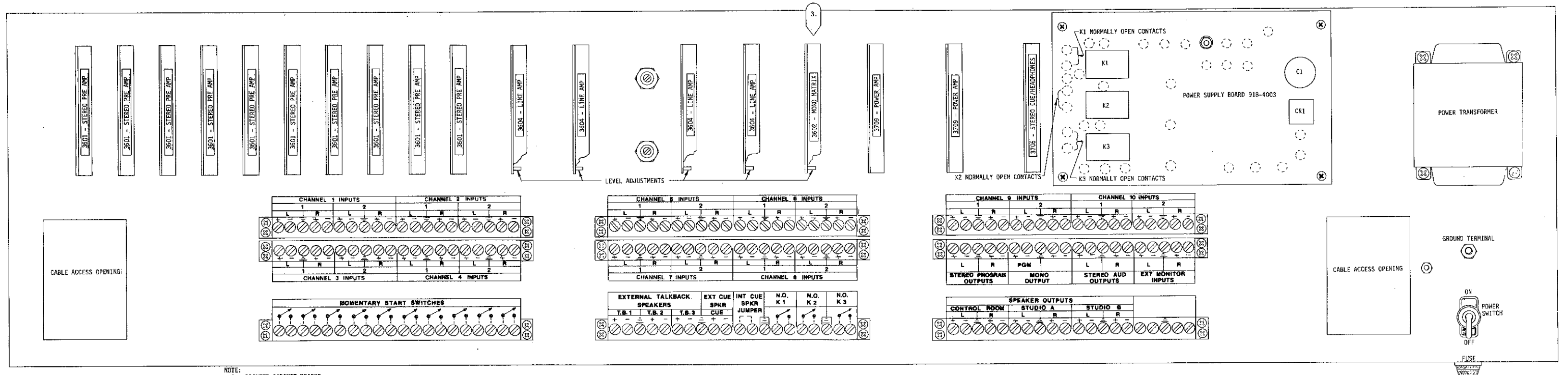
1. PRINTED CIRCUIT BOARDS INSERT WITH COMPONENTS TO THE RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.
2. PREAMPLIFIER CIRCUIT BOARDS ARE NUMBERED FROM LEFT TO RIGHT AS VIEWED FROM THE FRONT OF THE CONSOLE.

3. OPTIONAL.

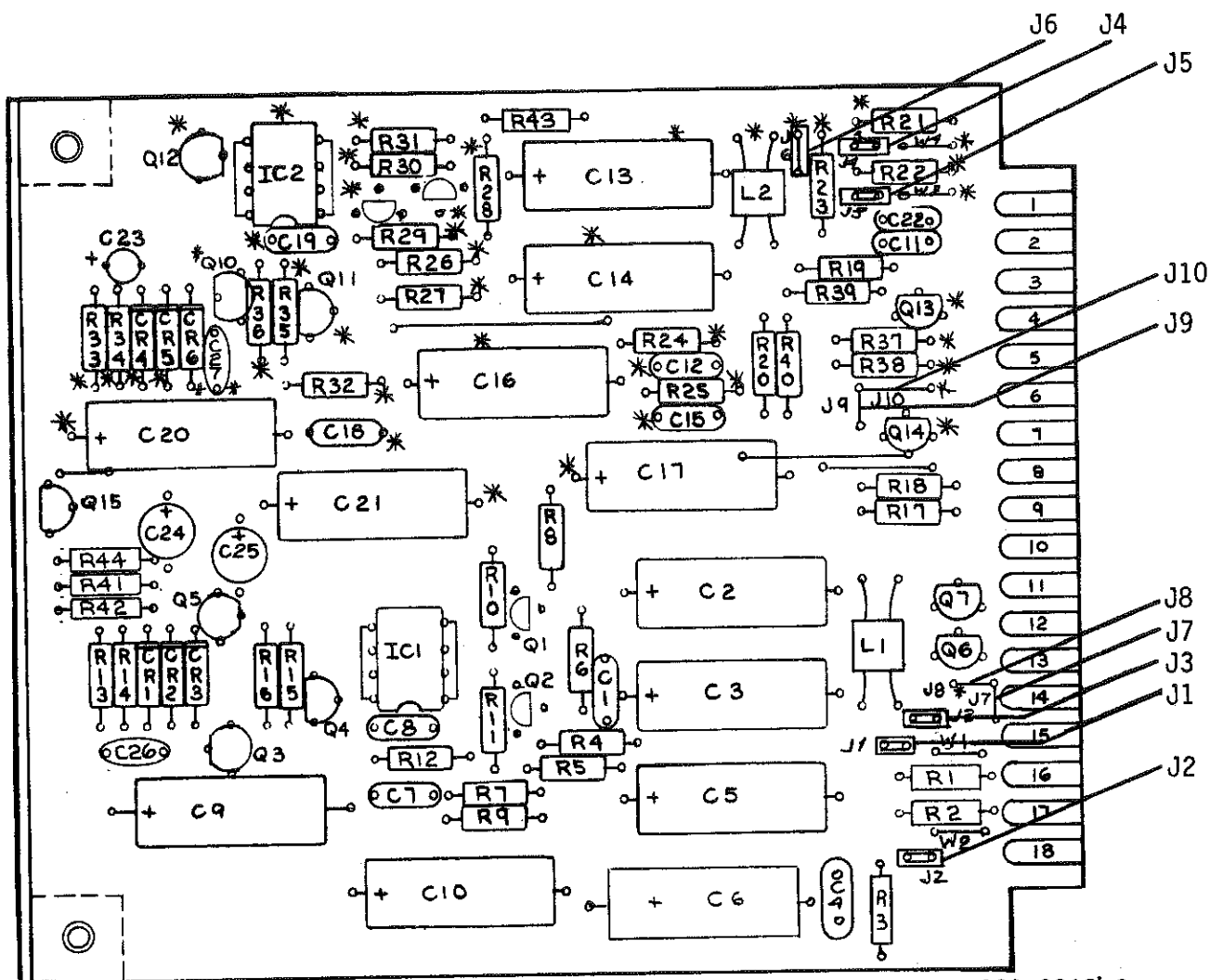
FIGURE 2-6. 8S250 CONSOLE CHASSIS



10M250 Console Chassis



10S250 Console Chassis



(* ITEMS USED ON STEREOGRAPHIC BOARD ONLY)

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INPUT LEVEL	STEREOGRAPHIC BOARD	MONOPHONIC BOARD
HIGH (LINE)	REMOVE J1, J2, J4, AND J5	REMOVE J1 AND J2 INSTALL J4 AND J5
LOW (MICROPHONE)	REMOVE J3 AND J6	REMOVE J3 INSTALL J6

INPUT MODE	INSTALL JUMPERS	REMOVE JUMPERS
MONOPHONIC	J9	J7, J8, AND J10
STEREOGRAPHIC	J8 AND J10	J7 AND J9

FIGURE 2-7. - PREAMPLIFIER CIRCUIT BOARD JUMPER PLUG PROGRAMMING

2-11. INPUT LEVEL SENSITIVITY. Any mixer will accept either low level (microphone) or high level (line) inputs. This option is determined by selection of jumpers on each preamplifier circuit board located within the console cabinet. One preamplifier is included for each mixer. As shipped from the factory, the first two preamplifiers (mixers 1 and 2) are normally preset for low-level use and the remaining preamplifiers are preset for high-level use (refer to Figure 2-7).

While a preamplifier may be preset to accept either monophonic or stereophonic inputs, any mixer set to accept a monophonic input requires that both inputs must be monophonic sources.

2-12. BALANCED INPUT WIRING. Connect the high side to the + terminal, the low side to the - terminal, and the shield to the ground terminal.

2-13. UNBALANCED INPUT WIRING. Connect the high side to the + terminal, the low side to the - terminal, and the shield to the ground terminal. Connect the - terminal and the ground terminal together with a jumper.

2-14. EXTERNAL MONITOR INPUT. The input to the monitor amplifier is intended to accept the output of a modulation monitor or other auxiliary audio monitor source. The input is unbalanced with an impedance of approximately 10 k Ohms. The input level should be externally adjusted so that the monitor level remains constant when switching between audition, program, or the external monitor input.

2-15. OUTPUT WIRING

2-16. CONSOLE PROGRAM OUTPUTS. Program and audition channel outputs are provided in the consoles. Additionally, a monophonic sum output derived from the left and right program channels is available in all stereophonic consoles as an option.

The program output is balanced, 600 Ohm, transformer coupled. Connect the high side to the + terminal, the low side to the - terminal, and the shield to the ground terminal. For proper level and frequency response, if the output is not connected to an external 600 Ohm load, a 620 Ohm, half-watt termination should be provided at the console.

2-17. SPEAKER CONNECTIONS. Monitor speaker outputs are provided for the console location in the control room and various studios. These speaker outputs are connected through the muting relays for operation with live microphones. The control room speaker is controlled by relay K1, studio A by K2, and studio B by K3.

CAUTION

TO AVOID DAMAGE TO THE MONITOR AMPLIFIER,
DO NOT EXCEED THE POWER CAPABILITIES OF
THE AMPLIFIER BY OVERDRIVING THE SOURCE
INPUT LEVEL. DO NOT OPERATE THE AMPLIFIER
INTO SPEAKER LOADS BELOW EIGHT OHMS.

The monitor circuitry is designed to drive eight Ohm speakers. For multiple speaker installations, use sixteen Ohm speakers or impedance matching transformers as required to maintain an overall impedance above eight Ohms.

2-18. EXTERNAL CUE SPEAKER. An internal cue speaker is provided in the console base, however an external cue speaker may be connected if desired. This speaker should be a high-efficiency device of eight or sixteen Ohms impedance. When an external cue speaker is connected, the internal speaker should be disconnected. The external cue speaker will be muted by relay K1 in a manner similar to the internal cue speaker.

CAUTION

AT NO TIME SHOULD A LOAD OF LESS THAN
EIGHT OHMS BE USED WITH THE HEADPHONE
AMPLIFIER. THE FRONT PANEL HEADPHONES
JACK AND THE INTERNAL HEADPHONE OUTPUT
MAY NOT BE USED SIMULTANEOUSLY.

2-19. EXTERNAL HEADPHONES CONNECTION AND FRONT PANEL HEADPHONES JACK. Terminals are provided to connect an external headphone jack should this be more convenient than the front panel jack. However, both outputs may not be used simultaneously.

The headphone jack on monophonic consoles is wired tip-to-sleeve to accommodate a stereophonic headset without modification.

2-20. MUTING RELAYS. All 250 series consoles are equipped with three muting relays. As wired at the factory, relay K1 activates when the mixer No. 1 A/P switch is set to A or P. Relay K2 and relay K3 both operate in a similar manner, controlled by the mixer No. 2 and mixer No. 3 A/P switches.

The maximum voltage which may be applied to each set of contacts is 24 volts, dc only. External devices operating from ac or higher potentials must be controlled by interface relays.

2-21. AC POWER CONNECTION

All Broadcast Electronics audio consoles are equipped with a three-wire input for connection to a 117 volt ac, 50 or 60 Hz power source. Models are available which operate from an ac input of 220 volts ac, 50 or 60 Hz. The console ac power switch and fuse are located inside the cabinet on the right side.

Ensure the power switch is set to OFF and connect the console to the proper ac input source. Operate the power switch to ON and make the following adjustments as required.

2-22. INSTALLATION ADJUSTMENTS

2-23. LINE AMPLIFIER LEVEL BALANCE. The level balance adjustments on the line amplifier circuit boards balances the left and right output levels in stereophonic and matches the audition and program outputs in monophonic consoles.

The level balance adjustment must be performed with an external VU meter connected to the console output across a 600 Ohm termination.

Feed a sine wave to the right channel input of any mixer and observe the output level. Feed the same signal to the left input of the same mixer and note the output level. Adjust the left or right balance adjustment as required to match the two output levels.

2-24. VU METER CALIBRATION. The console VU meters are calibrated at the factory to indicate 0 VU (100) when the output level is +8 dBm (1.95V RMS). If the console is operated at a different output level, the VU meter(s) may be recalibrated as desired. The meters can be adjusted to zero with output levels between +3 dBm and +11 dBm.

Connect an external dB meter to the console output across a 600 Ohm termination. Adjust the console output to the desired level as indicated by the external meter. Adjust the calibration adjustment on each VU meter rectifier circuit board so that the console VU meter(s) indicate 0 VU (100).

2-25. MONO MATRIX CIRCUIT ADJUSTMENT. The controls on the mono matrix circuit board adjust the input signal so that the left and right channel signals are mixed 50%/50% in the mono matrix output.

NOTE

THE FOLLOWING PROCEDURE IS REQUIRED ONLY
IN STEREOPHONIC CONSOLES WITH THE MONO
MATRIX OPTION.

Connect a sine wave signal to the right input of any mixer. Operate the A/P switch for that mixer to P and adjust the mixer to obtain an indication of 0 VU on the console VU meters. Adjust the right channel control on the mono matrix circuit board to obtain a monophonic output indication of +2 dBm on the external meter. Connect the input signal to the left input of the same mixer and perform the same adjustment with the left channel control on the mono matrix circuit board.

SECTION III

OPERATION

3-1. GENERAL

Broadcast Electronics audio consoles are used to combine multiple audio sources at various levels into a single feed. To assist operation and for operator convenience, several systems are integrated into each console.

Separate audition and program channels make the console two units in one. Each mixer may control multiple inputs, although not simultaneously. A cue circuit allows a source to be previewed before mixing. Self-contained amplifiers allow monitoring of the two mixing circuits and the cue system with a built-in speaker or headphones.

3-2. INPUT SELECTION

Two separate input sources may be connected to each mixer. Sets of two pushbutton switches (labeled 1 and 2 by channel) are provided for each mixer. The desired input is fed to the mixer by depressing the 1 or 2 switch for that channel.

3-3. CHANNEL SELECTION

Any mixer may be operated in either the program or audition output. This is determined by the setting of the three position switch immediately above each mixer control. In the audition (A) position, the signal from either 1 or 2 input is fed through the mixer to the audition output only. In the program (P) position, the input selected is fed through the mixer to the program output only. In the center position the input signal is disconnected.

3-4. LEVEL CONTROL

The channel attenuators can be used to keep each input at approximately the same level or to combine the signal from two or more inputs in a desired relationship. The VU meter(s) and the monitor circuits are provided as an aid in determining proper levels. The mixer(s) for active sources are adjusted so that the VU meter reads 100 (0 VU) on peaks. When mixing two or more inputs, the mixers are adjusted to yield the desired sound while maintaining a VU meter reading which peaks at 100 (0 VU).

NOTE

THE MASTER LEVEL CONTROLS PROVIDED FOR THE AUDITION AND PROGRAM OUTPUTS SHOULD NOT BE USED FOR ADJUSTING VARYING INPUT LEVELS DURING NORMAL OPERATION.

3-5. VU METERS

The Monophonic 250 Series Audio Consoles have separate VU meters for the audition and program channels. In the Stereophonic 250 Series Audio Consoles separate VU meters are provided for the left and right channels. These meters are switchable between the program or audition channel.

3-6. CUE SYSTEM

The console cue system allows previewing or monitoring a source prior to mixing. The cue system is activated by depressing the INPUT SELECT 1 or 2 switch for the particular channel and adjusting the associated mixer control to the cue stop at the extreme counterclockwise position.

An internal amplifier and speaker are provided for monitoring the cue system. The volume of the cue speaker is determined by the adjustment of the CUE control. The cue speaker is muted by the control room muting relay.

The cue system may be monitored by headphones plugged into the front panel jack by depressing the CUE switch above the phones level control.

3-7. HEADPHONES

The front panel headphone jack accepts a wide variety of headsets including low impedance stereophonic headphones.

The headphones jack on monophonic consoles is wired tip-to-sleeve to accomodate a stereophonic headset without modification.

CAUTION

AT NO TIME SHOULD A LOAD OF LOWER RESISTANCE THAN EIGHT OHMS BE USED WITH THE HEADPHONE AMPLIFIER.

The headphones may be connected to the program, audition or cue outputs by depressing the appropriate switch above the headphones level control. The headphone output is never muted.

3-8. MONITOR SPEAKERS

An internal amplifier provides audio for the control room speaker as well as separate speakers in several studios. These speakers may be muted for use with live microphones. The front panel MONITOR control adjusts the monitor channel audio level.

3-9. CUE/TALKBACK

Intercom operation is possible on the 10-Channel consoles by depressing the proper section on the TALKBACK select switch. This operation connects the studio thru the cue and allows the operator to listen while disabling the cue operation.

The console operator must depress the momentary talkback switch while talking to the studio. In order to connect the cue signal to the cue speaker output, the TALKBACK select switch (Off position) must be depressed.

SECTION IV

ELECTRONIC THEORY OF OPERATION

4-1. INTRODUCTION

This section provides a theory of operation for the 250 Series Audio Consoles. Refer to Figures 4-1 through 4-4, and the drawings in Section V as required for the following text.

4-2. OVERALL MONOPHONIC SYSTEM DESCRIPTION

4-3. AUDITION AND PROGRAM CHANNELS

Two inputs may be connected to each mixer from terminals provided on the equipment rear panel. The input signal is routed to the front panel input selector switches which determines which input will be applied to the pre-amplifier module. The signal from the front panel selector switches is adjusted by the level sensitivity pad and applied to the preamplifier module for amplification.

Following amplification, the signal is routed from the preamplifier to the front panel mixer. A ladder attenuator with 20 steps of 2 dB attenuation per step is used. A cue switch is installed on all mixers to route the signal to the cue system instead to the audition and program busses.

From the mixer, the signal is returned to the solid-state field-effect transistors(FET) located on the preamplifier board, which are controlled by the front panel audition/program switches. Following the FET's, separate outputs are obtained from the preamplifier for the audition and program busses.

The program outputs of all the preamplifiers are bussed together and presented to the input of a mixer/line driver amplifier module. The mixed signal is amplified, applied to a front panel program master gain control, and returned to the mixer line/driver amplifier. The signal enters a final amplification stage through a level trim potentiometer. This amplifier is directly coupled to the 600 Ohm/600 Ohm output transformer. A feed to the monitor selector switch is bridged from the amplifier output.

After the output transformer, the line level signal leaves the line driver amplifier module and is connected to the program output terminal strips. At the output of the line driver amplifier, a sample for the program VU meter is bridged from the transformer primary and connected to the VU rectifier circuit mounted on the rear of the VU meter.

The audition channel is identical in operation to the program channel. The audition outputs of all the preamplifiers are bussed together and fed to a separate line driver amplifier. The amplified signal is routed through the audition master gain control and is returned to the line driver amplifier for final amplification. Following this, the audition monitor feed is bridged from the output. The line signal is routed through the output transformer to the audition output.

The Audition channel VU meter is bridged from the line level signal utilizing the VU rectifier circuit mounted on the Audition VU meter.

4-4. CUE CIRCUITRY

The outputs of all cue switches (on the front panel mixers) are bussed together to feed the headphone selector switch and the cue speaker amplifier.

Signal from the cue bus is routed to the front panel cue level control. Following amplification, the cue signal is routed through a set of normally closed contacts of the control room muting relay, and to the internal cue speaker.

A connection is made directly to the external cue speaker output terminals on the sub-chassis. If an external cue speaker is connected, the built-in speaker must be disconnected.

4-5. MONITOR CIRCUITRY

The monitor outputs of the audition and program channel mixer line amplifiers are connected to separate sections of the monitor selector switch on the front panel. A third position is provided on this switch for connection of an "off-the-air" source or other external signals.

The output of the selector switch is connected through the front panel monitor level control to the monitor amplifier module. Following amplification, the signal is routed to the muting relays on the power supply board. There the signal is split and fed through normally closed contacts. The monitor output from each relay is taken to separate terminals on the sub-chassis barrier strips.

The monitor busses from the audition and program mixer line amplifiers are also connected to separate sections of the front panel headphone selector switch. A third position on this switch is connected to the cue bus. From the selector switch, the signal passes through the front panel headphone level control to the headphone amplifier. This amplifier is mounted on the same module as the cue amplifier. Following amplification, the signal is connected to the front panel headphone jack and to terminals on the sub-chassis.

4-6. MUTING RELAYS

Muting relays control the speakers and energize "on-the-air" lights in a studio with live microphones. Speaker connections are made through normally closed contacts which open when the relays are energized. The warning light (external and not supplied with the console) is connected through an interface relay controlled by normally open contacts which close when the relays energize. The relays and the relay driver circuits are located on the power supply board. The relays are controlled by the front panel audition/program switches. Each relay is energized by supplying a ground to the mute control bus.

When the microphone is switched to ON, a ground is applied to the junction of resistors R10 and R11. This ground will turn Q1 off, as there will be no voltage drop across R12, Q2 will turn on and energize relay K1.

When the microphone is switches to OFF, the ground to the junction of resistors R10 and R11 is removed. Current through R10 and R11 applied to the base of Q1 will turn Q1 on and the voltage across R12 will turn Q2 off and deenergize relay K1.

4-7. POWER SUPPLY

The Broadcast Electronics 250 Series Audio Consoles operate from a primary input potential of 115V $\pm 10\%$ or 230V $\pm 10\%$, 50/60 Hz.

4-7. POWER SUPPLY (5 & 8 Channel Consoles)

All 5 and 8 channel 250 consoles are equipped with a three conductor, NEMA standard line cord. The high side of the ac line is connected through the fuse to the primary of the power transformer. The low side of the ac line is connected through the switch to the transformer primary. The ground line is connected to the transformer frame and chassis at the point where the station ground terminal is located.

The secondary of the power transformer is connected to the full-wave bridge rectifier located on the chassis. The power supply furnishes low voltage and filtered dc only.

4-7a. POWER SUPPLY (10 Channel Consoles)

The Broadcast Electronics 10 Channel Audio Consoles operate from a primary input potential of 115V $\pm 10\%$ or 230V $\pm 10\%$, 50/60 Hz.

Power is applied to the equipment when the ON/OFF switch (S1) is set to ON. Overload protection for the power supply is provided by fuse F1. The meter lamps are wired to the internal +35 volt power supply and will illuminate whenever the internal circuitry is operational.

Voltage from the secondary winding of the power transformer is bridge rectified by CR1 and filtered by C1 to produce an unregulated potential of 35 volts to power the meter lamps, monitor amplifiers, and the control relays.

The unregulated +35 volt potential is applied to regulators VR1 and VR2. Both regulators are three-terminal adjustable positive devices containing internal thermal overload protected by diodes D1 and D2, each which protects its respective regulator from damage resulting from a short circuit on the input side of the regulator. The output voltage is established by the value of resistor R14 and R15 from VR1 and R16 and R17 for VR2. Transient response of both regulators is improved by the presence of capacitors C2 and C3.

All muting relays, the muting relay drivers and the associated components are mounted on the power supply circuit board.

4-8. GENERAL STEREOPHONIC SYSTEM DESCRIPTION

4-9. AUDITION AND PROGRAM CHANNELS.

Terminals are provided to connect two stereophonic input sources to each channel. The signals are routed from the input terminals on the sub-chassis inside the cabinet to the front panel selector switch. The front panel select switch determines which signal is then fed to the preamplifier through the level sensitivity pads.

The output of the right channel preamplifier is disconnected in monophonic operation and the left channel preamplifier output is connected to both the left and right channels. In stereophonic operation the two channels remain separate.

Following amplification, the stereophonic signal is routed from the preamplifier module to the front panel mixer; a dual ladder attenuator with 20 steps of 2 dB attenuation each. Cue switches which close at the full counter clockwise stop of the mixer route both these signals to the monophonic cue system instead of to the mixer. All channels have this feature.

From the mixer, the stereophonic signal is returned to the preamplifier to the FET switches which are controlled by the front panel audition/program switches. Separate outputs are obtained from each preamplifier and applied to the left and right audition and program busses.

The left program outputs of each preamplifier are bussed together and connected to the input of a line driver amplifier. The right program outputs are similarly bussed to a second line driver amplifier. A front panel dual master gain control between the first and second stage of the line driver amplifier adjusts the amplitude of the signal.

The line driver amplifiers are directly coupled through output transformers to the left and right program outputs on the internal terminal strip. A feed to the monitor selector switch, the VU meter signal, and the monophonic matrix inputs are bridged from the output of each driver amplifier prior to the output transformers.

A front panel selector switch allows either the audition or program output channels to be metered with the VU meters.

The left and right program is connected directly to separate inputs on the monophonic matrix amplifier. The signals enter through separate level balancing potentiometers, are combined, and amplified. The amplified monophonic signal is coupled through a 600 Ohm/600 Ohm output transformer to the monophonic program output terminals. No metering is provided for this derived monophonic output obtained from the primaries of the left and right output transformers. However, the program VU meters give a true indication of the input levels to the monophonic matrix amplifier.

The audition channel is identical in operation to the program channel. The left and right audition outputs of all the preamplifiers are presented to separate line driver amplifiers. The amplified signals are routed through the dual audition master gain control and are returned to the line driver amplifier. Following this, the audition monitor feeds (left and right) are bridged from the output. The line signal is passed through the output transformers to the audition left and right output terminals. (No provision is made for a monophonic signal is derived from the audition channel). A meter connection is bridged from the line signal and applied to the VU meter selector switch.

4-10. CUE CIRCUITRY

The outputs from the left and right cue switches (on the front panel mixers) are combined into a single cue bus to feed the headphone selector switch and the cue speaker amplifier. The signal from the cue bus is routed to the front panel cue level control. From there, the signal enters the cue speaker amplifier. Following amplification, the cue signal passes to the power supply board where the control room muting relay is mounted.

A cue output is routed through a set of normally closed contacts on K1. After the relay, the signal is split. A connection is made directly to the external cue speaker screw terminals on the sub-chassis. When an external speaker is connected, the built-in speaker must be disconnected.

4-11. MONITOR CIRCUITRY

The monitor outputs from the left and right audition and program channel mixer line amplifier modules are connected to separate sections of the monitor selector switch on the front panel. A third position is provided for connection of a stereo "off-the-air" monitor or other external feed. This is connected directly from input terminals on the sub-chassis to the selector switch.

The left and right audition and program monitor busses from the mixer line amplifiers are also connected to separate section of the front panel headphone selector switch. A third position is connected to the monophonic cue bus. From the selector switch, the signals are routed through the dual front panel headphone control to the headphone amplifier. This dual channel amplifier is mounted on the same module as the cue amplifier. The stereophonic signal is connected to both the front panel stereophonic headphone jack and to terminals on the sub-chassis.

4-12. MUTING RELAYS AND CONTROL

The muting relay system in the stereophonic consoles is identical to the system described for monophonic consoles.

4-13. POWER SUPPLY

The power supply in stereophonic consoles is identical to that described for the monophonic consoles. The power supply relay board contains the low voltage power supply and the three muting relay control circuits.

The three separate muting relay circuits are identical in operation. Control is exercised by the audition/program switches above the mixers. As shipped from the factory. Mixer 1 controls relay K1, mixer 2 controls K2, and mixer 3 controls K3. However, circuitry is provided on all mixers so that any relay may be controlled by any mixer audition/program switch by installation of the proper connections. Activating the relay disconnects the speaker lines connected through the normally closed contacts. The normally open contacts close to operate an on-air light.

4-14. VU METER RECTIFIER

Individual circuit boards contain the rectifier circuits for the VU meters. A T-pad comprising R1, R2, and R3 provides calibration so that the meter reads 0 VU (100) when the console output is +8 dBm.

4-15. DETAILED CIRCUIT OPERATION

4-16. MONOPHONIC PREAMPLIFIER

In monophonic preamplifiers the input level selection can be preset by jumper selection to accept low level (MICROPHONE). The remainder are preset for high level (LINE). To change factory level preset selection, simply change the jumper arrangement.

The printed circuit board accepts the left input signal on pins 16 and 17. The right channel is not used.

After the input attenuators consisting of resistors R1, R2, and R3, ferrite bead L1 and disc capacitors C1 and C4 will reject possible RF pick-up. The signal is applied to transistor pair Q1 and Q2 to raise the level of the signal sufficiently above the noise floor of the following amplifier (IC1). The base of Q1 and Q2 is maintained at approximately +14V which is one half the supply voltage. This voltage is regulated by transistor Q15, and the circuit eliminates prolonged charging time for capacitor C23.

After amplification, the signal from the collector of Q1 and Q2 is applied to IC1 and then amplified. The output of IC1, which is at approximately +14V will drive complementary transistor pair Q3 and Q5. These transistors provide the output signal from this stage. The overall gain is determined by feedback resistor R12 in conjunction with R7 and R5.

The purpose of transistor Q4 is to avoid damage to transistor Q3 in case an excessively low impedance load is applied to the output of the complementary pair. The right channel amplifier employs identical circuitry.

4-17. STEREOPHONIC PREAMPLIFIER

For the input level selection, refer to the monophonic preamplifier discussion as the procedure is the same for both preamplifiers.

The stereophonic preamplifier can be preset for monophonic or stereophonic operation by jumper selection. All stereophonic preamplifiers shipped from the factory, either in the new consoles or for replacement, are preset for stereophonic operation.

4-18. MONOPHONIC MATRIX AMPLIFIER

The signal is routed to IC1 through level balancing controls R1, R2 and RF filter L1/C1. IC1 is an active mixing amplifier. Q3, Q4, and their associated components provide a low impedance output. T1 provides a floating output. Q2 supplies a decoupled bias source for IC1.

4-19. MIXER LINE DRIVER AMPLIFIER

The mixer line driver amplifier contains two multiple stage amplifiers and isolation transformers to supply the console output. In monophonic consoles two line driver amplifiers are used to provide program and audition outputs. In stereophonic consoles, four are required to provide the program and audition outputs.

Signal from program and audition bus enters on pin 1 and is coupled through C2 to the input of the mixer amplifier composed of IC1, Q1 and Q2. Choke L1 and capacitor C1 act as a low-pass filter to prevent the appearance of RF in the amplifier input. Operational amplifier IC1 supplies 12 dB of gain as determined by R3 and the mix sum resistors in the mixing modules. Output drive is supplied by the complementary pair Q1 and Q2 which is driven directly by IC1. Capacitor C6 provides bootstrapping for the output stage. (Transistor Q3 provides protection in case of a short circuit on the output.)

The output of the mixer amplifier is coupled through C7 to pin 3. Following the master level control, the signal is returned to pin 5 for final amplification by the line driver. This three-step amplifier consists of a differential input stage (Q4-Q5), an operational amplifier (IC2), and a complementary symmetry output pair (Q6-Q7). Transistor Q8 provides short circuit protection. This stage can provide up to 40 dB of gain as determined by R16, R18 and in conjunction with the master level control R17, permits matching the gain of the two mixer/line driver amplifiers. A signal for use in the monitor circuit is bridged from the primary of T1.

4-20. STEREOPHONIC CUE/HEADPHONE AMPLIFIER (5 & 8 CHANNEL)

There are three identical sections to this amplifier, therefore only one will be discussed.

The input signal is coupled through L2, R2, C4 and R3, an attenuator and RF filter to the input of IC2. Gain is set by R11, R12, and C9. Output signal is coupled through C7. Pin 1 of IC2 provides bias for all amplifiers through R8, R9, and R10. VR-1 supplies 18V dc to IC1. One half of IC1 is not used.

4-21. STEREOPHONIC CUE/HEADPHONE AMPLIFIER (10 CHANNEL)

This amplifier is used in the 10 channel audio consoles only. In the cue position, the output from the left and right cue switches (on the front panel mixers) are combined into a single cue bus. This bus feeds the left and right sections of the phone selector switch. The headphone level control applies signal to printed circuit board terminals 14 and 15. The amplified signal is coupled to output pins, 3 and 2, which are connected to the headphone jack. L2, L3, R2, R5, R6, C4 and C5 provide attenuation and RF filtering. R9 and R10 connects half voltage bias reference to U2.

4-22. MONOPHONIC CUE/HEADPHONE AMPLIFIER

This circuit board contains two identical amplifiers. IC2 is a self-contained 18V regulator providing power to dual power amplifier IC1. The signal is coupled through L1, R1, and C4 to the input of IC1. L1, R1, and C3 form a low-pass filter to keep RF from the amplifier input. Pin 1 of R4, R5, and C5 determine amplifier gain. The output signal is coupled through dc blocking capacitor C6.

4-23. MONITOR AMPLIFIER

The 8 watt monitor amplifier provides low noise and high gain with low distortion. The amplifier provides approximately 26 dB of gain from input to output. Two such amplifiers are used in stereophonic consoles and one amplifier is provided in monaural consoles.

This amplifier has been designed for use in new consoles as well as a replacement monitor amplifier in Broadcast Electronics Audio Consoles delivered prior to 1980 (amplifier P/N 3609). If the amplifier is used for this purpose ensure a jumper exists between pins 4 (input common) and 13 (output common) of the monitor amplifier circuit board receptacle. No circuitry changes are required. This amplifier is provided as a modular plug-in replacement.

Input signal is applied to the non-inverting input of voltage amplifier U1 through RF choke L1 and coupling capacitor C1. Resistor R1 provides isolation from the signal source. Amplifier gain is established by a voltage applied to the inverting input of U1 which is developed from feedback applied across a voltage divider consisting of R2 and R3.

A constant current source is provided for differential amplifier U2 by C7, D1, and Q1. As U2 senses the voltage drop across R15, transistor Q2 varies the bias on the output stages. U1 acts as a current sink for the bias current.

The signal output of voltage amplifier U1 is applied to the negative peak power amplifier (Q3) and the positive peak power amplifier (Q4) through C8. The audio output is coupled to the load through C9.

The load impedance should be 8 ohms or greater. A lower impedance can cause excessive current flow in the output circuit and open fuse F1.

4-24. CUE/TALKBACK

A talkback feature has been added to the 10S250 and 10M250 consoles incorporated into the cue circuit. A four position interlocked pushbutton switch has been added to the front panel and labeled 1, 2, 3 and OFF. When the OFF button is depressed, the cueing function is activated. The cue system is identical to the cue system in the 5 and 8 channel 250 series consoles.

45 Ohm "Talkback" speakers may be located in studios, offices, reception areas, etc., and connected to the indicated terminals in the console. When any of the talkback select switches (1, 2, or 3) are depressed that speaker becomes a microphone and is heard on the console cue/talkback speaker. When the TALK switch on the console is depressed, the console speaker becomes a microphone, and the control room operator may talk to the REMOTE speaker.

Releasing the TALK switch reverses the procedure and the remote location may talkback to the control room operator. In the talkback mode, a preamplifier is inserted into the cue system to raise the talkback level to that of the cue bus. When the control room channel switch (factory wired for channel #1) is operated to either Program or Audition muting relay K1 operates and either disables or mutes the cue and talkback system.

SECTION V

MAINTENANCE

5-1. CLEANING

A. Pushbutton Switches

These switches are self-wiping and should not require cleaning.

B. Lever Switches

These may be cleaned as required with spray contact cleaner.

C. Step Attenuators

CAUTION

DO NOT USE AN ABRASIVE CLEANER OR BURNISHING TOOL ON THE STEP ATTENUATORS.

The mixers in the 250 series consoles can be opened and the steps cleaned with spray contact cleaner containing a lubricant.

D. Printed Circuit Boards and Card Edge Connectors

The card edge connectors do not require cleaning. Should intermittent contact between the connector and the printed circuit board occur, polish the fingers on the board with a soft cloth. The life of the card edge connectors can be prolonged by minimizing the removal and re-insertion of the printed circuit boards.

5-2. CONSOLE SPECIFICATION MEASUREMENTS

5-3. As a check on continued proper operation of the console, the user may wish to periodically perform a specification test. The results can be compared to the original factory results shown on the test sheet supplied with each unit.

5-4. These specification tests are performed at the factory with a -50 dBm signal supplied to a low level input. The gain controls are adjusted to yield a +8 dBm output. Active inputs and outputs are terminated with the proper load. When measuring the noise figure, the input signal should be disconnected and replaced by a 150 Ohm resistor.

5-5. TROUBLESHOOTING

CAUTION

AC POWER MUST BE TURNED OFF WHENEVER PRINTED CIRCUIT BOARDS ARE REMOVED OR INSERTED.

5-6. In determining the cause of a fault in the console it is necessary to isolate the fault to a particular section or circuit board. Begin by determining if the power supply is functioning (VU meter lamps on, muting relays operational, or actual voltage check). Second, check signal presence in the audition, program, and cue channels. Thirdly, interchange printed circuit modules to determine if the fault is caused by a particular module.

NOTE

THE MONOPHONIC PREAMPLIFIER MAY BE INSTALLED IN STEREOPHONIC CONSOLES WITHOUT HARM, BUT IT WILL PROVIDE A LEFT CHANNEL SIGNAL OUTPUT ONLY. SIMILARLY, THE STEREOPHONIC PREAMPLIFIER MAY BE INSTALLED IN MONOPHONIC CONSOLES WITHOUT DAMAGE. THE LEFT CHANNEL ONLY IS USED.

5-7. If the fault occurs with more than one module check wiring continuity within the console.

NOTE

THE OPTIONAL EXTENDER BOARD (BE P/N 919-3000) IS HELPFUL WHEN PERFORMING TROUBLESHOOTING MEASUREMENTS.

5-8. The major faults which occur on the printed circuit modules are failure of the integrated circuits or shorted capacitors. Test the integrated circuits by measuring the dc voltage present on the IC input and output pins with a 20,000 Ohms/Volt VOM. This voltage should be one half the dc voltage present at the IC's DC supply voltage input pin (+V). With the power off, test all capacitors for shorting or reversed polarity with an Ohmmeter.

5-9. COMPONENT REPLACEMENT ON CIRCUIT BOARDS

5-10. Many of the circuit boards used in the 250 series consoles are double-sided boards with plated through-holes. Because of the plated through-holes, solder fills the holes by capillary action. These conditions require that defective components be removed carefully to avoid damage to the board.

5-11. On all circuit boards, the adhesive securing the copper track to the board melts at almost the same temperature as solder. A circuit board track can be destroyed by excessive heat or lateral movement during soldering. Use of a small iron with steady pressure is required for circuit board repairs.

5-12. To remove a component from a double sided circuit board, cut the leads from the body of the defective component while the device is still soldered to the board.

5-13. Grip each component lead, one at a time, with long nose pliers. Turn the board over and touch the soldering iron to the lead at the solder connection. When the solder begins to melt, push the lead through the back side of the board and cut off the bent outer end of the lead. Each lead may now be heated independently and pulled out of each hole. The holes may be cleared of solder by carefully re-heating with a low wattage iron and removing the residual solder with a soldering vacuum tool.

5-14. Install the new component and apply solder from the bottom side of the board. If no damage has been done to the plated through-holes, soldering of the top side is not required.

WARNING

MOST SOLVENTS WHICH WILL REMOVE ROSIN FLUX ARE VOLATILE AND TOXIC BY THEIR NATURE AND SHOULD BE USED ONLY IN SMALL AMOUNTS IN A WELL VENTILATED AREA, AWAY FROM FLAME, INCLUDING CIGARETTES AND A HOT SOLDERING IRON.

OBSERVE THE MANUFACTURER'S CAUTIONARY INSTRUCTIONS.

5-15. After soldering, remove flux with a cotton swab moistened with a suitable solvent. Rubbing alcohol is highly diluted and is not effective. Solvents are available in electronic supply houses which are useful.

5-16. The board should be checked to ensure the flux has been removed and not just smeared about. Rosin flux is not normally corrosive, but rosin will absorb enough moisture in time to become conductive and cause problems.

5-17. DRAWINGS

5-18. The following drawings are provided as aids to troubleshooting.

SECTION VI
PARTS LIST & SCHEMATICS

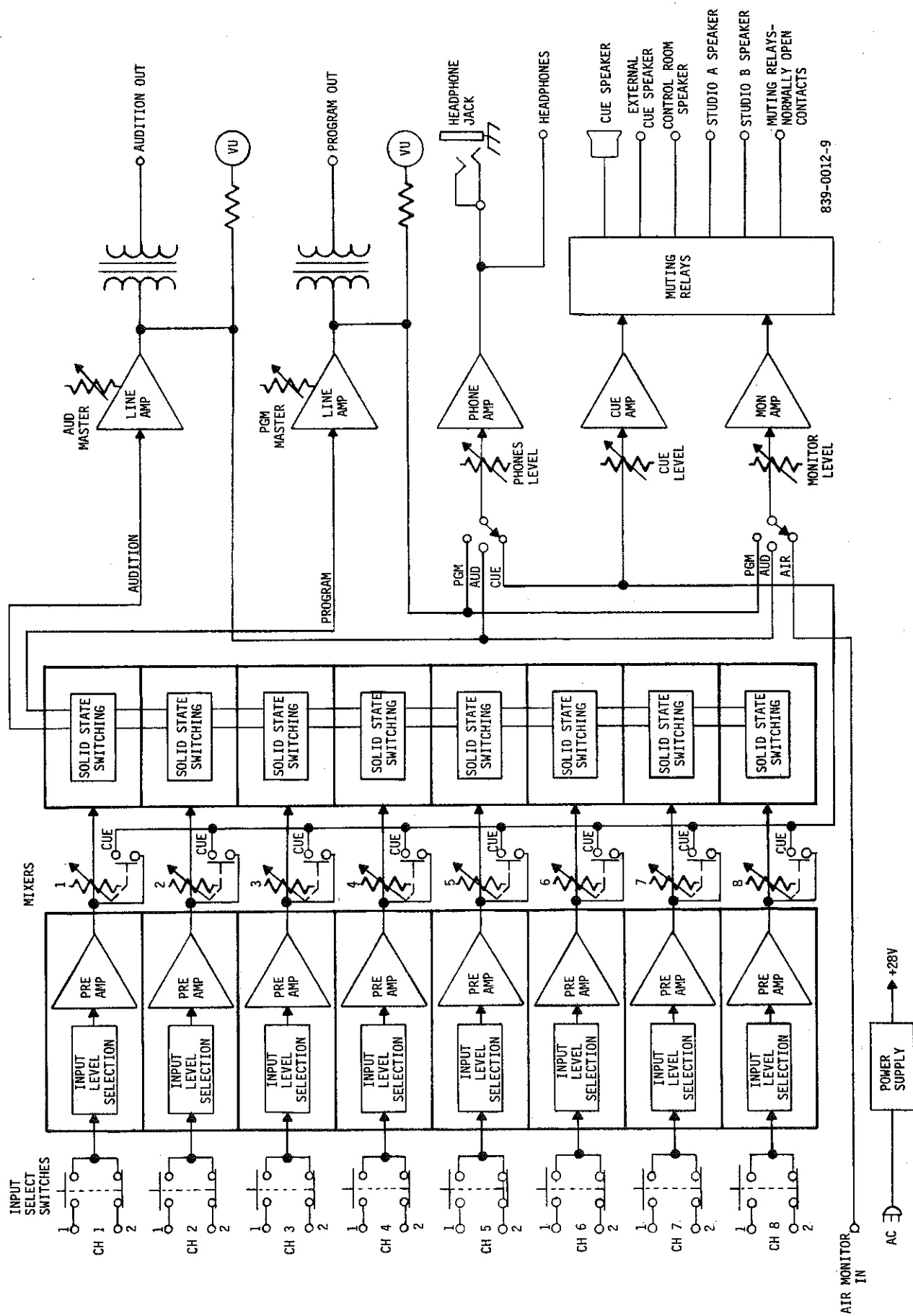
6-1. INTRODUCTION

 This section contains schematics preceeded by parts lists for all printed circuit board assemblies found in the 250 Series Consoles.

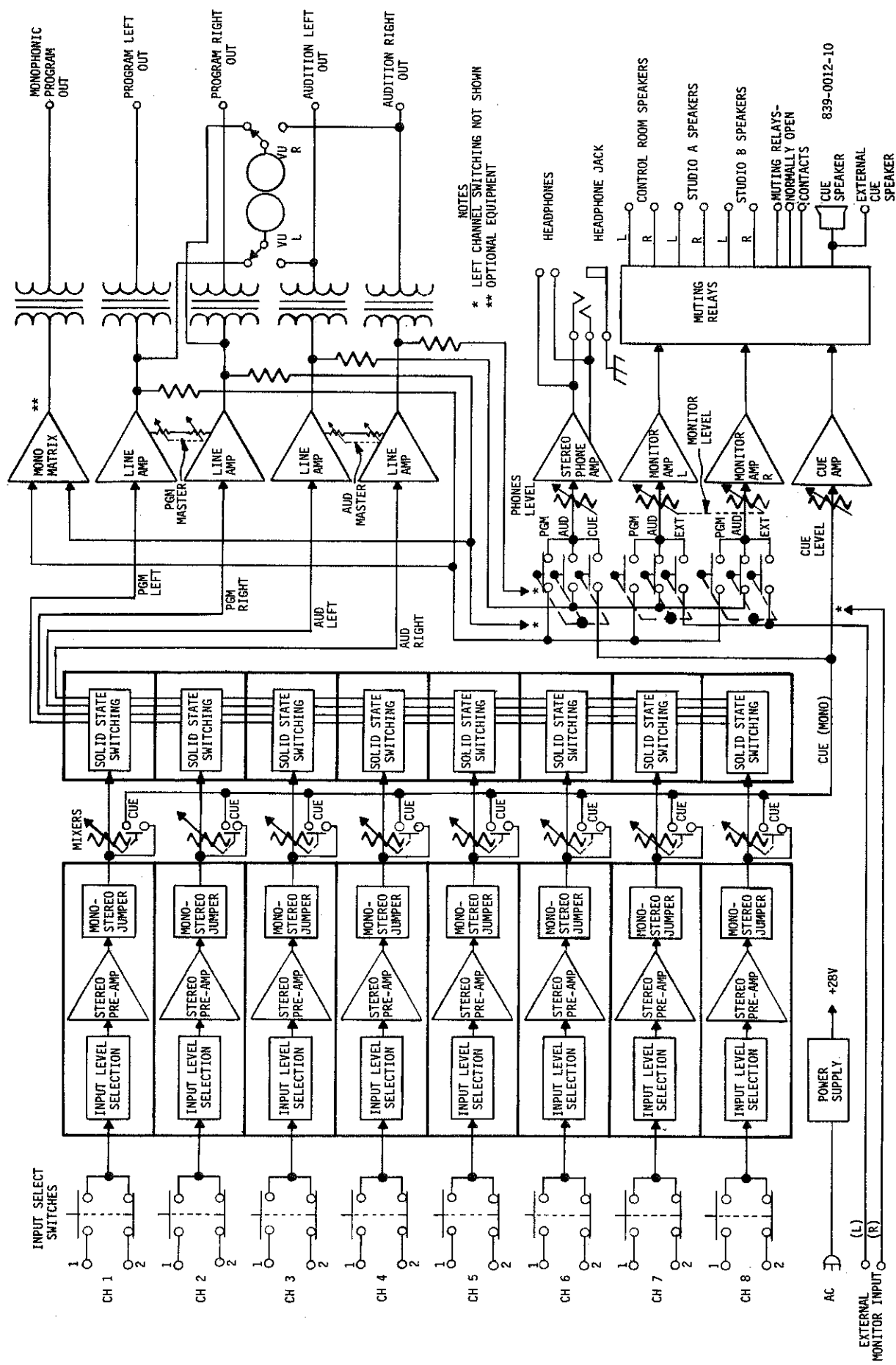
839-0012-9 --- Monophonic Block Diagram for 8 Channel Console
839-0012-10 -- Stereophonic Block Diagram for 8 Channel Console
839-0018-1 --- Monophonic Block Diagram for 10 Channel Console
839-0018-2 --- Stereophonic Block Diagram for 10 Channel Console
938-0541 ----- Five Mixer Monophonic Audio Console 5M250 - Parts List
938-0841 ----- Eight Mixer Monophonic Audio Console 8M250 - Parts List
D838-0511 ----- 5M/8M - 250, Schematic
938-0540 ----- Five Mixer Stereophonic Audio Console Model 5S250 - Parts List
938-0840 ----- Eight Mixer Stereophonic Audio Console Model 8S250 - Parts List
D838-0521 ----- 5S/8S - 250, Schematic
938-1041 ----- Ten Mixer Deluxe Monophonic Console 10M250 - Parts List
D906-7115 ----- 10M250 Console, Schematic
938-1040 ----- Ten Mixer Stereophonic Audio Console 10S250 - Parts List
D906-7113 ----- 10S250 Console, Schematic
918-3600 ----- Monaural Preamplifier Assembly - Parts List
C918-3600 ----- Mono Preamp drawing
D906-7112 ----- Mono, Stereo Preamp, Schematic
918-3601 ----- Stereophonic Preamplifier Assembly - Parts List
C918-3601 ----- Stereo Preamp drawing
918-3602 ----- Monaural Matrix Assembly Circuit Board - Parts List
C918-3602 ----- Assembly, Mono Matrix Card drawing
C906-3602 ----- Mono Matrix Printed Circuit Board Schematic
918-3604 ----- Mixer/Line Driver Amplifier - Parts List
D906-7100 ----- Mixer/Line Driver Amplifier schematic
C918-3604 ----- Mixer/Line Driver Amplifier drawing
918-3605 ----- Monaural Cue Headphone Amplifier Assembly - Parts List
C906-7111 ----- Stereo Monitor & Monitor Cue Headphone, Schematic
C918-3605 ----- Mono Cue/Headphone drawing

PARTS LIST AND SCHEMATICS CONT'D

918-3606 ----- Stereophonic Cue/Headphone Amplifier Assembly - Parts List
C918-3606 ----- Stereophonic Cue/Headphone Amplifier Assembly drawing
C906-3606 ----- Schematic Stereophonic Cue/Headphone Amplifier
918-0001 ----- VU Meter Circuit Board Assembly - Parts List
A918-0001 ----- Meter Rectifier Card VU-1 drawing
918-3709 ----- Audio Power Amplifier, 8 watt - Parts List
B906-3709 ----- 8W Power Amplifier, Schematic
C918-3709 ----- 8W Power Amplifier Printed Circuit Board drawing
918-4001 ----- Power Supply/Relay Board, 5 and 8 channel consoles - Parts List
C918-4001&1---- Power Supply/Relay Board drawing and Schematic
918-4003 ----- Power Supply/Relay Board, 10 channel, - Parts List
C918-4003 ----- Power Supply & Relay Board Printed Circuit Board drawing
C906-7114 ----- Schematic Power Supply & Relay Board
918-3706 ----- Stereo Cue/Headphone Amplifier - Part List
C906-3706 ----- Schematic Stereo Cue/Headphone Amplifier
C918-3706 ----- Stereo Cue/Headphone Amplifier drawing

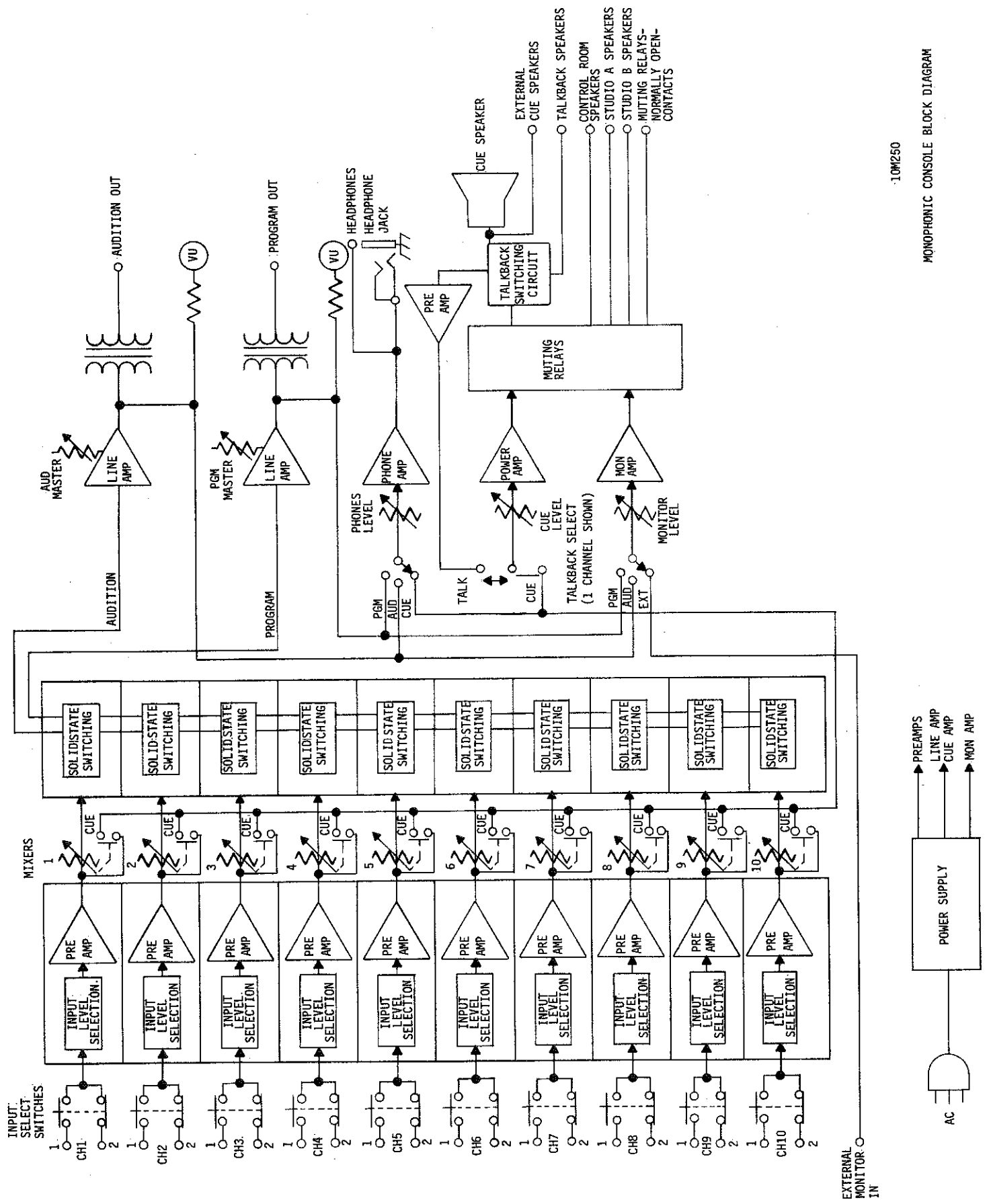


MONOPHONIC CONSOLE BLOCK DIAGRAM



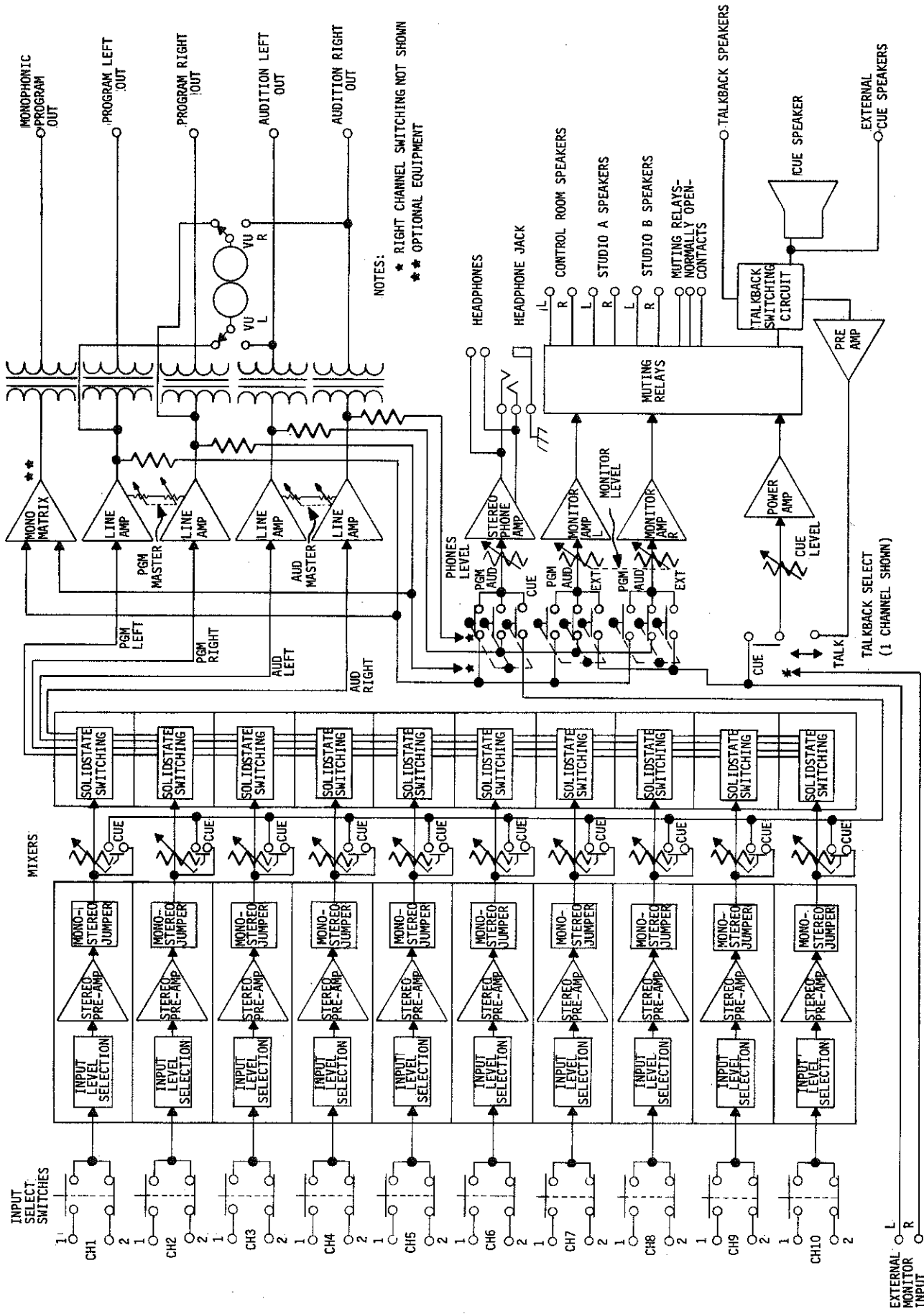
NOTES
 * LEFT CHANNEL SWITCHING NOT SHOWN
 ** OPTIONAL EQUIPMENT

STEREOPHONIC CONSOLE BLOCK DIAGRAM

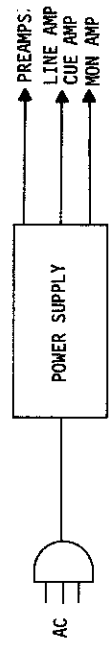


10M250

MONOPHONIC CONSOLE BLOCK DIAGRAM



NOTES:
 * RIGHT CHANNEL SWITCHING NOT SHOWN
 ** OPTIONAL EQUIPMENT



Five Mixer Monophonic Audio Console Model 5M250 - 938-0541
(Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
CR1	Bridge Rectifier, Full Wave, Silicon, 25A, 200 PIV	239-0006	1
CR2 THRU CR11	Diode, Silicon, 1N4004, 400V, 1 Ampere	203-4004	10
DS1,DS2	Lamp, 28V at 0.05 Amperes, No. 1828	321-1828	2
F1	Fuse, Slow-Blow, 3 AG, 2 Ampere	334-0200	1
J1 THRU J9	Receptacle, 18 Pin, PC Mount with Guides	417-1801	9
J20	Phone Jack, 1/4 inch (0.635 cm), 2 Circuit	417-0111	1
K1 THRU K3	Relay, Socket Mount Contacts: 4 sets SPDT, 2 Amperes, 28 Vdc or 115 Vac, Resistive Load Coil: 700 Ohm, 24 Vdc	270-0007	3
LS1	Speaker, Permanent Magnet, 3 inch (7.62 cm), 8 Ohm	414-0001	1
M1,M2	Meter, VU, 3.5 inch (8.89 cm) with Bezel, dc Microammeter Type, 1900 Ohm Movement, Type B Scale	319-1003	2
R1 THRU R5	Step Attenuator, Audio, 0.6W Continuous, 2.5W Peak, 600 Ohm Input/Output Impedance, 7 1/2° Cueing, 20 Step Ladder Type, 2 dB (CHANNEL Controls)	194-6032B	5
R6 THRU R10	Potentiometer, Audio Taper, 10k Ohm +20%, 1W (MASTER AUD, MASTER PGM, MONITOR, CUE, and PHONES Controls)	191-1053C	5
S1	Switch, Toggle, SPST, Power ON/OFF	348-0110	1
S2 THRU S6	Lever Switch, 2 DPDT, 3 Position, Positive Indexing, Black Handle, 3 Amperes at 110 Vac, Resistive Load (A/P/CHANNEL Switches)	343-3003	5
S7 THRU S14	Ganged, 2 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (INPUT SELECT Switches)	343-1201	7
S15,S16	Ganged, 3 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (EXTRA INPUTS Switches)	343-1202	2
T1 (50 Hz)	Power Transformer Primary: 230 Vac \pm 10%, 50/60 Hz Secondary: 23 Vac at 3 Amperes	376-0002	1

Five Mixer Monophonic Audio Console Model 5M250 - 938-0541
(Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
T1 (60 Hz)	Power Transformer Primary: 117V +10%, 60 Hz Secondary: 23 Vac at 3 Amperes	376-0007	1
TS1 THRU TS4	Barrier Strip, 20 Terminals	412-0020	4
XDS1,XDS2	Lamp Holder, Miniature Bayonet	322-0003	2
XF1	Fuse Holder, 3 AG	415-2012	1
----	Circuit Board Assembly, VU Meter	918-0001	2
----	Circuit Board Assembly, Power Supply	918-4001	1
----	Circuit Board Assembly, Monaural Input Amplifier	918-3600	5
----	Circuit Board Assembly, Driver Amplifier	918-3604	2
----	Circuit Board Assembly, Monaural Cue and Phones Amplifier	918-3605	1
----	Circuit Board Assembly, Monaural Monitor Amplifier	918-3709	1
----	Switch Cap, Black	343-1003	2
----	Switch Cap, White	343-1002	9
----	Switch Cap, Gray	343-1006	9
----	Terminal Board, Phenolic, 5 Lug	411-0819	5
----	Front Panel Fastener	424-0007	2
----	Stud, Quarter Turn	424-0004	2
----	Receptacle, Clip-on	424-0005	2
----	Split Ring Retainer	424-0006	2
----	Rubber Foot, Black	403-2194	4
----	Rubber Foot, Gray	403-0002	2
----	Label, Barrier Strip	594-0001	1
----	Overlay, Upper Front Panel	596-1016-2	1
----	Overlay, Lower Front Panel	596-1017	1
----	Overlay, Front Trim	596-1007-7	1
----	Knob, Round, with Skirt, Black (CHANNEL Controls)	482-0012	5
----	Knob, Round, Black	482-0016	5

Eight Mixer Monophonic Audio Console Model 8M250 - 938-0841
(Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
CR1	Bridge Rectifier, Full Wave, Silicon, 25A, 200 PIV	239-0006	1
CR2 thru CR17	Diode, Silicon, 1N404, 400V, 1 Ampere	203-4004	16
DS1,DS2	Lamp, 28V at 0.05 Amperes, No. 1828	321-1828	2
F1	Fuse, Slow-Blow, 3 AG, 2 Ampere	334-0200	1
J1 thru J12	Receptacle, 18 Pin, PC Mount with Guides	417-1801	12
J20	Phone Jack, 1/4 inch (0.635 cm), 2 Circuit	417-0111	1
K1 thru K3	Relay, Socket Mount Contacts: 4 sets SPDT, 2 Amperes, 28 Vdc or 115 Vac, Resistive Load Coil: 700 Ohm, 24 Vdc	270-0007	3
LS1	Speaker, Permanent Magnet, 3 inch (7.62 cm), 8 Ohm	414-0001	1
M1,M2	Meter, VU, 3.5 inch (8.89 cm) with Bezel, dc Microammeter Type, 1900 Ohm Movement, Type B Scale	319-1003	2
R1 thru R8	Step Attenuator, Audio, 0.6W Continuous, 2.5W Peak, 600 Ohm Input/Output Impedance, 7 1/2° Cueing, 20 Step Ladder Type, 2 dB per Step, Tapered to Off (CHANNEL Controls)	194-6032B	8
R9 thru R13	Potentiometer, Audio Taper, 10k Ohm +20%, 1W (MASTER AUD, MASTER PGM, MONITOR, CUE, and PHONES Controls)	191-1053C	5
S1	Switch, Toggle, SPST, Power ON/OFF	348-0110	1
S2 thru S9	Lever Switch, 2 DPDT, 3 Position, Positive Indexing, Black Handle, 3 Amperes at 110 Vac, Resistive Load (A/P/CHANNEL Switches)	343-3003	8
S10 thru S19	Ganged, 2 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (INPUT SELECT Switches)	343-1201	10
S20,S21	Ganged, 3 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (EXTRA INPUTS Switches)	343-1202	2
T1 (50 Hz)	Power Transformer Primary: 230 Vac +10%, 50/60 Hz Secondary: 23 Vac at 3 Amperes	376-0002	1

Eight Mixer Monophonic Audio Console Model 8M250 - 938-0841
(Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
T1 (60 Hz)	Power Transformer Primary: 117V +10%, 60 Hz Secondary: 23 Vac at 3 Amperes	376-0007	1
TS1 thru TS3	Barrier Strip, 20 Terminals	412-0020	3
XDS1, XDS2	Lamp Holder, Miniature Bayonet	322-0003	2
XF1	Fuse Holder, 3 AG	415-2012	1
---	Circuit Board Assembly, VU Meter	918-0001	2
---	Circuit Board Assembly, Power Supply	918-4001	1
---	Circuit Board Assembly, Monaural Input Amplifier	918-3600	8
---	Circuit Board Assembly, Driver Amplifier	918-3604	2
---	Circuit Board Assembly, Monaural Cue and Phones Amplifier	918-3605	1
---	Circuit Board Assembly, Monaural Monitor Amplifier	918-3709	1
---	Switch Cap, Black	343-1003	2
---	Switch Cap, White	343-1002	12
---	Switch Cap, Gray	343-1006	12
---	Terminal Board, Phenolic, 5 Lug	411-0819	8
---	Front Panel Fastener	424-0007	2
---	Stud, Quarter Turn	424-0004	2
---	Receptacle, Clip-on	424-0005	2
---	Split Ring Retainer	424-0006	2
---	Rubber Foot, Black	403-2194	4
---	Rubber Foot, Gray	403-0002	2
---	Label, Barrier Strip	594-0001	1
---	Overlay, Upper Front Panel	596-1018-2	1
---	Overlay, Lower Front Panel	596-1019	1
---	Overlay, Front Trim	596-1007-3	1
---	Knob, Round, with Skirt, Black (CHANNEL Controls)	482-0012	8
---	Knob, Round Black	482-0016	5

Five Mixer Stereophonic Audio Console Model 5S250 - 938-0540
(Sheet 1 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
CR1	Bridge Rectifier, Full Wave, Silicon, 25A, 200 PIV	239-0006	1
CR2 THRU CR11	Diode, Silicon, 1N4004, 400V, 1 Ampere	203-4004	10
DS1,DS2	Lamp, 28V at 0.05 Amperes, No. 1828	321-1828	2
F1	Fuse, Slow-Blow, 3 AG, 2 Ampere	334-0200	1
J1 THRU J13	Receptacle, 18 Pin, PC Mount with Guides	417-1801	13
J20	Phone Jack, 1/4 inch (0.635 cm), 3 Circuit	417-0311	1
K1 THRU K3	Relay, Socket Mount Contacts: 4 sets SPDT, 2 Amperes, 28 Vdc or 115 Vac, Resistive Load Coil: 700 Ohm, 24 Vdc	270-0007	3
LS1	Speaker, Permanent Magnet, 3 inch (7.62 cm), 8 Ohm	414-0001	1
M1,M2	Meter, VU, 3.5 inch (8.89 cm) with Bezel, dc Microammeter Type, 1900 Ohm Movement, Type B Scale	319-1003	2
R1 THRU R5	Step Attenuator, Audio, 0.6W Continuous, 2.5W Peak, 600 Ohm Input/Output Impedance, 7 1/2° Cueing, 20 Step Dual Ladder Type, 2 dB per Step Tapered to Off (CHANNEL Controls)	194-6032A	5
R6	Potentiometer, Audio Taper, 10k Ohm $\pm 20\%$, 1W (CUE Control)	191-1053C	1
R7 THRU R10	Potentiometer, Audio Taper, Dual 10k Ohm $\pm 20\%$, 1/2W (MASTER AUD, MASTER PGM, MONITOR, and PHONES Controls)	192-1053A	4
S1	Switch, Toggle, SPST, Power ON/OFF	348-0110	1
S2 THRU S6	Lever Switch, 2 DPDT, 3 Position, Positive Indexing, Black Handle, 3 Amperes at 110 Vac, Resistive Load (A/P/CHANNEL Switches)	343-3003	5
S7 THRU S14	Ganged, 2 Station, Interlocked Push Switch, 4 PDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (INPUT SELECT Switches)	343-1401	7
S15,S16	Ganged, 3 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (EXTRA INPUTS Switches)	343-1202	2

Five Mixer Stereophonic Audio Console Model 5S250 - 938-0540
(Sheet 2 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
S17	Ganged, 2 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (Meter PGM/AUD Switch)	343-1201	1
T1 (50 Hz)	Power Transformer Primary: 230 Vac $\pm 10\%$, 50 Hz Secondary: 23 Vac at 3 Amperes	376-0002	1
T1 (60 Hz)	Power Transformer Primary: 117V $\pm 10\%$, 60 Hz Secondary: 23 Vac at 3 Amperes	376-0007	1
TS1 THRU TS4	Barrier Strip, 20 Terminals	412-0020	4
XDS1, XDS2	Lamp Holder, Miniature Bayonet	322-0003	2
XF1	Fuse Holder, 3 AG	415-2012	1
----	Circuit Board Assembly, VU Meter	918-0001	2
----	Circuit Board Assembly, Power Supply	918-4001	1
----	Circuit Board Assembly, Stereophonic Input Amplifier	918-3601	5
----	Circuit Board Assembly, Monaural Matrix	918-3602	1
----	Circuit Board Assembly, Driver Amplifier	918-3604	4
----	Circuit Board Assembly, Stereophonic Cue and Phones Amplifier	918-3606	1
----	Circuit Board Assembly, Stereophonic Monitor Amplifier	918-3709	2
----	Switch Cap, Black	343-1003	2
----	Switch Cap, White	343-1002	10
----	Switch Cap, Gray	343-1006	10
----	Terminal Board, Pheonlic, 5 Lug	411-0819	5
----	Front Panel Fastener	424-0007	2
----	Stud, Quarter Turn	424-0004	2
----	Receptacle, Clip-on	424-0005	2
----	Split Ring Retainer	424-0006	2
----	Rubber Foot, Black	403-2194	4
----	Rubber Foot, Gray	403-0002	2
----	Label, Barrier Strip	594-0002	1

Bottom Cover
Retainer

Five Mixer Stereophonic Audio Console Model 5S250 - 938-0540
(Sheet 3 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Overlay, Upper Front Panel	596-1016-1	1
----	Overlay, Lower Front Panel	596-1017	1
----	Overlay, Front Trim	596-1007-6	1
----	Knob, Round with Skirt, Black (CHANNEL Controls)	482-0012	5
----	Knob, Round, Black	482-0016	5

Eight Mixer Stereophonic Audio Console Model 8S250 - 938-0840
(Sheet 1 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
CR1	Bridge Rectifier, Full Wave, Silicon, 25A, 200 PIV	239-0006	1
CR2 THRU CR17	Diode, Silicon, 1N4004, 400V, 1 Ampere	203-4004	16
DS1,DS2	Lamp, 28V at 0.05 Amperes, No. 1828	321-1828	2
F1	Fuse, Slow-Blow, 3 AG, 2 Ampere	334-0200	1
J1 THRU J16	Receptacle, 18 Pin, PC Mount with Guides	417-1801	16
J20	Phone Jack, 1/4 inch (0.635 cm), 3 Circuit	417-0311	1
K1 THRU K3	Relay, Socket Mount Contacts: 4 sets SPDT, 2 Amperes, 28 Vdc or 115 Vac, Resistive Load Coil: 700 Ohm, 24 Vdc	270-0007	3
LS1	Speaker, Permanent Magnet, 3 inch (7.62 cm), 8 Ohm	414-0001	1
M1,M2	Meter, VU, 3.5 inch (8.89 cm) with Bezel, dc Microammeter Type, 1900 Ohm Movement, Type B Scale	319-1003	2
R1 THRU R8	Step Attenuator, Audio, 0.6W Continuous, 2.5W Peak, 600 Ohm Input/Output Impedance, 7 1/2° Cueing, 20 Step Dual Ladder Type, 2 dB per Step Tapered to Off (CHANNEL Controls)	194-6032A	8
R9	Potentiometer, Audio Taper, 10k Ohm $\pm 20\%$, 1W (CUE Control)	191-1053C	1
R10 THRU R14	Potentiometer, Audio Taper, Dual 10k Ohm $\pm 20\%$, 1/2W (MASTER AUD, MASTER PGM, MONITOR, and PHONES Controls)	192-1053A	4
S1	Switch, Toggle, SPST, Power ON/OFF	348-0110	1
S2 THRU S8	Lever Switch, 2 DPDT, 3 Position, Positive Indexing, Black Handle, 3 Amperes at 110 Vac, Resistive Load (A/P/CHANNEL Switches)	343-3003	8
S9 THRU S18	Ganged, 2 Station, Interlocked Push Switch, 4 PDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (INPUT SELECT Switches)	343-1401	10
S19,S20	Ganged, 3 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (EXTRA INPUTS Switches)	343-1202	2

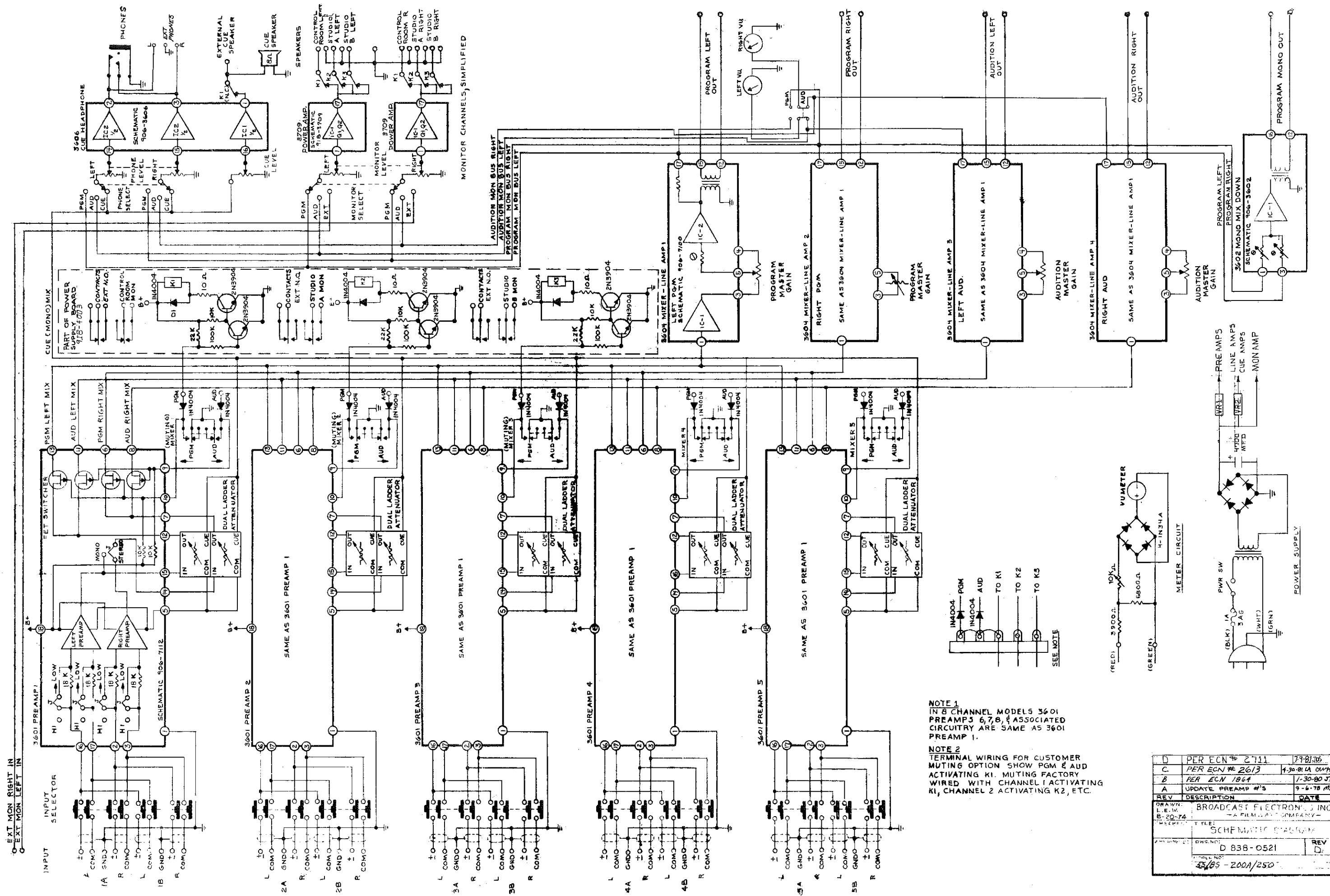
Eight Mixer Stereophonic Audio Console Model 8S250 - 938-0840
(Sheet 2 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
S21	Ganged, 2 Station, Interlocked Push Switch, DPDT, 25W Maximum, 0.5 Ampere at 50V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (Meter PGM/AUD Switch)	343-1201	1
T1 (50 Hz)	Power Transformer Primary: 230 Vac $\pm 10\%$, 50/60 Hz Secondary: 23 Vac at 3 Amperes	376-0002	1
T1 (60 Hz)	Power Transformer Primary: 117V $\pm 10\%$, 60 Hz Secondary: 23 Vac at 3 Amperes	376-0007	1
TS1 THRU TS4	Barrier Strip, 20 Terminals	412-0020	4
TS5	Barrier Strip, 10 Terminals	412-0010	1
XDS1,XDS2	Lamp Holder, Miniature Bayonet	322-0003	2
XF1	Fuse Holder, 3 AG	415-2012	1
----	Circuit Board Assembly, VU Meter	918-0001	2
----	Circuit Board Assembly, Power Supply	918-4001	1
----	Circuit Board Assembly, Stereophonic Input Amplifier	918-3601	8
----	Circuit Board Assembly, Monaural Matrix	918-3602	1
----	Circuit Board Assembly, Driver Amplifier	918-3604	4
----	Circuit Board Assembly, Stereophonic Cue and Phones Amplifier	918-3606	1
----	Circuit Board Assembly, Stereophonic Monitor Amplifier	918-3709	2
----	Switch Cap, Black	343-1003	2
----	Switch Cap, White	343-1002	13
----	Switch Cap, Gray	343-1006	13
----	Terminal Board, Phenolic, 5 Lug	411-0819	8
----	Front Panel Fastener	424-0007	2
----	Stud, Quarter Turn	424-0004	2
----	Receptacle, Clip-on	424-0005	2
----	Split Ring Retainer	424-0006	2
----	Rubber Foot, Black	403-2194	4
----	Rubber Foot, Gray	403-0002	2
----	Label, Barrier Strip	594-0002	1

Bottom Cover
Retainer

Eight Mixer Stereophonic Audio Console Model 8S250 - 938-0840
(Sheet 3 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Overlay, Upper Front Panel	596-1018-1	1
----	Overlay, Lower Front Panel	596-1019	1
----	Overlay, Front Trim	596-1007-2	1
----	Knob, Round with Skirt, Black (CHANNEL Controls)	482-0012	8
----	Knob, Round, Black	482-0016	5



10 Mixer Deluxe Monophonic Console Model 10M250 - 938-1041
(Sheet 1 of 2)

REF. NO.	DESCRIPTION	PART NO.	QTY.
AT1 Thru AT10	Attenuator, Mixer, Step	194-6032B	10
C1	Capacitor, Electrolytic, 5500 uF, 40V	024-5594	1
D1 Thru D20	Diode, 1N4004, Silicon, 400V, 1 Ampere	203-4004	20
DS1,DS2	Lamp, 28 V at 0.05 Amperes, No. 1828	321-1828	2
F1	Fuse, 2 Amperes, 3 AG, SLO-BLO	334-0200	1
J1	Connector, Phone Jack	417-0311	1
K1,K2,K3	Relay, Socket Mount Contacts: 4 sets SPDT, 2 Amperes, 28V dc or 115V ac, Resistive load Coil: 700 Ohm, 24V dc	270-0007	3
LS1	Speaker, 45 Ohm Voice Coil, 268 Ohm Resistor Frequency	414-0007	1
M1,M2	Meter, VU, 3.5 inch (8.89 cm) with Bezel, dc Microammeter Type, 1900 Ohm Movement, Type B Scale	319-1003	2
R1 Thru R6	Potentiometer, Audio Taper, 10k Ohm $\pm 20\%$, 1 W (CUE Control)	191-1053C	5
R6	Resistor, 4 Ohm $\pm 5\%$, 2W WW	132-4013	1
S1 Thru S10	Switch, Lever, 2 DPDT, 3 Position, Positive Indexing, Black Handle, 3 Amperes at 110 V ac, Resistive Load (A/P CHANNEL Switches)	343-3003	10
S11,S12	Switch, PB, DPDT, 3 Station, Interlock	343-1202	2
S13	Switch, Toggle, SPST, Power ON/OFF	348-0110	1
S14 Thru S23	Switch, PB, 2 Pole, Interlocked, 2 Station	343-1201	10
S24	Switch, PB15, 4 Station, 4 PDT, Interlocking	343-0920	1
S25	Switch, PB15, 4 PDT, 1 Station, Momentary	343-0921	1
T1	Power Transformer Primary: 117 V $\pm 10\%$, 60 Hz Secondary: 23 V ac at 3 Amperes	376-0007	1
----	Printed Circuit Board Assembly, VU Meter	918-0001	2
----	Printed Circuit Board Assembly, PS/Relay	918-4003	1
----	Printed Circuit Board Assembly, Input Amplifier	918-3600	10
----	Printed Circuit Board Assembly, Driver Amplifier	918-3604	2

10 Mixer Deluxe Monophonic Console Model 10M250 - 938-1041
(Sheet 2 of 2)

REF. NO.	DESCRIPTION	PART NO.	QTY.
----	Printed Circuit Board Assembly, Monitor Amplifier	918-3709	1
----	Printed Circuit Board Assembly, Cue/HDP Amplifier	918-3706	1
----	Cap Switch, Black	343-1003	2
----	Cap Switch, White	343-1002	16
----	Cap Switch, Gray	343-1006	14

Ten Mixer Stereophonic Audio Console Model 10S250 - 938-1040
Sheet 1 of 3

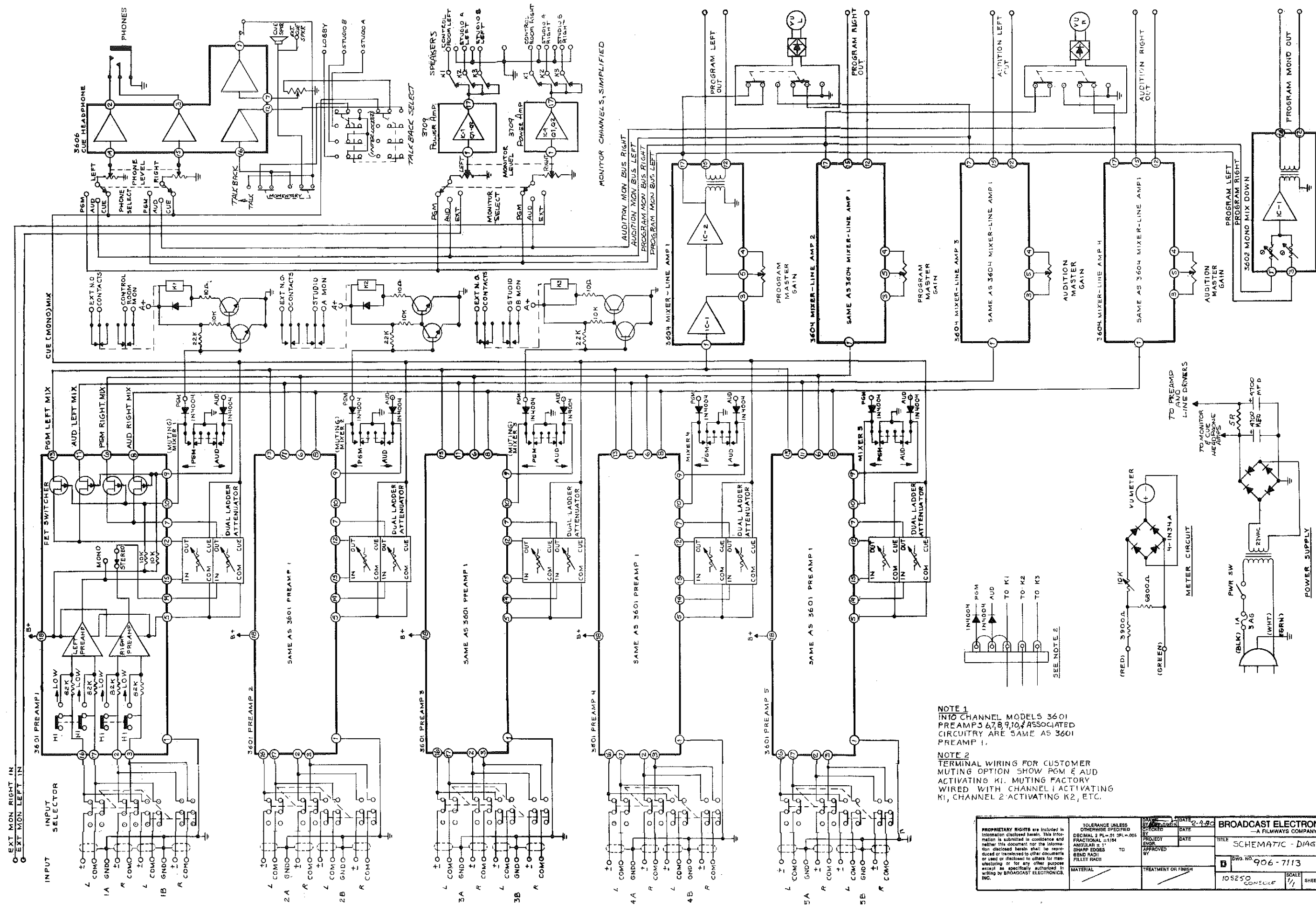
REF. DES.	DESCRIPTION	PART NO.	QUANTITY
C1	Capacitor, Electrolytic, 5500 uF, 40V	024-5594	1
CR1	Bridge Rectifier, Full Wave, Silicon, 6A, 200 PIV	239-0004	1
CR2 THRU CR21	Diode, Silicon, 1N4004, 400 V, 1 Amp	203-4004	20
DS1, DS2	Lamp, 28 V at 0.05 Amperes, No. 1828	321-1828	2
F1	Fuse, 2 A, 3 AG, Slow-Blow	334-0200	1
K1 THRU K3	Relay, Socket Mount Contacts: 4 sets SPDT, 2 Amperes 28 V DC or 115 V AC, Resistive Load Coil: 700 Ohm, 24 V DC	270-0007	3
LS1	Speaker, Permanent Magnet, 3 inch (7.62 cm), 8 Ohm	414-0001	1
M1, M2	Meter, Vu 3.5 inch (8.89 cm) with Bezel, dc Microammeter Type, 1900 Ohm Movement, Type B Scale	319-1003	2
R1 THRU R10	Step Attenuator, Audio, 0.6 W Continuous, 2.5 W Pead, 600 Ohm Input/Output Impedance, 1 1/2° Cueing, 20 Step Dual Ladder Type, 2 dB per Step Tapered to Off (CHANNEL Controls)	194-6032A	10
R11	Potentiometer, Audio Taper, 10k Ohm +20%, 1 W (CUE Control)	191-1053C	1
R12 THRU R15	Potentiometer, Audio Taper, Dual 10k Ohm +20%, 1/2 W (MASTER AUD, MASTER PGM, MONITOR, and PHONES Controls)	192-1053A	4
S1	Switch, Toggle, SPST, Power ON/OFF	348-0110	1
S2 THRU S11	Lever Switch, 2 DPDT, 3 Position, Positive Indexing, Black Handle, 3 Amperes at 110 V ac, Resistive Load (A/P CHANNEL Switches)	343-3003	10

Ten Mixer Stereophonic Audio Console Model 10S250 - 938-1040
Sheet 2 of 3

REF. DES.	DESCRIPTION	PART NO.	QUANTITY
S12 THRU S22	Ganged, 2 Station, Interlocked Push Switch, 4 PDT, 25 W Maximum, 0.5 Ampere at 50 V ac or dc, Resistive Load or 0.125 Ampere at 110/120 Vac, Resistive Load (INPUT SELECT Switches)	343-1401	11
S23, S24	Ganged, 3 Station, Interlocked Push Switch, DPDT, 25 W Maximum, 0.5 Ampere at 50 V ac or dc, Resistive Load or 0.125 Ampere at 110/120 V ac, Resistive Load (EXTRA INPUTS Switches)	343-1202	2
S25	Ganged, 2 Station, Interlocked Push Switch, DPDT, 25 W Maximum, 0.5 Ampere at 50 V ac or dc, Resistive Load or 0.125 Ampere at 110/120 V ac, Resistive Load (Meter PGM/AUD Switch)	343-1201	1
S26	Switch PB, 4 PDT, 4 Station, Interlocking	343-0920	1
S27	Switch PB, 4 PDT, 1 Station, Momentary	343-0921	1
T1	Power Transformer Primary: 117 V +10%, 60 Hz Secondary: 23 V _{ac} at 3 Amperes	376-0007	1
TS1 THRU TS9	Barrier Strip, 20 Terminals	412-0020	9
XDS1, XDS2	Lamp Holder, Miniature Bayonet	322-0003	2
XF1	Fuse Holder, 3 AG	415-2012	1
----	Circuit Board Assembly, VU Meter	918-0001	2
----	Circuit Board Assembly PS/Relay	918-4003	1
----	Circuit Board Assembly, Stereophonic Input Amplifier	918-3601	10
----	Circuit Board Assembly, Driver Amplifier	918-3604	4
----	Circuit Board Assembly, Monitor Amplifier	918-3709	2
----	Circuit Board Assembly, Cue/Phones Amplifier, Stereophonic	918-3606	1

Ten Mixer Stereophonic Audio Console Model 10S250 - 938-1040
Sheet 3 of 3

REF. DES.	DESCRIPTION	PART NO.	QUANTITY
----	Switch Cap, White	343-1002	16
----	Switch Cap, Gray	343-1006	14
----	Connector, 18-Pin PC Mount	417-1801	18
----	Bezel for Meters	319-1006	2
----	Knob, Round with Skirt	482-0012	10
----	Knob, Round	482-0016	3
----	Switch Cap, Black	343-1003	2
----	Mono Matrix Assembly	918-3602	1
----	Connector, Phone Jack	417-0311	1
----	Terminal Strip, T-type	411-0819	10



NOTE 1
 INTO CHANNEL MODELS 3601
 PREAMPS 6, 7, 8, 9, 10, ASSOCIATED
 CIRCUITRY ARE SAME AS 3601
 PREAMP 1.

NOTE 2
 TERMINAL WIRING FOR CUSTOMER
 MUTING OPTION SHOW PGM & AUD
 ACTIVATING K1. MUTING FACTORY
 WIRED WITH CHANNEL 1 ACTIVATING
 K1, CHANNEL 2 ACTIVATING K2, ETC.

PROPRIETARY RIGHTS are included in information disclosed herein. This infor- mation is submitted in confidence and neither this document nor the informa- tion disclosed herein shall be repro- duced or transferred to other documents or used or disclosed to others for man- ufacturing or for any other purpose except as specifically authorized in writing by BROADCAST ELECTRONICS, INC.		TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL - 01 SPL - 005 FRACTIONAL 1/16" ANGULAR 2° 1/2" SHARP EDGES BEND RADI FILLET RADI		DATE 2-1-80 PROJECT 906-7113 APPROVED BY TREATMENT OR FINISH		BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY - TITLE SCHEMATIC - DIAGRAM Dwg. No. 906-7113 105250 CONSOLE SCALE 1/1 SHEET 1 of 1	
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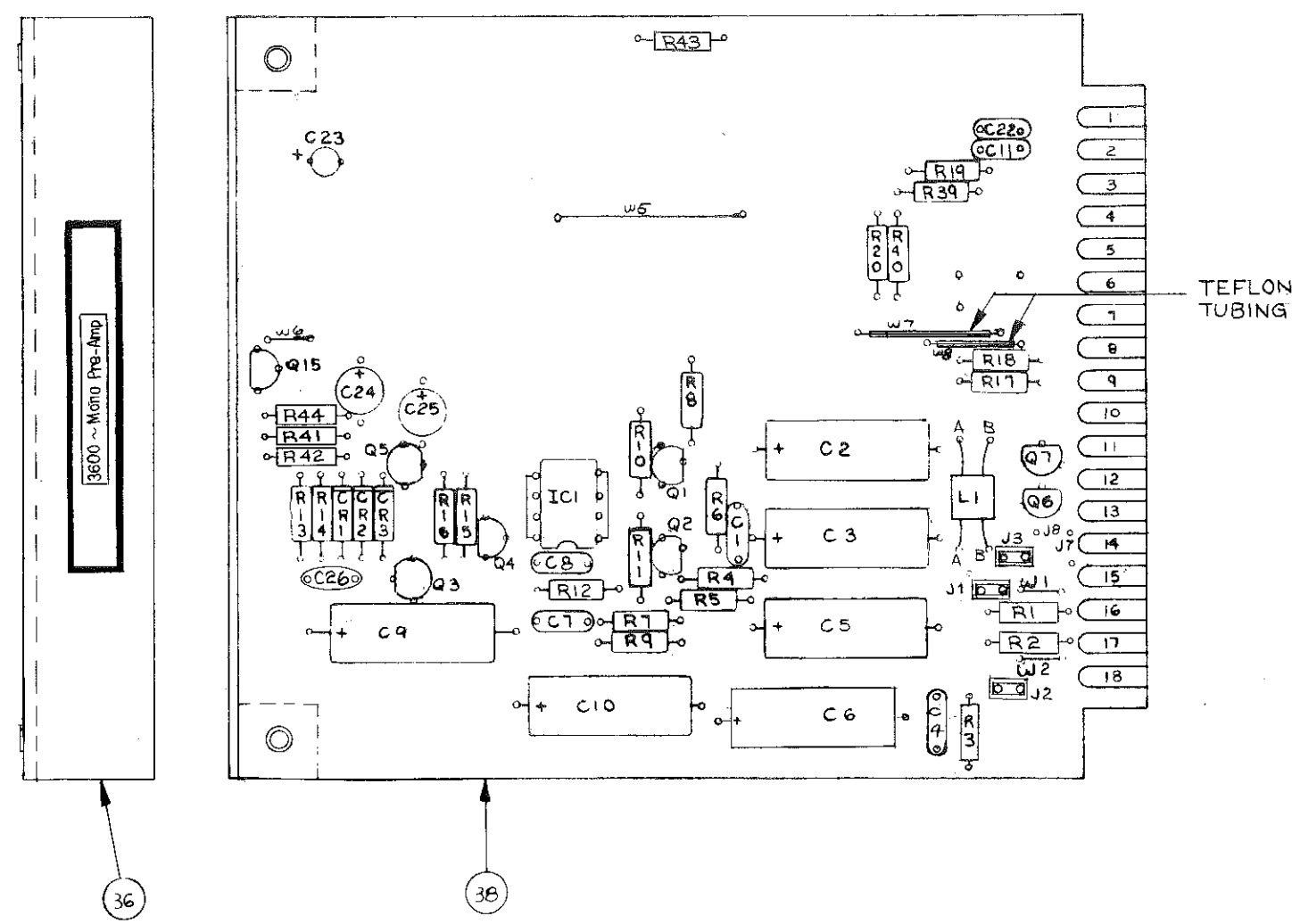
Monaural Preamplifier Assembly - 918-3600
(Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C2,C3	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C4	Capacitor, Ceramic Disc, 0.001, 1 kV	002-1034	1
C5,C6	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C7,C8	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C9	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1
C10	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C11,C22	Capacitor, Mylar Film, 0.022 uF, 200V	031-2243	2
C23	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	1
C24	Capacitor, Electrolytic, 100 uF, 25V	023-1084	1
C25	Capacitor, Electrolytic, 22 uF, 50V	024-2274	1
C26	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	1
CR1,CR2	Diode, Silicon, Fast Switching, 1N4148, 100V, 10 mA	203-4148	2
CR3	Diode, Germanium, 1N98, 100V, 20 mA	202-0098	1
IC1	Integrated Circuit, uA748, High Performance Performance Operational Amplifier, 8 Pin Dip	221-7480	1
J1 THRU J3	Jumper, Programmable, 2 Pin	340-0004	3
L1	Choke, Ferrite, 4 Leg	956-0002	1
P1 THRU P3	Connector, Header, 2 Pin	417-4004	3
Q1,Q2	Transistor, Silicon, PNP, 2N4250	210-4250	2
Q3	Transistor, Silicon, NPN, 2N5816	211-5816	1
Q4	Transistor, Silicon, NPN, 2N3904	211-3904	1
Q5	Transistor, Silicon, PNP, 2N5817	210-5817	1
Q6,Q7	Field, Effect Transistor, P Channel, Junction Type, 2N5462	212-5462	2
Q15	Transistor, Silicon, NPN, 2N3904	211-3904	1
R1,R2	Resistor, 27k Ohm, $\pm 5\%$, 1/4W	100-2753	2
R3	Resistor, 150 Ohm $\pm 5\%$, 1/4W	100-1533	1
R4,R5	Resistor, 470 Ohm $\pm 5\%$, 1/4W	100-4733	2
R6,R7	Resistor, 100 Ohm $\pm 5\%$, 1/4W	100-1033	2
R8	Resistor, 39k Ohm $\pm 5\%$, 1/4W	100-3953	1

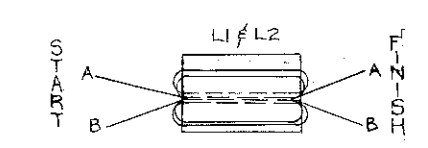
Monaural Preamplifier Assembly - 918-3600
(Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
R9	Resistor, 62k Ohm $\pm 5\%$, 1/4W	100-6253	1
R10,R11	Resistor, 82k Ohm $\pm 5\%$, 1/4W	100-8253	2
R12	Resistor, 39k Ohm $\pm 5\%$, 1/4W	100-3953	1
R13	Resistor, 3.9k Ohm $\pm 5\%$, 1/4W	100-3943	1
R14	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	1
R15,R16	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R17,R18	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	2
R19,R20 R39,R40	Resistor, 2 Meg Ohm $\pm 5\%$, 1/4W	100-2073	4
R41	Resistor, 9.1k Ohm $\pm 5\%$, 1/4W	100-9143	1
R42	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R43	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R44	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
XIC1	Socket, Integrated Circuit, 8 Pin Dip	417-0800	1
----	Label	594-3600	1
----	Blank Printed Circuit Board	518-3600	1

REVISIONS				REVISIONS			
REV	DESCRIPTION	DATE	APPROVED	REV	DESCRIPTION	DATE	APPROVED
G	PER ECN # 1780	9-4-79	GH	A	ECN # 999	10-19-77	MW
H	PER ECN # 1889	2-7-80	MS	B	ECN 1096	1-16-78	CLO
J	PER ECN # 2270	8-27-80	MS	C	ECN 1160	3-17-78	MH
K	PER ECN # 2270 A	4-2-81	L Ad	D	ECN 1244	6-20-78	MH
L	PER ECN # 2787	10-19-81	MDM	E	ECN 1248	7-14-78	MH
				F	ECN 1501	1-8-79	MH



SEE B/M #918-3600
SEE SCHEMATIC D-906-7112

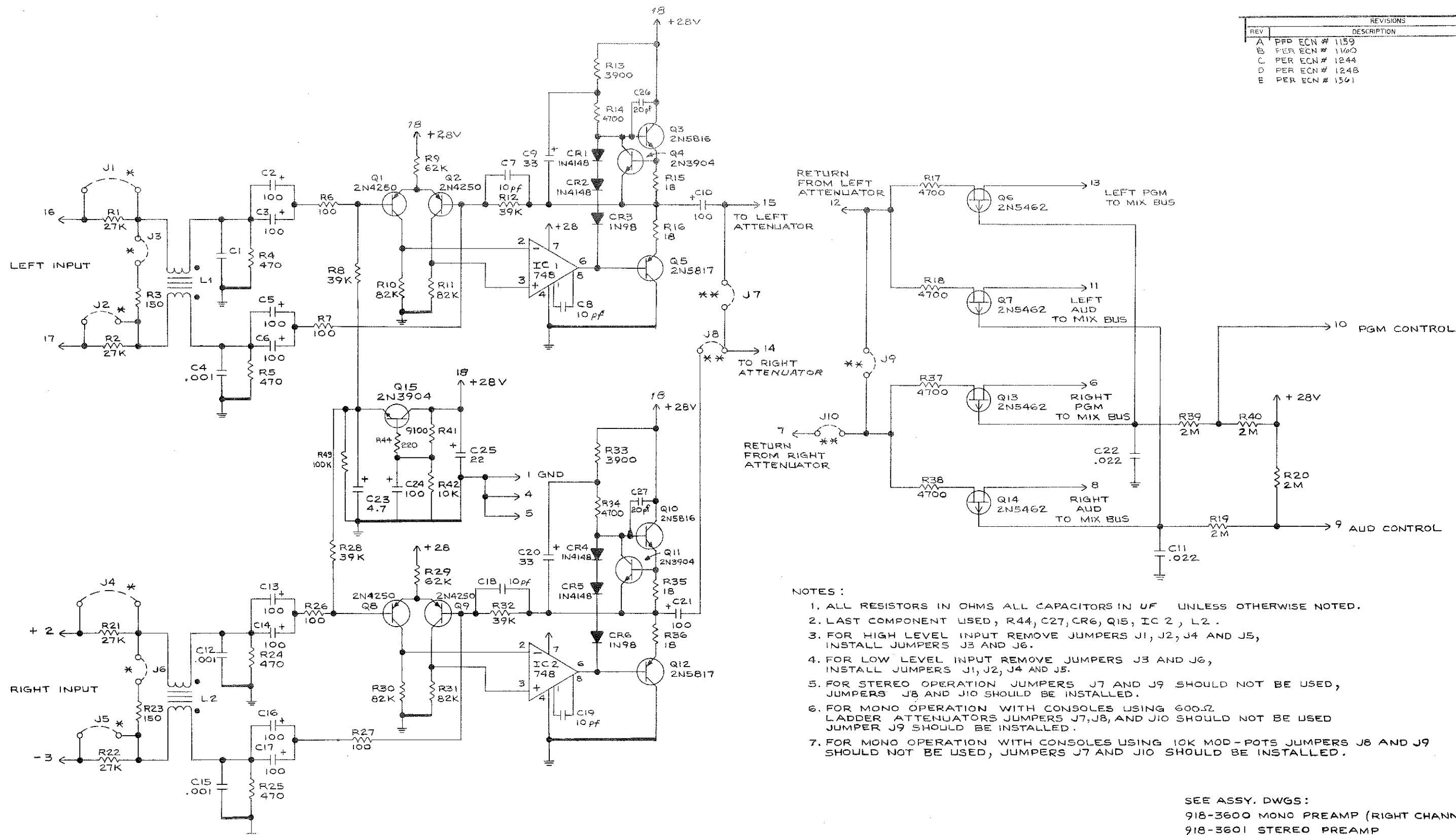


- 1. EACH WINDING 4 TURNS OF #32 SOLID ENAMEL WIRE
- 2. EACH WINDING STARTED FROM SAME SIDE AND WOUND IN SAME DIRECTION.
- 3. STRIP 1/4" INSULATION FROM EACH END.
- 4. PROPER POLARITY MUST BE MAINTAINED DURING INSERTION

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ALL RIGHTS RESERVED

ITEM	QTY	QCD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED			DRAWN BY G. J. H. 7-12-77	BROADCAST ELECTRONICS, INC.	
DECIMAL 2 PL - 01 3 PL - 005			CHECKED BY	- A FILMWAYS COMPANY -	
FRACTIONAL ± 1/64			DATE	TITLE	
ANGULAR ± 1°			PROJECT ENGR	MONO PREAMP	
SHARP EDGES			APPROVED BY	C DWG NO 918-3600	
BEND RADIUS			TO	REV 4	
FILLET RADIUS			MATERIAL	TREATMENT OR FINISH	
				SCALE 2:1 SHEET 1 OF 1	

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PER ECN # 1159	3-15-78	MH
B	PER ECN # 1160	3-17-78	MH
C	PER ECN # 1244	6-20-78	MH
D	PER ECN # 1248	7-14-78	MH
E	PER ECN # 1501	1-8-79	MH



NOTES:

1. ALL RESISTORS IN OHMS ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED.
2. LAST COMPONENT USED, R44, C27, CR6, Q15, IC 2, L2.
3. FOR HIGH LEVEL INPUT REMOVE JUMPERS J1, J2, J4 AND J5, INSTALL JUMPERS J3 AND J6.
4. FOR LOW LEVEL INPUT REMOVE JUMPERS J3 AND J6, INSTALL JUMPERS J1, J2, J4 AND J5.
5. FOR STEREO OPERATION JUMPERS J7 AND J9 SHOULD NOT BE USED, JUMPERS J8 AND J10 SHOULD BE INSTALLED.
6. FOR MONO OPERATION WITH CONSOLES USING 600Ω LADDER ATTENUATORS JUMPERS J7, J8, AND J10 SHOULD NOT BE USED JUMPER J9 SHOULD BE INSTALLED.
7. FOR MONO OPERATION WITH CONSOLES USING 10K MOD-POTS JUMPERS J8 AND J9 SHOULD NOT BE USED, JUMPERS J7 AND J10 SHOULD BE INSTALLED.

SEE ASSY. DWGS:
918-3600 MONO PREAMP (RIGHT CHANNEL OMITTED)
918-3601 STEREO PREAMP

* INPUT LEVEL SELECT JUMPERS SEE NOTES 3 AND 4
** MONO-STEREO SELECT JUMPERS SEE NOTES 5, 6 AND 7

ITEM	QTY ROD	PART NUMBER	DESCRIPTION	NO
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY Wm.	DATE 7/6/77	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -
DECIMAL 2 PL ± 0.1 3 PL ± 0.005		CHECKED BY	DATE	
FRACTIONAL 1/64		PROJECT ENGR	DATE	
ANGULAR ± 1°		APPROVED BY	DATE	
SHARP EDGES TO		TITLE SCHEMATIC		
BEND RADIUS		MONO-STEREO PREAMP		
FILLET RADIUS		DWG NO. 906 7/12		
MATERIAL		TREATMENT OR FINISH		
FOR THE EXCLUSIVE USE OF BROADCAST ELECTRONICS, INC. PERSONNEL AND CUSTOMERS ALL RIGHTS RESERVED		SCALE SHEET 1 OF 1		

Stereophonic Preamplifier Assembly - 918-3601
(Sheet 1 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C2,C3	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C4	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C5,C6	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C7,C8	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C9	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1
C10	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C11	Capacitor, Mylar Film, 0.022 uF, 200V	031-2243	1
C12	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C13,C14	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C15	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C16,C17	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C18,C19	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C20	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1
C21	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C22	Capacitor, Mylar Film, 0.022 uF, 200V	031-2243	1
C23	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	1
C24	Capacitor, Electrolytic, 100 uF, 25V	023-1084	1
C25	Capacitor, Electrolytic, 22 uF, 50V	024-2274	1
C26,C27	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	2
CR1,CR2	Diode, Silicon, Fast Switching, 1N4148, 100V, 10 mA	203-4148	2
CR3	Diode, Germanium, 1N98, 100V, 20 mA	202-0098	1
CR4,CR5	Diode, Silicon, Fast Switching, 1N4148, 100V, 10 mA	203-4148	2
CR6	Diode, Germanium, 1N98, 100V, 20 mA	202-0098	1
IC1,IC2	Integrated Circuit, uA748, High Performance Operational Amplifier, 8 Pin Dip	221-7480	2
J1 THRU J6	Jumper, Programmable, 2 Pin	340-0004	6
L1,L2	Choke, Ferrite, 4 Leg	956-0002	2
P1 THRU P6	Connector, Header, 2 Pin	417-4004	6
Q1,Q2	Transistor, Silicon, PNP, 2N4250	210-4250	2

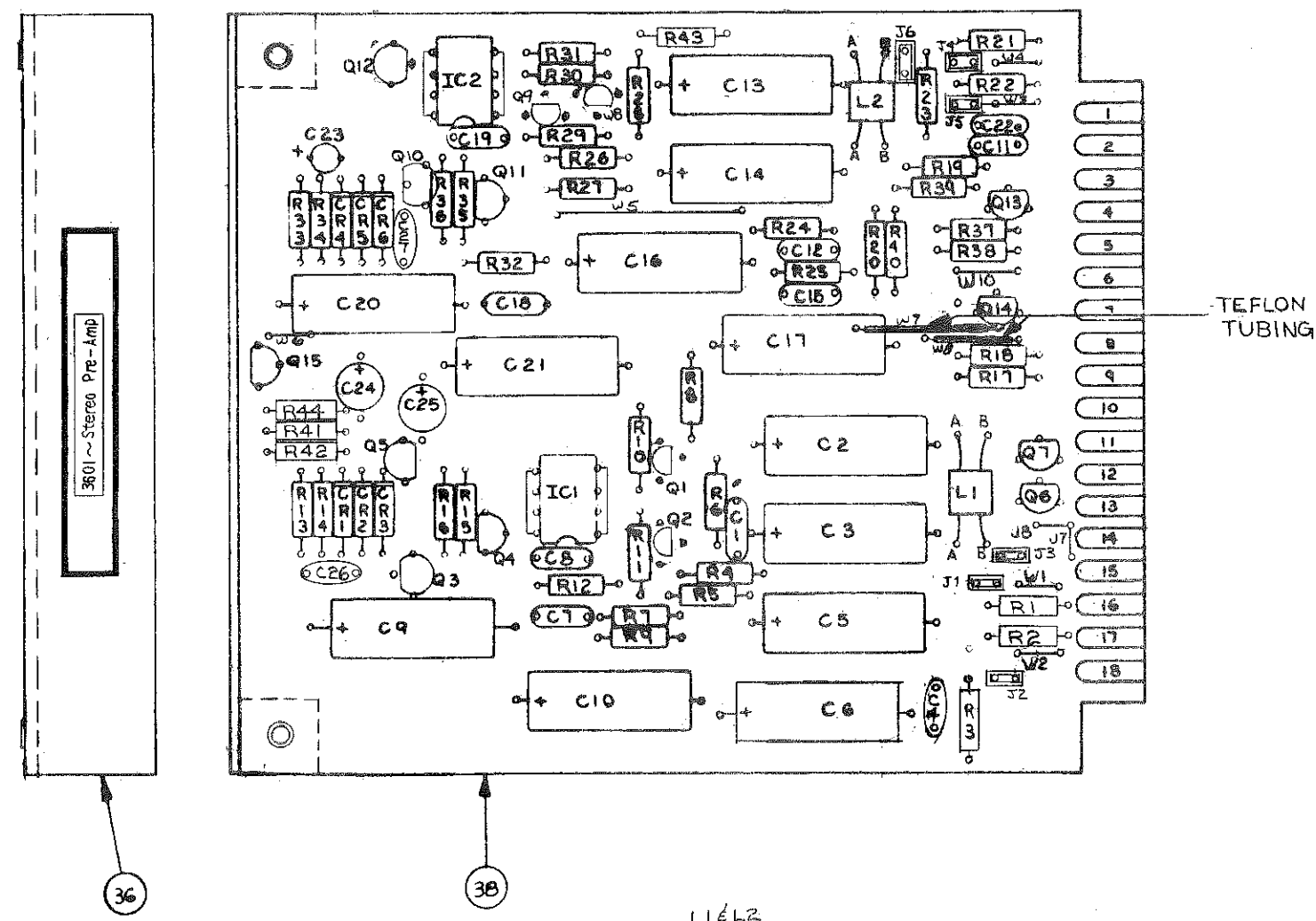
Stereophonic Preamplifier Assembly - 918-3601
(Sheet 2 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
Q3	Transistor, Silicon, NPN, 2N5816	211-5816	1
Q4	Transistor, Silicon, NPN, 2N3904	211-3904	1
Q5	Transistor, Silicon, PNP, 2N5817	210-5817	1
Q6,Q7	Field Effect Transistor, P Channel, Junction Type, 2N5462	212-5462	2
Q8,Q9	Transistor, Silicon, PNP, 2N4250	210-4250	2
Q10	Transistor, Silicon, NPN, 2N5816	211-5816	1
Q11	Transistor, Silicon, NPN, 2N3904	211-3904	1
Q12	Transistor, Silicon, PNP, 2N5817	210-5817	1
Q13,Q14	Field Effect Transistor, P Channel, Junction Type, 2N5462	212-5462	2
Q15	Transistor, Silicon, NPN, 2N3904	211-3904	1
R1,R2	Resistor, 27k Ohm $\pm 5\%$, 1/4W	100-2753	2
R3	Resistor, 150 Ohm $\pm 5\%$, 1/4W	100-1533	1
R4,R5	Resistor, 470 Ohm $\pm 5\%$, 1/4W	100-4733	2
R6,R7	Resistor, 100 Ohm $\pm 5\%$, 1/4W	100-1033	2
R8	Resistor, 39k Ohm $\pm 5\%$, 1/4W	100-3953	1
R9	Resistor, 62k Ohm $\pm 5\%$, 1/4W	100-6253	1
R10,R11	Resistor, 82k Ohm $\pm 5\%$, 1/4W	100-8253	2
R12	Resistor, 39k Ohm $\pm 5\%$, 1/4W	100-3953	1
R13	Resistor, 3.9k Ohm $\pm 5\%$, 1/4W	100-3943	1
R14	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	1
R15,R16	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R17,R18	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	2
R19,R20	Resistor, 2 Meg Ohm $\pm 5\%$, 1/4W	100-2073	2
R21,R22	Resistor, 27k Ohm $\pm 5\%$, 1/4W	100-2753	2
R23	Resistor, 150 Ohm $\pm 5\%$, 1/4W	100-1533	1
R24,R25	Resistor, 470 Ohm $\pm 5\%$, 1/4W	100-4733	2
R26,R27	Resistor, 100 Ohm $\pm 5\%$, 1/4W	100-1033	2
R28	Resistor, 39k Ohm $\pm 5\%$, 1/4W	100-3953	1
R29	Resistor, 62k Ohm $\pm 5\%$, 1/4W	100-6253	1
R30,R31	Resistor, 82k Ohm $\pm 5\%$, 1/4W	100-8253	2
R32	Resistor, 39k Ohm $\pm 5\%$, 1/4W	100-3953	1

Stereophonic Preamplifier Assembly - 918-3601
(Sheet 3 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
R33	Resistor, 3.9k Ohm $\pm 5\%$, 1/4W	100-3943	1
R34	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	1
R35,R36	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R37,R38	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	2
R39,R40	Resistor, 2 Meg Ohm $\pm 5\%$, 1/4W	100-2073	2
R41	Resistor, 9.1k Ohm $\pm 5\%$, 1/4W	100-9143	1
R42	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R43	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R44	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
XIC1,XIC2	Socket, Integrated Circuit, 8 Pin Dip	417-0800	2
----	Label	594-3601	1
----	Blank Printed Circuit Board	518-3600	1

REVISIONS				REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED	REV.	DESCRIPTION	DATE	APPROVED
F	PER ECN #1569	1-8-77	MH	A	ECN #999	10-19-77	MH
G	PER ECN #1780	9-4-79	GH	B	ECN 1096	1-16-78	CLO
H	PER ECN #1569	2-7-80	MS	C	ECN 1160	3-17-78	MH
J	PER ECN #2270	8-27-80	MS	D	ECN 1244	6-20-78	MH
K	PER ECN #2270A	4-2-81	LAL	E	ECN 1248	7-14-78	MH
L	PER ECN #2787	10-19-81	MDM				



1. EACH WINDING 4TURNS OF #32 SOLID ENAMEL WIRE
2. EACH WINDING STARTED FROM SAME SIDE AND WOUND IN SAME DIRECTION.
3. STRIP 1/4" INSULATION FROM EACH END.
4. PROPER POLARITY MUST BE MAINTAINED DURING INSERTION

SEE B/M # 918-3601
SEE SCHEMATIC D-906-7112

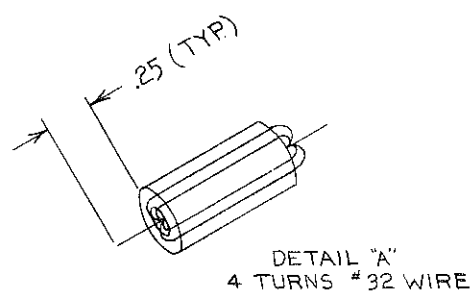
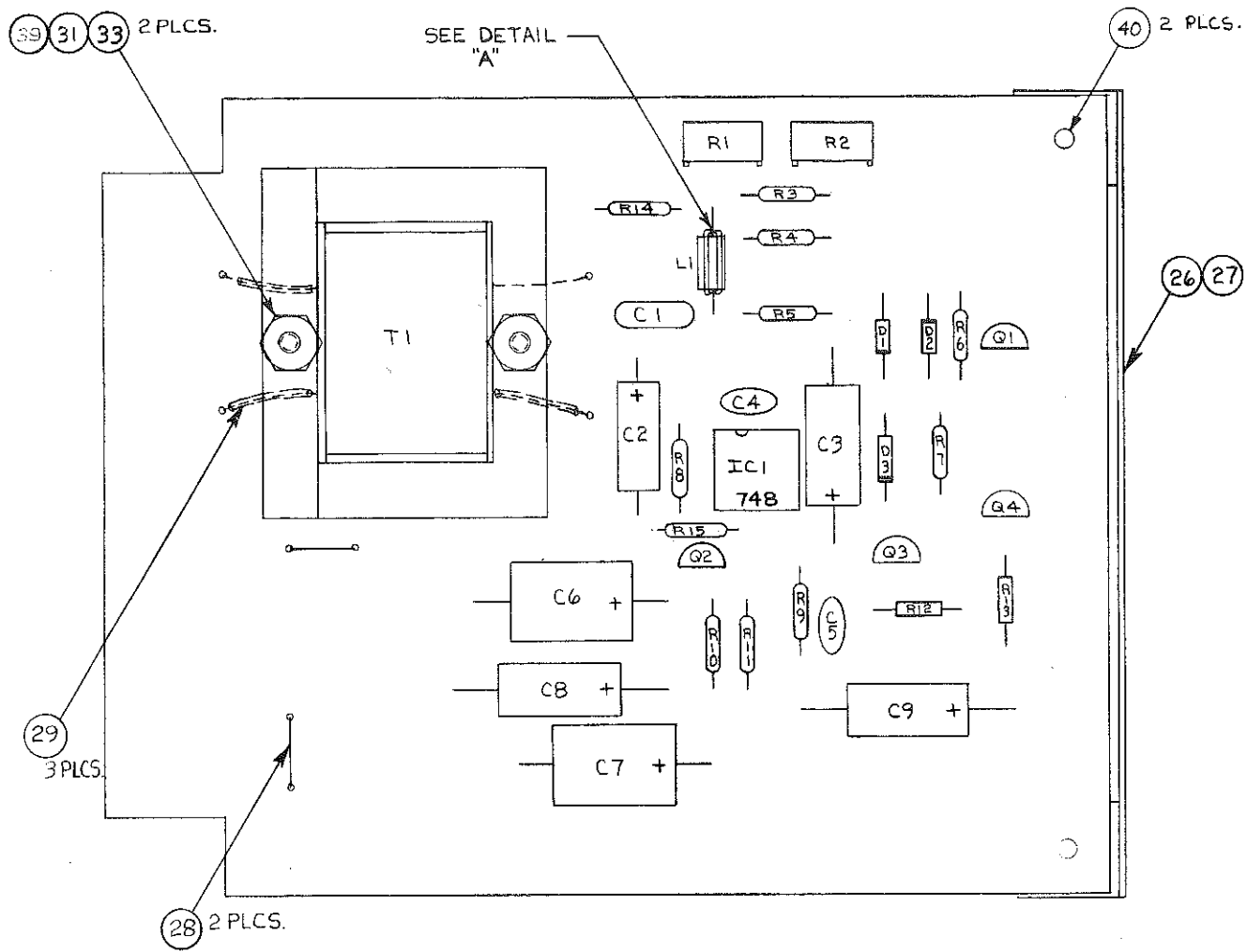
ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED.			BROADCAST ELECTRONICS INC.	
DECIMAL 2 PL/101 SPL:005			- A FILMWAYS COMPANY -	
FRACTIONAL 2 1/64			TITLE	
ANGULAR 2 P			STEREO PREAMP	
SHARP EDGES			C	
BEND RADI			DWG NO. 918-3601	
Fillet Radi			SCALE	
MATERIAL			2:1	
TREATMENT OR FINISH			SHEET 1 OF 1	

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Monaural Matrix Assembly - 918-3602

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Mica, 50 pF $\pm 10\%$, 50V	040-5013	1
C2	Capacitor, Electrolytic, 4.7 uF, 35V	015-5064	1
C3	Capacitor, Electrolytic, 22 uF, 25V	013-2574	1
C4,C5	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C6,C7	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C8,C9	Capacitor, Electrolytic, 33 uF, 35V	014-3274	2
D1,D2	Diode, Silicon, Fast Switching, 1N4148, 100V, 10 mA	203-4148	2
D3	Diode, Germanium, 1N98, 100V, 20 mA	202-0098	1
IC1	Integrated Circuit, High Performance Operational Amplifier, uA748C, 8 Pin Dip	221-7480	1
L1	Choke, Ferrite, 2 Leg	956-0001	1
Q1,Q2	Transistor, Silicon, NPN, 2N3904	211-3904	2
Q3	Transistor, Silicon, PNP, 2N5817	210-5817	1
Q4	Transistor, Silicon, NPN, 2N5816	211-5816	1
R1,R2	Potentiometer, 50k Ohm $\pm 10\%$, 1/2W	178-5054	2
R3,R4	Resistor, 33k Ohm $\pm 5\%$, 1/4W	100-3353	2
R5	Resistor, 47 Ohm $\pm 5\%$, 1/4W	100-4723	1
R6	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	1
R7	Resistor, 3.9k Ohm $\pm 5\%$, 1/4W	100-3943	1
R8,R9	Resistor, 33k Ohm $\pm 5\%$, 1/4W	100-3353	2
R10	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R11	Resistor, 8.2k Ohm $\pm 5\%$, 1/4W	100-8243	1
R12,R13	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R14	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R15	Resistor, 220k Ohm $\pm 5\%$, 1/4W	100-2233	1
T1	Transformer, Audio Output, 1:1 Primary: 600 Ohms CT Secondary: 600 Ohms CT (Broadcast Electronics Manufacture)	371-0001	1
----	Blank Circuit Board	518-3602	1
XIC1	Socket, Integrated Circuit, 8 Pin Dip	417-0800	1
----	Label	594-3602	1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PER ECN #1148	2-15-78	MH
B	PER ECN #1248	7-14-78	MH
C	PER ECN #1972	3-21-80	JH
D	PER ECN # 2787	10-19-81	MDM



SEE B/M NO. 918-3602
 LAST USED: C9,R15,D3,Q4,L1,TI,IC1

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 BROADCAST ELECTRONICS, INC.
 PERSONNEL AND CUSTOMERS
 ALL RIGHTS RESERVED

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY M. HAYDEN	DATE 1-12-78	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -
DECIMAL 2 PL=01 3 PL=.005		CHECKED BY	DATE	
FRACTIONAL ± 1/64		PROJECT ENGR	DATE	
ANGULAR ± 1°		APPROVED BY		
SHARP EDGES TO				TITLE ASS'Y, MONO MATRIX CARD
BEND RADII				C DWG NO. 918-3602
FILLET RADII				REV D
MATERIAL		TREATMENT OR FINISH		CONSOLES
				SCALE 2/1
				SHEET 1 OF 1

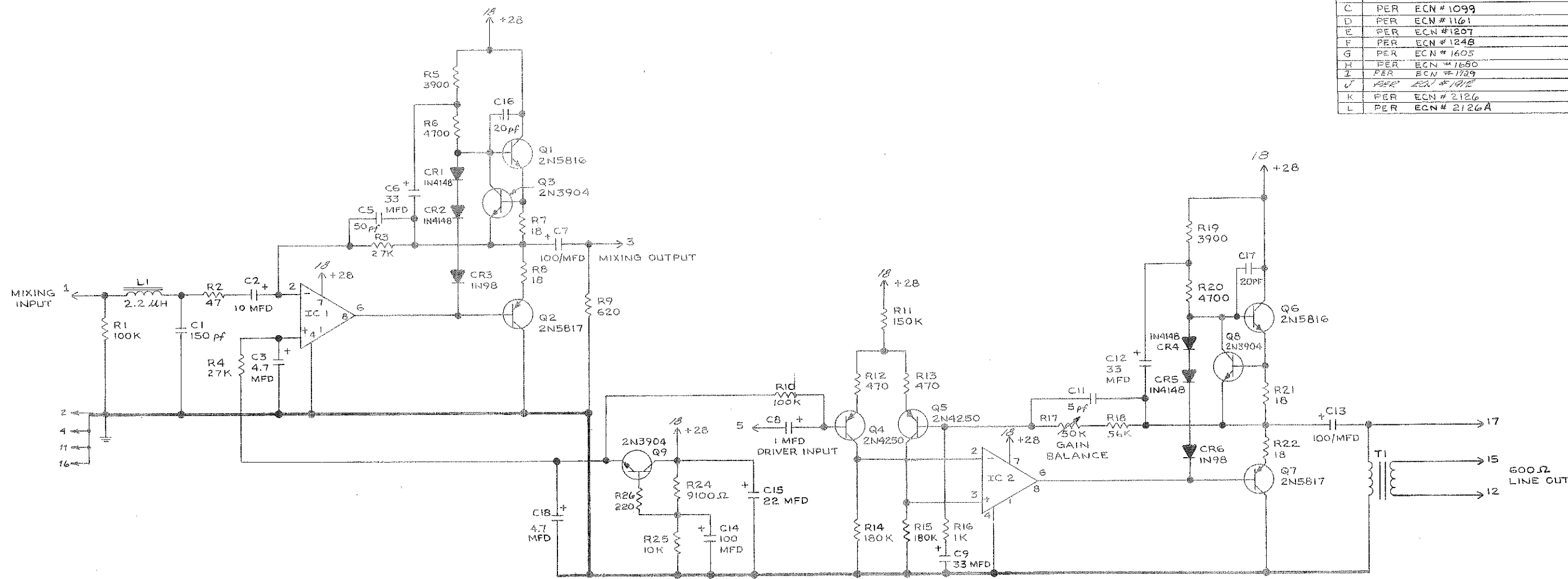
Line Driver Amplifier - 918-3604
(Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Mica, 150 pF, 500V	040-1522	1
C2	Capacitor, Tantalum, 10 uF $\pm 20\%$, 25V	063-1074	1
C3	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	1
C4	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	1
C5	Capacitor, Mica, 50 pF, 50V	040-5013	1
C6	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1
C7	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C8	Capacitor, Electrolytic, 1 uF $\pm 10\%$, 35V, Tantalum	064-1063	1
C9	Capacitor, Electrolytic, 33 uF, 35V	024-3374	1
C10	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	062-2013	1
C11	Capacitor, Ceramic Disc, 5 pF, 500V, NPO	001-5004	1
C12	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1
C13	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C14	Capacitor, Electrolytic, 100 uF, 25V	023-1084	1
C15	Capacitor, Electrolytic, 22 uF, 50V	024-2274	1
C16,C17	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	2
C18	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	1
CR1,CR2	Diode, Silicon, Fast Switching, 1N4148, 100V, 10 mA	203-4148	2
CR3	Diode, Germanium, 1N98, 100V, 20 mA	202-0098	1
CR4,CR5	Diode, Silicon, Fast Switching, 1N4148, 100V, 10 mA	203-4148	2
CR6	Diode, Germanium, 1N98, 100V, 20 mA	202-0098	1
IC1,IC2	Integrated Circuit, Low Noise Operational Amplifier, NE5534AN, 8 Pin Dip	221-5534	2
L1	Inductor, 2.2 mH	364-0022	1
Q1	Transistor, Silicon, NPN, 2N5816	211-5816	1
Q2	Transistor, Silicon, PNP, 2N5817	210-5817	1
Q3	Transistor, Silicon, NPN, 2N3904	211-3904	1
Q4,Q5	Transistor, Silicon, PNP, 2N4250	210-4250	2
Q6	Transistor, Silicon, NPN, 2N5816	211-5816	1
Q7	Transistor, Silicon, PNP, 2N5817	210-5817	1

Line Driver Amplifier - 918-3604
(Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
Q8,Q9	Transistor, Silicon, NPN, 2N3904	211-3904	2
R1	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R2	Resistor, 47 Ohm $\pm 5\%$, 1/4W	100-4723	1
R3,R4	Resistor, 27k Ohm $\pm 5\%$, 1/4W	100-2753	2
R5	Resistor, 3900 Ohm $\pm 5\%$, 1/4W	100-3943	1
R6	Resistor, 4700 Ohm $\pm 5\%$, 1/4W	100-4743	1
R7,R8	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R9	Resistor, 620 Ohm $\pm 5\%$, 1/4W	100-6233	1
R10	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R11	Resistor, 150k Ohm $\pm 5\%$, 1/4W	100-1563	1
R12,R13	Resistor, 470 Ohm $\pm 5\%$, 1/4W	100-4733	2
R14,R15	Resistor, 180k Ohm $\pm 5\%$, 1/4W	100-1863	2
R16	Resistor, 1k Ohm $\pm 5\%$, 1/4W	100-1043	1
R17	Potentiometer, 50k Ohm $\pm 10\%$, 1/2W	178-5054	1
R18	Resistor, 56k Ohm $\pm 5\%$, 1/4W	100-5653	1
R19	Resistor, 3900 Ohm $\pm 5\%$, 1/4W	100-3943	1
R20	Resistor, 4700 Ohm $\pm 5\%$, 1/4W	100-4743	1
R21,R22	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R24	Resistor, 9100 Ohm $\pm 5\%$, 1/4W	100-9143	1
R25	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R26	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
T1	Transformer, Audio Output, 1:1 Primary: 600 Ohms CT Secondary: 600 Ohms CT (Broadcast Electronics Manufacture)	371-0001	1
XIC1	Socket, Integrated Circuit, 8 Pin Dip	417-0800	1
----	Label	594-3604	1
----	Blank Printed Circuit Board	518-3604	1

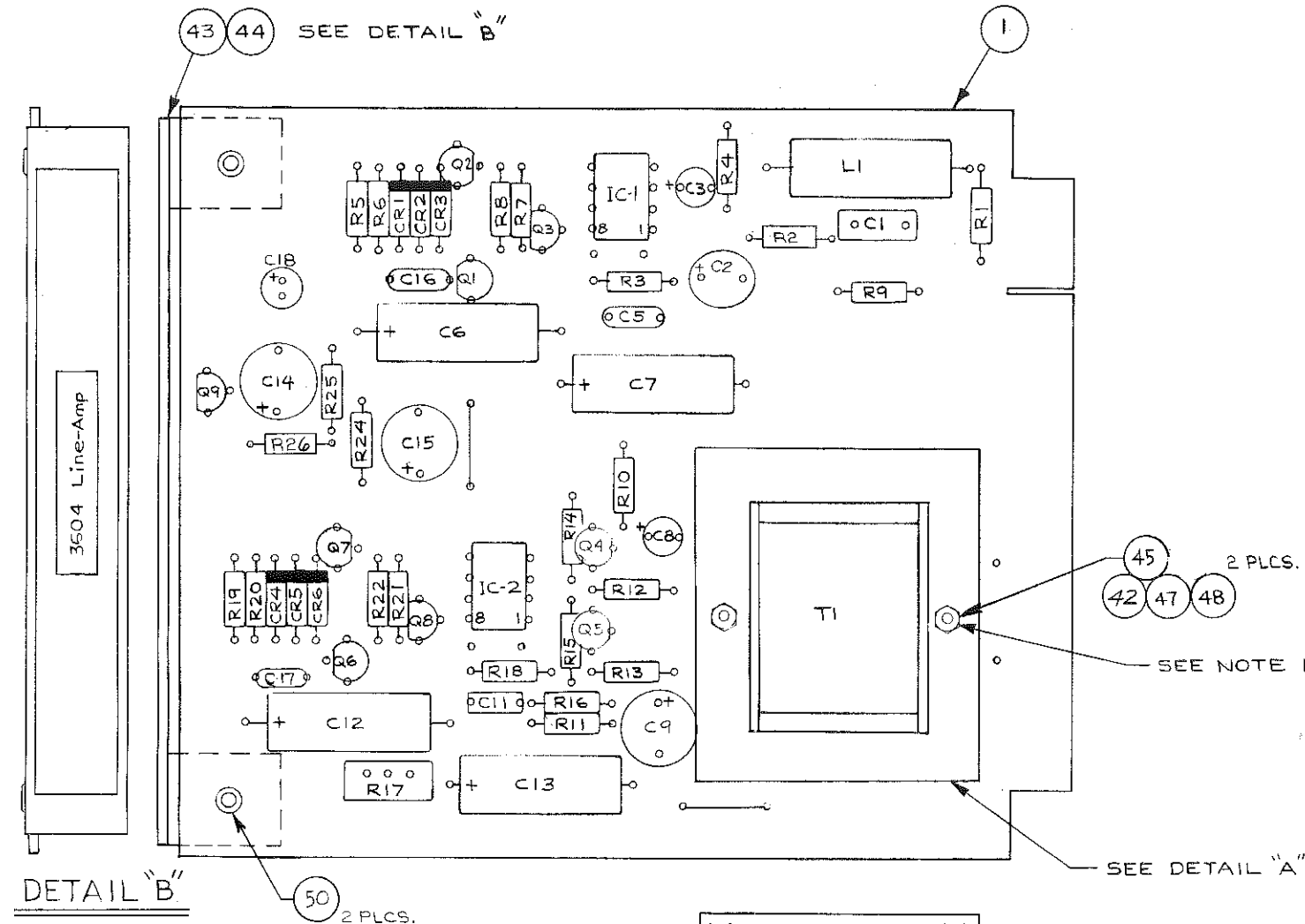
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	INCORP. ECN # 962 GJ.	7/12/77	
B	PER ECN # 982 CL6	9-15-77	
C	PER ECN # 1099	1-18-78	MH
D	PER ECN # 1161	3-17-78	MH
E	PER ECN # 1207	5-16-78	MH
F	PER ECN # 1248	7-4-78	MH
G	PER ECN # 1605	2-14-79	BE
H	PER ECN # 1650	4-5-79	BE
I	PER ECN # 1729	6-5-79	GH
J	PER ECN # 1812	8-6-80	BL
K	PER ECN # 2126	6-25-80	MH
L	PER ECN # 2126A	10-14-80	mm



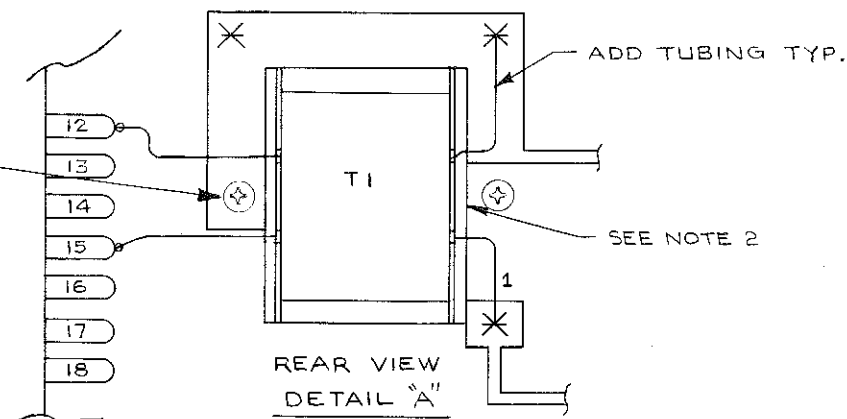
- NOTE :
1. LAST COMPONENTS USED, C18, R26, CR6, Q9, IC-2, T1, L1
 2. IC-1, IC-2 ARE 5534 .
 3. COMPONENT NOT USED R23, C4, C10

ASSY. NO. 918-3604

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		BROADCAST ELECTRONICS INC.		
DECIMAL 2 PL+01 3 PL+005		- A FILMWAYS COMPANY -		
FRACTIONAL 1/64		TITLE MIXER-LINE DRIVER AMP		
ANGULAR 1°		DWS NO 906-7100		
SHARP EDGES		SCALE		
BEND RADIUS		SHEET 1 OF 1		
FILLET RADIUS				
FOR THE EXCLUSIVE USE OF BROADCAST ELECTRONICS, INC. PERSONNEL AND CUSTOMERS ALL RIGHTS RESERVED				



- NOTE :
1. TRANSFORMER CORE MUST CONNECT TO GROUND.
 2. INPUT SIDE OF TRANSFORMER INDICATED BY BLACK MARK.



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INCOMP ECN # 962 G.J.	7-13-77	
B	PER ECN # 982 CLO	9-15-77	
C	PER ECN # 1096	1-16-78	MH
D	PER ECN # 1099	1-18-78	MH
E	PER ECN # 1161	3-17-78	MH
F	PER ECN # 1207	5-16-78	MH
G	PER ECN # 1226	6-8-78	MH
H	PER ECN # 1248	7-14-78	MH
J	PER ECN # 1330	9-11-78	CLO
K	PER ECN # 1605	2-14-79	BE
L	PER ECN # 1680	4-5-79	BE
M	PER ECN # 1729	6-5-79	GH
N	PER ECN # 1912	2-11-80	JH
O	PER ECN # 2100	6-25-80	MH
P	PER ECN # 2126A	10-14-80	MM
R	PER ECN # 2787	10-19-81	MDM

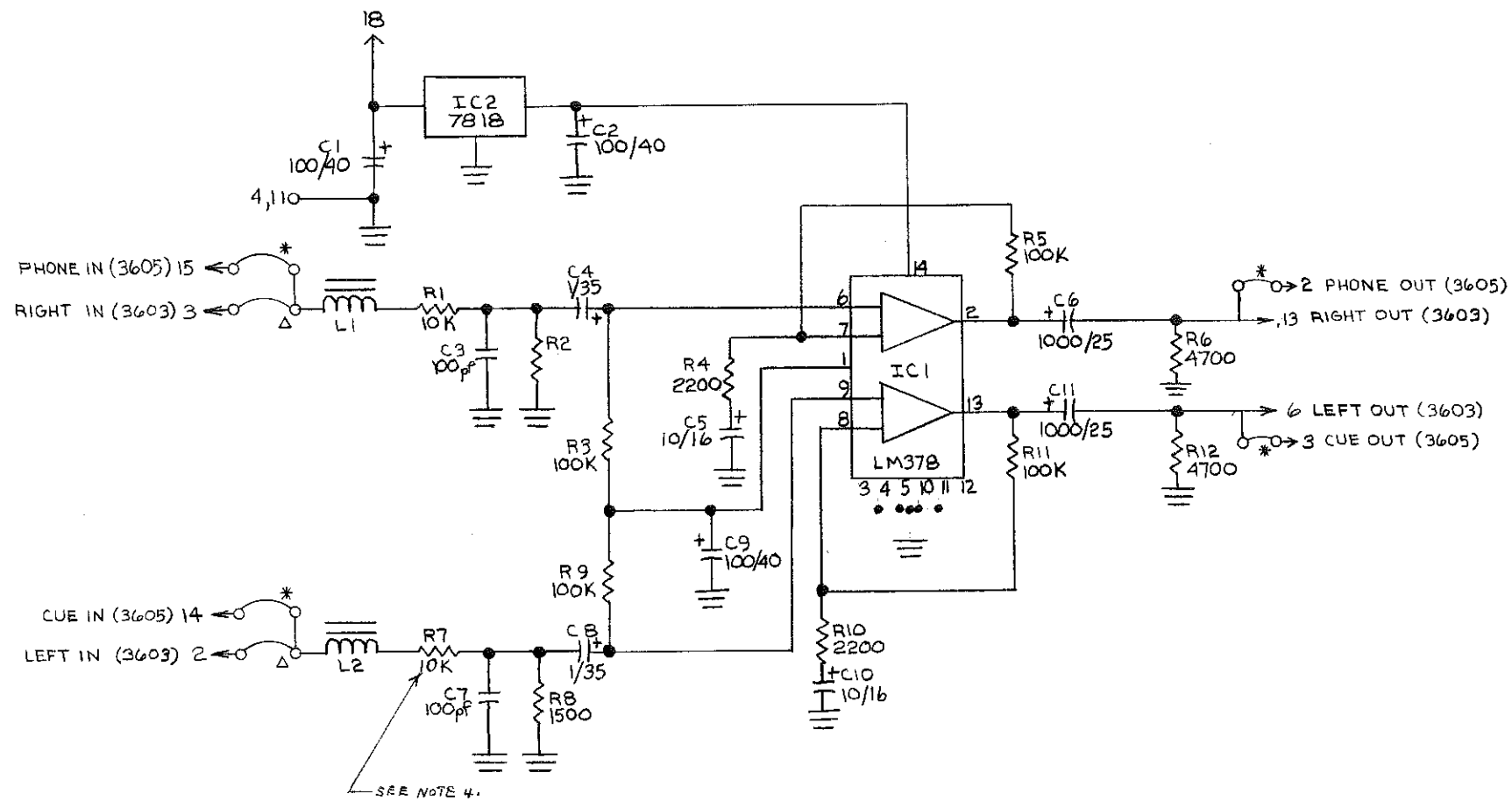
SEE B/M # 918-3604
SEE SCHEMATIC # D-906-7100

PROPRIETARY RIGHTS are included in information disclosed herein. This information is submitted in confidence and neither this document nor the information disclosed herein shall be reproduced or transferred to other documents or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by BROADCAST ELECTRONICS, INC.		TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL = .01 3 PL = .005 FRACTIONAL $\pm 1/64$ ANGULAR $\pm 1^\circ$ SHARP EDGES BEND RADII FILLET RADII		DRAWN BY M. HAYDEN CHECKED BY PROJECT ENGR. APPROVED BY		DATE 6-25-80 DATE DATE		BROADCAST ELECTRONICS INC. —A FILMWAYS COMPANY—	
		MATERIAL		TREATMENT OR FINISH		TITLE MIXER - LINE DRIVER AMP		DWG. NO. 918-3604 REV. R	
CONSOLES				SCALE 2/1		SHEET 1 OF 1			

Monaural Cue/Headphone Amplifier Assembly - 918-3605

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C3	Capacitor, Mica, 50 pF, 50V	040-1022	1
C4	Capacitor, Electrolytic, 1.0 uF, 35V	015-1064A	1
C5	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1
C6	Capacitor, Electrolytic, 1000 uF -10%, +50%, 25V	013-1095	1
C7	Capacitor, Mica, 50 pF, 50V	040-1022	1
C8	Capacitor, Electrolytic, 1.0 uF, 35V	015-1064A	1
C9	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C10	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1
C11	Capacitor, Electrolytic, 1000 uF -10%, +50%, 25V	013-1095	1
IC1	Integrated Circuit, LM378N, Dual 5 Watt Audio Power Amplifier, 14 Pin Dip	222-3780	1
IC2	Integrated Circuit, uA7818UC, Fixed +18 Volt Regulator, 1.5 Ampere, TO-220 Package	227-7818	1
L1,L2	Choke, Ferrite, 2 Leg	956-0001	2
R1	Resistor, 10k Ohm <u>+5%</u> , 1/4W	100-1053	1
R2	Resistor, 220 Ohm <u>+5%</u> , 1/4W	100-2233	1
R3	Resistor, 100k Ohm <u>+5%</u> , 1/4W	100-1063	1
R4	Resistor, 2.2k Ohm <u>+5%</u> , 1/4W	100-2243	1
R5	Resistor, 100k Ohm <u>+5%</u> , 1/4W	100-1063	1
R6	Resistor, 4.7k Ohm <u>+5%</u> , 1/4W	100-4743	1
R7	Resistor, 2.2k Ohm <u>+5%</u> , 1/4W	100-2243	1
R8	Resistor, 1.5k Ohm <u>+5%</u> , 1/4W	100-1543	1
R9	Resistor, 100k Ohm <u>+5%</u> , 1/4W	100-1063	1
R10	Resistor, 2.2k Ohm <u>+5%</u> , 1/4W	100-2243	1
R11	Resistor, 100k Ohm <u>+5%</u> , 1/4W	100-1063	1
R12	Resistor, 4.7k Ohm <u>+5%</u> , 1/4W	100-4743	1
----	Label	594-3605	1
----	Blank Printed Circuit Board	518-3603	1
----	Heat Sink for IC2	455-3509	1
----	Heat Sink for IC1	455-3603	1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
REV A	PER ECN 1723	5-24-79	GH
B	PER ECN 1822	9-20-79	GH

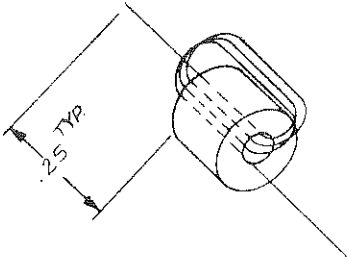
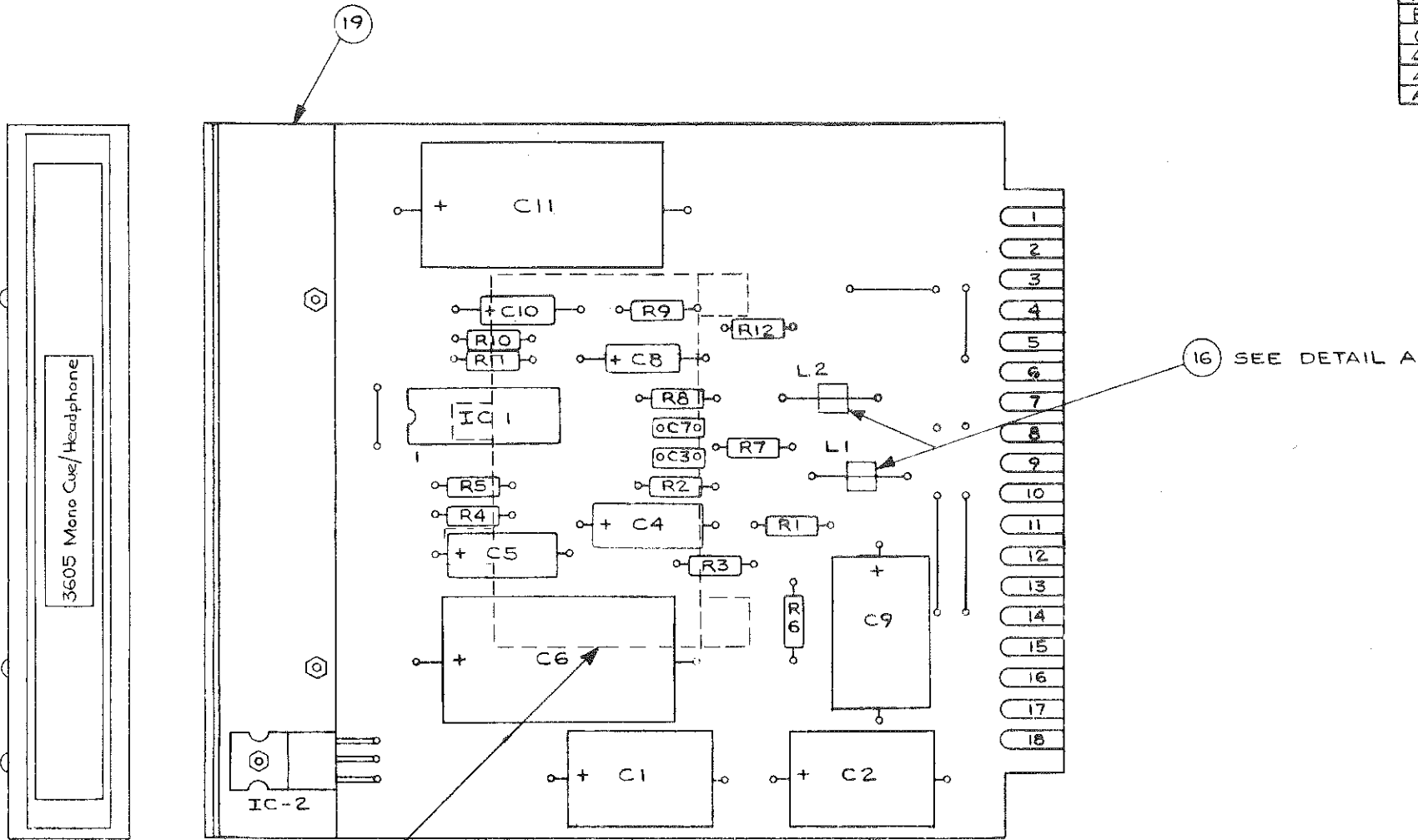


- NOTES:
1. RESISTORS IN OHMS, 1/4 W; CAPACITORS IN MICROFARADS, UNLESS OTHERWISE NOTED.
 2. LAST COMPONENTS USED: C11, IC2, L2, R12.
 3. SEE P.C. BOARD ASSEMBLY NO. 918-3603 AND 918-3605.
 - * JUMPER FOR 918-3605.
 - Δ JUMPER FOR 918-3603.
 - * R7 IS 2.2K ONLY FOR 3605.
 - * R2 IS 220 OHMS ONLY FOR 3605 CARD.
 - * R2 IS 1500 OHMS ONLY FOR 3603 CARD.

ITEM	QTY RQD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL= .01 3 PL= .005 FRACTIONAL 1/64 ANGULAR ± 1° SHARP EDGES TO BEND RADII FILLET RADII		DRAWN BY M. HAYDEN	DATE 2-3-78	BROADCAST ELECTRONICS INC. — A FILMWAYS COMPANY —
		CHECKED BY	DATE	
		PROJECT ENGR	DATE	
		APPROVED BY		
MATERIAL _____		TREATMENT OR FINISH _____		TITLE SCHEMATIC - STEREO MONITOR & MONITOR CUE HEADPHONE
				C DWG NO. 906-7111
		CONSOLE		SCALE /

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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PER ECN # 1059	11-30-77	MH
B	PER ECN # 1063	12-6-77	CLO
C	PER ECN # 1783	8-31-79	MH
D	PER ECN # 1822	9-20-79	GH
E	PER ECN # 1867	2-11-80	JH
F	PER ECN # 2302	12-5-80	MH



4 TURNS OF # 32 WIRE

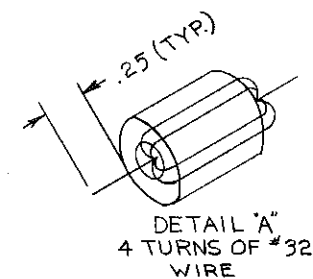
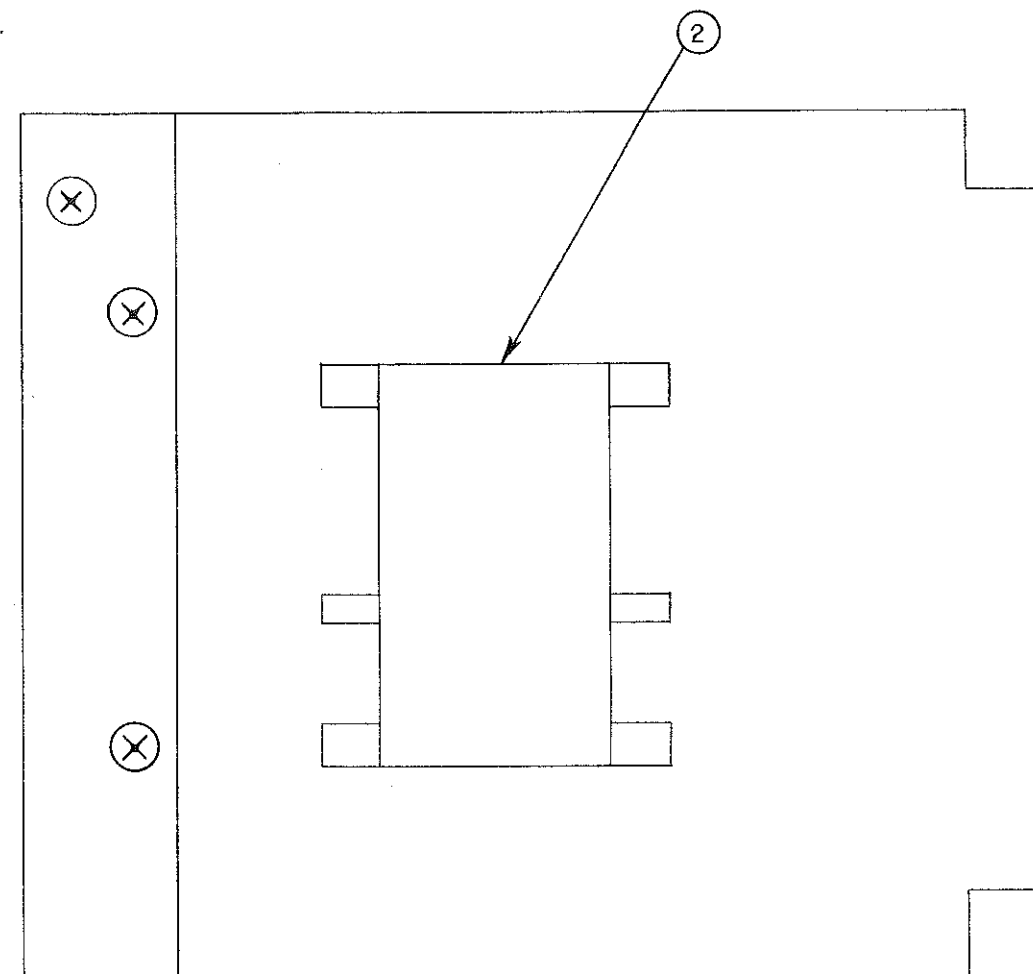
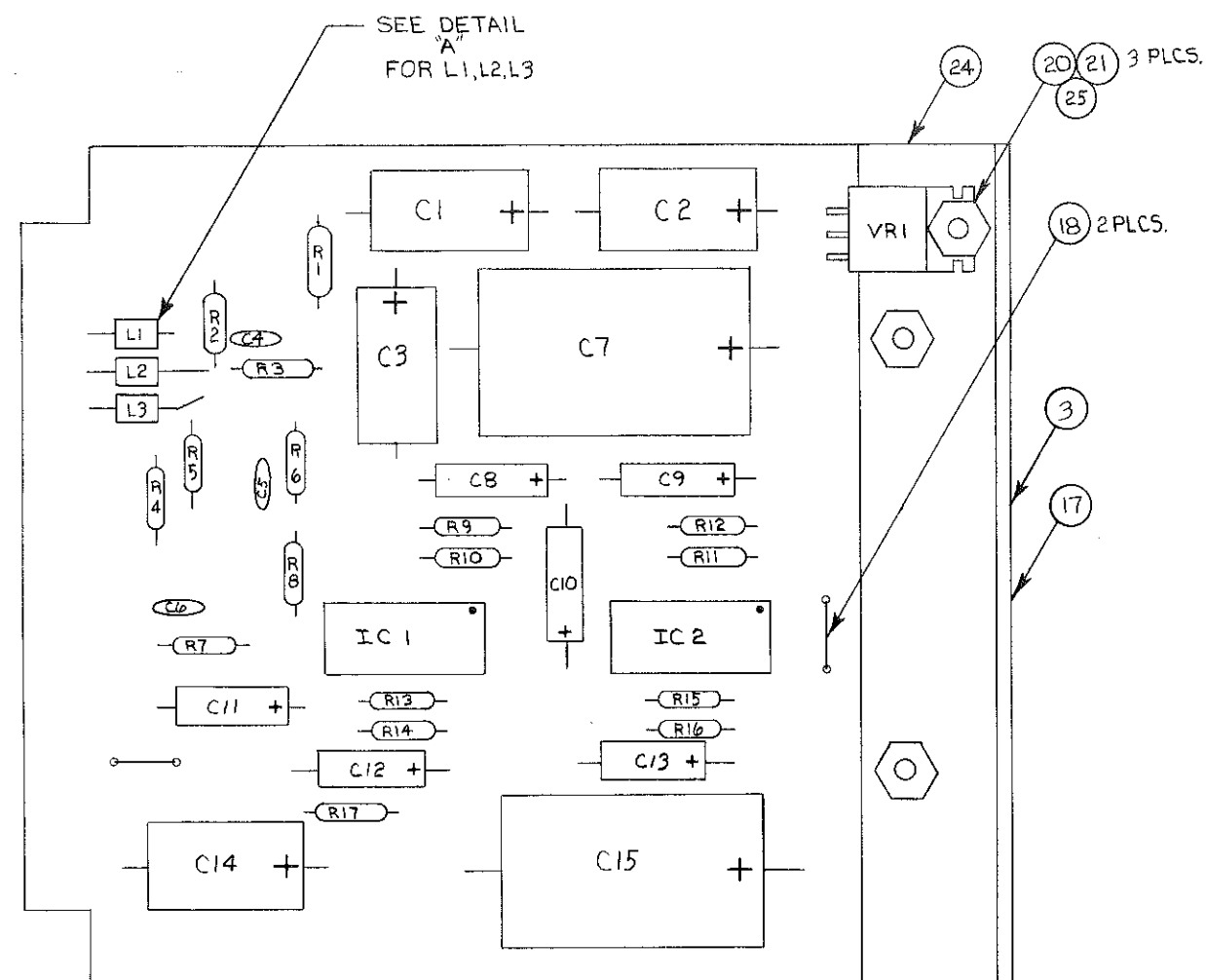
DETAIL "A"

FOR THE EXCLUSIVE USE OF BROADCAST ELECTRONICS, INC. PERSONNEL AND CUSTOMERS ALL RIGHTS RESERVED		TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY Wm. DATE 6/24/77		BROADCAST ELECTRONICS INC. -A FILMWAYS COMPANY-	
		DECIMAL 2 PL ± .01 3 PL ± .005		CHECKED BY DATE		TITLE	
		FRACTIONAL ± 1/64		PROJECT ENGR DATE		MONO CUE/HEADPHONE	
		ANGULAR ± P		APPROVED BY		C DWG No. 918-3605 REV F	
SHARP EDGES		TO		MATERIAL		TREATMENT OR FINISH	
BEND RADII						CONSLES SCALE 2/1 SHEET 1 OF 1	
FILLET RADII							

Stereophonic Cue/Headphone Amplifier Assembly - 918-3606

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1 THRU C3	Capacitor, Electrolytic, 100 uF, 40V	014-1084A	3
C4 THRU C6	Capacitor, Ceramic Disc, 100 pF, 500V	002-1024	3
C7	Capacitor, Electrolytic, 1000 uF -10%, +50%, 25V	013-1095	1
C8	Capacitor, Electrolytic, 1.0 uF, 35V	015-1064A	1
C9	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1
C10,C11	Capacitor, Electrolytic, 1.0 uF, 35V	015-1064A	2
C12,C13	Capacitor, Electrolytic, 10 uF, 16V	013-1074	2
C14	Capacitor, Electrolytic, 100 uF, 40V	014-1084A	1
C15	Capacitor, Electrolytic, 1000 uF -10%, +50%, 25V	013-1095	1
IC1,IC2	Integrated Circuit, LM378N, Dual 5 Watt Audio Power Amplifier, 14 Pin Dip	222-3780	2
L1 THRU L3	Choke, Ferrite, 2 Leg	956-0001	3
R1	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	1
R2	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R3	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
R4	Resistor, 2.2k Ohm $\pm 5\%$, 1/4W	100-2243	1
R5	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R6	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
R7	Resistor, 1.5k Ohm $\pm 5\%$, 1/4W	100-1543	1
R8 THRU R11	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	4
R12	Resistor, 2.2k Ohm $\pm 5\%$, 1/4W	100-2243	1
R13	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R14	Resistor, 2.2k Ohm $\pm 5\%$, 1/4W	100-2243	1
R15	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R16	Resistor, 2.2k Ohm $\pm 5\%$, 1/4W	100-2243	1
R17	Resistor, 4.7k Ohm $\pm 5\%$, 1/4W	100-4743	1
VR1	Integrated Circuit, uA7818UC, Fixed +18 Volt Regulator, 1.5 Ampere, TO-220 Package	227-7818	1
----	Blank Printed Circuit Board	518-3606	1
----	Heat Sink for IC1 and IC2	455-3606	1
----	Heat Sink for VR1	455-3509	1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PER ECN #1149	2-15-78	MH

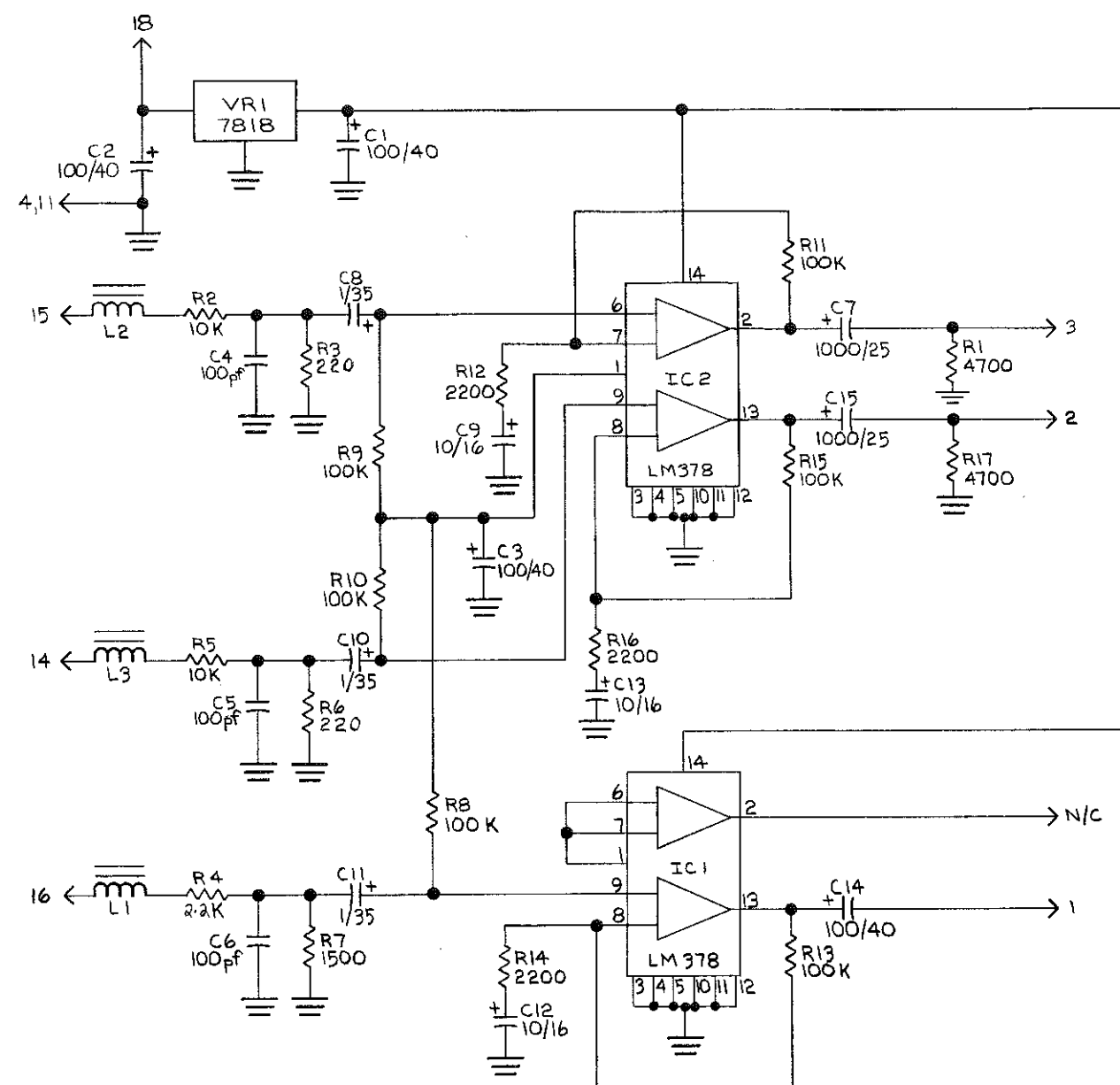


SEE B/M NO. 918-3606
LAST USED: C15, R17, IC2, VR1, L3.

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ALL RIGHTS RESERVED

ITEM	QTY REQD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY M. HAYDEN	DATE 1-12-78	BROADCAST ELECTRONICS INC. — A FILMWAYS COMPANY —
DECIMAL 2 PL ± .01 3 PL ± .005		CHECKED BY	DATE	
FRACTIONAL ± 1/64		PROJECT ENGR	DATE	TITLE ASSY. STEREOPHONIC CUE/HEADPHONE AMPLIFIER
ANGULAR ± 1°		APPROVED BY		
SHARP EDGES TO				C DWG NO. 918-3606
BEND RADIUS				
FILLET RADIUS				REV A
MATERIAL		TREATMENT OR FINISH		
				CONSOLES
				SCALE 2/1
				SHEET 1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
REV A	PER-ECN 1723	5-24-79	GH
B	PER-ECN# 1818	9-19-79	GH



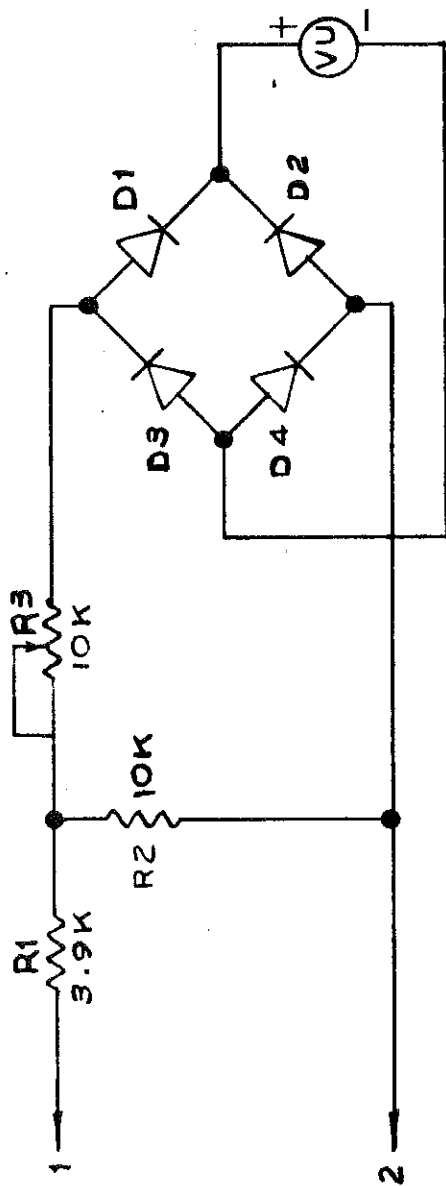
- NOTES:
1. RESISTORS IN OHMS, 1/4W; CAPACITORS IN MICROFARADS, UNLESS OTHERWISE NOTED.
 2. LAST COMPONENTS USED: R17, C15, IC2, VR1, L3.
 3. SEE PC BOARD ASSEMBLY NO. 918-3606.

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ALL RIGHTS RESERVED

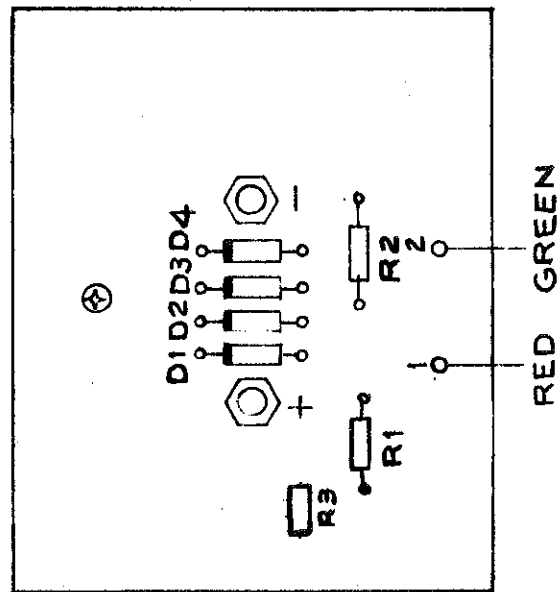
ITEM	QTY RQD	PART NUMBER	DESCRIPTION	NOTE		
LIST OF MATERIAL						
TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL=01 3 PL=005 FRACTIONAL $\pm 1/64$ ANGULAR $\pm 1^\circ$ SHARP EDGES TO SEND RADII FILLET RADII		DRAWN BY M. HAYDEN	DATE 1-13-78	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -		
		CHECKED BY	DATE			
		PROJECT ENGR	DATE			
		APPROVED BY				
MATERIAL		TREATMENT OR FINISH		C	DWG NO. 906-3606	REV B
				CONSOLES		SCALE

VU Meter Circuit Board Assembly - 918-0001

REF. DES.	DESCRIPTION	PART NO.	QTY.
D1 THRU D4	Diode, 1N34, Germanium, 60V, 8.5 mA	202-0034	4
R1	Resistor, 3.9k Ohm <u>±</u> 5%, 1/4W	100-3943	1
R2	Resistor, 10k Ohm <u>±</u> 5%, 1/4W	100-1053	1
R3	Potentiometer, 10k Ohm <u>±</u> 10%, 1/2W with Lock	178-1054	1
----	Blank Printed Circuit Board	518-1502	1



NOTE:
1. ALL DIODES IN98 OR EQUIVALENT

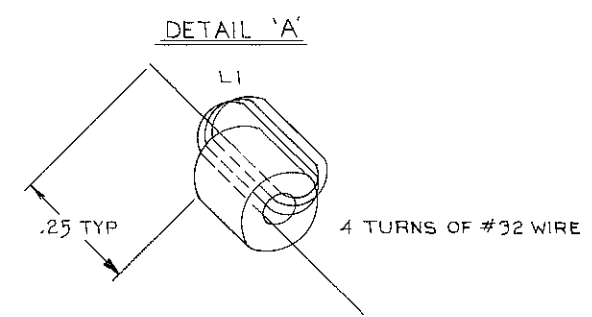
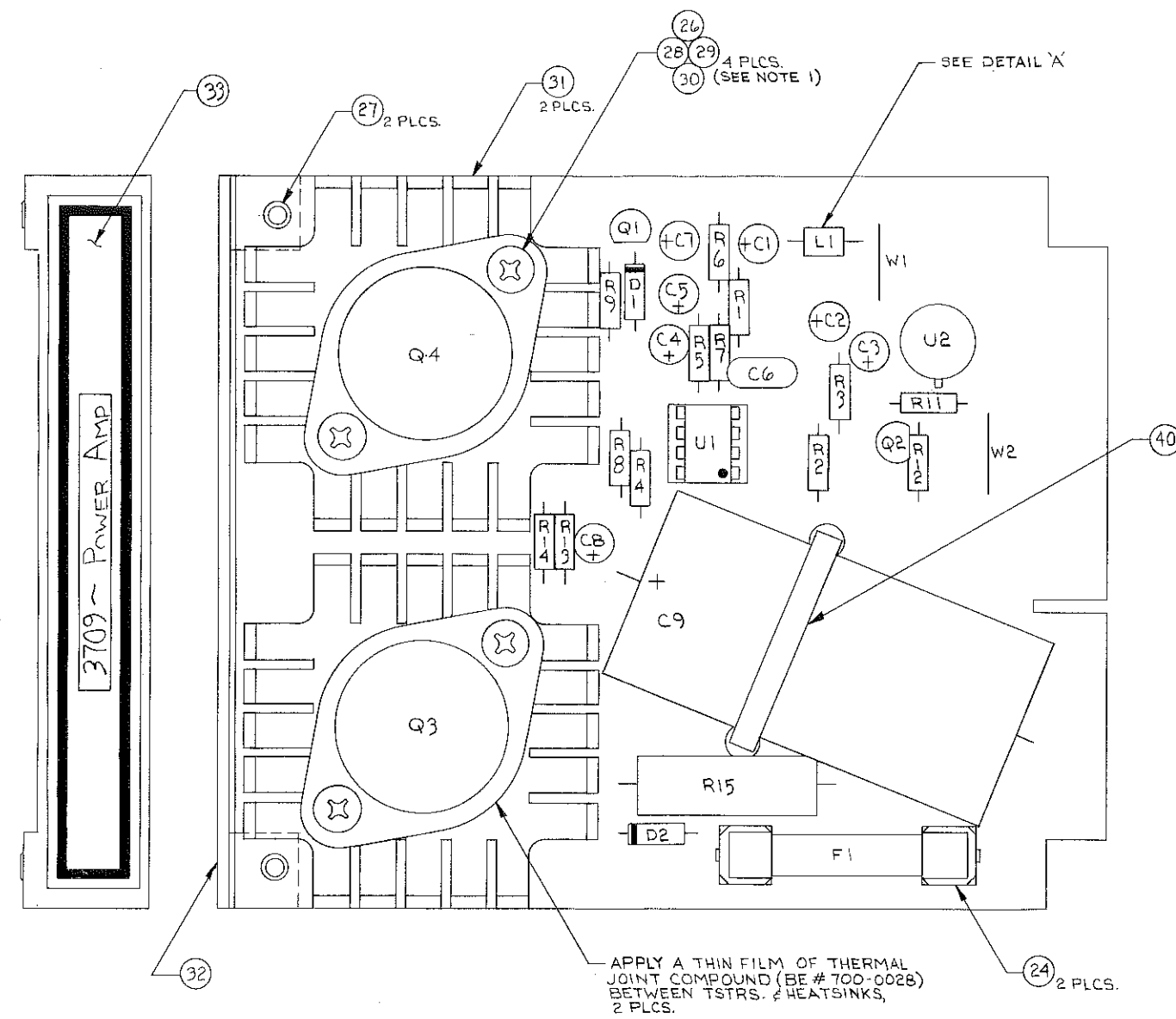


BROADCAST ELECTRONICS, INC. A FILMWAYS COMPANY
METER RECTIFIER CARD VU-1
A DWG,NO.: A-918-0001

Monitor Amplifier - 918-3709

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1 THRU C5	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	5
C6	Capacitor, Mica, 100 pF, 50 V	040-1022	1
C7, C8	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	2
C9	Capacitor, Electrolytic, 4700 uF, 35 V	014-4795	1
D1	Diode, Zener, 1N4744A, 15V $\pm 5\%$, 1 Watt	200-0015	1
D2	Diode, Silicon, 400 V, 1 Ampere	203-4004	1
F1	Fuse, 1 Ampere, 3 AG	330-0100	1
L1	Choke, Ferrite, 2-leg, 4-Turns of #32 Solid Enameled Wire	956-0001	1
Q1	Transistor, Silicon, 2N3904, NPN	211-3904	1
Q2	Transistor, Silicon, MSPA55, PNP	210-0055	1
Q3	Transistor, Silicon, MJ3000, Darlington, NPN	219-3000	1
Q4	Transistor, Silicon, MJ2500, Darlington, PNP	219-2500	1
R1	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R2	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	1
R3	Resistor, 5.1k Ohm $\pm 5\%$, 1/4 W	100-5143	1
R4	Resistor, 330 Ohm $\pm 5\%$, 1/4 W	100-3333	1
R5	Resistor, 180k Ohm $\pm 5\%$, 1/4 W	100-1863	1
R6, R7	Resistor, 220k Ohm $\pm 5\%$, 1/4 W	100-2263	2
R8, R9	Resistor, 3.9k Ohm $\pm 5\%$, 1/4 W	100-3943	2
R11	Resistor, 360 Ohm $\pm 5\%$, 1/4 W	100-3633	1
R12 THRU R14	Resistor, 10 Ohm $\pm 5\%$, 1/4 W	100-1023	3
R15	Resistor, 0.2 Ohm $\pm 5\%$, 5 W, W/W	132-2003	1
U1	Integrated Circuit, NE5534AN, Low-Noise, Operational Amplifier	221-5534	1
U2	Integrated Circuit, LM394H, Super-Matches, Low-Noise, NPN Pair	226-0394	1
XF1	Fuse Clip, 3 AG	415-2068	1
----	Ferrite Bead for L1	100-1863	1
----	Blank Printed Circuit Board	518-3709	1
XU1	Socket, Integrated Circuit, 8 pin DIP	417-0800	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PER ECN #1934	2-28-80	MH
B	PER ECN 2787	10-19-81	MDM

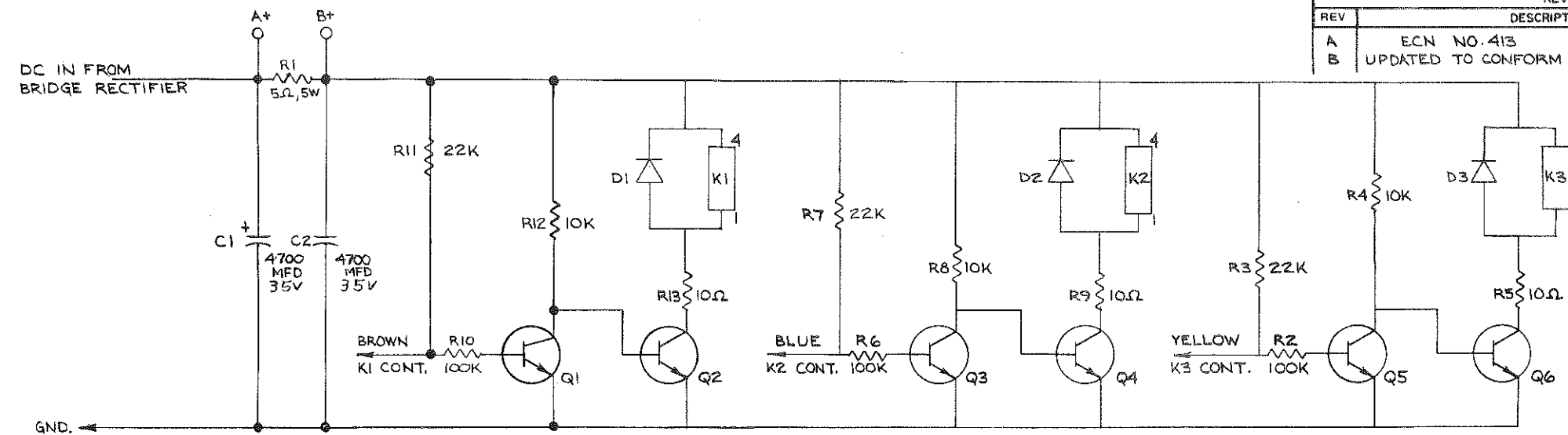


- NOTES:
1. POSITION #10 FLAT WASHERS (ITEM 29) ON SCREWS BETWEEN HEATSINK & PC BOARD.
 2. SEE B/M # 918-3709
SEE SCHEMATIC # B-906-3709

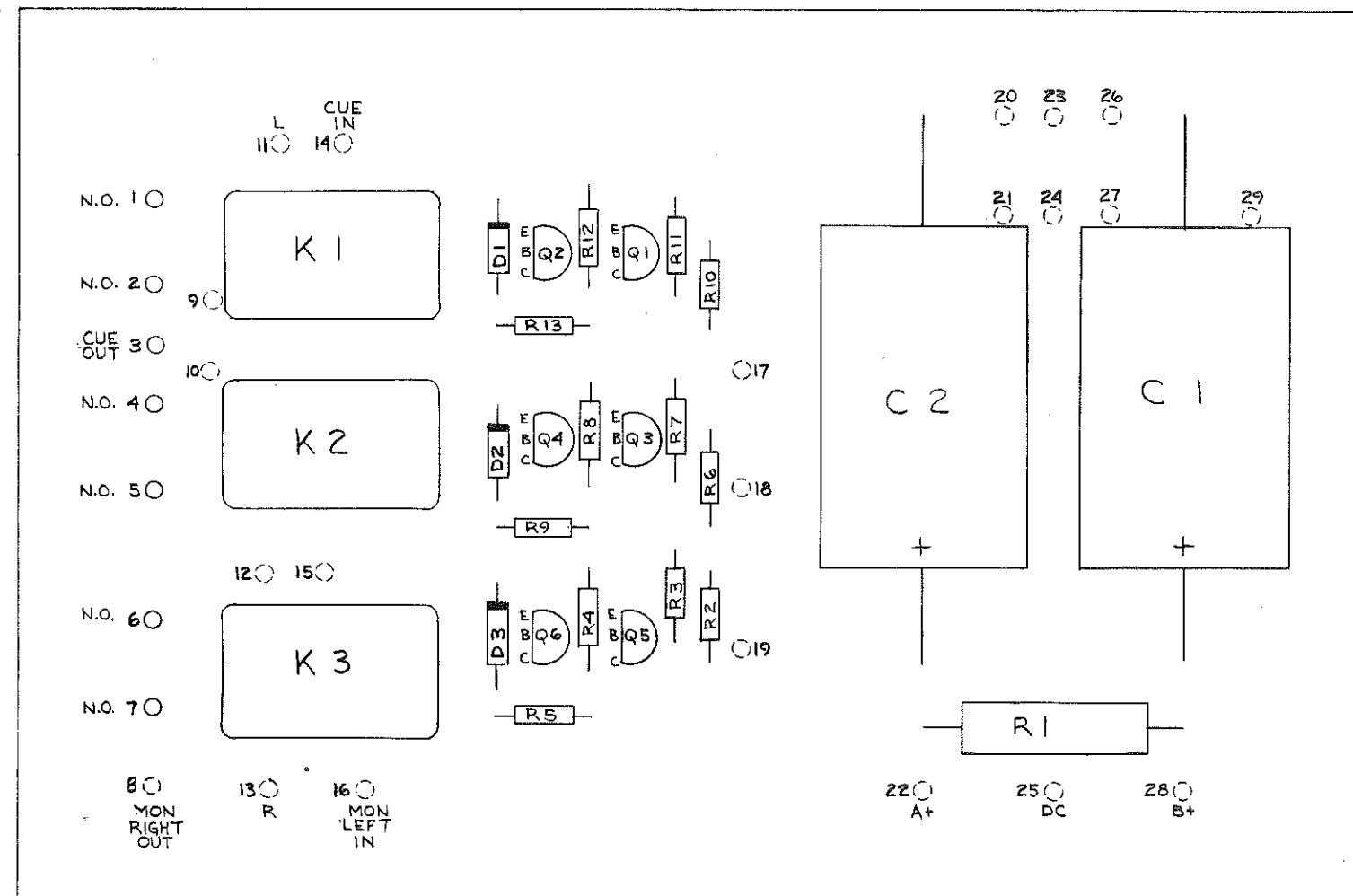
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		DECIMAL 2 PL = .01 3 PL = .005		CHECKED BY		DATE			
		FRACTIONAL ± 1/64		PROJECT ENGR.		DATE		TITLE	
		ANGULAR ± 1°		APPROVED BY		DATE		PCB ASSEMBLY	
SHARP EDGES TO		MATERIAL		TREATMENT OR FINISH		DWG. NO. 918-3709		REV. B	
BEND RADII						CONSOLES		SCALE 2/1 SHEET 1 OF 1	
FILLET RADII									

Power Supply/Relay Board, 250 Series Console - 918-4001

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 4700 uF, 35V	014-4795	2
D1 THRU D3	Diode, Silicon, 1N4004, 400V, 1A	203-4004	3
Q1 THRU Q6	Transistor, Silicon, NPN, 2N3904	211-3904	6
R1	Resistor, 5 Ohm $\pm 5\%$, 5W, W/W	133-5013	1
R2	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R3	Resistor, 22k Ohm $\pm 5\%$, 1/4W	100-2253	1
R4	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R5	Resistor, 10 Ohm $\pm 5\%$, 1/4W	100-1023	1
R6	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R7	Resistor, 22k Ohm $\pm 5\%$, 1/4W	100-2253	1
R8	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R9	Resistor, 10 Ohm $\pm 5\%$, 1/4W	100-1023	1
R10	Resistor, 100k Ohm $\pm 5\%$, 1/4W	100-1063	1
R11	Resistor, 22k Ohm $\pm 5\%$, 1/4W	100-2253	1
R12	Resistor, 10k Ohm $\pm 5\%$, 1/4W	100-1053	1
R13	Resistor, 10 Ohm $\pm 5\%$, 1/4W	100-1023	1
XK1 THRU XK3	Socket, Relay, 16 Pin	270-0008	3
----	Blank Circuit Board	518-4001	1



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	ECN NO. 413	11/6/74	CLO
B	UPDATED TO CONFORM W/LATEST P.C.B. C-ECN-1164	9/29/77	CLO
	D ECN 1896	3/23/78	CLO
		1-31-80	DIC



- NOTE:
1. ALL DIODES IN4004
 2. ALL TRANSISTORS 2N3904
 3. ALL RELAYS 700Ω/28V 4PDT
 4. A+ TO ALL POWER AMPLIFIERS & LAMPS
 5. B+ TO ALL PREAMPS & DRIVER AMPS

ITEM	QTY	RQD	PART NUMBER	DESCRIPTION	NOTE
12	1		133-5013	RESISTOR, 5Ω, 5W (R1)	
11	3		100-1023	RESISTOR, 10Ω, 1/4W (R5)(R9)(R13)	
10	3		100-2253	RESISTOR, 22K, 1/4W (R3)(R7)(R11)	
9	3		100-1063	RESISTOR, 100K, 1/4W (R2)(R6)(R10)	
8	3		100-1053	RESISTOR, 10K, 1/4W (R12)(R8)(R4)	
7	2		014-4795	CAPACITOR, 4700MF/35V (C1)(C2)	
6	3		203-4004	DIODE, IN4004 (D1)(D2)(D3)	
5	6		211-3904	TRANSISTOR, 2N 3904 (Q1 THRU Q6)	
4	3		270-0008	SOCKET, RELAY (K1)(K2)(K3)	
3					
2	29		413-1597	TURRET TERMINAL (1 THRU 29)	
1	1		518-4001-B	BLANK P.C. BOARD	

1. 918-4001 AS SHOWN
2. 918-4001-1 INSTALL TERMINALS #1-7 ON OPPOSITE SIDE OF BOARD.

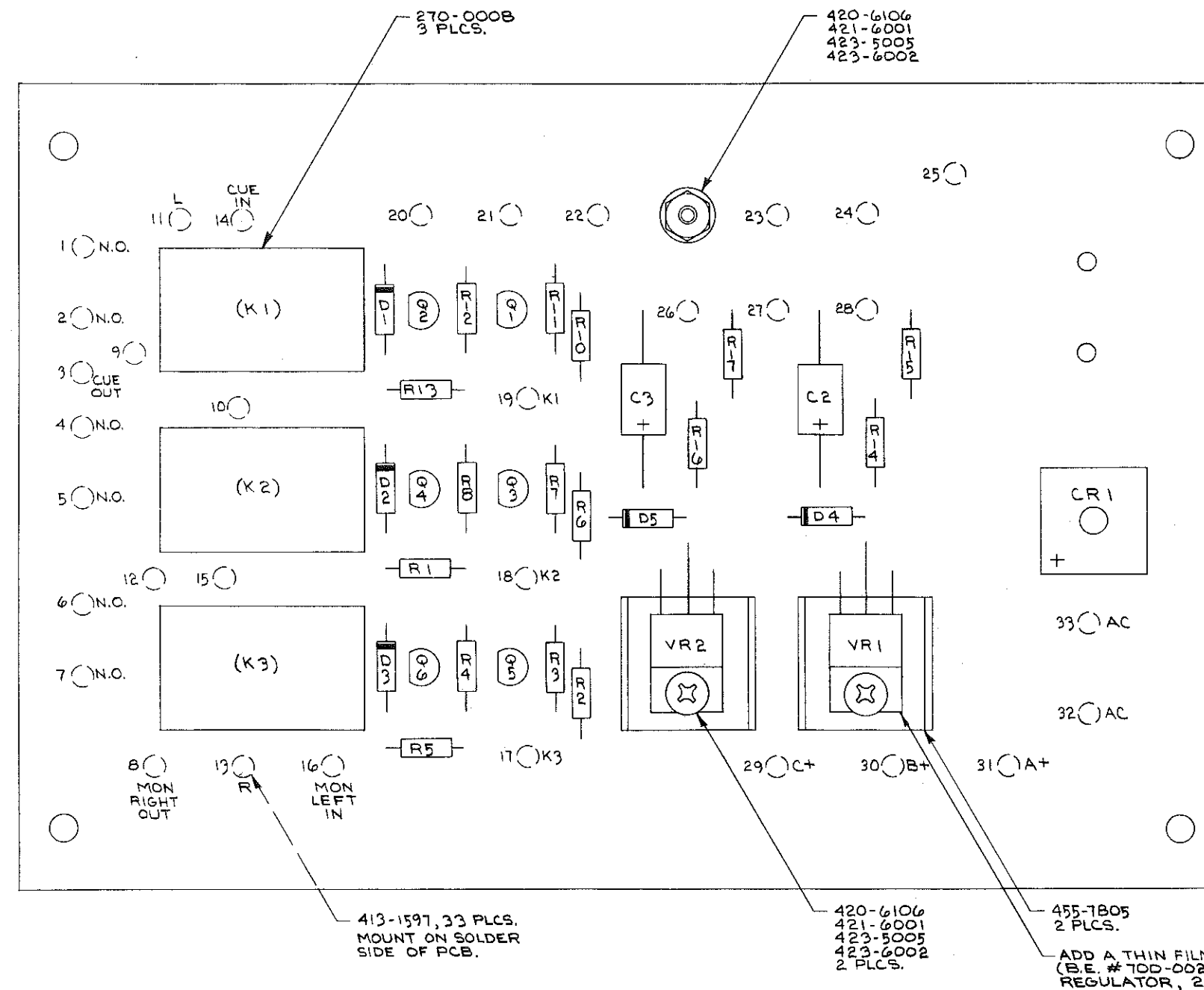
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TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY C.L. ORR		DATE 9/29/77		BROADCAST ELECTRONICS INC.	
DECIMAL 2 PL: 01 3 PL: 005		CHECKED BY		DATE		- A FILMWAYS COMPANY -	
FRACTIONAL 1/64		PROJECT ENGR		DATE		TITLE	
ANGULAR ± 1°		APPROVED BY				POWER SUPPLY/RELAY BOARD	
SHARP EDGES TO						C DWG NO. 918-4001-1	
BEND RADIUS						REV D	
FILLET RADIUS						200 SERIES CONSOLES	
						SCALE SHEET 1 OF 1	

Printed Circuit Board Assembly - Power Supply/Relay - 918-4003

REF. DES.	DESCRIPTION	PART NO.	QTY.
C2, C3	Capacitor, Electrolytic, 33 uF, 35 V	014-3274	2
CR1	Bridge Rectifier	239-0004	1
D1 THRU D5	Diode, IN4004	203-4004	5
R1	Resistor, 10 Ohm $\pm 5\%$, 1/4 W	100-1023	1
R2	Resistor, 100k Ohm , $\pm 5\%$, 1/4 W	100-1063	1
R3	Resistor, 22k Ohm $\pm 5\%$, 1/4 W	100-2253	1
R4	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R5	Resistor, 10 Ohm $\pm 5\%$, 1/4 W	100-1023	1
R6	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	1
R7	Resistor, 22k Ohm $\pm 5\%$, 1/4 W	100-2253	1
R8	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R10	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	1
R11	Resistor, 22k Ohm $\pm 5\%$, 1/4 W	100-2253	1
R12	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R13	Resistor, 10 Ohm $\pm 5\%$, 1/4 W	100-1023	1
R14	Resistor, 240 Ohm $\pm 5\%$, 1/4 W	100-2433	1
R15	Resistor, 5.1k Ohm $\pm 5\%$, 1/4 W	100-5143	1
R16	Resistor, 240 Ohm $\pm 5\%$, 1/4 W	100-2433	1
R17	Resistor, 5.1k Ohm $\pm 5\%$, 1/4 W	100-5143	1
VR1, VR2	Voltage Regulator, LM317	227-0317	2
----	Printed Circuit Board	C518-4003	1

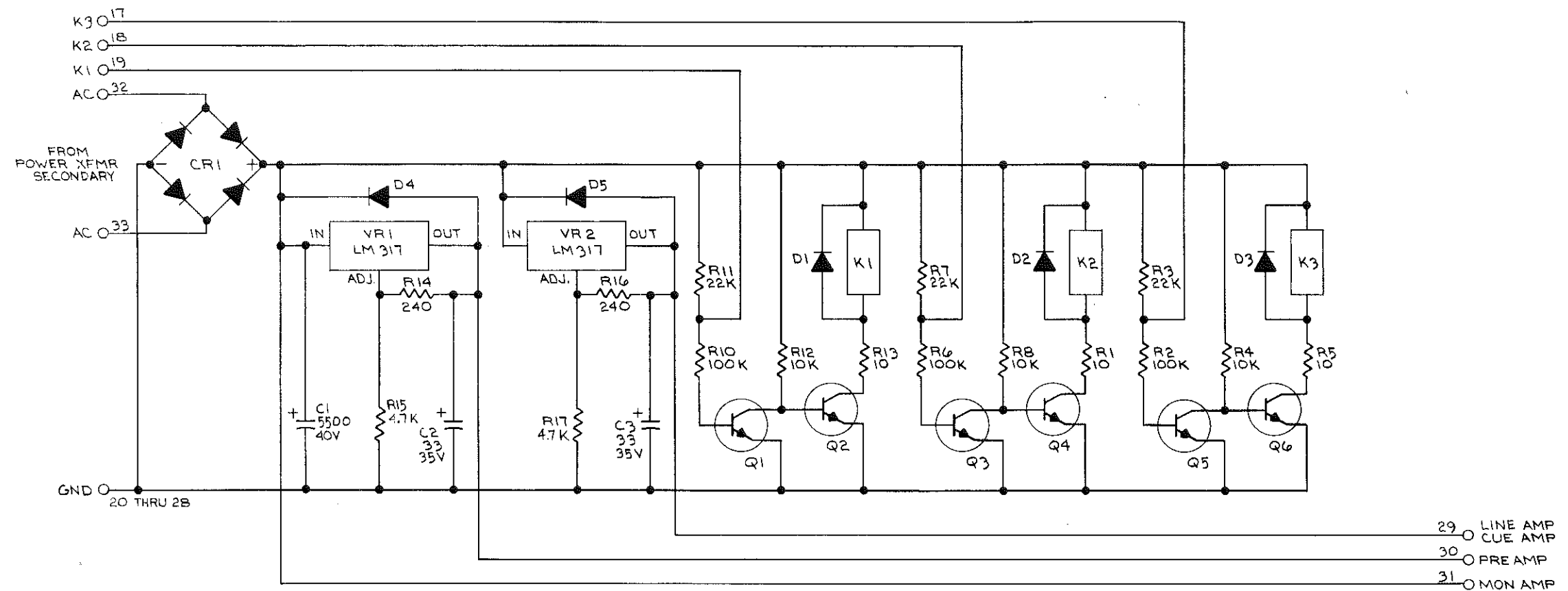
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PER ECN #2719	6-3-81	GED



SEE B/M # 918-4003
SEE SCHEMATIC # C-906-7114

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		MATERIAL TREATMENT OR FINISH		REV. A			

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PER ECN 2576	3-3-81	LA
B	PER ECN 2719	6-3-81	GED



NOTES:

- CAPACITORS IN MICROFARADS; RESISTORS IN OHMS, 1/4W; D1-D5 ARE 1N4004; Q1-Q6 ARE 2N3904; K1-K3 ARE 4PDT, 24V; UNLESS NOTED OTHERWISE.
- COMPONENTS LAST USED: C3, CR1, D5, K3, Q6, R17, VR2.
- COMPONENTS NOT USED: R9.
- SEE PCB ASSY. # C-918-4003.

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		MATERIAL: _____ TREATMENT OR FINISH: _____		TITLE: SCHEMATIC POWER SUPPLY & RELAY BD.		DWG. NO. 906-7114 SCALE: 105250		REV. B SHEET 1 OF 1	

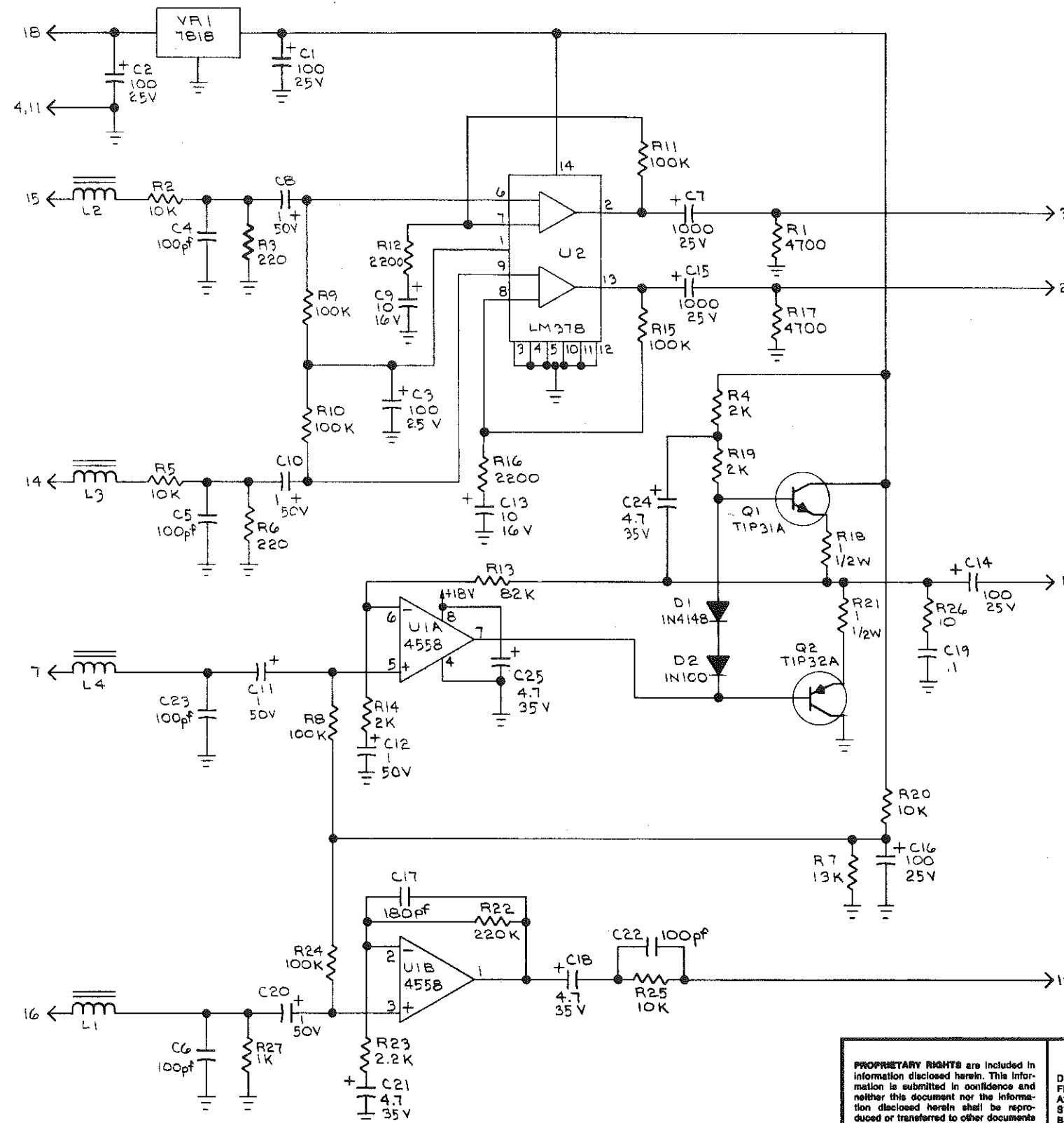
Printed Circuit Board Assembly Stereo Cue/Headphone Amplifier
918-3706 - Page 1 of 2

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1 THRU C3	Capacitor, Electrolytic, 1000 uF, 25 V	023-1084	3
C4, THRU C6	Capacitor, Ceramic Disc, 100 pF, 500 V	002-1024	3
C7	Capacitor, Electrolytic, 1000 uF, -10%, +50%, 25 V	013-1095	1
C8	Capacitor, Electrolytic, 1 uF, 50 V	024-1064	1
C9	Capacitor, Electrolytic, 10 uF, 16 V	023-1074	1
C10 THRU C12	Capacitor, Electrolytic, 1 uF, 50 V	024-1064	3
C13	Capacitor, Electrolytic, 10 uF, 16 V	023-1074	1
C14	Capacitor, Electrolytic, 100 uF, 25 V	023-1084	1
C15	Capacitor, Electrolytic, 1000 uF, 25 V	013-1095	1
C16	Capacitor, Electrolytic, 100 uF, 25 V	023-1084	1
C17	Capacitor, Ceramic Disc, 180 pF, 500 V	002-1824	1
C18	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	1
C19	Capacitor, Ceramic Disc, 0.1 uF, 50 V	000-1054	1
C20	Capacitor, Electrolytic, 1 uF, 50 V	024-1064	1
C21	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	1
C22, C23	Capacitor, Ceramic Disc, 100 pF, 500 V	002-1024	2
C24, C25	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	2
D1	Diode, 1N4148, Silicon, 100 V, 75 mA	203-4148	1
D2	Diode, 1N100, Germanium	202-0098	1
L1 THRU L4	Choke, 2 Turns of #32 Enameled Wire, Ferrite	956-0001	4
Q1	Transistor, TIP31 A, TO-220 Case	219-0031	1
Q2	Transistor, TIP32 A, TO-220 Case	218-0032	1
R1	Resistor, 4.7k Ohm $\pm 5\%$, 1/4 W	100-4743	1
R2	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R3	Resistor, 220 Ohm $\pm 5\%$, 1/4 W	100-2233	1
R4	Resistor, 2k Ohm $\pm 5\%$, 1/4 W	100-2043	1
R5	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R6	Resistor, 220 Ohm $\pm 5\%$, 1/4 W	100-2233	1
R7	Resistor, 13k Ohm $\pm 5\%$, 1/4 W	100-1353	1
R8 THRU R10	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	3

Printed Circuit Board Assembly Stereo Cue/Headphone Amplifier
918-3706 - Page 2 of 2

REF. DES.	DESCRIPTION	PART NO.	QTY.
R11	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	1
R12	Resistor, 2.2k Ohm $\pm 5\%$, 1/4 W	100-2243	1
R13	Resistor, 82k Ohm $\pm 5\%$, 1/4 W	100-8253	1
R14	Resistor, 2k Ohm $\pm 5\%$, 1/4 W	100-2043	1
R15	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	1
R16	Resistor, 2.2k Ohm $\pm 5\%$, 1/4 W	100-2243	1
R17	Resistor, 4.7k Ohm $\pm 5\%$, 1/4 W	100-4743	1
R18	Resistor, 1 Ohm $\pm 5\%$, 1/2 W	110-1013	1
R20	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R19	Resistor, 2k Ohm $\pm 5\%$, 1/4 W	100-2043	1
R21	Resistor, 1 Ohm $\pm 5\%$, 1/2 W	110-1013	1
R22	Resistor, 220k Ohm $\pm 5\%$, 1/4 W	100-2263	1
R23	Resistor, 2.2k Ohm $\pm 5\%$, 1/4 W	100-2243	1
R24	Resistor, 100k Ohm $\pm 5\%$, 1/4 W	100-1063	1
R25	Resistor, 10k Ohm $\pm 5\%$, 1/4 W	100-1053	1
R26	Resistor, 10 Ohm $\pm 5\%$, 1/4 W	100-1023	1
R27	Resistor, 1k Ohm $\pm 5\%$, 1/4 W	100-1043	1
U1	Integrated Circuit, Dual Operational Amplifier, RC-4558, 8 Pin DIP	221-4558	1
U2	Integrated Circuit, Dual Operational Amplifier, LM378, 14-Pin DIP	222-3780	1
VR1	Voltage Regulator, 18V, 7818VC	227-7818	
XU1	Socket, IC 8-Pin DIP	417-0800	1
XU2	Socket, IC 14-Pin DIP	417-1400	1
----	Blank Printed Circuit Board	518-3706	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED



- NOTES:
1. RESISTORS IN OHMS, 1/4W; CAPACITORS IN MICROFARADS, UNLESS NOTED OTHERWISE.
 2. LAST COMPONENTS USED: C25, D2, L4, Q2, R27, U2, VR1.
 3. SEE PCB ASSY. # C-918-3706.

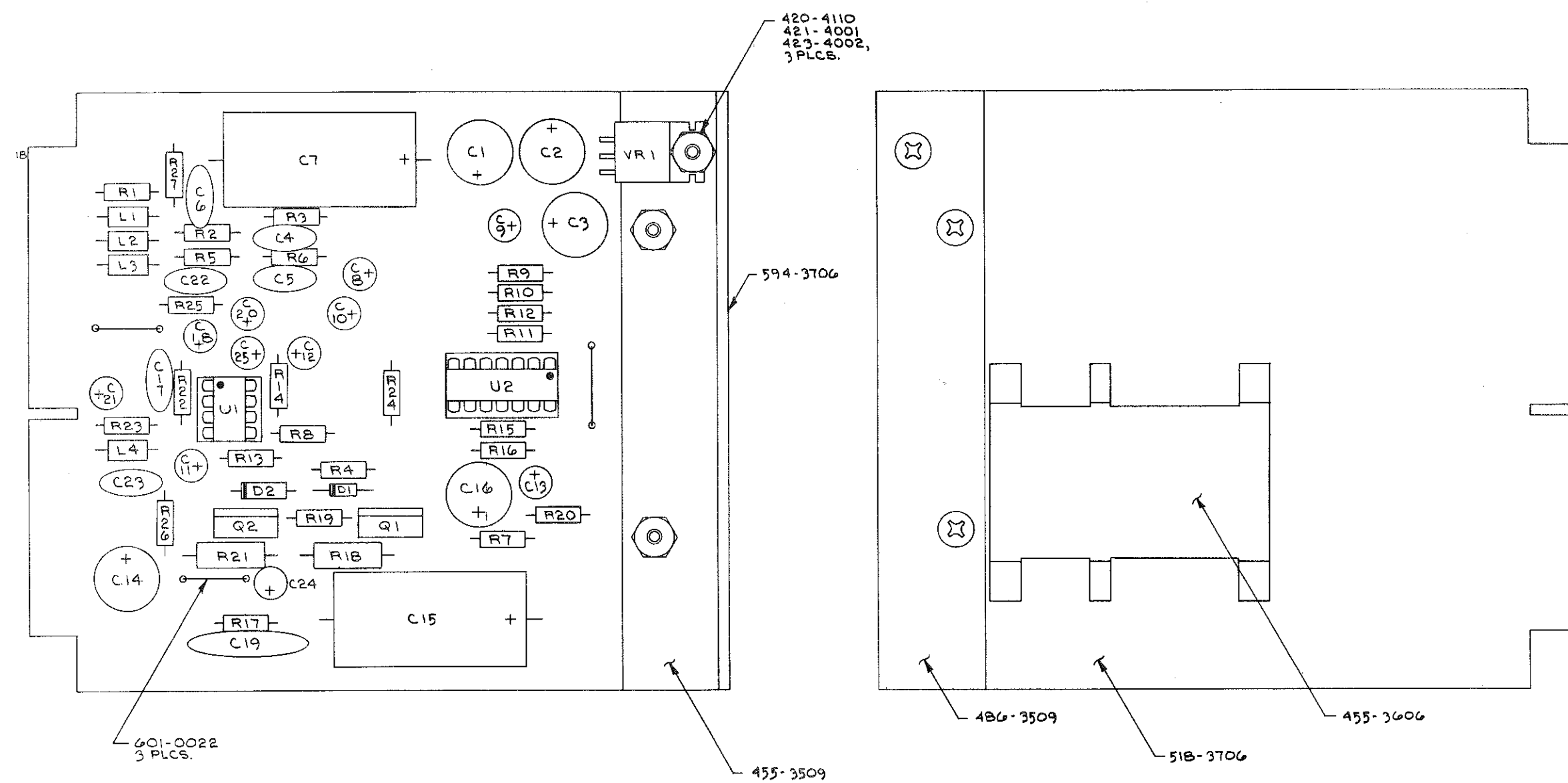
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TOLERANCE UNLESS OTHERWISE SPECIFIED
DECIMAL 2 PL = .01 3 PL = .005
FRACTIONAL $\pm 1/64$
ANGULAR $\pm 1^\circ$
SHARP EDGES
BEND RADII
FILLET RADII

DRAWN BY M. HAYDEN
CHECKED BY
PROJECT ENGR. C. W. K.
APPROVED BY
DATE 10-9-80
DATE 11-13-80
DATE 11-13-80

BROADCAST ELECTRONICS INC.
—A FILMWAYS COMPANY—
TITLE SCHEMATIC
STEREO CUE/HEADPHONE AMPLIFIER
DWG. NO. 906-3706
REV. C
10 S 250
SCALE
SHEET 1 OF 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED



SEE B/M # 918-3706
SEE SCHEMATIC # C-906-3706

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		MATERIAL TREATMENT OR FINISH	DWG. NO. 918-3706 SCALE 2/1 SHEET 1 OF 1	

PRODUCT WARRANTY

LIMITED ONE YEAR

While this warranty gives you specific legal rights, which terminate one (1) year (6 months on turntable motors) from the date of shipment, you may also have other rights which vary from state to state.

Broadcast Electronics, Inc. ("BE"), 4100 North 24th Street, P. O. Box 3606, Quincy, Illinois 62305, hereby warrants cartridge machines, consoles, transmitters and other new Equipment manufactured by BE against any defects in material or workmanship at the time of delivery thereof, that develop under normal use within a period of one (1) year (6 months for turntable motors) from the date of shipment. Other manufacturers' Equipment, if any, shall carry only such manufacturers' standard warranty. This warranty extends to the original user and any subsequent purchaser during the warranty period. BE's sole responsibility with respect to any Equipment or parts not conforming to this warranty is to replace such equipment or parts upon the return thereof F.O.B. BE's factory or authorized repair depot within the period aforesaid.

In the event of replacement pursuant to the foregoing warranty, only the unexpired portion of the warranty from the time of the original purchase will remain in effect for any such replacement. However, the warranty period will be extended for the length of time that the original user is without the services of the Equipment due to its being serviced pursuant to this warranty. The terms of the foregoing warranty shall be null and void if the Equipment has been altered or repaired without specific written authorization of BE, or if Equipment is operated under environmental conditions or circumstances other than those specifically described in BE's product literature or instruction manual which accompany the Equipment purchased. BE shall not be liable for any expense of any nature whatsoever incurred by the original user without prior written consent of BE.

BE shall not be liable to the original user for any and all incidental or consequential damages for breach of either expressed or implied warranties. However, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. All express and implied warranties shall terminate at the conclusion of the period set forth herein.

Except as set forth herein, and except as to title, there are no warranties, or any affirmations of fact or promises by BE, with reference to the Equipment, or to merchantability, fitness for a particular application, signal coverage, infringement, or otherwise, which extend beyond the description of the Equipment in BE's product literature or instruction manual which accompany the Equipment. Any card which is enclosed with the Equipment will be used by BE for survey purposes only.

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