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Operating Instructions

TYPE PG-140

RCA PHOTOPHONE

High Fidelity Theatre Sound Reproducing Equipment

OPERATING PROCEDURE

(a) 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. 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 MAIN AMPLIFIER USING THE METER AND SWITCH AS EXPLAINED BELOW.

(c) TURN ON THE MAIN SWITCH FOR THE PROJECTOR MOTOR SUPPLY.

(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 CHANGEOVER CUE IS OBSERVED ON THE SCREEN, TURN THE FADER CONTROL KNOB ON EITHER FADER CABINET TO THE OTHER PROJECTOR POSITION.

STAND-BY OPERATION

STAND-BY AMPLIFIER CHANNEL: A stand-by switch having an "A" and "B" position is mounted on the rear panel of the Monitor Amplifier (see Figure 1). In the "A" position the regular Voltage Amplifier and Power Amplifier channel amplifies the sound, and in the "B" position the Monitor Amplifier replaces the main amplifier channel.

When the switch is in the "B" or stand-by position, the volume level in the auditorium can only be controlled by the monitor volume control. The monitor volume control should be adjusted to obtain sufficient volume in the auditorium, immediately after the switch is thrown to the "B" position.

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

MI-1792D
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lamp, while in the "B" position of the switch a-c current is supplied to the exciter lamp.

AMPLIFIER RACK

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

VOLTAGE AND POWER AMPLIFIERS

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 RCA 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 the Voltage Amplifier located above the Power Amplifier (see Figure 1).

CAUTION: Replace grid covers of RCA 1620 tubes after replacing tubes.

MONITOR AMPLIFIER

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

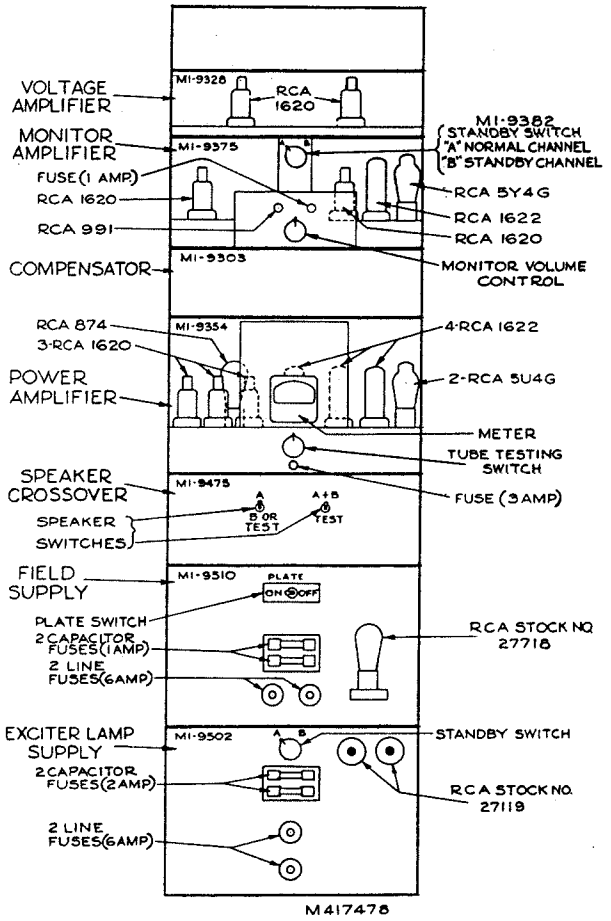


Figure 1 - PG-140 Amplifier Rack

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

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.

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."

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.

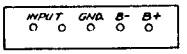
RADIOTRONS: The tubes should be tested periodically to determine their condition and any showing signs of deterioration should be replaced.

REPLACEMENT PARTS

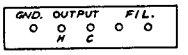
DESCRIPTION	STOCK NO.
MI-9303 Compensator Panel	
Capacitor - .007 mfd. (C13)	30854
Capacitor - .01 mfd. (C12)	30855
Capacitor - .025 mfd. (C1, C9, C14)	30859
Capacitor - .05 mfd. (C11, C18)	30847
Capacitor - .07 mfd. (C3)	30858
Capacitor - .1 mfd. (C11, C18)	30848
Capacitor - .5 mfd. use two unparallel to make 1.0 mfd. (C16, C17)	30860
Capacitor - .25 mfd. (C8)	30849
Reactor - .015 and .023 henries - XT-3038 (L2, L3) (used only with MI-1443 speaker)	27996
Reactor - .75 henries - XT-3037 (L4)	27997
Resistor - 1,500 ohms, 1 watt (R1)	3153
MI-9475 Cross-over Network	
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
MI-9510 Speaker Field Supply	
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

REPLACEMENT PARTS

DESCRIPTION	STOCK NO.
MI-9382 Monitor Emergency Switch	
Bracket - Switch bracket	27998
Knob - Switch bracket knob	28000
Resistor - 270 ohms, 1/2 watt (R2, R4)	30929
Resistor - 39,000 ohms, 1/2 watt (R1, R3)	30147
Switch - Monitor emergency switch	27999
MI-9502 Exciter Lamp Supply Panel	
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	27119
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



DESCRIPTION	STOCK NO.
MI-9328 Voltage Amplifier	
Cap - Grid contact cap	12118
Capacitor - 47 mmfd. (C9)	13141
Capacitor - .025 mfd. (C8)	30859
Capacitor - .07 mfd. (C1)	30858
Capacitor - .1 mfd. (C5)	30848
Capacitor - .25 mfd. (C7)	30849
Capacitor - .5 mfd. (C3)	30860
Capacitor - 4 mfd. (C4)	13919
Capacitor - 25 mfd. (C2, C6)	16727
Clamp - Capacitor clamp for Stock #13919	4358
Resistor - 820 ohms, 1/2 watt (R8)	30158
Resistor - 1,000 ohms, 1/2 watt (R2)	4687
Resistor - 56,000 ohms, 1/2 watt (R5)	30650
Resistor - 100,000 ohms, 1/2 watt (R1, R4)	3252
Resistor - 150,000 ohms, 1/2 watt (R9)	30493
Resistor - 180,000 ohms, 1/2 watt (R3)	11959
Resistor - 220,000 ohms, 1/2 watt (R11)	14583
Resistor - 270,000 ohms, 1/2 watt (R7, R10)	30651
Resistor - 390,000 ohms, 1/2 watt	11988
Resistor - 470,000 ohms, 1/2 watt (R6)	30648
Shield - Tube shield	12110
Socket - Socket section only of cushion tube socket	17896
Transformer - Input transformer XT-2874 (T1)	27995
Transformer - Output transformer XT-2875 (T2)	18051



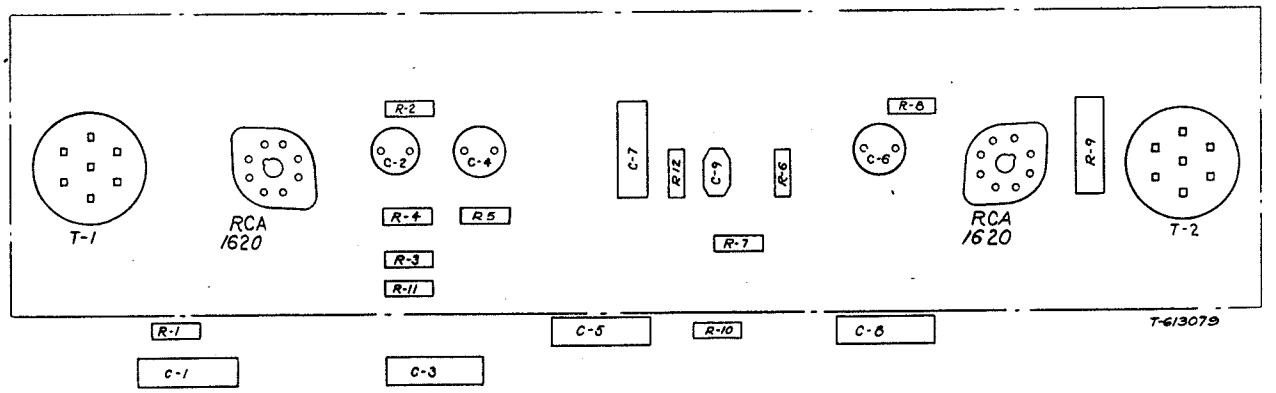


Figure 2 - Parts Layout - MI-9328 Voltage Amplifier

DESCRIPTION	STOCK NO.
MI-9375 Monitor Amplifier	
Cap - Grid contact cap	30314
Capacitor - .05 mfd. (C3, C5)	30847
Capacitor - .25 mfd. (C2, C4)	30849
Capacitor - 10 mfd. (C7, C10)	13224
Capacitor - 25 mfd. (C8, C9)	13036
Capacitor - 25 mfd. (C1, C6)	16727
Fuse - 1 ampere, 250 v. (F1)	14133
Knob - Volume control knob	28000
Post - Fuse post	32059
Resistor - 270 ohms, 1/2 watt (R1, R20)	30929
Resistor - 330 ohms, 2 watt (R9)	16625
Resistor - 390 ohms, 2 watt (R16)	30547
Resistor - 820 ohms, 1/2 watt (R6)	30158
Resistor - 1,800 ohms, 1/2 watt (R3)	30930
Resistor - 6,800 ohms, 2 watt (R19)	30148
Resistor - 39,000 ohms, 1/2 watt (R2, R17, R11)	30147
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

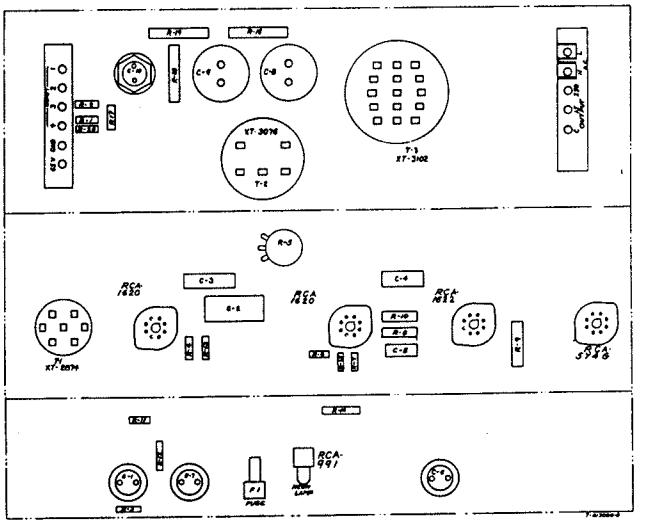


Figure 3 - Parts Layout - MI-9375 Monitor Amplifier

REPLACEMENT PARTS

MI-9375 Monitor Amplifier (Cont'd.)

DESCRIPTION	STOCK NO.
Resistor - 270,000 ohms, 1/2 watt (R4)	30651
Resistor - 390,000 ohms, 1/2 watt (R8)	11988
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 (T1)	27995
Transformer - Output transformer XT-3076 (T2)	28028
Transformer - Power transformer XT-3102 (T3)	28026
Volume Control - 500,000 ohms (R5)	28027

MI-9354 Power Amplifier

DESCRIPTION	STOCK NO.
Capacitor - 56 mmfd. (C8)	12723
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
Capacitor - .5 mfd. (C3)	30860
Capacitor - 10 mfd. (C15, C19)	13224
Capacitor - 25 mfd. (C16, C17 and 3 connected in parallel to make C14)	13036
Capacitor - 25 mfd. (C1, C5, C10)	16727
Fuse - 3 ampere (F1)	10907
Grid Cap	30314
Knob - Meter switch knob	27990
Meter - D.C. Milliammeter	27985
Post - Fuse post	32059
Potentiometer - 200 ohm potentiometer (R27,R28)	17905
Reactor - XT-8750 (L1)	17569
Resistor - 1 ohm (R37, R38, R39, R40)	27986
Resistor - 15 ohms, 1/2 watt (R44)	12014
Resistor - 33 ohms, 1/2 watt (R35, R36)	30789
Resistor - 39 ohms, 1/2 watt (R34)	11956
Resistor - 47 ohms, 1 watt (R19, R20, R21, R22)	18190
Resistor - 90 ohms (R16)	27982
Resistor - 160 ohms, 1/2 watt (R49)	32484
Resistor - 470 ohms, 2 watt (R23, R24)	32165
Resistor - 1,000 ohms, 1/2 watt (R2)	4687
Resistor - 2,200 ohms, 1/2 watt (R7, R8)	3526
Resistor - 4,700 ohms, 1 watt (R31, R47)	30788
Resistor - 10,000 ohms, 1/2 watt (R48)	3078
Resistor - 12,000 ohms, 1/2 watt (R12)	30436
Resistor - 15,000 ohms, 1/2 watt (R45)	12759
Resistor - 15,000 ohms (R41)	27983
Resistor - 27,000 ohms, 1 watt (R25)	13477
Resistor - 47,000 ohms, 1/2 watt (R14, R15, R17, R18)	30787
Resistor - 68,000 ohms, 1/2 watt (R1)	14138
Resistor - 82,000 ohms, 1/2 watt (R5, R9, R10)	8064
Resistor - 100,000 ohms, 1/2 watt (R43)	3252
Resistor - 150,000 ohms, 1/2 watt (R11, R13)	30493
Resistor - 220,000 ohms, 1/2 watt (R42)	14583
Resistor - 220,000 ohms, 1 watt (R4, R46)	30684
Resistor - 470,000 ohms, 1/2 watt (R6)	30648
Resistor - 1 megohm, 1/2 watt (R3)	30652
Resistor - Voltage divider resistor tapped at 1650 and 15,000 ohms (R29, R30)	27984
Shield - Grid cap shield	12110
Socket - 4 contact tube socket	31769
Socket - Octal base tube socket	17896
Switch - Meter switch	27981
Transformer - Input transformer XT-2874A (T1)	27989
Transformer - Output transformer XT-3109 (T2)	27988
Transformer - Power transformer XT-3033 (T3)	27987

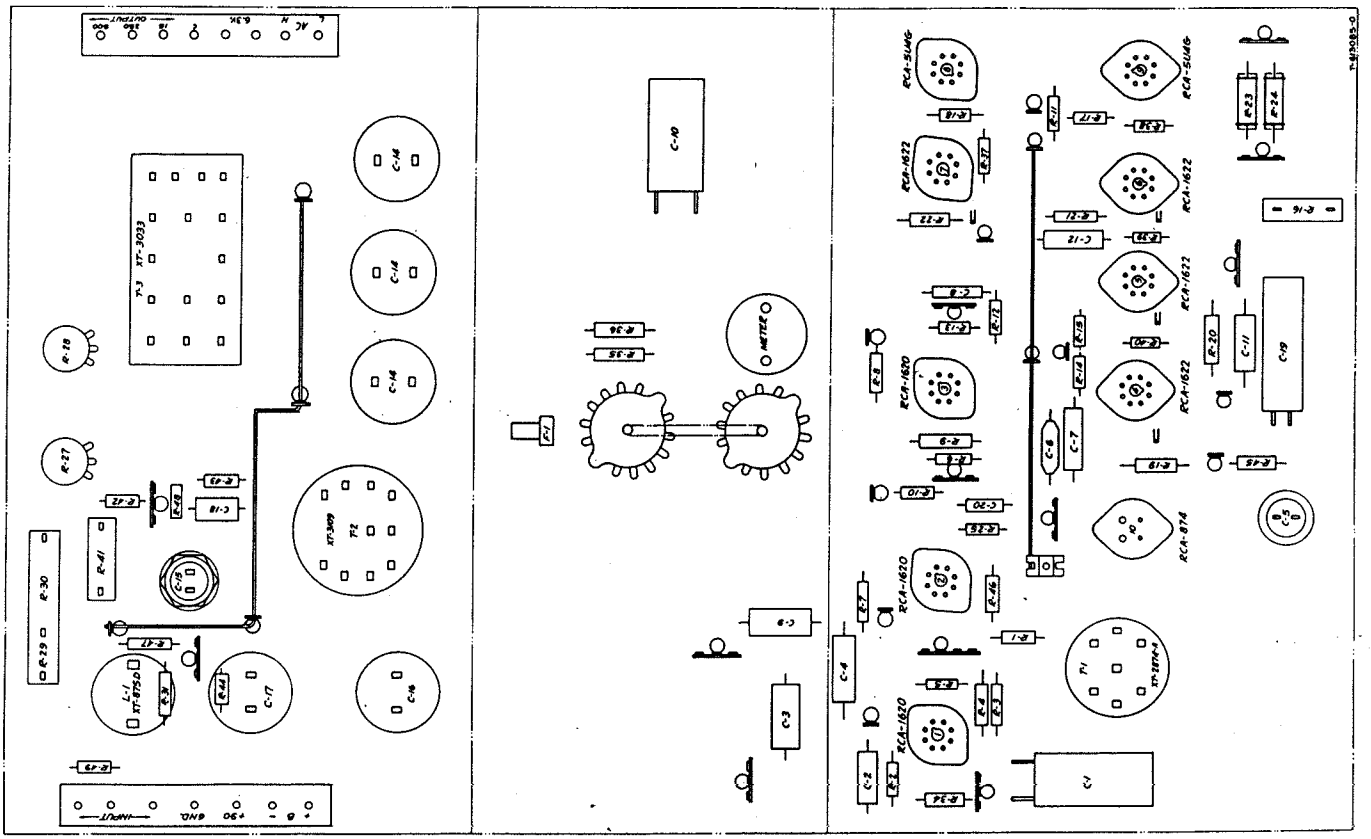


Figure 4 - Parts Layout - MI-9354 Power Amplifier