

INSTRUCTION MANUAL

10M350A AND 10S350A AUDIO CONSOLES

NOVEMBER, 1992

IM No.597-0013-001

BROADCAST ELECTRONICS, INC.



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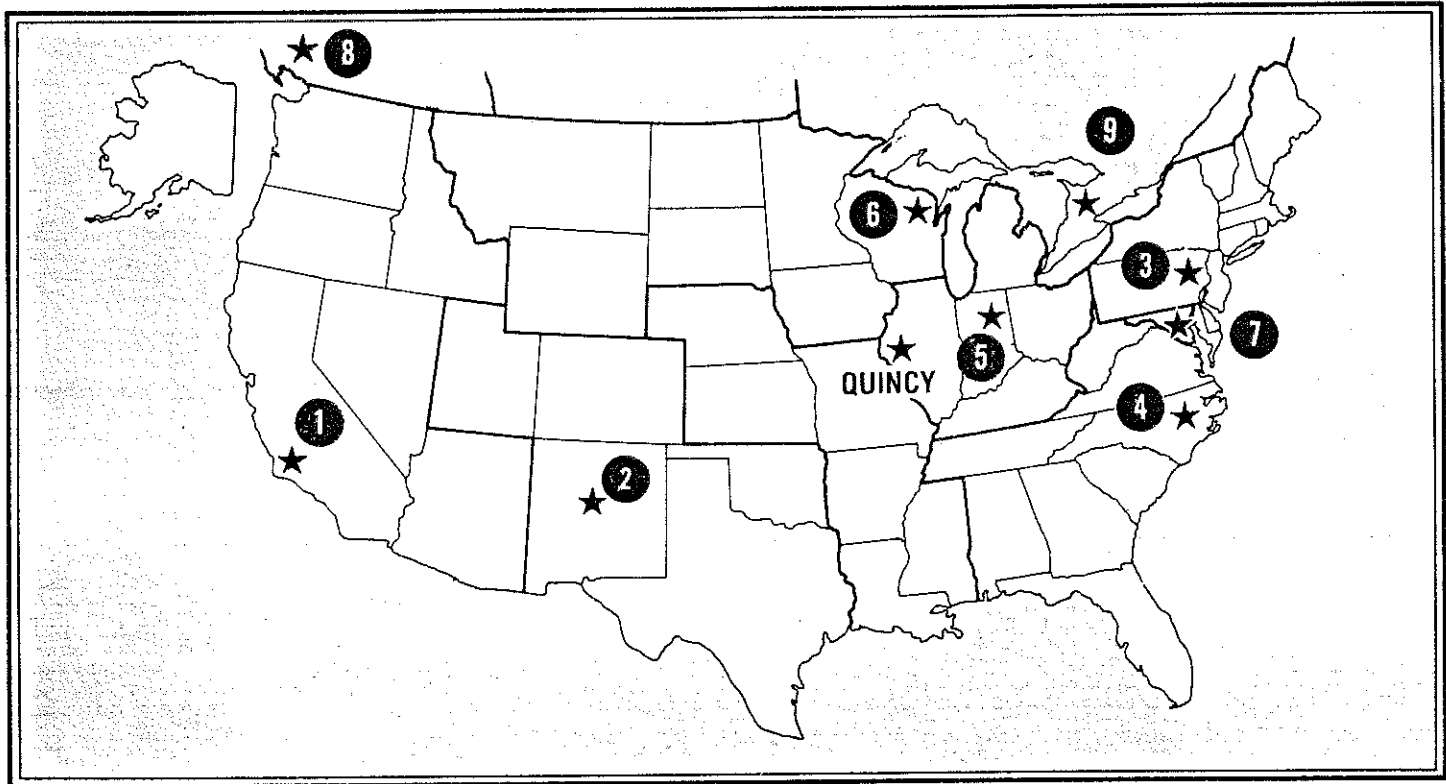
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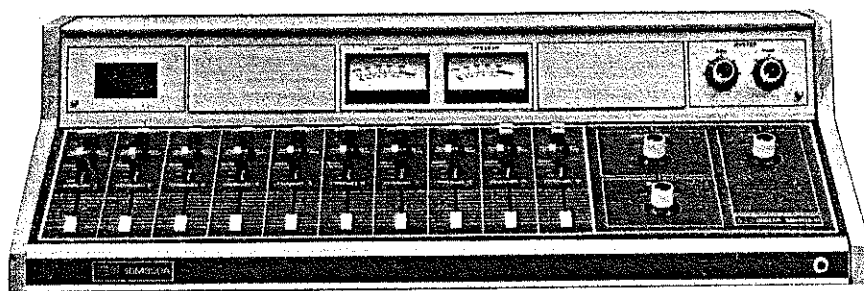
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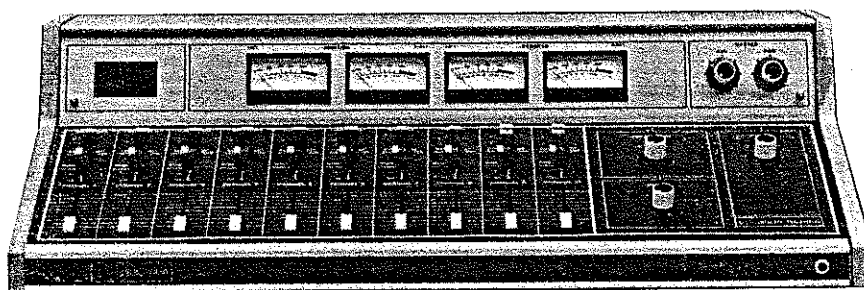


INSTRUCTION MANUAL

350A Series Audio Consoles



10M350A - Monophonic Version



10S350A - Stereophonic Version

<u>MODEL</u>	<u>PART NUMBER</u>	<u>DESCRITPION</u>
10M350A	901-1051-000	10 CHANNEL SLIDE-MIXER MONOPHONIC CONSOLE, 117V ac 60 Hz OPERATION.
10S350A	901-1050-000	10 CHANNEL SLIDE-MIXER STEREOPHONIC CONSOLE, 117V ac 60 Hz OPERATION.
10M350A	901-1051-300	10 CHANNEL SLIDE-MIXER MONOPHONIC CONSOLE, 220V ac 50 Hz OPERATION.
10S350A	901-1050-300	10 CHANNEL SLIDE-MIXER STEREOPHONIC CONSOLE, 220V ac 50 Hz OPERATION.

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SECTION I

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. Information presented by this section provides a general description of the Broadcast Electronics 350A Series Audio Consoles and lists equipment specifications.

1-3. EQUIPMENT DESCRIPTION.

1-4. ELECTRICAL AND MECHANICAL.

1-5. The Broadcast Electronics 350A series audio consoles are 10 channel vertical slide-mixer devices available in monophonic and stereophonic models. The 350A series consoles are designed for AM and FM radio stations, television broadcast installations, CATV systems, recording studios, and other audio facilities.

1-6. **CONSOLE ELECTRONICS.** Each console is equipped with modular plug-in amplifier circuit boards. Console preamplifier circuit boards are designed to accept either microphone or line level inputs to provide maximum input assignment flexibility. A chassis mounted power supply circuit board provides the required operating voltages and houses a muting relay circuit. VU meter circuit boards provide rectified outputs for application to the VU meters. All circuit boards are designed for high reliability and ease of maintenance.

1-7. **CONSOLE OUTPUTS.** All 350A series consoles are equipped with two identical outputs: program and audition. An additional mono matrix output is available as an option for stereophonic models.

1-8. Audio is routed to the program or audition output through field-effect transistors for maximum reliability. The program and audition outputs are transformer balanced with an impedance of 600 Ohms.

1-9. **CUE/TALKBACK CIRCUITRY.** Cue circuitry is provided on all mixer channels for previewing inputs. On stereophonic consoles, both the left and the right channels are routed to the system. The cue circuitry consists of an amplifier circuit, a cue level control, and a console cue speaker. The cue speaker is muted by the console muting system for operation with a live microphone.

1-10. On all 350A series consoles, the cue system is combined with talkback circuitry to provide intercom operation. The system allows two-way communication between the console operator and a studio through the console cue speaker and a speaker located in the studio.

1-11. MONITOR CIRCUITRY. A monitor circuit is provided to monitor the program output, the audition output, or an external input source (example: on-air monitor etc.). The monitor circuitry consists of an amplifier circuit, a monitor level control, a monitor select switch, and connections for two monitor speakers. The speakers are muted by the console muting system for operation with a live microphone.

1-12. A headphone circuit is provided for monitoring the program output, the audition output, or the cue system. The headphone circuitry consists of an amplifier circuit, a headphone level control, a headphone select switch, and a front-panel headphone jack.

1-13. INPUT CONNECTIONS. All console inputs are connected to labeled terminal strips located inside the console chassis. With the connections inside the console, wiring is protected from dirt, tampering, and mechanical damage.

1-14. MUTING SYSTEM. A muting system is provided for the monitor and cue speakers. The system consists of two relays which are activated by two of the front-panel output mode switches. Control of the relays may be changed as required through modification of the mute wiring.

1-15. EQUIPMENT SPECIFICATIONS.

1-16. Refer to Table 1-1 for the electrical and physical specifications of the Broadcast Electronics 350A Series Audio Consoles.

TABLE 1-1. ELECTRICAL AND PHYSICAL SPECIFICATIONS
(Sheet 1 of 2)

PARAMETER	SPECIFICATIONS
<u>NUMBER OF INPUTS PER MIXER CHANNEL</u>	<u>INPUTS</u>
Channels 1 Thru 8	2 per Channel.
Channels 9 and 10	3 per Channel.
<u>INPUT IMPEDANCE/LEVEL</u>	
Microphone Mode:	
Impedance	150 Ohms, Balanced.
Level	-65 dBv to -38 dBv.
High Level Mode:	
Impedance	54 k Ohms, Balanced Bridging.
Level	-20 dBv to +20 dBv.
<u>FREQUENCY RESPONSE</u>	+0, -1 dB, 30 Hz to 20 kHz.
NOTE: 1. 0 dBv = 0.7746V	

TABLE 1-1. ELECTRICAL AND PHYSICAL SPECIFICATIONS
(Sheet 2 of 2)

PARAMETER	SPECIFICATION
<u>DISTORTION</u>	0.075% IM and THD, 30 Hz to 20 kHz (+18 dBm Console Output).
<u>SIGNAL-TO-NOISE RATIO</u>	68 dB Below a +18 dBm Console Output with a -50 dBv Signal applied to any Microphone Input. 20 kHz bandwidth.
<u>OUTPUT IMPEDANCE/LEVEL</u>	
Impedance	600 Ohms, Balanced.
Level	+8 dBm with Console VU Meters Indica- ting 0 VU. +18 dBm Maximum.
<u>MONITOR AMPLIFIER PARAMETERS</u>	
Frequency Response	+0, -1 dB, 50 Hz to 20 kHz (1 kHz Reference).
Distortion	0.75% or Less, 30 Hz to 20 kHz @ Rated RMS Output and Load.
Output Impedance/Power	
Impedance	8 Ohms.
Power	7.5 Watts RMS per Channel.
<u>HEADPHONE AMPLIFIER OUTPUT</u>	1.0 Watt RMS per Channel.
<u>CUE AMPLIFIER OUTPUT</u>	1.0 Watt RMS.
<u>MUTING RELAYS</u>	Two assigned to Mixing Channels 1 and 2.
<u>POWER REQUIREMENTS</u>	
Standard	105V to 125V ac, 50/60 Hz.
Optional	210V to 230V ac, 50/60 Hz.
<u>DIMENSIONS</u>	
Width	36 Inches (91.4 cm).
Height	10.75 Inches (27.3 cm).
Depth	19 Inches (48.2 cm).
<u>WEIGHT (Packed)</u>	
10M350A	80 Pounds (36.4 kg).
10S350A	85 Pounds (38.6 kg).
NOTE: 1. 0 dBv = 0.7746V	

SECTION II

INSTALLATION

2-1. INTRODUCTION.

2-2. This section contains information required for the installation of the Broadcast Electronics 350A Series Audio Consoles.

2-3. UNPACKING.

2-4. The equipment becomes the property of the customer when the equipment is delivered to the carrier. Carefully unpack the console. Perform a visual inspection to determine that no apparent damage has been incurred during shipment. All shipping materials should be retained until it is determined that the unit has not been damaged. Claims for damaged equipment must be filed promptly or the carrier may not accept the claim.

2-5. The contents of the shipment include a warranty card, a test certification card, and an instruction manual in addition to the console. If the contents are incomplete, or if the unit is damaged electrically or mechanically, notify both the carrier and Broadcast Electronics, Inc.

2-6. INSTALLATION.

2-7. MOUNTING.

2-8. Place the console within convenient access of the operator and within easy access of power and audio cabling. All Broadcast Electronics 350A Series Audio Consoles are intended for desk-top mounting. Cable access is provided through cut-outs located in the bottom of the cabinet.

2-9. ASSIGNMENT OF INPUTS.

2-10. Electrical installation is primarily controlled by: 1) the level and type of input sources, 2) the requirement for microphone muting, and 3) the separation of various signals. Both inputs to a mixer channel must be the same level class (either microphone or line).

2-11. The 350A series consoles are shipped from the factory with mixer channels 1 and 2 preset for microphone level inputs. However, any mixer channel will accept microphone level inputs with proper circuit board programming.

2-12. Stereophonic consoles will accept either stereophonic or monophonic inputs with the proper circuit board programming. It is recommended that both inputs to a channel mixer be either monophonic or stereophonic. However, one monophonic input and one stereophonic input may be assigned to the same mixer channel if the following guidelines are observed.

- A. Both inputs are the same level class.
- B. The mixer channel preamplifier circuit board is programmed for stereophonic inputs.
- C. The monophonic input is connected to the left channel only.

2-13. Operationally, input sources used simultaneously (mixed), cross faded, or used in rapid sequence should be on separate mixers. Conversely, two inputs rarely or never used in conjunction with each other may be assigned to the same mixer.

2-14. As an example of proper input assignment, turntables should be assigned to a separate mixer so that records can be sequenced or mixed easily. Likewise it is unlikely that a reel-to-reel playback will be required while the network line is in use, therefore those two items may be assigned to the same mixer. This arrangement also prevents reverberation being accidentally introduced when recording the network on the reel-to-reel recorder.

2-15. PREAMPLIFIER CIRCUIT BOARD PROGRAMMING.

2-16. After assigning the audio inputs to a mixer channel, the preamplifier circuit boards may require programming to accept an assigned input. To program each circuit board for the assigned input, refer to Figure 2-1 and install the jumpers in the appropriate positions.

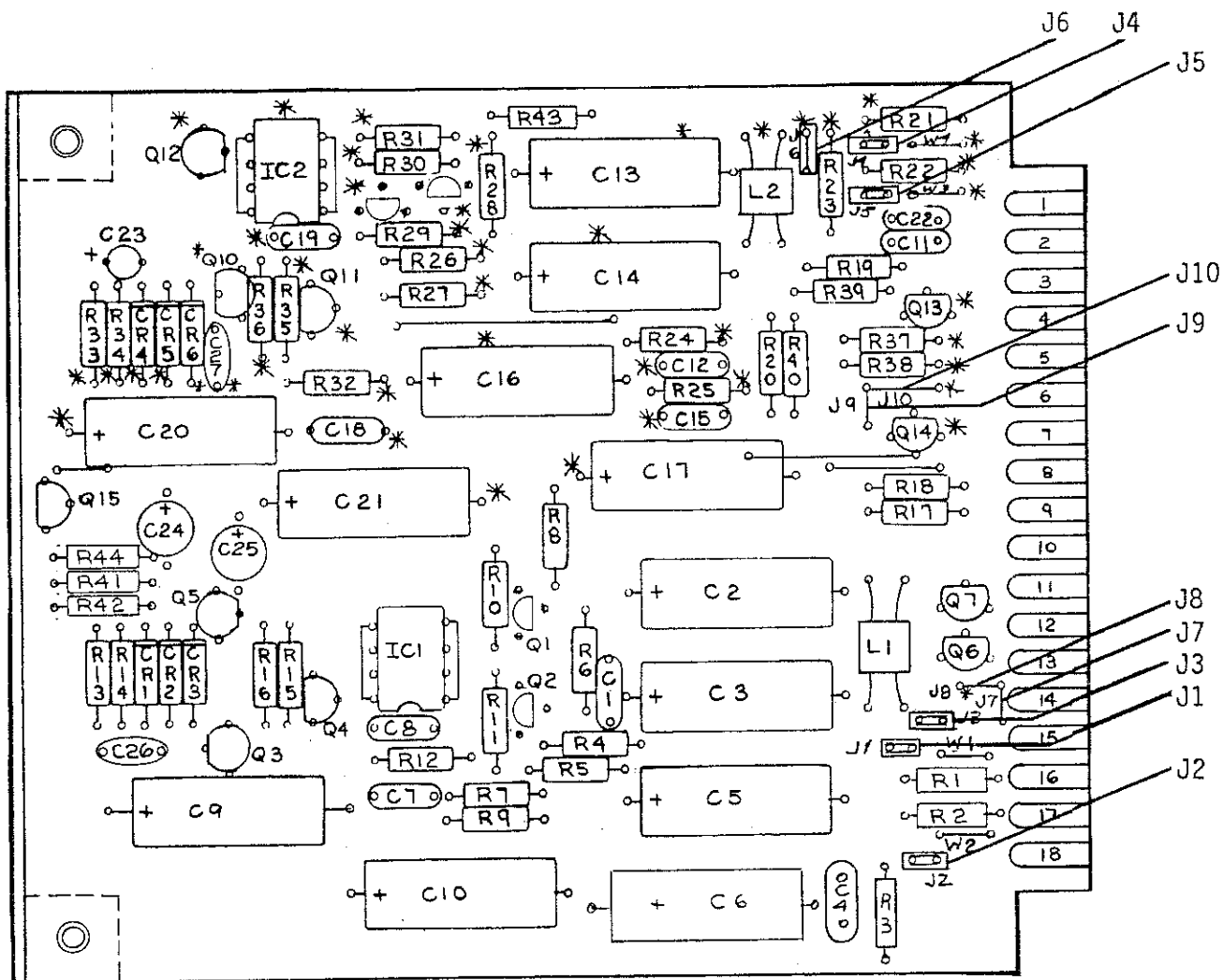
2-17. WIRING.

WARNING

DO NOT CONNECT AC POWER UNTIL INSTALLATION IS COMPLETE.

2-18. GENERAL. Audio connections to the console should be made with a 2-conductor shielded cable such as Belden 8441, Alpha 2400, etc. Separate the audio cables into low-level, high-level, and speaker wiring. Route the cables to the console keeping as much distance between the different level of cables as possible.

2-19. Power connections should be made with the appropriate size and type of cable. If practical, wire the power connections with shielded cables to prevent ac coupling to the audio cables. Route the power cables to the console keeping as much distance between the power and audio cables as possible.



(* ITEMS USED ON STEREOGRAPHIC BOARD ONLY)

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INPUT LEVEL JUMPER PROGRAMMING

INPUT LEVEL	STEREOGRAPHIC BOARD (918-3601)	MONOPHONIC BOARD (918-3600)
HIGH (LINE)	REMOVE J1, J2, J4, AND J5 INSTALL J3 AND J6	REMOVE J1 AND J2 INSTALL J3
LOW (MICROPHONE)	REMOVE J3 AND J6 INSTALL J1, J2, J4, AND J5	REMOVE J3 INSTALL J1 AND J2

MONOPHONIC/STEREOGRAPHIC JUMPER PROGRAMMING

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

FIGURE 2-1. PREAMPLIFIER CIRCUIT BOARD JUMPER PROGRAMMING

2-20. GROUNDING. The most important consideration in ensuring low noise performance from the unit is the grounding and shielding of the various interconnections.

2-21. First, it is necessary to achieve a good ground for the console itself. This should be central earth ground. If possible, connect the console to the transmitter RF ground. Alternately, connect it to a power line earth ground. The console ground terminal (located on the bottom panel inside the console cabinet) should be connected to ground with a braided strap (such as Alpha 1235 or Belden 8657) or solid copper strap.

2-22. Secondly, signal shields should be grounded to avoid ground loops (unintended signal paths through shields and grounds). To prevent ground loops, shields should be grounded at only one end of the cable. Generally this is done at the console. However, it may be best to ground the shield at the source equipment or even at a point between the console and the source. Particular care must be exercised to avoid unintended grounds at patch panels, at external switching arrangements, through uninsulated (case grounded) jacks on associated equipment, or from grounded racks or cabinets.

2-23. INPUT WIRING. Connect all input wiring to the labeled terminal strips located inside the console cabinet as follows.

2-24. Balanced Inputs. For a balanced input, proceed as follows:

- A. Connect the high signal line to the + terminal.
- B. Connect the low signal line to the - terminal.
- C. Connect the shield to the ground terminal common to the two inputs.

2-25. Unbalanced Inputs. For an unbalanced input, proceed as follows:

- A. Connect the high signal line to the + terminal.
- B. Connect the low signal line to the - terminal.
- C. Connect the shield to the ground terminal.
- D. Connect a wire from the - terminal to the ground terminal.

2-26. EXTERNAL MONITOR INPUT. An external monitor input connection is designed to accept the output of an on-air-monitor or other auxiliary audio monitor source. The input is unbalanced with an impedance of approximately 10 k Ohms. It is recommended that a monitor level control be installed external to the console to provide a constant level when switching between the audition output, program output, or the external monitor input. Connect the monitor input wiring to the AIR INPUT terminals as follows:

1. On monophonic consoles, connect the high signal line to the + terminal. On stereophonic consoles, connect the high signal line to the L/R terminal.
2. Connect the low signal line to ground.

2-27. CONSOLE OUTPUTS. Connections for the program, audition, and optional mono matrix outputs are located on the PGM OUTPUT, AUD OUTPUT, and MONO PGM OUTPUT terminals. Install each console output wiring as follows:

- A. Connect the high signal line to the + terminal.
- B. Connect the low signal line to the - terminal.
- C. Connect the shield to the ground terminal.

2-28. CONSOLE OUTPUT TERMINATIONS. Ensure the program, audition, and mono matrix outputs are properly terminated into a 600 Ohm load to achieve the specified frequency response. If the outputs are not connected to a 600 Ohm load, a 620 Ohm, 1/2 watt resistor should be connected at the console terminal strip to provide the proper load.

2-29. MONITOR SPEAKER CONNECTIONS. Connections are provided for a control room and studio monitor speakers. The speaker outputs are connected through muting relays for operation with a live microphone.

<u>CAUTION</u>	TO AVOID DAMAGE TO THE MONITOR AMPLIFIER, DO
<u>CAUTION</u>	NOT EXCEED THE POWER CAPABILITIES OF THE AMP-
<u>CAUTION</u>	LIFIER BY OVERDRIVING THE SOURCE INPUT LEVEL.
<u>CAUTION</u>	DO NOT OPERATE THE AMPLIFIER INTO SPEAKER
	LOADS BELOW EIGHT OHMS.

2-30. The monitor circuitry is designed to drive eight-Ohm speakers. For multiple speaker installations, use 16-Ohm speakers or impedance matching transformers as required to maintain the overall impedance above eight Ohms. To install the speakers, connect the wiring to the MONITOR SPEAKER OUTPUT terminals as described in paragraph 2-26.

2-31. EXTERNAL CUE SPEAKER CONNECTION. A connection is provided for an external cue speaker if one is desired. It is recommended that the speaker be a high efficiency device of approximately 8 Ohms impedance or higher. Connect the speaker wiring to the CUE SPEAKER OUTPUT terminals as follows:

- A. Connect the high signal line to the + terminal.
- B. Connect the low signal line to ground.
- C. Disconnect the internal cue speaker.

2-32. TALKBACK SPEAKER CONNECTION. Terminals are provided for an intercom system talkback speaker. It is recommended that the talkback speaker be a high efficiency device of approximately 8 Ohms impedance or higher. Connect the speaker wiring to the INTERCOM SPEAKER (IN/OUT) terminals as follows:

- A. Connect the high signal line to the + terminal.
- B. Connect the low signal line to ground.

2-33. MUTING RELAYS. All 350A series consoles are equipped with two muting relays (K1 and K2). Relay K1 mutes the control room monitor and console cue speakers. Relay K2 mutes the studio monitor speaker.

2-34. The console is shipped from the factory with the CHANNEL 1 output MODE and AUD/PGM switches activating relay K1 and the CHANNEL 2 output MODE and AUD/PGM switches activating relay K2 (refer to Figure 2-2). Any channel however may control any of the muting relays. If a change in muting control is required, refer to Figure 2-3 and perform the following steps.

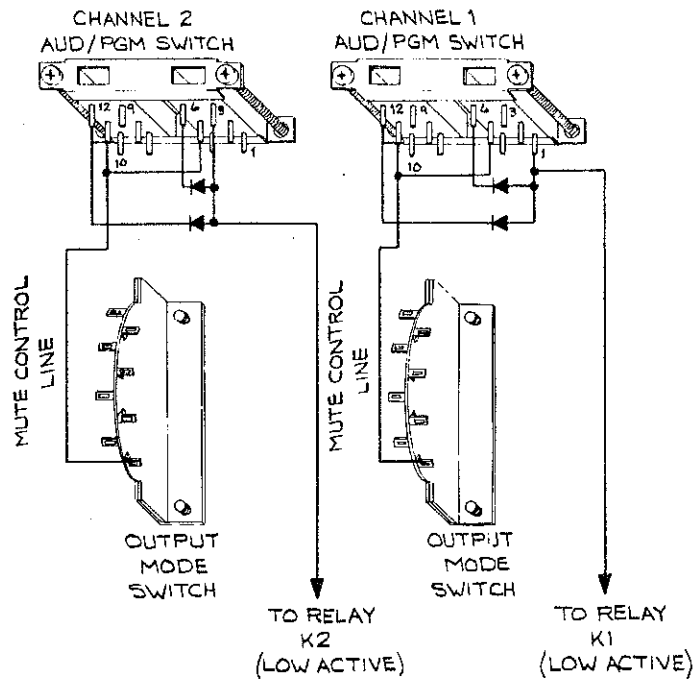
- A. Connect two 1N4148 diodes (BE P/N 203-4148) to the AUD/PGM switch selected for muting control.
- B. Connect a mute control line from the output MODE select switch to the AUD/PGM switch.
- C. Connect a jumper from terminal 11 to terminal 5 on the AUD/PGM switch.
- D. Connect jumpers from the diodes of the selected muting control MODE switch to the diodes of the original muting control MODE switch.

2-35. Muting Relay Normally Open Contacts. Each muting relay is equipped with an additional set of normally open contacts. The contacts may be used to control an on-the-air indicator or to mute an external amplifier circuit etc. If normally open muting relay control is desired, connect the device wiring to the K1 N.O. or K2 N.O. terminals as required.

2-36. AC POWER.

2-37. The standard 350A series console operates from a 115V ac input potential at either 50 or 60 Hz. Units for 230 volt ac operation are optionally available. Operating voltage requirements are indicated on the console identification plate located on the rear inside panel of the unit.

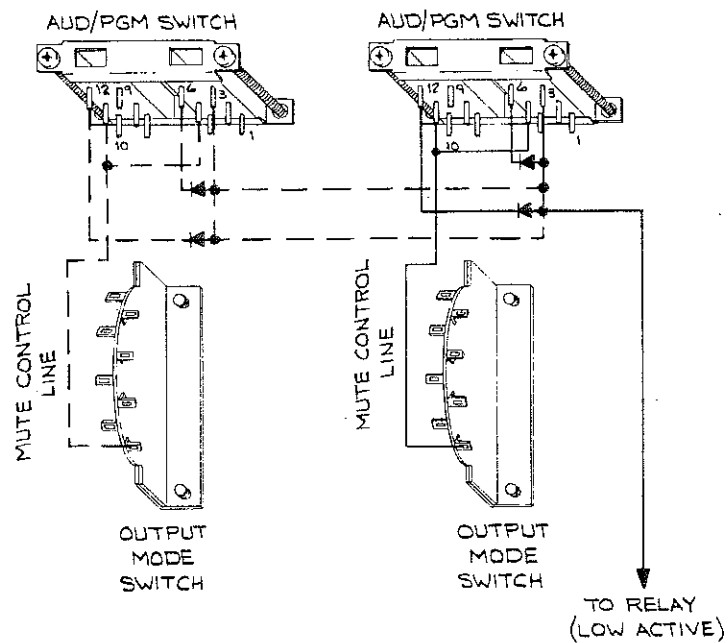
2-38. Ensure the power switch is operated to OFF and connect the console to the proper ac input source.



597-0013-2

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FIGURE 2-2. FACTORY MUTING RELAY CONTROL WIRING



597-0013-3

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FIGURE 2-3. WIRING FOR ADDITIONAL MUTING RELAY CONTROL

SECTION III

OPERATION

3-1. INTRODUCTION.

3-2. This section provides operating procedures for the Broadcast Electronics 350A Series Audio Consoles.

3-3. OPERATION.

3-4. Operate the console power switch to ON.

3-5. INPUT SELECTION AND OUTPUT ROUTING.

3-6. For channels 1 through 8, operate the INPUT SELECT switch to the 1 or 2 position to route a desired input to the mixer control. For channels 9 and 10, operate the INPUT SELECT switch to the 1, 2, or 3 position to route a desired input to the mixer control.

3-7. To route an input to the program output, proceed as follows:

- A. Operate the output MODE switch to AUD/PGM.
- B. Operate the OUTPUT SELECT switch to PGM.

3-8. To route an input to the audition output, proceed as follows:

- A. Operate the output MODE switch to AUD/PGM.
- B. Operate the OUTPUT SELECT switch to AUD.

3-9. To disconnect the input from the program or audition output, operate the output MODE switch to OFF.

3-10. PROGRAM AND AUDITION MASTER CONTROLS.

3-11. Adjust the MASTER PGM and AUD controls for maximum performance as follows:

- A. Select a mixer channel for the procedure and route an input to the program output.
- B. Operate the test channel mixer control to a position between 3 and 7.
- C. Operate the MASTER PGM control to obtain a peak level indication of 0 VU (+8 dBm output) on the PROGRAM VU meter.
- D. Repeat the procedure for the audition output.
- E. Once the MASTER PGM and AUD controls are operated to a satisfactory position, the controls should not be adjusted during normal operation.

3-12. MIXER CONTROLS.

3-13. Operate the mixer controls to maintain the level of each input or to combine two or more inputs in a desired relationship. Adjust the controls during normal operation to obtain a peak level indication of 0 VU (+8 dBm output) on the VU meter. For maximum performance, obtain the 0 VU indication between the 3 and 7 position.

3-14. CUE SYSTEM.

3-15. To connect an input source to the console cue system, proceed as follows:

- A. Operate the output MODE switch to CUE or the mixer control to the detent position (below the 0 position).
- B. Operate the CUE/INTERCOM switch to CUE.

3-16. Operate the CUE/INTERCOM level control to adjust the cue audio level as required.

3-17. HEADPHONE SYSTEM.

3-18. The headphone jack accepts a wide variety of headsets including low impedance stereophonic headphones. For monophonic consoles, the headphone jack is wired tip-to-ring to accommodate stereophonic headphones without modification. On stereophonic consoles, the headphone jack will not accept monophonic headphones without damage to the headphone amplifier circuit board. Ensure that only stereophonic headphones are connected to stereophonic consoles.

CAUTION

DO NOT USE A HEADPHONE WITH AN IMPEDANCE OF LESS THAN EIGHT OHMS.

CAUTION

DO NOT CONNECT MONOPHONIC HEADPHONES TO STEREOPHONIC CONSOLES.

3-19. Connect the headphones to the headphone jack and operate the PHONES switch to the PGM, AUD, or CUE position to monitor the program output, audition output, or cue audio output.

3-21. Operate the PHONES level control to adjust the headphone level as required.

3-22. MONITOR SYSTEM.

3-23. Operate the MONITOR switch to the PGM, AUD, or AIR position to monitor the program output, audition output, or the external input source.

3-24. Operate the MONITOR level control to adjust the monitor level as required. The monitor speakers will be muted if muting control output MODE and AUD/PGM switches are operated.

3-25. TALKBACK SYSTEM.

3-26. To receive a message from the studio, operate the CUE/INTERCOM switch to LISTEN.

3-27. To communicate a message to the studio, operate the CUE/INTERCOM switch to TALK.

3-28. Operate the CUE/INTERCOM level control to adjust the intercom level as required.

SECTION IV

THEORY OF OPERATION

4-1. INTRODUCTION.

4-2. This section provides theory of operation for the Broadcast Electronics 350A Series Audio Consoles. Refer to 10S350A overall schematic diagram 906-6501 and 10M350A overall schematic diagram 906-6502 in Section VII as required for the following discussion.

4-3. OVERALL MONOPHONIC SYSTEM DESCRIPTION.

4-4. AUDITION AND PROGRAM CHANNELS.

4-5. Inputs are connected to each mixer channel through the console terminal strips and routed to the input selection switches. Input selection is performed by an interconnected audio switch which routes a selected source to a preamplifier circuit board (918-3600).

4-6. On the preamplifier circuit board, the signal is applied through impedance matching and level sensitivity jumpers to a preamplifier circuit. Following amplification, the signal is routed from the preamplifier circuit to the front-panel mixer control. If required, the signal may be routed to the cue bus via the output node switch.

4-7. From the mixer, the signal is returned to field-effect transistors on the preamplifier circuit board which are controlled by the front panel audition/program switches. Following application to the FET's, separate outputs are obtained for the program and audition buses.

4-8. The program outputs of all the preamplifiers are bused together and applied to the input of a mixer/line driver circuit board (P/N 918-3604). The mixed signal is amplified, applied to a front panel master gain control, and returned to the mixer/line driver amplifier. The signal enters a final stage of amplification through a gain balance control. The amplifier is directly coupled to the 600 Ohm/600 Ohm output transformer. Samples for the monitor circuit, headphone circuit, and VU meter circuit are bridged from the amplifier output.

4-9. The audition channel is identical in operation to the program channel. The audition outputs of all the preamplifiers are bused together and fed to a separate mixer/line driver amplifier. The amplified signal is routed through a master gain control and returned to the line driver amplifier circuit board for final amplification. Samples for the monitor circuit, headphone circuit, and VU meter circuit are bridged from the amplifier output.

4-10. CUE CIRCUITRY.

4-11. The outputs of all cue positions on the output mode switches are bused together to provide a signal for the headphone select switch and the cue speaker amplifier. The signal from the cue bus is routed to the front panel cue level control. The signal is then applied to the cue speaker amplifier on the cue/intercom amplifier circuit board. Following amplification, the cue signal is routed to the external cue speaker connection and the control room muting relay for amplification to the internal cue speaker.

4-12. MONITOR CIRCUITRY.

4-13. The monitor outputs of the audition and program channel mixer/line driver amplifiers are connected to separate sections of the monitor select switch. A third position is provided on this switch for connection of an on-air-monitor or other external load which is connected directly from input terminals on the sub-chassis to the selector switch.

4-14. The output of the monitor select switch is connected through the monitor level control to the monitor amplifier circuit board. Following amplification, the signal is routed to the muting relays on the power supply circuit board. There the signal is divided and fed through normally closed contacts. The monitor output from each relay is taken to separate terminals on sub-chassis terminal strips.

4-15. The monitor buses from the audition and program mixer/line-driver amplifiers are also connected to separate sections of the front panel headphone select switch. A third position on this switch is connected to the cue bus. From the select switch, the signal passes through the headphone level control to the headphone amplifier (located on the cue/headphone amplifier circuit board). Following amplification, the signal is applied to the front panel headphone jack.

4-16. MUTING RELAYS.

4-17. Muting relays K1 and K2 on the power supply circuit board are used to mute speakers for operation with a live microphone. Relay K1 mutes the control room monitor speaker and the internal cue speaker. Relay K2 mutes the studio monitor speaker. The muting relays are controlled by a ground from controlling output mode and audition/program switches.

4-18. Talk/listen relay K3 provides signal control for intercom operation. Relay K3 is controlled by the cue/intercom switch.

4-19. The muting relays are also equipped with normally open contacts. The normally open contacts can be used to operate an on-the-air warning light or other device when the speakers are muted.

4-20. INTERCOM SYSTEM.

4-21. All 350A series consoles are equipped with an intercom system to permit conversation between a studio and the console operator. Whenever the cue/intercom switch is operated to listen or talk, the cue bus is disconnected by the cue/intercom switch.

4-22. In the talk position, the cue bus is disconnected and the talk/listen relay (K3) is energized to enable 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.

4-23. 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.

4-24. POWER SUPPLY.

4-25. The 350A series consoles operate from a primary input potential of 115V-125V ac or optional 230V-250V ac at 50 or 60 Hz. The input voltage is applied through a fuse and on/off power switch to the power transformer.

4-26. OVERALL STEREOPHONIC SYSTEM DESCRIPTION.

4-27. AUDITION AND PROGRAM CHANNELS.

4-28. Inputs are connected to each mixer channel through the console terminal strips and routed to the input selection switches. Input selection is performed by an interconnected audio switch which routes a selected source to a stereophonic preamplifier circuit board (918-3601).

4-29. On the preamplifier circuit board, the signal is applied through impedance matching and level sensitivity jumpers to a preamplifier circuit. The output of the right channel preamplifier is connected to the mono/stereo jumper. When the jumper is in the mono position, the output of the right channel preamplifier is disconnected and the left channel preamplifier output is connected to both the left and right channels. In the stereo position, the two channels remain separate.

4-30. Following amplification, the two stereophonic signals are routed from the preamplifier circuit board to the front panel mixer. If required, the signal may be routed to the cue bus via the output mode switch.

4-31. From the mixer, the stereophonic signal is applied to field-effect transistor switches located on the preamplifier circuit board. These FET's are controlled by the front panel audition/program switches. Separate outputs are obtained from each preamplifier for the left and right audition and program buses.

4-32. The left program outputs from each preamplifier are bused together and connected to the input of a line driver amplifier. The right program outputs are similarly bused to a second line driver amplifier. A front panel dual master gain control adjusts the amplitude of the signal between the first and second stages of the line amplifier.

4-33. The line driver amplifiers are directly coupled through output transformers to the left and right program outputs on the internal terminal strip. Samples for the monitor circuit, headphone circuit, VU meter circuit, and mono matrix circuit board are bridged from the output. A front panel select switch allows either the audition or program output channels to be displayed on the VU meters.

4-34. The left and right program outputs are connected to separate inputs on the mono matrix amplifier circuit board (optional). The signals enter through separate level balancing controls, and then are combined and amplified. The amplified monophonic signal is coupled through a 600 Ohm/600 Ohm output transformer to the monophonic output terminals. No metering is provided for this monophonic output.

4-35. The audition channel is identical in operation to the program channel. The left and right audition outputs from all the preamplifiers are applied to separate line driver amplifiers. The amplified signals are applied through a dual section master gain control and returned to the line amplifier circuit board. The left and right channel signals are output to the monitor circuit, the headphone circuit, the audition output terminals, and the VU meter circuit.

4-36. CUE CIRCUITRY.

4-37. Cue system operation in stereophonic consoles is identical to the operation in monophonic consoles. Refer to paragraph 4-10 for the monophonic description as required.

4-38. MONITOR CIRCUITRY.

4-39. The monitor outputs from the left and right audition and program channel mixer/line driver amplifier circuit board are connected to separate sections of the monitor select switch. A third position is provided for connection of a stereo on-air-monitor or other external output.

4-40. The left and right audition and program monitor buses from the mixer/line driver amplifiers are also connected to a separate section of the front panel headphone select switch. A third position is connected to the cue bus. From the select switch, the signals are routed through the headphone level control to the headphone amplifier (located on the cue/headphone circuit board). Following amplification, the signal is applied to the front panel headphone jack.

4-41. MUTING RELAY CIRCUIT.

4-42. Muting relay operation in stereophonic consoles is identical to the operation in monophonic consoles. Refer to paragraph 4-16 for the monophonic description as required.

4-43. INTERCOM SYSTEM.

4-44. Intercom system operation in stereophonic consoles is identical to the operation in monophonic consoles. Refer to paragraph 4-20 for the monophonic description as required.

4-45. POWER SUPPLY.

4-46. Power supply operation in stereophonic consoles is identical to the operation in monophonic consoles. Refer to paragraph 4-24 for the monophonic description as required.

4-47. DETAILED CIRCUIT OPERATION.

4-48. MONOPHONIC PREAMPLIFIER.

4-49. The left input signal is applied to the preamplifier circuit board on pins 16 and 17 (refer to schematic 906-7112). The right channel input is not used. Possible RF pick-up after input is prevented by a filter consisting of resistors R1, R2, and R3, ferrite bead L1, and capacitors C1 and C4. The signal is then applied to transistor pair Q1 and Q2 to raise the level of the signal sufficiently above the noise floor of amplifier IC1. The base of Q1 and Q2 is maintained at approximately +14V dc, which is one-half the supply voltage. This voltage is regulated by Q15 which eliminates a prolonged charging time for C23.

4-50. The signal from the collectors of Q1 and Q2 is applied to IC1 for amplification. The output of IC1 (approximately +14V) will drive complementary transistor pair Q3 and Q5. These transistors provide the output signal for this stage. The overall gain of the stage is determined by feedback resistor R12 in conjunction with R7 and R5. The purpose of Q4 is to prevent damage to Q3 in case an excessively low load is applied to the output of the pair.

4-51. Next, the signal is routed to the mixer control and returned to the circuit board through pin 12. From pin 12 the signal is applied to field-effect-transistors Q6 and Q7. The FET's are biased off when the output mode switch is in the off position. When the output mode and audition/program switches are operated, the FET's will be biased on allowing audio to be output through pin 13 or pin 11.

4-52. STEREOPHONIC PREAMPLIFIER.

4-53. The preamplifier circuit board accepts the left input signal on pins 16 and 17 and the right channel input signal on pins 2 and 3. Right and left channel amplifier circuitry are identical. Refer to the description of left channel amplifier circuitry provided in paragraph 4-49.

4-54. MONO MATRIX AMPLIFIER (OPTIONAL-STEREO UNITS ONLY).

4-55. Audio enters through pins 1 and 3 on the circuit board and is applied to level balancing controls R1 and R2 (refer to schematic C906-3602). L1 and C1 form an RF filter. IC1 performs the active mixing function, while Q3, Q4, and associated components provide a low impedance output. T1 provides a balanced output. Q2 supplies a decoupled bias source to IC1.

4-56. MIXER/LINE DRIVER AMPLIFIER.

4-57. Audio from the program and audition bus enters on pin 1 and is coupled through C2 to the input of the mixer preamplifier which is composed of IC1, Q1, and Q2 (refer to schematic 906-7100). L1 and C1 act as a low-pass filter to prevent the appearance of RF in the amplifier input. Operational amplifier IC1 supplies 12 dB of gain, as determined by R3 and the mix sum resistors in the mixing modules. Output drive is supplied by the complementary pair Q1 and Q2. Q2 is directly driven by IC1. Capacitor C6 provides bootstrapping for the output stage. Transistor Q3 provides protection in case of a short circuit on the output.

4-58. The output of the mixer amplifier is coupled through C7 to pin 3 and a master gain control. The signal is routed through pin 5 to the line driver for final amplification. This three-step amplifier consists of differential input stage Q4 and Q5, operational amplifier IC2, and complementary-symmetry transistors Q6 and Q7. Transistor Q8 provides short circuit protection. This stage can provide up to 40 dB of gain as determined by R16 and R18 in conjunction with gain balance control R17. R17 permits matching the gain of the two/four mixer/line driver amplifiers. A signal for use in the monitor circuit is bridged from the primary of T1.

4-59. MONOPHONIC CUE/HEADPHONE AMPLIFIER.

4-60. Refer to schematic C906-7111 for the following description. The circuit board consists of two identical amplifier circuits, one for cue audio and one for headphone audio. Only one amplifier circuit will be described.

4-61. IC2 is a self-contained 18V regulator providing power for dual audio power amplifier IC1. The audio signal is coupled through L1, R1, and C4 to the input of IC1. L1, R1, and C4 form a low-pass filter to block RF from the amplifier input. Pin 1 of R4, R5, and C5 determine amplifier gain. The output signal is coupled through dc blocking capacitor C6.

4-62. STEREOPHONIC CUE/HEADPHONE AMPLIFIER.

4-63. Refer to schematic C906-3606 for the following discussion. The circuit board consists of three identical sections (left headphone, right headphone, and cue), therefore only one section of the amplifier will be discussed.

4-64. Voltage regulator VR1 supplies 18V dc to IC1 and IC2. The audio input signal is coupled through RF filter L2, R2, and C4 and attenuator R3 to the input of IC2. Gain is set by R11, R12, and C9. The output signal is coupled through C7 to pin 3 of the circuit board. Pin 1 of IC2 provides bias for all amplifiers through R8, R9, and R10. Half of IC1 is not used.

4-65. CUE/INTERCOM AMPLIFIER.

4-66. The intercom signal from the talk/listen relay enters the board on pins 13 and 15 and is connected to transformer T1 (refer to schematic 906-7104). T1 provides impedance transformation and voltage gain. The transformer output is applied to the non-inverting input of IC1. The output is coupled through C5 to pin 1 for connection to the front panel cue/intercom select switch. Bias for the input of IC1 is supplied from voltage divider R6 and R7. Gain is determined by R2, R4, and C1.

4-67. The cue signal from the cue/intercom select switch enters on pin 2 and is coupled through C6 to the non-inverting input of IC2. 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.

4-68. The +18V dc power for the circuit board is supplied by regulator Q1, R1, and zener diode CR1. Capacitor C7 provides filtering. The +28V dc is applied to the regulator from pin 18. Ferrite bead FE-1 prevents distribution of RF on the power supply bus.

4-69. MONITOR AMPLIFIER.

4-70. Input signal is applied to the non-inverting input of voltage amplifier U1 through RF choke L1 and coupling capacitor C1 (refer to schematic 906-3709). 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.

4-71. 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.

4-72. 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.

4-73. VU METER RECTIFIER.

4-74. Individual circuit boards contain the rectifier circuits for the VU meters (refer to schematic 918-0001). A T-pad comprising R1, R2, and R3 is factory calibrated so that the meter will indicate 0 VU (100) when console output is +8 dBm.

4-75. POWER SUPPLY AND RELAY CIRCUIT BOARD (MONOPHONIC CONSOLES).

4-76. A 23V ac supply from the power transformer is rectified by CR1 and filtered by capacitors C1 and C2 to produce an unregulated +35V dc supply (refer to schematic 911-0350). The unregulated +35V supply is applied to the cue/phones amplifier circuit boards, monitor amplifier circuit boards, cue/intercom circuit boards, voltage regulators VR1 and VR2, and the muting relay circuitry.

4-77. Voltage Regulator Circuits. Voltage regulators VR1 and VR2 are 3-terminal positive adjustable regulators containing internal thermal and short circuit current limiting features. Regulators VR1 and VR2 are further protected by diodes D2 and D3 respectively, which protect the regulators from a short circuit applied to the input. Regulator VR1 outputs a 28V dc supply to the line amplifier circuit boards with the output of VR2 supplying the preamplifier circuit boards.

4-78. Muting and Talk/Listen Relay Circuitry. The following text describes the muting and talk/listen relay operation. All three relays operate in an identical manner, therefore only relay K1 will be discussed.

4-79. An unregulated +35V supply is applied to relay K1 and associated switching transistor Q1. When the audition/program switch (cue/intercom switch for talk/listen relay) controlling relay K1 is operated, a ground biases Q1 on. This action energizes relay K1 and mutes the corresponding speaker.

4-80. POWER SUPPLY AND RELAY CIRCUIT BOARD (STEREOPHONIC CONSOLES).

4-81. The power supply and relay board contains two muting relays, the intercom selection relay, and the power supply filtering (refer to schematic 918-4002). The +35V dc supply is connected to terminal R1 as are the buses which supply the rest of the console. Ripple and noise on the +35V dc supply are filtered by network R12, C1 and C2. Regulator Q5 provides a regulated voltage of +24V for all preamplifiers (stereo and mono).

4-82. Power for muting relays K1 and K2 and talk/listen relay K3 is supplied directly from the +35V dc supply. Relay K3 is controlled by the front panel cue/intercom select switch and is not energized with the switch in the cue or listen position. When the cue/intercom is in the talk position, a ground is supplied to energize K3.

4-83. Relays K1 and K2 are controlled by identical pairs of switching transistors and the two mute control lines. Power for the switching transistors is supplied through R8 and zener diode CR4. When Q1 and Q2 is not conducting, the associated relay drivers Q3 and Q4 do not conduct. If the mute control goes low, Q1 or Q2 supplies current to the relay driver transistors. The relay driver turns on and the relay energizes. The monitor speaker signal connected through the normally closed contacts is muted.

SECTION V
MAINTENANCE

5-1. INTRODUCTION.

5-2. This section provides general maintenance information, electrical adjustment procedures, and component replacement procedures for the 350A Series Audio Consoles.

5-3. SAFETY CONSIDERATIONS.

5-4. Low voltages are used throughout the 350A series console circuitry, however maintenance with power energized is always considered hazardous and caution should be observed. Good judgement, care, and common sense are the best accident preventatives. The procedures contained in this section should be performed only by trained and experienced maintenance personnel.

5-5. FIRST LEVEL MAINTENANCE.

5-6. First level maintenance consists of procedures performed on a regular basis to maintain the correct operational environment for the 350A series console.

<u>WARNING</u>	DISCONNECT POWER FROM THE UNIT AND REMOVE
<u>WARNING</u>	ALL JEWELRY BEFORE PERFORMING THE FOLLOWING
	MAINTENANCE PROCEDURES.

5-7. CLEANING.

5-8. On a regular basis, the unit should be cleaned of accumulated dust using a brush and vacuum cleaner. Remove fingerprints and other marks from machined surfaces with a cloth moistened with a mild household cleaner.

5-9. Push switches and the mixer controls are self-wiping and should not require cleaning. Lever switches may be cleaned as required with an aerosol contact cleaner.

5-10. VISUAL INSPECTION.

5-11. Regularly inspect the console for loose connections and hardware, damaged or improperly seated semi-conductors, components damaged by overheating, and mechanical surfaces requiring lubrication.

5-12. SPECIFICATION TEST.

5-13. Perform a specification test periodically to ensure proper console operation. A copy of the original factory specifications test results can be obtained from Broadcast Electronics by returning the test certification card which is supplied with each unit.

5-14. Specification tests are performed at the factory during final test with a -50 dBv signal supplied to a microphone level input and a 0 dBm signal applied to a line level input. The gain controls are adjusted to yield a +8 dBm output from the console. Active inputs and outputs are terminated with the proper load. When performing the test for console noise, the input signal should be disconnected and replaced with a 150 Ohm resistor.

5-15. SECOND LEVEL MAINTENANCE.

5-16. Second level maintenance consists of procedures required to restore the unit to proper operation after a fault has occurred.

5-17. ADJUSTMENTS.

5-18. The following text describes procedures to adjust all controls associated with the 350A series consoles. Adjustment procedures are presented in the following order.

- A. VU meter rectifier circuit board adjustments.
- B. Mixer/Line driver circuit board adjustments.
- C. Mono matrix circuit board adjustments.

5-19. VU METER RECTIFIER CIRCUIT BOARD ADJUSTMENTS.

5-20. VU METER CALIBRATION. The console VU meters are calibrated at the factory to indicate 0 VU (100) when the console output is +8 dBm. If the console VU meters require calibration or the console is required to operate at a different level, adjust VU meter calibration control R3 as follows.

5-21. Required Equipment. The following equipment is required to adjust the VU meter calibration controls.

- A. Insulated adjustment tool, flat tip (BE P/N 407-0083).
- B. External VU meter.
- C. Two 620 Ohm $\pm 5\%$, 1/4W resistors.
- D. Audio signal generator with a calibrated output.

5-22. Procedure. The following procedure describes the adjustment of a stereophonic console. For monophonic consoles, perform the steps for the left channel only. To adjust the VU meter rectifier circuit board control, proceed as follows:

5-23. Operate the console power switch to OFF.

5-24. Select a mixer channel which contains line level inputs and disconnect the wiring of one input from the console terminal strip.

5-25. Connect an audio signal generator to the left channel input terminals.

- 5-26. Terminate the program output with the 620 Ohm resistors.
- 5-27. Connect the external VU meter to the program output left channel.
- 5-28. Operate the console power switch to ON.
- 5-29. Adjust the audio signal generator for a 1 kHz output at 0 dBv.
- 5-30. Route the test signal to the program output.
- 5-31. Ensure the MASTER PGM control is in the normal operating position.
- 5-32. With the test channel mixer control, adjust the console output until the external VU meter indicates the desired output level (+18 dBm maximum).
- 5-33. Adjust VU meter calibration control R3 on the left channel VU meter rectifier circuit board until the console VU meter indicates 0 VU (100).
- 5-34. Operate the console power switch to OFF.
- 5-35. Connect the audio signal generator to the right channel input terminals.
- 5-36. Connect the VU meter to the program output right channel.
- 5-37. Operate the console power switch to ON.
- 5-38. Adjust VU meter calibration control R3 on the right channel VU meter rectifier circuit board until the console VU meter indicates 0 VU (100).
- 5-39. Repeat the procedure for the audition output.
- 5-40. Operate the console power switch to OFF.
- 5-41. Remove the VU meter, audio signal generator, and the resistors.
- 5-42. Reconnect the input wiring to the console terminal strip.
- 5-43. MIXER/LINE DRIVER CIRCUIT BOARD ADJUSTMENTS.
- 5-44. PROGRAM/AUDITION OUTPUT LEVEL BALANCING. Output level balance control R17 on the mixer/line driver amplifier circuit boards allow the levels of the left and right channels in stereophonic consoles or the program and audition outputs in monophonic consoles to be balanced. To adjust the control, proceed as follows.

5-45. Required Equipment. The following equipment is required to adjust the controls on the line amplifier circuit boards.

- A. Insulated adjustment tool, flat tip (BE P/N 407-0083).
- B. External VU meter.
- C. Two 620 Ohm $\pm 5\%$, 1/4W resistors.
- D. Audio signal generator with a calibrated output.

5-46. Procedure. The following procedure describes the adjustment of a stereophonic console. For monophonic consoles, perform the steps for the left channel only. To adjust the output level balance control proceed as follows:

- 5-47. Operate the console power switch to OFF.
- 5-48. Select a mixer channel which contains line level inputs and disconnect the wiring of one input from the console terminal strip.
- 5-49. Connect an audio signal generator to the left channel input terminals.
- 5-50. Terminate the program output with the 620 Ohm resistors.
- 5-51. Connect the external VU meter to the program output left channel.
- 5-52. Adjust output level balance control R17 on the left and right channel program mixer/line driver circuit boards until the control is in the approximate center of its range.
- 5-53. Operate the console power switch to ON.
- 5-54. Adjust the audio signal generator for a 1 kHz output at 0 dBv.
- 5-55. Route the test signal to the program output.
- 5-56. Adjust the test channel mixer control and the MASTER PGM output control to the normal operating positions.
- 5-57. If required, coarse adjust the output level with the mixer control until the external VU meter indicates the approximate normal output.
- 5-58. Fine adjust the output with output level balance control R17 on the left channel program mixer/line driver circuit board until the external VU meter indicates the normal program output.
- 5-59. Operate the console power switch of OFF.

- 5-60. Connect the audio signal generator to the right channel input terminals.
- 5-61. Connect the VU meter to the program output right channel.
- 5-62. Operate the console power switch to ON.
- 5-63. Adjust output level balance control R17 on the right channel program mixer/line driver circuit board until the external VU meter indicates the previously measured left channel output.
- 5-64. Repeat the procedure for the audition output.
- 5-65. Operate the console power switch to OFF.
- 5-66. Remove the VU meter, audio signal generator, and the resistors.
- 5-67. Reconnect the input wiring to the console terminal strip.
- 5-68. MONO MATRIX CIRCUIT BOARD ADJUSTMENTS.
- 5-69. MONO MATRIX OUTPUT LEVEL BALANCING. Left balance control R1 and right channel balance control R2 adjust the mix of the left and right channels. To adjust the controls, proceed as follows.
- 5-70. Required Equipment. The following equipment is required to adjust the mono matrix circuit board controls.
- A. Insulated adjustment tool, flat tip (BE P/N 407-0083).
 - B. External VU meter.
 - C. One 620 Ohm $\pm 5\%$, 1/4W resistor.
 - D. Audio signal generator with a calibrated output.
- 5-71. Procedure. To adjust the mono matrix circuit board controls, proceed as follows:

NOTE

ENSURE THE PROGRAM OUTPUT IS BALANCED OR
PERFORM THE MIXER/LINE DRIVER OUTPUT LEVEL
BALANCING PROCEDURE BEFORE PROCEEDING.

NOTE

- 5-72. Operate the console power switch to OFF.
- 5-73. Select a mixer channel which contains line level inputs and disconnect the wiring of one input from the console terminal strip.
- 5-74. Connect an audio signal generator to the left channel input terminals.

- 5-75. Terminate the program output left channel with a 620 Ohm resistor.
- 5-76. Connect the external VU meter to the program output left channel.
- 5-77. Operate the console power switch to ON.
- 5-78. Adjust the audio signal generator for a 1 kHz output at 0 dBv.
- 5-79. Route the test signal to the program output.
- 5-80. Adjust the test channel mixer control until the external VU meter indicates +8 dBm.
- 5-81. Operate the console power switch to OFF.
- 5-82. Terminate the mono matrix output with a 620 Ohm resistor.
- 5-83. Connect the external VU meter to the mono matrix output.
- 5-84. Operate the console power switch to ON.
- 5-85. Adjust left channel balance control R1 until the external VU meter indicates +2 dBm.
- 5-86. Operate the console power switch to OFF.
- 5-87. Connect the audio signal generator to the right channel input terminals.
- 5-88. Operate the console power switch to ON.
- 5-89. Adjust right channel balance control R2 until the external VU meter indicates +2 dBm.
- 5-90. Operate the console power switch to OFF.
- 5-91. Remove the VU meter, audio signal generator, and the resistor.
- 5-92. Reconnect the input wiring to the console terminal strip.
- 5-93. TROUBLESHOOTING.
- 5-94. Troubleshooting within the console chassis is not considered hazardous due to the low voltages and currents involved. All high voltages and currents have been shielded, however do not touch any component within the console chassis with the power energized.
- 5-95. The troubleshooting philosophy for the 350A series consoles consists of isolating a problem to a specific circuit board or component. A problem may be isolated by referencing the following warnings and general troubleshooting guidelines.

<u>WARNING</u>	REMOVE ALL JEWELRY BEFORE TROUBLESHOOTING AND DO NOT TOUCH ANY COMPONENT WITHIN THE CONSOLE CHASSIS WITH POWER ENERGIZED.
<u>WARNING</u>	
<u>WARNING</u>	DISCONNECT ALL POWER BEFORE INSERTING OR REMOVING PRINTED CIRCUIT BOARDS OR REPLACING ANY COMPONENTS.
<u>WARNING</u>	
<u>WARNING</u>	MOST SOLVENTS THAT ARE SUITABLE FOR CLEANING ELECTRONIC EQUIPMENT ARE VOLATILE BY THEIR NATURE AND SHOULD BE USED ONLY IN SMALL AMOUNTS IN A WELL-VENTILATED AREA, AWAY FROM FLAME, CIGARETTES, OR HOT SOLDERING IRONS.
<u>WARNING</u>	
<u>WARNING</u>	OBSERVE THE MANUFACTURERS CAUTIONARY INSTRUCTIONS.
<u>CAUTION</u>	
<u>CAUTION</u>	INADVERTENT CONTACT BETWEEN ADJACENT COMPONENTS ON CIRCUIT BOARDS WITH TEST EQUIPMENT CAN CAUSE SERIOUS DAMAGE TO THE CONSOLE.

5-96. 350A SERIES CONSOLE GENERAL TROUBLESHOOTING GUIDELINES. The 350A series console guideline are as follows:

- A. Check the console power supply for proper operation.
- B. Check for signal presence in the program, audition and cue channels.
- C. Isolate defective amplifier modules through circuit board substitution.
- D. Check integrated circuits and capacitors on circuit boards for proper operation.

5-97. Once the trouble is isolated and power is totally deenergized, it is recommended that the exact problem be located with resistance checks using the schematic diagrams and the theory of operation. The faulty component may be repaired locally or the entire device may be returned to Broadcast Electronics, Inc. for repair or replacement.

5-98. COMPONENT REPLACEMENT.

<u>WARNING</u>	DISCONNECT POWER BEFORE REMOVING OR REPLACING CIRCUIT BOARDS OR COMPONENTS.
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5-99. The circuit boards used in the 350A series consoles are double-sided boards with plated through-holes. Because of the plated through-holes, solder fills the holes by capillary action. These conditions require that defective components be removed carefully to avoid damage to the circuit board.

5-100. On all circuit boards, the adhesion of the copper trace to the board fails at almost the same temperature as solder melts. A circuit board trace can be destroyed by excessive heat or lateral movement during soldering. Use of a small iron with steady pressure is required for circuit board repairs.

5-101. To remove a component other than the plug-in type from a circuit board, cut the leads from the body of the defective component while the device is still soldered to the board.

5-102. Grip each component lead, one at a time, with long nose pliers. Turn the board over and touch the soldering iron to the lead at the solder connection. When the solder begins to melt, push the lead through the back side of the board and cut off the clinched end of the lead. Each lead may now be heated independently and pulled out of each hole. The holes may be cleared of solder by carefully re-heating with a low wattage iron and removing the residual solder with a soldering vacuum tool.

5-103. Install the new component and apply solder from the bottom side of the board. If no damage has been done to the plated through-holes, soldering of the top side is not required.

WARNING

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

WARNING

WARNING

WARNING

OBSERVE THE MANUFACTURERS CAUTIONARY INSTRUCTIONS.

5-104. After soldering, remove residual flux with a cotton swab moistened with a suitable solvent. Rubbing alcohol is highly diluted and is not effective. Solvents are available from electronic supply houses which are useful.

5-105. The board should be checked to ensure the flux has been removed and not just smeared about. Rosin flux is not normally corrosive, but it will absorb enough moisture in time to become conductive and cause problems.

5-106. INTEGRATED CIRCUITS. Extra care should be exercised with integrated circuits. Each integrated circuit must be oriented so that its notch matches the notch on the socket. Do not attempt to remove an integrated circuit with your fingers. Use an integrated circuit puller to lightly pry the circuit from its socket.

SECTION VI

PARTS LIST

6-1. INTRODUCTION.

6-2. This section provides descriptions and part numbers of electrical components, assemblies, and selected mechanical parts required for maintenance of the Broadcast Electronics 350A Series Audio Consoles. Each table entry in this section is indexed by reference designators appearing on the applicable schematic diagram.

6-3. Table 6-1 indexes all tables listing assemblies and sub-assemblies having replaceable parts, the table number listing the parts, and the page number of the applicable table.

TABLE 6-1. REPLACEABLE PARTS INDEX
(Sheet 1 of 2)

TABLE NO.	DESCRIPTION	PART NO.	PAGE
6-2	10M350A MONOPHONIC 10 CHANNEL SLIDE-MIXER AUDIO CONSOLE	901-1051 -XXX	6-3
6-3	10S350A STEREOPHONIC 10 CHANNEL SLIDE-MIXER AUDIO CONSOLE	901-1050 -XXX	6-3
6-4	PREAMPLIFIER CIRCUIT BOARD ASSEMBLY	918-3600 918-3601	6-4
6-5	MONO MATRIX CIRCUIT BOARD ASSEMBLY	918-3602	6-6
6-6	MIXER/LINE DRIVER AMPLIFIER CIRCUIT BOARD ASSEMBLY	918-3604	6-6
6-7	MONAURAL CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD ASSEMBLY	918-3605	6-7
6-8	CUE INTERCOM AMPLIFIER CIRCUIT BOARD ASSEMBLY	918-7018	6-8
6-9	STEREOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD ASSEMBLY	918-3606	6-8
6-10	MONITOR AMPLIFIER CIRCUIT BOARD ASSEMBLY	918-3709	6-9

TABLE 6-1. REPLACEABLE PARTS INDEX
(Sheet 2 of 2)

TABLE NO.	DESCRIPTION	PART NO.	PAGE
6-11	VU METER RECTIFIER CIRCUIT BOARD ASSEMBLY	918-0001	6-10
6-12	POWER SUPPLY/RELAY CIRCUIT BOARD ASSEMBLY (For 10S350A Consoles)	918-4002	6-10
6-13	POWER SUPPLY/RELAY CIRCUIT BOARD ASSEMBLY (For 10M350 Consoles)	911-0350	6-10
6-14	POWER TRANSFORMER ASSEMBLY	951-0007	6-11

TABLE 6-2. 10M350A MONOPHONIC 10 CHANNEL SLIDE-MIXER AUDIO CONSOLE
901-1051-XXX

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Resistor, 4 Ohm $\pm 5\%$, 2W, W/W	132-4013	1
----	Resistor, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	10
----	Capacitor, Ceramic Disc, 0.0047 μ F, 125V	002-4724	2
----	Potentiometer, Modular, 10 K Ohm $\pm 10\%$ (MASTER PGM and AUD Level Controls, CUE/INTERCOM Level Control, PHONES Level Control, MONITOR Level Control)	191-1053C	5
----	Mixer Controls:		
	Potentiometer, slide-attenuator, linear taper	180-0008	10
	Switch, Micro, Detent, 125V ac @ 100 mA (Mixer Control Cue Switches)	340-0073	10
----	Diode, 1N4148, Silicon, 75V @ 0.3 Amperes	203-4148	4
----	Fuse, AGC, 2 Amperes, Slow-Blow	334-0200	1
----	Holder, Fuse	415-2012	1
----	VU Meter, 3.5 inch (8.89 cm), DC Microammeter Type, 1.9 k Ohm Movement	319-1003	2
----	Speaker, 3 inch (7.62 cm), 8 Ohms	414-0001	1
----	Lamp, 1828, 28V @ 0.05 Amperes	321-1828	2
----	Lamp Holder	322-0003	2
----	Switches, Lever, 2 Pole, 3 Position (MODE, CUE/INTERCOM Select, MONITOR Select, and PHONES Select Switches)	343-3004	13
----	Switches, Pushbutton, DPDT, 2 Station (OUTPUT SELECT Switches)	343-1203	10
----	Switches, Pushbutton, 4 PDT, 2 Station (INPUT SELECT Switches, Mixer Channels 1 THRU 8)	343-1201	8
----	Switches, Pushbutton, DPDT, 3 Station (INPUT SELECT Switches, Mixer Channels 9 and 10)	343-1202	2
----	Switches, Toggle, SPST (ON/OFF Switch)	348-0110	1
----	Connector, 18-Pin	417-1801	15
----	Barrier Strip, 20 Terminals	412-0020	4
----	Terminal Strip, 5 Lug (Power Supply)	411-0866	2
----	Knob (MASTER PGM and AUD, CUE/INTERCOM, PHONES, MONITOR, Level Controls)	481-0018	5
----	Knob (Lever Switches)	481-0017	13
----	Switch Cap, Gray	343-1006	20
----	Switch Cap, White	343-1002	20
----	Switch Cap, Black	343-1003	2
----	Turnlock Fastener, 1/4 Turn		
	Stud	424-0004	3
	Receptacle	424-0005	3
	Retainer	424-0006	3
----	Overlay, Upper Front Panel	596-1024-002	1
----	Overlay, Lower Front Panel	596-1025-001	1
----	Overlay, Front Trim	595-0028-001	1
----	Blank Circuit Board, Mixer Control	511-3733	10
----	Preamplifier Circuit Board Assembly	918-3600	10
----	Mixer/Line Driver Amplifier Circuit Board Assembly	918-3604	2
----	Monaural Cue/Headphone Amplifier Circuit Board Assembly	918-3605	1
----	Cue Intercom Amplifier Circuit Board Assembly	918-7018	1
----	Monitor Amplifier Circuit Board Assembly	918-3709	1
----	VU Meter Rectifier Circuit Board Assembly	918-0001	2
----	Power Supply/Relay Circuit Board Assembly	911-0350	1
----	Transformer, Power Assembly	951-0007	1

TABLE 6-3. 10S350A STEREOGRAPHIC 10 CHANNEL SLIDE-MIXER AUDIO CONSOLE
901-1050-XXX (Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Resistor, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	20
----	Capacitor, Ceramic Disc, 0.0047 μ F	002-4724	2
----	Potentiometer, 10 k Ohm, Dual	192-1053A	4
----	Potentiometer, 10 k Ohm (CUE/INTERCOM)	191-1053C	1

TABLE 6-3. 10S350A STEREOPHONIC 10 CHANNEL SLIDE-MIXER AUDIO CONSOLE
901-1050-XXX (Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Mixer Controls:		
	Potentiometer, slide-attenuator, linear taper	180-0009	10
	Switch, Micro, Detent, 125V ac @ 100 mA (Mixer Control Cue Switches)	340-0073	10
----	Bridge Rectifier, MDA2502, 200V, 25 Amperes	239-0006	1
----	Diode, 1N4148, Silicon, 75V @ 0.3 Amperes	203-4148	4
----	Fuse, AGC, 2 Amperes, Slow-Blow	334-0200	1
----	Fuse Holder	415-2012	1
----	VU Meters, 3.5 inch (8.89 cm), DC Microammeter Type, 1.9 k Ohm Movement	319-1003	4
----	Speaker, 3 inch (7.62 cm), 8 Ohms	414-0001	1
----	Lamp, 1828, 28V @ 0.05 Amperes	321-1828	4
----	Lamp Holder	322-0003	4
----	Switch, Lever, 2 Pole, 3 Position (MODE, CUE/INTERCOM Select, MONITOR Select, and PHONES Select Switches)	343-3004	13
----	Switch, Pushbutton, DPDT, 2 Station (OUTPUT SELECT Switches)	343-1203	10
----	Switch, Pushbutton, 4 PDT, 2 Station (INPUT SELECT Switches, Mixer Channels 1 Thru 8)	343-1401	8
----	Switch, Pushbutton, 4 PDT, 3 Station (INPUT SELECT Switches, Mixer Channels 9 and 10)	343-1204	2
----	Switch, Toggle, SPST (ON/OFF Switch)	348-0110	1
----	Terminal Strip, 5 Lug	411-0866	2
----	Connector, 18-Pin	417-1801	19
----	Phone Jack Connector	417-0311	1
----	Barrier Strip, 20 Terminals	412-0020	7
----	Turnlock Fastener, 1/4 Turn		
	Stud	424-0004	3
	Receptacle	424-0005	3
	Retainer	424-0006	3
----	Knob (MASTER PGM and AUD, CUE/INTERCOM, PHONES, MONITOR, Level Controls)	481-0018	5
----	Knob, (Lever Switches)	481-0017	13
----	Switch Cap, Gray	343-1006	20
----	Switch Cap, White	343-1002	20
----	Switch Cap, Black	343-1003	2
----	Overlay, Upper Front Panel	596-1024-001	1
----	Overlay, Lower Front Panel	596-1025-001	1
----	Overlay, Panel Trim	595-0027-001	1
----	Blank Circuit Board, Mixer Control	511-3733	10
----	Preamplifier Circuit Board Assembly	918-3601	10
----	Mono Matrix Circuit Board Assembly	918-3602	1
----	Mixer/Line Driver Amplifier Circuit Board Assembly	918-3604	4
----	Cue Intercom Amplifier Circuit Board Assembly	918-7018	1
----	Stereophonic Cue/Headphone Amplifier Circuit Board Assembly	918-3606	1
----	Monitor Amplifier Circuit Board Assembly	918-3709	2
----	VU Meter Rectifier Circuit Board Assembly	918-0001	4
----	Power Supply/Relay Circuit Board Assembly	918-4002	1
----	Transformer, Power Assembly	951-0007	1

TABLE 6-4. PREAMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3600/-3601
(Sheet 1 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
COMPONENTS FOR MONAURAL AND STEREO ASSEMBLIES			
C1	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C2,C3	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C4	Capacitor, Ceramic Disc, 0.001, 1 kV	002-1034	1
C5,C6	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C7,C8	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C9	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1

TABLE 6-4. PREAMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3600/-3601
(Sheet 2 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
COMPONENTS FOR MONAURAL AND STEREO ASSEMBLIES (Cont'd)			
C10	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C11,C22	Capacitor, Mylar Film, 0.022 uF, 200V	031-2243	2
C23	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	1
C24	Capacitor, Electrolytic, 100 uF, 25V	023-1084	1
C25	Capacitor, Electrolytic, 22 uF, 50V	024-2274	1
C26	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	1
CR1,CR2	Diode, 1N4148, Silicon, 75V @ 0.3 Ampere	203-4148	2
CR3	Diode, 1N98, Germanium, 80V @ 0.2 Ampere	202-0098	1
IC1	Integrated Circuit, uA748, High Performance Operational Amplifier, 8-Pin DIP	221-7480	1
J1 THRU J3	Jumper, Programmable, 2-Pin	340-0004	3
L1	Choke, Ferrite, 4 Leg	956-0002	1
P1 THRU P3	Connector, Header, 2-Pin	417-4004	3
Q1,Q2	Transistor, 2N4250, Silicon, PNP, TO-92 Case	210-4250	2
Q3	Transistor, GES5816, Silicon, NPN, TO-92 Case	211-5816	1
Q4	Transistor, 2N3904, Silicon, NPN, TO-92 Case	211-3904	1
Q5	Transistor, GES5817, Silicon, PNP, TO-92 Case	210-5817	1
Q6,Q7	Transistor, 2N5462, P-Channel, JFET, TO-92 Case	212-5462	2
Q15	Transistor, 2N3904, Silicon, NPN, TO-92 Case	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, 3.9 k Ohm $\pm 5\%$, 1/4W	100-3943	1
R14	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
R15,R16	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R17,R18	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	2
R19,R20, R39,R40	Resistor, 2 Meg Ohm $\pm 5\%$, 1/4W	100-2073	4
R41	Resistor, 9.1 k 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
R44	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
XIC1	Socket, Integrated Circuit, 8-Pin DIP	417-0804	1
----	Blank Circuit Board	518-3600	1

ADDITIONAL PARTS FOR STEREO PREAMPLIFIER
ONLY - 918-3601

C12	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C13,C14	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C15	Capacitor, Ceramic Disc, 0.001 uF, 1 kV	002-1034	1
C16,C17	Capacitor, Electrolytic, 100 uF, 40V	014-1084	2
C18,C19	Capacitor, Ceramic Disc, 10 pF, 500V	001-1014	2
C20	Capacitor, Electrolytic, 33 uF, 35V	014-3274	1
C21	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C27	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	1
CR4,CR5	Diode, 1N4148, Silicon, Fast Switching, 100V, 10 mA	203-4148	2
CR6	Diode, 1N98, Germanium, 100V, 20 mA	202-0098	1
IC2	Integrated Circuit, uA748, High Performance Operational Amplifier, 8-Pin DIP	221-7480	1
J4 THRU J6	Jumper, Programmable, 2-Pin	340-0004	3
L2	Choke, Ferrite, 4 Leg	956-0002	1
P4 THRU P6	Connector, Header, 2-Pin	417-4004	3
Q8,Q9	Transistor, 2N4250, Silicon, PNP, TO-92 Case	210-4250	2
Q10	Transistor, GES5816, Silicon, NPN, TO-92 Case	211-5816	1
Q11	Transistor, 2N3904, Silicon, NPN, TO-92 Case	211-3904	1
Q12	Transistor, GES5817, Silicon, PNP, TO-92 Case	210-5817	1
Q13,Q14	Transistor, 2N5462, P-Channel, JFET, TO-92 Case	212-5462	2
Q15	Transistor, 2N3904, Silicon, NPN, TO-92 Case	211-3904	1

TABLE 6-4. PREAMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3600/-3601
(Sheet 3 of 3)

REF. DES.	DESCRIPTION	PART NO.	QTY.
ADDITIONAL PARTS FOR STEREO PREAMPLIFIER ONLY - 918-3601 (Cont'd)			
R21,R22	Resistor, 27 k Ohm $\pm 5\%$, 1/4W	100-2753	2
R23	Resistor, 150 Ohm $\pm 5\%$, 1/4W	100-1533	1
R24,R25	Resistor, 470 Ohm $\pm 5\%$, 1/4W	100-4733	2
R26,R27	Resistor, 100 Ohm $\pm 5\%$, 1/4W	100-1033	2
R28	Resistor, 39 k Ohm $\pm 5\%$, 1/4W	100-3953	1
R29	Resistor, 62 k Ohm $\pm 5\%$, 1/4W	100-6253	1
R30,R31	Resistor, 82 k Ohm $\pm 5\%$, 1/4W	100-8253	2
R32	Resistor, 39 k Ohm $\pm 5\%$, 1/4W	100-3953	1
R33	Resistor, 3.9 k Ohm $\pm 5\%$, 1/4W	100-3943	1
R34	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
R35,R36	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R37,R38	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	2
X1C2	Socket, Integrated Circuit, 8-Pin DIP	417-0804	1

TABLE 6-5. MONAURAL MATRIX CIRCUIT BOARD ASSEMBLY - 918-3602

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Mica, 50 pF $\pm 10\%$, 50V	040-5013	1
C2	Capacitor, Electrolytic, 4.7 uF, 35V	015-5064	1
C3	Capacitor, Electrolytic, 22 uF, 25V	013-2574	1
C4,C5	Capacitor, Ceramic Disc, 10 pF $\pm 10\%$, 1 kV	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, 75V @ 0.3 Amperes	203-4148	2
D3	Diode, 1N98, Germanium, 80V @ 0.2 Ampere	202-0098	1
IC1	Integrated Circuit, LM318P, Operational Amplifier, 8-Pin DIP	221-0318	1
L1	Choke, Ferrite, 2 Leg	956-0001	1
Q1,Q2	Transistor, 2N3904, Silicon, NPN, TO-92 Case	211-3904	2
Q3	Transistor, 2N5817, Silicon, PNP, TO-92 Case	210-5817	1
Q4	Transistor, 2N5816, Silicon, NPN, TO-92 Case	211-5816	1
R1,R2	Potentiometer, 50 k Ohm $\pm 10\%$, 1/2W	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, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
R7	Resistor, 3.9 k 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, 8.2 k 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, 1:1 Primary: 600 Ohms CT Secondary: 600 Ohms CT (Broadcast Electronics Manufacture)	371-0001	1
X1C1	Socket, Integrated Circuit, 8-Pin DIP	417-0804	1
----	Blank Circuit Board	518-3602	1

TABLE 6-6. MIXER/LINE DRIVER AMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3604
(Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1	Capacitor, Mica, 150 pF, 500V	040-1522	1
C2	Capacitor, Electrolytic, 10 uF, 25V, Tantalum	063-1074	1
C3	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	1
C4	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	1

TABLE 6-6. MIXER/LINE DRIVER AMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3604
(Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C5	Capacitor, Mica, 50 pF $\pm 5\%$, 500V	040-5013	1
C6	Capacitor, Electrolytic, 33 μ F, 35V	014-3274	1
C7	Capacitor, Electrolytic, 100 μ F, 40V	014-1084	1
C8	Capacitor, Electrolytic, 1 μ F, 35V, Tantalum	064-1063	1
C9	Capacitor, Electrolytic, 33 μ F, 35V	024-3374	1
C10	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	062-2013	1
C11	Capacitor, Ceramic Disc, 5 pF, 500V, NPO	001-5004	1
C12	Capacitor, Electrolytic, 33 μ F, 35V	014-3274	1
C13	Capacitor, Electrolytic, 100 μ F, 40V	014-1084	1
C14	Capacitor, Electrolytic, 100 μ F, 25V	023-1084	1
C15	Capacitor, Electrolytic, 22 μ F, 50V	024-2274	1
C16,C17	Capacitor, Ceramic Disc, 20 pF $\pm 10\%$, 1 kV	002-2013	2
C18	Capacitor, Electrolytic, 4.7 μ F, 35V	024-4764	1
CR1,CR2	Diode, 1N4148, Silicon, 75V @ 0.3 Amperes	203-4148	2
CR3	Diode, 1N98, Germanium, 80V @ 0.2 Amperes	202-0098	1
CR4,CR5	Diode, 1N4148, Silicon, 75V @ 0.3 Amperes	203-4148	2
CR6	Diode, 1N98, Germanium, 80V @ 0.2 Amperes	202-0098	1
IC1,IC2	Integrated Circuit, NE5534AN, Low Noise Operational Amplifier, 8-Pin DIP	221-5534	2
L1	Inductor, 2.2 μ H	364-0022	1
Q1	Transistor, 2N5816, Silicon, NPN, TO-92 Case	211-5816	1
Q2	Transistor, 2N5817, Silicon, PNP, TO-92 Case	210-5817	1
Q3	Transistor, 2N3904, Silicon, NPN, TO-92 Case	211-3904	1
Q4,Q5	Transistor, 2N4250, Silicon, PNP, TO-92 Case	210-4250	2
Q6	Transistor, 2N5816, Silicon, NPN, TO-92 Case	211-5816	1
Q7	Transistor, 2N5817, Silicon, PNP, TO-92 Case	210-5817	1
Q8,Q9	Transistor, 2N3904, Silicon, NPN, TO-92 Case	211-3904	2
R1	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R2	Resistor, 47 Ohm $\pm 5\%$, 1/4W	100-4723	1
R3,R4	Resistor, 27 k Ohm $\pm 5\%$, 1/4W	100-2753	2
R5	Resistor, 3.9 k Ohm $\pm 5\%$, 1/4W	100-3943	1
R6	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
R7,R8	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R9	Resistor, 620 Ohm $\pm 5\%$, 1/4W	100-6233	1
R10	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R11	Resistor, 150 k Ohm $\pm 5\%$, 1/4W	100-1563	1
R12,R13	Resistor, 470 Ohm $\pm 5\%$, 1/4W	100-4733	2
R14,R15	Resistor, 180 k Ohm $\pm 5\%$, 1/4W	100-1863	2
R16	Resistor, 1 k Ohm $\pm 5\%$, 1/4W	100-1043	1
R17	Potentiometer, 50 k Ohm $\pm 10\%$, 1/2W	178-5054	1
R18	Resistor, 56 k Ohm $\pm 5\%$, 1/4W	100-5653	1
R19	Resistor, 3.9 k Ohm $\pm 5\%$, 1/4W	100-3943	1
R20	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
R21,R22	Resistor, 18 Ohm $\pm 5\%$, 1/4W	100-1823	2
R24	Resistor, 0.1 k Ohm $\pm 5\%$, 1/4W	100-9143	1
R25	Resistor, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	1
R26	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
T1	Transformer Audio Output, 1:1 Primary: 600 Ohms CT Secondary: 600 Ohms CT (Broadcast Electronics Manufacture)	371-0001	1
XIC1	Socket, Integrated Circuit, 8-Pin DIP	417-0804	1
----	Blank Circuit Board	518-3604	1

TABLE 6-7. MONAURAL CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3605
(Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 100 μ F, 40V	014-1084	2
C3	Capacitor, Mica, 100 pF $\pm 5\%$, 500V	040-1022	1
C4	Capacitor, Electrolytic, 1 μ F, 35V	015-1064A	1
C5	Capacitor, Electrolytic, 10 μ F, 16V	013-1074	1
C6	Capacitor, Electrolytic, 1000 μ F, 25V	013-1095	1
C7	Capacitor, Mica, 100 pF $\pm 5\%$, 500V	040-1022	1

TABLE 6-7. MONAURAL CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3605
(Sheet 2 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C8	Capacitor, Electrolytic, 1 uF, 35V	015-1064A	1
C9	Capacitor, Electrolytic, 100 uF, 40V	014-1084	1
C10	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1
C11	Capacitor, Electrolytic, 1000 uF, 25V	013-1095	1
IC1	Integrated Circuit, LM378N, Dual Audio Power Operational Amplifier, 14-Pin DIP	222-3780	1
IC2	Integrated Circuit, uA7818UC, Fixed +18 Volt Regulator, 1.5 Ampere, TO-220 Package	227-7818	1
L1,L2	Choke, Ferrite, 2 Leg	956-0001	2
R1	Resistor, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	1
R2	Resistor, 220 Ohm $\pm 5\%$, 1/4W	100-2233	1
R3	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R4	Resistor, 2.2 k Ohm $\pm 5\%$, 1/4W	100-2243	1
R5	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R6	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
R7	Resistor, 2.2 k Ohm $\pm 5\%$, 1/4W	100-2243	1
R8	Resistor, 1.5 k Ohm $\pm 5\%$, 1/4W	100-1543	1
R9	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R10	Resistor, 2.2 k Ohm $\pm 5\%$, 1/4W	100-2243	1
R11	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R12	Resistor, 4.7 k Ohm $\pm 5\%$, 1/4W	100-4743	1
XIC1	Socket, 14-Pin DIP	417-1404	1
----	Blank Circuit Board	518-3603	1

TABLE 6-8. CUE INTERCOM AMPLIFIER 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
IC1	Integrated Circuit, Molded Plastic, Operational Amplifier, 8-Pin DIP	221-7410	1
IC2	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 Turns #32 Enameled Wire	956-0001	1
----	Blank Circuit Board	518-7018	1

TABLE 6-9. STEREOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD ASSEMBLY
918-3606 (Sheet 1 of 2)

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1 THRU C3	Capacitor, Electrolytic, 100 uF, 40V	014-1084	3
C4 THRU C6	Capacitor, Ceramic Disc, 100 pF, 500V	002-1024	3
C7	Capacitor, Electrolytic, 1000 uF, 25V	013-1095	1
C8	Capacitor, Electrolytic, 1.0 uF, 35V	015-1064A	1
C9	Capacitor, Electrolytic, 10 uF, 16V	013-1074	1

TABLE 6-9. STEREOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD ASSEMBLY
918-3606 (Sheet 2 of 2)

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

TABLE 6-10. MONITOR AMPLIFIER CIRCUIT BOARD ASSEMBLY - 918-3709

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1 THRU C5	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	5
C6	Capacitor, Mica, 100 pF, 500V	040-1022	1
C7,C8	Capacitor, Electrolytic, 4.7 uF, 35V	024-4764	2
C9	Capacitor, Electrolytic, 4700 uF, 35V	014-4795	1
D1	Diode, Zener, 1N4744A, 15V $\pm 5\%$, 1W	200-0015	1
D2	Diode, 1N4004, Silicon, 400V, 1 Ampere	203-4004	1
F1	Fuse, 3AC, 1 Ampere, Fast-Blow	330-0100	1
L1	Choke, Ferrite, 2 Leg, 4 Turns of #32 Solid Enameled Wire	956-0001	1
Q1	Transistor, 2N3904, Silicon, NPN, 10-92 Case	211-3904	1
Q2	Transistor, MPSA55, Silicon, PNP, 10-92 Case	210-0055	1
Q3	Transistor, MJ3000, Silicon, Darlington, NPN, 10-3 Case	219-3000	1
Q4	Transistor, MJ2500, Silicon, Darlington, PNP, 10-3 Case	219-2500	1
R1	Resistor, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	1
R2	Resistor, 100 k Ohm $\pm 5\%$, 1/4W	100-1063	1
R3	Resistor, 5.1 k Ohm $\pm 5\%$, 1/4W	100-5143	1
R4	Resistor, 330 Ohm $\pm 5\%$, 1/4W	100-3333	1
R5	Resistor, 180 k Ohm $\pm 5\%$, 1/4W	100-1863	1
R6,R7	Resistor, 220 k Ohm $\pm 5\%$, 1/4W	100-2263	2
R8,R9	Resistor, 3.9 k Ohm $\pm 5\%$, 1/4W	100-3943	2
R11	Resistor, 360 Ohm $\pm 5\%$, 1/4W	100-3633	1
R12 THRU R14	Resistor, 10 Ohm $\pm 5\%$, 1/4W	100-1023	3
R15	Resistor, 0.2 Ohm $\pm 5\%$, 5W, W/W	132-2003	1
U1	Integrated Circuit, NE5534AN, Low-Noise Operational Amplifier, 8-Pin DIP	221-5534	1
U2	Integrated Circuit, LM394H, Super-Match, Low-Noise, NPN Pair, 10-5 Case	226-0394	1
XF1	Fuse Clip, 3AC	415-2068	1
XU1	Socket, Integrated Circuit, 8-Pin DIP	417-0804	1
----	Ferrite Bead for L1	100-1863	1
----	Blank Circuit Board	518-3709	1

TABLE 6-11. VU METER RECTIFIER CIRCUIT BOARD ASSEMBLY - 918-0001

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

TABLE 6-12. POWER SUPPLY/RELAY CIRCUIT BOARD ASSEMBLY (For 10S350A Consoles)
918-4002

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 4700 μ F, 35V	014-4795	2
C3	Capacitor, Electrolytic, 100 μ F, 25V	013-1084	1
C4	Capacitor, Ceramic Disc, 0.1 μ F, 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
K1 THRU K3	Relay, Plug-in Coil: 24V dc Contacts: 4 PDT, 24V dc, 2 Amperes	270-0007	3
Q1,Q2	Transistor, GES5817, 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, 1 k Ohm $\pm 5\%$, 1/4W	100-1043	2
R6,R7	Resistor, 10 k 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, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	1
R12	Resistor, 5 Ohm $\pm 5\%$, 5W	133-5013	1
R13	Resistor, 10 k Ohm $\pm 5\%$, 1/4W	100-1053	1
----	Clip, Relay	270-0017	3
----	Blank Circuit Board	518-4002	1

TABLE 6-13. POWER SUPPLY/RELAY CIRCUIT BOARD ASSEMBLY (For 10M350A Consoles)
911-0350

REF. DES.	DESCRIPTION	PART NO.	QTY.
C1,C2	Capacitor, Electrolytic, 5500 μ F, 40V	024-5594	2
C3 THRU C6	Capacitor, Electrolytic, 33 μ F, 35V	014-3274	4
C7	Capacitor, Ceramic Disc, 1 μ F $\pm 20\%$, 100V	000-1054	1
CR1	Bridge Rectifier, VH248, 6 Amperes, 200 PIV	239-0004	1
D1 THRU D5	Diode, 1N4004, Silicon, 400V @ 30 μ A	203-4004	5
K1 THRU K3	Relay, Socket Type Coil: 24V dc Contacts: 4PDT, 24V dc, 2 Amperes	270-0007	3
Q1,Q2	Transistor, 2N3906, PNP, Silicon, TO-92 Case	210-3906	2
R1	Resistor, 47 k Ohm $\pm 5\%$, 1/4W	100-4753	1
R2	Resistor, 2.2 Ohm $\pm 5\%$, 10W, WW	132-2213	1
R3	Resistor, 100 Ohm $\pm 5\%$, 1/4W	100-1033	1
R4,R5	Resistor, 4.7 k Ohm $\pm 1\%$, 1/4W	103-4741	2
R6,R7	Resistor, 243 Ohm $\pm 1\%$, 1/4W	103-2431	2
R8	Resistor, 47 k Ohm $\pm 5\%$, 1/4W	100-4753	1
R9,R10	Resistor, 100 Ohm $\pm 5\%$, 1/4W	100-1033	2
U1,U2	Integrated Circuit, LM317T, Adjustable Positive Voltage Regulator, 1.2V to 37V, 1.5 Ampere, TO-220 Case	227-0317	2
XK1 THRU XK3	Relay Socket	270-0008	3
----	Relay Hold-down Spring	270-0017	3
----	Blank Circuit Board	511-0350	1

TABLE 6-14. POWER TRANSFORMER ASSEMBLY - 951-0007

REF. DES.	DESCRIPTION	PART NO.	QTY.
----	Transformer, Power Primary: 117V ac $\pm 10\%$, 50/60 Hz Secondary: 23V ac @ 3 Amperes	376-0007	1

SECTION VII
350A SERIES CONSOLE DRAWINGS

7-1. INTRODUCTION.

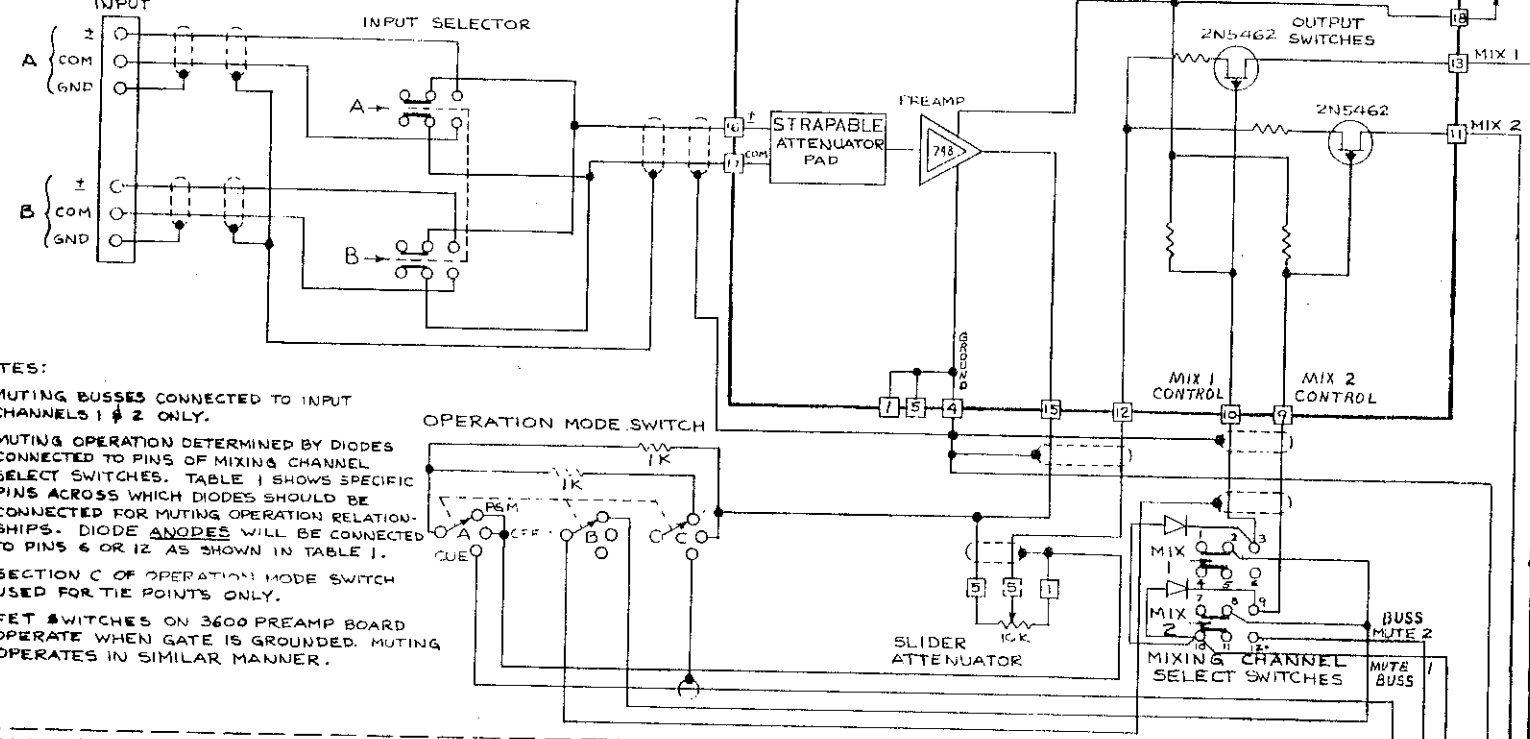
7-2. This section provides schematic diagrams and assembly drawings as indexed below for the Broadcast Electronics 350A Series Audio Consoles.

<u>FIGURE</u>	<u>TITLE</u>	<u>NUMBER</u>
7-1	OVERALL SCHEMATIC DIAGRAM, 10M350A CONSOLE	SD906-6502
7-2	OVERALL SCHEMATIC DIAGRAM, 10S350A CONSOLE	SD906-6501
7-3	ASSEMBLY DIAGRAM, POWER SUPPLY AND RELAY CIRCUIT BOARD (FOR STEREOPHONIC CONSOLES)	AB918-4002
7-4	SCHEMATIC DIAGRAM, MONO/STEREO PREAMPLIFIER CIRCUIT BOARDS	SD906-7112
7-5	ASSEMBLY DIAGRAM, MONO/STEREO PREAMPLIFIER CIRCUIT BOARDS	AC918-3600/ -3601
7-6	SCHEMATIC DIAGRAM, MIXER/LINE DRIVER AMPLIFIER CIRCUIT BOARD	SD906-7100
7-7	ASSEMBLY DIAGRAM, MIXER/LINE DRIVER AMPLIFIER CIRCUIT BOARD	AC918-3604
7-8	SCHEMATIC DIAGRAM, MONO MATRIX CIRCUIT BOARD	SC906-3602
7-9	ASSEMBLY DIAGRAM, MONO MATRIX CIRCUIT BOARD	AC918-3602
7-10	SCHEMATIC/ASSEMBLY DIAGRAM, VU METER RECTIFIER CIRCUIT BOARD	AA918-0001
7-11	SCHEMATIC DIAGRAM, STEREOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD	SC906-3606
7-12	ASSEMBLY DIAGRAM, STEREOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD	AC918-3606
7-13	SCHEMATIC DIAGRAM, MONOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD	SC906-7111
7-14	ASSEMBLY DIAGRAM, MONOPHONIC CUE/HEADPHONE AMPLIFIER CIRCUIT BOARD	AC918-3605
7-15	SCHEMATIC DIAGRAM, MONITOR AMPLIFIER CIRCUIT BOARD	SC906-3709
7-16	ASSEMBLY DIAGRAM, MONITOR AMPLIFIER CIRCUIT BOARD	AC918-3709
7-17	SCHEMATIC DIAGRAM, CUE/INTERCOM CIRCUIT BOARD	SB906-7104
7-18	ASSEMBLY DIAGRAM, CUE/INTERCOM CIRCUIT BOARD	AC918-7018

<u>FIGURE</u>	<u>TITLE</u>	<u>NUMBER</u>
7-19	SCHEMATIC DIAGRAM, POWER SUPPLY AND RELAY CIRCUIT BOARD (FOR MONOPHONIC CONSOLES)	SC911-0350
7-20	ASSEMBLY DIAGRAM, POWER SUPPLY AND RELAY CIRCUIT BOARD (FOR MONOPHONIC CONSOLES)	AC911-0350
7-21	CIRCUIT BOARD PLACEMENT DIAGRAM, 10M350A CONSOLE	AB906-4010
7-22	CIRCUIT BOARD PLACEMENT DIAGRAM, 10S350A CONSOLE	AB906-4011
7-23	ASSEMBLY DIAGRAM, SLIDE ATTENUATOR	597-0013- 100
7-24	WIRING DIAGRAM, POWER SUPPLY INPUT	597-0013- 101

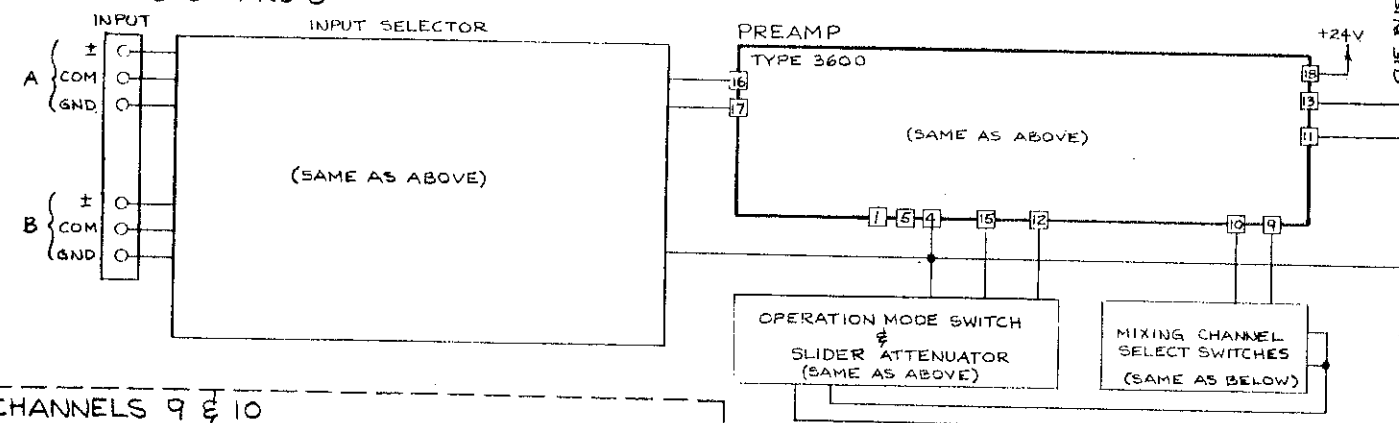
EXTERNAL
OR
AIR INPUT

CHANNELS 1 & 2



- NOTES:
1. MUTING BUSES 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

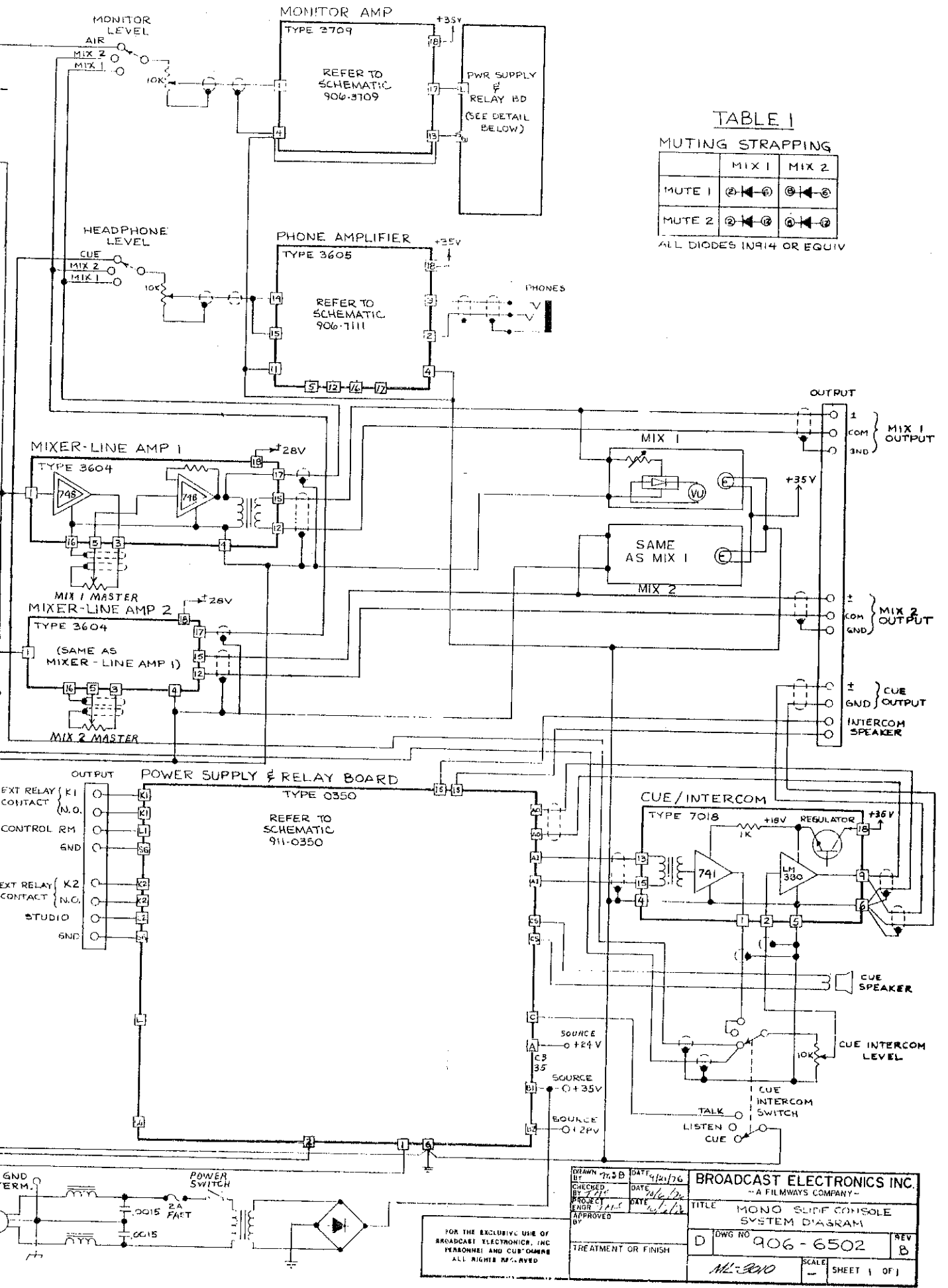
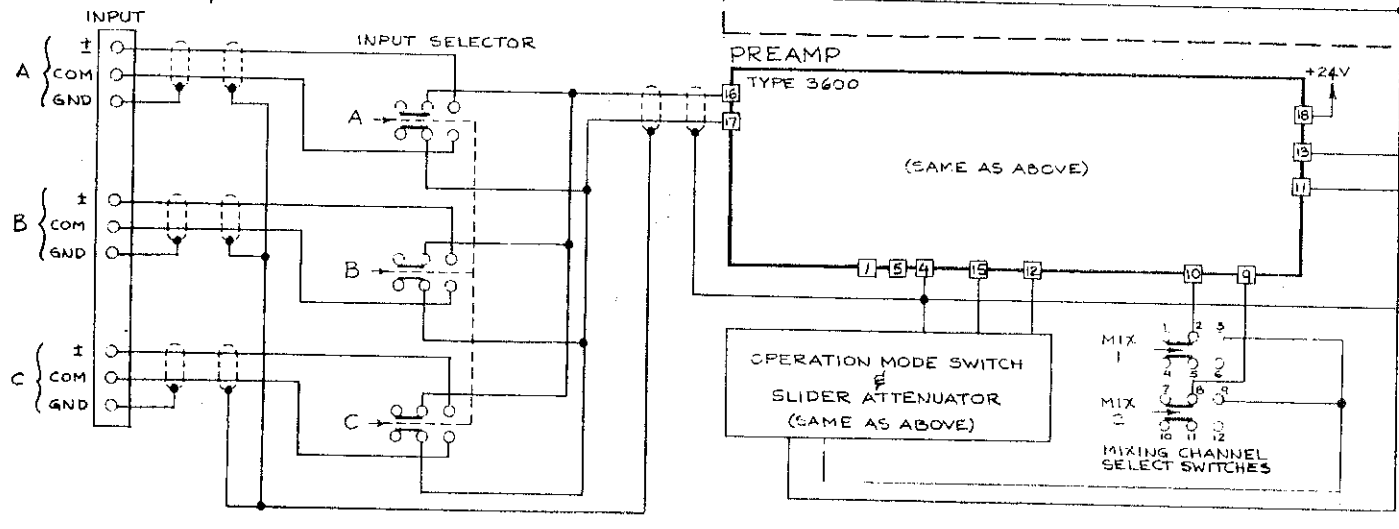


TABLE 1
MUTING STRAPPING

	MIX 1	MIX 2
MUTE 1	(2) ← (6)	(3) ← (6)
MUTE 2	(2) ← (6)	(3) ← (7)

ALL DIODES IN 914 OR EQUIV

FOR THE EXCLUSIVE USE OF
BROADCAST ELECTRONICS, INC.
PERSONNEL AND CUSTOMERS
ALL RIGHTS RESERVED

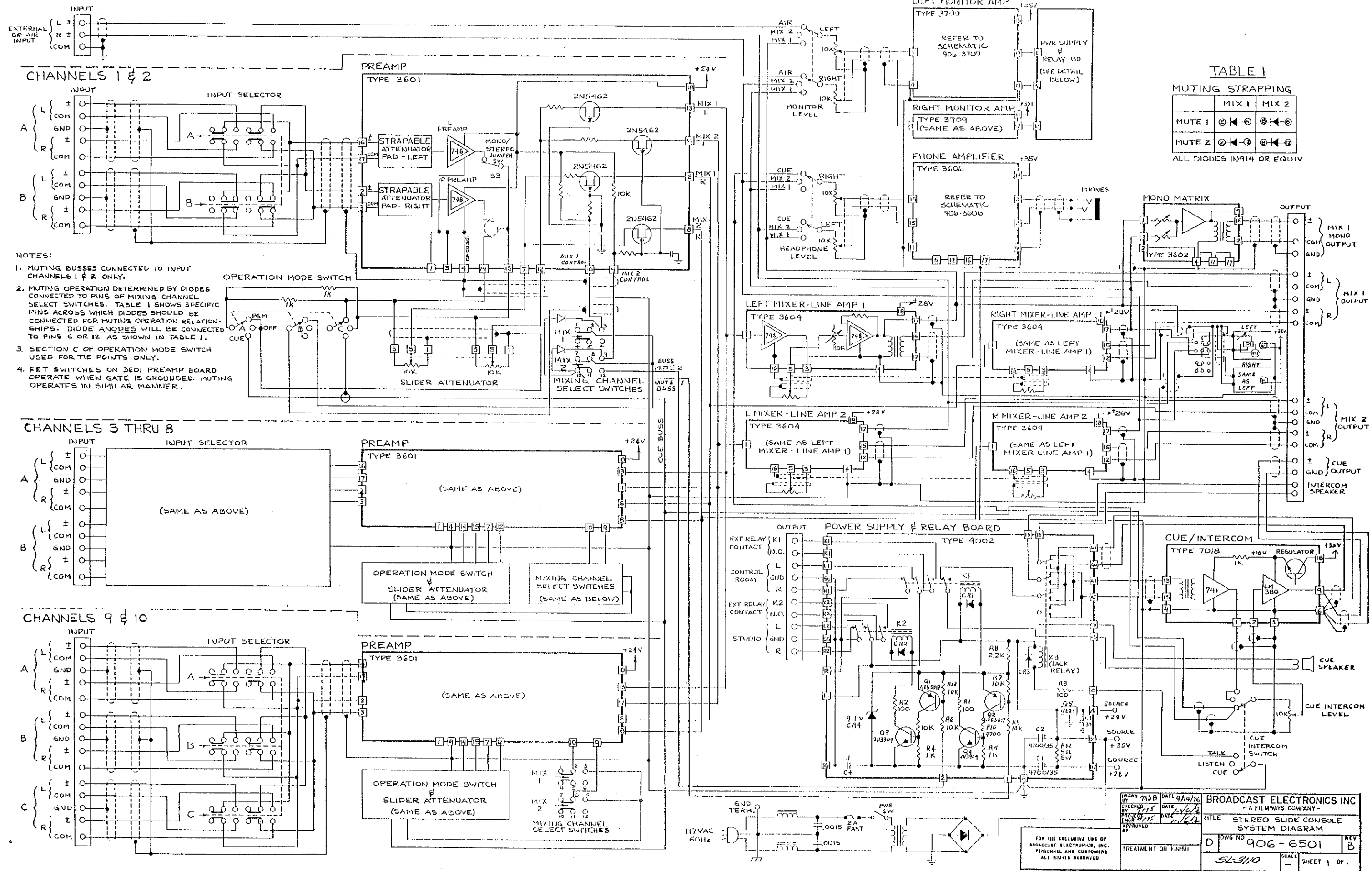
DATE: 1/11/76
BY: J. J. J.
PROJECT: 906-6502
APPROVED BY: J. J. J.

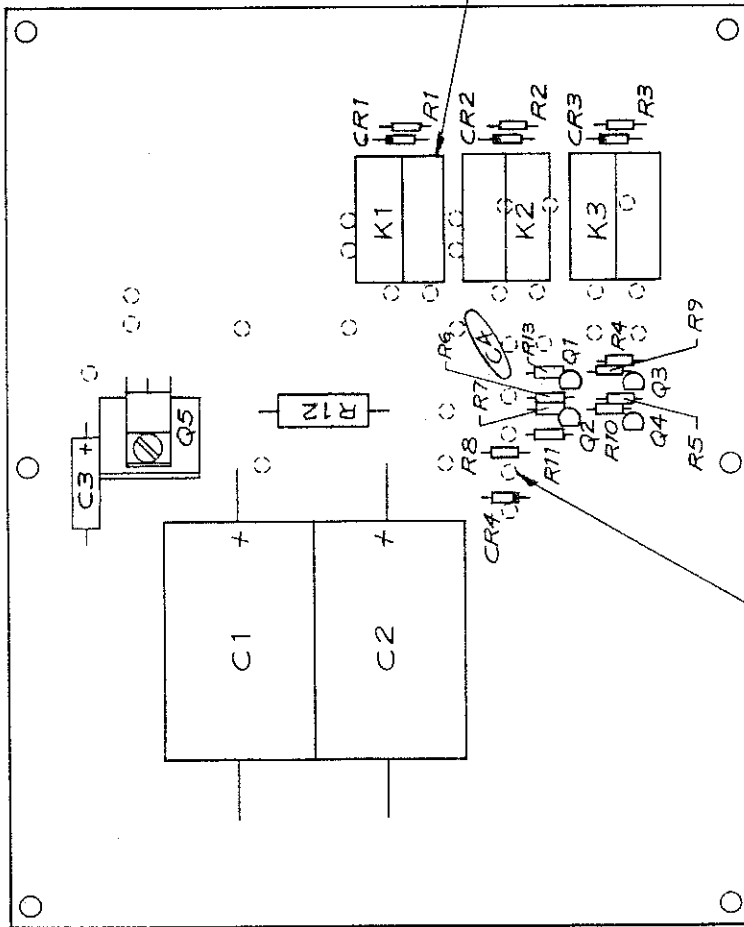
TREATMENT OR FINISH: D

SCALE: 1/8"

SHEET 1 OF 1

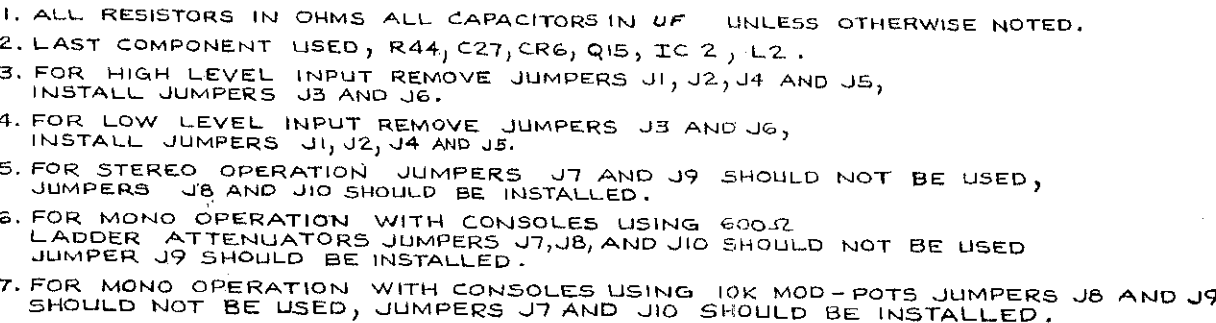
BROADCAST ELECTRONICS INC.
-A FILMWAYS COMPANY-
TITLE: MONO SLIDE CONSOLE
SYSTEM DIAGRAM
DWG NO: 906-6502
REV: B





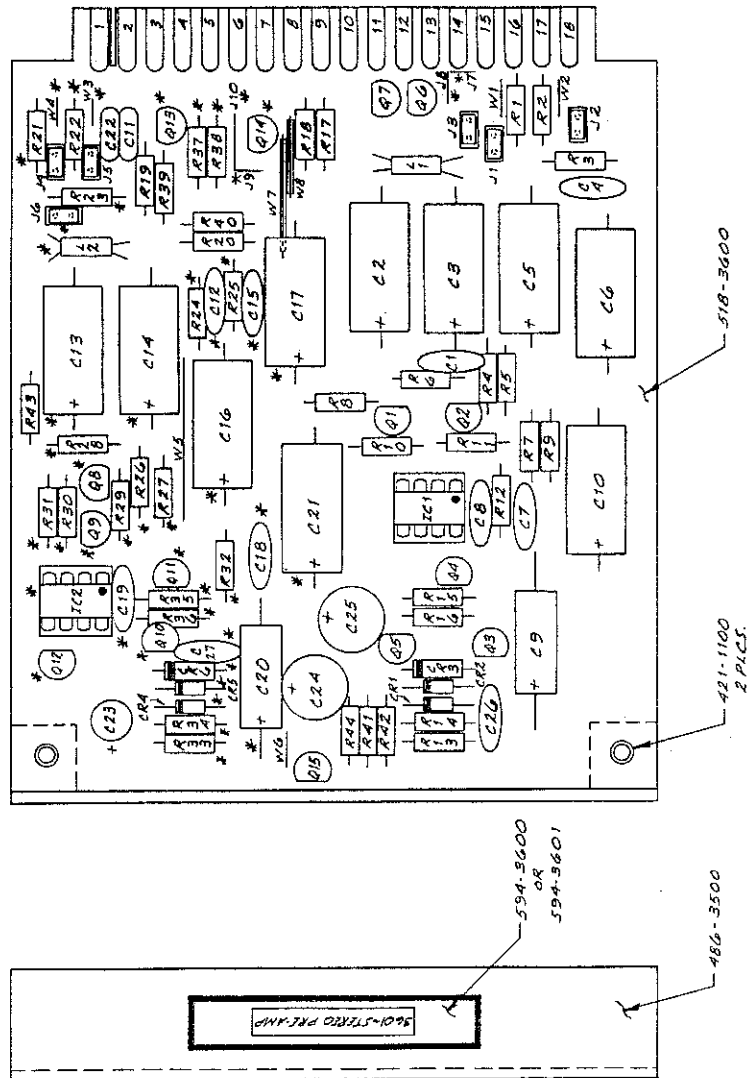
TURRET TERMINAL (MOUNTED ON
UNDERSIDE OF P.C. BOARD), TYP
30 PLACES

BROADCAST ELECTRONICS INC. —A FILMWAYS COMPANY—		DATE 9-20-78
TOLERANCE UNLESS OTHERWISE SPECIFIED DECIMAL 2 PL—01 3PL—.005 FRACTIONAL $\pm 1/64$ ANGULAR $\pm 1^\circ$ SHARP EDGES BEND RADI FILLET RADI		DATE 9-20-78
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TITLE POWER SUPPLY & RELAY ASSY		DATE 9-20-78
DWG. NO. B	REV. F	DATE 9-20-78
MANUAL		SCALE 1/1
SHEET 1 OF 1		



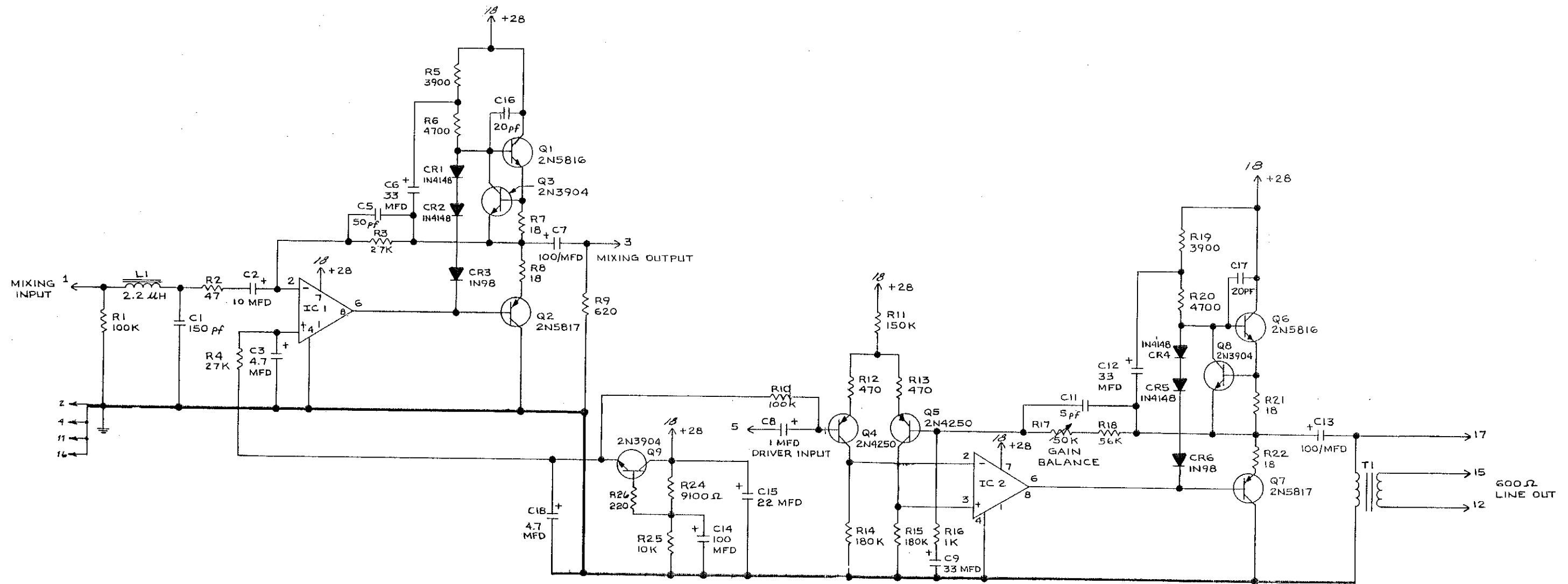
* INPUT LEVEL SELECT JUMPERS SEE NOTES 3 AND 4
* * MONO-STEREO SELECT JUMPERS SEE NOTES 5,6 AND 7

ITEM	QTY REQD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY Wm.	DATE 7/6/77	BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -
DECIAL 2 PL. DI SPL + .005		CHECKED BY	DATE	
FRACTIONAL 1/84		PROJECT	DATE	
ANGULAR 2 1/4		APPROVED BY		
SHARP EDGES TO		TITLE SCHEMATIC		
BEND RADI		MONO-STEREO PRE-IMP		
FILLET RADI		DWG NO 906 7112		
MATERIAL	TREATMENT OR FINISH		D	REV E
FOR THE EXCLUSIVE USE OF BROADCAST ELECTRONICS, INC. PERSONNEL AND CUSTOMERS ALL RIGHTS RESERVED		SHEET 1 OF 1		



NOTES:
 1. PART NUMBER 918-3600-MONO PREAMP.
 2. 918-3601-STEREO PREAMP.
 3. 918-3601-INSTALL J8 & J10 ONLY. (78J7)
 4. 918-3600-J7 THRU J10 NOT USED.
 5. SEE SCHEMATIC D908-THE FOR PROPER
 LAMP SELECTION.
 6. SEE B/M # 918-3600 (MONO) OR
 B/M # 918-3601 (STEREO)

BROADCAST ELECTRONICS INC. —A FILMWAYS COMPANY—	
DATE 5-24-82	TITLE PCB ASSEMBLY
BY MCK	DATE 5-24-82
CHECKED	APPROVED
PROJECT JMK	BY MCK
ENGINEER	DESIGNED
DATE 5-24-82	BY MCK
REV C	QWS NO. 918-3600
SCALE 2/1	SHEET 1 OF 1
TOLERANCE UNLESS OTHERWISE SPECIFIED: RESISTORS: 1% CAPACITORS: 5% ANGULAR: ±1° SURFACE MOUNTED: TO FILLET RADIUS MATERIAL	
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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	PARI	NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY Wm.		DATE 5/9/77	
DECIMAL 2 PL ± 01 3 PL ± 005		CHECKED BY		DATE 5/9/77	
FRACTIONAL 1/16 1/32		PROJECT ENGR BIRKIS		DATE 5/9/77	
SHARP EDGES TO		APPROVED BY		DATE	
BEND RADIUS		TREATMENT OR FINISH		DATE	
FILLET RADIUS		MATERIAL		DATE	
FOR THE EXCLUSIVE USE OF BROADCAST ELECTRONICS, INC. PERSONNEL AND CUSTOMERS ALL RIGHTS RESERVED				REV	
				D	
				DWG NO. 906-7100	
				SCALE	
				SHEET 1 OF 1	

BROADCAST ELECTRONICS INC.
- A FILMWAYS COMPANY -

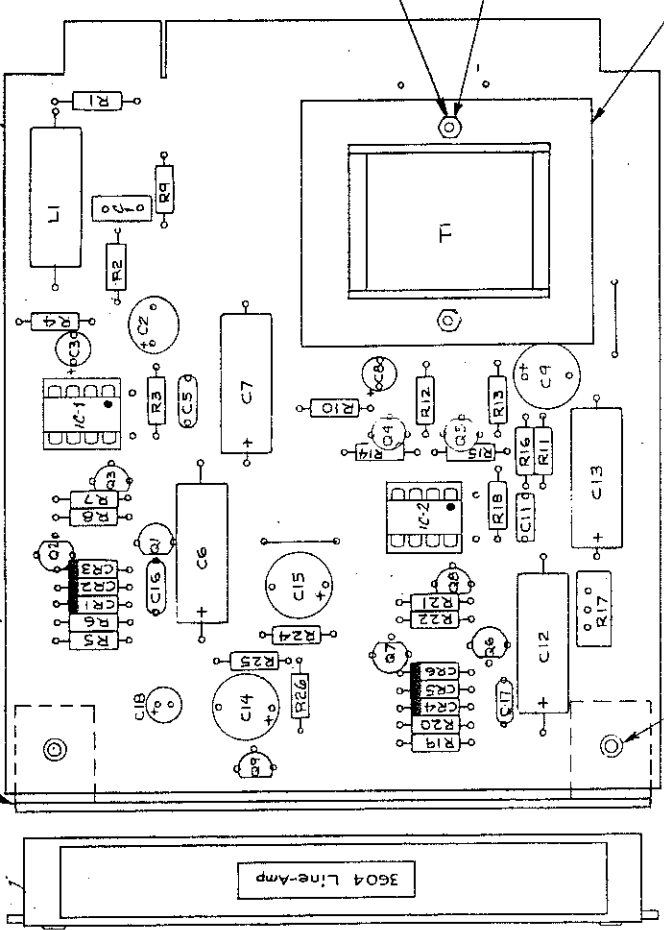
MIXER-LINE DRIVER AMP

DWG NO. 906-7100

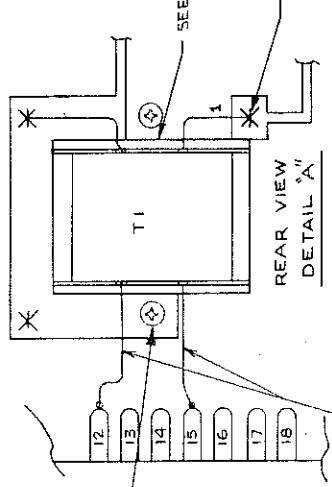
SCALE SHEET 1 OF 1

518-3604

486-3800
594-3604
(SEE DETAIL "B")



DETAIL "B"

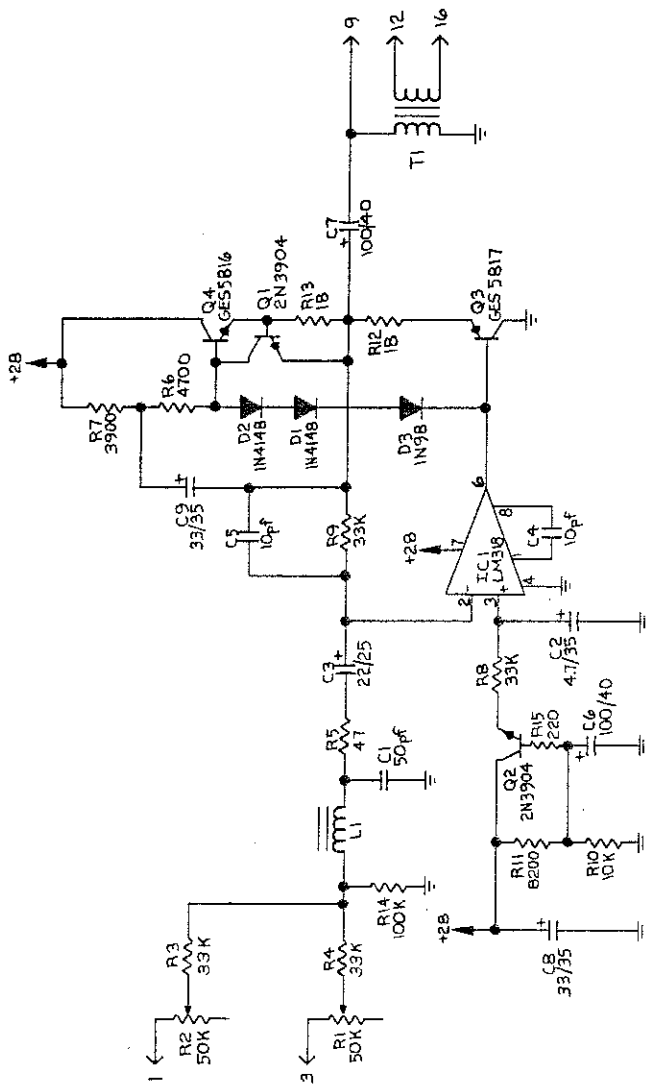


NOTE:
1. TRANSFORMER CORE MUST CONNECT TO GROUND.
2. INPUT SIDE OF TRANSFORMER INDICATED BY BLACK MARK.

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

ADD TUBING, 2 PLCS.

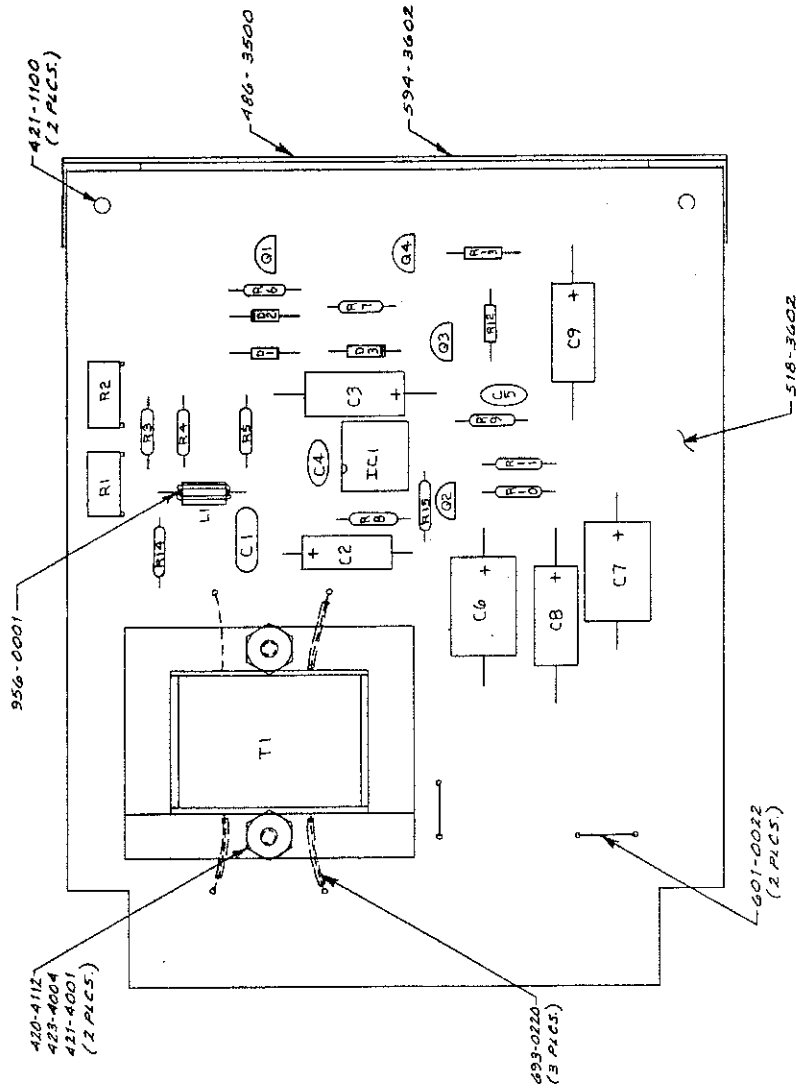
BROADCAST ELECTRONICS INC.		DATE 6-25-80	
DESIGNED BY	DATE	CHECKED BY	DATE
ENGINEER	DATE	APPROVED BY	DATE
TOLERANCE UNLESS OTHERWISE SPECIFIED		TITLE	
DECIMAL 2 PL = .01 3PL = .005		MIXER - LINE DRIVER AMP	
FRACTIONAL 1/16		DWG NO. 918-3604	
SHARP EDGES TO BEND RADIUS		REV	
FILLET RADIUS		C	
MATERIAL		CONSOLES	
TREATMENT OR FINISH		SCALE 2/1	
SHEET 1 OF 1			



- 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 PCB BOARD ASSEMBLY NO. 918-3602.

ITEM	QTY	ROD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
BROADCAST ELECTRONICS INC.					
- A FILMWAYS COMPANY -					
TITLE SCHEMATIC					
MONO MATRIX PCB					
C 906-3602					
CONSOLES					
SHEET 1 OF 1					

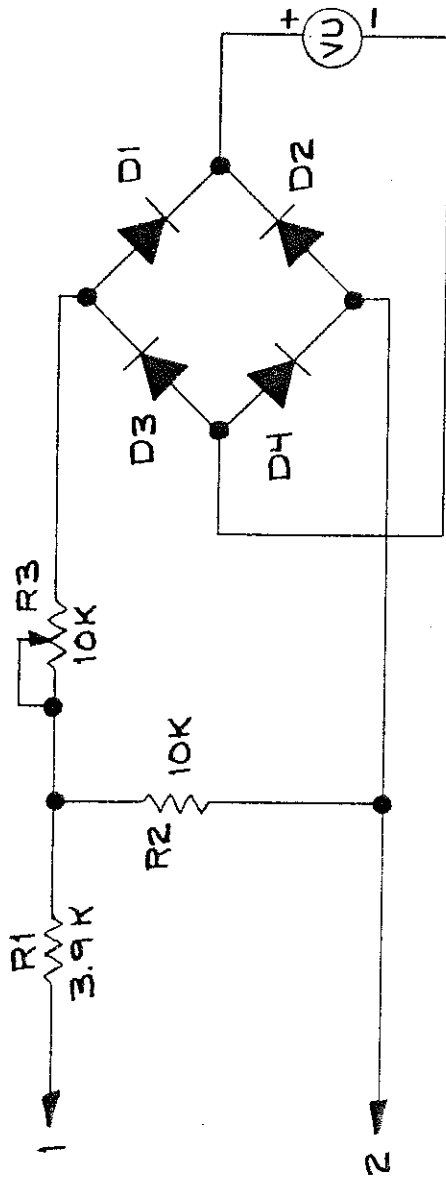
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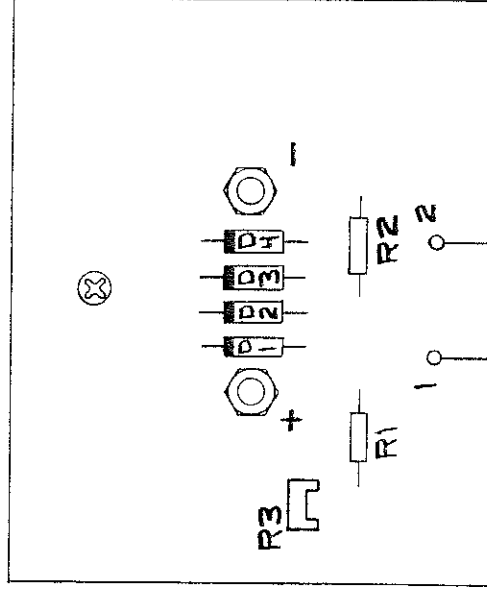
SEE B/M NO. 918-3602
LAST USED: C9, R15, D3, Q4, L1, T1, IC1

ITEM	QTY	ROD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED		DATE 12-78		BROADCAST ELECTRONICS INC.	
DECIMAL 2 PL, 01 3 PL, 003		DATE		- A FILMWAYS COMPANY -	
FRACTIONAL 2 1/84		DATE		TITLE ASS'Y, MONO MATRIX CARD	
ANGULAR 1/84		DATE		DWG NO 918-3602	
HOLE DIA 1/84		DATE		REV F	
BEND RADIUS		DATE		SCALE 2/1	
FILLET RADI		DATE		SHEET 1 OF 1	
MATERIAL		DATE		CONSOLES	

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BROADCAST ELECTRONICS, INC.
PERSONNEL AND CUSTOMERS
ALL RIGHTS RESERVED

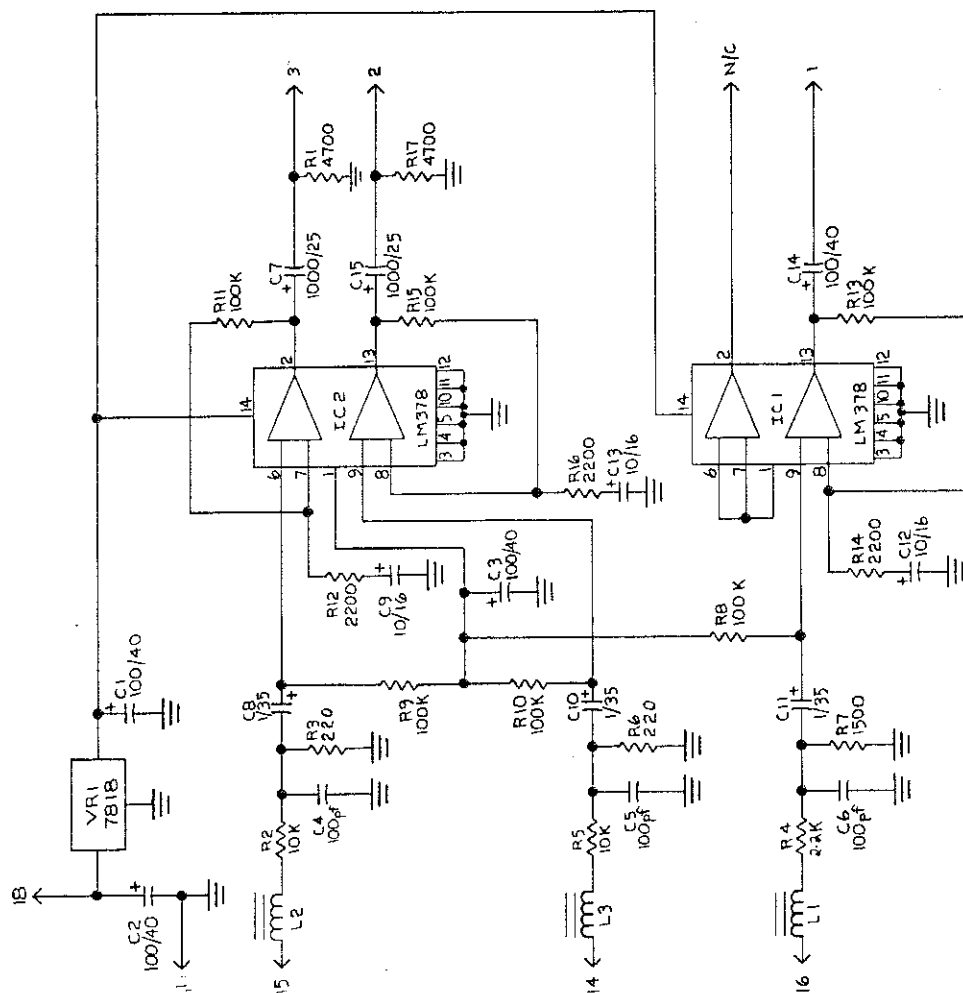


NOTE:
1 ALL DIODES IN 98
OR EQUIVALENT



RED GREEN

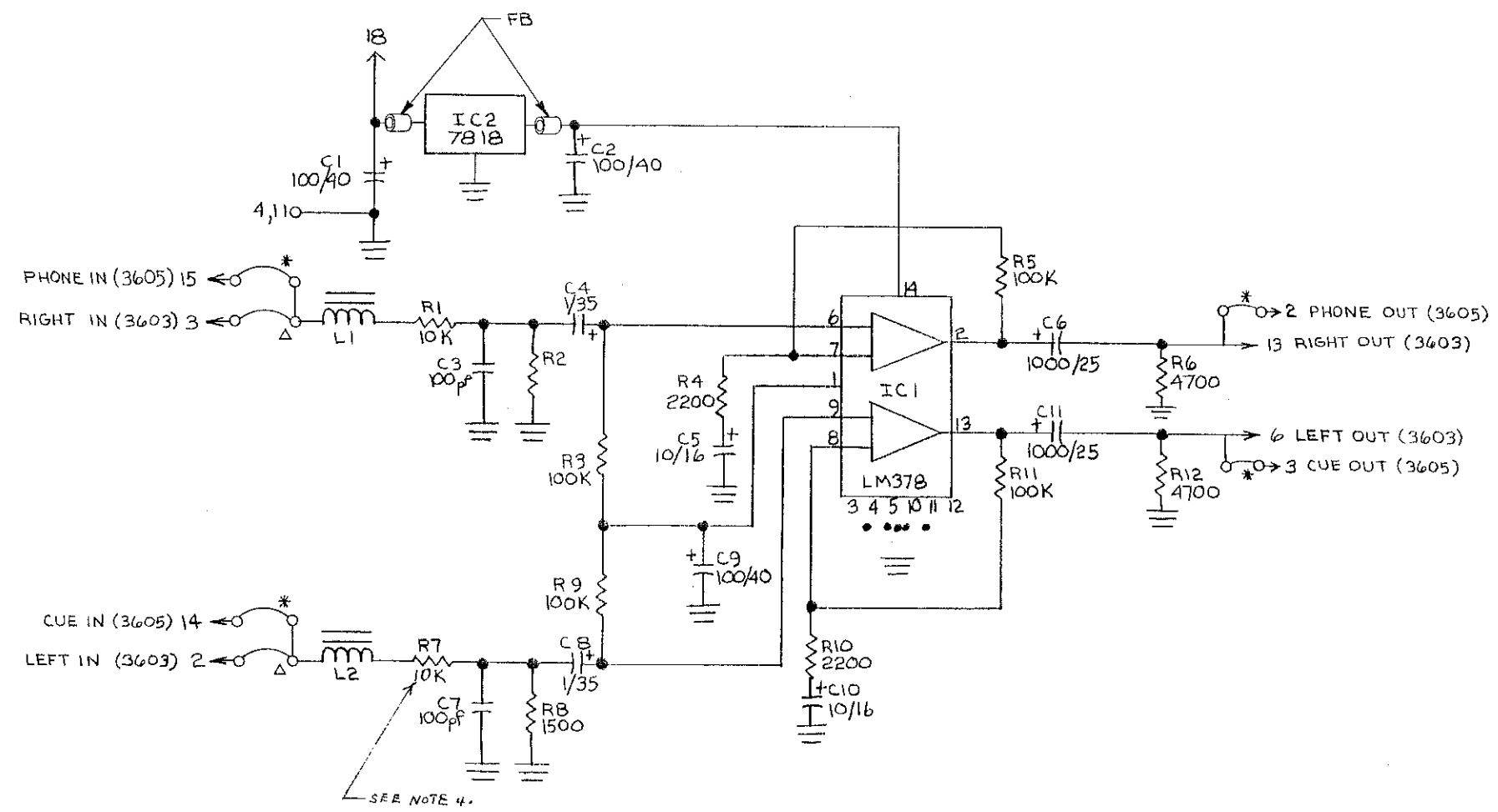
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TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xx ± .015	ANGLES ± 1°	ME PROJ. ENGR.	FINISH _____	TITLE METER RECTIFIER CARD VU-1
TYPE A SIZE A DWG. NO. 918-0001		MODEL _____	SCALE _____	REV B
SHEET 1 OF 1				



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	QDD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED		DATE		BROADCAST ELECTRONICS INC.	
DECIMAL 2 PL. OF 3 PL. 003		1-13-78		- A FILMWAYS COMPANY -	
FRACTIONAL 1/64		DATE		TITLE SCHEMATIC STEREOGRAPHIC	
ANGULAR 1/2"		DATE		CUE/HEADPHONE AMPLIFIER	
SHARP EDGES		DATE		DWG. NO. 906-3606	
BEND RADI		DATE		REV. 1	
FILLET RADI		DATE		CONSOLES	
MATERIAL		DATE		SHEET 1 OF 1	

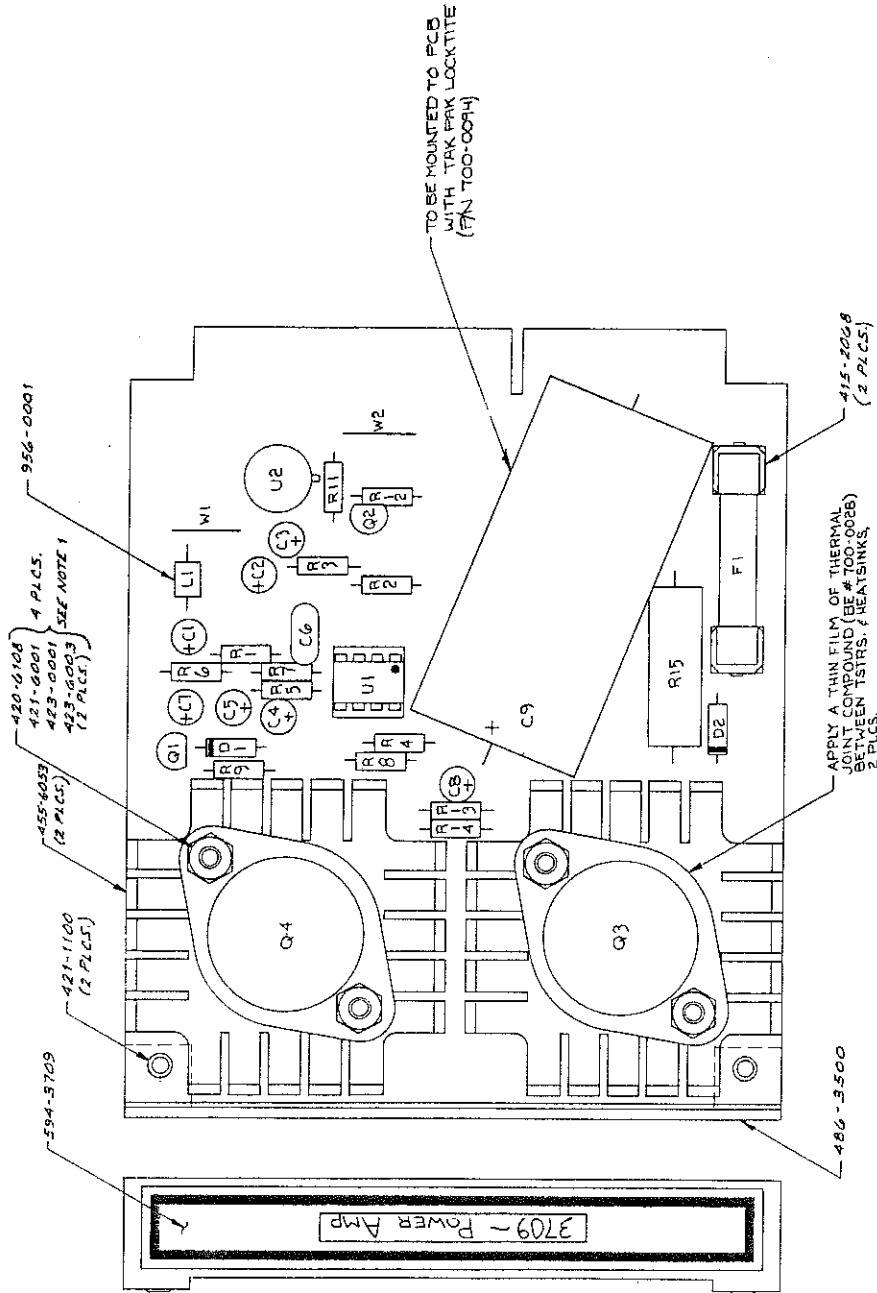
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 BROADCAST ELECTRONICS INC.
 PERSONNEL AND CUSTOMERS
 ALL RIGHTS RESERVED



- NOTES:
1. RESISTORS IN OHMS, 1/4 W; CAPACITORS IN MICROFARADS, UNLESS OTHERWISE NOTED.
 2. LAST COMPONENTS USED: C11, IC2, L2, R12.
 3. SEE P.C. BOARD ASSEMBLY NO. 918-3603 AND 918-3605.
 - * JUMPER FOR 918-3605.
 - Δ JUMPER FOR 918-3603.
 4. 47 IS 22K ONLY FOR 3605.
 5. R2 IS 220 OHMS ONLY FOR 3605 CARD.
 6. R2 IS 1500 OHMS ONLY FOR 3603 CARD.

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BROADCAST ELECTRONICS, INC.
PERSONNEL AND CUSTOMERS
ALL RIGHTS RESERVED

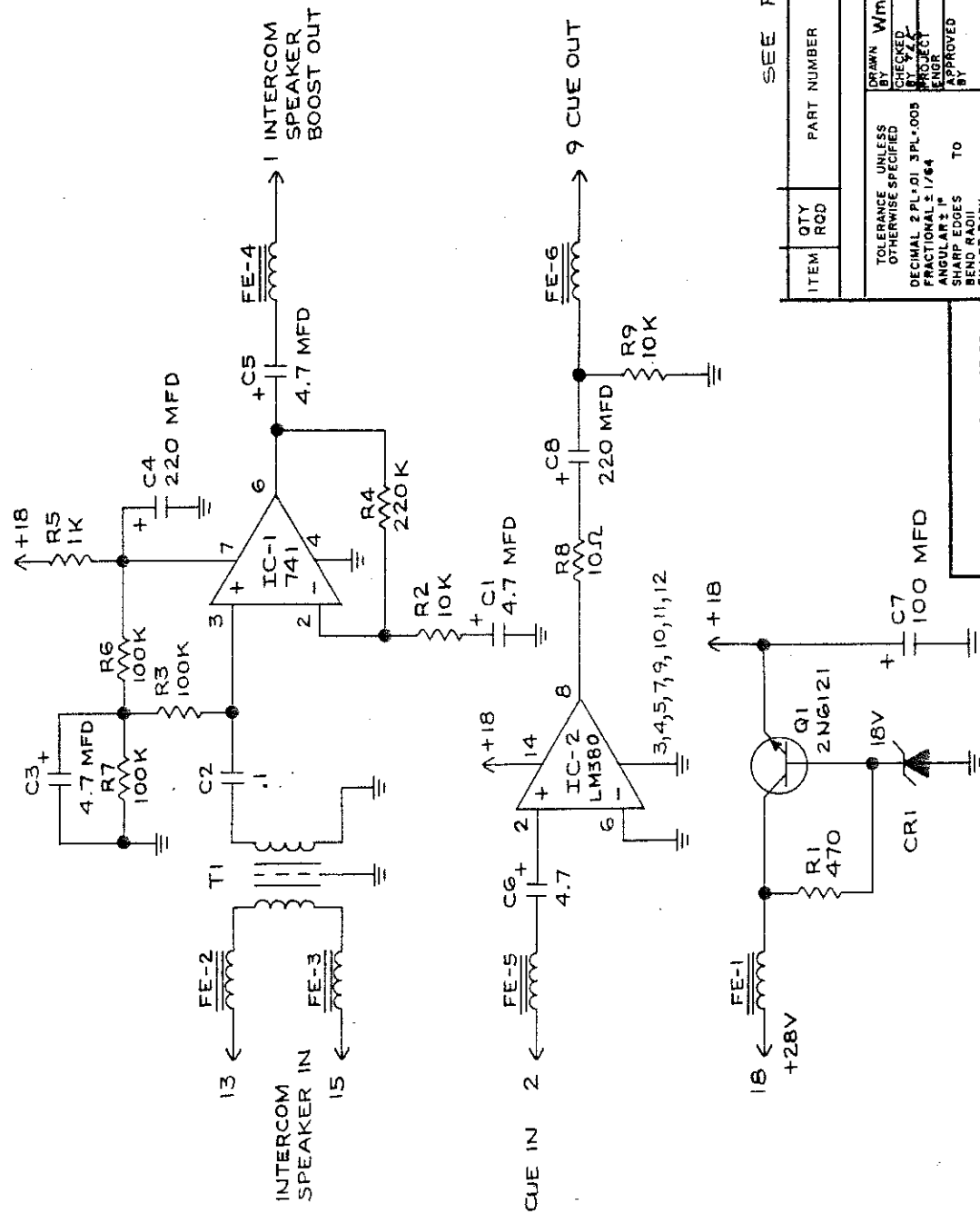
ITEM	QTY	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL				
TOLERANCE UNLESS OTHERWISE SPECIFIED		DRAWN BY M. HAYDEN DATE 2-3-78		
DECIMAL 2 PL ± 01 3 PL ± 005		CHECKED BY DATE		
FRACTIONAL ± 1/64		PROJECT ENGR DATE		
ANGULAR ± 1°		APPROVED BY		
SHARP EDGES TO		TREATMENT OR FINISH		
BEND RADII		MATERIAL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



NOTES:
 1. POSITION #10 FLAT WASHERS (423-0001) ON SCREWS BETWEEN HEATSINK & PCB BOARD. POSITION #17 LOCK WASHER UNDER HEAD OF SCREW.
 2. SEE B/M # 918-3709
 SEE SCHEMATIC # B-906-3709

TO BE MOUNTED TO PCB WITH TRK PRK LOCKTITE (FN 100-0094)		DATE 28-79 CHECKED BY PROJECT APPROVED BY		BROADCAST ELECTRONICS INC. -A FILMWAYS COMPANY-	
TOLERANCE VALUES OTHERWISE SPECIFIED DECIMAL 2 PL = 01.3PL = 005 FRACTIONAL 1/64 ANGLES 1/16 SHARP EDGES BEND RADIUS FILLET RADIUS MATERIAL		PCB ASSEMBLY B/W POWER AMP NON-INVERTING DWG NO 918-3709 REV E		CONSOLES SCALE 2/1 SHEET 1 OF 1	

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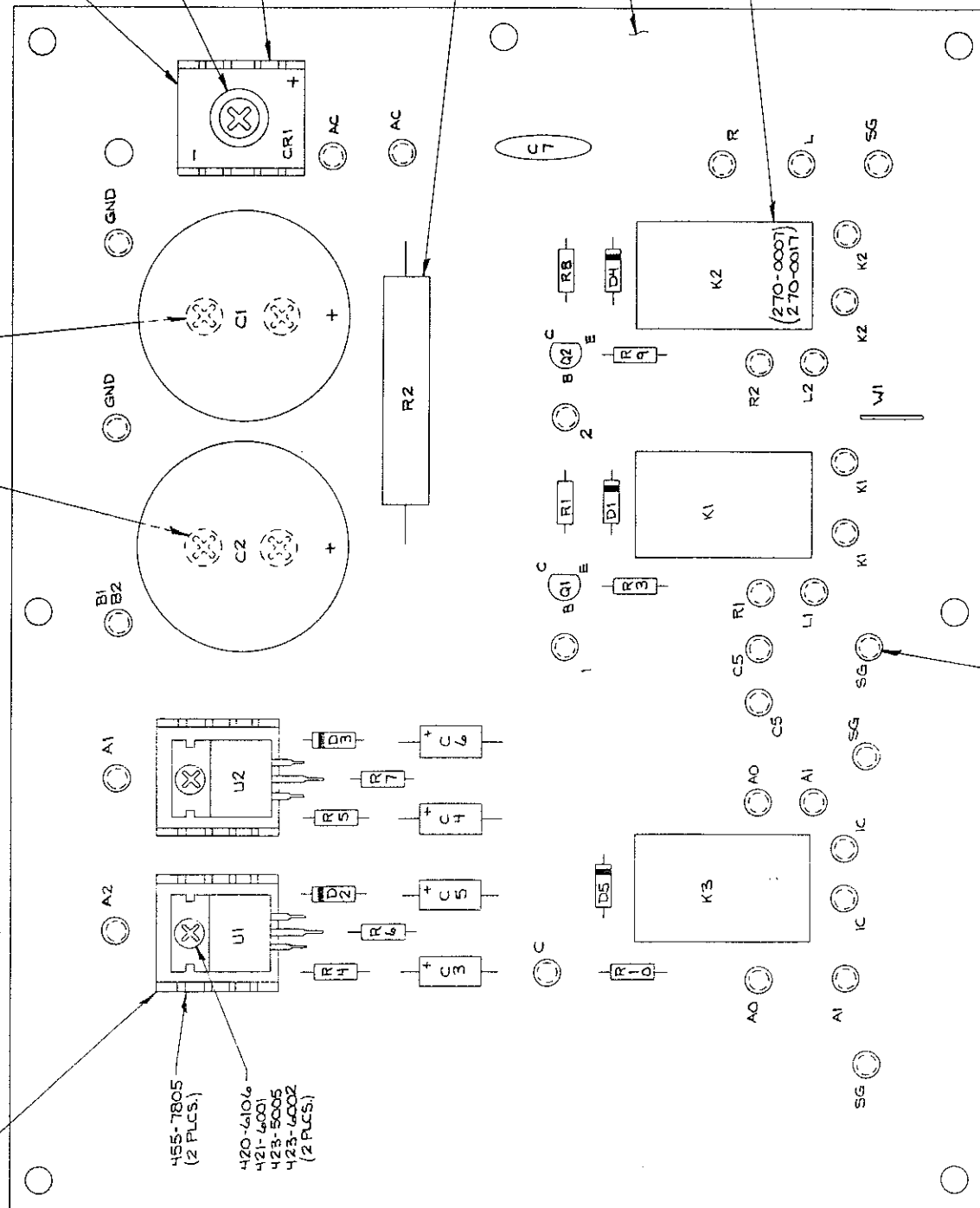
NOTES:
1.) LAST COMPONENTS USED:
R9, C8, CR1, Q1, IC-2, T1, FE-6

SEE PCB ASSY. NO. C-918-7018

ITEM	QTY	ROD	PART NUMBER	DESCRIPTION	NOTE
LIST OF MATERIAL					
TOLERANCE UNLESS OTHERWISE SPECIFIED	DATE 6/9/77	DATE	DATE	DATE	DATE
BY	BY	BY	BY	BY	BY
CHECKED	CHECKED	CHECKED	CHECKED	CHECKED	CHECKED
PROJECT	PROJECT	PROJECT	PROJECT	PROJECT	PROJECT
ENGR	ENGR	ENGR	ENGR	ENGR	ENGR
APPROVED	APPROVED	APPROVED	APPROVED	APPROVED	APPROVED
BY	BY	BY	BY	BY	BY
TREATMENT OR FINISH					
MATERIAL					
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BROADCAST ELECTRONICS INC. - A FILMWAYS COMPANY -					
TITLE SCHEMATIC					
CUE INTERCOM					
B					
10WG NO. 906-7104					
3000 ± 4000					
CONSOLES					
SHEET 1 OF 1					

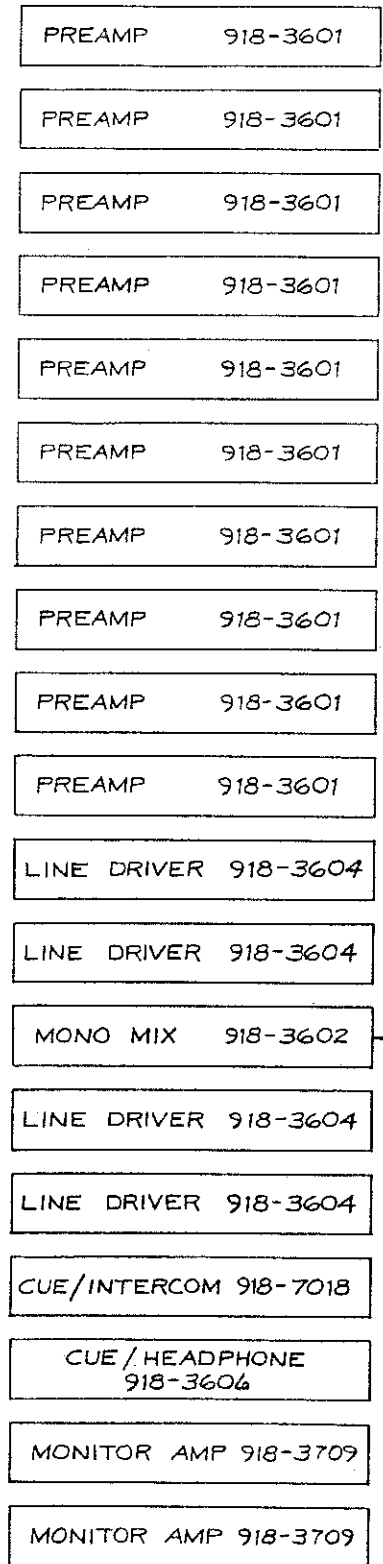
ADD A THIN FILM OF THERMAL JOINT COMPOUND (B-E #100-0028) (2 PLCS.)

ADD A THIN LAYER OF THERMAL JOINT COMPOUND (B-E #100-0028) BETWEEN HEATSINK & RECTIFIER.



BROADCAST ELECTRONICS INC.		4100 N. 24TH ST., P.O. BOX 3006, CUNY, S. 62508 217-224-8900	
TELEX 250142 CABLE BROADCAST		PCB ASSEMBLY	
TITLE		POWER SUPPLY & RELAY BD	
TYPE		DWG. NO.	
A		911-0350	
REV		B	
MODEL QM/105 350A		SCALE 2/1	
SHEET 1 OF 1			

OWN. BY JAH 9-10-85		MATERIAL	
CUST. NO.		FINISH	
ME		NET ASBY	
PROJ. ENGR.			
MFG.			
TOLERANCE (DECIMAL) U.O.S.			
± .005			
± .015			
± .035			



TOP VIEW

OPTIONAL

NOTE:

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

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---	--	--	--	----	--	----------	--	---------------------	--	--	--	---	--

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

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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or used or disclosed to others for man-
ufacturing or for any other purpose
except as specifically authorized in
writing by BROADCAST ELECTRONICS,
INC.

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

MATERIAL

TREATMENT OR FINISH

DRAWN BY C. ORR DATE 9-19-78
CHECKED BY DATE
PROJECT ENGR DATE
APPROVED BY

BROADCAST ELECTRONICS INC.
—A FILMWAYS COMPANY—

TITLE

PC. BOARD PLACEMENT
ML3010 MONO CONSOLE

DWG. NO.

906-4010

REV.
A

SCALE

SHEET 1 of 1

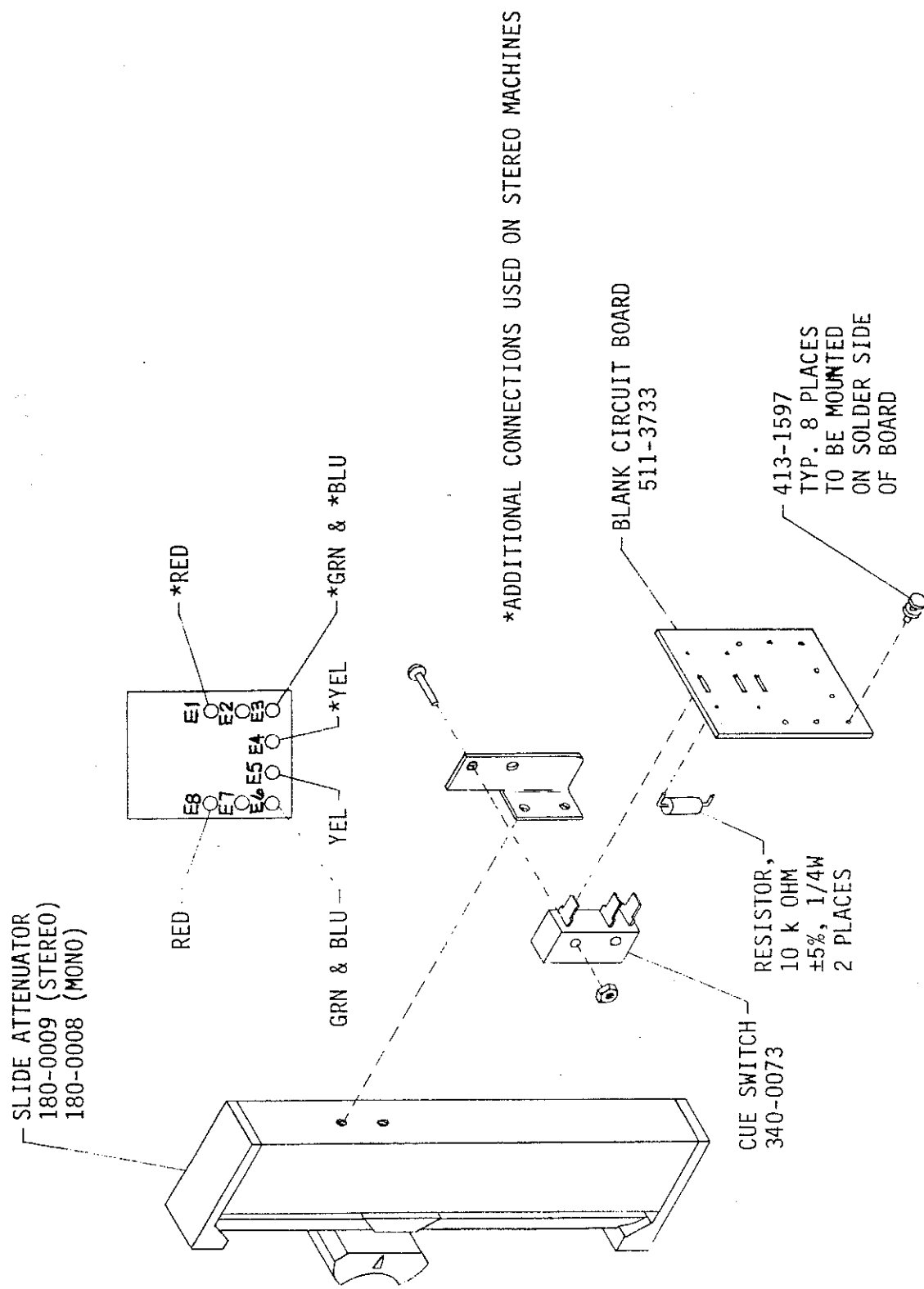


FIGURE 7-23. ASSEMBLY DIAGRAM, SLIDE ATTENUATOR

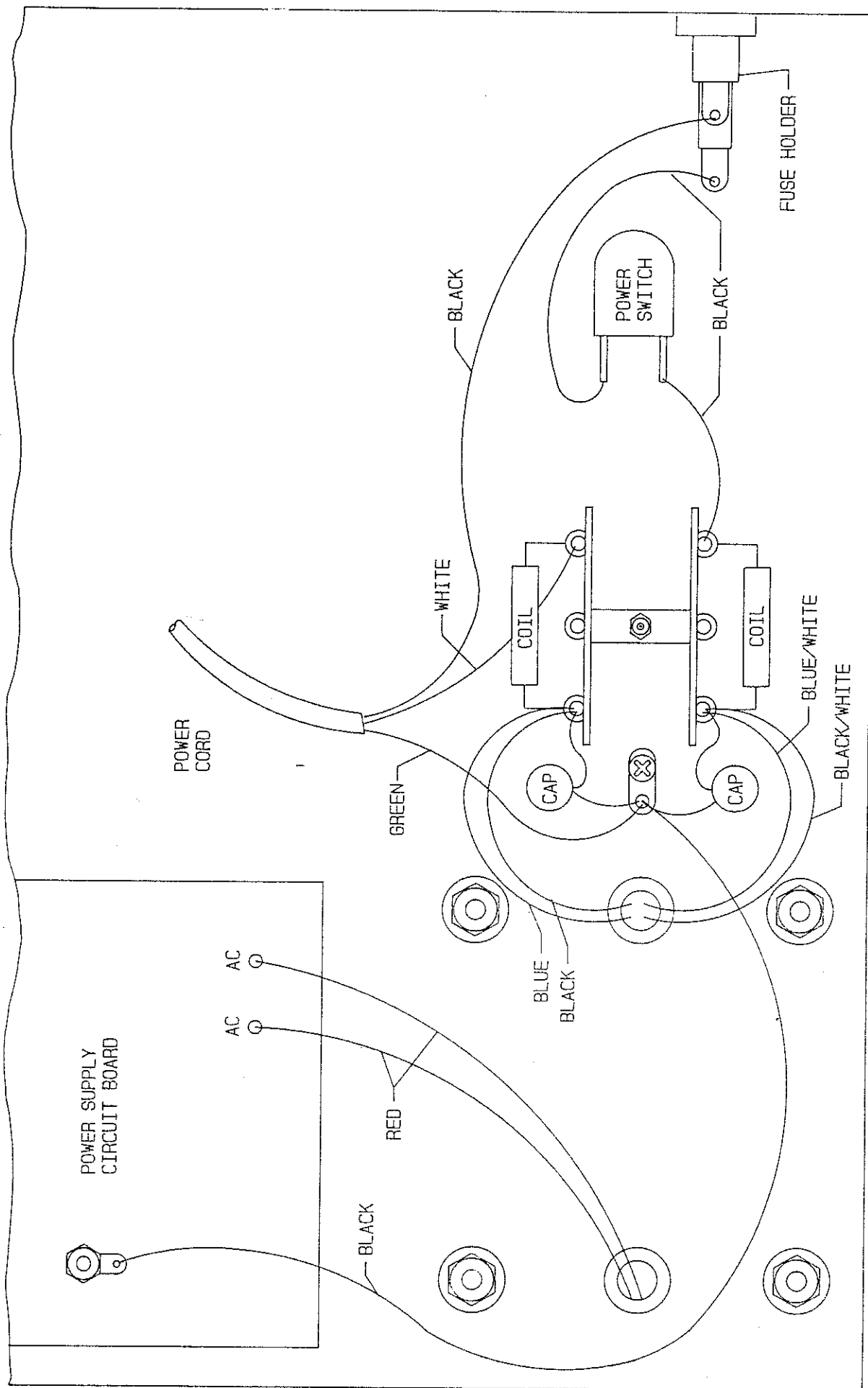


FIGURE 7-24. WIRING DIAGRAM, POWER SUPPLY INPUT

597-0013-101

PRODUCT WARRANTY

LIMITED TWO YEAR

While this warranty gives Purchaser specific legal rights, which terminate two (2) years (one year on turntable, cartridge and blower motors) from the date of shipment, Purchaser may also have other rights which vary state to state.

Broadcast Electronics, Inc. ("Seller") hereby warrants cartridge machines, consoles, and other new Equipment manufactured by Seller against any defects in material or workmanship at the time of delivery thereof, that develop under normal use within a period of two (2) years (one year for turntable, cartridge and blower motors) from the date of shipment, as such term is defined herein. Other manufacturer's and suppliers' Equipment and services, if any, including electronic tubes, solid state devices, transmission line, antennas, towers, related equipment and installation and erection services, shall carry only such manufacturer's or suppliers' standard warranty. This warranty extends to the original user and any subsequent purchaser during the warranty period. Seller'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. Seller'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 Purchaser 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 Seller, or if Equipment is operated under environmental conditions or circumstances other than those specifically described in Seller's product literature or instruction manual which accompany the Equipment. Seller shall not be liable for any expense of any nature whatsoever incurred by the original user without prior written consent of Seller.

Seller shall not be liable to Purchaser 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 Purchaser. All express and implied warranties shall terminate at the conclusion of the period set forth herein. Any card which is enclosed with the equipment will be used by Seller for survey purposes only.

If the Equipment is described as used, it is sold as is and where is. If the contract covers equipment not owned by Seller at this date, it is sold subject to Seller's acquisition of possession and title.

EXCEPT AS SET FORTH HEREIN, AND EXCEPT AS TO TITLE, THERE ARE NO WARRANTIES, OR ANY AFFIRMATIONS OF FACT OR PROMISES BY SELLER, WITH REFERENCE TO THE EQUIPMENT, OR TO MERCHANTABILITY, FITNESS FOR A PARTICULAR APPLICATION, SIGNAL COVERAGE, INFRAFRINGEMENT, OR OTHERWISE, WHICH EXTEND BEYOND THE DESCRIPTION OF THE EQUIPMENT ON THE FACE HEREOF.

BROADCAST ELECTRONICS, INC.

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