BROADCAST AND TELEVISION EQUIPMENT

RCA

Instructions

RADIO CORPORATION OF AMERICA, Industrial Electronic Products

TYPE BW-66F
AMPLITUDE MODULATION MONITOR

IB-30241

TYPE BW-66F

AMPLITUDE MODULATION MONITOR

MI-30066-B

FCC APPROVAL NO. 1559

INSTRUCTIONS

RADIO CORPORATION OF AMERICA
INDUSTRIAL ELECTRONIC PRODUCTS, CAMDEN, N. J.

PRINTED IN U.S.A.
DV 650

IB-30241

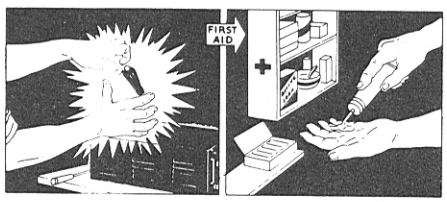
FIRST AID

WARNING!

Operation of electronic equipment involves the use of high voltages which are dangerous to life. Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside the equipment with voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors, etc. To avoid casualties, ALWAYS DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM.

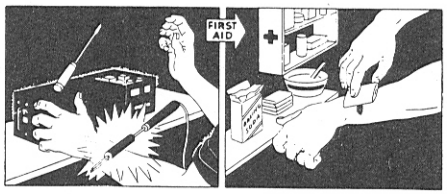
ABOUT FIRST AID

Personnel engaged in the installation, operation and maintenance of this equipment or similar equipment are urged to become familiar with the following rules both in theory and in the practical application thereof. It is the duty of every radioman to be prepared to give adequate First Aid and thereby prevent avoidable loss of life.



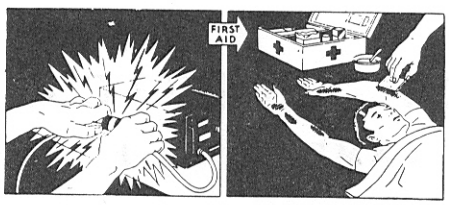
FIRST DEGREE BURN

SKIN REDDENED. Temporary treatment—Apply baking soda or Unguentine.



SECOND DEGREE BURN

SKIN BLISTERED. Temporary treatment—Apply baking soda, wet compress, white petroleum jelly, foille jelly, olive oil, or tea.



THIRD DEGREE BURN

FLESH CHARRED. Temporary treatment—Apply baking soda, wet compress, white petroleum jelly, or foille spray. Treat for severe shock.

BACK PRESSURE—ARM LIFT METHOD OF ARTIFICIAL RESPIRATION

(Courtesy of the American Red Cross)

1. Position of the subject (See Fig. 1)

Place the subject in the face down, prone position. Bend his elbows and place the hands one upon the other. Turn his face to one side, placing the cheek upon his hands.

FIGURE 1

2. Position of the operator (See Fig. 2)

Kneel on either the right or left knee at the head of the subject facing him. Place the knee at the side of the subject's head close to the forearm. Place the opposite foot near the elbow. If it is more comfortable, kneel on both knees, one on either side of the subject's head. Place your hands upon the flat of the subject's back in such a way that the heels lie just below a line running between the armpits. With the tips of the thumbs just touching, spread the fingers downward and outward.

FIGURE 2

3. Compression phase (See Fig. 3)

Rock forward until the arms are approximately vertical and allow the weight of the upper part of your body to exert slow, steady, even pressure downward upon the hands. This forces air out of the lungs. Your elbows should be kept straight and the pressure exerted almost directly downward on the back.

4. Position for expansion phase (See Fig. 4)

Release the pressure, avoiding a final thrust, and commence to rock slowly backward. Place your hands upon the subject's arms just above his elbows.

FIGURE 3

5. Expansion phase (See Fig. 5)

Draw his arms upward and toward you. Apply just enough lift to feel resistance and tension at the subject's shoulders. Do not bend your elbows, and as you rock backward the subject's arms will be drawn toward you. Then lower the arms to the ground. This completes the full cycle. The arm lift expands the chest by pulling on the chest muscles, arching the back, and relieving the weight on the chest.

THE CYCLE SHOULD BE REPEATED 12 TIMES PER MINUTE AT A STEADY, UNIFORM RATE. THE COMPRESSION AND EXPANSION PHASES SHOULD OCCUPY ABOUT EQUAL TIME; THE RELEASE PERIODS BEING OF MINIMUM DURATION.

FIGURE 4

Additional related directions:

It is all important that artificial respiration, when needed, be started quickly. There should be a slight inclination of the body in such a way that fluid drains better from the respiratory passage. The head of the subject should be extended, not flexed forward, and the chin should not sag lest obstruction of the respiratory passages occur. A check should be made to ascertain that the tongue or foreign objects are not obstructing the passages. These aspects can be cared for when placing the subject into position or shortly thereafter, between cycles. A smooth rhythm in performing artificial respiration is desirable, but split-second timing is not essential. Shock should receive adequate attention, and the subject should remain recumbent after resuscitation until seen by a physician or until recovery seems assured.

FIGURE 5

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

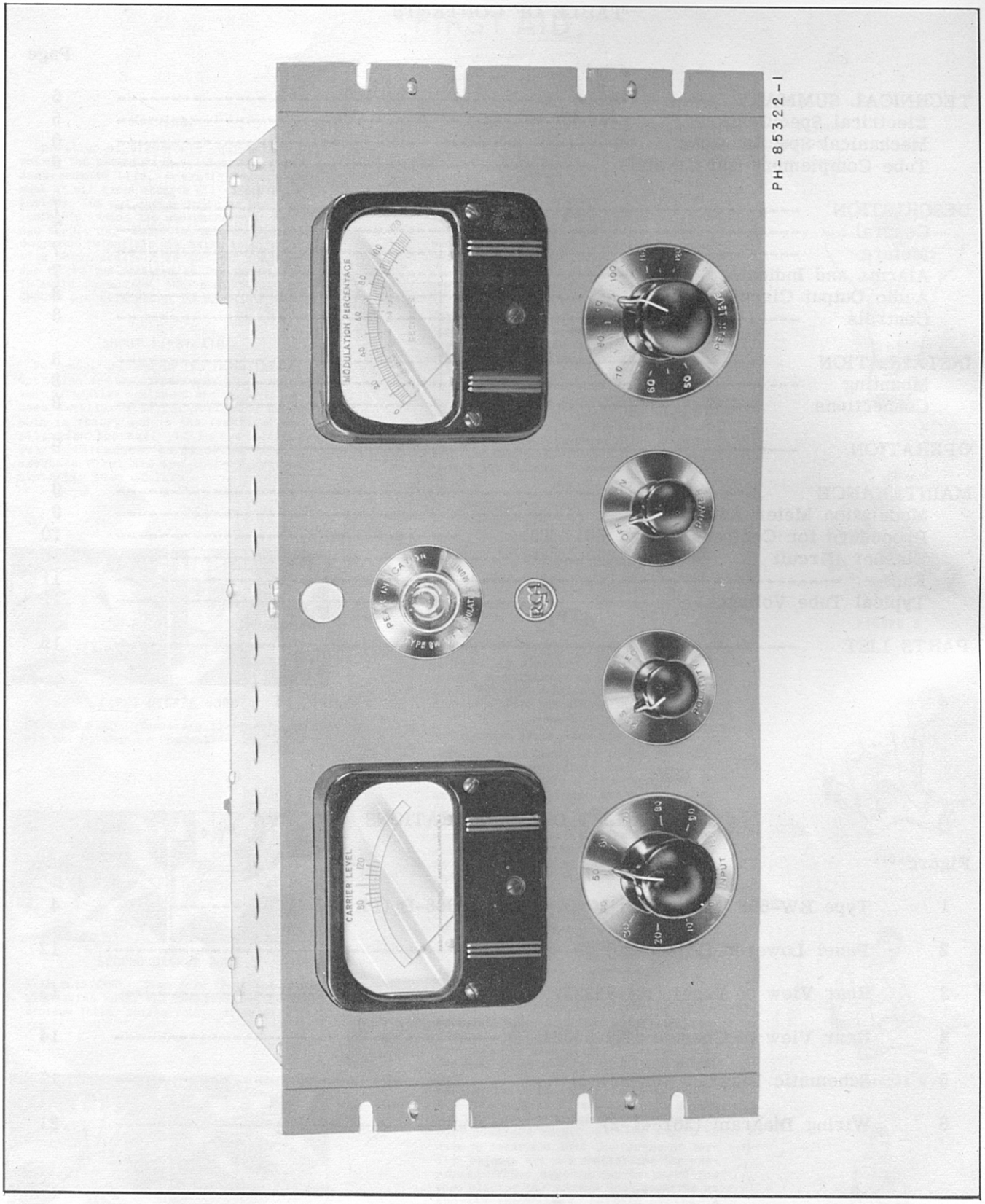


Figure 1 - Type BW-66F Modulation Monitor, MI-30066-B (PH-85322)

TECHNICAL SUMMARY

ELECTRICAL SPECIFICATIONS

FCC APPROVAL NUMBER 1559

POWER REQUIRED

110 watts
110 to 125 volts
50 to 60 cycles

FUSES

2 amperes, type 3AG

FREQUENCY RANGE

500 to 2500 kc

R. F. INPUT (Nominal Impedance 75 ohms)

Minimum: 0.35 watt
Maximum: 6 watts

AUDIO OUTPUT CIRCUITS

Audio Monitoring Circuit

Source Impedance: 600 ohms
Level: 1 volt rms at 100% modulation
Response: 30 to 15,000 cps ±1 db
Distortion: Less than 1%
Noise Level: Better than 60 db below the audio level at 100% modulation

Distortion Meter Circuit

Source Impedance: 20,000 ohms
Level: 3 volts rms at 100% modulation
Response: 30 to 45,000 cps ±1/2 db
Distortion: Less than 0.2%
Hum and Noise Level (at the terminals): Better than 70 db below the audio level at 100% modulation

ACCURACY OF METER

±2% of full scale at 100% modulation
±4% of full scale at any other percentage modulation

ZERO SHIFT WITH LINE VOLTAGE

Compensated to less than 1.0% for line voltage variation from 110 to 125 volts.

MODULATION RANGE

0 to 120% positive
0 to 100% negative

ALARM RELAY CONTACTS RATING

1 ampere
115 volts ac

MECHANICAL SPECIFICATIONS

DIMENSIONS AND WEIGHT

Height: 8-3/4 inches
Width: 19 inches
Depth: 11 inches
Weight: 37 pounds

TUBE COMPLEMENT (MI-30450)

2 RCA 6AL5
1 RCA 6C4
1 RCA 6AQ5
1 RCA 5814
2 RCA 884
2 RCA OD3
1 RCA 5V4G

CRYSTALS

2 Type 1N97

DESCRIPTION

GENERAL

The Type BW-66F Amplitude Modulation Monitor (MI-30066-B), shown in Figure 1, is an instrument designed for measuring the degree of modulation on the carrier wave of an amplitude modulated transmitter operating on any frequency within the range of 500 to 2500 kilocycles. It was designed to meet the specifications of the Federal Communication Commission as set forth in Section 3.50 (b) of the Rules.

Panel meters indicate both the modulation percentage and the carrier level. Provision is made for connecting a remote alarm, or a counter for recording the periods when the percentage modulation exceeds that desired to be maintained by the station. An over-modulation alarm or flashing lamp is provided to give instant warning when the modulation exceeds the established level.

In addition, two auxiliary audio output circuits operating from a separate diode rectifier are provided. One of these, a 600-ohm impedance circuit, is intended for audible monitoring; the other, a high impedance circuit, gives a faithful reproduction of the carrier envelope with less than 0.2% distortion. The high impedance output circuit can be connected directly to the RCA WM-71A Distortion and Noise Meter, enabling overall fidelity and noise measurements to be made on the transmitter. The unit is designed for standard rack mounting. Two RF INPUT terminals, a POWER receptacle and a terminal board for all other connections are mounted on the back of the chassis. See Figure 4.

METERS

Two panel mounting meters having illuminated scales are provided. The CARRIER meter includes a scale calibrated from 80 to 120 with a red mark at 100. Normal operation is obtained when the pointer is set at this red mark which denotes the correct radio frequency input level.

The MODULATION PERCENTAGE meter has a range of zero to 120% and is also calibrated in decibels using 100% modulation as zero db. The ballistic characteristics of this meter meet the requirements of the FCC. A polarity switch is provided so that either the positive or negative peak values may be measured. The accuracy of measurement of percentage modulation is greater than that required by the FCC, which is ±2% at 100% modulation and ±4% of full scale at any other percentage of modulation. The frequency response of the modulation meter circuit is 30 to 15,000 cps ±1/2 db. Terminals are provided for connecting one or more external modulation meters.

If one or two external meters are used, ballistic characteristics will meet FCC requirements. Use of more than two external meters, however, may result in ballistic characteristics outside the limits specified by the FCC.

The CARRIER LEVEL meter is calibrated from 80% to 120% to show carrier level shift.

ALARMS AND INDICATORS

The PEAK INDICATOR or over-modulation alarm consists of a flashing neon lamp which operates when the percent modulation exceeds that set by the manually operated PEAK LEVEL control. Simultaneously with the operation of the flasher, a relay is caused to operate. This relay may be used to control a remote peak counter. The timing of the relay circuit is such that it remains closed for the duration of any over-modulation peak.

The alarm circuit is arranged so that it will operate properly when the modulation frequency lies between the limits of 30 to 15,000 cps. Constant accuracy of alarm operation, regardless of line voltage changes at the power supply input, is insured by supplying regulated power to the circuit. The contact connections of the relay are available on a terminal board at the rear of the instrument. These contacts are designed to carry a current of one ampere at 115 volts.

AUDIO OUTPUT CIRCUITS

There are two audio output sources from the Type BW-66F Modulation Monitor. Refer to Figure 4. One of these circuits is intended to operate the monitor loudspeaker through a suitable amplifier. The impedance of this source is 600 ohms, unbalanced, and the output level is one volt rms with 100% modulation. The frequency response of the monitoring circuit is 30 to 15,000 cps ±1 db and the distortion is less than one percent. Connection to this circuit is made through terminals number 5 and 6.

The second output circuit from the monitor is employed for connection to a distortion meter. The impedance of this source is 20,000 ohms (one side is grounded) and the level is three volts rms with 100% modulation. The frequency response of the circuit is within ±1/2 db between 30 and 45,000 cps and the distortion is less than 0.2% between 30 and 15,000 cps. The hum and noise level at the distortion meter terminals is better than 70 db below the audio level at 100% modulation. Connection to this circuit is made through terminals number 7 and 8.

CONTROLS

The instrument has four conveniently disposed controls mounted upon the front panel. Refer to Figure 1. They are: the **RF INPUT** control which is used for adjusting the signal input to the monitor, the **POLARITY** switch which allows either positive or negative peaks to be measured, depending upon the switch position, the **POWER** switch permitting the monitor to be turned **ON** or **OFF** from the front panel, and the **PEAK LEVEL** control which is calibrated from 50 to 120% modulation is used for setting the lowest value of percent modulation at which it is desired to have the overmodulation alarm operate.

INSTALLATION

MOUNTING

The monitor is designed for mounting in a standard 19-inch rack such as the RCA Type BR-84 (MI-30951 series) Cabinet Rack.

CONNECTIONS

The RF input terminals, see Figure 4, should be connected to the standard RETMA pick-up circuit which is usually provided as part of the transmitter. A 75-ohm coaxial cable should be used for this connection.

Terminals (to which R11 is connected in Figure 4) are provided for the connection, in series, of additional external MODULATION meters when and if desired. When external meters are used, the resistance value of R11 must be reduced by approximately 1500 ohms for each external

meter added, in order to maintain a total resistance at terminals 1 and 2 of TB1, including meter(s) of 6500 ohms. When an external meter is connected to the end of a long line, the resistance of this line also must be included in the total resistance. If no external meter is used, these terminals should be shorted by the 6490 ohm resistor, R11, which is provided for that purpose.

The contacts of the MODULATION ALARM relay K1 are connected to terminals numbers 3 and 4 at the rear of the monitor, see Figure 4. The contacts of the relay have a capacity of one ampere at 115 volts. A peak counter or warning circuit may be connected to these terminals. These circuits should not draw over 1 ampere. Connect the receptacle J1 to a 110-125 volt, 50-60 cycle source.

OPERATION

With the monitor connected to a 110-125 volt, 50-60 cycle power source and with the power switch S2 in the ON position, put the instrument into operation in the following manner:

1. Set the RF INPUT control to its extreme counterclockwise position.

2. With the transmitter pick up circuit connected to the RF input jack, TB-13, turn on the transmitter. If the pointer of the carrier level meter moves beyond the red mark, adjust the position of the pickup coil in the transmitter to reduce the signal input to the monitor. Only about 0.35 watt r-f power is required to operate the indicator within its normal range.

3. Adjust the RF INPUT control so that the carrier meter reads 100. For stations operating with different day and night power outputs, the pickup coil should be adjusted so that the CARRIER LEVEL meter can be properly set for both power levels by the RF INPUT control.

After these adjustments, the MODULATION meter will indicate the percentage of modulation directly, and of such polarity as is shown on the POLARITY switch. If the modulation percentage exceeds the setting of the PEAK LEVEL control, the PEAK INDICATOR neon tube will light and the MODULATION ALARM terminals 3 and 4 will be shorted by the relay.

MAINTENANCE

MODULATION METER ADJUSTMENT

If for any reason the adjustment of the AUDIO LEVEL potentiometer, R19, has been altered from its original setting it may be readjusted in the following manner: With the TRANSMITTER and the MODULATION MONITOR in operation, set the polarity switch to the NEGATIVE position. With the CARRIER LEVEL meter at 100, check the zero setting of the modulation meter. The meter should be adjusted to indicate any residual noise modulation in the transmitter after the modulator is turned off. Then, using 1000-cycle constant-frequency modulation, feed sufficient signal into the transmitter to cause 100% modulation. Adjust the RF INPUT control to set the pointer of the CARRIER LEVEL meter at the red line. Adjust the AUDIO LEVEL control R19 until the modulation meter indicates 100%.

IMPORTANT: In order to obtain an accurate adjustment it is necessary that the transmitter be in proper operation and correctly neutralized.

The meter indication should be the same on either position of the POLARITY switch provided the modulation waveform is purely sinusoidal and no sideband clipping is present in the transmitter.

PROCEDURE FOR COMPENSATION OF 5814 TUBE

In order to compensate this tube for variations in line voltage, the monitor should be connected to the power supply lines through a "Variac" or similar voltage varying device. If a "Variac" is not available it will be necessary to check the operation of the monitor at periods of the day when low and high limits of line voltage are encountered.

To compensate for "zero" drift of a 5814 tube proceed as follows:

1. Set the mechanical zero on the MODULATION PERCENTAGE meter.

2. Apply normal line voltage (117 v a-c measured with an accurate voltmeter) to the unit and allow it to warm up for 15 minutes.

3. Using a screwdriver, set controls R4 (ZERO SET) and R41 (BIAS) at the mid-position of their adjustment range.

4. Apply an unmodulated r-f signal to the unit then adjust the electrical zero of the MODULATION PERCENTAGE meter by means of R41 (BIAS).

5. Without changing the setting of R4 (ZERO SET) vary the applied a-c line voltage between the limits of 110 volts and 125 volts. Allow the voltage to remain at each of these limits for at least 30 seconds to stabilize the heater temperature, then note the amount of zero shift on the MODULATION PERCENTAGE meter at each limit.

6. If the zero shift is greater than 1.0%, change the setting of R41 (BIAS) slightly, then restore the meter zero by adjusting R4 (ZERO SET).

7. Again vary the line voltage between the specified limits as described in step 5 and note the amount of zero shift.

If the shift has increased from the previous value, change the setting of R41 (BIAS) in the opposite direction past the original position. Readjust the meter zero by means of R4 (ZERO SET).

A decrease in the amount of zero shift indicates that R41 has been moved in the correct direction and should be moved still further this way. Readjust the meter zero by means of R4 (ZERO SET).

8. Repeat the procedures in steps 5 and 7 until a setting is found for R41 (BIAS) which gives a zero shift value of less than 1.0% when the line voltage is varied between 110 volts and 125 volts.

FLASHER CIRCUIT

When the flasher circuit is properly adjusted, the PEAK INDICATOR neon lamp, I-1, will just begin to flash when the percentage modulation set by the PEAK LEVEL control corresponds

to the percentage modulation indicated by the MODULATION PERCENTAGE meter. If the RCA-884 MODULATION ALARM tube has been changed, or the adjustment of R19 disturbed, readjustment should be made as follows: With sufficient carrier and modulation to give an indication of 100% on the MODULATION PERCENTAGE meter, set the PEAK LEVEL control knob at 100. Then adjust the PEAK CALIBRATION CONTROL 'A', indicated in Figure 2, until the neon lamp just flashes. Reduce the percentage of modulation so that the MODULATION PERCENTAGE meter indicates 50% modulation. Set the PEAK LEVEL knob to 50, and adjust the 'B' PEAK CALIBRATION control until the neon lamp just flashes. Repeat these adjustments until the threshold operation of the neon lamp is obtained when the PEAK LEVEL control and the MODULATION PERCENTAGE meter indicate 100% and when the control and meter indicate 50%.

FUSES

When replacing a blown fuse, make sure that the replacement fuse is of the same type and rating (3 amperes, type 3AG) as the one furnished with the monitor. To replace a fuse with one of higher rating will needlessly endanger the equipment.

TYPICAL TUBE VOLTAGES

Voltages measured to ground except V4 and V5 filaments.
No signal on input.
AC line voltage 117 v, 60 cycles.
All voltages DC unless otherwise indicated.
DC voltages measured with 20,000 ohms/volt meter.

No.	Type	Function	Pin Number								
			1	2	3	4	5	6	7	8	9
V1	6AL5	AF Diode	0.7		6.3 ac		0.7				
V2	5814	DC Amplifier	300		14	6.3 ac	6.3 ac	300		14	
V3	6C4	AF Amplifier	300		6.3 ac		300		18		
V4	884	Mod. Alarm		6.3 ac	300		18			68	
V5	884	Mod. Alarm		6.3 ac	400					66	
V6	6AQ5	AF Amplifier		40	6.3 ac		300	300	25		
V7	5V4G	Rectifier		5.0 ac		380		380			
V8	OD3	Regulator		150			300				
V9	OD3	Regulator		0			150				
V10	6AL5	RF Demodulator			6.3 ac						

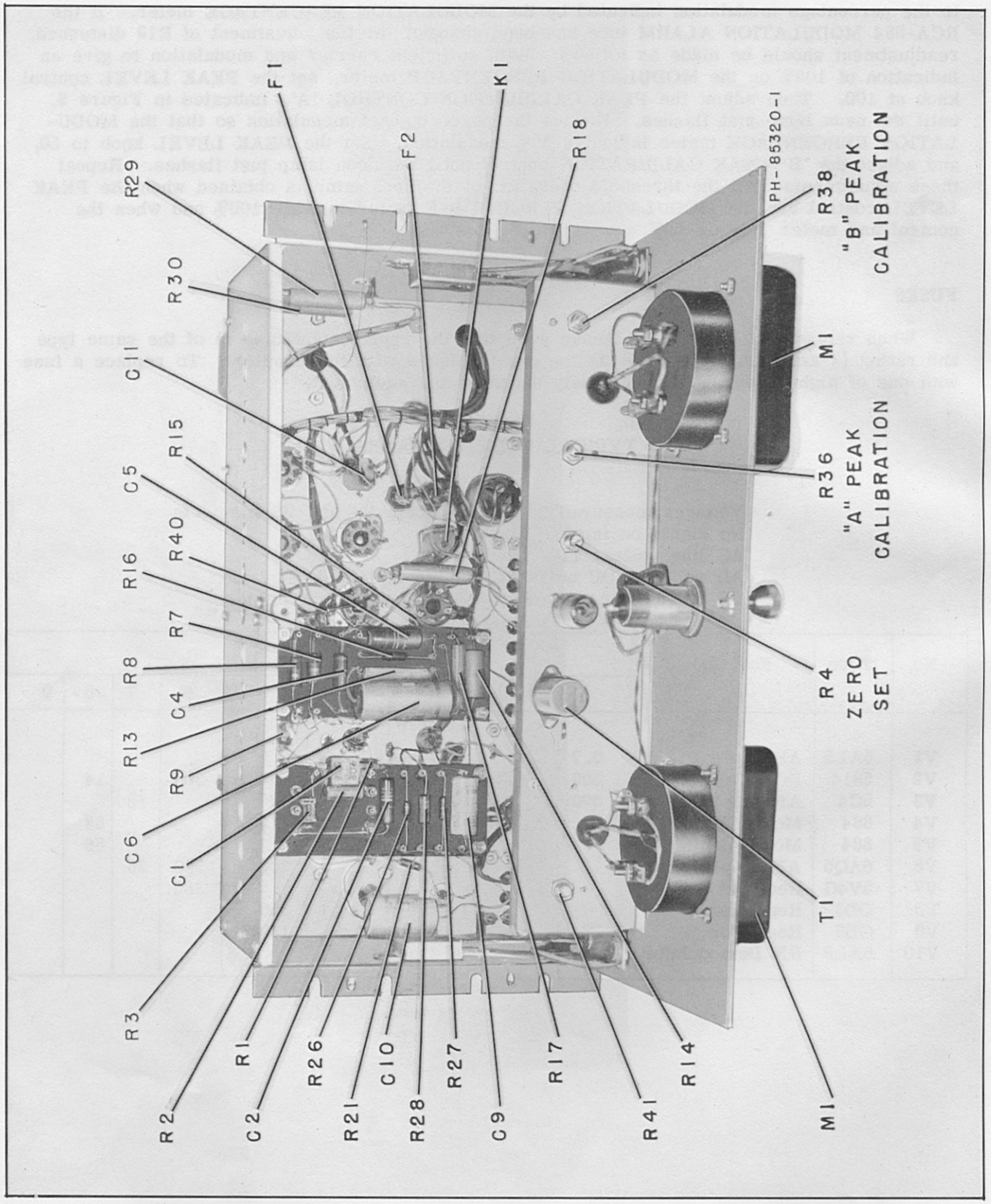


Figure 2 - Panel Lowered (PH-85320)

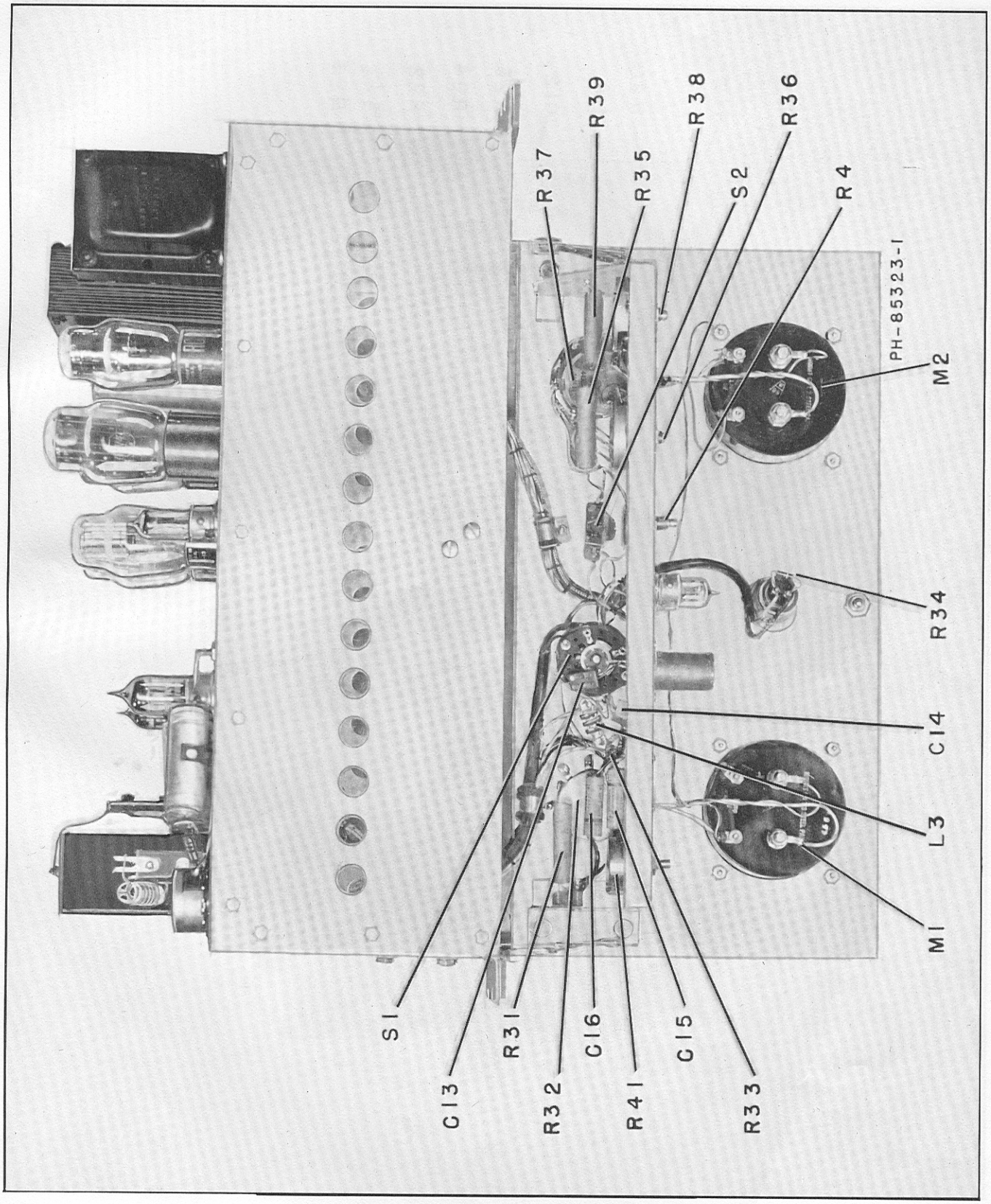


Figure 3 - Rear View of Panel (PH-85323)

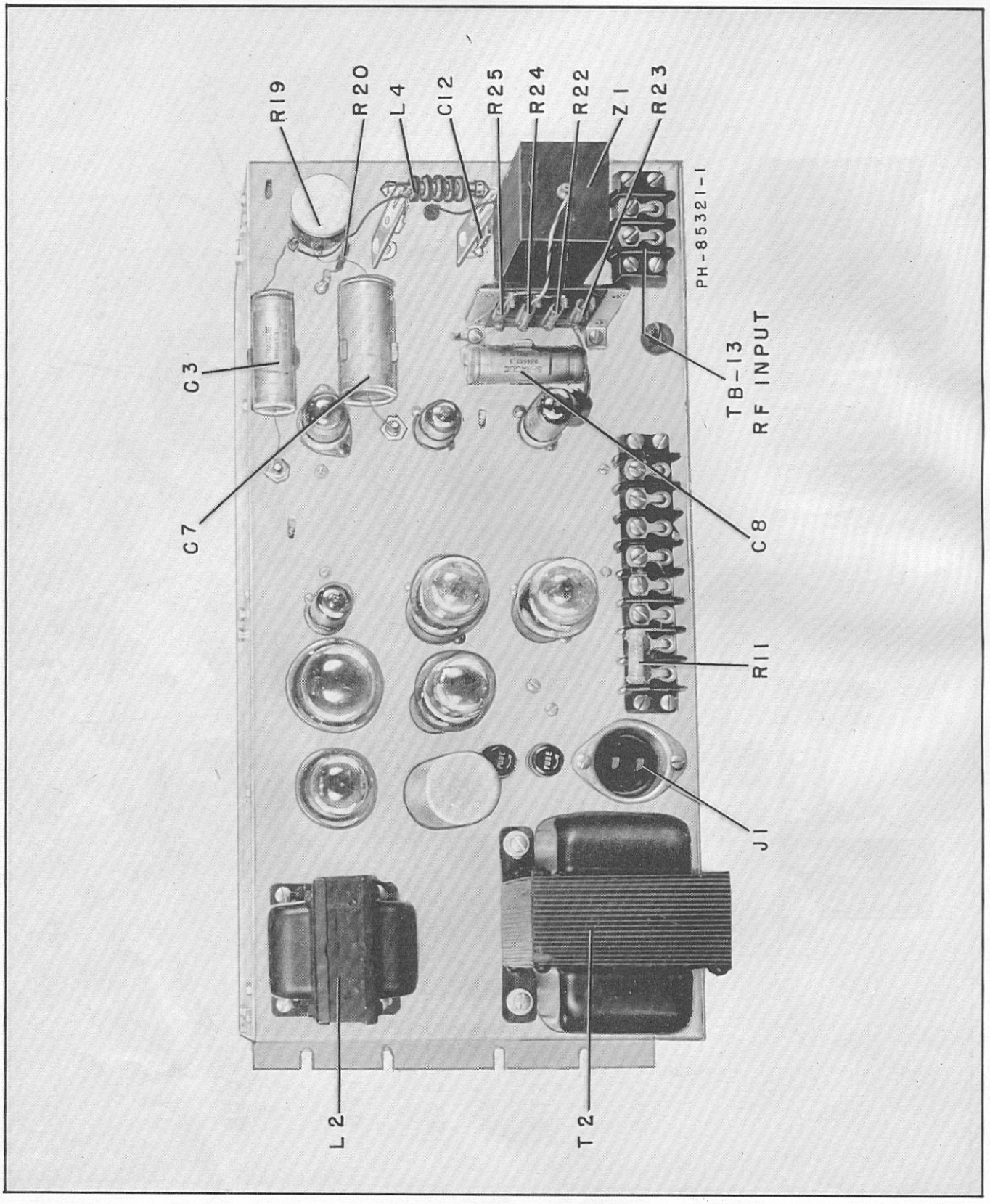


Figure 4 - Rear View of Chassis (PH-85321)

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt.

Report all shortages and damages to RCA, Broadcast and Television Department, Camden 2, N. J.

Radio Corporation of America will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

REPLACEMENT PARTS AND ENGINEERING SERVICE

RCA field engineering service is available at current rates. Requests for field engineering service may be addressed to your RCA Broadcast Field Representative or the RCA Service Company, Inc., Broadcast Service Division, Camden, N. J. Telephone: WOodlawn 3-8000.

When ordering replacement parts, please give symbol, description, and stock number of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment.

The following tabulations list service parts and electron tube ordering instructions according to your geographical location.

SERVICE PARTS

LOCATION	ORDER SERVICE PARTS FROM:
Continental United States, including Alaska and Hawaii	RCA Electron Tube Division, Parts and Equipment, P.O. Box 654, Camden, New Jersey or through your nearest RCA Regional Office. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg. 60, Camden, N. J. (Telephone: WO 3-8000).
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	RCA International Division, Clark, N. J., U.S.A. or through your local Sales Representative.

ELECTRON TUBES

LOCATION	ORDER ELECTRON TUBES FROM:
Continental United States, including Alaska and Hawaii	Local RCA Tube Distributor.
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	Local RCA Tube Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

RETURN OF ELECTRON TUBES

If for any reason, it is desired to return tubes, please return them through your local RCA tube distributor, RCA Victor Co. Ltd., or RCA International Div., depending on your location.

PLEASE DO NOT RETURN TUBES DIRECTLY TO RCA WITHOUT AUTHORIZATION AND SHIPPING INSTRUCTIONS.

It is important that complete information regarding each tube (including type, serial number, hours of service and reason for its return) be given.

When tubes are returned, they should be shipped to the address specified on the Return Authorization form. A copy of the Return Authorization and also a Service Report for each tube should be packed with the tubes.

LIST OF RCA REGIONAL OFFICES

Atlanta 3, Georgia
1121 Rhodes-Haverty Bldg.
134 Peachtree St. N.W.
JAckson 4-7703

Boston 16, Mass.
Room 2301, John Hancock Bldg.
200 Berkley St.
HUbbard 2-1700

Chicago 54, Ill.
1186 Merchandise Mart Plaza
DElaware 7-0700

Cleveland 15, Ohio
1600 Keith Bldg.
CHerry 1-3450

Dallas 35, Texas
7901 Empire Freeway
FLeetwood 2-3911

Hollywood 28, Calif.
RCA Bldg., 1560 N. Vine St.
HOllywood 9-2154

Kansas City 6, Missouri
340 Home Savings Bldg.
HArrison 1-6480

New York 20, New York
36 W. 49th St.
JUdson 6-3800

Branch—San Francisco 2, Calif.
420 Taylor St.
ORdway 3-8027

Seattle, Washington
2250 First Ave., S.
MAin 2-8350

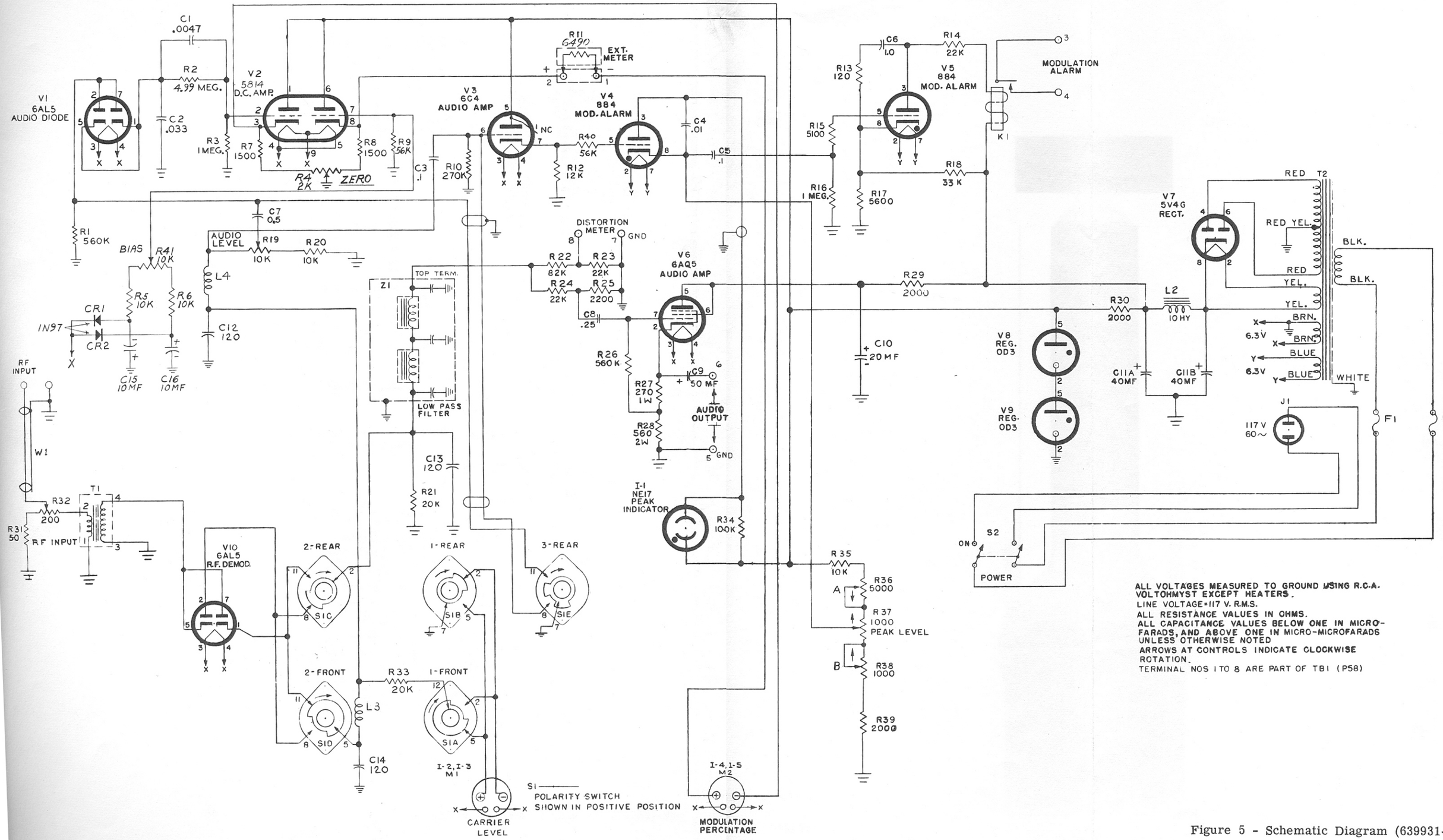
PARTS LIST

For ordering information see page 15

SYMBOL NO.	DESCRIPTION	STOCK NO.
C1	Capacitor: fixed, mica, 0.0047 mf ±5%	58316
C2	Capacitor: molded, paper, 0.033 mf ±10%, 400 v	73552
C3	Capacitor: paper, 0.1 mf ±10%, 200 v	56184
C4	Capacitor: molded, paper, 0.01 mf ±10%, 400 v	73561
C5	Capacitor: molded, paper, 0.1 mf ±10%, 400 v	73551
C6	Capacitor: paper, tubular, 1.0 mf ±10%, 400 v	70620
C7	Capacitor: paper, 0.5 mf ±10%, 400 v	52769
C8	Capacitor: paper, 0.25 mf ±10%, 200 v	59168
C9	Capacitor: dry electrolytic, 50 mf -10 +250%, 25 v	94667
C10	Capacitor: dry electrolytic, 20 mf -10 +50%, 450 v	99149
C11A, B	Capacitor: dry electrolytic, 40-40 mf -10 +50%, 450 v	58567
C12 to C14	Capacitor: fixed, mica, 120 mmf ±10%, 500 v	99160
C15, C16	Capacitor: dry electrolytic, 10 mf, 25 v	52533
CR1, CR2	Crystal: germanium junction, type 1N97	213238
F1, F2	Fuse: 3 amp	10907
I1	Socket: lamp, double contact bayonet receptacle	59162
J1	Connector: male, 2 contacts	55410
K1	Relay: armature coil 6500 ohms, 500 v; contacts SPDT, 1 amp, 115 v, non-inductive	212900
L1	Not Used	
L2	Reactor: filter, 10 henries, 3 v, 60 cy, 0.110 amp dc	59166
L3	Reactor: choke, 10 mh, 50 ma	215190
L4	Reactor: choke, 10 mh, 125 ma	206043
M1, I2, I3	Meter: carrier level, scale 80-120	59161
M2, I4, I5	Meter: modulation percentage, scale 0-300 ma	214831
R1	Resistor: fixed, composition, 560,000 ohms ±5%, 1/2 w	502456
R2	Resistor: fixed, film type, 4.99 meg ±1%, 1 w	214810
R3	Not Used	
R4	Resistor: variable, 2000 ohms	93456
R5, R6	Resistor: fixed, composition, 10,000 ohms ±10%, 1/2 w	502310
R7, R8	Resistor: fixed, wire wound, 1500 ohms ±5%, 2 w	59435
R9	Resistor: fixed, composition, 56,000 ohm ±10%, 1/2 w	502356
R10	Resistor: fixed, composition, 270,000 ohms ±5%, 1/2 w	502427
R11	Resistor: fixed, composition, 6490 ohms ±1%, 1 w	214670
R12	Resistor: fixed, composition, 12,000 ohms ±5%, 1/2 w	502312
R13	Resistor: fixed, wire wound, low power, 120 ohms ±5%, 2 w	54881
R14	Resistor: fixed, wire wound, 22,000 ohms ±5%, 5 w	59175
R15	Resistor: fixed, composition, 5100 ohms ±5%, 1 w	512251
R16	Not Used	
R17	Resistor: fixed, wire wound, 5600 ohms ±5%, 2 w	59174
R18	Resistor: fixed, wire wound, 33,000 ohms ±5%, 10 w	44893
R19	Resistor: variable, 10,000 ohms ±10%, 2 w	56381
R20	Resistor: fixed, composition, 10,000 ohms ±1%, 1/2 w	209648
R21	Resistor: fixed, composition, 20,000 ohms ±5%, 1 w	512320
R22	Resistor: fixed, composition, 82,000 ohms ±5%, 1 w	512382
R23, R24	Resistor: fixed, composition, 22,000 ohms ±5%, 1 w	512322
R25	Resistor: fixed, composition, 2200 ohms ±5%, 1 w	512222
R26	Resistor: fixed, composition, 560,000 ohms ±5%, 1/2 w. Same as R1	502456
R27	Resistor: fixed, composition, 270 ohms ±5%, 1 w	512127

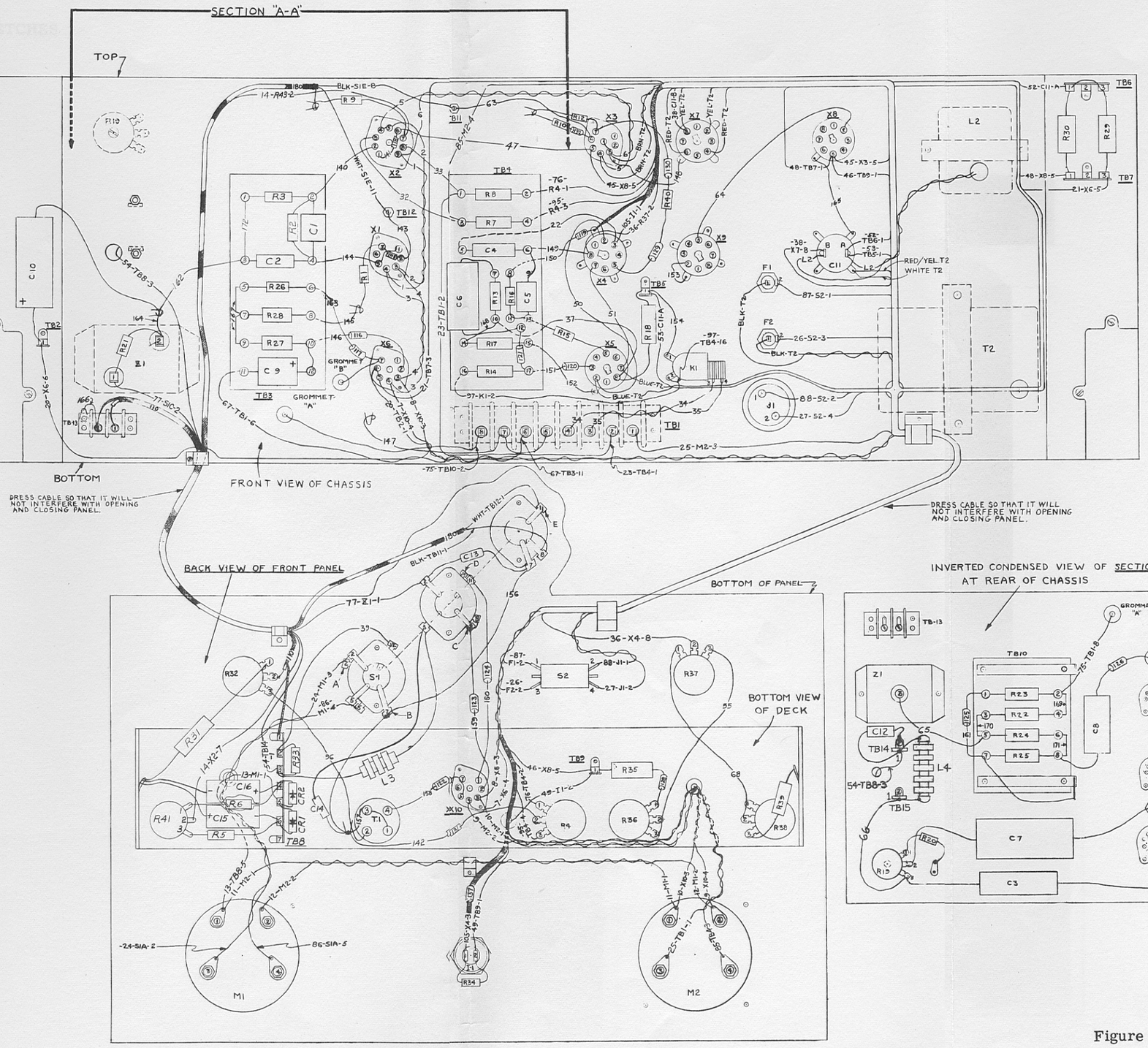
For ordering information see page 15

SYMBOL NO.	DESCRIPTION	STOCK NO.
R28	Resistor: fixed, composition, 560 ohms ±5%, 2 w	522156
R29, R30	Resistor: fixed, wire wound, 2000 ohms ±5%, 10 w	53366
R31	Resistor: fixed, wire wound, 50 ohms ±10%, 10 w	59178
R32	Resistor: variable, 200 ohms ±10%, 3 w	59156
R33	Resistor: fixed, composition, 20,000 ohms ±1%, 1/2 w	213657
R34	Resistor: fixed, composition, 100,000 ohms ±5%, 1/2 w	502410
R35	Resistor: fixed, wire wound, 10,000 ohms ±5%, 10 w	205837
R36	Resistor: variable, 5000 ohms ±20%, 3 w	57134
R37	Resistor: variable, 1000 ohms ±2%, 3 w	59157
R38	Resistor: variable, 1000 ohms ±10%, 3 w	18002
R39	Resistor: fixed, wire wound, 2000 ohms ±5%, 10 w. Same as R29	53366
R40	Resistor: fixed, composition, 56,000 ohms ±10%, 1/2 w. Same as R9	502356
R41	Resistor: variable, 10,000 ohms ±10%, 2 w. Same as R19	56381
S1A to S1E	Switch: rotary, 2 position, 3 section	59158
S2	Switch: power, DPST, "off-on"	59159
T1	Transformer: RF wide band, impedance ratio 55/2400 450 kc to 3000 kc	59164
T2	Transformer: power, plate & filament, pri 115 v 50/60 cy. plate 350-350 v 0.110 amp. fil #2 5.0 v 2 amp. fil #3 6.3 v 1 amp	94631
Z1	Filter: low pass filter pack	59170
	MISCELLANEOUS	
	Holder: fuse	48894
	Jewel: for indicator lamp	59163
	Knob: control, large	17268
	Knob: control, small	30075
	Screw: thumb, for front panel	59171
	Shield: tube, for 7 pin miniature tube socket	53016
	Socket: tube, 7 pin miniature	94879
	Socket: tube, octal	54414
	Socket: tube, 9 pin miniature	94880



ALL VOLTAGES MEASURED TO GROUND USING R.C.A. VOLTOHMYST EXCEPT HEATERS.
LINE VOLTAGE=117 V. R.M.S.
ALL RESISTANCE VALUES IN OHMS.
ALL CAPACITANCE VALUES BELOW ONE IN MICRO-FARADS, AND ABOVE ONE IN MICRO-MICROFARADS UNLESS OTHERWISE NOTED
ARROWS AT CONTROLS INDICATE CLOCKWISE ROTATION.
TERMINAL NOS 1 TO 8 ARE PART OF TB1 (P58)

Figure 5 - Schematic Diagram (639931-3)



WIRE TABLE	
WIRE NO (INCLUSIVE)	DESCRIPTION
1 TO 14	WHT.- BROWN
20 TO 27	WHT.- RED
32 TO 39	WHT.- YEL.
45 TO 55	WHT. BLUE
63 TO 68	WHT. GRN.
75 TO 77	WHT. BLK./YEL.
85 TO 88	WHT. BLK./RED
95 TO 97	WHT. YEL/RED
105	SHIELDED CABLE
110	CABLE - RG-59U
115 TO 126, 138 TO 155	SLEEVING BLK EXT .062 I.D.
137	SLEEVING- BLK EXT .263 I.D.
140 TO 156, 158 TO 159	TINNED COPPER .032 I.D.
180	MICROPHONE CABLE

NOTE #1 NUMBERS IN WIRES REFER TO WIRE TABLE & WIRE DESTINATIONS RESPECTIVELY

Figure 6 - Wiring Diagram (361841-2)

NOTES AND SKETCHES

RADIO CORPORATION OF AMERICA

INDUSTRIAL ELECTRONIC PRODUCTS, CAMDEN, N. J.