

INSTRUCTION MANUAL

***10M350 & 10S350***  
***Audio Consoles***

15 May 1981

IM No. 839-0013



**BROADCAST ELECTRONICS INC.**

a FILMWAYS company



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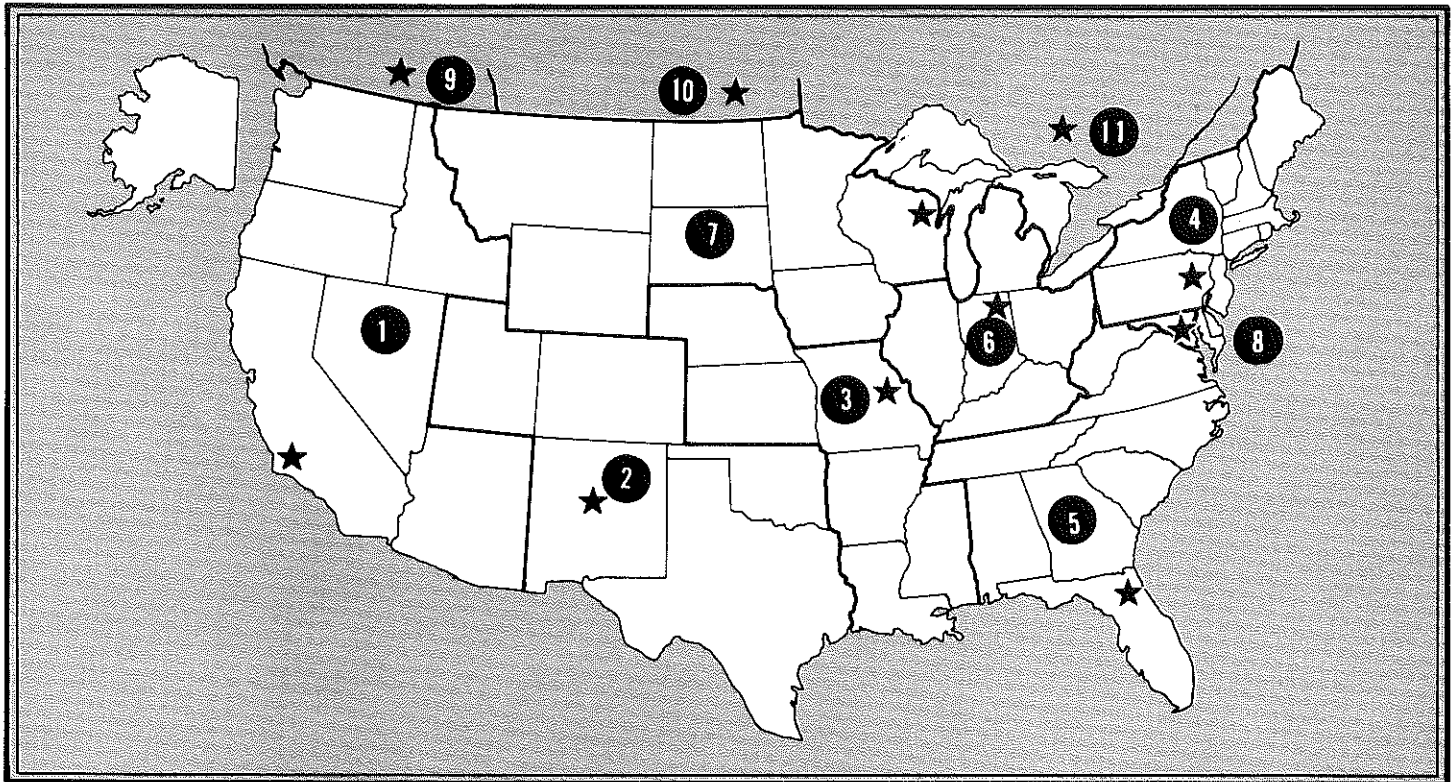
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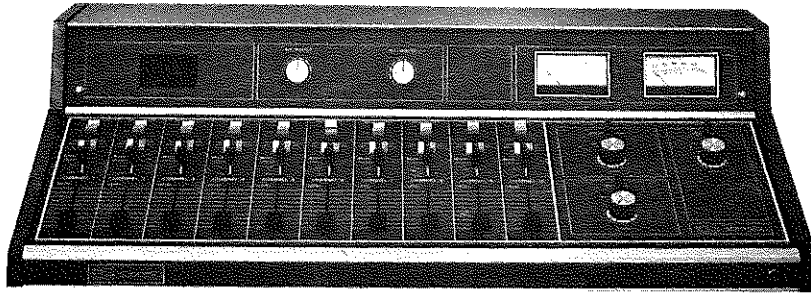


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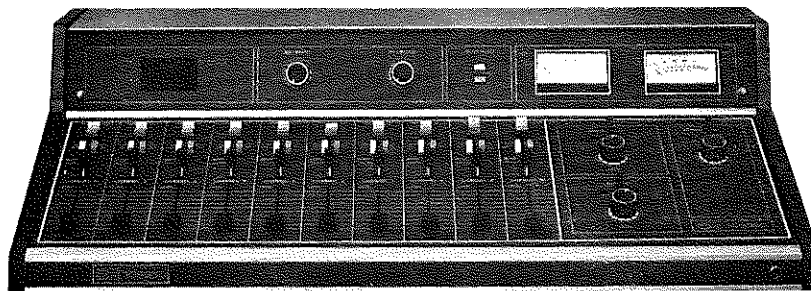


## INSTRUCTION MANUAL

### 350 Series Audio Consoles



10M350 - Monophonic Version



10S350 - Stereophonic Version

10M350 ----- 938-1051 ----- 10 Mixer, Slider-Fader, Dual-Channel,  
Monophonic Console

10S350 ----- 938-1050 ----- 10 Mixer, Slider Fader, Dual-Channel,  
Stereophonic Console

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## INTRODUCTION

The Broadcast Electronics 350 Series Audio Console line provides a reliable 10 mixer device in monophonic and stereophonic configurations. These consoles represent 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. Both consoles are designed with features that are most needed to provide operating flexibility, installation simplicity and reliable service convenience.

All amplifiers are mounted on plug-in printed circuit board modules. Integrated circuits are used extensively. The power supply is mounted in the console cabinet.

All preamplifiers are equipped for operation with microphone or line level signals as set by jumper selection. In new consoles, the first two preamps (channel I and channel II) have been preset for low level (mix). The remainder are preset for high (line) level inputs.

A cue program switch is installed on all mixers so that input assignments can be previewed as desired. In the stereophonic model, both the left and right channels are fed to the cue system. The stereophonic console is also equipped to accept monophonic or stereophonic inputs to all preamplifiers. This switch can be used to feed a mono signal to both the left and right channels.

Both consoles are designed for dual channel operation with the Program and Audition channels identical in operating specifications. A third output is optionally available in the stereo model. A monophonic signal is derived from the stereophonic program channels.

The switching of signals to the Program or Audition channel is accomplished electronically with field effect transistors. These provide noiseless, bounceless switching for a cleaner sound. The FET's provide excellent isolation when off and are protected from RF pick-up.

Built-in amplifier(s) are provided for monitor speakers. Separate outputs are provided for several studios. 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. A built-in intercom system permits two way communication between the console and the studio.

Separate amplifiers are provided to drive a cue speaker and headphone. An internal cue speaker and connections for an external speaker are 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.

# Electrical and Physical Specifications for 350 Series Consoles

PARAMETER	SPECIFICATIONS
Input Impedances and Levels	
Microphone Mode:	150 Ohms balanced, -65 dBm minimum to -38 dBm maximum
High Level Mode:	54k Ohms balanced bridging, -20 dBm minimum to +20 dBm maximum
Frequency Response	$\pm 0.5$ dB, 30 Hz -20 kHz
Distortion	0.5% IM and THD 30 Hz -20 kHz, at +18 dBm output
S/N Ratio	70 dB below +18 dBm output with -50 dBm to any microphone input, 20 kHz bandwidth
Output Impedance/Levels	600 Ohms balanced, +8 dBm for zero VU meter reading, +18 dBm capability
Monitor Amp	
Frequency Response	$\pm 0.75$ dB, 50 Hz -20 kHz (1 kHz reference)
Distortion	0.75% or less, 30 Hz -20 kHz @ rated RMS output and load.
Output Impedance/Power	8 Watts RMS per channel/8 Ohm load
Headphone Amp	1.0 W RMS per channel. Front panel jack and input select switching
Cue Amp	1.0 W RMS to integral cue speaker, also functions as intercom amplifier
Muting Relays	2 relays standard. Assigned to Mixers I and II. Other combinations readily field modified
Dimensions	36 inches Wide x 10.75 inches High x 19 inches Deep (91.4 W x 27.3 H x 48.2 cm D)
Shipping Weights (Packed)	10M350: 80 lbs. (36.4 kg) 10S350: 85 lbs. (38.6 kg)



## SECTION I INSTALLATION

### 1-1. UNPACKING

The console is shipped in one container. Carefully unpack and inspect the console to make certain that no damage has occurred during shipment. Any damage should be immediately reported to Broadcast Electronics, Inc., and to the transportation company. Check before throwing away the packing material to determine if all invoiced items are present. Besides the console, the shipment should include a Warranty Card and the Instruction Manual.

### 1-2. INSTALLATION

Determine the physical location of the console in relation to other associated equipment. Specifically, requirements for operator convenience, cable access and proper electrical interconnection must be considered.

Broadcast Electronics Audio consoles are intended for desk top mounting. All connections are made inside the cabinet. Cable access is provided through a cutout located in the bottom of the cabinet. If mounted flush on a table top, a matching opening is required in the table top beneath the console.

### 1-3. 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 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.

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

### 1-4. INPUT WIRING

#### **WARNING**

ENSURE ALL POWER TO THE CONSOLE IS DEENERGIZED BEFORE PROCEEDING.

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.

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

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.

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.

#### 1-5. OUTPUT WIRING

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.

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.

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 HEADPHONE JACK AND THE INTERNAL HEADPHONE OUTPUT MAY NOT BE USED SIMULTANEOUSLY.

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

MUTING RELAYS. The 350 Series consoles are equipped with two muting relays. The consoles come wired for activation of relay K1 (control room), when the Mix 1 MODE switch is in the PROGRAM position and either Program or Audition is in the ON position. The studio A relay (K2) is similarly controlled by Mix 2. Each relay can be controlled by any one mixer (the relay is activated by making a connection to ground).

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.

#### 1-6. 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, 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.

#### 1-7. INSTALLATION ADJUSTMENTS

LINE AMPLIFIER LEVEL BALANCE. The level balance adjustments on the line amplifier circuit boards balances the left and right output levels in stereophonic consoles 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.

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.

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 un-insulated (case grounded) jacks on associated equipment, or from racks and cabinets.

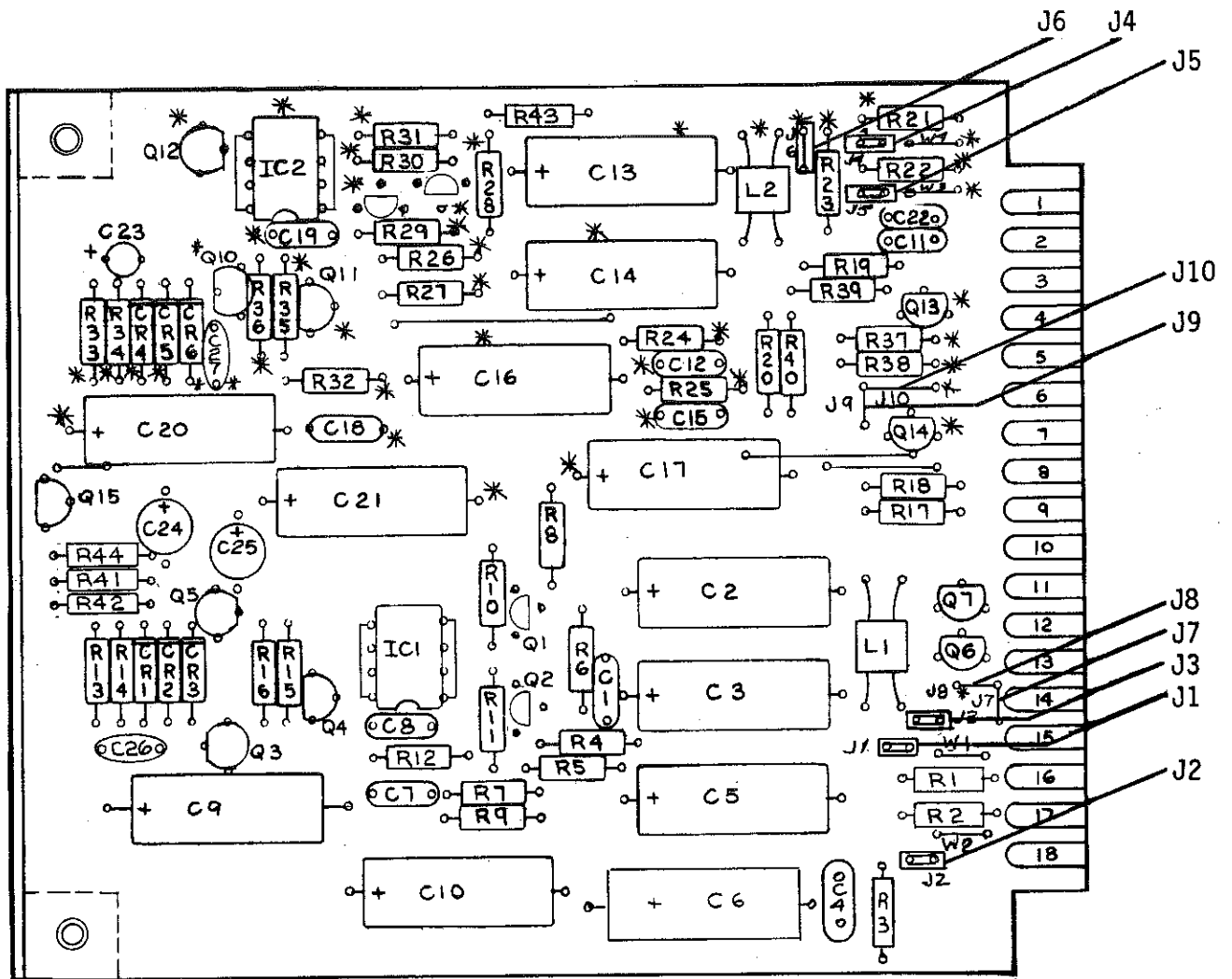
TERMINATIONS. A proper load or termination for transformer coupled equipment is necessary to ensure proper frequency response and levels. Each program output requires a 600 Ohm termination. For example, sources requiring a 600 Ohm termination but which have no external 600 Ohm load should have a low-wattage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

INPUTS TO STEREOPHONIC CONSOLES. Normally, consoles are shipped from the factory with the inputs wired to accept stereophonic programming. Any input to a 350 Series stereophonic console may be wired to accept a monophonic input by changing the jumper configuration on the preamplifier circuit board (refer to Figure 1-1).

While a mixer may be preset to accept either high or low level inputs, all inputs to a single mixer must be either all high level inputs or all low level inputs.

INPUT LEVEL SENSITIVITY. Any mixer will accept either low level (microphone) or high (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 1-1).





(\* ITEMS USED ON STEREOGRAPHIC BOARD ONLY)

839-0012-8

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 1-1. - PREAMPLIFIER CIRCUIT BOARD JUMPER PLUG PROGRAMMING

VU METER CALIBRATION. The console VU meters are calibrated at the factory to indicate 0 VU (100) when the output level is +8 dBm (1.95 V 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).

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.

The line amplifier circuit adjustment procedure must be performed first. Next, connect an external VU meter terminated in 600 Ohms to the mono matrix output.

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 II

### OPERATION

#### 2-1. 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.

#### 2-2. INPUT SELECTION

Two separate input sources may be connected to mixers one through eight and three input sources to mixers nine and ten. Two pushbutton switches labeled A and B are provided for each mixer. The desired input is fed to the mixer by depressing the A or B, in nine and ten A, B or C switch for that mixer.

#### 2-3. 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.

#### 2-4. 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 NORMAL OPERATION.

## 2-5. VU METERS

In the 10M350 (mono) console, separate VU meters are provided for the audition and program channels. In the stereophonic console (10S350) separate VU meters are provided for the left and right channels. These two meters may monitor either the program or audition outputs as determined by the setting of the VU meter switch.

## 2-6. 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 relays.

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

## 2-7. 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.

### **WARNING**

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.

## 2-8. 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 provides a means to adjust the monitor channel audio level.

### **CAUTION**

THE AMPLIFIER(S) TOTAL SPEAKER LOAD IMPEDANCE SHOULD NEVER BE LESS THAN 8 OHMS PER AMPLIFIER.



## SECTION III ELECTRONIC THEORY OF OPERATION

### 3-1. INTRODUCTION

This section provides a theory of operation for the 350 Series Audio Consoles. Refer to the drawings in the next section as required in the following text.

### 3-2. OVERALL MONOPHONIC SYSTEM DESCRIPTION (10M350)

### 3-3. AUDITION AND PROGRAM CHANNELS

Terminals are provided to connect two input sources to each mixer (mixer 9 and 10 accept three input sources). The input signal is routed to the front panel input selector switches which determines which input will be applied to the preamplifier 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. In the 10M350 console, this is a vertical slide attenuator which may be opened and cleaned.

From the mixer, the signal is returned to the solid-state switches 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 signal utilizing the VU rectifier circuit mounted on the audition VU meter.

### 3-4. 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 enclosed contacts of the control room muting relay.

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.

### 3-5. INTERCOM SYSTEM

All 350 series consoles are equipped with an intercom system to permit conversation between a studio and the console position in the control room. Whenever the CUE/INTERCOM switch is set to LISTEN or TALK, the cue bus is disconnected by the CUE/INTERCOM switch.

In the TALK position the cue bus is disconnected and the talk relay (K3) is energized to connect the cue speaker as a microphone. Audio from the cue speaker is transformer coupled to the booster amplifier on the cue /intercom circuit board. The booster amplifier output is applied to the TALK/LISTEN switch, routed through the intercom level control, and applied to the cue amplifier on the cue/intercom circuit board. The output of the cue amplifier is routed through contacts of the talk/listen relay to the external intercom speaker terminals.

In the LISTEN position the talk relay (K3) is deenergized and audio from the studio is fed to the cue amplifier to drive the console cue speaker. The console audio in the listen mode can be adjusted with the intercom level control.

### 3-6. 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.

### 3-7. MUTING RELAYS AND CONTROL

Muting relays control the speakers and energize the "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. Two relays (K1 and K2) are controlled by the front panel audition/program switches. A third relay (K3) is controlled by the LISTEN/TALK switch. Relay K1 and K2 are energized by supplying a ground to the mute control bus.

### 3-8. POWER SUPPLY

All 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 at 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.

### 3-9. GENERAL STEREOPHONIC SYSTEM DESCRIPTION

### 3-10. AUDITION AND PROGRAM CHANNELS

Terminals are provided to connect two stereo input sources to each mixer. The signals are routed from the input terminals on the sub-chassis inside the cabinet to the front panel selector switches. Here, either the A or B (in the first eight mixers, and A, B, or C in mixer 9 and 10) source is connected to the preamplifier. The left and right channel signals enter the preamplifier modules and pass through the separate level sensitivity pads.

The output of the right channel preamplifier is connected to the stereo/mono jumper select on the preamplifier module. When the jumper select is in the mono position, the output of the right channel preamplifier is disconnected, the left channel preamplifier output is connected to both the left and right channels. In the stereo position, the two channels remain separate.

Following amplification, the two stereophonic signals are taken from the preamplifier module to the front panel mixer. In the 10S350 this is a vertical slide attenuator which may be opened and cleaned. Cue switches route both these signals to the monophonic cue system instead of the mixer at the full counterclockwise stop of the mixer. All channels have this feature.

From the mixer, the stereo signal is returned to the FET switches, located on the preamplifier board, which is controlled by the front panel Audition/Program switches. Separate outputs are obtained from the pre-amplifier and applied to the left and right Audition and Program busses.

The Mixer Line Driver Amplifier signal is amplified and routed through the left and right channel Master Level Control to the final amplification stage. This amplifier is coupled to the 600 Ohm/600 Ohm output transformer to the console output terminals. The monitor selector switch, headphone selector switch, mono matrix and the VU-1 rectifier assembly mounted on the VU meter and bridged off the amplifier output.

In the 10S350 console, the VU meter signals are connected to the meter rectifier circuits through a front panel selector switch so that either the Audition or Program output channel may be metered.

The left and right Program outputs for the mono matrix are connected directly to separate inputs on the mono 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 and routed from the mono matrix to the monophonic program output terminals. No metering is provided for this derived monophonic output, since it is taken from the primaries of the left and right output transformers. The level into the mono matrix module is controlled by the program master level control. The program VU meters give a true indication of the input level of the Mono Matrix.

### 3-11. CUE CIRCUITRY

The outputs from the left and right preamplifiers are summed to the front panel cue switches and are combined into a single cue bus to feed the headphone selector switch and the cue speaker amplifier.

The cue bus feeds the cue amplifier through the gain control located on the front panel. From there the signal enters the cue speaker amplifier on the Intercom Module. Following amplification, the cue signal passes from the module to the power supply board where the intercom and control room muting relay is mounted.

The 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. A separate connection is made through an exposed jumper on the power supply board to the internal cue speaker. When an external speaker is connected, this jumper should be removed to disconnect the built-in speaker.

### 3-12. CUE/INTERCOM

The cue/intercom system in the stereophonic console is identical to the monophonic system.



### 3-13. MONITOR CIRCUITRY

The monitor outputs from both 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" or other external feed, this is connected directly from its input terminals on the sub-chassis to the selector switch.

The left and right outputs of this switch pass through the dual front panel monitor level control to the monitor amplifiers. In the 10S350 consoles, two single channel amplifiers, two monitor amplifier modules are used. Following amplification, the signals are routed to the muting relays on the power supply board. There the signals are fed through normally closed contacts to separate terminals on the sub-chassis barrier strips.

Both the left and right busses of the Audition and Program from the Mixer Line Amplifiers are connected to separate sections of the front panel headphone selector switch. A third position is connected to the monophonic cue bus. From the selector switch, the signals pass through the dual front panel headphone level control to the headphone amplifier. This dual channel amplifier is the cue headphone amplifier. Following amplification, the stereo signal leaves the printed circuit module and is connected to both the front panel stereo headphone jack and to terminals on the sub-chassis. An external jack may be connected at these terminals.

### 3-14. MUTING RELAYS AND CONTROL

The muting relay system in the stereophonic console is identical to the monophonic system.

### 3-15. POWER SUPPLY

The power supply is identical to the power supply in the monophonic console.

### 3-16. VU-1 VU METER RECTIFIER - (Refer to Drawing A918-0001)

The VU-1 contains the rectifier circuit for the VU meter. The T pad (R1, R2, R3) provides calibration so that the meter reads 0 VU (100) when the output is +8 dBm.

### 3-17. LOW LEVEL INPUT PRELIMINARY AMPLIFIER - 918-3600 AND 918-3601

The 918-3600 (Mono) and the 918-3601 (Stereo) preamplifiers differ only in that the stereo preliminary amplifier has two identical amplifiers on the same board. One is removed for monophonic version.

The theory of operation for both amplifiers is identical.

The purpose of the preamp is to raise the level of the input signal above the noise level to a level compatible with the mixing bus, where all individual mixers are combined.

Input pads are provided to accomodate signal levels higher than microphone level for instance, tape recorders and phonographic inputs. The schematic indicates the method of jumper selection to accomodate either level.

Two inputs on each preamplifier are selectable by interlock push-button switches located on the front panel for each channel. The input stage of the preamplifier is a discreet differential amplifier which feeds an operational amplifier for the required gain which is approximately 40 dB. The signal is then routed through the front panel gain control(s) to the output analog switch(s) which connects the amplifier output to the proper mixing bus. The stereo model has two such amplifiers, gain controls and analog switches. The functions of the analog switches are controlled by a lever switch located above the channel fader.

### 3-18. MONO MATRIX AMPLIFIER - (Refer to Drawing C906-3602)

The Mono Matrix Amplifier module is used in the stereophonic consoles to mix the left and right channel signals and to amplify this composite (Matrix) signal sufficiently to drive a 600 Ohm line at +8 dBm (+18 dBm peak). This is accomplished with a mixing network, an integrated circuit amplifier, and a 600 Ohm output transformer.

Signal enters through R1 and R2 which are level balancing controls. L1 and C1 form an RF-filter. IC-1 performs the active mixing function, while Q3, Q4 and their associated components provide a low impedance output. T1 provides a balanced output. Q2 supplies a decoupled bias source to IC-1.

The circuitry employed in the mono matrix amplifier closely resembles the circuit on the two above mentioned preamplifiers.

### 3-19. MIXER LINE DRIVER AMPLIFIER - (Refer to Drawing D906-7100)

The Mixer Line Driver Amplifier module contains two multiple stage amplifiers and the isolation transformer to supply the console output. In monophonic consoles, two Mixer Line Driver Amplifiers are used to provide program and audition outputs. In stereophonic consoles, four are required to provide the program and audition outputs.

The signal from the program and audition bus enters on pin 1 and is coupled through C2 to the input of the mixer amplifier composed of IC-1 and Q1-Q2. Choke L1 and capacitor C1 acts as a low-pass filter to prevent the appearance of RF in the amplifier's input. Operational amplifier IC-1 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 IC-1. Capacitor C6 provides boot-strapping 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 in the line driver. This three-stage amplifier consists of a differential input stage (Q4-Q5) an operational amplifier (IC-2), and a complementary 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 variable resistor R17. In conjunction with the master level control, R17 permits matching the gain of two Mixer Line Driver amplifiers. A signal for use in the monitor circuit is bridged from the primary of T1.

3-20. MONOPHONIC CUE/HEADPHONE AMPLIFIER - (Refer to Drawing C906-7111)

The Monophonic Cue/Headphone Amplifier contains two identical amplifiers of which one will be explained.

IC-2 is a self-contained 18 V regulator providing power to IC-1, a dual power amplifier. The signal is coupled through L1, R1 and C4 to Pin 6 (input) of IC-1. L1, R1 and C3 form a low pass filter to keep RF from the amplifiers input. Pin 1 of IC-1 provides bias current through R3 to Pin 6. Negative feedback components R4, R5 and C5 determine amplifier gain. The output signal is coupled through DC blocking capacitor C6.

This mono cue/headphone amplifier is used in both the monophonic and the stereophonic console.

3-21. MONITOR (POWER) AMPLIFIER - (Refer to Drawing C906-3709)

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 is provided in monaural consoles.

The 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.

3-22. POWER SUPPLY AND RELAY BOARD - (Refer to Drawing B918-4002)

The Power Supply and Relay Board contains two muting relays, the intercom selection relay, and the power supply filtering. The +35 VDC supply is connected to terminal R1 as are the busses which supply the rest of the console. Ripple and noise on the +35 VDC supply are filtered by network R12, C1 and C2. A regulator Q5 provides a regulated voltage of +24 V for all preamplifiers (stereo and mono).

Power for muting relays K1 and K2 are intercom selection relay K3 is supplied directly from the +35 VDC supply.

Relay K3 is controlled by the front panel CUE/INTERCOM selection switch S7, and is not energized with the switch in the CUE or LISTEN position. When S7 is in the TALK position, a ground is supplied to energize K3. A diode CR3 suppresses transients as K3 energizes and de-energizes.

Relays K1 and K2 are controlled by identical pairs of switching transistors and the two MUTE controls. Power for the switching transistors is supplied through R8 and zener diode CR4. When Q1 or Q2 is not conducting, the associated relay drivers Q3 and Q4 do not conduct. If the mute control goes low, Q1, or Q2 turn on supplying current to the relay driver. The relay driver turns on and the relay energizes. The monitor speaker signal connected through the normally closed contacts is shut off. Terminals for the studio speakers and one pair of normally closed contacts are available on the terminal strip adjacent to power supply.

### 3-23. CUE INTERCOM AMPLIFIER - (Refer to Drawing C918-7018)

The Cue Intercom Amplifier module contains the power amplifier for the cue speaker and the intercom booster amplifier.

The intercom signal from the intercom selection relay enters the board on pins 13 and 15 and is connected to transformer T1, which provides impedance transformation and voltage gain. Ferrite beads (FE-2 and FE-3) are installed on these leads to the non-inverting input of IC-1. The output is coupled through C5 to pin 1 for connection to the front panel CUE/INTERCOM selection switch. A ferrite bead (FE-4) is also installed on the output lead. Bias for the input of IC-1 is supplied from the voltage divider R6 and R7. Gain is determined by R2, R4 and C1.

The cue signal from the CUE/INTERCOM selection switch enters on pin 2 and is coupled through C6 to the non-inverting input of IC-2. This power amplifier provides 32 dB of gain. The output is coupled through resistor R8 and capacitor C8 to pin 9. This output is connected to the intercom selection relay on the Power Supply. Ferrite beads (FE-5 and FE-6) are installed on both the input and the output.

The +18 VDC power for the board is supplied by regulator Q1, R1 and zener diode CR-1. Capacitor C7 provides filtering. The +28 VDC is applied to the regulator from pin 18. Ferrite bead FE-1 prevents distribution of RF on the power supply bus.



## SECTION IV MAINTENANCE

### 4-1. CLEANING

- A. PUSHBUTTON SWITCHES. These switches are self-wiping and should not require cleaning.
- B. LEVER SWITCHES. These may be cleaned, if required, with either a burnishing tool or an aerosol spray contact cleaner.
- C. 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 pencil eraser. The life of the card edge connectors can be prolonged by minimizing the removal and re-insertion of printed circuit modules.

### 4-2. CONSOLE SPECIFICATION MEASUREMENTS

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

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 may be disconnected by lightly pressing the input selector switch so that both A or B inputs are disconnected. When making noise measurements the master gain control should be set to approximately 12 o'clock and the mixer 3/4 up or clockwise.

### 4-3. TROUBLESHOOTING

#### **NOTE**

AC POWER MUST BE TURNED OFF WHEN PRINTED CIRCUIT BOARDS ARE REMOVED OR REPLACED.

In determining the cause of a fault in the console, it is necessary to isolate it to a particular section or electronic module.

- A. Begin by determining that the main power supply is functioning (VU meter lamps burning, muting relays operational, or by actual voltage check).
- B. Check signal presence in the program, audition and cue channels.
- C. Interchange printed circuit modules to determine if the fault is caused by a particular module.

### **NOTE**

THE MONOPHONIC PREAMPLIFIER MAY BE INSTALLED IN STEREOGRAPHIC CONSOLES WITHOUT HARM. IT WILL PROVIDE A LEFT CHANNEL SIGNAL ONLY. THE STEREOGRAPHIC PREAMPLIFIER MAY BE INSTALLED IN MONOPHONIC CONSOLES WITHOUT DAMAGE. THE LEFT CHANNEL ONLY IS USED.

D. If the fault occurs with more than one module, check wiring continuity within the console.

4-4. The major faults which occur on the printed circuit modules are failure of the integrated circuits or shorting of capacitors. Test the IC by measuring the DC voltage present on the IC input and output pins (with a 20,000 Ohms/Volt VOM). This 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.

### **NOTE**

THE DC VOLTAGE MEASUREMENTS MUST BE MADE WITH A 20,000 OHMS/VOLT OR GREATER METER TO AVOID DAMAGE TO THE INTEGRATED CIRCUIT. THE OPTIONAL 919-3000 EXTENDER CARD IS HELPFUL IN RAISING A MODULE ABOVE THE LEVEL OF OTHER MODULES WHEN PERFORMING THESE MEASUREMENTS.

#### 4-5. COMPONENT REPLACEMENT ON PRINTED CIRCUIT BOARDS

Great care should be exercised when working on printed circuit boards, since excessive heat may cause the foil to peel off. The Broadcast Electronics warranty on printed circuit boards is void if boards are damaged by improper handling.

Broadcast Electronics maintains a complete inventory of parts (e.g., resistors, transistors, etc.) as well as complete board assemblies. Order by Broadcast Electronics part number.

When replacing components on a printed circuit board, use a small soldering iron (60 watts maximum) with a small tip. Use a brush or de-soldering tool to remove excessive solder. Protect the board contacts with masking tape and mount gently in a small vise.

Touch the iron to the connection to be unsoldered. When heated, quickly remove the iron and brush away the excess solder. Be careful that no solder splatters onto the board. Unbend the leads with a small pair of needle nose pliers and remove the component.

## **NOTE**

WHEN REPLACING MULTI-PIN COMPONENTS (INTEGRATED CIRCUITRY, CONNECTORS, ETC.) DE-SOLDER ALL THE PINS BEFORE ATTEMPTING TO REMOVE THE COMPONENT. IT IS VIRTUALLY IMPOSSIBLE TO HEAT ALL THE PINS SIMULTANEOUSLY.

Check the mounting holes in the board to be sure they are clear of solder and open before mounting the replacement. Put the leads through the holes and trim the leads to about 1/8 inch. Bend the leads over so they touch only the foil strips and leads they are to be soldered to.

Touch the iron to the leads and let the solder flow onto the foil. Always use a fine rosin core solder such as No. 20 gauge. Check for "bridges" of solder between adjacent foil strips.

Clean the flux off the connection. Solder flux left on the printed circuit board may cause noise in the circuit. If the contacts were covered with masking tape, clean them also.

SECTION V  
PARTS LIST & DRAWINGS

5-1. The following section contains parts list and schematics for the 10M350 and 10S350 Series Audio Consoles.

Ten Slide Fader Dual Channel Monophonic Console - 938-1051

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Resistor, 10k Ohm $\pm 5\%$ , 1/4 W	100-1052	10
----	Potentiometer, 10k Ohm	191-1053C	5
----	Potentiometer, 10k Ohm	180-105QA	10
----	Bridge Rectifier, 25 A, 200 V, MDA 2502	239-0006	1
----	Diode, 1N4148	203-4148	4
----	Transformer, 110 V Primary; 28 Vdc, 4 A secondary	376-0008	1
----	Fuse, 2 A, 3 AG, Slow-Blow	334-0200	1
----	VU meter, 1900 Ohm	319-1003	2
----	Speaker	414-0001	1
----	Lamp, 28 V	321-1828	2
----	Switches, Lever, 2 P, 3 position	343-3004	13
----	Switches, push-button, DPDT, 2 station	343-1203	10
----	Switches, push-button, 4 PDT, 2 station	343-1201	8
----	Switches, push-button, DPDT, 3 station	343-1202	2
----	Switches, Toggle, SPST	348-0110	1
----	Connector, 18-pin	417-1801	15
----	Barrier Strip, 20 terminals	412-0020	4
----	Capacitor, Ceramic Disc, 0.0047 $\mu$ F, 125 V	002-4724	2
----	Relay, Socket type, 4 PDT, 24 V Coil Contacts: 2 A, 24 V	270-0007	3
R 16	Resistor, WW, 4 Ohm $\pm 5\%$ , 2 W	132-4013	1
----	Printed Circuit Board Assembly, VU Meter	918-0001	1
----	Printed Circuit Board Assembly, Power Supply	918-4002	1
----	Printed Circuit Board Assembly, Input Amplifier (Mono)	918-3600	1
----	Printed Circuit Board Assembly, 8 W Power Amp	918-3709	1
----	Printed Circuit Board Assembly, Cue/Phone Amplifier (Mono)	918-3605	1
----	Printed Circuit Board Assembly, Driver Amp	918-3604	1

## 10 Slide Fader Dual Channel Stereophonic Console - 938-1050

REF. DES.	DESCRIPTION	PART NO.	QTY?
----	Resistor, 10k Ohm $\pm 5\%$ , 1/4 W	100-1052	20
----	Potentiometer, 10k Ohm , Dual	192-1053A	4
----	Potentiometer, 10k Ohm	193-1053C	1
----	Potentiometer, 10k Ohm , Slide, Dual	180-1050B	10
----	Bridge Rectifier, 25A, 200 V, MDA 2502	239-0006	1
----	Diode, 1N4148	203-4148	4
----	Transformer: 110 V Primary; 28 Vdc, 4 A Secondary	376-0007	1
----	Fuse, 2 A, 3 AG, Slow Blow	334-0200	1
----	VU Meters, 1900 Ohm	319-1003	2
----	Speaker	414-0001	1
----	Lamp, 28 V	321-1828	2
----	Switch, Lever, 2 Pole, 3 Position	343-3004	13
----	Switch, Pushbutton, DPDT, 2 station	343-1203	10
----	Switch, Pushbutton, 4 PDT, 2 Station	343-1401	8
----	Switch, Pushbutton, 4 PDT, 3 Station	343-1204	2
----	Switch, Toggle, SPST	348-0110	1
----	Terminal Strip, 5 lug	411-0866	2
----	Connector, 18-pin	417-1801	19
----	Phone jack	417-0311	1
----	Barrier Strip, 20 Terminals	412-0200	7
----	Capacitor, Ceramic Disc, 0.0047 uF	002-4724	2
----	Switch, Pushbutton, 2 pole, interlock	343-1201	1
----	Relay, Socket type, 4 PDT, 24 V Coil, Contacts: 2 A, 24 V	270-0007	3
----	Printed Circuit Board Assembly, VU Meter	918-0001	1
----	Printed Circuit Board Assembly, Power Supply	918-4002	1
----	Printed Circuit Board Assembly, Input Amp- lifier (Stereo)	918-3601	1
----	Printed Circuit Board Assembly, Headphone	918-3606	1
----	Printed Circuit Board Assembly, 8 W Power Amp	918-3709	1
----	Printed Circuit Board Assembly, Cue Intercom	918-7018	1
----	Printed Circuit Board Assembly, Driver Amp	918-3604	1

## Mono Matrix Card Assembly - 918-3602

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Mica, 50 pF, 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, 1N4148, Silicon, Fast Switching	203-4148	2
D3	Diode, 1N98, Germanium Signal	202-0098	1
IC-1	Integrated Circuit, Operational Amplifier, 8 Pin Dip	221-7480	1
L1	Choke, Ferrite, 2 turns of #32 Enameled Wire	956-0001	1
Q1,Q2	Transistor, 2N3904, NPN, Silicon	211-3904	2
Q3	Transistor, GES5817, PNP, Small Signal, TO-18 Case	210-5817	1
Q4	Transistor, GES5816, NPN, Small Signal, TO-18 Case	211-5816	1
R1,R2	Potentiometer, 50 K Ohm	178-5054	2
R3,R4	Resistor, 33 k Ohm, $\pm 5\%$ , 1/4W	100-3353	2
R5	Resistor, 47 Ohm, $\pm 5\%$ , 1/4W	100-4723	1
R6	Resistor, 4700 Ohm, $\pm 5\%$ , 1/4W	100-4743	1
R7	Resistor, 3900 Ohm, $\pm 5\%$ , 1/4W	100-3943	1
R8,R9	Resistor, 33 K Ohm, $\pm 5\%$ , 1/4W	100-3353	2
R10	Resistor, 10 K Ohm, $\pm 5\%$ , 1/4W	100-1053	1
R11	Resistor, 8200 Ohm, $\pm 5\%$ , 1/4W	100-8243	1
R12,R13	Resistor, 18 Ohm, $\pm 5\%$ , 1/4W	100-1823	2
R14	Resistor, 100 K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
R15	Resistor, 220 Ohm, $\pm 5\%$ , 1/4W	100-2233	1
T1	Transformer, Audio Output, (Broadcast Manufactured Part)	371-0001	1
----	Socket for IC-1 8-pin	417-0800	
----	Blank Printed Circuit Board	518-3602	

## Mono Preamp 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 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,C22	Capacitor, Dipped Film, 0.022 uF, 100V	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
V26	Capacitor, Ceramic Disc, 20 pF, 1 kV	002-2013	1
CR1,CR2	Diode, 1N4148, Fast Switching, Silicon	203-4148	2
CR3	Diode, 1N98, Germanium Signal	202-0098	1
IC-1	Integrated Circuit, Operational Amplifier 748 8 Pin Dip	221-7480	1
J1 thru J3	Jumper, Programmable	340-0004	3
L1	Choke, Ferrite, 4 Turns #32 Enameled Wire	956-0002	1
Q1,Q2	Transistor, 2N4250, PNP, TO-92 Case	210-4250	2
Q3	Transistor, GES5816, NPN, TO-18 Case	211-5816	1
Q4	Transistor, 2N3904, NPN, Silicon	211-3904	1
Q5	Transistor, GES5817, PNP, TO-18 Case	210-5817	1
Q6,Q7	Transistor, 2N5462, JFET, P-Channel	212-5462	2
Q15	Transistor, 2N3904, NPN, Silicon	211-3904	1
R1,R2	Resistor, 27 K 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, 39 K Ohm, $\pm 5\%$ , 1/4W	100-3953	1
R9	Resistor, 62 K Ohm, $\pm 5\%$ , 1/4W	100-6253	1
R10,R11	Resistor, 82 K Ohm, $\pm 5\%$ , 1/4W	100-8253	2
R12	Resistor, 39 K Ohm, $\pm 5\%$ , 1/4W	100-3953	1
R13	Resistor, 3900 Ohm, $\pm 5\%$ , 1/4W	100-3943	1



## Mono Preamp Assembly - 918-3600 (Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
R14	Resistor, 4700 Ohm, $\pm 5\%$ , 1/4W	100-4743	1
R15,R16	Resistor, 18 Ohm, $\pm 5\%$ , 1/4W	100-1823	2
R17,R18	Resistor, 4700 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, 9100 Ohm, $\pm 5\%$ , 1/4W	100-9143	1
R42	Resistor, 10 K Ohm, $\pm 5\%$ , 1/4W	100-1053	1
R43	Resistor, 100 K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
----	Blank Printed Circuit Board	518-3600	1

Cue Amplifier Printed Circuit Board Assembly - 918-7018

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Electrolytic, 4.7 uF, 35V	015-5064	1
C2	Capacitor, Ceramic Disc, 0.1 uF, 50V	000-1054	1
C3	Capacitor, Electrolytic, 4.7 uF, 35V	015-5064	1
C4	Capacitor, Electrolytic, 220 uF, 25V	013-2284	1
C5,C6	Capacitor, Electrolytic, 4.7 uF, 35V	015-5064	2
C7	Capacitor, Electrolytic, 100 uF, 35V	014-1084	1
C8	Capacitor, Electrolytic, 220 uF, 25V	013-2284	1
CR1	Diode, Zener, 18V, 1W	200-0018	1
IC-1	Integrated Circuit, Molded Plastic, Operational Amplifier, 8-Pin Dip	221-7410	1
IC-2	Integrated Circuit, LM380N, Power Amplifier, 14-Pin	222-3800	1
Q1	Transistor, 2N6121, NPN, TO-220	219-6121	1
R1	Resistor, 470 Ohm, $\pm 5\%$ , 1/4W	100-4733	1
R2	Resistor, 10 K Ohm, $\pm 5\%$ , 1/4W	100-1053	1
R3	Resistor, 100 K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
R4	Resistor, 220 K Ohm, $\pm 5\%$ , 1/4W	100-2263	1
R5	Resistor, 1 K Ohm, $\pm 5\%$ , 1/4W	100-1043	1
R6,R7	Resistor, 100 K Ohm, $\pm 5\%$ , 1/4W	100-1063	2
R8	Resistor, 10 Ohm, $\pm 5\%$ , 1/4W	100-1023	1
R9	Resistor, 10 k Ohm, $\pm 5\%$ , 1/4W	100-1053	1
T1	Transformer, Input (Broadcast Electronics Part)	376-0520	1
----	Choke, Ferrite, 2 Turn #32 Enameled Wire	956-0001	1
----	Blank Printed Circuit Board	518-7018	1

Monitor/Amplifier Assembly - 918-3609

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Electrolytic, 1000 uF, 25 V	013-1095	1
C2	Capacitor, Electrolytic, 22 uF, 25 V	013-2574	1
C3	Capacitor, Electrolytic, 4.7 uF, 50 V	015-5064	1
C4	Capacitor, Electrolytic, 100 uF, 35 V	014-1084	1
C5	Capacitor, Electrolytic, 33 uF, 35 V	014-3274	1
C6	Capacitor, Mica, 50 pF, 50 V	040-5013	1
C7	Capacitor, Dipped Film, 0.047 uF, 50 V	030-4743	1
C8	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	1
F1	Fuse, 1.5 A, Slow-Blow	334-0150	1
IC-1	Integrated Circuit, Hybrid Amplifier, 10 W	221-1010	1
L1	Choke, Ferrite, 2 Turns of #32 Enameled Wire	956-0001	1
R1	Resistor, 10 ohms $\pm 5\%$ , 1/4 W	100-1023	1
R2	Resistor, 10k ohms $\pm 5\%$ , 1/4 W	100-1053	1
----	Blank Printed Circuit Board	518-3609	1

Power Supply Relay PCB Assembly - 918-4002

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 4700 uF, 35V	014-4795	2
C3	Capacitor, Electrolytic, 100 uF, 25V	013-1084	1
C4	Capacitor, Ceramic Disc, 0.1 uF, 50V	000-1054	1
CR1 thru CR3	Bridge Rectifier 1N4005, Silicon, 600V, 1A	203-4005	3
CR4	Diode, Zener, 1N4739, 9.1V $\pm 10\%$ , 1W	200-0009	1
Q1,Q2	Transistor, GES 5817, PNP, Small Signal, TO-18 Case	210-5817	2
Q3,Q4	Transistor, 2N3904, NPN, Silicon	211-3904	2
Q5	Voltage Regulator, 24V, TO-220 Case	227-7824A	1
R1 thru R3	Resistor, 100 Ohm, $\pm 5\%$ , 1/4W	100-1033	3
R4,R5	Resistor, 1K Ohm, $\pm 5\%$ , 1/4W	100-1043	2
R6,R7	Resistor, 10K Ohm, $\pm 5\%$ , 1/4W	100-1053	2
R8	Resistor, 2200 Ohm, $\pm 5\%$ , 1/4W	100-2243	1
R9,R10	Resistor, 4700 Ohm, $\pm 5\%$ , 1/4W	100-4743	2
R11	Resistor, 10K Ohm, $\pm 5\%$ , 1/4W	100-1053	1
R12	Resistor, 5 Ohm, $\pm 5\%$ , 5W	133-5013	1
R13	Resistor, 10K Ohm, $\pm 5\%$ , 1/4W	100-1053	1
----	PCB Blank	C518-4002	1

Stereophonic Cue/Headphone Amplifier Assembly - 918-3606

REF. DES	DESCRIPTION	PART NO.	QTY.
C1 THRU C3	Capacitor, Electrolytic, 100 uF, 40 V	014-1084A	3
C4 THRU C6	Capacitor, Ceramic Disc, 100 pF, 500 V	002-1024	3
C7	Capacitor, Electrolytic, 1000 uF, 25 V	013-1095	1
C8	Capacitor, Electrolytic, 1 uF, 35 V	015-1064A	1
C9	Capacitor, Electrolytic, 10 uF, 16 V	013-1074	1
C10, C11	Capacitor, Electrolytic, 1 uF, 35 V	015-1064A	2
C12, C13	Capacitor, Electrolytic, 10 uF, 16 V	013-1074	2
C14	Capacitor, Electrolytic, 100 uF, 40 V	014-1084A	1
C15	Capacitor, Electrolytic, 1000 uF, 25 V	013-1095	1
IC1, IC2	Integrated Circuit, Dual Power Amplifier, LM378	222-3780	2
L1 THRU L3	Choke, Ferrite, 2 Turns of #32 Enameled Wire	A956-0001	3
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, 2200 Ohm $\pm 5\%$ , 1/4 W	100-2243	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, 1.5k Ohm $\pm 5\%$ , 1/4 W	100-1543	1
R8 THRU R11	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	4
R12	Resistor, 2200 Ohm $\pm 5\%$ , 1/4 W	100-2243	1
R13	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	1
R14	Resistor, 2200 Ohm $\pm 5\%$ , 1/4 W	100-2243	1
R15	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	1
R16	Resistor, 2200 Ohm $\pm 5\%$ , 1/4 W	100-2243	1
R17	Resistor, 4.7k Ohm $\pm 5\%$ , 1/4 W	100-4743	1
VR1	Voltage Regulator, 18 V, 1A, T0-220 Case	227-7818	1
---	Blank Printed Circuit Board	518-3606	1

Audio Power Amplifier, 8 Watt - 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 W	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	A956-0001	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 $\pm 3\%$ , 5 W, W/W	132-2002	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	C518-3709	1
XU1	Socket, Integrated Circuit, 8 pin DIP	417-0800	1

Printed Circuit Board Assembly, Power Supply & Relay - 918-4002

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1, C2	Capacitor, Electrolytic, 4700 uF, 35V	014-4795	2
C3	Capacitor, Electrolytic, 100 uF,	013-1084	1
C4	Capacitor, Ceramic Disc, 0.1 uF	000-1054	1
CR1 THRU CR3	Diode, IN4005	203-4005	3
CR4	Diode, Zener, 9.1 V	200-0009	1
Q1, Q2	Transistor, GES 5817, PNP, Signal, T0-10 Case	210-5817	2
Q3, Q4	Transistor, 2N3904, Silicon, NPN	211-3904	2
Q5	Transistor, Voltage Regulator, +24V, T0-3 Case	227-7824	1
R1 THRU R3	Resistor, 100 Ohm, <u>+5%</u> , 1/4 W	100-1033	3
R4, R5	Resistor, 1k Ohm <u>+5%</u> , 1/4 W	100-1043	2
R6, R7	Resistor, 10k Ohm <u>+5%</u> , 1/4 W	100-1053	2
R8	Resistor, 2200 Ohm <u>+5%</u> , 1/4 W	100-2243	1
R9, R10	Resistor, 4700 Ohm <u>+5%</u> , 1/4 W	100-4743	2
R11	Resistor, 10k Ohm <u>+5%</u> , 1/4 W	100-1053	1
R12	Resistor, 5 Ohm , 5 W	133-5013	1
R13	Resistor, 10k Ohm <u>+5%</u> , 1/4 W	100-1053	1
----	Socket, for relay	270-0008	1
----	Printed Circuit Board Assembly, Blank	518-4002	1



## Mixer/Line Driver Amplifier - 918-3604 - Sheet 1 of 2

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Mica, 150 pF, 500 V	040-1522	1
C2	Capacitor, Tantalum, 10 uF $\pm 10\%$ , 25V	063-1074	1
C3	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	1
C4	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$ , 1 kV	002-2013	1
C5	Capacitor, Mica, 50 pF, 50 V	040-5013	1
C6	Capacitor, Electrolytic, 33 uF, 35 V	014-3274	1
C7	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C8	Capacitor, Tantalum, 1 uF $\pm 10\%$ , 35 V	064-1063	1
C9	Capacitor, Electrolytic, 33 uF, 35 V	024-3374	1
C10	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$ , 1 kV	062-2013	1
C11	Capacitor, Ceramic Disc, 5 pF, 500 V, NPO	001-5004	1
C12	Capacitor, Electrolytic, 33 uF, 35 V	014-3274	1
C13	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	1
C14	Capacitor, Electrolytic, 100 uF, 25 V	023-1084	1
C15	Capacitor, Electrolytic, 22 uF, 50 V	024-2274	1
C16, C17	Capacitor, Ceramic Disc, 20 pF, $\pm 10\%$ , 1 kV	002-2013	2
C18	Capacitor, Electrolytic, 4.7 uF, 35 V	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, 100 V, 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
Q8, Q9	Transistor, Silicon, NPN, 2N3904	211-3904	2

## Mixer/Line Driver Amplifier - 918-3604 - Sheet 2 of 2

REF. DES.	DESCRIPTION	PART NO.	QTY.
R1	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	1
R2	Resistor, 47 Ohm $\pm 5\%$ , 1/4 W	100-4723	1
R3, R4	Resistor, 27k Ohm $\pm 5\%$ , 1/4 W	100-2753	2
R5	Resistor, 3900 Ohm $\pm 5\%$ , 1/4 W	100-3943	1
R6	Resistor, 4700 Ohm $\pm 5\%$ , 1/4 W	100-4743	1
R7, R8	Resistor, 18 Ohm $\pm 5\%$ , 1/4 W	100-1823	2
R9	Resistor, 620 Ohm $\pm 5\%$ , 1/4 W	100-6233	1
R10	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	1
R11	Resistor, 150k Ohm $\pm 5\%$ , 1/4 W	100-1563	1
R12, R13	Resistor, 470 Ohm $\pm 5\%$ , 1/4 W	100-4733	2
R14, R15	Resistor, 180k Ohm $\pm 5\%$ , 1/4 W	100-1863	2
R16	Resistor, 1k Ohm $\pm 5\%$ , 1/4 W	100-1043	1
R17	Potentiometer, 50k Ohm $\pm 10\%$ , 1/2 W	178-5054	1
R18	Resistor, 56k Ohm $\pm 5\%$ , 1/4 W	100-5653	1
R19	Resistor, 3900 Ohm $\pm 5\%$ , 1/4 W	100-3943	1
R20	Resistor, 4700 Ohm $\pm 5\%$ , 1/4 W	100-4743	1
R21, R22	Resistor, 18 Ohm $\pm 5\%$ , 1/4 W	100-1823	2
R24	Resistor, 9100 Ohm $\pm 5\%$ , 1/4 W	100-9143	1
R25	Resistor, 10k Ohm $\pm 5\%$ , 1/4 W	100-1053	1
R26	Resistor, 220 Ohm $\pm 5\%$ , 1/4 W	100-2233	1
T1	Transformer, Audio Output, 1:1 Primary: 600 Ohms Center Tapped Secondary: 600 Ohms Center Tapped (Broadcast Electronics Manufactured)	371-0001	1
X1C1	Socket, Integrated Circuit, 8 pin DIP	417-0800	1
----	Label	594-3604	1
----	Blank Printed Circuit Board	C518-3604	1

## Mono Cue Headphone - 918-3605

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C3	Capacitor, Mica, 100 pF, 50V	040-1022	1
C4	Capacitor, Electrolytic, 1 uF, 35V	015-1064A	1
C5	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1
C6	Capacitor, Electrolytic, 1000 uF, 25V	013-1095	1
C7	Capacitor, Mica, 100 pF, 50V	040-1022	1
C8,C9	Capacitor, Electrolytic, 1 uF, 35V	015-1064A	1
C10	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1
C11	Capacitor, Electrolytic, 1000 uF, 25V	013-1095	1
IC1	Integrated Circuit, LM370, Dual Operational Amplifier	222-3780	1
IC2	Voltage Regulator, 18V	227-7818	1
L1,L2	Choke, Ferrite, 2 Turns #32 Enameled	A956-0001	2
R1	Resistor, 10K Ohm, $\pm 5\%$ , 1/4W	100-1053	1
R2	Resistor, 220 Ohm, $\pm 5\%$ , 1/4W	100-2233	1
R3	Resistor, 100K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
R4	Resistor, 2200 Ohm, $\pm 5\%$ , 1/4W	100-2243	1
R5	Resistor, 100K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
R6	Resistor, 4700 Ohm, $\pm 5\%$ , 1/4W	100-4743	1
R7	Resistor, 2200 Ohm, $\pm 5\%$ , 1/4W	100-2233	1
R8	Resistor, 1500 Ohm, $\pm 5\%$ , 1/4W	100-1543	1
R9	Resistor, 100K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
R10	Resistor, 2200 Ohm, $\pm 5\%$ , 1/4W	100-2243	1
R11	Resistor, 100K Ohm, $\pm 5\%$ , 1/4W	100-1063	1
R12	Resistor, 4700 Ohm, $\pm 5\%$ , 1/4W	100-4743	1
----	Blank PCB	518-3603	1

Monaural Matrix Assembly Parts List - 918-3602

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Dipped Mica, 50 pF, 50V	040-5013	1
C2	Capacitor, Electrolytic, 4.7 uF $\pm 10\%$ , 35V	015-5064	1
C3	Capacitor, Electrolytic, 22uF, $\pm 10\%$ , 25V	013-2574	1
C4, C5	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C6, C7	Capacitor, Electrolytic, 100 uF $\pm 10\%$ , 40V	014-1084	2
C8, C9	Capacitor, Electrolytic, 33 uF $\pm 10\%$ , 35V	014-3274	2
D1, D2	Diode, IN4148, Silicon, Fast-Switching, 100V	203-4148	2
D3	Diode, IN98, Germanium, Signal 80V, 20mA	202-0098	1
IC-1	Operational Amplifier, uA748, 8-Pin DIP	221-7480	1
L1	Choke, Ferrite, 2-leg, 4-Turns of #32 Solid Enameled Wire	956-0001	1
Q1, Q2	Transistor, 2N3904, NPN, Silicon	211-3904	2
Q3	Transistor, Silicon, PNP, GES5817	210-5817	1
Q4	Transistor, Silicon, NPN, GES5816	211-5816	1
R1, R2	Potentiometer, 50k Ohm $\pm 10\%$ , 1/2 W	178-5054	2
R3, R4	Resistor, 33k Ohm $\pm 5\%$ , 1/4 W	100-3353	2
R5	Resistor, 47 Ohm $\pm 5\%$ , 1/4 W	100-4723	1
R6	Resistor, 4700 Ohm $\pm 5\%$ , 1/4 W	100-4743	1
R7	Resistor, 3900 Ohm $\pm 5\%$ , 1/4 W	100-3943	1
R8, R9	Resistor, 33k Ohm $\pm 5\%$ , 1/4 W	100-3353	2
R10	Resistor, 10k Ohm $\pm 5\%$ , 1/4 W	100-1053	1
R11	Resistor, 8200 Ohm $\pm 5\%$ , 1/4 W	100-8243	1
R12, R13	Resistor, 18 Ohm $\pm 5\%$ , 1/4 W	100-1823	2
R14	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	1
R15	Resistor, 220 Ohm $\pm 5\%$ , 1/4 W	100-2233	1
T1	Transformer: 600 Ohms, Broadcast Electronics, manufactured part	371-0001	1
XIC-1	Integrated Circuit Socket, 8-pin DIP	417-0800	1
----	Ferrite Bead for L1	360-0001	1
----	Printed Circuit Board	518-3602	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, 40 V	014-1084	2
C4	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C5, C6	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	2
C7, C8	Capacitor, Ceramic Disc, 10 pF, 500 V	001-1014	2
C9	Capacitor, Electrolytic, 33 uF, 35 V	014-3274	1
C10	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	1
C11	Capacitor, Mylar Film, 0.022 uF, 200 V	031-2243	1
C12	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C13, C14	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	2
C15	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C16, C17	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	2
C18, C19	Capacitor, Ceramic Disc, 10 pF, 500 V	001-1014	2
C20	Capacitor, Electrolytic, 33 uF, 35 V	014-3274	1
C21	Capacitor, Electrolytic, 100 uF, 40 V	014-1084	1
C22	Capacitor, Mylar Film, 0.022 uF, 200 V	031-2243	1
C23	Capacitor, Electrolytic, 4.7 uF, 35 V	024-4764	1
C24	Capacitor, Electrolytic, 100 uF, 25 V	023-1084	1
C25	Capacitor, Electrolytic, 22 uF, 50 V	024-2274	1
C26, C27	Capacitor, Ceramic Disc, 20 pF, $\pm 10\%$ , 1 kV	002-2013	2
CR1, CR2	Diode, Silicon, Fast Switching, 1N4148, 100 V 10 mA	203-4148	2
CR3	Diode, Germanium, 1N98, 100 V, 20 mA	202-0098	1
CR4, CR5	Diode, Silicon, Fast Switching, 1N4148, 100 V 10 mA	203-4148	2
CR6	Diode, Germanium, 1N98, 100 V, 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	A956-0002	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	Transistor, Field-Effect, 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	Transistor, Field Effect, P-Channel, Junction Type, 2N5462	212-5462	2
Q15	Transistor, Silicon, NPN, 2N3904	211-3904	1
R1, R2	Resistor, 27k Ohm $\pm 5\%$ , 1/4 W	100-2753	2
R3	Resistor, 150 Ohm $\pm 5\%$ , 1/4 W	100-1533	1
R4, R5	Resistor, 470 Ohm $\pm 5\%$ , 1/4 W	100-4733	2
R6, R7	Resistor, 100 Ohm $\pm 5\%$ , 1/4 W	100-1033	2
R8	Resistor, 39k Ohm $\pm 5\%$ , 1/4 W	100-3953	1
R9	Resistor, 62k Ohm $\pm 5\%$ , 1/4 W	100-6253	1
R10, R11	Resistor, 82k Ohm $\pm 5\%$ , 1/4 W	100-8253	2
R12	Resistor, 39k Ohm $\pm 5\%$ , 1/4 W	100-3953	1
R13	Resistor, 3.9k Ohm $\pm 5\%$ , 1/4 W	100-3943	1
R14	Resistor, 4.7k Ohm $\pm 5\%$ , 1/4 W	100-4743	1
R15, R16	Resistor, 18 Ohm $\pm 5\%$ , 1/4 W	100-1823	2
R17, R18	Resistor, 4.7k Ohm $\pm 5\%$ , 1/4 W	100-4743	2
R19, R20	Resistor, 2 Meg Ohm $\pm 5\%$ , 1/4 W	100-2073	2
R21, R22	Resistor, 27k Ohm $\pm 5\%$ , 1/4 W	100-2753	2
R23	Resistor, 150 Ohm $\pm 5\%$ , 1/4 W	100-1533	1
R24, R25	Resistor, 470 Ohm $\pm 5\%$ , 1/4 W	100-4733	2
R26, R27	Resistor, 100 Ohm $\pm 5\%$ , 1/4 W	100-1033	2
R28	Resistor, 39k Ohm $\pm 5\%$ , 1/4 W	100-3953	1
R29	Resistor, 62k Ohm $\pm 5\%$ , 1/4 W	100-6253	1
R30, R31	Resistor, 82k Ohm $\pm 5\%$ , 1/4 W	100-8253	2
R32	Resistor, 39k Ohm $\pm 5\%$ , 1/4 W	100-3953	1

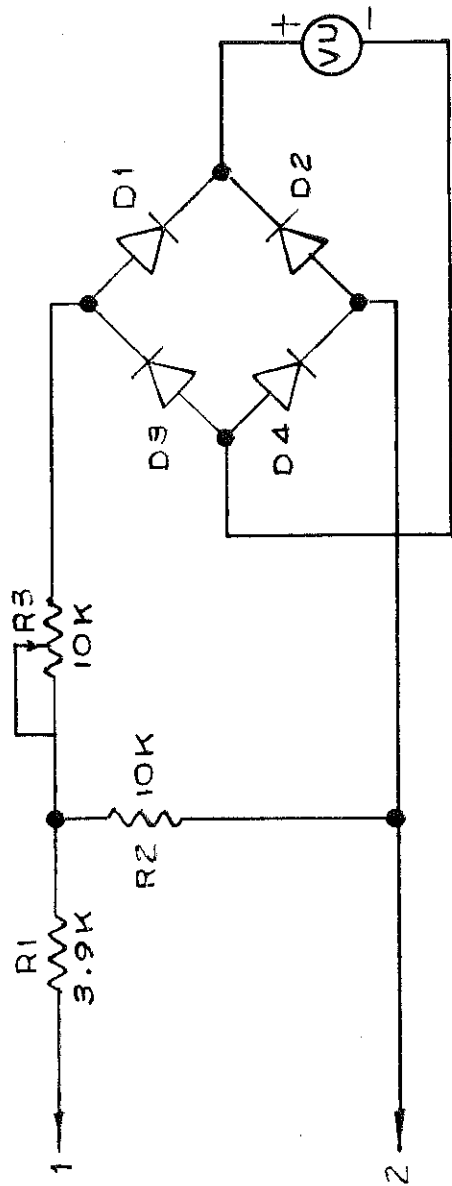
Stereophonic Preamplifier Assembly - 918-3601 - Sheet 3 of 3

REF. DES.	DESCRIPTION	PART NO.	QTY.
R33	Resistor, 3.9k Ohm $\pm 5\%$ , 1/4 W	100-3943	1
R34	Resistor, 4.7k Ohm $\pm 5\%$ , 1/4 W	100-4743	1
R35, R36	Resistor, 18 Ohm $\pm 5\%$ , 1/4 W	100-1823	2
R37, R38	Resistor, 4.7k Ohm $\pm 5\%$ , 1/4 W	100-4743	2
R39, R40	Resistor, 2 Meg Ohm $\pm 5\%$ , 1/4 W	100-2073	2
R41	Resistor, 9.1k Ohm $\pm 5\%$ , 1/4 W	100-9143	1
R42	Resistor, 10k Ohm $\pm 5\%$ , 1/4 W	100-1053	1
R43	Resistor, 100k Ohm $\pm 5\%$ , 1/4 W	100-1063	1
R44	Resistor, 220 Ohm $\pm 5\%$ , 1/4 W	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

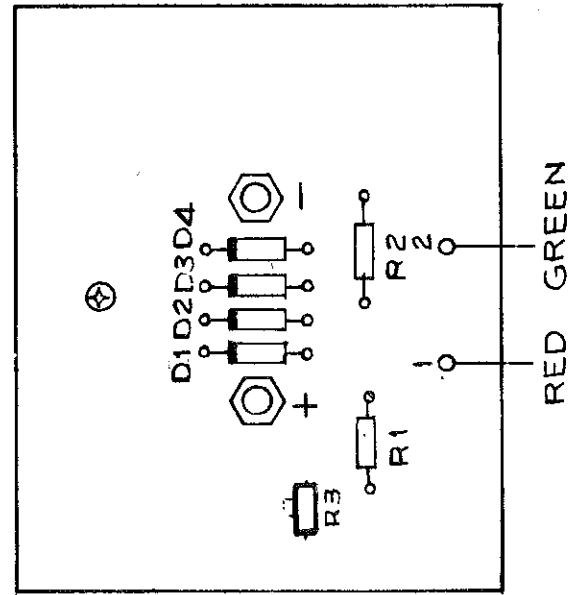
VU Meter PC Board Assembly - 918-0001

REF. DES.	DESCRIPTION	PART NO.	QTY.
D1 THRU D4	Diode, 1N34, Germanium, 60 V, 8.5 mA	202-0034	4
R1	Resistor, 3.9k Ohm $\pm 5\%$ , 1/4 W	100-3943	1
R2	Resistor, 10k Ohm $\pm 5\%$ , 1/4 W	100-1053	1
R3	Potentiometer, 10k Ohm	178-1054	1
----	Blank Printed Circuit Board	B518-1502	1





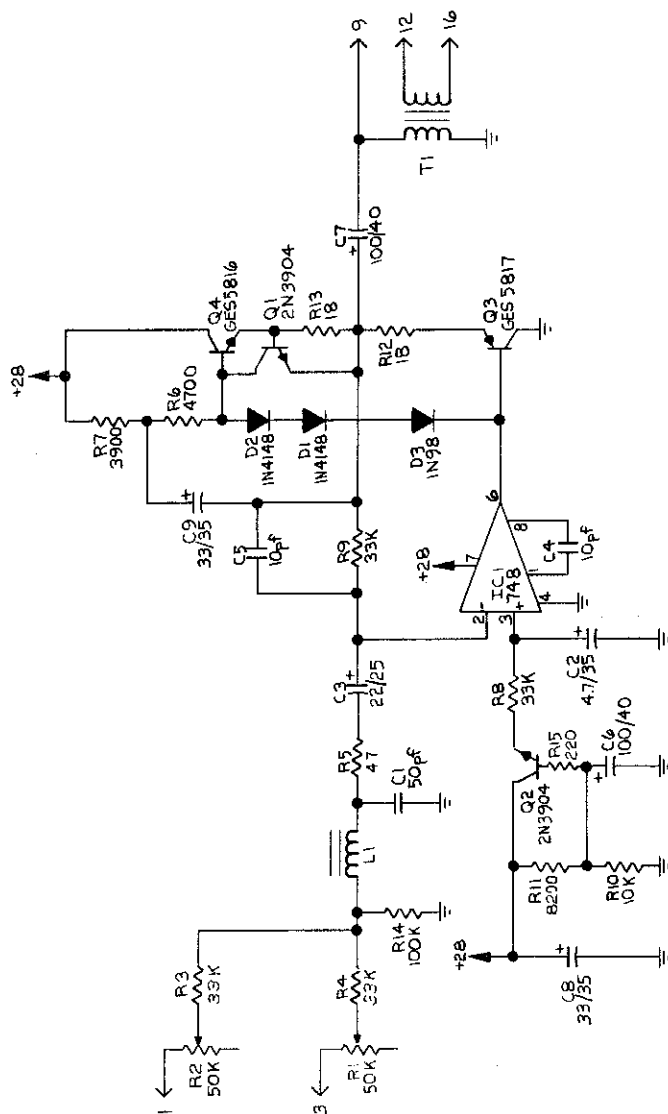
NOTE:  
1. ALL DIODES IN98 OR EQUIVALENT



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



REVISIONS		
REV	DESCRIPTION	DATE
A	PER ECN #1248	7/19/78
B	PER ECN #692	4-18-78
C	PER ECN #1716	5-17-79



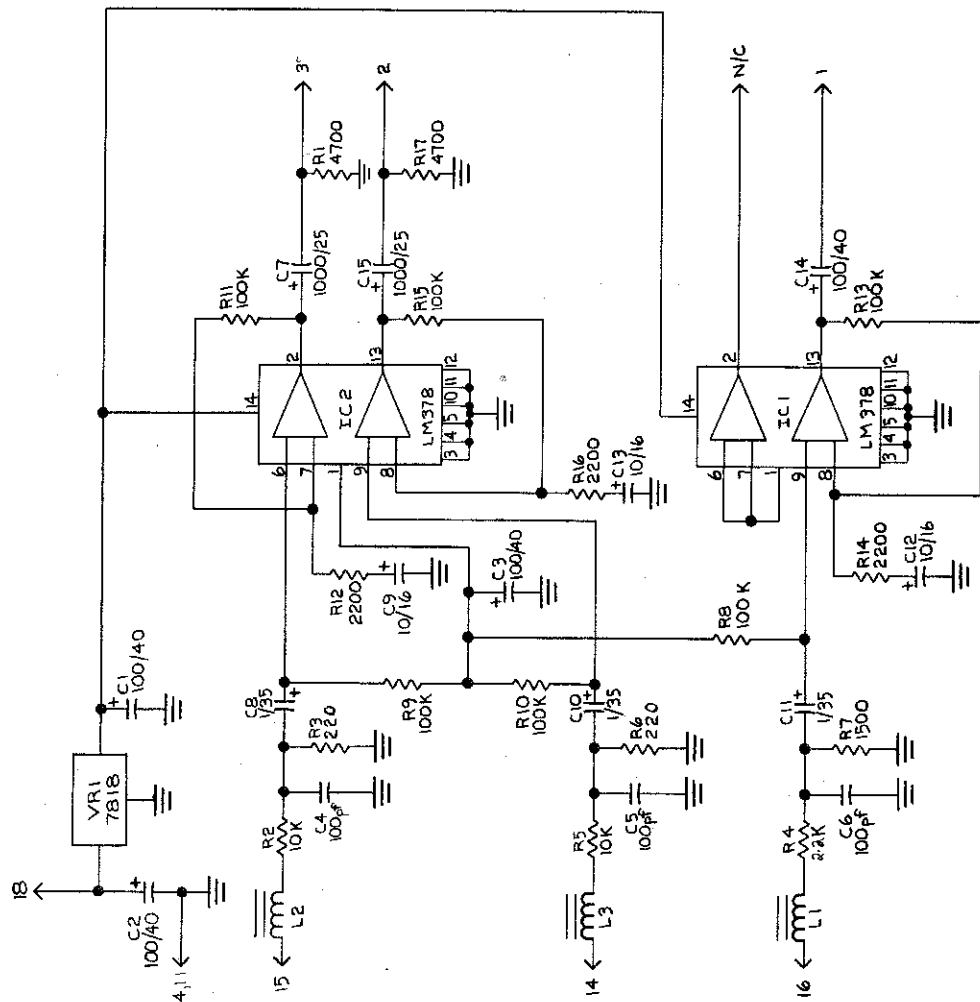
NOTES:  
 1. RESISTORS IN OHMS, 1/4W; CAPACITORS IN MICROFARADS, UNLESS OTHERWISE NOTED.  
 2. LAST COMPONENTS USED: R15, C9, D3, Q4, L1, T1, IC1.  
 3. SEE PC BOARD ASSEMBLY NO. 918-3602.

ITEM	QTY	RD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
DRAWN BY: HYDEN DATE: 1-14-78					
CHECKED BY: DATE:					
PROJECT: DATE:					
ENGINEER: DATE:					
APPROVED BY: DATE:					
TOLERANCE: UNLESS OTHERWISE SPECIFIED					
DECIMAL: 2 PL. 01 3 PL. 005					
FRACTIONAL: 1/64					
ANGULAR: ± 1°					
SHARP EDGES TO					
FILLET RADI					
MATERIAL					
TREATMENT OR FINISH					
SCALE					
CONSOLES					
SHEET 1 OF 1					

BROADCAST ELECTRONICS INC.	
- A FILMWAYS COMPANY -	
TITLE	SCHEMATIC
DWG NO.	906-3602
REV	C
PCB	MONO MATRIX

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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
REV A	PER-ECN 1723	5-14-79	G. H.
B	PER-ECN# 1818	9-19-79	G. H.



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.

ITEM	QTY	ROD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
BROADCAST ELECTRONICS INC.					
- A FILMWAYS COMPANY -					
TITLE SCHEMATIC STEREOGRAPHIC CUE/HEADPHONE AMPLIFIER					
C					
DWG NO. 906-3606					
REV B					
CONSOLES					
SCALE SHEET 1 OF 1					

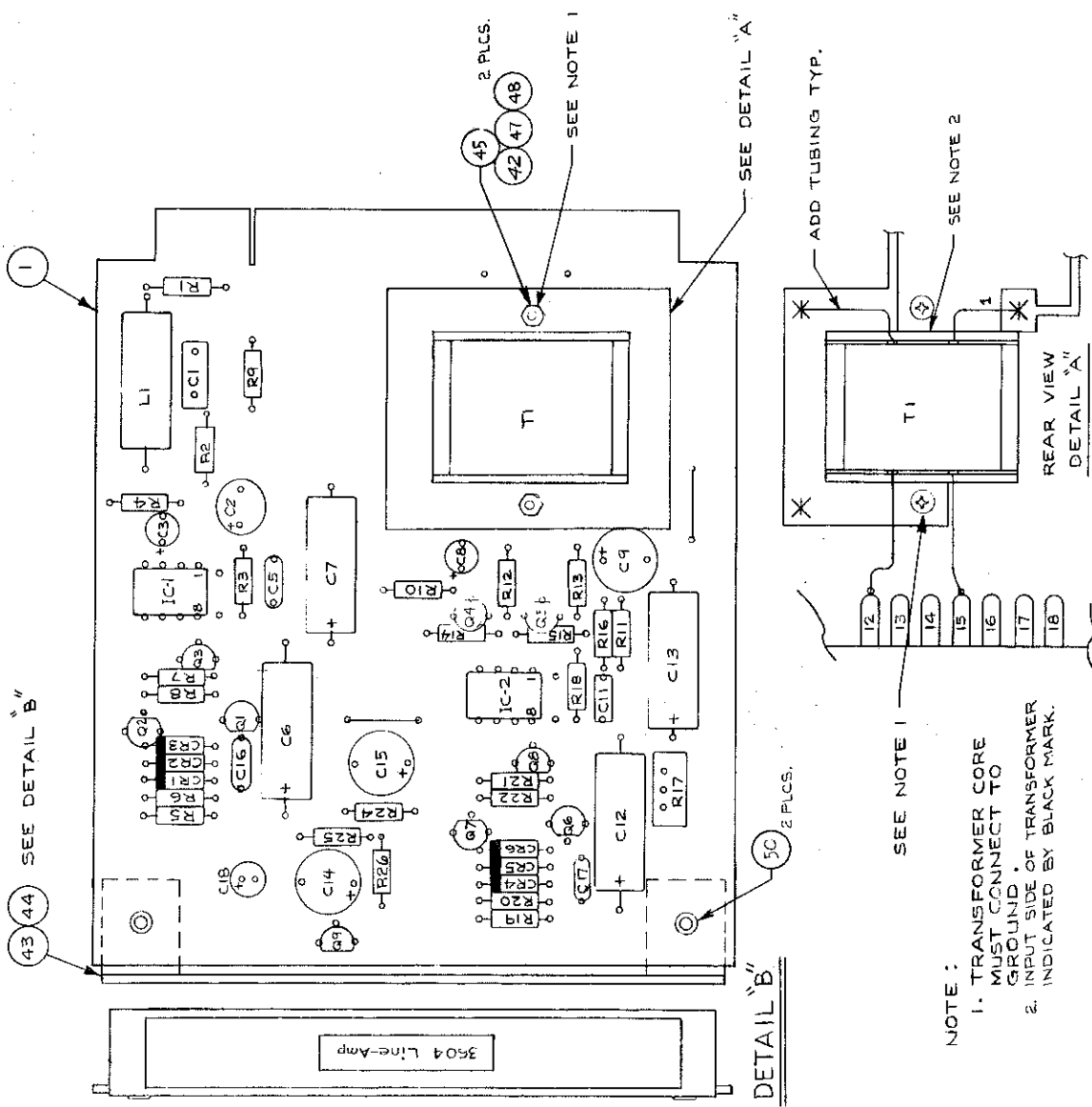
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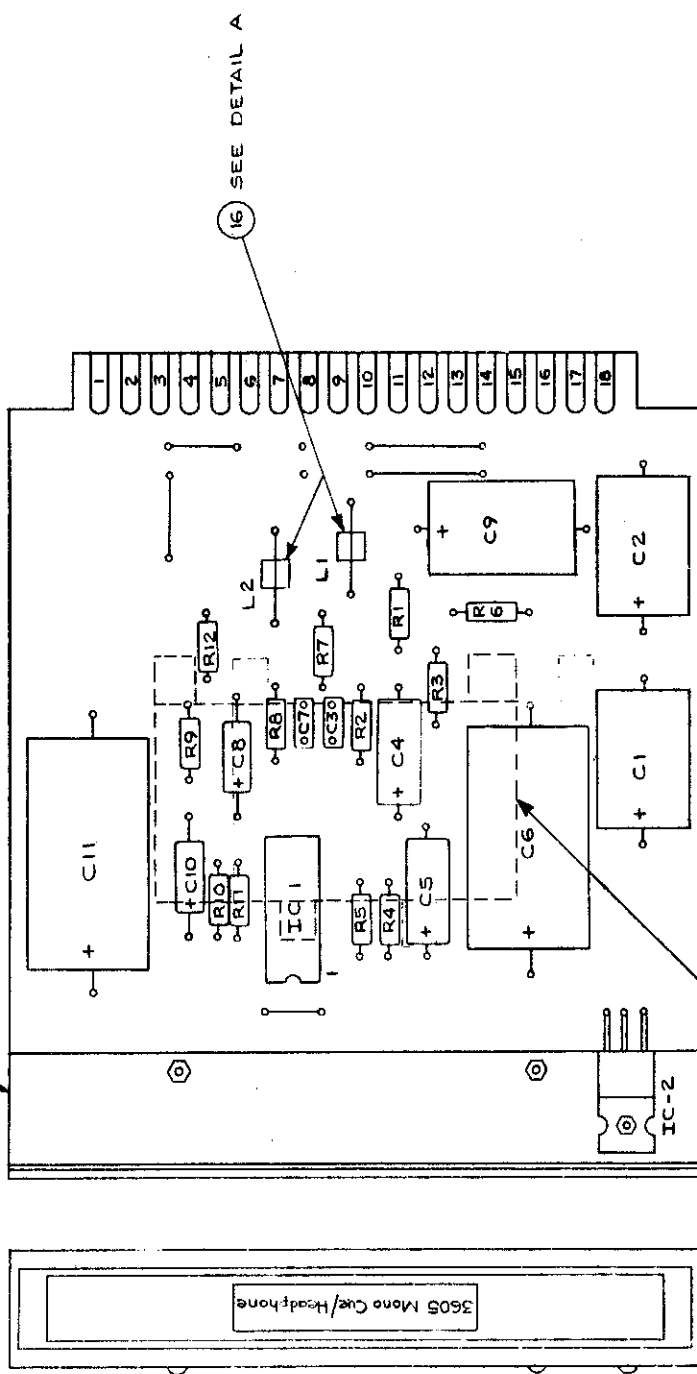
REV.	DESCRIPTION	DATE	APPROVED
A	INCORP ECN # 902 G.J.	7-13-77	
B	PER ECN # 982 CLO	9-15-77	
C	PER ECN # 1096	1-10-78	MH
D	PER ECN # 1099	1-18-78	MH
E	PER ECN # 1101	3-17-78	MH
F	PER ECN # 1201	5-16-78	MH
G	PER ECN # 1226	6-5-78	MH
H	PER ECN # 1248	7-14-78	MH
J	PER ECN # 1315	9-14-78	JLO
K	PER ECN # 1605	2-14-79	SE
L	PER ECN # 1690	4-5-79	SE
M	PER ECN # 1723	6-5-79	SE
N	PER ECN # 1912	2-11-80	JH
O	PER ECN # 2100	9-25-80	MH
P	PER ECN # 2126A	10-16-80	MH

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

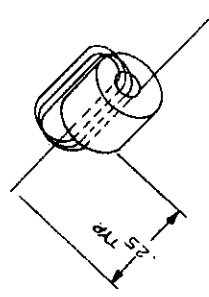
BROADCAST ELECTRONICS INC. —A FILMWAYS COMPANY—	
DATE: 6-25-80	DATE: 6-25-80
CHECKED BY: J. H. HENDEN	PROJECT ENGR: J. H. HENDEN
APPROVED BY: J. H. HENDEN	APPROVED BY: J. H. HENDEN
TOLERANCE UNLESS OTHERWISE SPECIFIED: DECIMAL 2 PL - .01 3PL - .005 FRACTIONS 1/16" - 1/8" ANGULAR ± 1° BEND RADIUS TO SHARP EDGES FILLET RADIUS TO SHARP EDGES MATERIAL: 304 STAINLESS STEEL	
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TITLE: MIXER - LINE DRIVER AMP DWG. NO.: 918-3604 REV.: P SCALE: 2/1 SHEET: 1 OF 1	



REVISIONS			DATE	APPROVED
REV	DESCRIPTION			
A	PER ECN # 1059	11-30-77	MM	
B	PER ECN # 1063	12-6-77	CLD	
C	PER ECN # 185	8-31-78	MM	
D	PER ECN # 1822	9-20-79	GH	
E	PER ECN # 1867	2-11-80	JH	
F	PER ECN # 2104	12-28-80	MM	



4 TURNS OF # 32 WIRE



DETAIL "A"

TOLERANCE UNLESS OTHERWISE SPECIFIED: DIMENSIONAL 2 PL. 01 3 PL. 005 HOLE DIA. 0.015 0.010 ANGULARITY 0.010 0.005 SHARP EDGES FILLET RADIUS MATERIAL		DATE 6/24/77	DATE	DATE	DATE
DESIGN BY	WMM	CHECKED	DATE	PROJECT	APPROVED
BROADCAST ELECTRONICS INC. -A FILMWAYS COMPANY-					
TITLE MONO CUE/HEADPHONE					
DWG NO 918-3605					
REV C					
CONSULES 2/11 SHEET 13 OF 14					

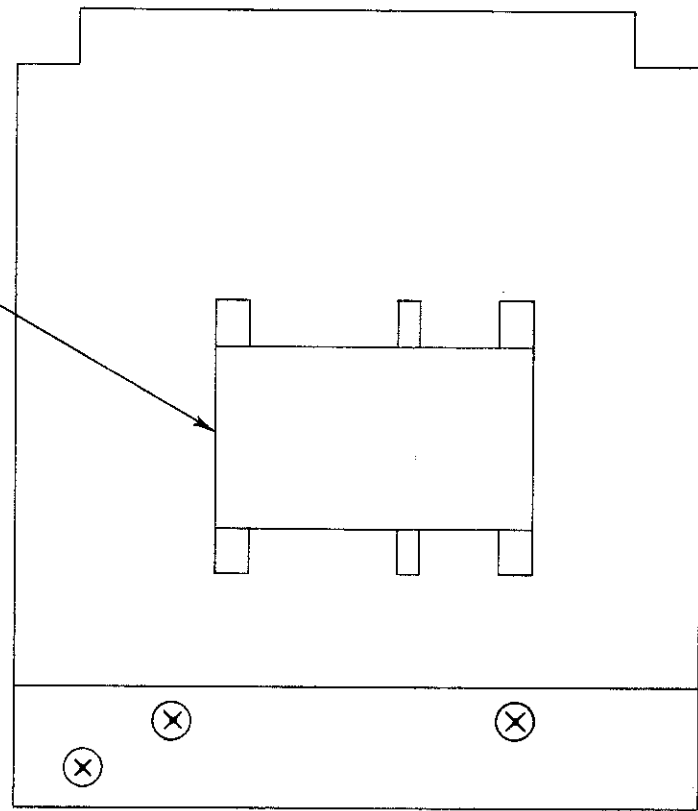
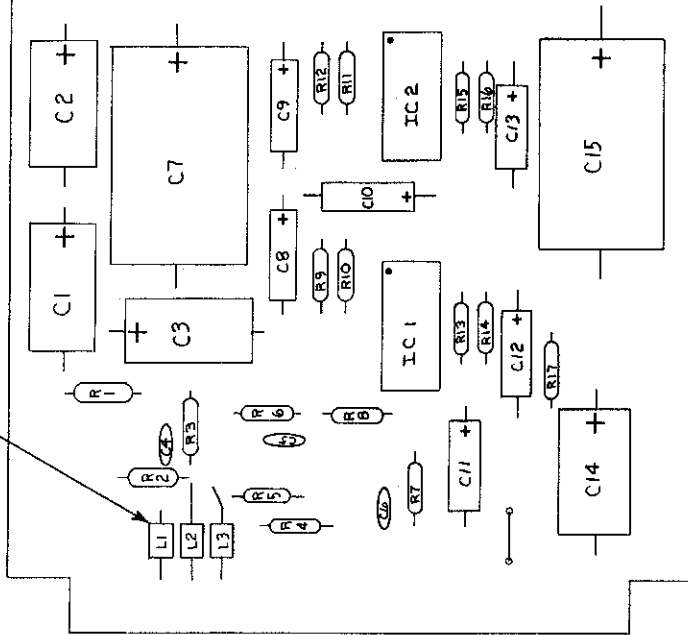
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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PER ECN #143	8-18-78	JH

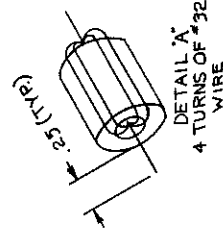
SEE DETAIL  
A  
FOR L1, L2, L3

(24) (20) (21) 3 PLCS.  
(25)

(18) 2 PLCS.  
VR1



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



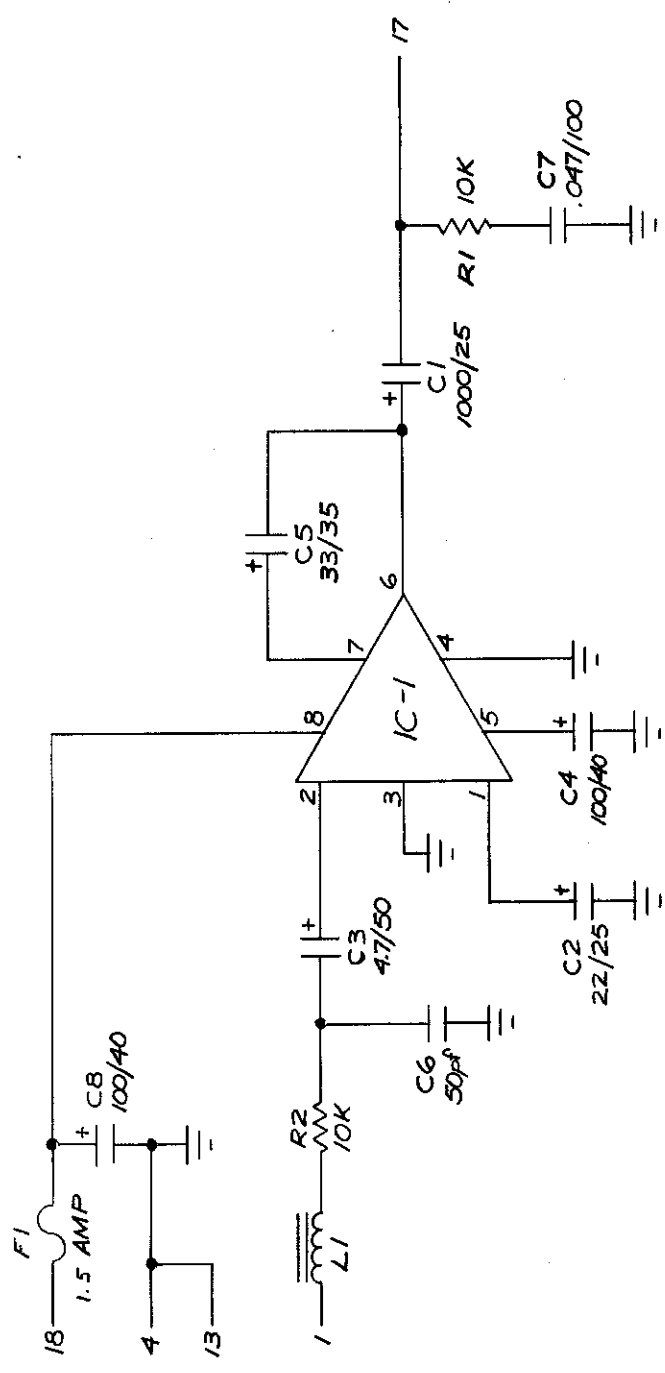
ITEM	QTY	ROD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED		DATE		DATE	
BY HAND		1-12-78			
CHECKED					
PROJECT					
ENGINEER					
APPROVED					
BY					
TO					
SHARP EDGES					
FILLET RADIUS					
MATERIAL					
TREATMENT OR FINISH					
CONSOLES		2/1		SHEET 1 OF 1	

BROADCAST ELECTRONICS INC.	
- A FILMWAYS COMPANY -	
TITLE ASSY. STEREOPHONIC CUE/HEADPHONE AMPLIFIER	
DWG NO. 918-3606	
REV A	

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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	ECN 1627	2-27-79	B.E.

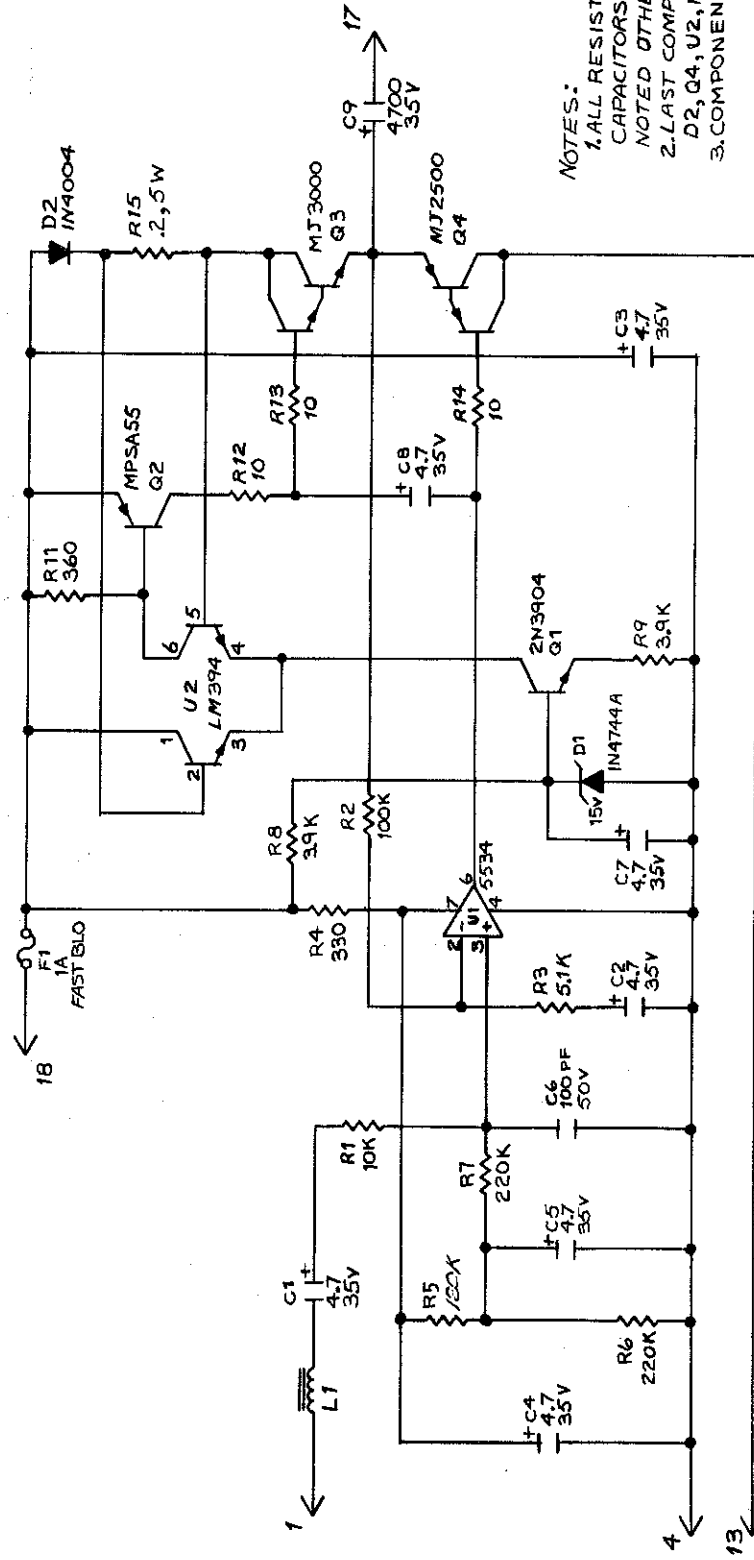


ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED				
DECIMAL 2 PL=01 3 PL=005				
FRACTIONAL 1/64				
ANGULAR ± °				
SHARP EDGES TO				
BEND RADIUS				
FILLET RADIUS				
MATERIAL				
TREATMENT OR FINISH				
SCALE				
SHEET / OF /				

DRAWN CLO DATE 3/31/78  
 CHECKED BY DATE  
 PROJECT ENGR DATE  
 APPROVED BY  
 TITLE  
 BROADCAST ELECTRONICS INC.  
 - A FILMWAYS COMPANY -  
 SCHEMATIC- MONITOR AMP PCB  
 DWG NO. 906-3609  
 REV A  
 SCALE 1" = 1"

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REVISIONS		DESCRIPTION		DATE	APPROVED
REV.					



NOTES:  
 1. ALL RESISTORS IN OHMS, 1/4 W; ALL CAPACITORS IN MICROFARADS, UNLESS NOTED OTHERWISE.  
 2. LAST COMPONENTS USED: C9, R15, D2, Q4, U2, F1, L1.  
 3. COMPONENTS NOT USED: R10.

BROADCAST ELECTRONICS INC. —A FILMWAYS COMPANY—		DATE 7-3-80
TITLE SCHEMATIC — 2W POWER AMP		DATE
DWG. NO. 906-3709		DATE
REV. B		DATE
SEE PCB ASSY. #C-918-3709		DATE
SCALE		DATE
SHEET 1 OF 1		DATE

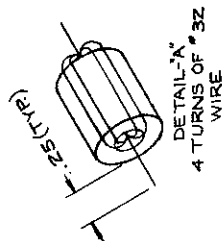
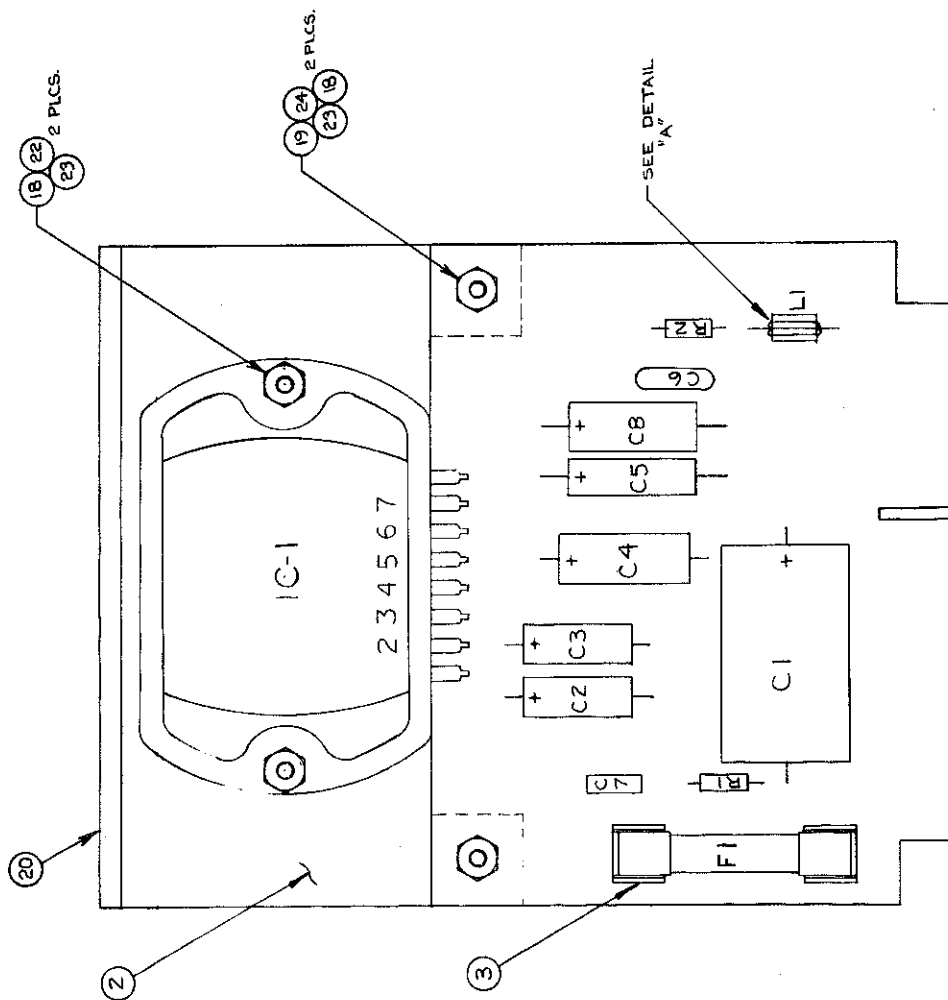
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TOLERANCE UNLESS OTHERWISE SPECIFIED  
 DECIMAL 2 PL = .01 3 PL = .005  
 FRACTIONAL ± 1/64  
 ANGULAR ± 1°  
 SHARP EDGES  
 BEND RADI  
 FILLET RADI

MATERIAL

TREATMENT OR FINISH

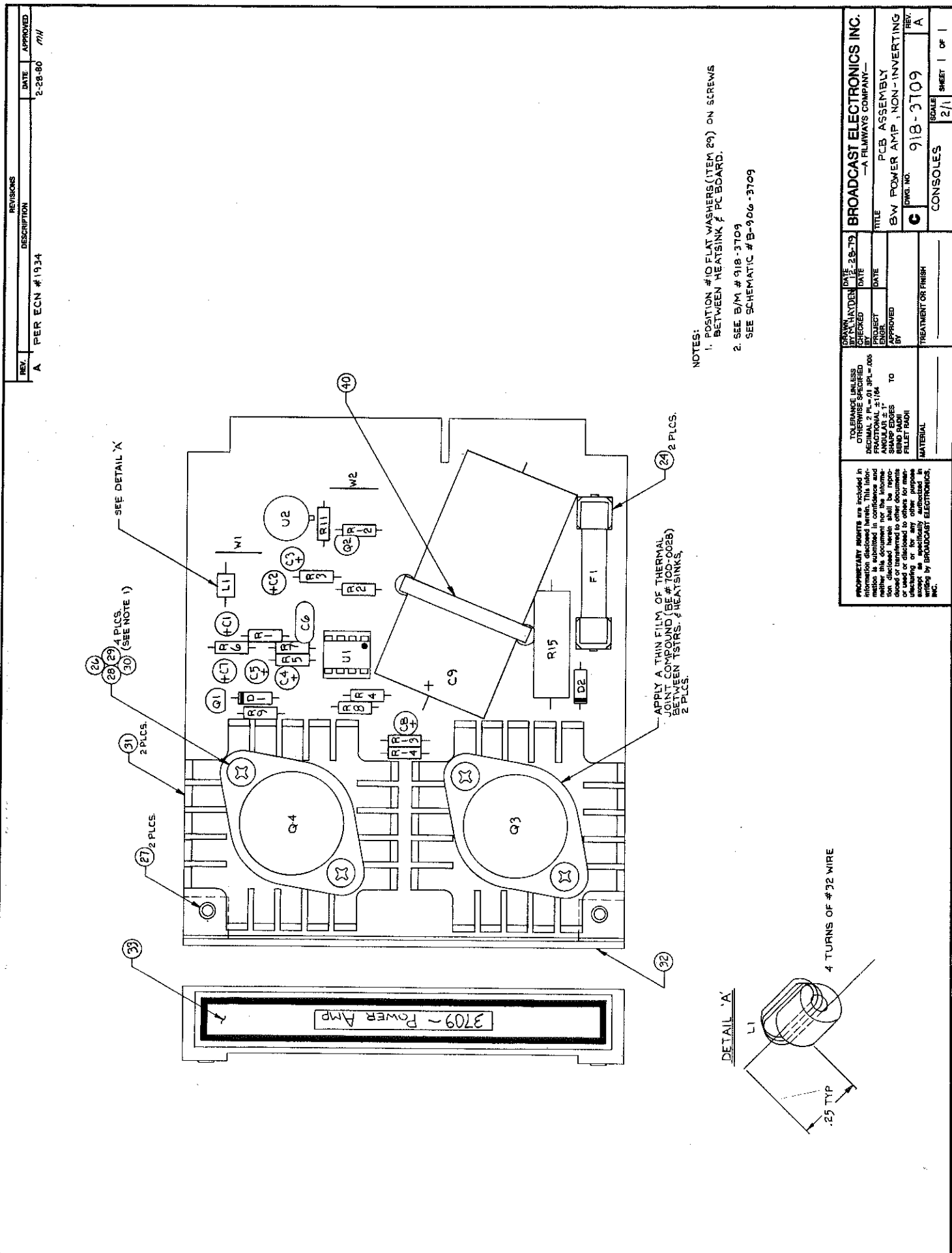
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	ECN 1196	3/1/78	CLO
B	ECN 1237	6-9-78	MH



SEE B/M NO. 918-3609

ITEM	QTY	ROD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED		DATE 11-16-77	BROADCAST ELECTRONICS INC.		
BY C. L. ORR		DATE	- A FILMWAYS COMPANY -		
CHECKED BY		DATE	TITLE		
PROJECT		DATE	ASSY-MONITOR/AMP PCB		
APPROVED BY		DATE	C		
TREATMENT OR FINISH		DATE	918-3609		
MATERIAL		DATE	CONSOLES		
		DATE	2/1		
		DATE	SHEET 1 OF 1		

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ALL RIGHTS RESERVED



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

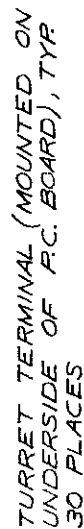
REVISIONS		DATE	APPROVED
REV.	A	PER ECN #1934	2-28-80 ml

TOLERANCE UNLESS OTHERWISE SPECIFIED		DATE	DATE
LINEAR DIMENSIONS	±.010	BY	DATE
ANGULAR DIMENSIONS	±.1°	BY	DATE
SHARP EDGES	TO	BY	DATE
FILLET RADIUS	TO	BY	DATE
MATERIAL	TREATMENT OR FINISH		

BROADCAST ELECTRONICS INC.		BROADCAST ELECTRONICS INC.	
—A FILMWAYS COMPANY—		—A FILMWAYS COMPANY—	
TITLE		TITLE	
BW POWER AMP, NON-INVERTING		BW POWER AMP, NON-INVERTING	
C		C	
DWG. NO. 918-3709		DWG. NO. 918-3709	
CONSOLES		CONSOLES	
SCALE 2/1		SCALE 2/1	
SHEET 1 OF 1		SHEET 1 OF 1	



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		CHECKED	DATE	TITLE <b>POWER SUPPLY &amp; RELAY ASSY</b>		
		ENGINEER	DATE	REV. <b>D</b>	DWG. NO. <b>918-4002</b>	
		APPROVED BY	DATE	SCALE <b>1/1</b>	SHEET <b>1</b> OF <b>1</b>	
		TREATMENT OR FINISH	<b>MANUAL</b>			



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	ECN 1843	6/6/90	R.S.

PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
PREAMP	918-3601
LINE DRIVER	918-3604
LINE DRIVER	918-3604
MONO MIX	918-3602
LINE DRIVER	918-3604
LINE DRIVER	918-3604
CUE/INTERCOM	918-7018
CUE/HEADPHONE	918-3605
MONITOR AMP	918-3709
MONITOR AMP	918-3709

OPTIONAL

TOP VIEW

NOTE:

1. PRINTED CIRCUIT MODULES INSERT WITH COMPONENTS TO THE RIGHT AS CONSOLE IS VIEWED FROM THE FRONT.

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TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL = .01 3PL = .005 FRACTIONAL ± 1/64 ANGULAR ± 1° SHARP EDGES BEND RADIUS FILET RADIUS		DATE 9-19-78	
DRAWN BY C. ORR		CHECKED BY PROJECT ENGR.	
APPROVED BY		DATE	
TREATMENT OR FINISH			
<b>BROADCAST ELECTRONICS INC.</b> —A FILMWAYS COMPANY— TITLE P.C. BOARD PLACEMENT SL310 STEREO CONSOLE DWG. NO. 906-4011 SCALE SHEET 1 OF 1 REV. A			

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	ECN 1843	6/6/80	RS

PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
PREAMP	918-3600
LINE DRIVER	918-3604
LINE DRIVER	918-3604
CUE/INTERCOM	918-7018
CUE/HEADPHONE	918-3605
MONITOR AMP	918-3709

NOTE:

1. PRINTED CIRCUIT MODULES INSERT WITH COMPONENTS TO THE RIGHT AS CONSOLE IS VIEWED FROM THE FRONT.

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TOL. FRANGE UNLESS OTHERWISE SPECIFIED  
DECIMAL 2 PL. = .01 3 PL. = .005  
FRACTIONAL ± 1/64  
ANGULAR ± 1°  
SHARP EDGES  
FILLET RADIUS  
TO

MATERIAL

TREATMENT OR FINISH

BROADCAST ELECTRONICS INC.

—A FILMWAYS COMPANY—

TITLE

PC. BOARD PLACEMENT  
ML3010 MONO CONSOLE

DWG. NO.

906-4010

REV.

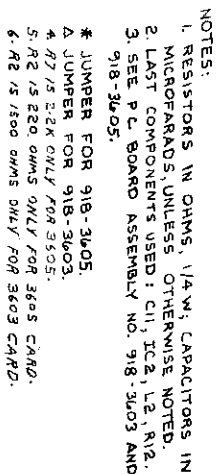
A

SCALE

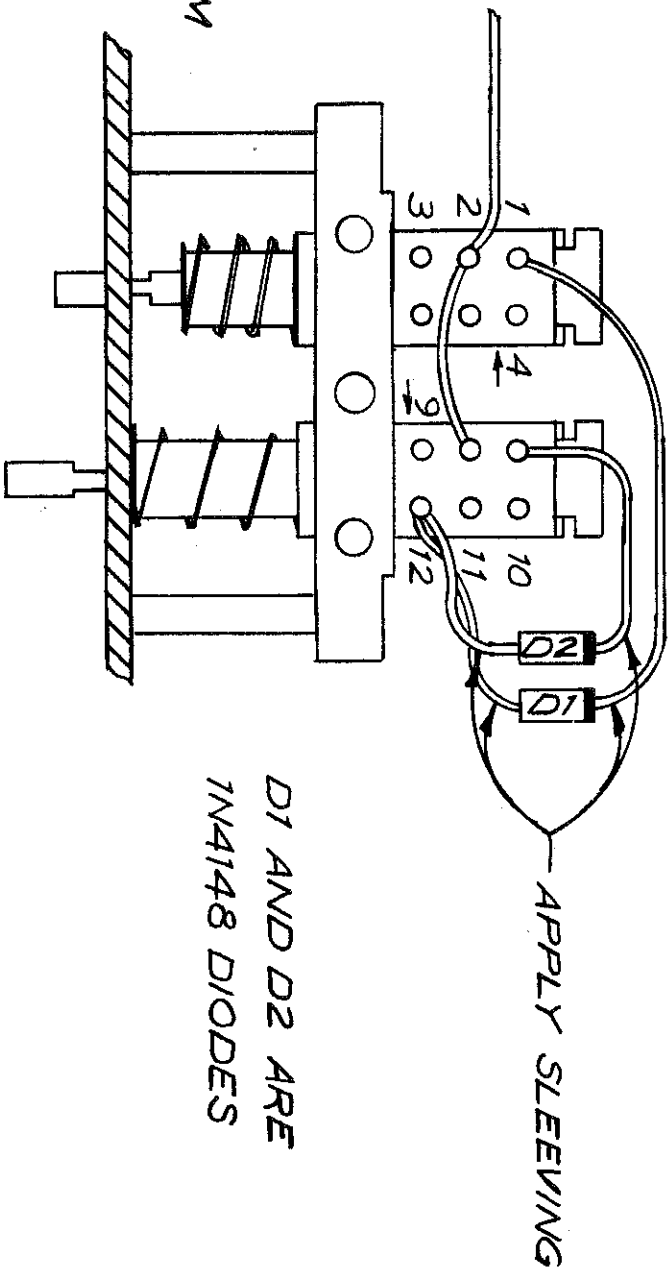
SHEET 1 OF 1



ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
BROADCAST ELECTRONICS INC.				
- A FILMWAYS COMPANY -				
TITLE SCHEMATIC - STEREO MONITOR				
& MONITOR CUE HEADPHONE				
DRAW NO. 906-7111				
REV B				
CONSOLE				
SCALE				
SHEET 1 OF 1				



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED



VIEWED FROM BOTTOM  
OF PANEL

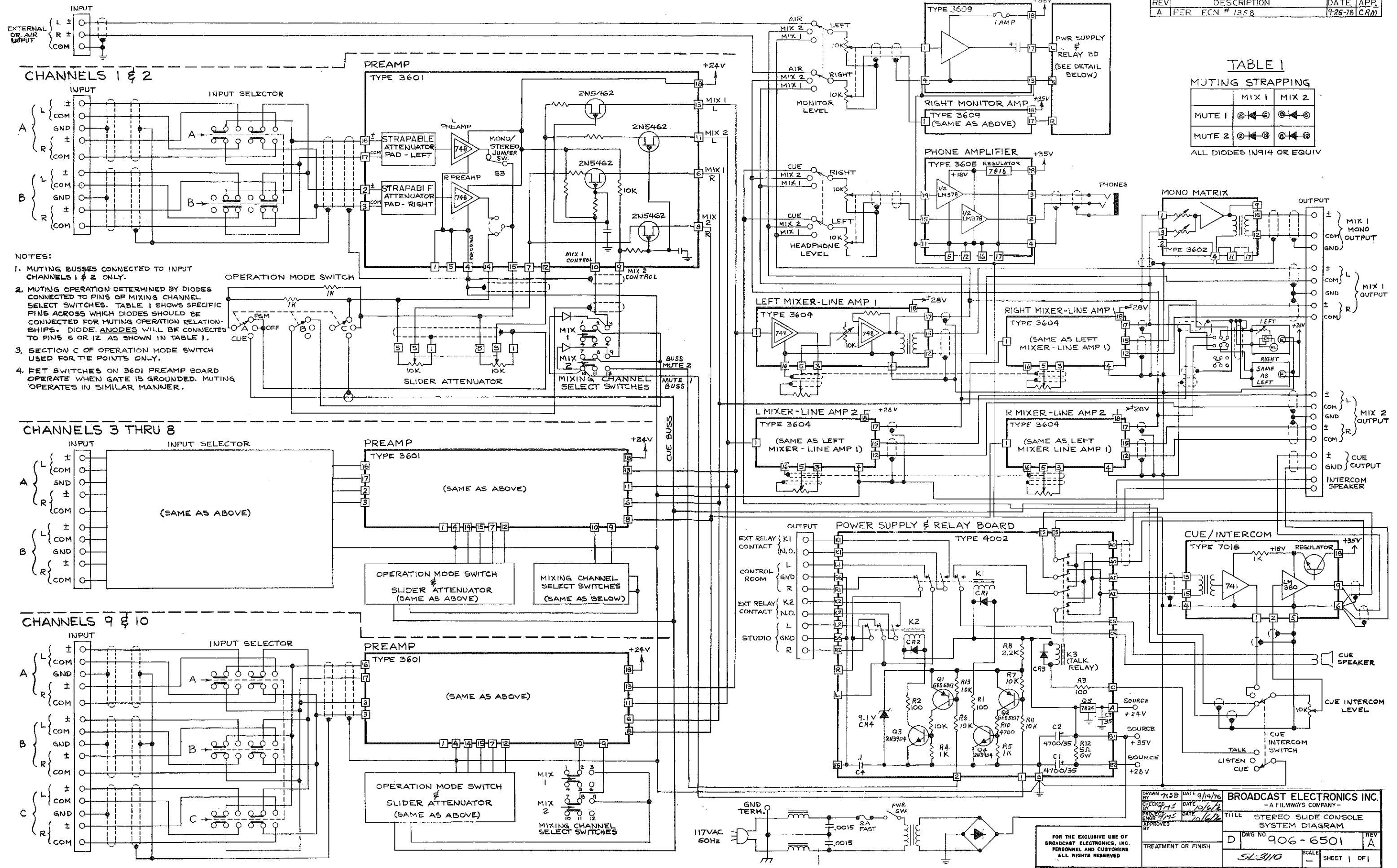
D1 CAUSES MUTE 1 CONTROL TO ACTIVATE WITH  
MIX 1 AND PGM.

D2 CAUSES MUTE 1 CONTROL TO ACTIVATE WITH  
MIX 2 AND PGM.

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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 RADIUS FILLET RADIUS		DRAWN BY C. ORR CHECKED BY PROJECT ENGR. APPROVED BY		DATE 9-27-78 DATE DATE DATE	
MATERIAL		TREATMENT OR FINISH		TITLE MUTING DIAGRAM	
A		DWG. NO. 906-5141		REV.	
3000 SERIES CONSOLE		SCALE		SHEET 1 OF 1	

BROADCAST ELECTRONICS INC.  
—A FILMWAYS COMPANY—



REVISIONS			
REV	DESCRIPTION	DATE	APP
A	PER ECN # 1358	7-25-78	CRM

TABLE 1		
MUTING STRAPPING		
	MIX 1	MIX 2
MUTE 1	②-⑥	③-⑩
MUTE 2	②-⑩	③-⑥

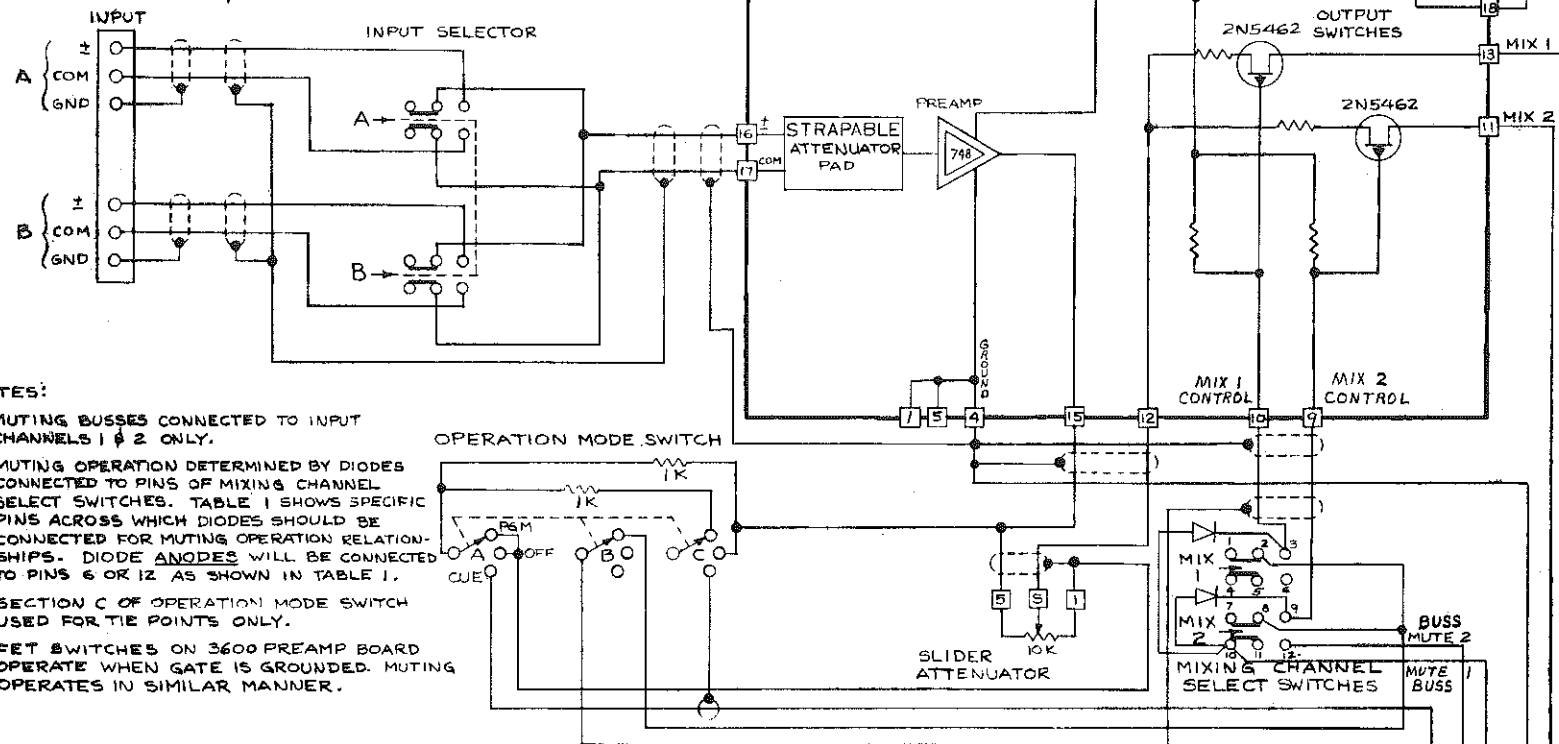
ALL DIODES IN 1/4 OR EQUIV

- NOTES:
- MUTING BUSSES CONNECTED TO INPUT CHANNELS 1 & 2 ONLY.
  - MUTING OPERATION DETERMINED BY DIODES CONNECTED TO PINS OF MIXING CHANNEL SELECT SWITCHES. TABLE 1 SHOWS SPECIFIC PINS ACROSS WHICH DIODES SHOULD BE CONNECTED FOR MUTING OPERATION RELATIONSHIPS. DIODE ANODES WILL BE CONNECTED TO PINS 6 OR 12 AS SHOWN IN TABLE 1.
  - SECTION C OF OPERATION MODE SWITCH USED FOR TIE POINTS ONLY.
  - FET SWITCHES ON 3601 PREAMP BOARD OPERATE WHEN GATE IS GROUNDED. MUTING OPERATES IN SIMILAR MANNER.

BROADCAST ELECTRONICS INC.			
- A FILMWAYS COMPANY -			
DRAWN BY	DATE	TITLE	REV
CHECKED BY	DATE	906-6501	A
PROJECT ENG	DATE	STEREO SLIDE CONSOLE SYSTEM DIAGRAM	
APPROVED BY	DATE	DWG NO.	
TREATMENT OR FINISH		SCALE	SHEET 1 OF 1
		51-3110	

EXTERNAL  
OR  
AIR INPUT

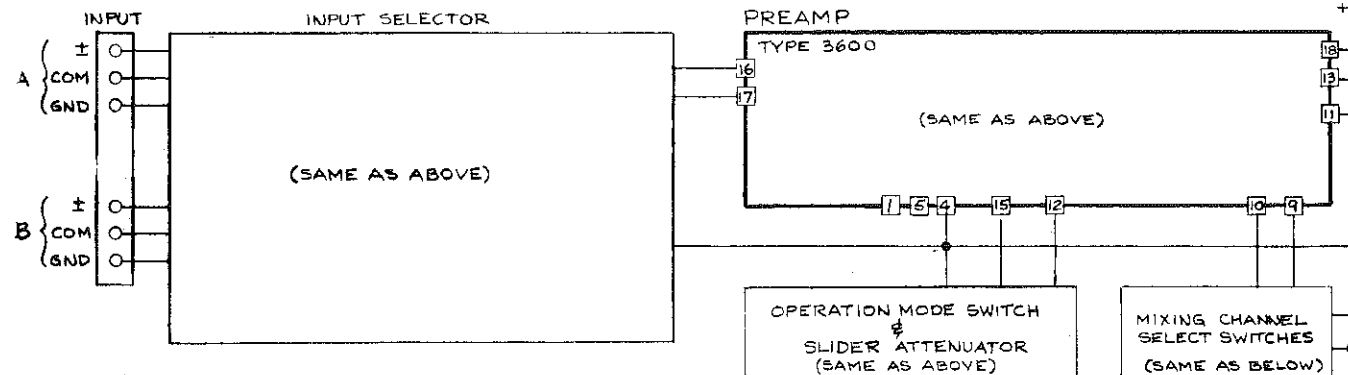
## CHANNELS 1 & 2



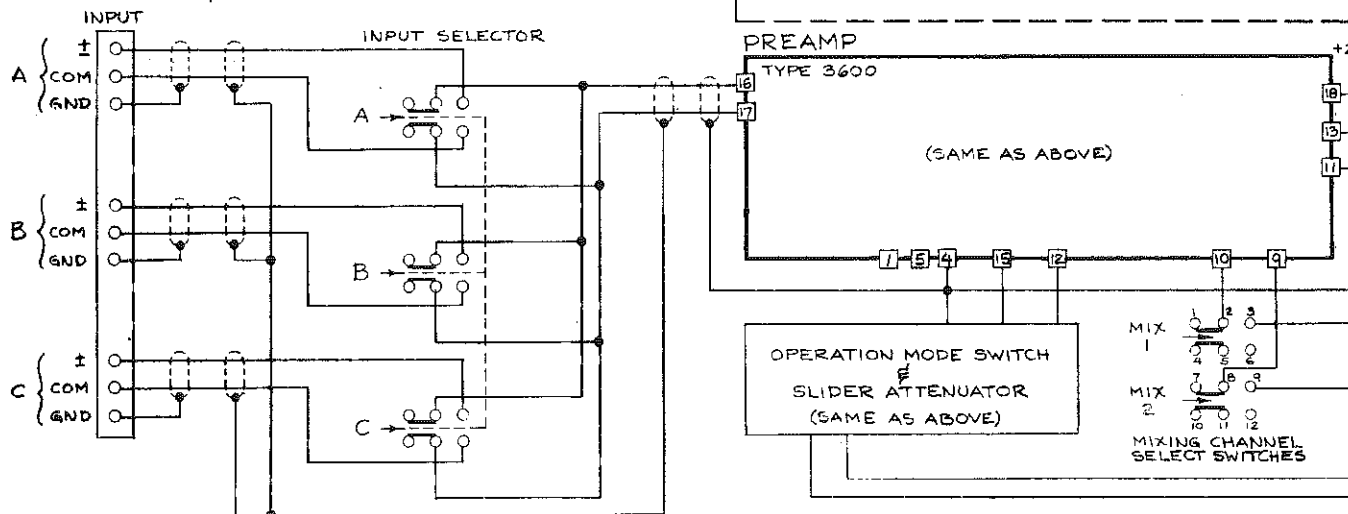
### NOTES:

1. MUTING BUSSES CONNECTED TO INPUT CHANNELS 1 & 2 ONLY.
2. MUTING OPERATION DETERMINED BY DIODES CONNECTED TO PINS OF MIXING CHANNEL SELECT SWITCHES. TABLE 1 SHOWS SPECIFIC PINS ACROSS WHICH DIODES SHOULD BE CONNECTED FOR MUTING OPERATION RELATIONSHIPS. DIODE ANODES WILL BE CONNECTED TO PINS 6 OR 12 AS SHOWN IN TABLE 1.
3. SECTION C OF OPERATION MODE SWITCH USED FOR TIE POINTS ONLY.
4. FET SWITCHES ON 3600 PREAMP BOARD OPERATE WHEN GATE IS GROUNDED. MUTING OPERATES IN SIMILAR MANNER.

## CHANNELS 3 THRU 8



## CHANNELS 9 & 10



MONITOR LEVEL

AIR MIX 2 MIX 1

MONITOR AMP

TYPE 3609

1 AMP

+35V

PWR SUPPLY & RELAY BD (SEE DETAIL BELOW)

HEADPHONE LEVEL

CUE MIX 2 MIX 1

PHONE AMPLIFIER

TYPE 3605

REGULATOR 7818

+35V

+18V

PHONES

MIXER-LINE AMP 1

TYPE 3604

28V

MIX 1 MASTER

MIXER-LINE AMP 2

TYPE 3604

28V

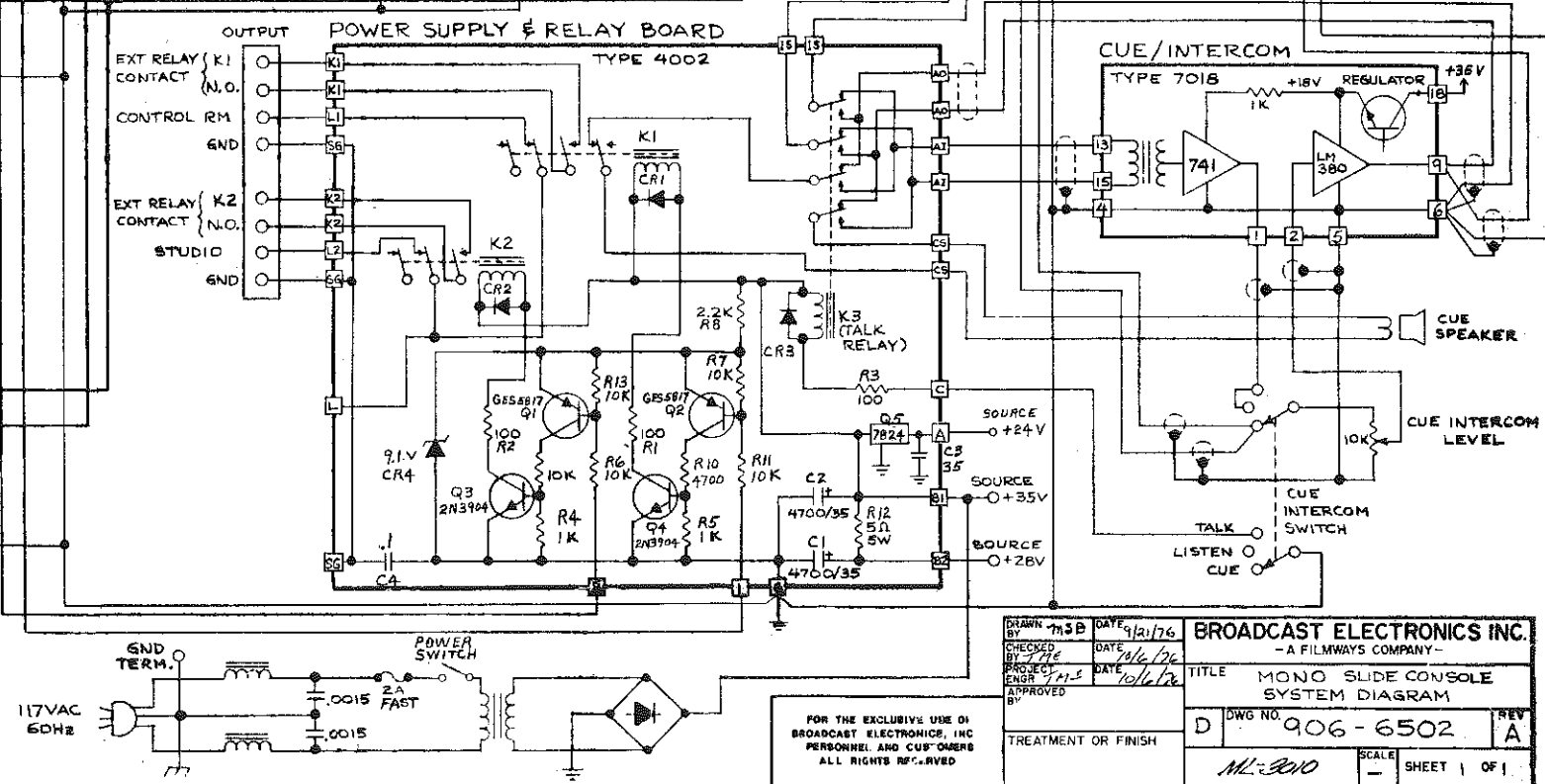
(SAME AS MIXER-LINE AMP 1)

MIX 2 MASTER

REV.	DESCRIPTION	DATE	APP.
A	PER ECN #1358	9-26-78	CRM

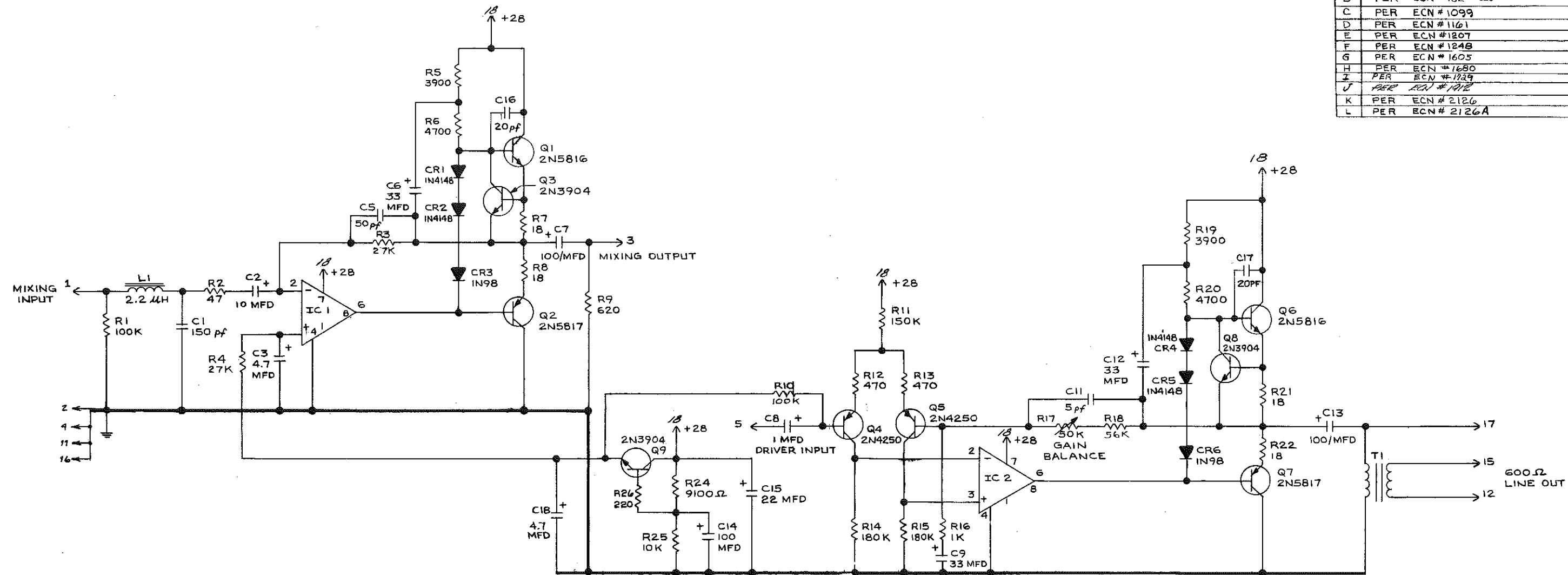
TABLE 1		
MUTING STRAPPING		
	MIX 1	MIX 2
MUTE 1	② ← ③	③ ← ⑥
MUTE 2	② ← ③	③ ← ⑥

ALL DIODES IN 914 OR EQUIV



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DRAWN BY: JMS		DATE: 9/21/76	
CHECKED BY: JMS		DATE: 9/21/76	
PROJECT: ENG 215		DATE: 10/6/76	
APPROVED BY:		DATE:	
BROADCAST ELECTRONICS, INC. - A FILMWAYS COMPANY -		TITLE: MONO SLIDE CONSOLE SYSTEM DIAGRAM	
D		DWG NO. 906-6502	
REV A		SCALE: 1/2" = 1"	
SHEET 1 OF 1			

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	INCORP. ECN # 962 GJ.	7/13/77	
B	PER ECN # 982 CLO	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	7-14-78	MH
G	PER ECN # 1605	2-14-79	BE
H	PER ECN # 1680	4-3-79	BE
I	PER ECN # 1939	6-5-79	GJ
J	PER ECN # 1912	2-6-80	BL
K	PER ECN # 2126	6-25-80	MH
L	PER ECN # 2126A	10-14-80	MH

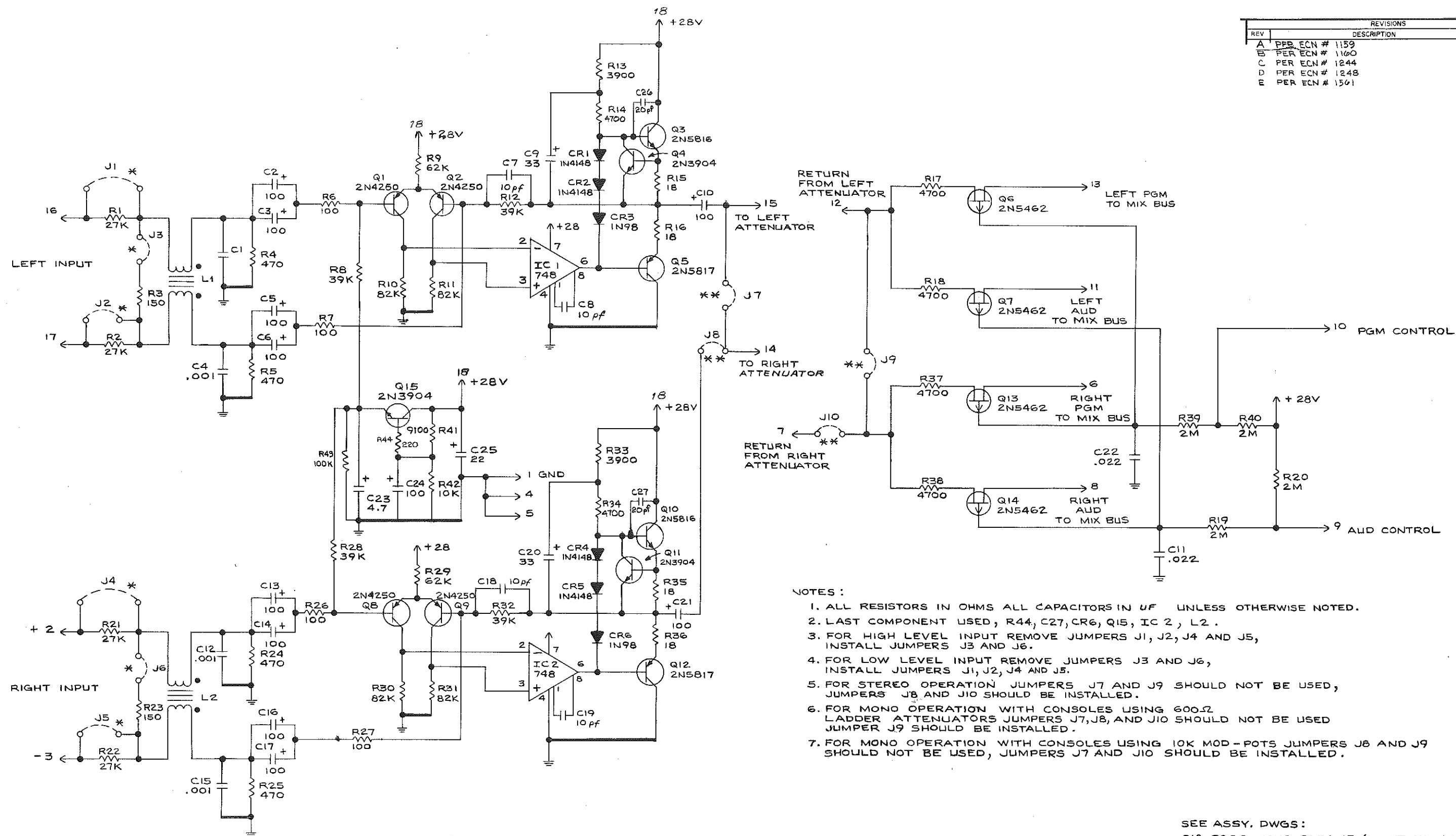


- NOTE :
1. LAST COMPONENTS USED,  
C18, R26, CR6, Q9, IC-2, T1, L1
  2. IC-1, IC-2 ARE 5534 .
  3. COMPONENT NOT USED R23, C4, C10

ASSY. NO. 918-3604

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY Wm.	DATE 5/9/77	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -
DECIMAL 2 PL=01 3 PL=005		CHECKED BY	DATE	
FRACTIONAL 2 1/64		PROJECT ENGR SIKKIS	DATE 5-19-77	
ANGULAR 2 1°		APPROVED BY		
SHARP EDGES				MIXER-LINE DRIVER AMP
BEND RADI				
FILLET RADI				D DWG NO. 906-7100
MATERIAL		TREATMENT OR FINISH		
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				SHEET 1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PPB 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 # 1561	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	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED					
DECIMAL 2 PL ±.01 3 PL ±.005					
FRACTIONAL 1/64					
ANGULAR ± 1°					
SHARP EDGES TO					
BEND RADIUS					
FILLET RADIUS					
MATERIAL					
TREATMENT OR FINISH					
DRAWN BY DATE 7/6/77					
CHECKED BY DATE					
PROJECT ENGR					
APPROVED BY					
BROADCAST ELECTRONICS INC.					
- A FILMWAYS COMPANY -					
TITLE SCHEMATIC					
MONO-STEREO PREAMP					
DWG NO 906 7/12					
REV E					
SCALE					
SHEET 1 OF 1					

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## 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.

**BROADCAST ELECTRONICS, INC.**

4100 North 24th Street, P. O. Box 3606, Quincy, Illinois 62305