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Operating Instructions

TYPE PG-142

RCA PHOTOPHONE

High Fidelity Theatre Sound Reproducing Equipment

OPERATING PROCEDURE

- (a) MAKE SURE THAT THE MAIN A C SWITCH FOR THE POWER AMPLIFIER IS IN THE "FIL" POSITION. THEN, TURN ON THE MAIN AMPLIFIER A C SWITCH IN THE EXTERNAL POWER SUPPLY CIRCUIT AT LEAST TWO MINUTES BEFORE THE TIME THE EQUIPMENT IS TO BE USED. AFTER THE TUBES HAVE HEATED UP FOR ONE MINUTE, THE MAIN A-C SWITCH FOR THE POWER AMPLIFIER MAY BE TURNED TO THE "ON" POSITION. IF A MOTOR GENERATOR SET OR ROTARY CONVERTER IS EMPLOYED, START THIS EQUIPMENT BEFORE TURNING ON THE AMPLIFIER A-C CONTROL SWITCH.

It is preferable to turn on the amplifier a reasonable length of time before the performance begins, in order to allow the tubes to reach proper operating temperature, and all components to reach a state of thermal stability. This will insure quietness of operation when the performance starts, and will also allow time to ascertain that the amplifying system is in proper operating condition.

- (b) CHECK THE TUBES IN THE TWO MI-9354 POWER AMPLIFIERS, USING THE METER AND SWITCH AS EXPLAINED BELOW
- (c) TURN ON THE MAIN SWITCH FOR THE PROJECTOR MOTOR SUPPLY AND CHECK MOTORS FOR OPERATION.
- (d) EXAMINE THE "FADER SETTING INSTRUCTION LEADER" OF THE FILM TO DETERMINE WHETHER IT IS A "REGULAR," "HIGH-RANGE," OR "LOW-RANGE" RECORDED PRINT, AND DETERMINE WHAT THE APPROXIMATE FADER SETTING IS TO BE.
- (e) THREAD THE FILM IN THE PROJECTOR AND SOUNDHEAD AS SHOWN IN THE SOUNDHEAD INSTRUCTION CARD.

Make sure that the sound is not "faded" to the soundhead being threaded or the soundhead to be started first, by checking the position of the fader knob located at the top of each fader cabinet. The fader switches are so arranged that either fader control knob may be used to fade the sound to either soundhead.

- (f) WHEN THE PERFORMANCE IS TO BEGIN, START THE MOTOR OF THE FIRST SOUNDHEAD BY TURNING ON THE MOTOR STARTING SWITCH. WHEN THE MOTOR HAS ATTAINED FULL RUNNING SPEED (IN APPROXIMATELY TWO SECONDS), TURN THE FADER CONTROL KNOB TO THE PROPER PROJECTOR POSITION.
- (g) ADJUST THE VOLUME CONTROL OF EITHER FADER CABINET TO THE SETTING DETERMINED IN (D) ABOVE TO OBTAIN THE PROPER VOLUME LEVEL IN THE AUDITORIUM.

Musical reproduction is usually more pleasing when reproduced at a higher volume level than dialogue. In "High-range" recorded prints the dialogue passages are intentionally reduced in volume level compared to the musical passages so that a volume differential of approximately 6 db is automatically provided between music and dialogue. WHEN SUCH A PRINT IS BEING REPRODUCED, THE VOLUME CONTROL MUST BE RAISED AT LEAST 6 DB FOR PROPER DIALOGUE VOLUME. This reproduces the musical passages at a higher volume level, and gives the desired effect, WITHOUT ANY ADDITIONAL ADJUSTMENT OF THE VOLUME CONTROL DURING THE PERFORMANCE.

When "Regular" recorded prints are used, the volume level differentiation between music and dialogue reproduction may be accomplished manually, if so desired, by adjusting the volume control for more volume during musical passages.

The number of persons in the auditorium is an additional factor in the adjustment of the volume control. A full auditorium requires an advanced volume control setting compared to the setting when the auditorium is half-filled.

- (h) ADJUST THE MONITOR AMPLIFIER VOLUME CONTROL TO OBTAIN PROPER SOUND LEVEL IN THE PROJECTION ROOM.
- (i) WHEN A VOLUME PRE-SELECTOR CONTROL FOR EACH MACHINE IS EMPLOYED, THE VOLUME LEVEL OF THE IDLE SOUNDHEAD CAN BE PRE-SET SO THAT WHEN THE SOUND IS "FADED" TO THIS MACHINE, NO FURTHER ADJUSTMENT OF THE MAIN VOLUME CONTROL IS NECESSARY TO COMPENSATE FOR ANY DIFFERENCES IN SOUND LEVEL BETWEEN SUCCESSIVE REELS OF FILM.
- (j) WHEN THE FILM IN THE FIRST PROJECTOR NEARS THE END, WATCH FOR THE MOTOR CUE ON THE SCREEN AND WHEN IT APPEARS, SWITCH ON THE MOTOR OF THE SECOND PROJECTOR. WHEN THE CHANGEVER CUE IS OBSERVED ON THE SCREEN, TURN THE FADER CONTROL KNOB ON EITHER FADER CABINET TO THE OTHER PROJECTOR POSITION.

STAND-BY OPERATION

Three Amplifier Stand-by Switches are supplied, designated in Figure 1 as Stand-by Switch No. 1, Stand-by Switch No. 2 and Stand-by Switch No. 3.

In the "A" position of Stand-by Switch No. 1, the upper Voltage Amplifier is in operation. In the "B" position, the lower Voltage Amplifier is in operation.

In the "A" position of Stand-by Switch No. 2, the upper Power Amplifier (MI-9354) is in operation, while in the "B" position the lower Power Amplifier is in operation.

In the "A" position of Stand-by Switch No. 3, the Main Power Amplifier (MI-9355) supplies the signal to the speakers, while in the "B" position one of the MI-9354 Power Amplifiers supplies the signal to the speakers.

LOUDSPEAKERS: Two speaker switches are provided on the speaker cross-over panel. THE SWITCH ON THE RIGHT MARKED "A + B" AND "TEST" MUST ALWAYS REMAIN IN THE "A + B" POSITION. When the switch on the left is thrown to the "B or Test" position, the low frequency speaker only reproduces the sound. The switch on the right is used only when a frequency response curve of the system is being taken.

EXCITER LAMP SUPPLY: A switch having an "A" and "B" position is provided on the exciter lamp supply unit for stand-by operation. When the switch is in the "A" position, d-c current is supplied to the exciter lamp, while in the "B" position of the switch a-c current is supplied to the exciter lamp.

AMPLIFIER RACKS

IMPORTANT: Turn off main power switch before replacing any Radiotrons or fuses.

**VOLTAGE AND MEDIUM POWER AMPLIFIERS
MI-9328 AND MI-9354**

FUSE: The fuse is located beneath the tube testing switch (see Figure 1) and may be removed by means of a screwdriver. If the fuse "blows" replace the two 5U4G rectifier tubes before replacing the fuse.
IMPORTANT: Never replace the fuse with one of higher rating than 3 amperes.

RADIOTRONS: A meter and switch are located on the front of the power amplifier to check the condition of the Radiotrons. The switch dial is numbered to correspond to the Radiotron numbers, marked near the tube sockets on top of the amplifier chassis. For each position of the meter switch, the meter pointer should fall within the green area of the dial. Radiotrons which indicate in the red dial areas should be replaced. If all Radiotrons check "low," replace the RCA-5U4G rectifier tubes, before replacing any other tubes. The extreme clockwise position of the switch marked "VA" checks the tubes in its corresponding Voltage Amplifier located above the power Amplifier (see Figure 1).

CAUTION: Replace grid covers of RCA-1620 tubes after replacing tubes. Turn meter switch to the "OFF" position after testing tubes.

MAIN POWER AMPLIFIER

The meters located on the front panel of this amplifier, show the condition of the Radiotrons during operation. Should the meter pointer indicate in the red areas of the meter dial, the Radiotron corresponding to the meter should be replaced.

When the ROA 866 Radiotrons are replaced or first installed, the filament voltage only should be applied to this tube by turning the main A-C Control Switch to the "Fil" position and the tube allowed to heat up for at least 15 minutes before the switch is turned to the "ON" position.

The fuses are located on the front panel of the amplifiers.

IMPORTANT: Never replace the "F" fuse with a fuse of a higher rating than 3 amperes.
Never replace the "P" fuse with a fuse of higher rating than 6 amperes.

MONITOR AMPLIFIER

RADIOTRONS: The Radiotrons should be tested periodically to determine their condition. Replace any that show signs of deterioration.

FUSE: The location and rating of the fuse is shown in Figure 1. The fuse may be removed by means of a screwdriver. If the fuse blows replace the RCA 5Y4G rectifier tube before replacing the fuse.

IMPORTANT: Never replace the fuse with one of higher rating than 1 ampere.

FIELD SUPPLY UNIT

PLATE SWITCH: When the tube is replaced in this unit, the plate switch must be turned to the "OFF" position and the tube allowed to heat up for at least 30 minutes, before the switch is turned "ON."

FUSES: The location and ratings of the fuses are shown in Figure 1. If excessive hum is noticed in the speakers, the capacitor fuses should be checked and replaced if necessary.

IMPORTANT: Never replace fuses with a fuse of higher rating than shown.

EXCITER LAMP SUPPLY UNIT

FUSES: The location and ratings of the fuses are shown in Figure 1. If excessive hum is noticed in the speakers, the capacitor fuses should be checked and replaced if necessary.

IMPORTANT: Never replace a fuse with one of higher rating than shown.

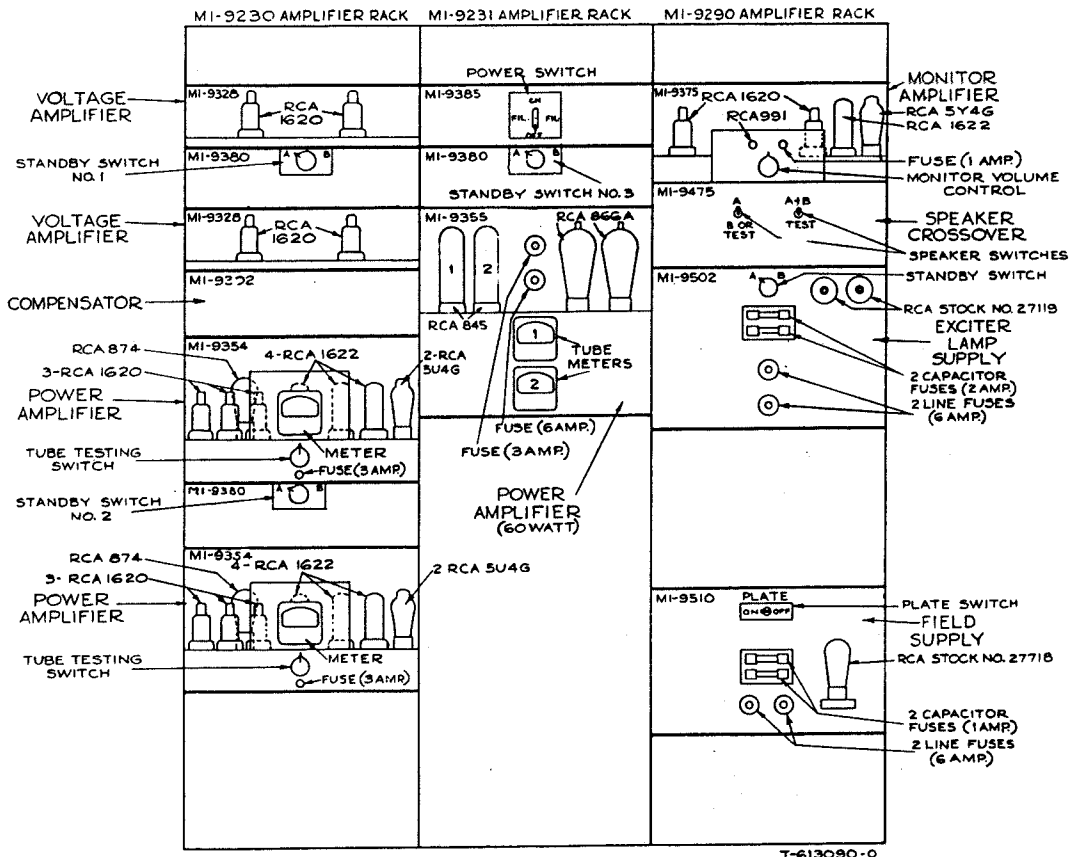


Figure 1 - PG-142 Amplifier Racks

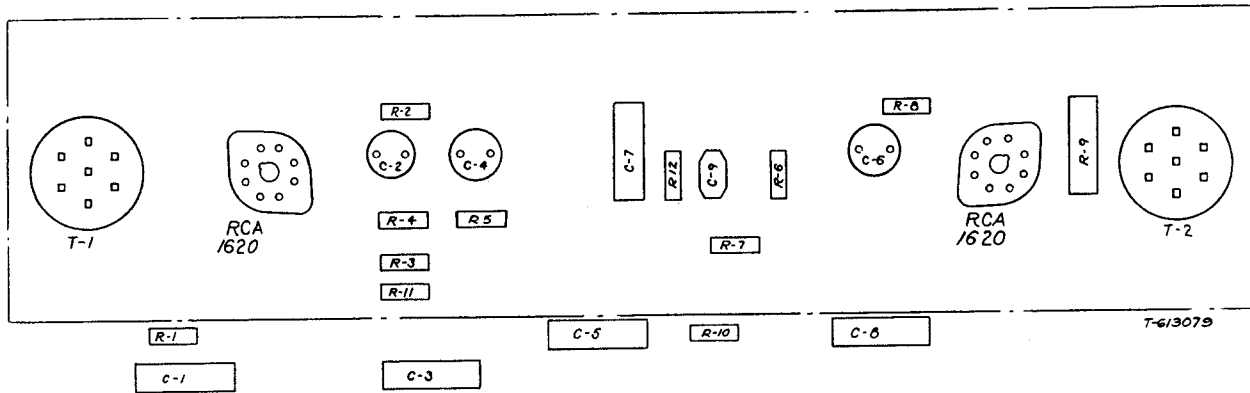


Figure 2 - Parts Layout - MI-9328 Voltage Amplifier
REPLACEMENT PARTS

MI-9328 Voltage Amplifier		MI-9354 Power Amplifier		MI-9354 Power Amplifier		MI-9375 Monitor Amplifier	
Cap - Grid contact cap	12148	Capacitor - .5 mfd. (C3)	30860	Resistor - 100,000 ohms, 1/2 watt (R43)	3252	Cap - Grid contact cap	30314
Capacitor - 47 mmfd. (C9)	43141	Capacitor - 10 mfd. (C15, C19)	43224	Resistor - 150,000 ohms, 1/2 watt (R11, R13)	30493	Capacitor - .05 mfd. (C3, C5)	30847
Capacitor - .025 mfd. (C8)	30859	Capacitor - 25 mfd. (C16, C17 and 3 connected in parallel to make C14)	30858	Resistor - 220,000 ohms, 1/2 watt (R42)	14583	Capacitor - +25 mfd. (C2, C4)	30849
Capacitor - .07 mfd. (C1)	30858	Capacitor - 25 mfd. (C1, C5, C10)	30848	Resistor - 220,000 ohms, 1 watt (R4, R46)	30684	Capacitor - 10 mfd. (C7, C10)	4687
Capacitor - .1 mfd. (C5)	30848	Fuse - 3 ampere (F1)	30849	Resistor - 470,000 ohms, 1/2 watt (R6)	30648	Capacitor - 25 mfd. (C1, C6)	3526
Capacitor - .25 mfd. (C7)	30860	Grid Cap	13919	Resistor - 1 megohm, 1/2 watt (R3)	30652	Fuse - 1 ampere, 250 v. (F1)	14133
Capacitor - .5 mfd. (C3)	16727	Knob - Meter switch knob	4358	Resistor - 4 contact tube tapped at 1650 and 15,000 ohms (R29, R30)	27984	Knob - Volume control knob	28000
Capacitor - 4 mfd. (C4)	30158	Meter - D.C. Milliammeter	4687	Shield - Grid cap shield	12110	Post - Fuse post	32059
Capacitor - 25 mfd. (C2, C6)	16727	Post - Fuse post	30650	Socket - 4 contact tube socket	31769	Potentiometer - 200 ohm potentiometer (R27, R28)	17905
Clamp - Capacitor clamp for Stock #13919	4358	Resistor - 1 ohm (R37, R38, R39, R40)	3252	Socket - Octal base tube socket	17896	Reactor - XT-875D (L1)	17569
Resistor - 820 ohms, 1/2 watt (R8)	30650	Resistor - 15 ohms, 1/2 watt (R44)	30493	Switch - Meter switch	27981	Transformer - Input transformer XT-2874A (T1)	27989
Resistor - 1,000 ohms, 1/2 watt (R2)	3252	Resistor - 33 ohms, 1/2 watt (R35, R36)	11959	Transformer - Output transformer XT-3109 (T2)	27988	Transformer - Output transformer XT-3109 (T2)	27988
Resistor - 56,000 ohms, 1/2 watt (R5)	30493	Resistor - 39 ohms, 1/2 watt (R34)	14956	Transformer - Power transformer XT-3033 (T3)	27987	MI-9375 Monitor Amplifier	
Resistor - 100,000 ohms, 1/2 watt (R1, R4)	11959	Resistor - 47 ohms, 1 watt (R19, R20, R21, R22)	14956	Cap - Grid contact cap	30314	Capacitor - .05 mfd. (C3, C5)	30847
Resistor - 150,000 ohms, 1/2 watt (R9)	14959	Resistor - 90 ohms (R16)	30651	Capacitor - +25 mfd. (C2, C4)	30849	Capacitor - 10 mfd. (C7, C10)	4687
Resistor - 180,000 ohms, 1/2 watt (R3)	14583	Resistor - 160 ohms, 1/2 watt (R49)	11988	Capacitor - 40 mfd. (C7, C10)	33224	Capacitor - 25 mfd. (C1, C6)	16727
Resistor - 220,000 ohms, 1/2 watt (R11)	30648	Resistor - 470 ohms, 1/2 watt (R7, R8)	12110	Capacitor - 25 mfd. (C1, C6)	16727	Fuse - 1 ampere, 250 v. (F1)	14133
Resistor - 270,000 ohms, 1/2 watt (R7, R10)	17896	Resistor - 4,700 ohms, 1 watt (R48)	27995	Knob - Volume control knob	28000	Post - Fuse post	32059
Resistor - 390,000 ohms, 1/2 watt	17896	Resistor - 10,000 ohms, 1/2 watt (R48)	18051	Resistor - 270 ohms, 1/2 watt (R1, R20)	30929	Resistor - 330 ohms, 2 watt (R9)	16625
Resistor - 470,000 ohms, 1/2 watt (R6)	17896	Resistor - 12,000 ohms, 1/2 watt (R12)		Resistor - 390 ohms, 2 watt (R16)	30547	Resistor - 820 ohms, 1/2 watt (R6)	30158
Shield - Tube shield	17896	Resistor - 15,000 ohms, 1/2 watt (R45)		Resistor - 820 ohms, 1/2 watt (R3)	30930	Resistor - 1,800 ohms, 1/2 watt (R3)	30930
Socket - Socket section only of cushion tube socket	17896	Resistor - 15,000 ohms (R41)		Resistor - 6,800 ohms, 2 watt (R19)	30148	Resistor - 6,800 ohms, 2 watt (R19)	30148
Transformer - Input transformer XT-2874 (T1)	27995	Resistor - 27,000 ohms, 1 watt (R25)					
Transformer - Output transformer XT-2875 (T2)	18051	Resistor - 47,000 ohms, 1/2 watt (R14, R15, R17, R18)					
MI-9354 Power Amplifier		Resistor - 68,000 ohms, 1/2 watt (R1)					
Capacitor - 56 mmfd. (C8)	12723	Resistor - 82,000 ohms, 1/2 watt (R5, R9, R10)	8064				
Capacitor - 680 mmfd. (C6)	14498						
Capacitor - .0035 mfd. (C11, C12)	30851						
Capacitor - +05 mfd. (C2, C4)	30847						
Capacitor - .1 mfd. (C7, C9)	30848						
Capacitor - .25 mfd. (C18)	30849						

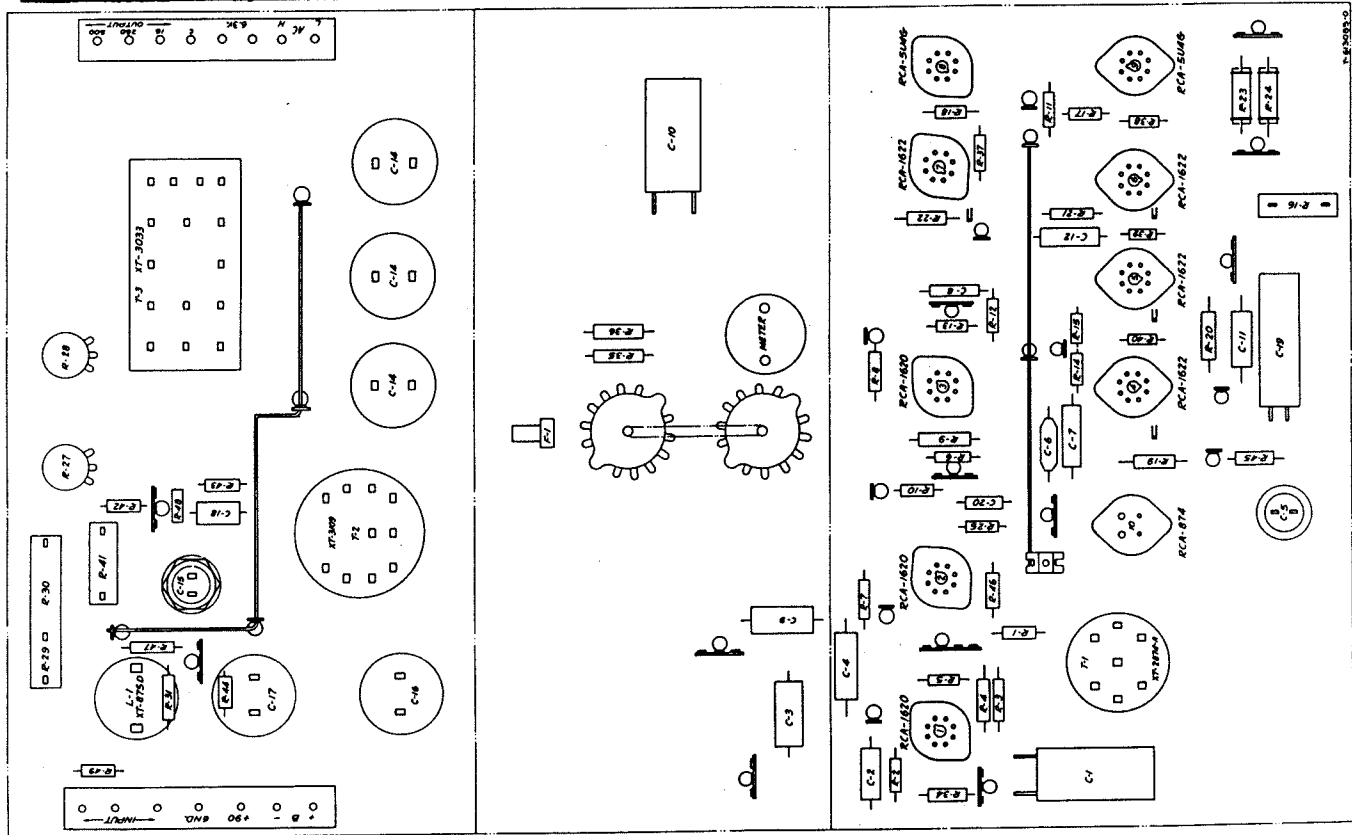


Figure 3 - Parts Layout MI-9354 Power Amplifier

REPLACEMENT PARTS

<p>MI-9375 Monitor Amplifier (Cont'd.)</p> <p>Resistor - 39,000 ohms, 1/2 watt (R2, R17, R14) 30447 Resistor - 39,000 ohms, 1 watt (R14) 30434 Resistor - 82,000 ohms, 1 watt (R12) 30435 Resistor - 82,000 ohms, 2 watt (R18) 18092 Resistor - 150,000 ohms, 1 watt (R10) 31895 Resistor - 220,000 ohms, 1/2 watt (R7) 14583 Resistor - 170,000 ohms, 1/2 watt (R4) 30651 Resistor - 390,000 ohms, 1/2 watt (R6) 14988 Resistor - 1.2 megohms, 1/2 watt (R13, R15) 30162 Socket - Neon lamp socket (V4) 28133 Socket - Octal base tube socket (V1, V2, V3, V5) 17896 Spring - Spring for volume control knob 4484 Transformer - Input transformer XT-2874 (T4) 27995 Transformer - Output transformer XT-3076 (T2) 28028 Transformer - Power transformer XT-3102 (T3) 28026 Volume Control - 500,000 ohms (R5) 28027</p> <p>MI-9510 Speaker Field Supply</p> <p>Capacitor - 100 mfd. (C1, C2) 28021 Fuse - 1 ampere (F1, F2) 14433 Fuse - 6 ampere (F3, F4) 23633 Fuse Block - Fuse block for 1 ampere fuse 13535 Fuse Block - Fuse block for 6 ampere fuse 16156 Reactor - XT-3045 (L2) 28020 Reactor - XT-3045A (L1) 28019 Resistor - 25 ohms (R1) 28023 Resistor - 600 ohms (R2) 28022 Socket - 4 contact rectifier socket 28025 Switch - Power switch D.P.S.T. (S1) 28024 Transformer - Power transformer XT-3044 (T1) 28018</p> <p>MI-9502 Exciter Lamp Supply Panel</p> <p>Capacitor - 4000 mfd., 25 volts (C1, C2) 27726 Fuse - 2 ampere fuse (F1, F2) 3883 Fuse - 6 ampere fuse (F3, F4) 23633 Reactor - XT-3059 (L1, L2) 28047 Rectifier Tubes 27149 Resistor - 2 ohms, 160 watt adjustable vitreous enameled resistor (R1, R2) 26228 Resistor - 30 ohms, 55 watt vitreous enameled resistor (R3) 23632 Socket - Rectifier tube socket 28048 Switch - D.P.D.T. toggle section of ganged switch (S1) 28143 Transformer - Power transformer XT-3058 (T1) 28046 Switch - S.P.S.T. Toggle section of ganged switch (S2) 28142 Bracket - Ganged switch bracket 27998 Knob - Ganged switch knob 28000 Spring - Knob spring 4484</p>	<p>MI-9475 Cross-over Network</p> <p>Capacitor - 1.5 mfd. (C1) 28014 Capacitor - 2.5 mfd. (C2) 28015 Reactor - Air core reactor XT-3078 (L2) 28016 Reactor - Air core reactor XT-2947A (L1) 28017 Switch - D.P.S.T. (S1) 28001</p> <p>MI-9355 60 Watt Power Amplifier</p> <p>Capacitor - 3.5 mfd. (C3, C4) 26162 Capacitor - 12 mfd., 330 volts, AC 60 cycle (C1, C2) 16438 Fuse Block 28008 Fuse - 3 ampere (F1) 26493 Fuse - 6 ampere (F2) 23633 Meter - (M1, M2) 27985 Potentiometer - 100 ohm potentiometer (R13, R14) 28009 Reactor - 20 henries XT-2930 (L1) 28007 Receptacle - 3-prong male receptacle 23553 Resistor - 100 ohms, 1/2 watt (R9, R10, R11, R12) 30540 Resistor - #275 ohms, tapped at 560 and 715 ohms (R1, R2) 28011 Resistor - 2400 ohms with tap at .7 ohms (R15, R16, R17, R18) 28010 Resistor - 4225 ohms, tapped at 945, 1280 and 1900 ohms (R3, R4, R5) 28022 Resistor - 4700 ohms, 2 watt (R8) 14768 Resistor - 56,000 ohms, 1 watt (R6, R7) 17440 Resistor - 120,000 ohms, 2 watt (R19, R20, R21, R22) 11366 Socket - Model UR-542A for RCA 866A (V3, V4) MI-7438A Socket - Model UT-544A for RCA 845 (V1, V2) MI-7437A Switch - (S1) 23592 Transformer - Filament transformer XT-2931 (T3) 28004 Transformer - Input transformer XT-2926 (T1) 28006 Transformer - Output transformer XT-2927 - MI-9355 only (T2) 28005 Transformer - Power transformer XT-2925 (T4) 28003</p> <p>MI-9380 Emergency Switch Panel</p> <p>Bracket - Switch bracket 27998 Knob - Switch knob 28000 Switch - Emergency switch 27999</p>	<p>MI-9701 Main Fader MI-9702 Extension Fader</p> <p>Attenuator - 500-500 ohm "T" Pad 28032 Capacitor - 5 mfd. 300 volt 30660 Clip - Spring clip supporting mercury unit 28132 Coupling - Fader switch and attenuator rod coupling 28038 Gear - Bevel gear used on attenuator or fader switch shaft. Bore .253" 28035 Gear - Bevel gear used on attenuator or fader switch extension shaft. Bore .378" 28034 Knob - Fader switch or attenuator knob 28037 Potentiometer - 100,000 ohm 23548 Resistor - 120,000 ohm 30180 Spring - Spring for knob stock #28037 15974 Spring - 6 turn spiral spring used on fader switch 28040 Spring - 9 turn spiral spring used on fader switch 28039 Switch - Fader switch unit 28033 Switch - Mercury unit only 28036</p> <p>MI-9302 Compensator Panel</p> <p>Capacitor - .007 mfd. (C13) 30854 Capacitor - .01 mfd. (C12) 30855 Capacitor - .025 mfd. (C1) (C9) (C14) 30859 Capacitor - .035 mfd. (C2) 30857 Capacitor - .05 mfd. (C4) (C7) (C10) (C15) 30847 Capacitor - .07 mfd. (C3) 30858 Capacitor - 1 mfd. (C11) 30848 Capacitor - .5 mfd. 2 each used to make (C5) (C6) (C16) (C17) 30860 Capacitor - .25 mfd. (C8) Pt. of C5, Pt. of C6 30849 Reactor - .023 and .015 henries each reactor (XT-3038) (L2) (L3) 27996 Reactor - .75 henries (XT-3037) (L1) (L4) 27997 Resistor - 160 ohm, 1 watt (R4) 32484 Resistor - 1000 ohms - 1 watt (R2) 30192 Resistor - 1900 ohms - 1 watt (R1) (R3) 3153</p> <p>MI-9510 Speaker Field Supply</p> <p>Capacitor - 100 mfd. (C1, C2) 28021 Fuse - 1 ampere (F1, F2) 14133 Fuse - 6 ampere (F3, F4) 23633 Fuse Block - Fuse block for 1 ampere fuse 13535 Fuse Block - Fuse block for 6 ampere fuse 16156 Reactor - XT-3045 (L2) 28020 Reactor - XT-3045A (L1) 28019 Resistor - 25 ohms (R1) 28023 Resistor - 600 ohms (R2) 28022 Socket - 4 contact rectifier socket 28025 Switch - Power switch D.P.S.T. (S1) 28024 Transformer - Power transformer XT-3044 (T1) 28018</p> <p>MI-9704 Pre-selector Kit</p> <p>Attenuator - "T" pad 23924 Knob - Attenuator knob 28000</p>
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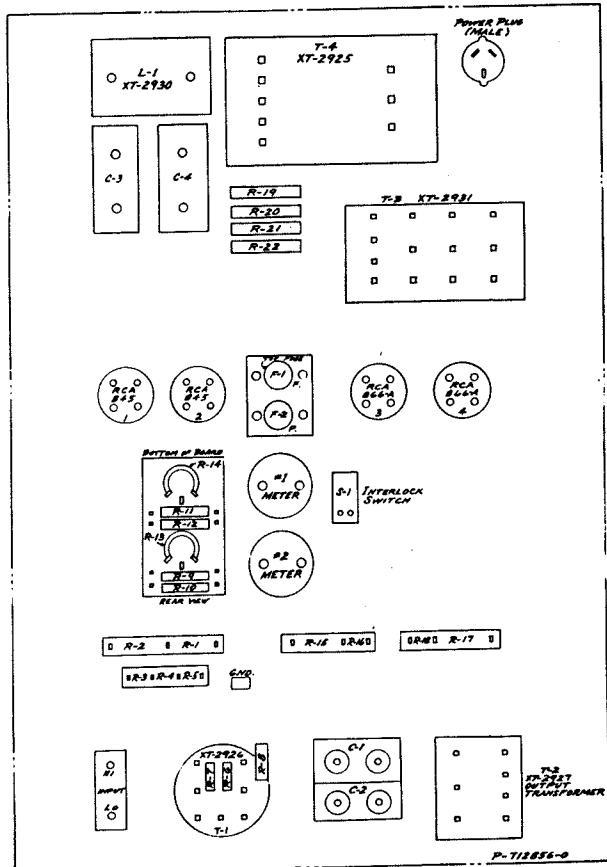


Figure 4 - Parts Layout MI-9355 Power Amplifier

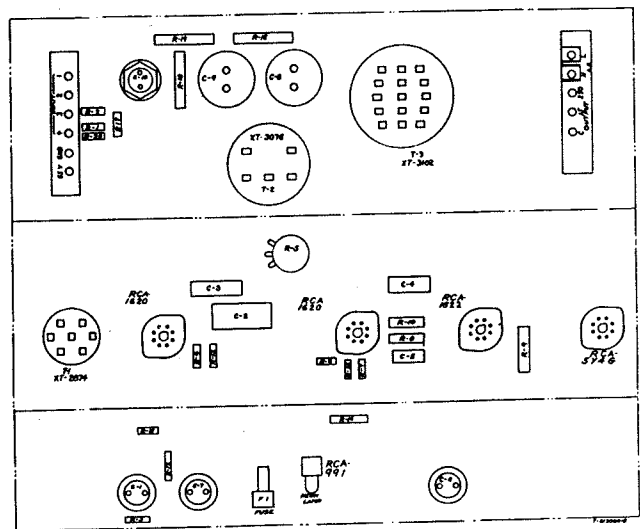


Figure 5 - Parts Layout MI-9375 Monitor Amplifier