

SECTION II

INSTALLATION AND ADJUSTMENT

2.1 UNPACKING AND INSPECTING.

Remove all packing material, and carefully lift the units from their crates. Check the equipment against the packing slips. Visually inspect the units for any apparent damage and for missing components. Check for proper operation of controls. Any claims for damage should be filed promptly with the transportation agency. If such claims are to be filed, all packing material must be retained.

2.2 INSTALLATION PROCEDURE.

2.2.1 GENERAL.

The location in an individual station will be determined by the arrangement of studio and control room facilities. The placement of equipment and wiring should be planned carefully before any installation work is started. Low-level microphone leads must be separated from high-level audio leads. All audio leads should be separated from the power and control wiring.

2.2.2 EQUIPMENT LOCATION.

Broadcast Console 212G-1 may be placed within 1/2-inch of a window, wall, or other vertical surface without sacrificing maintenance accessibility. Outline and mounting dimensions of the console are shown in figure 7-3.

2.2.3 EQUIPMENT MOUNTING PROCEDURE.

Lift the top panel and swing the front panel forward. Remove the three wing nuts that secure the terminal strip cover and remove the cover. Refer to figures 2-1 and 7-3. Four 1-1/2-inch diameter holes are

provided in the console base plate for the entry of external wiring. These holes are located directly in front of the terminal strip, TB1.

a. Drill additional holes for bolting down the console if desired. If the console is bolted down, the rubber feet should be left in place for spacers.

b. Rewire Preamplifiers 356A-1 to be used as booster amplifiers (J7 and J10) as follows. Move the lead that is connected to terminal 4 of transformer T201 in the 356A-1 to terminal 5 of T201. This reconnection changes the input impedance of the pre-amplifier from 150 ohms to 250 ohms.

c. After Broadcast Console 212G-1 is mounted, the modules may be plugged into their receptacles according to the following steps. Refer to figure 2-2 for layout of unit connectors.

NOTE

To remove an amplifier module, lift its rear edge clear of the retaining rail, and push toward the rear to unplug.

d. Plug Preamplifiers 356A-1 or jumper plugs into J1 through J6 as determined by the number and types of inputs to be used. If a mixer is used with a source which does not require a preamplifier (tape recorder, turntable with external preamplifier) use a jumper plug in lieu of a 356A-1. Refer to figure 2-3 for the schematic diagram of a jumper plug. The input impedance should be 600 ohms (unbalanced). If an attenuation pad is needed, refer to figure 2-4 for correct values of resistance.

e. Plug booster amplifiers (356A-1 modules wired for 250-ohm input impedance) into J7 and J10.

f. Plug a Program/Monitor Amplifier 356B-1 into J8. Set S301 at LOW.

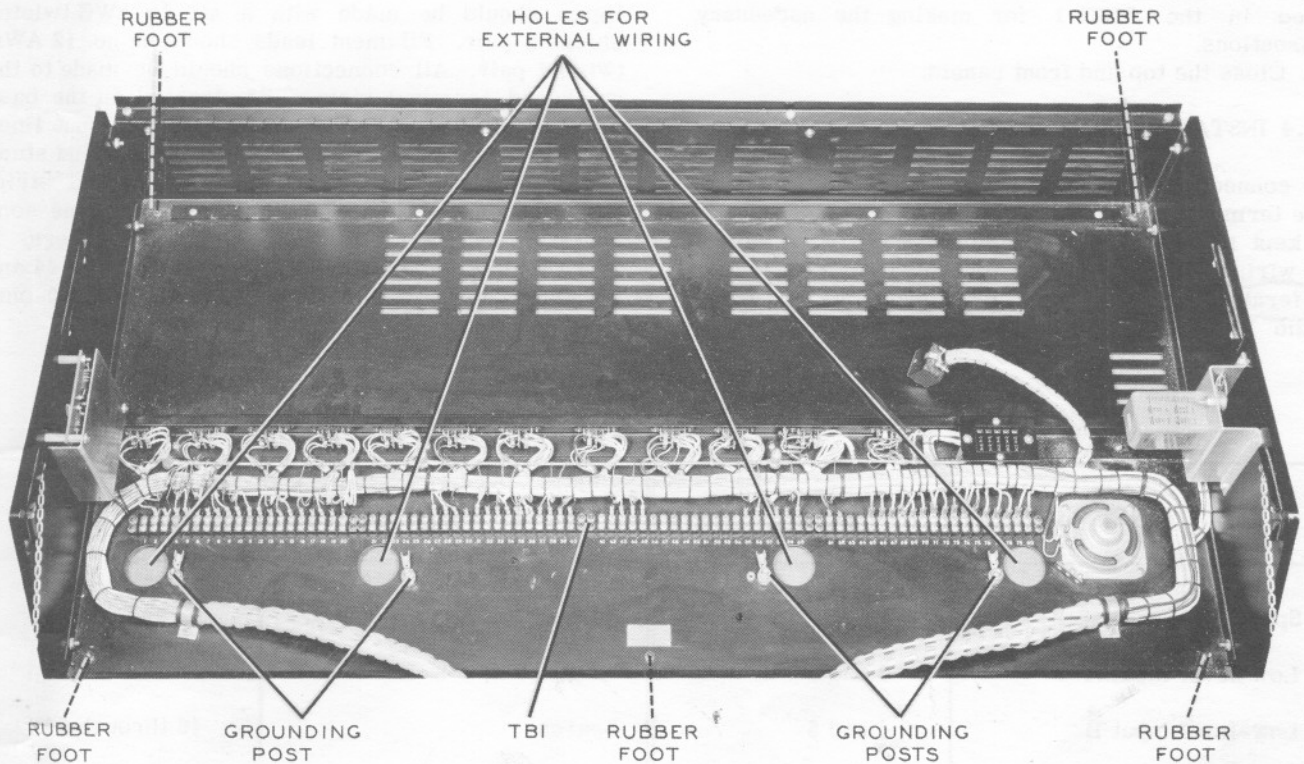


Figure 2-1. Broadcast Console 212G-1, Mounting and Wiring Detail

- g. Plug a Cue Amplifier 356Q-1 into J9, if cue speaker LS1 in the console is to be used. If a headset or an external cueing amplifier is to be used, insert a jumper plug into J9 and disconnect cue speaker LS1.
- h. Plug a Program/Monitor Amplifier 356B-1 into J11. Set S301 at HIGH.
- i. Plug Relay Unit 274K-2 into J12.
- j. Plug the connector on the pendent cable from Relay Unit 274K-2 into J13.

- k. Mount Power Supply 409X-2.
- l. Plug J14 into the plug on the 409X-2.
- m. Wire jumper connections on TB4 as desired for the specific installation. Use insulated wire for all jumpers. Jumper terminals CR and RELAY 1. Jumper other terminals as desired for control of studio lights and speakers. Refer to figure 4-5.
- n. A cue speaker is located in the 212G-1. If a different location is desired for the cue speaker, it

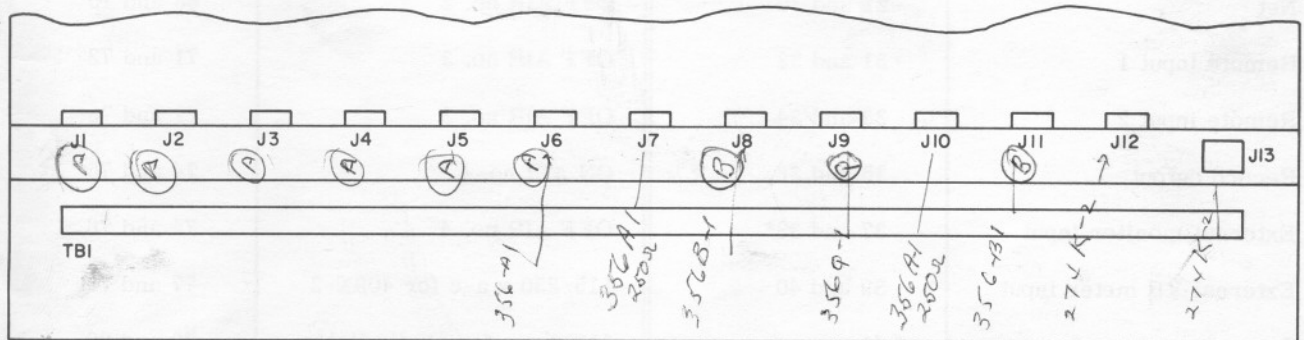


Figure 2-2. Broadcast Console 212G-1, Amplifier Connector Location

may be removed. A two-lug terminal strip is provided in the 212G-1 for making the necessary connections.

- o. Close the top and front panels.

2.2.4 INSTALLATION WIRING.

All connections to the 212G-1 are made with screw type terminals. All low-level audio input lines should be kept separate from the power and control wires. All wiring should be made with twisted shielded pairs preferably insulated and grounded at one end only. Audio lines should be a no. 20 or 22 AWG twisted

shielded pair. Studio circuit connections for signal lights should be made with a no. 16 AWG twisted shielded pair. Filament leads should be no. 12 AWG twisted pair. All connections should be made to the numbered terminal strip, TB1, located on the base plate of the console. The shields of the input lines should be grounded at the four 1/4-inch ground studs and lugs provided adjacent to the terminal strip. Refer to figure 2-1. Table 2-1 lists the line connections and their respective terminal numbers. If line 1 or line 2 (TB1, terminals 42 and 43, and 44 and 45) is not used, terminate unused line in a 600-ohm resistor.

TABLE 2-1. CONNECTIONS TO TERMINAL STRIP TB1

LINE	TB1 TERMINAL NUMBERS	LINE	TB1 TERMINAL NUMBERS
Spare	1	Program line 1	42 and 43
Low-level input A	2 and 3	Program line 2	44 and 45
Low-level input B	4 and 5	Spares	46 through 54
Low-level input C	6 and 7	Speaker no. 1 (or 600-ohm 10-w resistor)	55 and 56
Low-level input D	8 and 9	Speaker no. 2 (or 600-ohm 10-w resistor)	57 and 58
Control room mike input	10 and 11	Speaker no. 3 (or 600-ohm 10-w resistor)	59 and 60
Auxiliary input	12 and 13	Speaker no. 4 (or 600-ohm 10-w resistor)	61 and 62
Turntable input 1	14 and 15	Spares	63 and 64
Turntable input 2	16 and 17	ON AIR no. 1	65 and 66
Tape input 1	18 and 19*	OFF AIR no. 1	65 and 67
Ground	20	ON AIR no. 2	68 and 69
Spares	21 through 26	OFF AIR no. 2	68 and 70
Tape input 2	27 and 28*	OFF AIR no. 3	71 and 72
Net	29 and 30	OFF AIR no. 3	71 and 73
Remote input 1	31 and 32	ON AIR no. 4	74 and 75
Remote input 2	33 and 34	OFF AIR no. 4	74 and 76
Record output	35 and 36	115/230 v a-c for 409X-2	77 and 78
External monitor input	37 and 38*	115 v a-c for studio lights	79 and 80
External VU meter input	39 and 40	ON AIR-OFF AIR	
Spare	41		

*Unbalanced inputs, 19, 28, and 38 grounded.

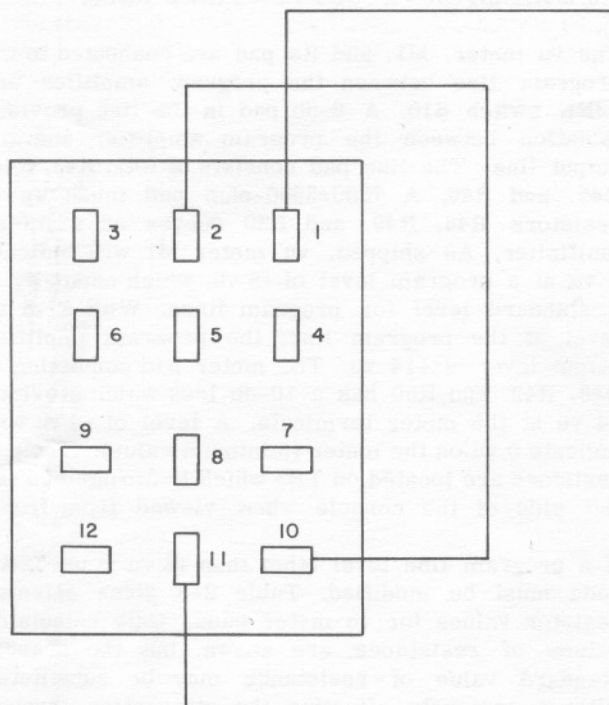


Figure 2-3. Jumper Plug Wiring Schematic Diagram

2.3 MODIFICATION AND INITIAL ADJUSTMENTS.

2.3.1 GENERAL.

Initial adjustments of Broadcast Console 212G-1 consist of input and output impedance selection, gain level selection of Program/Monitor Amplifier 356B-1, and d-c voltage adjustment of Power Supply 409X-2.

2.3.2 SELECTION OF IMPEDANCES.

Preamplifiers 356A-1 are factory wired for input impedance of 150 ohms and output impedance of 600 ohms. When Preamplifier 356A-1 is used as a booster amplifier, its input must be rewired for 250 ohms impedance. Refer to Preamplifier 356A-1 Instruction Book for rewiring information.

Program/Monitor Amplifier 356B-1 is factory wired for 600-ohm input and output impedances. For other desired input or output impedances, refer to Program/Monitor Amplifier 356B-1 Instruction Book.

2.3.3 GAIN ADJUSTMENT FOR PROGRAM/MONITOR AMPLIFIER 356B-1.

If Program/Monitor Amplifier 356B-1 is to be used as a program amplifier, 56 db gain is required, and the gain selection switch (S301) on the right front of the chassis (near P301) should be in the LOW position. If the 356B-1 is to be used as a monitor amplifier, the switch should be placed in the HIGH position to provide 68 db gain.

2.3.4 ADJUSTMENT OF 300 VOLTS D-C OUTPUT FROM POWER SUPPLY 409X-2.

A screwdriver adjustment, R401, on top of Power Supply 409X-2 chassis varies d-c output voltage. Adjust R402 until the output voltage is 300 volts d-c. Test points J1- and J2+ are provided on the top of the chassis to facilitate this adjustment. J1- is connected to B-, J2+ to the B+ output.

2.3.5 INITIAL ADJUSTMENTS FOR USE OF LIMITER AMPLIFIER 356E-1.

The following steps outline initial adjustments of Limiter Amplifier 356E-1 for a three-to-one compression ratio:

- a. Plug Limiter Amplifier 356E-1 into J8.
- b. Adjust Power Supply 409X-2 output for 300 volts d-c.
- c. With no input to the amplifier, make the adjustments of steps d through f.
- d. Set the METER switch to GR, and adjust the zeroing potentiometer, R47, for a 0 reading on the GR meter.
- e. Adjust R612 for 23.5 volts at the test jacks located on the 356E-1.
- f. Repeat step e after 30 minutes warmup.
- g. Set S601 at average.
- h. The GR meter and amplifiers now are ready to use. The GR meter will read the level of the input signal above the threshold when the METER switch is in the GR position. With the equipment adjusted as in step g, the 356E-1 will operate according to steps i through k.
- i. All signal below threshold (-44 vu) applied to the input of the 356E-1 will be amplified uniformly.
- j. All signals above threshold will be limited at a three-to-one compression ratio. For every 3 vu rise in input above the threshold level, the output level will increase 1 vu.

NOTE

Levels are specified in vu, implying a complex wave, such as a program waveform with high peaks. The peaks usually are assumed to be about 10 db above the sine wave peak. When testing with a sine wave input, it is normal to test at a level 10 db higher than normal vu level. With a signal level 10 db higher than normal level, the vu meter in the 212G-1 will be pinned. When testing at higher levels, disable the vu meter by setting the METER switch, S13, to EXT. Zero dbm is a power level of 1 milliwatt in 600 ohms.

- k. The desired amount of system limiting may be obtained by adjustment of Limiter Amplifier 356E-1. The average signal level may be maintained at threshold or above threshold according to the operator's preference. Table 2-2 gives typical values of the

input, output, and program line levels based on a 3-to-1 compression ratio, a 6-db line pad, and a 356E-1 with 54 db gain.

TABLE 2-2
LINE LEVELS

VU INPUT TO 356E-1	OUTPUT LEVEL 356E-1 (VU)	LINE LEVEL IN VU
-44*	+10	+4
-39	+11.5	+5.5
-34	+13	+7
-30.67	+14	+8
-29	+14.5	+8.5
-24	+16	+10
*Threshold		

NOTE

Assuming 3:1 ratio, 6 db line pad, 54 db gain in 356E-1.

NOTE

The vu meter will indicate 0 vu at +14 vu program amplifier output. If it is desired to change the operating level of the 356E-1, the vu meter pad must be modified.

2.3.6 MONITOR EXTERNAL CIRCUIT LEVEL WITH VU METER.

External levels may be monitored by connecting the circuit to be metered at terminals 39 and 40 of TB1.

NOTE

External circuit must include a fixed or variable meter pad. For fixed pad values see figure 2-4. Variable pads, Collins part number 378 0011 00 or Daven 7500/3900 ohm vu meter attenuator, may be used.

2.3.7 RESISTOR VALUES FOR FIXED PADS.

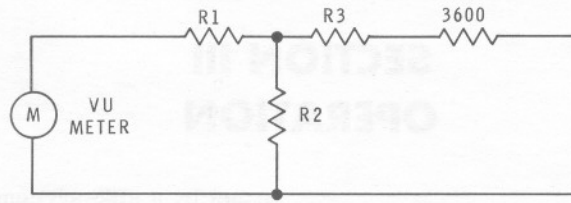
The vu meter, M1, and its pad are connected to the program line between the program amplifier and LINE switch S10. A 6-db pad in the line provides isolation between the program amplifier and the output line. The line pad consists of R42, R43, R44, R45, and R46. A 7500/3900-ohm pad made up of resistors R48, R49, and R50 serves as a meter multiplier. As shipped, vu meter M1 will indicate 0 vu at a program level of +8 vu, which normally is a standard level for program lines. With a +8 vu level at the program line, the program amplifier output level is +14 vu. The meter pad consisting of R48, R49, and R50 has a 10-db loss which provides +4 vu at the meter terminals. A level of +4 vu will indicate 0 vu on the meter (minimum value). The pad resistors are located on TB3 which is mounted on the left side of the console when viewed from front.

If a program line level other than +8 vu is used, the pads must be modified. Table 2-3 gives selected resistor values for vu meter pads. Only calculated values of resistance are shown, but the nearest standard value of resistance may be substituted without seriously affecting the attenuation through the pad.

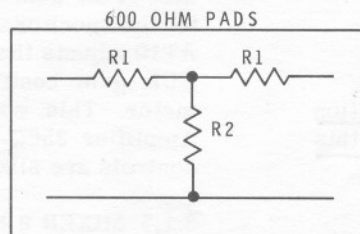
TABLE 2-3
LINE LEVELS

VU LEVEL FOR 0 VU ON METER	R48	R49	R50
18	6203	2603	1620
16	5934	2334	2091
14	5626	2026	2741
12	5279	1679	3690
10	4896	1296	5221
8	4482	882	8177
6	4047	447	16,788
4	3600	0	Open

The level given is the level at the output of the program amplifier and is higher than the program line by the decibel attenuation in the line pad. A typical example would be a desired program line level of +4 vu and a line pad of 6 db. The level at the output of the program amplifier will be +10 vu and resistor values for the meter pad will be R48, 4896 ohms; R49, 1296 ohms; and R50, 5221 ohms.



RESISTANCE VALUES IN OHMS				
LEVEL TO BE METERED	PAD LOSS FOR 0 VU READING	R1	R2	R3
+ 4DBM	0	0	OPEN	0
+10DBM	6DB	1296	5221	1296
+32DBM	28DB	3601	311	3601
+39DBM	35DB	3764	139	3764



LOSS IN DB	R1 IN OHMS	R2 IN OHMS
0	0	OPEN
3	103	1703
6	199	803
10	312	422
15	419	220
20	490	121

Figure 2-4. Resistor Values for Fixed Pads

NOTE

Above levels are specified in vu, implying a complex wave, such as a program waveform with high peaks. It usually is assumed that the peaks are 10 db above the sine wave peak. When testing with a sine wave input, it is normal to test at a level 10 db higher than normal level. At this 10-db higher level, the 212G-1 vu meter, M1, will be pinned if it is left in the circuit. When testing at higher levels, disable vu meter by setting the METER switch S13 to EXT.

2.3.8 SUGGESTED FUNCTION FOR SPARE SWITCHES.

Spare switches may be wired for switching the following:

- Override.
- Tape recorder.
- Headphones.

d. Vu meter.

e. Auxiliary input or output circuits.

2.3.9 SPEAKER AND WARNING LIGHT CONTROL CIRCUITS.

A simplified schematic diagram of the speaker and warning light control circuits is shown in figure 4-5. Mixer key switches S11 and S12 and program/audition switches S1 through S6 control application of 12 volts d-c to relays located in Relay Unit 274K-2. Mixer circuit wiring may be modified easily for specific station applications. Cue speaker LS1 in the console is removed from the circuit by MIXER 3 A/P switch S3 whenever the control room microphone is in use.

NOTE

If this interlock feature is not desired, jumper contacts 14 and 20 on S3. A jack may be placed in the cue speaker line so that the speaker is muted when a headset is plugged into the jack.