

Film-Tech

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INSTALLATION AND SERVICE DIVISION

MI-9250

RCA MANUFACTURING CO., INC.

CAMDEN, N. J.

CLASSIFICATION Technical - Photophone - Amplifiers

DATE Jan. 15, 1939

SUBJECT: MI-9250 AMPLIFIER (PG-138) MI-4283H

NUMBER SL-203-20.01

TO: B-1, B-2, B-4, C-7, D-7, E-7, H-7

Issue 1

ELECTRICAL SPECIFICATIONS

Application Theatre Sound Reproduction
Voltage rating 105/125 volts - 50/ 60 cycles
Power consumption at 125 volts 165 watts
Input impedance 80,000 ohms
Load impedances (MI-4283H Amplifier) 4, 7.5, and 15 ohms
Load impedance (MI-9250 Amplifier) 250 ohms
Frequency response See response curve, Figure 1
Power output at 2.25% harmonic distortion 5 watts
Output level - (.006 watt zero reference level) 29 db
 (.0125 watt zero reference level) 26 db
Input level - max. permissible (.006 watt zero reference level) -37 db
 max. permissible (.0125 watt zero reference level) -40 db
 min. for normal power output (.006 watt zero reference level) -72 db
 min. for normal power output (.0125 watt zero reference level) -75 db
Hum level - 15 ohm load (.006 watt zero reference level) - 9 db
 15 ohm load (.0125 watt zero reference level) -12 db
Average overall gain 100 db
Power supply to external fields 100 volts at 100 ma to monitor speaker field

MECHANICAL SPECIFICATIONS

Height 21-3/4 inches
Width 16-1/2 inches
Depth 7-7/16 inches
Weight 60 pounds

COMPONENTS

MI-4283H Amplifier MI-1265 Voice Filter MI-9471 Coupling Transformer MI-9477 Crossover Network

RADIOTRON SOCKET VOLTAGES

110 Volt A-C Line, 110 Volt Transformer Tap, 20,000-ohms-per-volt meter

| Radiotron No. | Plate MA | Plate Volts | Screen Grid Volts | Cathode Volts | Control Grid Volts | Heater Volts | Rect. Heater Volts To Gnd |
|---------------|----------|-------------|-------------------|---------------|--------------------|--------------|---------------------------|
| 1. 6C6 | 1.2 | 200 | 80 | 3.0 | -- | 6.3 | -- |
| 2. 75 | .7 | 280 | -- | 2.0 | -- | 6.3 | -- |
| 3. 42 | 29 | 290 | 290 | 21.5 | -- | 6.3 | -- |
| 4. 42 | 19 | 390 | 390 | 35.0 | -- | 6.3 | -- |
| 5. 42 | 19 | 390 | 390 | 35.0 | -- | 6.3 | -- |
| 6. 5Z3 | -- | 370 AC | -- | -- | -- | 5.0 | 395 |

All voltages are read to ground except Filament Voltages.

- ADJUSTMENT FOR LINE VOLTAGE - A two ampere fuse is located on the amplifier terminal board for the purpose of adjusting the amplifier to the supply voltage. Should the supply voltage be below 115 volts, insert the fuse in the clips marked 110 volts. Should it be between 115 and 125 volts, insert the fuse in the clips marked 120 volts.
- BIAS AND FIELD SUPPLY - The bias for the RCA-42 output tubes is secured from the voltage drop across R-36 and R-15 in series with the monitor speaker field. CAUTION: BE SURE MONITOR SPEAKER FIELD IS CONNECTED TO AMPLIFIER BEFORE TURNING ON A-C SUPPLY, OTHERWISE INADEQUATE BIAS WILL BE APPLIED TO OUTPUT TUBES WITH PROBABLE DAMAGE TO SAME.

3. COMPENSATION -

- (a) FREQUENCY RESPONSE LIMITS - MI-9250 is compensated at the factory, and the film frequency response curve obtained in the field should follow the curve in Figure 1 within the following limits:
- (1) 50 to 100 cycles ± 0 db
 - (2) 100 to 5000 cycles ± 1 db
 - (3) 5000 to 8000 cycles ± 2 db
- (b) MI-1265 VOICE FREQUENCY FILTER (Shorted at Factory) - The MI-1265 voice frequency filter is provided to attenuate certain lower voice frequencies. It may be necessary to vary the characteristics of this filter to obtain best results on each installation. Refer to Photophone Data 2C2-5.3 for data on the adjustment of this filter. Adjustment of MI-1265 filter should be made prior to changing any other compensation in the system.
- (c) LOW FREQUENCY BOOSTER (Shorted at Factory) - A low frequency booster is provided in the photocell circuit consisting of R-25 (150,000 ohms), and C-27 (.015 mfd.), in parallel, in series with R-41. It is suggested that no attempt be made to boost low frequencies by increasing resistance of R-25 beyond 150,000 ohms, as distortion and loss of gain in the mid-range and higher frequencies would result. IN NO CASE SHOULD THE RESPONSE AT LOW FREQUENCIES EXCEED THE RESPONSE AT 1000 CYCLES BY MORE THAN 8 DB.
- (d) Capacitors C-12, C-16, C-10 and Resistor R-14 are used to secure the high frequency cut-off. By reducing the value of R-14, cut-off at a lower frequency will result.

4. SPECIAL INPUT - A special receptacle to take a single circuit plug jack is provided to take either high impedance microphone or high impedance phonograph. Either the microphone or the phonograph can be plugged in by means of a standard telephone type plug having one tip and one sleeve. A velocity microphone, such as the MI-4036 can be used with the MI-9250 amplifier, however, the full secondary winding (terminals S and F) of the built-in microphone transformer should be connected to the microphone cable when used with this amplifier. Any good high impedance phonograph pickup should work satisfactorily when plugged into the input jack. CAUTION: NEITHER THE MICROPHONE NOR THE PICKUP SHOULD REMAIN "PLUGGED IN" WHEN REPRODUCING SOUND ON FILM.

REPLACEMENT PARTS

| DESCRIPTION | STOCK NO. | DESCRIPTION | STOCK NO. |
|---|-----------|---|-----------|
| MI-4283H AMPLIFIER ASSEMBLY | | MISCELLANEOUS ASSEMBLIES | |
| Capacitor - .00022 mfd. (Part of C-1) | 12894 | Capacitor - 15 mfd. (C-20-21) | 32045 |
| Capacitor - .001 mfd. (C-17) | 12835 | Knob - Monitor Volume Control or Amplifier | |
| Capacitor - .001 mfd. (Part of C-1) | 12835 | Volume Control Knob | 27990 |
| Capacitor - .0025 mfd. (C-13-16) | 30850 | Potentiometer - 60 ohm, Monitor Volume Control | |
| Capacitor - .015 mfd. (C-10) | 30856 | (R-34) | 28104 |
| Capacitor - .025 mfd. (C-5) | 30859 | Resistor - 100 ohms, 10 watt (R-42) | 30561 |
| Capacitor - .05 mfd. (C-6) | 30847 | Resistor - 2,200 ohms, 100 watts (R-36) | 28122 |
| Capacitor - 0.1 mfd. (C-4-8) | 30848 | Resistor - 4,000 ohms, 20 watts (R-35) | 23958 |
| Capacitor - .25 mfd. (C-9) | 30849 | Spring - For Monitor Volume Control or Amplifier | |
| Capacitor - .25 mfd. (C-2) | 30849 | Volume Control Knob | 15971 |
| Capacitor - 10-10-10 mfd., Electrolytic (C-7-14-19) | 28113 | PHOTOCELL SUPPLY PANEL | |
| Capacitor - 15 mfd., Electrolytic (C-11-13) | 28119 | Capacitor - .015 mfd. (C-27) | 30856 |
| Capacitor - 20 mfd., Electrolytic (C-3) | 28118 | Capacitor - .025 mfd. (C-25) | 30859 |
| Capacitor - 30-30 mfd., Electrolytic (C-15-18) | 28114 | Capacitor - .25 mfd. (C-26-28) | 30849 |
| Fuse - 2 ampere (F-1) | 3883 | Resistor - 82,000 ohms, 1/2 watt (R-41) | 8064 |
| Jack - Phono. Input Jack | 30187 | Resistor - 120,000 ohms, 1/2 watt (R-27-32) | 30180 |
| Reactor - 3.65 henries (L-5) | 28123 | Resistor - 150,000 ohms, 1/2 watt (R-25) | 30493 |
| Reactor - 100 ohms RT-305 (L-2) | 4923 | Resistor - 180,000 ohms, 1/2 watt (R-28-30) | 11959 |
| Resistor - 220 ohms, 10 watts (R-15) | 28120 | Resistor - 250,000 ohms variable resistor (R-85) | 23529 |
| Resistor - 680 ohms, 1 watt (R-12) | 32886 | Resistor - 1 meg., 1/2 watt (R-29-31) | 30652 |
| Resistor - 2,000 ohms, 10 watts (R-13) | 23541 | MI-9477 CROSS-OVER NETWORK | |
| Resistor - 2,200 ohms, 1/2 watt (R-4) | 3528 | Capacitor - 1.5 mfd. (C-23) | 28014 |
| Resistor - 2,700 ohms, 1/2 watt (R-10) | 30730 | Capacitor - 2.5 mfd. (C-24) | 28015 |
| Resistor - 8,200 ohms, 1/2 watt (R-14) | 14250 | Reactor - Air Core Reactor XT-3078 (L-7) | 28016 |
| Resistor - 10,000 ohms, 1/2 watt | 3078 | Reactor - Air Core Reactor XT-2947A (L-8) | 28017 |
| Resistor - 15,000 ohms, 1/2 watt (R-8) | 12759 | Switch - D.P.S.T. (S-1) | 28001 |
| Resistor - 27,000 ohms, 1/2 watt (R-7) | 30409 | MI-1265 COMPENSATOR PACK | |
| Resistor - 33,000 ohms, 1/2 watt (R-1) | 30685 | Compensator Pack Complete RT-434 (L-6,C-22 R-39) | 26400 |
| Resistor - 100,000 ohms, 1/2 watt (R-5-9) | 3252 | Resistor - 200 ohms (R-39) | 26631 |
| Resistor - 470,000 ohms, 1/2 watt (R-11) | 30648 | MI-9471 COUPLING TRANSFORMER | |
| Resistor - 1 meg., 1/2 watt (R-6-40) | 30652 | Transformer - Coupling transformer XT-3113(T-4) | 28099 |
| Resistor - 2.2 meg., 1/2 watt (R-3) | 30649 | SPEAKER ASSEMBLY | |
| Socket - 4 contact tube socket | 31789 | Cone - Speaker cone and voice coil assembly complete with mounting gaskets and dust screens | 26402 |
| Socket - 6 contact tube socket | 28117 | Speaker - Speaker complete (L-3) | 26503 |
| Transformer - Audio Trans. pack RT-427 (T-1-2-L-1) | 26407 | | |
| Transformer - Power Trans. RT-425A (T-3) | 17847 | | |
| Volume Control - 1 meg. (V-1) | 28121 | | |

FREQUENCY RESPONSE CURVE

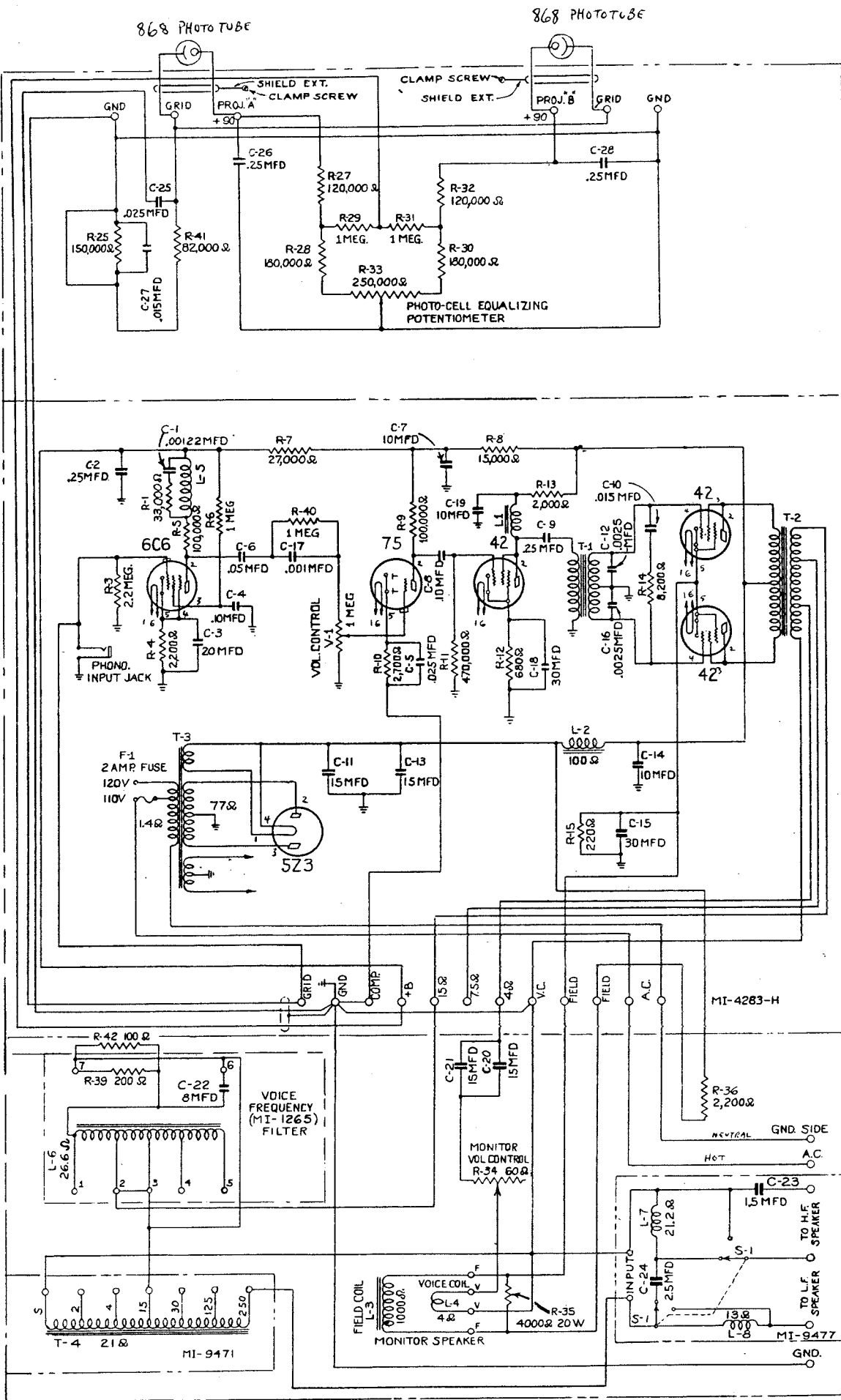
- (1) Stock No. 26571 Film
- (2) 1-1/4 mil Image Slit
- (3) Monitor Volume Control "OFF"
- (4) Power Level at 1000 cycles +12 db (.0125 watt zero ref.)
- (5) Disconnect Input to Crossover Network. Connect 15 ohm Resistor across MI-4285H Output.

RESPONSE IN DB
 + 6
 + 4
 + 2
 0
 - 2
 - 4
 - 6
 - 8
 - 10
 - 12
 - 14
 - 16
 - 18

30 40 50 60 70 80 90 100 200 300 400 500 600 700 1000 2000 3000 4000 5000 6000 7K 10,000
 10K

FREQUENCY RESPONSE IN CYCLES PER SECOND

Figure 1 - Response Curve - PG-138



THIS AMPLIFIER NEEDS A MONITOR FIELD COIL CONNECTED AT ALL TIMES.
THE STAGE FIELD COIL POWER IS SUPPLIED BY A SEPARATE SUPPLY.

MI-9250 T-160242
Figure 2 - Schematic Diagram MI-9250

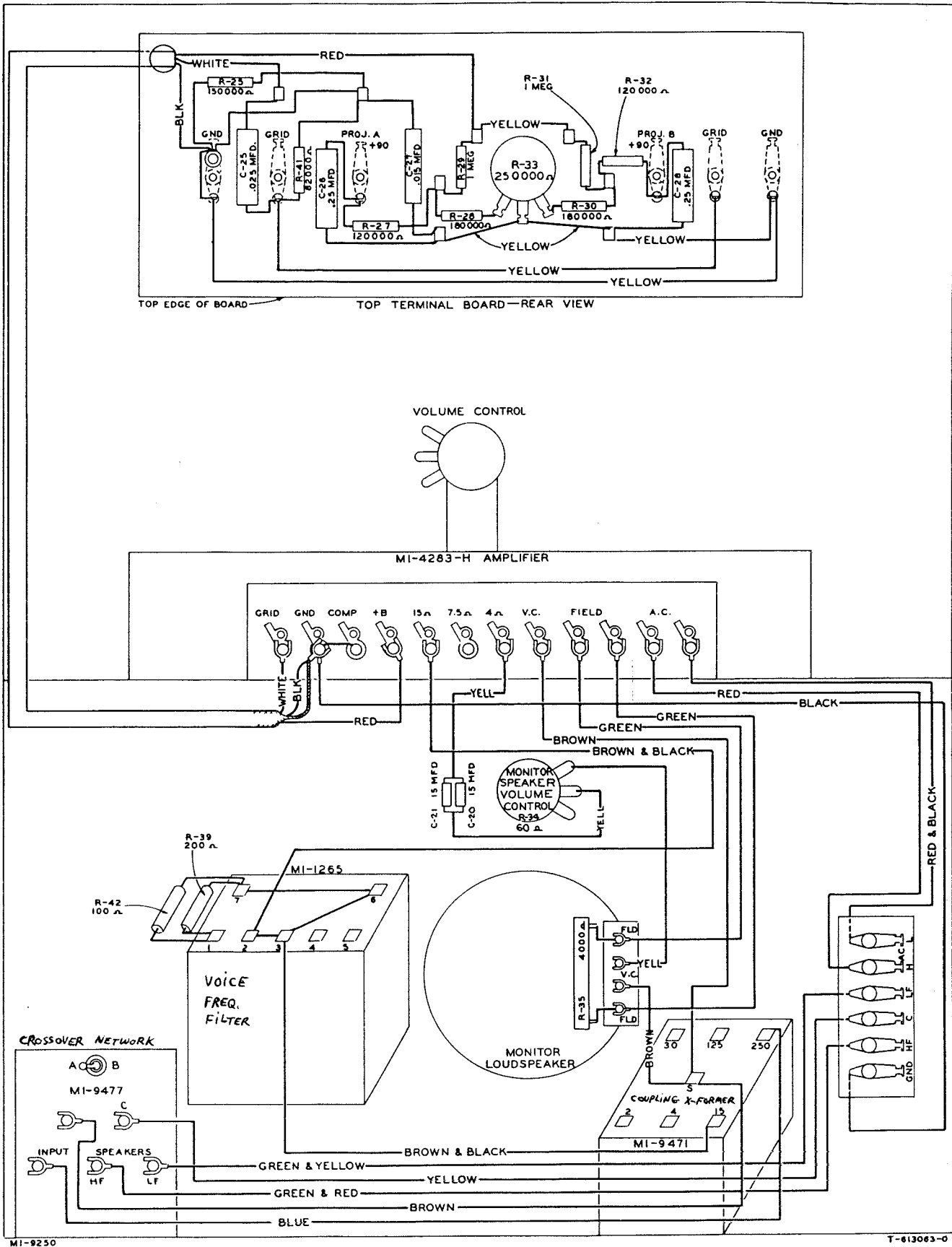


Figure 3 - Cabinet Wiring MI-9250

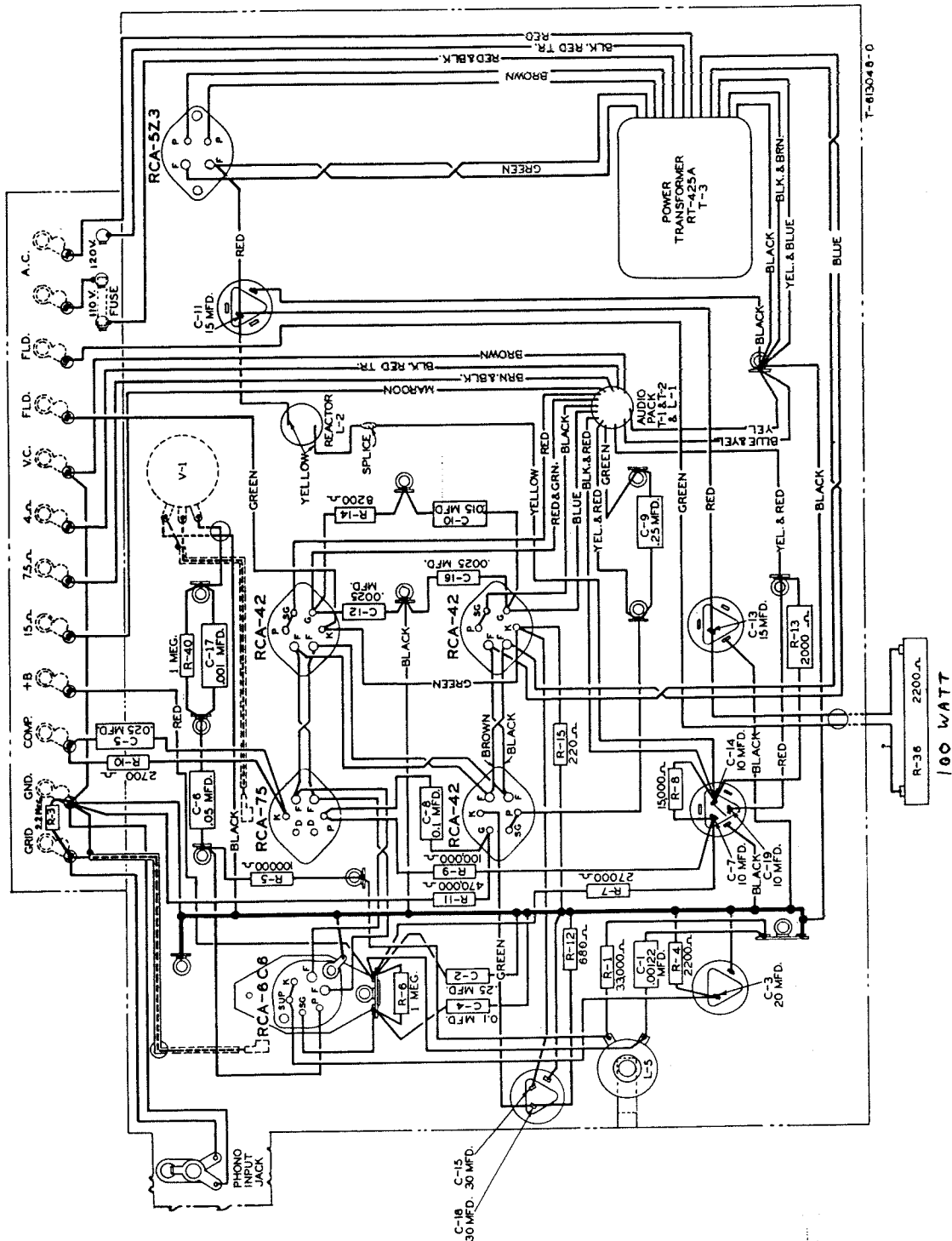
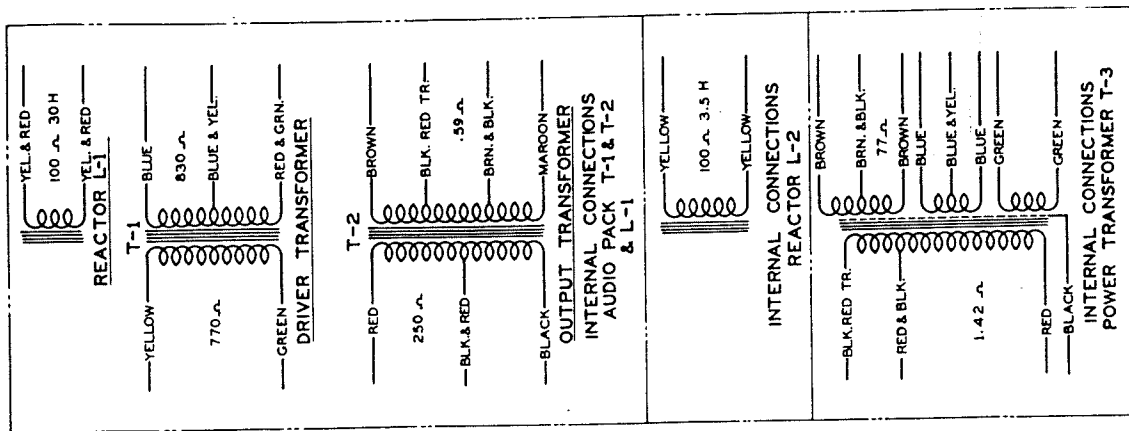


Figure 4 - M1-4283H Wiring Diagram