

## SECTION IV

# PRINCIPLES OF OPERATION

### 4.1 GENERAL.

A functional block diagram of a typical Broadcast Console 212G-1 is shown in figure 4-1. Amplifiers of the plug-in module type may be added, as necessary, to handle up to nine of 13 possible inputs and serve one of two output lines. Lever switches permit the selection of two possible sources for two of six of the low-level input attenuators. The remote input attenuator may be switched to three possible inputs. The output of each step type attenuator is connected to a key switch which can feed either the program or the audition line. During normal program operation, the monitor line can be used for audition purposes. Output from the two-stage Preamplifier 356A-1 is passed through a constant impedance attenuator before being switched to the program or audition circuit. Connections for control room speakers and warning lights must be interlocked with the third mixer key switch (MIXER 3) and remote and cue functions to prevent program interruptions. Studio speakers can be interlocked with other mixer keys. The program line can be monitored with vu meter M1. Cueing signals from cue positions on MIXERS 4, 5, 6, 7, 8, and 9 are available when Cue Amplifier 356Q-1 is plugged into J9. A CUE speaker level control is provided on the front panel and a cue speaker is provided in the console.

### 4.2 MIXER CIRCUITS.

Refer to figures 4-2 and 7-1. Nine independent input circuits are provided. Six are low-level microphone

or turntable inputs, each having an individual two-stage preamplifier. One remote net and two medium-level inputs are provided. The mixing circuits maintain the correct impedance relationship at all times, and the volume level in any specific circuit is independent of mixing and switching operations in other circuits. Attenuators AT1 through AT9 control the input levels to the mixing circuits. Each is a constant-impedance attenuator with 600:1200 impedance ratio. Resistors R20 through R37 compensate for changes of impedance at the mixer bus when one or more of the mixers is out of the circuit. Mixer controls and terminating resistors introduce approximately 15 db loss. Contacts on the mixer and channel key switches complete 12-volt d-c circuits to operate the speaker and warning light control relays K701 through K704. These circuits should be interlocked to prevent program interruption. Talk back from the control room into any one of the studios or into the remote lines not in use is possible by key switch control.

### 4.3 PROGRAM CIRCUITS.

Input signals connected into the program line are applied to the input of the booster amplifier. The booster amplifier is a type 356A-1 with input terminals connected for 250 ohms impedance. The booster amplifier plugs into J7. Output from the booster amplifier is attenuated by the MASTER gain control AT10. Output from the program amplifier is isolated from the program lines by a 6-db pad. The pad consists of resistors R42, R43, R45, and R46. Nominal

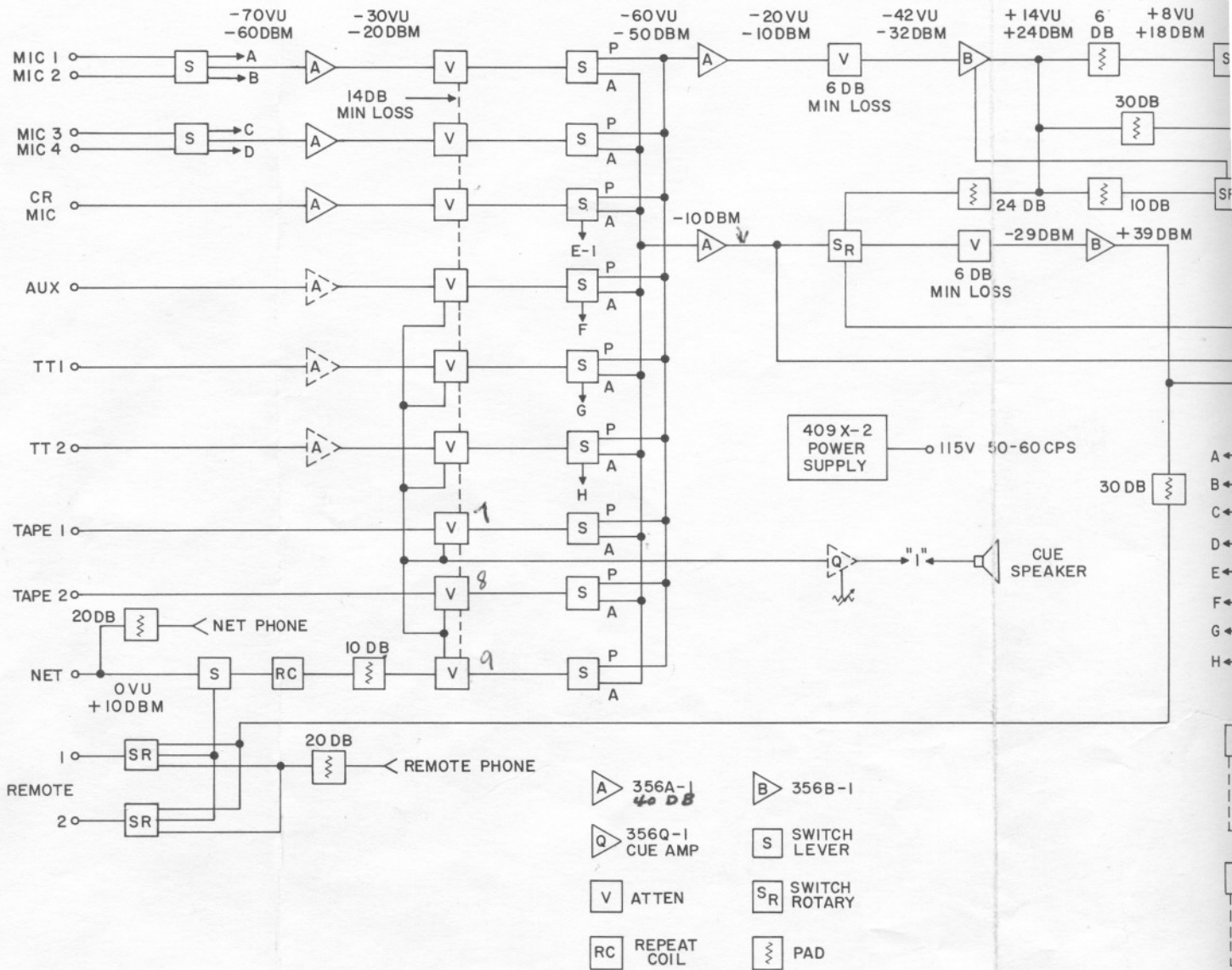


Figure 4-1. Broadcast Console 212G-1, Functional Block Diagram

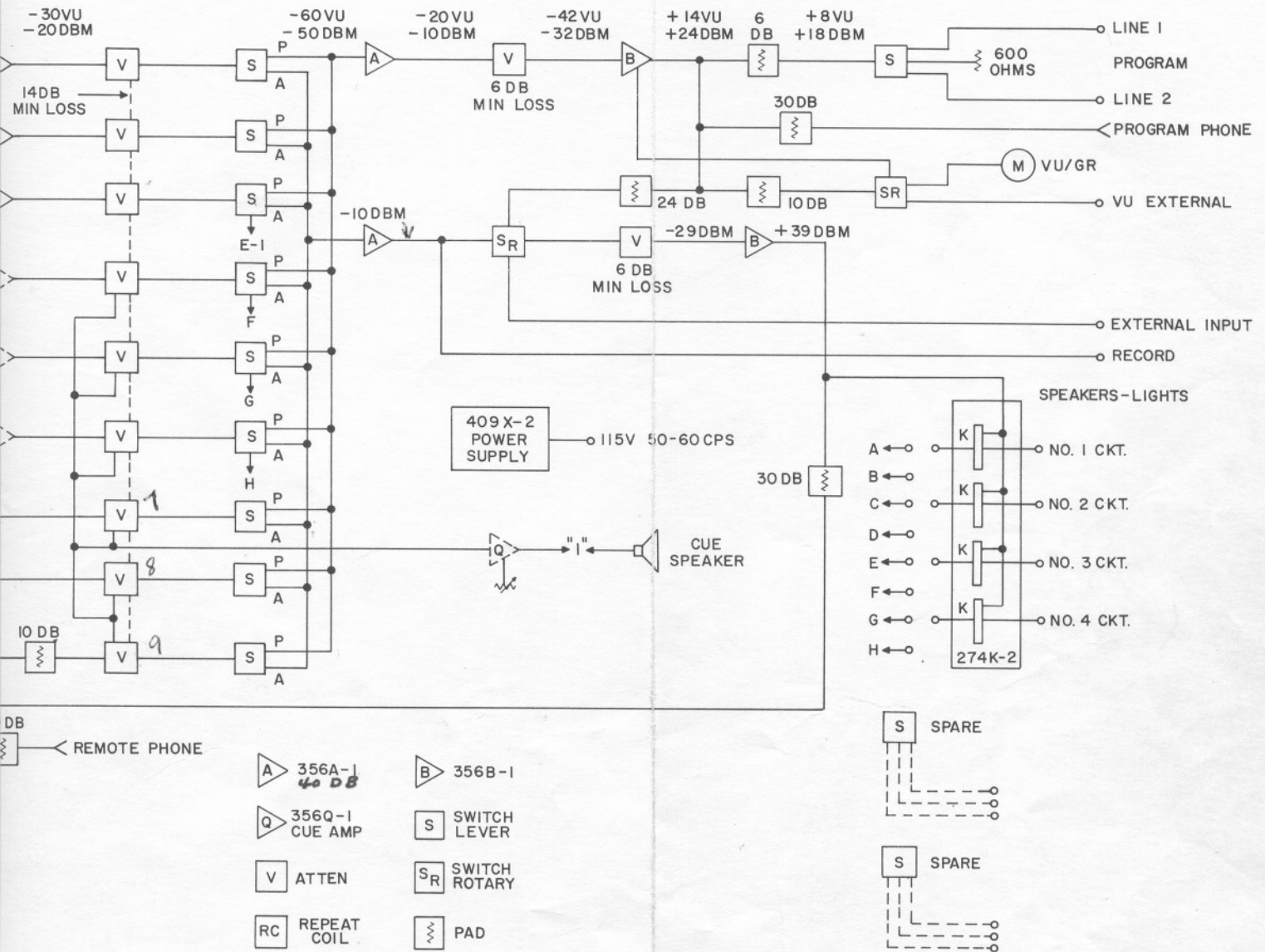
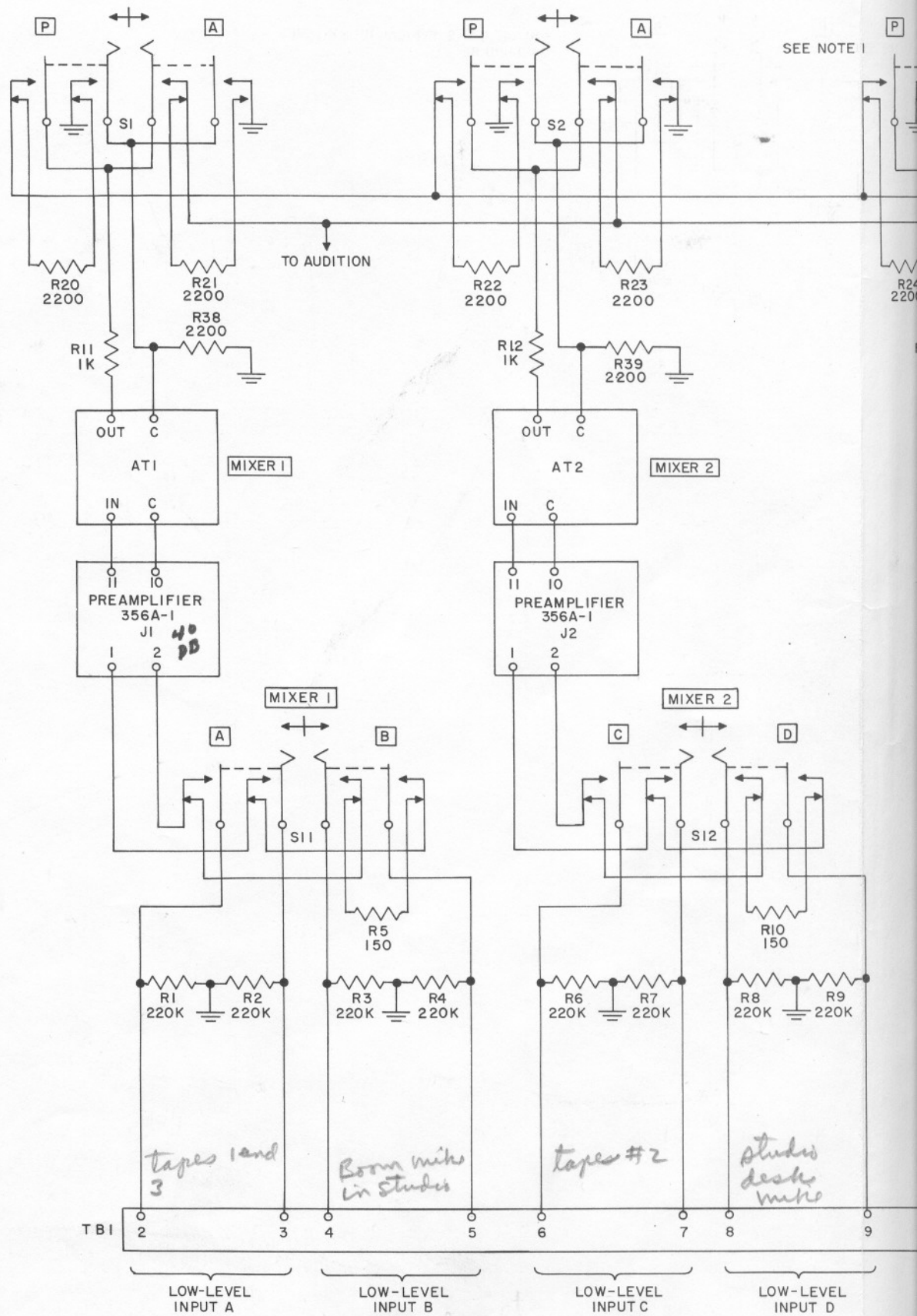
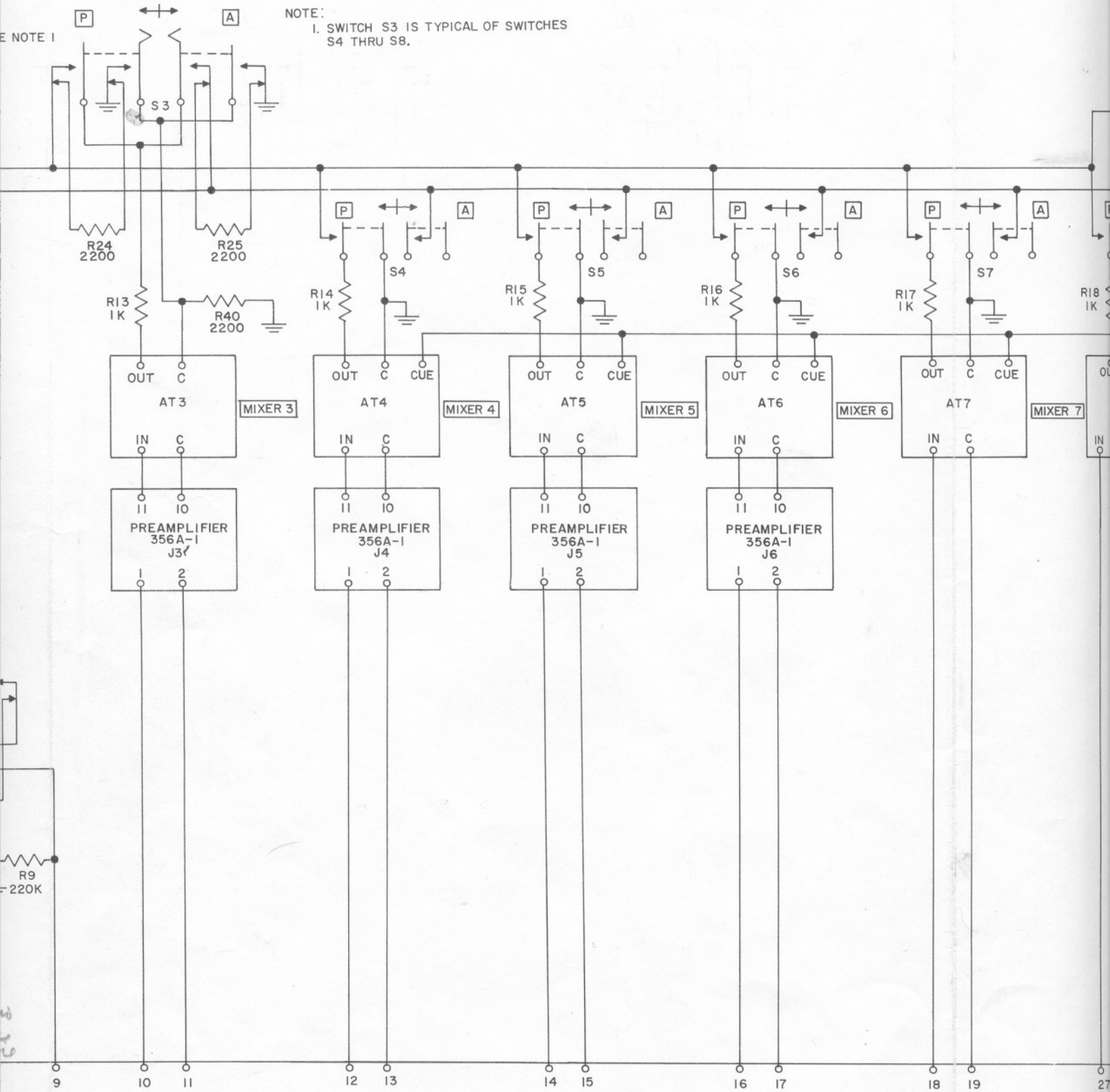


Figure 4-1. Broadcast Console 212G-1, Functional Block Diagram







*Announcer, mike*

*AUX  
spotmaster  
(on left)*

*BOTH  
TAPES*

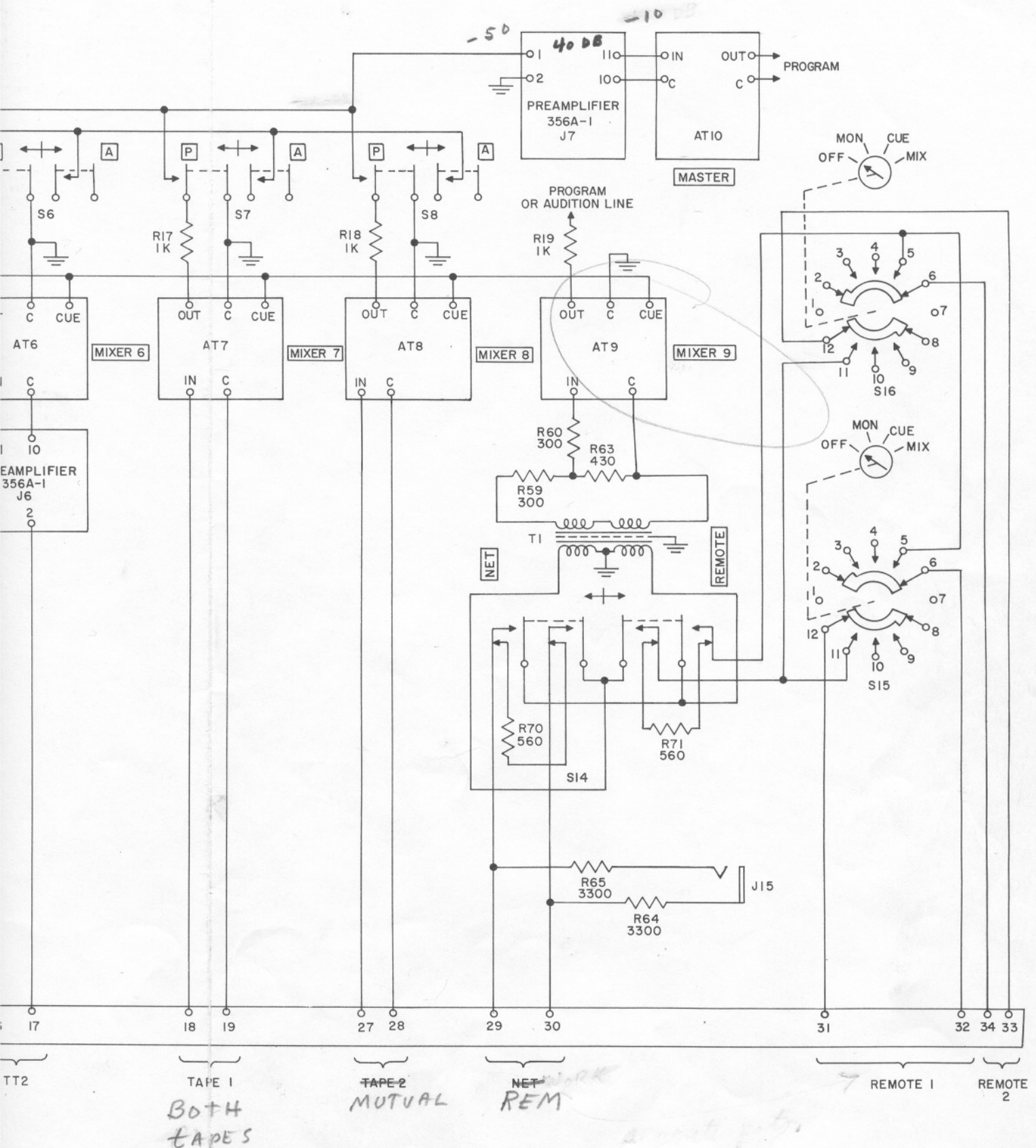


Figure 4-2. Mixer Circuits, Simplified Schematic Diagram

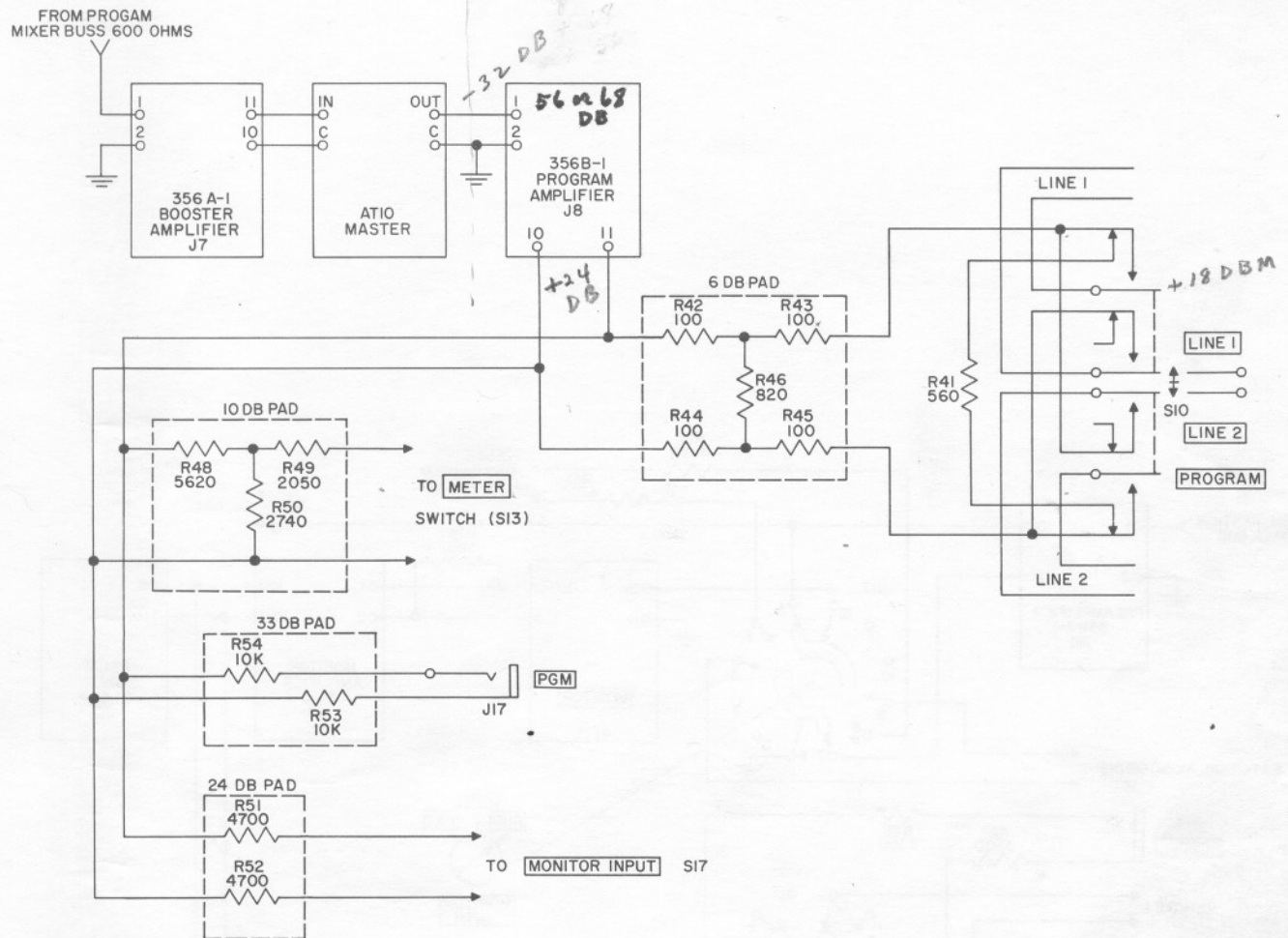


Figure 4-3. Program Circuits, Simplified Schematic Diagram

signal levels are -50 dbm at the input to the booster amplifier, -10 dbm at the output of the booster amplifier, -32 dbm at the input of the program amplifier, +24 dbm at the program amplifier output, and +18 dbm at the program line. The signal from the output of the program amplifier (+24 dbm) is connected through a 6-db pad and a LINE switch, S10, to the output line connections of the console. The program amplifier output also is applied through pads, to the MONITOR INPUT switch, S17, and the PGM phone jack, J17. The VU METER INPUT switch, S13, connects the VU meter, M1, through a pad to monitor the output of the program amplifier. Figure 4-3 is a simplified schematic diagram of the program circuits.

#### 4.4 MONITOR CIRCUITS.

Refer to figure 4-4. The MONITOR INPUT selector (S17) has three positions: AUD, PGM, and EXT. When the switch is in the EXT position, a signal connected at terminals 37 and 38 of TB1 may be monitored. With the switch in the PGM position, the program line

can be monitored. With the MONITOR INPUT switch in the AUD position and a mixer key in position A, the audition bus will be connected to the monitor circuit.

#### 4.5 STUDIO SPEAKER AND WARNING LIGHT CONTROL CIRCUITS.

Refer to figure 4-5. Mixer circuit key switches S11 and S12 and audition/program switches S1 through S6 control application of 12 volts d-c to relays K701 through K704.

The switches must be interlocked electrically to prevent program interruption. Speakers are operated from the 600-ohm output of Program/Monitor Amplifier 356B-1. Resistors R701, R702, R703, and R704 are connected as terminating resistors when speakers are removed from the circuit. Contacts on relays K701 through K704 control the application of 115 volts a-c to the ON AIR and OFF AIR warning lights. Wiring modifications may be necessary to meet individual station requirements.



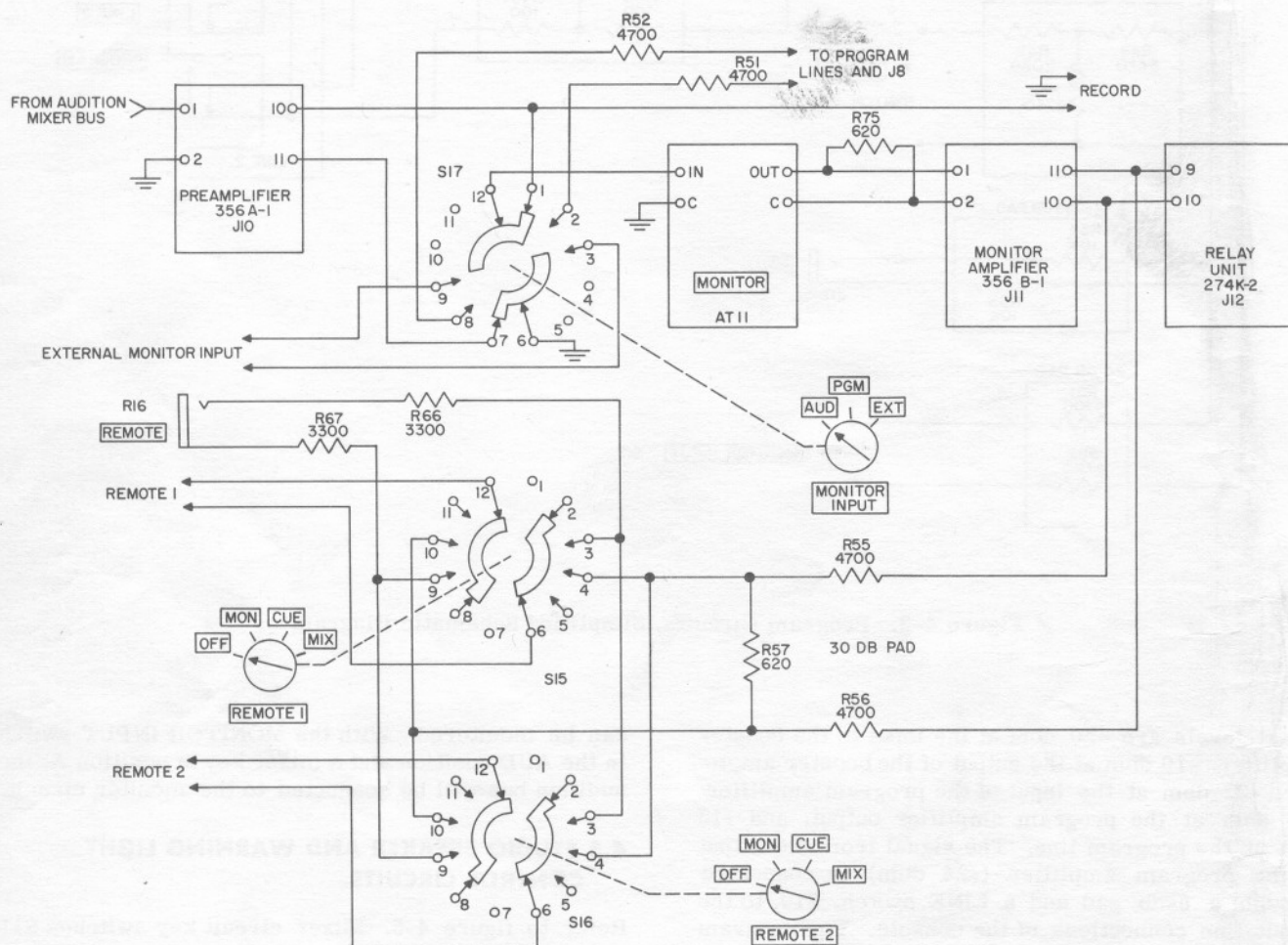
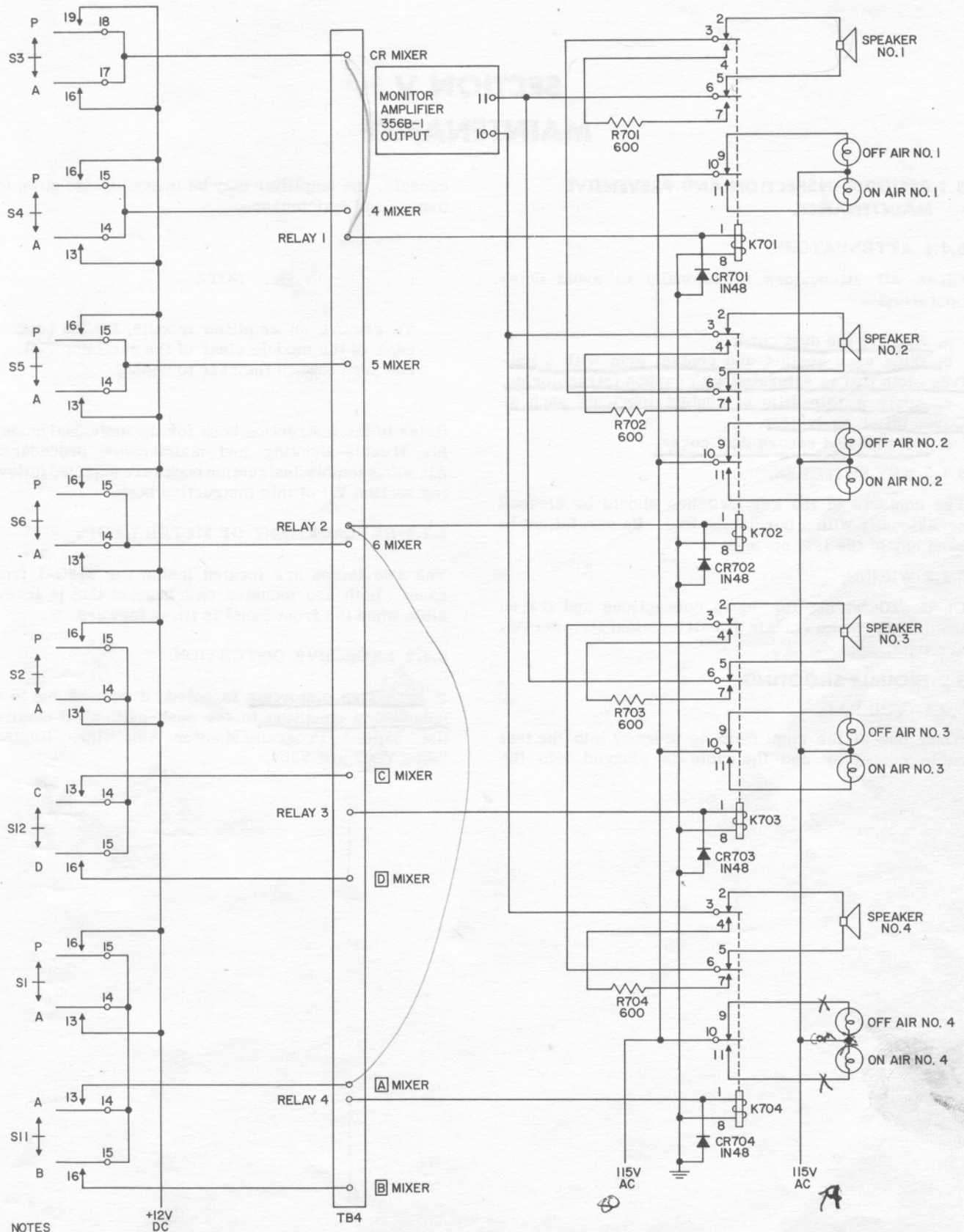


Figure 4-4. Monitor Circuits, Simplified Schematic Diagram





NOTES

1. A JUMPER MUST BE PLACED FROM CR MIXER TO RELAY 1 ON TB4 WHEN SPEAKER NO. 1 IS LOCATED IN THE CONTROL ROOM. ADDITIONAL JUMPERS MUST BE PLACED BETWEEN RELAYS 2, 3, 4 AND THE ASSOCIATED MIXER WHEN THERE IS A SPEAKER IN A STUDIO WITH A MICROPHONE.
2. IF MORE THAN ONE MICROPHONE IS USED IN A SPECIFIC LOCATION, THE SWITCH CONTACTS FOR EACH SHOULD BE PARALLELED & JUMPED ON TB4 SO THAT EITHER MICROPHONE WILL OPERATE THE ASSOCIATED RELAY.

Figure 4-5. Speaker and Warning Light Control Circuits, Simplified Schematic Diagram