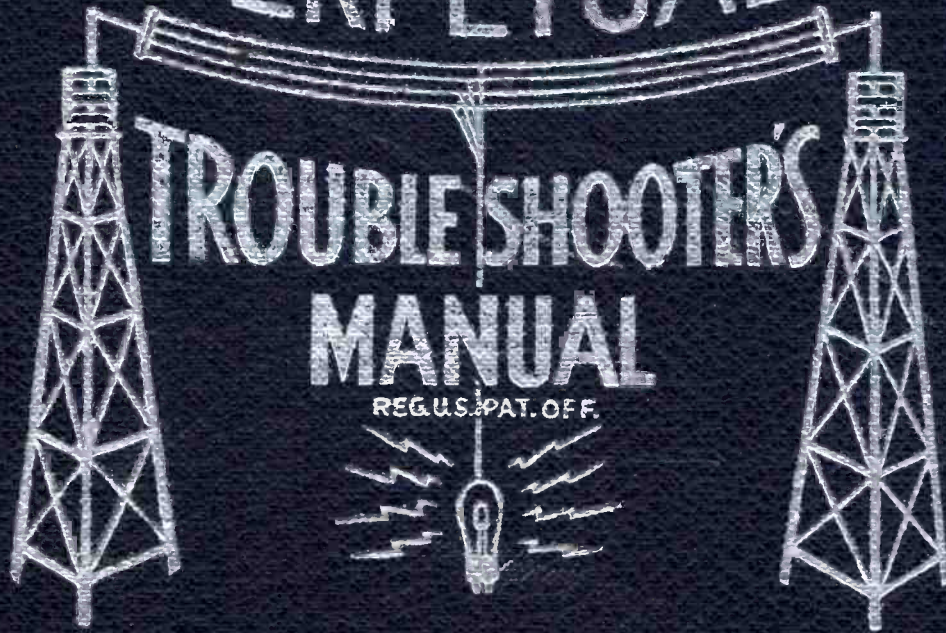


VOLUME XVII

PERPETUAL

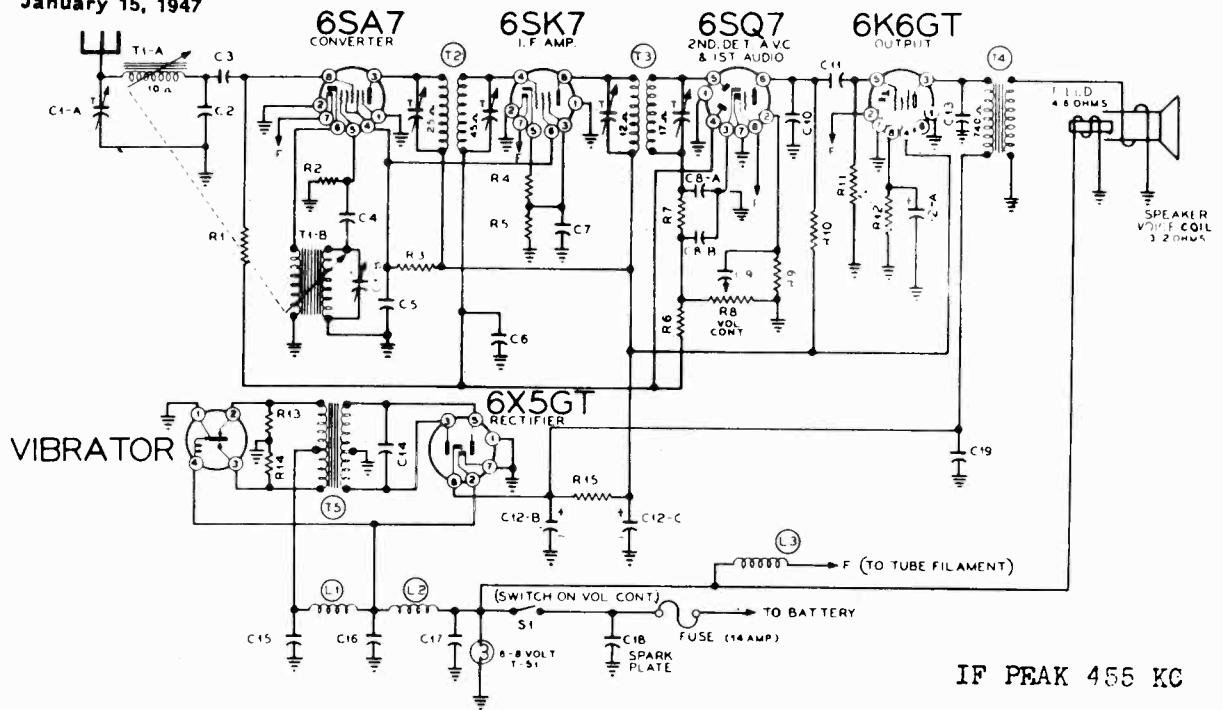


**TROUBLE SHOOTER'S
MANUAL**

REG. U.S. PAT. OFF.

JOHN F. RIDER

January 15, 1947

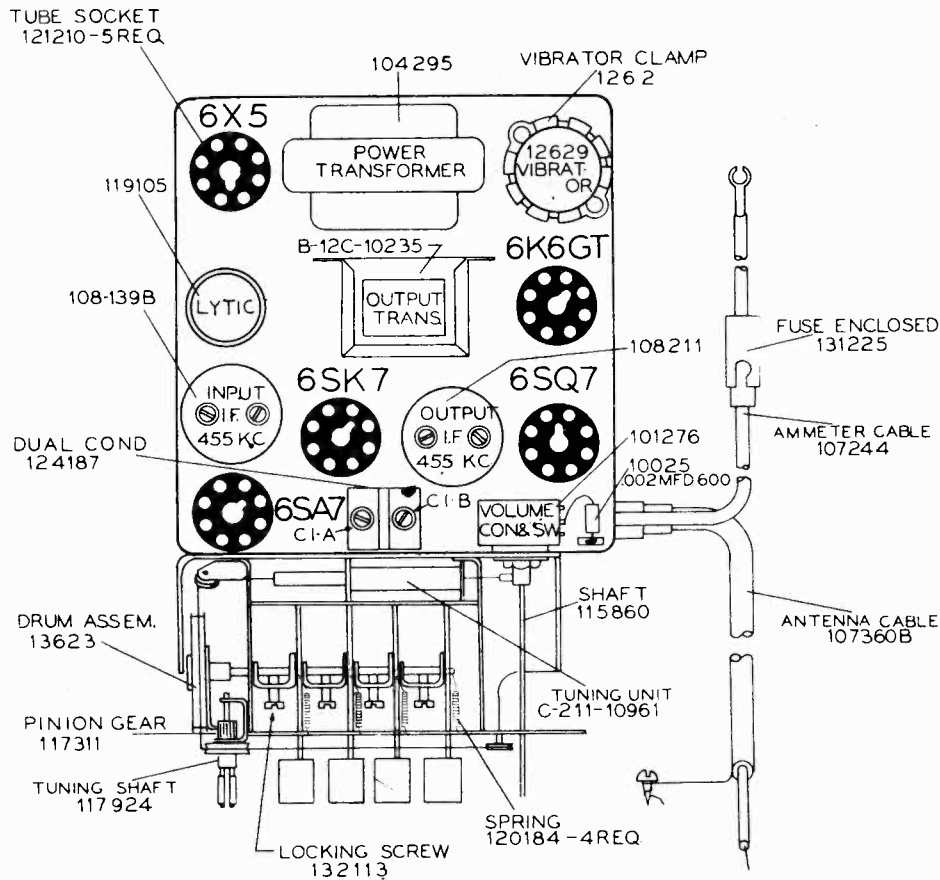


ON SOME SETS R-5 AND C-7 IS ELIMINATED AND THE CATHODE OF THE 6SK7 IS GROUNDED

2209

| Part No. | Schematic Diagram Reference | Description | No. Used in Set |
|---------------------|-----------------------------|---|-----------------|
| CONDENSERS | | | |
| 100-26 | C9 | .02 x 400 Volt Tubular | 1 |
| 100-87 | C13 | .01 x 600 Volt Tubular | 1 |
| 100-13 | C6 | .05 x 400 Volt Tubular | 1 |
| 100-20 | C7 | .1 x 200 Volt Tubular | 1 |
| 100-9 | C5 | .05 x 200 Volt Tubular | 1 |
| 100-125 | C14 | .0035 x 1600 Volt Tubular | 1 |
| 100-25 | C11 | .002 x 600 Volt Tubular | 1 |
| 100-31 | C15, C16, C17 | .5 x 120 Volt Oval Type | 3 |
| 100-81 | | .5 Mfd. Generator Cond. | 1 |
| 100-82 | | .5 Mfd. Ammeter Cond. | 1 |
| 119-105 | C12 A-B-C | Electrolytic Filter Condenser—20 Mfd. x 25 Volt; 15 Mfd. x 350 Volt; 15 Mfd. x 350 Volt | 1 |
| 124-187 | C1-A-B | Ant. and Osc. Dual Trimmer | 1 |
| 129-161 | C8A-B | .0001 Dual Mica—10% | 1 |
| 129-2 | C3, C10 | .0005 Mica Type—20% | 2 |
| 129-188 | C2 | .00008 Mica Type—3% | 1 |
| 129-21 | C4 | .0002 Mica Type—20% | 1 |
| 129-12 | C19 | .00025 Mica Type—20% | 1 |
| 11749B | C18 | Spark Plate | 1 |
| RESISTORS | | | |
| C-9B1-35 | R9 | 4.7 Megohm, 1/2 Watt—20% | 1 |
| C-9B1-27 | R10 | 220K Ohm, 1/2 Watt—20% | 1 |
| C-9B1-29 | R11 | 470K Ohm, 1/2 Watt—20% | 1 |
| C-9B1-60 | R12 | 680 Ohm, 1/2 Watt—10% | 1 |
| C-9B1-34 | R6 | 3.3 Megohm, 1/2 Watt—20% | 1 |
| C-9B1-23 | R7 | 47K Ohm, 1/2 Watt—20% | 1 |
| C-9B1-31 | R1 | 1 Megohm, 1/2 Watt—20% | 1 |
| C-9B1-22 | R2 | 33K Ohm, 1/2 Watt—20% | 1 |
| C-9B2-76 | R3 | 15K Ohm, 1 Watt—10% | 1 |
| C-9B2-64 | R15 | 1500 Ohm, 1 Watt—10% | 1 |
| C-9B1-50 | R13, R14 | 100 Ohm, 1/2 Watt—10% | 2 |
| C-9B1-52 | R4 | 150 Ohm, 1/2 Watt—10% | 1 |
| C-9B1-56 | R5 | 330 Ohm, 1/2 Watt—10% | 1 |
| COILS | | | |
| 108139B | T2 | Input I.F. Coil | 1 |
| 108211 | T3 | Output I.F. Coil | 1 |
| C-211-10961 | | Permeability Tuning Unit Complete with Ant. and Osc. Coils | 1 |
| 10566 | L3 | "A" Choke No. 16 Wire | 1 |
| 10568 | L1-L2 | "A" Choke No. 18 Wire | 2 |
| TRANSFORMERS | | | |
| 104235 | T5 | Power Transformer | 1 |
| B-12C-10235 | T4 | Output Transformer for Speaker | 1 |

| Part No. | Schematic Diagram Reference | Description | No. Used in Set |
|-----------------------------|-----------------------------|--|-----------------|
| SPEAKER | | | |
| B-18B10236 | | Five Inch Electrodynamic Speaker. Less Output Transformer | 1 |
| VIBRATOR UNIT | | | |
| 12629 | | Plug-in Vibrator Unit | 1 |
| DIAL AND TUNER PARTS | | | |
| A-6D-10740 | | Dial Scale | 1 |
| D-4B-10750 | | Escutcheon | 1 |
| 1121029 | | Set of Station Call Letters | 1 |
| 128773-45 | | Knob—For Tuning and Volume | 2 |
| 115860 | | Shaft for Volume Control | 1 |
| 128766-45 | | Pushbuttons | 4 |
| 1121027 | | Pointer | 1 |
| A-53A-10989 | | String for Pointer | 1 |
| 120442 | | Tension Spring for Pointer String | 1 |
| 1121026 | | Diffuser for Dial | 1 |
| A-2M-7758 | | Snap-in Rivet to Fasten Diffuser | 2 |
| 107400 | | Socket Assembly for Pilot Lite | 1 |
| 10797 | | 6-8 Volt Lite. Type T-51 | 1 |
| 115807 | | Pushrod—For Pushbuttons | 4 |
| 115799 | | "U" Cam—With Set Screw | 4 |
| 120-184 | | Return Spring—For Pushrods | 4 |
| 117924 | | Tuning Shaft | 1 |
| 117311 | | Pinion Gear—Drives Crown Gear | 1 |
| 13623 | | Drum Assembly Complete with 115800 Crown Gear | 1 |
| 120441 | | Tension Spring for Slug String | 1 |
| MISCELLANEOUS | | | |
| 107360B | | Antenna Cable | 1 |
| 107244 | | Ammeter Cable | 1 |
| 131225 | | Fuse—14 Amp.—Type SFE | 1 |
| 115713 | | Mounting Strap Bracket | 1 |
| 115808 | | Case Mounting Bracket—Left | 1 |
| 115809 | | Case Mounting Bracket—Right | 1 |
| 115810 | | Case Mounting Bracket—Short Left | 1 |
| 117929 | | Mounting Spacer | 6 |
| 132293 | | No. 10-32 x 3/4 Fancy Head Screw | 2 |
| 131145 | | Flat Steel Washer—For Above Screw | 2 |
| 131403 | | Extruded Washer for Chevrolet 1941-42-46 | 2 |
| 131397 | | Extruded Washer for Dodge—DeSoto—Plymouth—Chrysler 1940-41-42-46 | 2 |
| 13625 | | Complete Kit of Mounting Hardware Including Brackets, Condensers, Screws, etc. | 1 |
| 131-50 | | Buzz, Clips—for case | 10 |



ALIGNMENT PROCEDURE (Refer to Chassis View)

Output meter across 3.2-ohm output load.

Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

- Volume control at maximum for all adjustments.
- Connect ground post of signal generator to radio chassis.

| BAND | SIGNAL GENERATOR | | | | ADJUSTMENT Adjust for Max. Output |
|----------------|------------------|---------------|--------------------------|-------------------|--|
| | Frequency | Dummy Antenna | Connection to Radio | Ground Connection | |
| I.F. | 455 kc | .1 mfd. | Pin #4 Grid 6SK7 Tube | Chassis | Adjust Trimmers of T3 output I.F. |
| L.F. | 455 kc | .1 mfd. | Pin #8 Grid 6SA7 Tube | Chassis | Adjust Trimmers of T2 input I.F. |
| Broadcast Band | 1600 kc | 30 mmfd. | Antenna Lead | Chassis | Adjust Trimmers C1-B Oscillator and C1-A Antenna. |
| Broadcast Band | 1400 kc | 30 mmfd. | Antenna Lead | Chassis | *Slide Antenna Coil lengthwise for max. output by means of a screw driver. |
| Broadcast Band | 1600 kc | 30 mmfd. | Antenna Lead | Chassis | **Adjust Antenna Trimmer C1-A to maximum output. |

*This adjustment will seldom be necessary in service work as the Antenna Coil is adjusted and sealed in place at the factory. The necessity of this adjustment can be checked quickly by tuning set to a 1400 kc. signal and adjusting C1-A. If a large increase in output is noted the Antenna Coil should be adjusted.

**If Antenna Coil is adjusted, C1-A should be readjusted at 1600 kc. These two adjustments (Antenna Trimmer C1-A and Antenna Coil) should be repeated until no further improvement is noted.

NOTE: At 1600 kc., the Oscillator Core should extend 31/32 inch from the edge of the Coil Form.

ELIMINATING MOTOR NOISE

GENERATOR CONDENSER

A Generator Condenser must be connected in all cases from the battery terminal of the generator to the Generator frame.

This condenser must not be connected across the field winding terminal on late cars which use Automatic Cutouts.

It is advisable that you find out from your local car dealers where the manufacturer recommends the condenser be connected for each make of car.

DISTRIBUTOR SUPPRESSOR

A Distributor Suppressor is required in practically all cases, except Ford V8's where none is used. The high tension lead must be removed from the distributor head and the suppressor inserted in its place. The high tension lead is then plugged into the suppressor.

AMMETER CONDENSER

A .5 Mfd. by pass condenser should be connected from one ammeter terminal to a good ground on the instrument panel. Usually this condenser plus the generator condenser and distributor suppressor will remove all objectionable ignition noise.

ELECTRICAL ACCESSORIES

If the above procedure has not reduced the noise sufficiently, it will be necessary to continue by passing sources of noise.

Accessories such as lighters, electric motor heaters, horns, light switches, automatic relays, electrical gauges such as oil, water and gas are often a source of interference. In these cases the procedure is to try a condenser from ground to various accessories until the interference is eliminated, then install the condensers in those places permanently. Spark intensifiers should not be used.

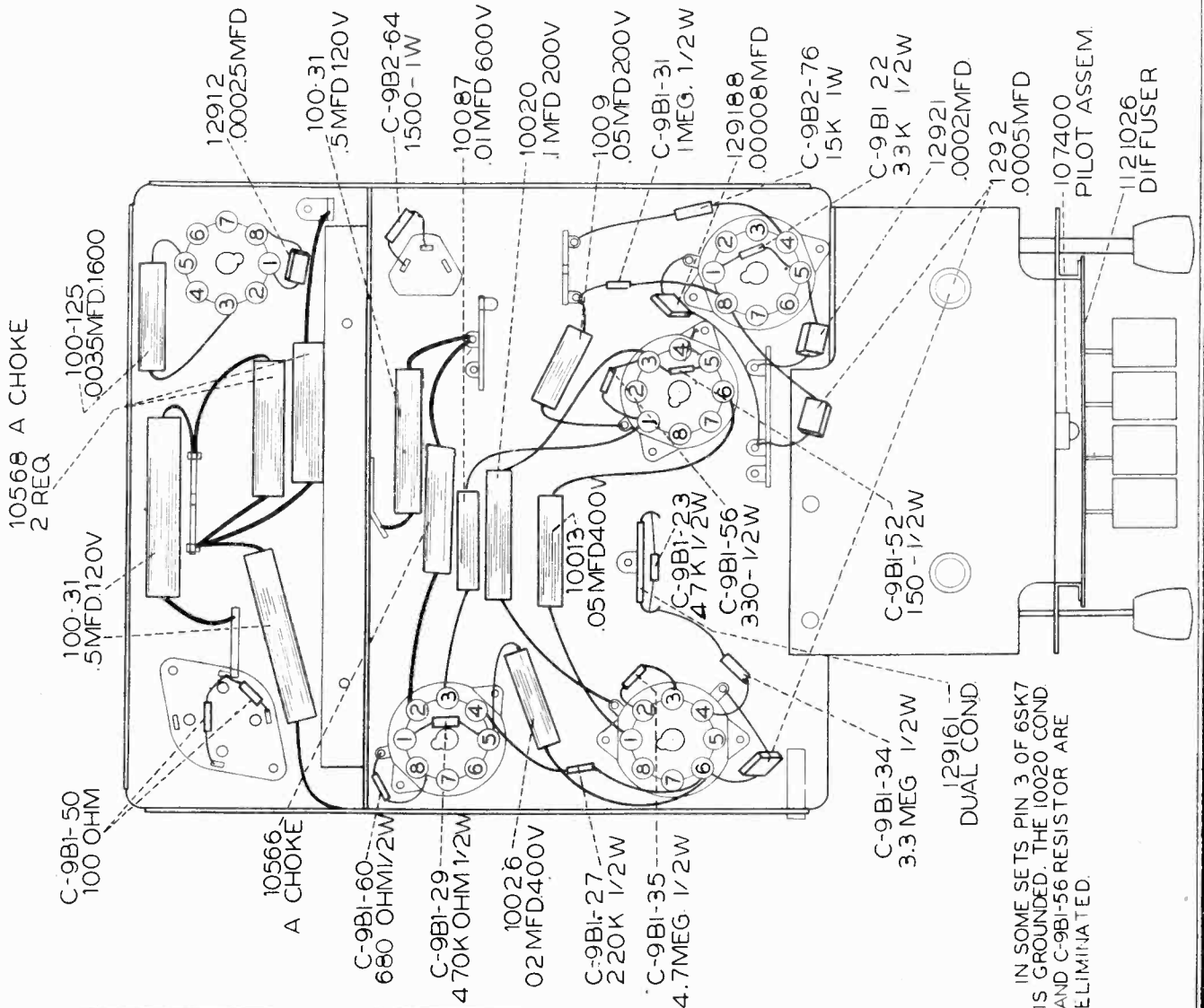
HIGH AND LOW TENSION LEADS

In many cars the low tension battery leads, etc., are grouped together with the high tension wires. These leads will very often pick up motor noise and feed it into the receiver through the battery circuit. In cases such as these it will be necessary to separate the low tension from the high tension wires and run them through another hole if they run from the engine compartment up to the instrument panel. This condition is particularly true on the V-8 Ford as the battery and primary leads run through a special tube which also houses the high tension leads. Shield and ground these leads.

IGNITION COILS

In cars where the ignition coil is located on the back side of the instrument panel it is often necessary to use an additional condenser. It must be installed from the battery side of the ignition coil to the closest ground on the instrument panel.

Short leads are very important. Where coils are mounted either on the instrument panel or in the driver's compartment, it may be necessary to shield the high tension lead from the coil to the distributor.



IN SOME SETS PIN 3 OF 6SK7 IS GROUNDED. THE 10020 COND AND C-9B1-56 RESISTOR ARE ELIMINATED.

IMPORTANT (ALL INSTALLATIONS)

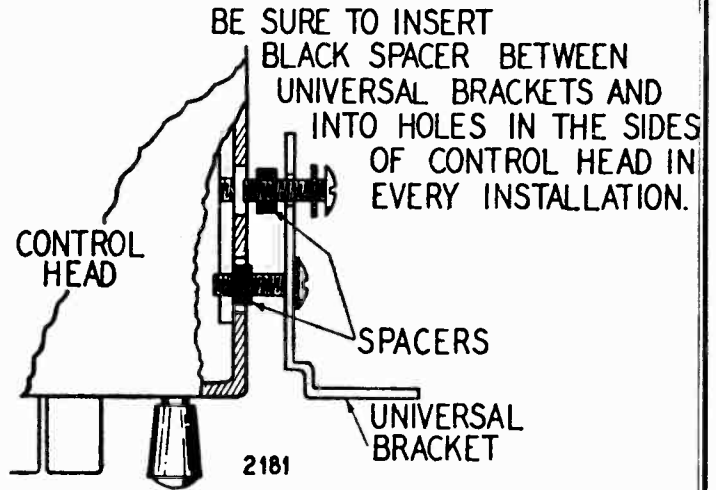
Two universal mounting brackets are supplied with the kit of hardware and are mounted in various positions on the chassis for installation in or under the dash of different cars.

In all installations it is very important that the black metal spacers be used between the front mounting brackets and the side of the chassis. The spacers must fit into the holes in the side of the chassis. They are packed in the kit of hardware.

Be sure to draw the rear mounting strap up tight so that it holds the chassis rigid.

In some installations it may be necessary to adjust the antenna trimmer before bolting the chassis to the dash.

Two pairs of extruded washers are supplied for use when bolting the chassis to the dash. Be sure the washers seat properly in the dash mounting holes and use the pair which fits the holes snugly.

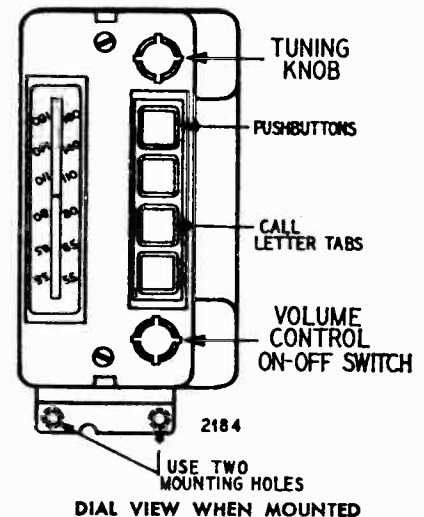


Dash Panel Mounting

1940, 1941, 1942 and 1946 Models of Chrysler, De Soto, Dodge, Plymouth

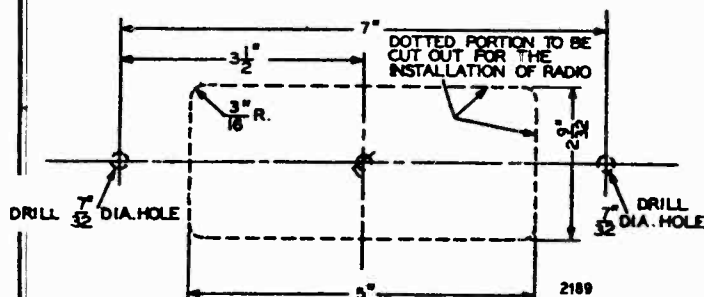
Mount the chassis as shown with the dial vertical. A special bracket marked "short" is supplied with the kit of hardware. Mount this bracket to the chassis, using the solid black holes shown in the left hand drawing. Note that the chassis should be mounted with the tuning knob at the top. It may be necessary in some installations to reverse the bolt in the cowl lever to prevent it from hitting the speaker grill. On Plymouth cars remove Pal nut behind dash at top of dial opening so the dial will come up flush.

The call letters must be carefully trimmed to fit the push-buttons horizontally. Be sure to use the black spacers pictured above when mounting the front (short) bracket.



1941 and 1942 Americar Models (Willys)

Remove the panel from the left side of the dash and cut an opening, using the dimensions below. Mount the chassis the same as in the Chevrolet installation.



FINAL CONNECTIONS

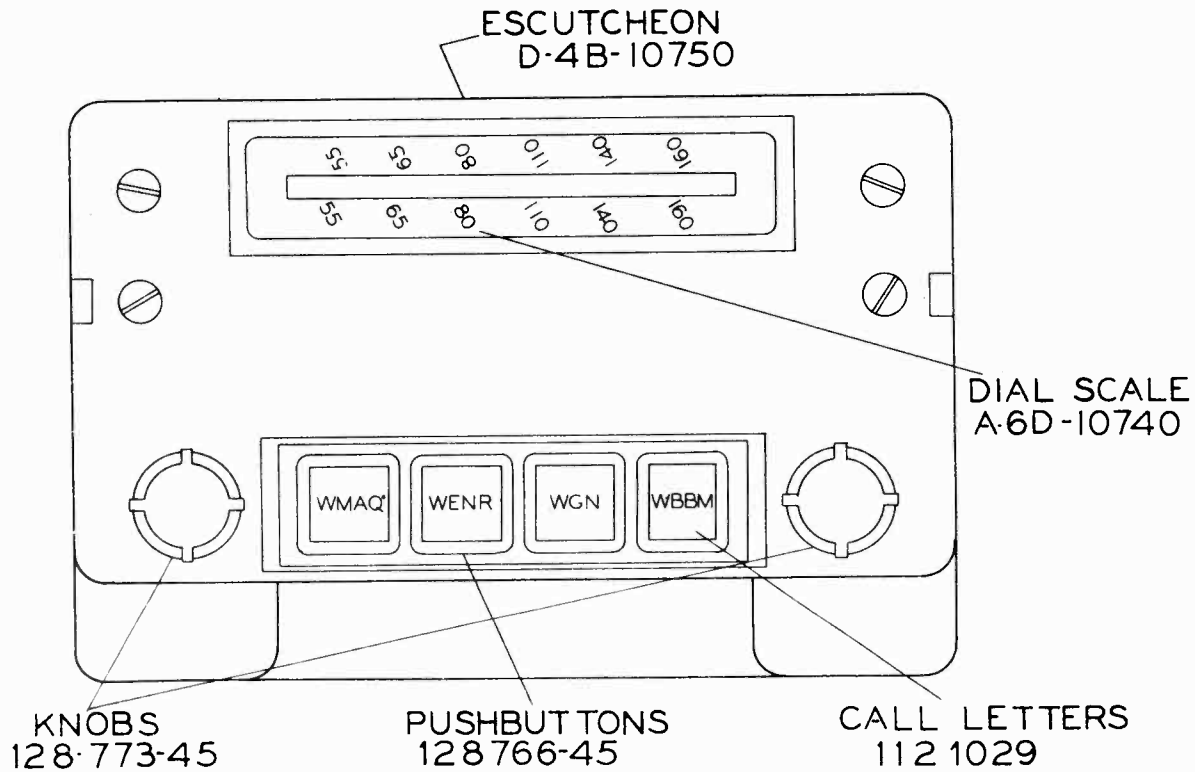
The antenna cable should be connected and the shield grounded to the car body.

Connect the battery cable to the hot side of the ammeter behind the instrument panel and then insert the fuse in the cable receptor.

ANTENNA TRIMMER
(See Chassis View)

The input circuit has been especially designed to be used with a low capacity antenna of the fish pole or whip type. Truetone antennas are especially designed to be used with this radio.

Tune in a station on the high frequency end of the dial and adjust the antenna trimmer for maximum volume. A weak station which does not fade is best for this adjustment.



VOLUME CONTROL AND ON-OFF SWITCH

Turning this knob to the right turns the radio on and increases the volume. Turning it all the way to the left lowers the volume until the switch clicks and the radio goes off.

TUNING KNOB

This knob tunes the radio for Manual Tuning.

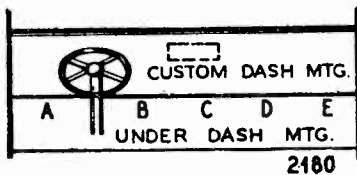
After the automatic pushbuttons have been set to your favorite stations, any of them may be quickly tuned by pressing the proper button firmly all the way in.

4 stations may be tuned automatically—Instructions for setting your favorite stations on the automatic are given in detail below.

SETTING THE PUSHBUTTONS

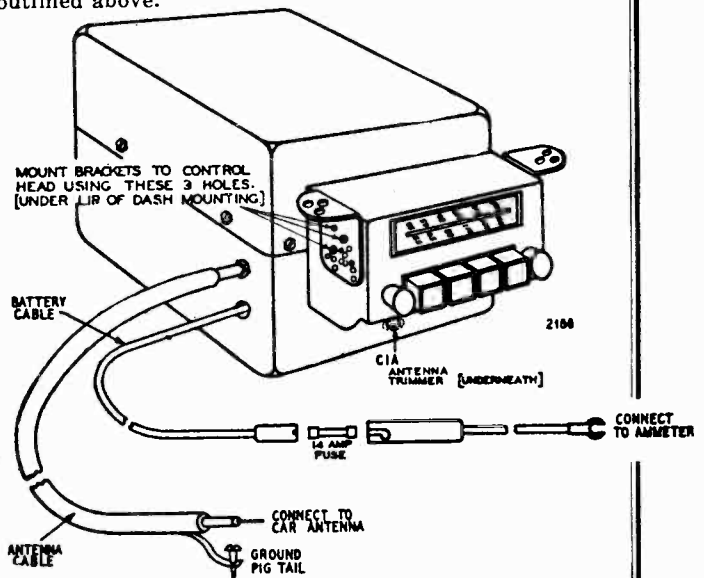
Make a list of your four favorite stations and push out the call letters of these stations from the call letter sheets supplied. Next, pull the pushbuttons off their levers. Alongside of the lever is a hole as shown in the picture above.

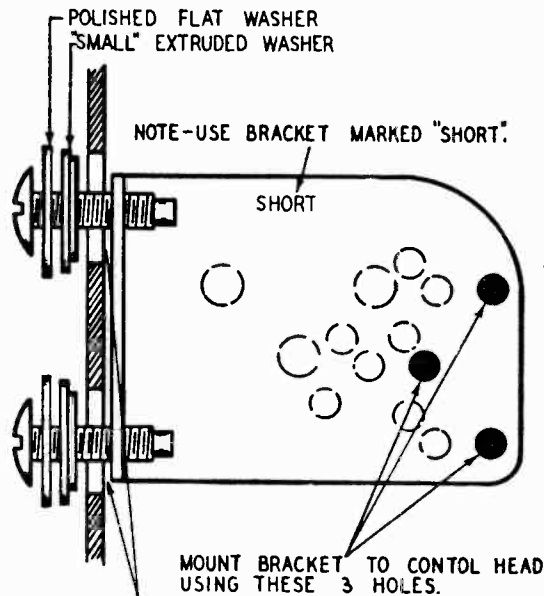
Press the first pushbutton lever in firmly and the locking screw will show up in the hole. Unscrew the locking screw several turns to the left with a screw driver. Hold the pushbutton lever pressed in firmly and tune in the desired station. With the pushbutton lever still pressed in, tighten the pushbutton locking screw. Continue to set up the other three pushbuttons in the same manner. Replace the pushbuttons on the levers and insert the call letters. Stations may be changed whenever desired by pulling one or all of the pushbuttons off and re-setting to any desired station as outlined above.



Universal Under Dash Mounting

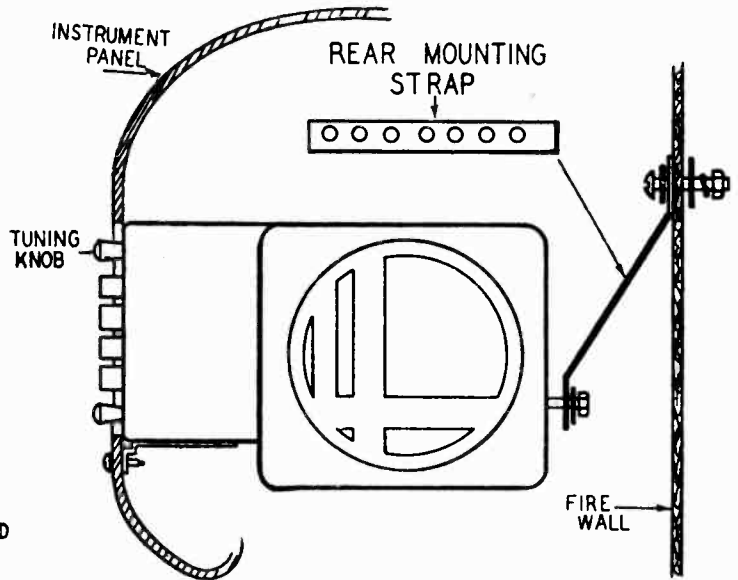
This view shows the battery cable, antenna and ground cable and the two mounting brackets at the side of the tuning dial which are used to mount the radio to the underlip of the dash. These brackets are packed with the kit of hardware and should be fastened to the chassis using the holes shown in solid black. They are then bolted to the underlip of the dash and the rear mounting strap used as shown in the Chevrolet installation. Under Dash Mounting must be used on cars not shown as Dash Mounting in the chart





ON 1941 DODGE INSERT CARDBOARD WASHERS SUPPLIED IN HARDWARE KIT.

NOTE: Lay the bracket on drawing above to identify holes. Bracket when mounted will of course be at bottom of tuner.



2182

NOTE: Mount Chassis as shown - Be sure to use Rear Mounting Strap

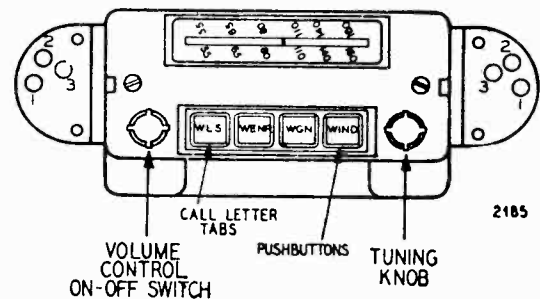
1941, 1942 and 1946 Chevrolet

FOR CHEV MOUNTING USE HOLES MARKED [1]

FOR PONTIAC MOUNTING USE HOLES MARKED [2]

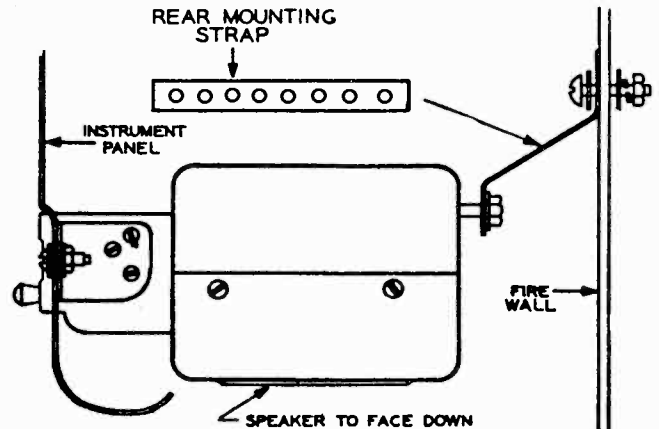
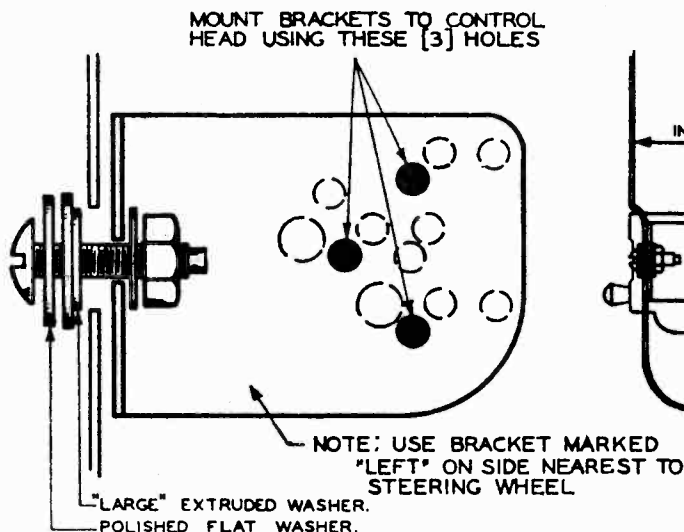
FOR FORD MOUNTING USE HOLES MARKED [3]

This view shows how the chassis is mounted to the dash. The rear mounting strap (in the kit of hardware) should be bent as shown and used to support the chassis at the back. The two front mounting brackets should be fastened to the chassis using the solid black holes as shown. Lay the bracket on the left hand drawing and the black circles will show through the holes to be used. The two holes marked No. 1 in the front brackets, as shown in the Dial View Drawing, should be used to bolt the chassis to the dash.



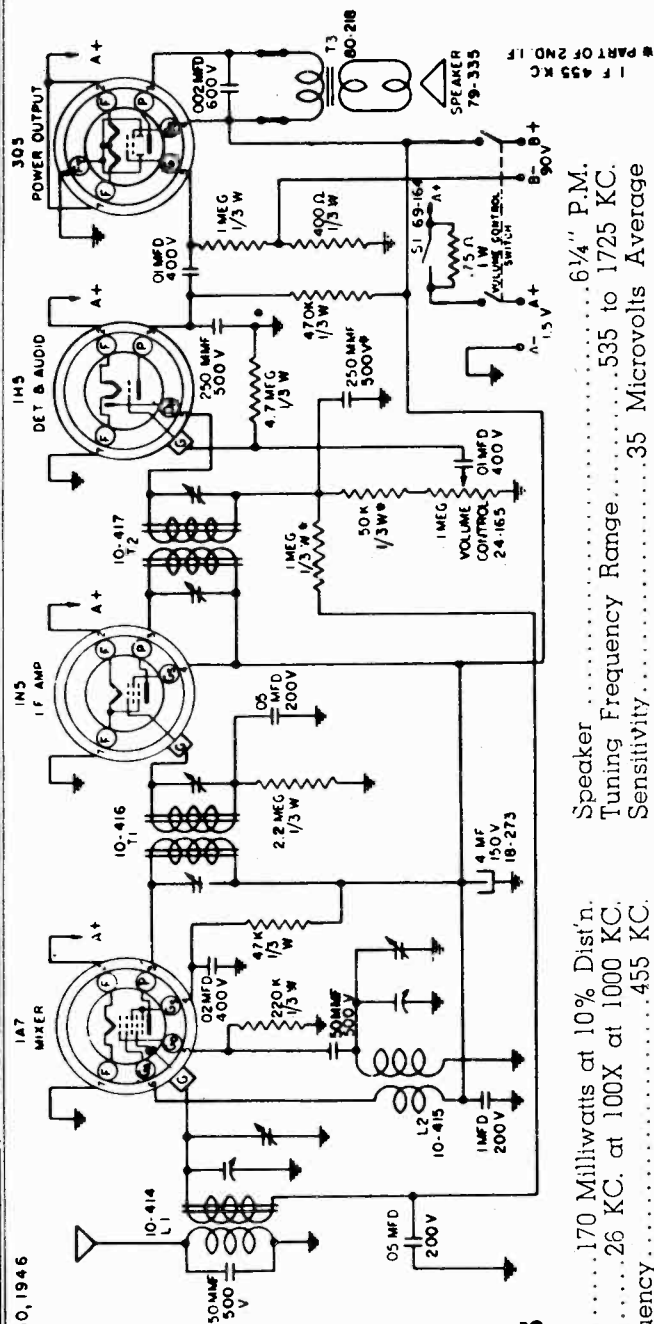
2185

DIAL VIEW WHEN MOUNTED



2183

NOTE: Mount Chassis as shown with the speaker face down. Be sure to use rear mounting strap.



SPECIFICATIONS

Power Output.....170 Milliwatts at 10% Dist'n.
 Selectivity26 KC. at 100X at 1000 KC.
 Intermediate Frequency.....455 KC.

Speaker6 1/4" P.M.
 Tuning Frequency Range.....535 to 1725 KC.
 Sensitivity.....35 Microvolts Average

CONTINUITY AND VOLTAGE

Tube sockets as shown on the schematic diagram have each element numbered with respect to the guide pin. Tube sockets on the chassis are also numbered in the same manner. All voltage measurements are average and were taken with a new battery or one known to be good, volume control full on, antenna and ground wires shorted together, using a volt meter with a resistance of 1000 ohms per volt. The correct voltages are shown in the voltage chart.

A complete realignment of all tuned circuits will be necessary after replacing an I.F. transformer, the antenna coil, or the oscillator coil. Never attempt realignment unless all other circuit components have been checked and found to be normal. If realignment is necessary follow the instructions under "ALIGNMENT PROCEDURE". After alignment has been completed repeat the procedure as a final check.

VOLTAGE CHART

All voltages measured with a 1000 ohm per volt meter on the 150 volt scale. For the following voltages the "B" battery section of the power pack should read 90 volts under load. Where no voltages are shown

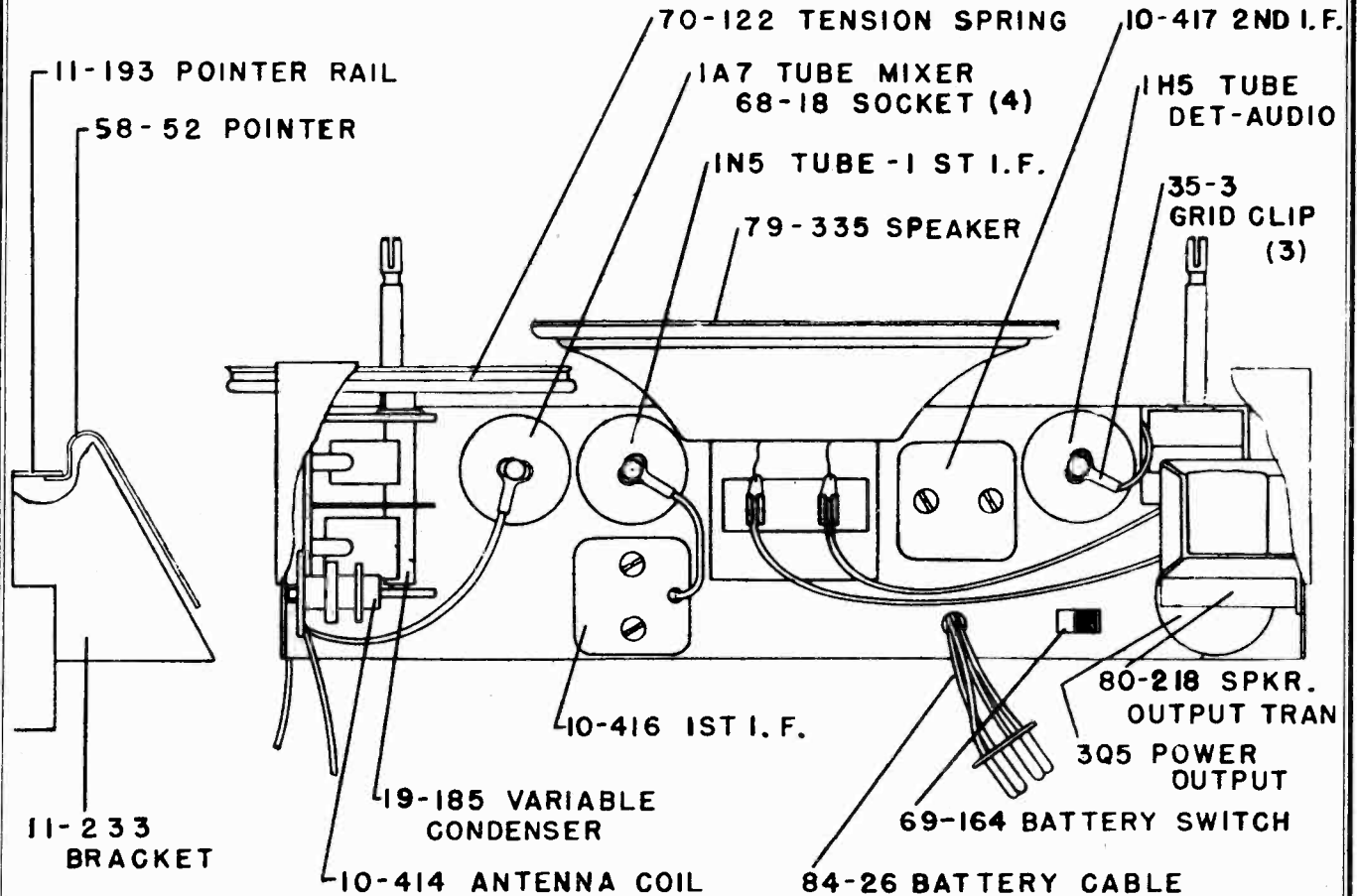
the voltage is O or is too low to be read with this type of voltmeter.

| TUBE | PIN NO. | VOLTS |
|--------------------------|---------|-------|
| 1A7GT TUBE | | |
| Plate-P—to ground | 3 | 85 |
| Screen-G3 & G5—to ground | 4 | 37 |
| Grid-G2—to ground | 6 | 85 |
| 1N5GT TUBE | | |
| Plate-P—to ground | 3 | 85 |
| Screen-G2—to ground | 4 | 85 |
| 1H5GT TUBE | | |
| Plate-P—to ground | 3 | 17 |
| 3Q5GT TUBE | | |
| Plate-P—to ground | 3 | 83 |
| Screen-G2—to ground | 4 | 85 |

ALIGNMENT EQUIPMENT

Do not attempt to realign this chassis without the equipment listed below:

- 1--Signal generator, capable of giving a modulated signal from 455 KC to 1725 KC.
- 2--Non-metallic screwdriver.
- 3--Dummy antennas, .1 MFD. and .00025 MFD. condensers.
- 4--Output meter.



ALIGNMENT PROCEDURE

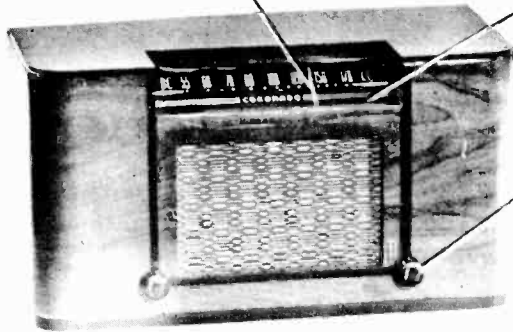
Volume control maximum all adjustments.
 Connect ground lead of signal generator to chassis.
 Connect dummy antenna in series with output lead of signal generator.
 Connect output meter across voice coil of speaker.

| Variable Condenser Setting | Generator Frequency | Dummy Antenna Mfd. | Connection to Radio | Trimmer Adjustment | Trimmer Function |
|---------------------------------|---------------------|--------------------|---------------------|---------------------------|--------------------|
| Minimum Capacity (Fully Opened) | 455 K.C. | .1 | Grid of 1A7GT Tube | Two Trimmers on top of T2 | Output I.F. |
| Minimum Capacity (Fully Opened) | 455 K.C. | .1 | Grid of 1A7GT Tube | Two Trimmers on top of T1 | Input I.F. |
| Minimum Capacity (Fully Opened) | 1725 K.C. | .00025 | Antenna Lead | C1B (on gang) | Oscillator Trimmer |
| Tune in Signal From Generator | 1500 K.C. | .00025 | Antenna Lead | C1A (on gang) | Antenna Trimmer |

With an output meter connected across the voice coil of the speaker, the output meter reading for 50 milliwatts is 4 volts using a signal which is modulated 400 c.p.s.

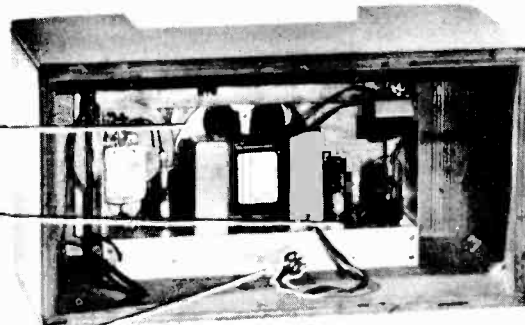
Frequency Range
 535 to 1725 K.C.
 I.F. Frequency 455K.C.

58-52 POINTER

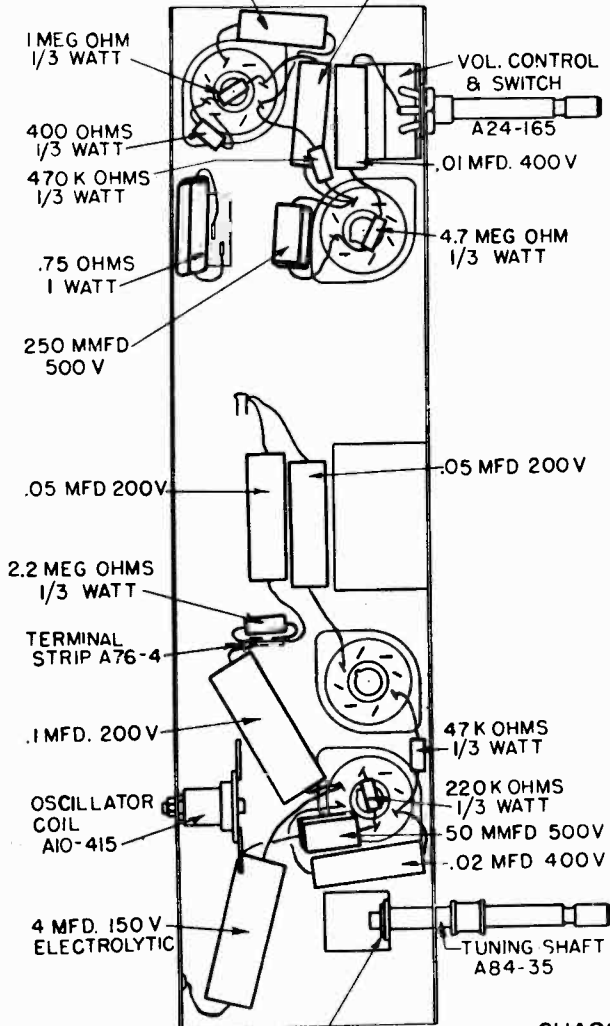


67-483 GLASS DIAL SCALE
83-277 DIAL RETAINER
97-60 MOUNTING SCREWS
42-383 CABINET
52-182 KNOBS (2)

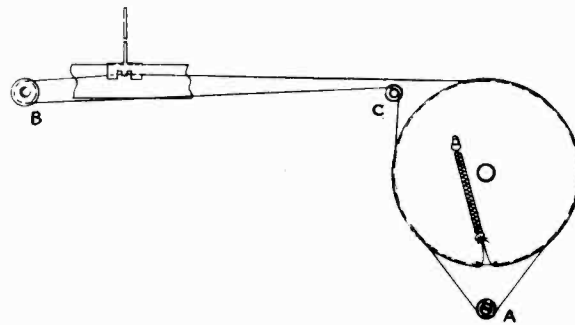
79-335 SPEAKER
74-174 MTG. SCREWS (4)
69-164 BATT. ECONOMIZER SWITCH
74-173 CHASSIS MTG. SCREWS (2)
84-26 BATT. CABLE & PLUG



.002 MFD 600V .01 MFD 400V



DRIVE CORD REPLACEMENT



Turn gang condenser to fully open position. Use a new drive cord and fasten one end to tension spring. Fasten the other end of the tension spring to the hook on the drive pulley. Pass the drive cord through the slot in the drive pulley rim and continue over the top of pulley counter-clockwise completely around through the string guide, around pulley B, over pulley C, around idler A counter-clockwise two times. Pass cord through slot in pulley rim, stretch the tension spring and fasten free end of cord to the spring.

CIRCUIT DESCRIPTION

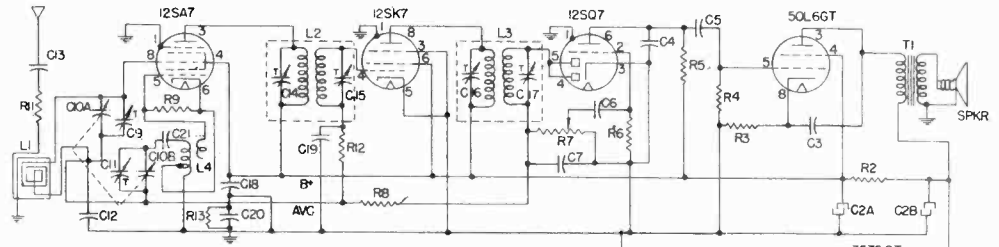
This receiver is a four tube battery operated superhetrodyne. The battery used is of the combination "A" and "B" type, with 1 1/4 volts for filament current, and 90 volts for the high voltage circuits.

The tubes used, and their circuit application are as follows:

- 1—1A7GT—Oscillator converter
- 1—1N5GT—I. F. Amplifier
- 1—1H5GT—AVC, Detector, Audio Amplifier
- 1—3Q5GT—Power Output

"C" WASHER A86-51 CHASSIS BOTTOM VIEW

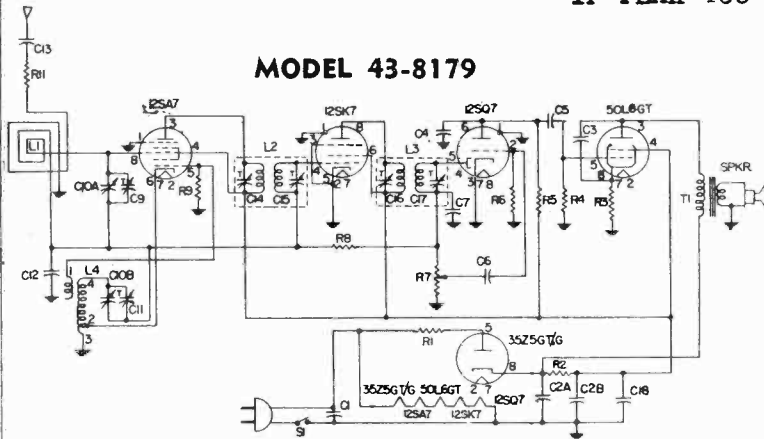
May 1, 1947



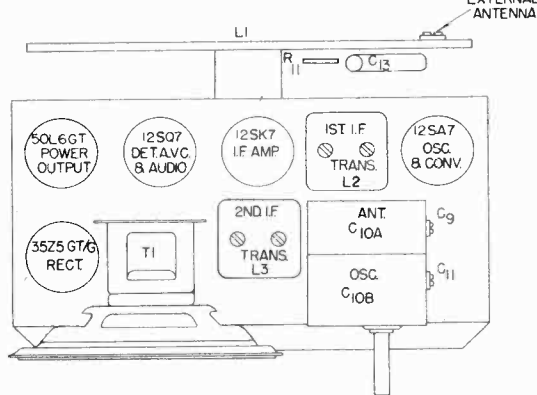
IF PEAK 455 KC

MODEL 43-8179

MODELS 43-8177, 43-8178

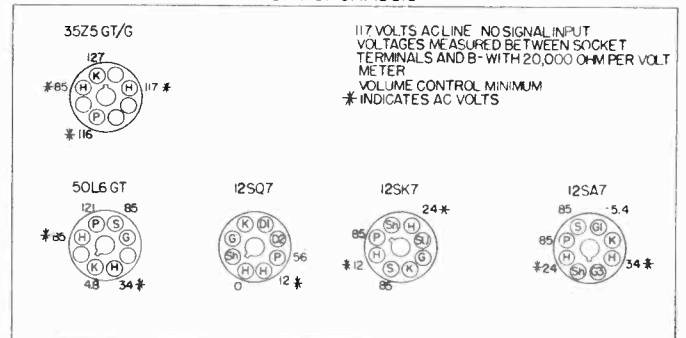


TUBE AND TRIMMER LOCATION



SOCKET VOLTAGE DIAGRAM

FRONT OF CHASSIS



BOTTOM VIEW OF CHASSIS

ALIGNMENT PROCEDURE

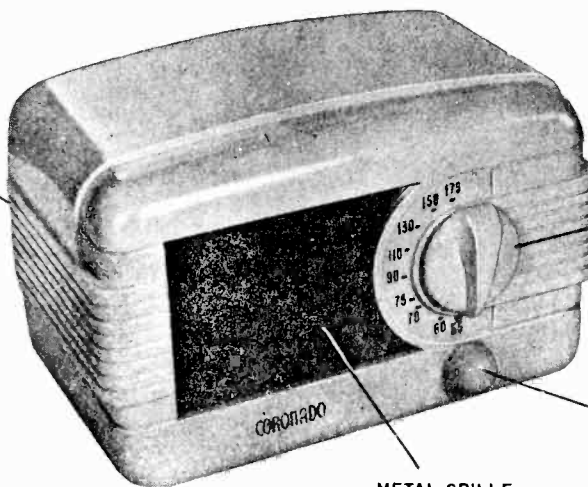
Allow unit to heat for a few minutes before starting alignment.
Volume control set to maximum.
Output meter across speaker.
Align for maximum output.
Reduce input as needed to keep output near 1.0 volt.

Note: If signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC through the capacitor will introduce hum and/or create the possibility of a burned out signal generator attenuator.

| FREQUENCY | SIGNAL GENERATOR COUPLING CAPACITOR | SIGNAL GENERATOR CONNECTION TO RADIO | GROUND CONNECTION | TUNER SETTING | ADJUST TRIMMERS FOR MAXIMUM OUTPUT (in order shown) |
|-----------|-------------------------------------|--------------------------------------|-------------------|-------------------------|--|
| 455 KC | 0.1 mf | Converter grid | B- | Wide open | 2nd IF transformer trimmer 1st IF transformer trimmer |
| 1725 KC | 200 mmf | Receiver antenna post | B- | Wide open | Oscillator trimmer C11 |
| 1500 KC | 200 mmf | Receiver antenna post | B- | Tune for maximum output | Antenna trimmer C9 |

MODELS 43-8177,
43-8178, 43-8179

CABINET
SAU-014 (MAHOG.)
SAU-015 (IVORY)



KNOB, TUNING
SDK-005 (MAHOG.)
SDK-006 (IVORY)

KNOB, VOLUME CONTROL
SDK-007 (MAHOG.)
SDK-008 (IVORY)

METAL GRILLE
SAG-001 (FOR MAHOG. CAB.)
SAG-002 (FOR IVORY CAB.)

SPECIFICATIONS

5 tube Superheterodyne, including rectifier tube
 Intermediate Frequency ----- 455 KC
 Antenna Sensitivity ----- 89 mv. average for 0.5 w output
 Selectivity -- 70 KC broad at 1000 times signal at 1000 KC
 Power Output ----- 0.8 w undistorted, 1.5 w minimum
 full power output
 Frequency range ----- 540 to 1720 KC
 Tuning ----- Direct drive—2 gang condenser
 Power supply ----- 105 to 125 Volts, AC or DC
 Frequency on AC ----- 40 to 60 cycles
 Power Consumption ----- 28 watts at 117V.
 Speaker ----- 4 inch "Alnico 5" Magnet Dynamic, voice
 coil impedance 3.5 ohms (400 cycles)
 Antenna ----- Self contained loop antenna, also
 provision for external antenna

| CATALOG NO. | SYMBOL | TITLE | VALUE | RATING | TOLERANCE |
|-------------|--------|--|-------------|---------|------------|
| UCC-045 | C1 | Paper Capacitor | .05 mf | 600WVDC | +40 - 15% |
| SCE-003 | C2A | Electrolytic Capacitor | 40 mf | 150WVDC | +100 - 10% |
| SCE-003 | C2B | Electrolytic Capacitor | 40 mf | 150WVDC | +100 - 10% |
| UCC-041 | C3 | Paper Capacitor | .02 mf | 600WVDC | ±20% |
| UCU-1040 | C4 | Mica Capacitor | 330 mmf | 500WVDC | ±10% |
| UCC-040 | C5 | Paper Capacitor | .01 mf | 400WVDC | ±20% |
| UCC-039 | C6 | Paper Capacitor | .006 mf | 600WVDC | +40 - 15% |
| UCU-1040 | C7 | Mica Capacitor | 330 mmf | 500WVDC | ±10% |
| * | C9 | Antenna Trimmer | | | |
| * | C10A | Variable Condenser ant. section | | | |
| * | C10B | Variable Condenser osc. section | | | |
| * | C11 | Oscillator Trimmer | | | |
| UCC-045 | C12 | Paper Capacitor | .05 mf | 400WVDC | ±20% |
| UCC-039 | C13 | Paper Capacitor | .005 mf | 600WVDC | ±20% |
| UCC-045 | C18 | Paper Capacitor | .05 mf | 400WVDC | ±20% |
| URE-007 | R1 | Carbon Resistor | 22 ohm | ½ W | ±20% |
| URF-053 | R2 | Carbon Resistor | 1500 ohm | 2 W | ±20% |
| URD-029 | R3 | Carbon Resistor | 150 ohm | ½ W | ±20% |
| URD-113 | R4 | Carbon Resistor | 470,000 ohm | ½ W | ±20% |
| URD-105 | R5 | Carbon Resistor | 220,000 ohm | ½ W | ±20% |
| URD-145 | R6 | Carbon Resistor | 10 megohm | ½ W | ±20% |
| SRC-004 | R7 | Volume Control | 500,000 ohm | | |
| URD-129 | R8 | Carbon Resistor | 2.2 megohm | ½ W | ±20% |
| URD-081 | R9 | Carbon Resistor | 22,000 ohm | ½ W | ±20% |
| URD-041 | R11 | Carbon Resistor | 470 ohm | ½ W | ±20% |
| * | L1 | Antenna Loop | | | |
| * | L2 | 1st IF Transformer | | | |
| * | L3 | 2nd IF Transformer | | | |
| SLC-001 | L4 | Oscillator Coil | | | |
| * | T1 | Output Transformer | | | |
| SRC-004 | S1 | Power Switch with R7 | | | |
| * | SPKR | 4" PM Speaker | | | |
| SJS-002 | | Socket-Octal base tube | | | |
| SMS-003 | | Speed Nuts—for fastening metal grille in cabinet | | | |

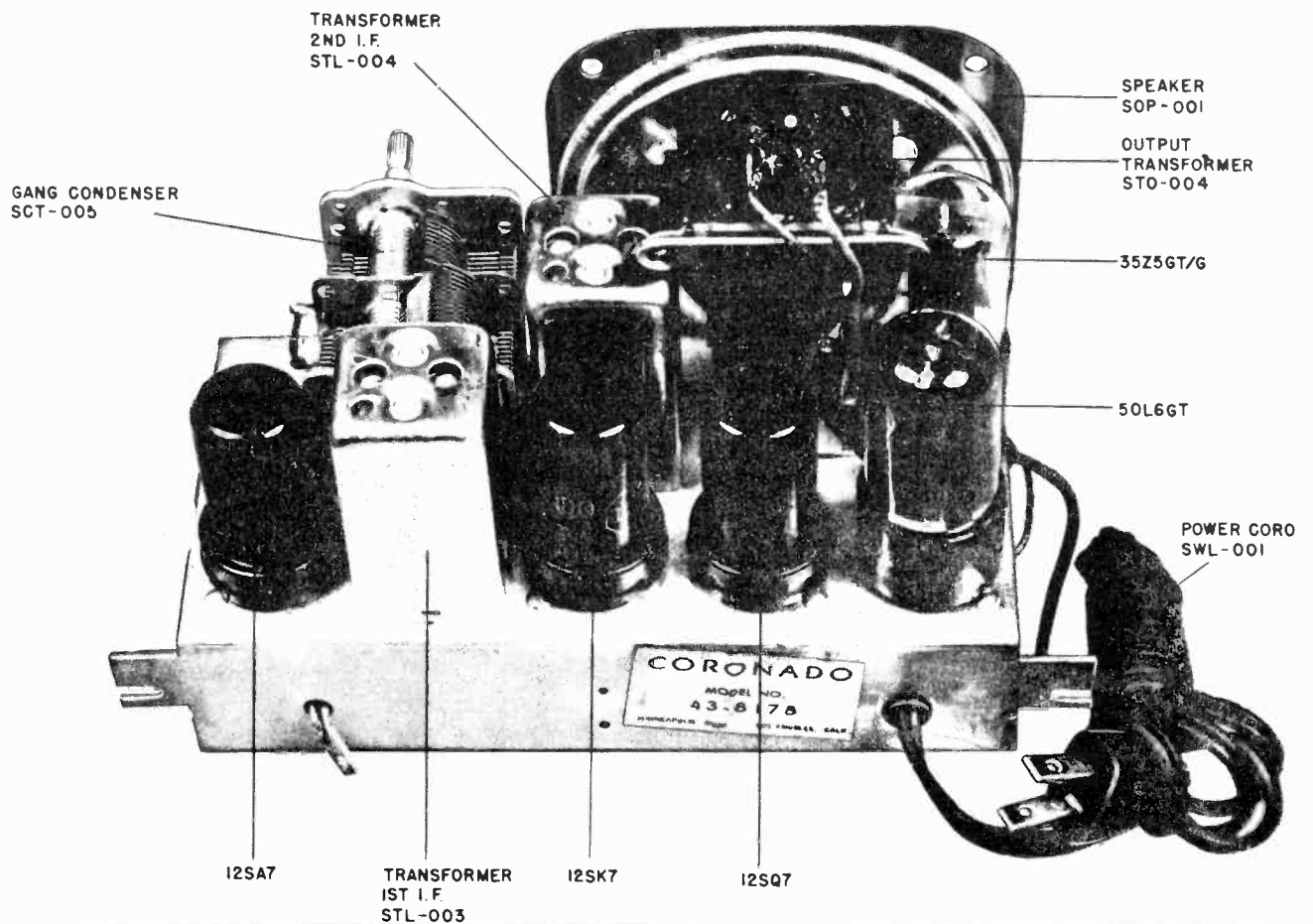
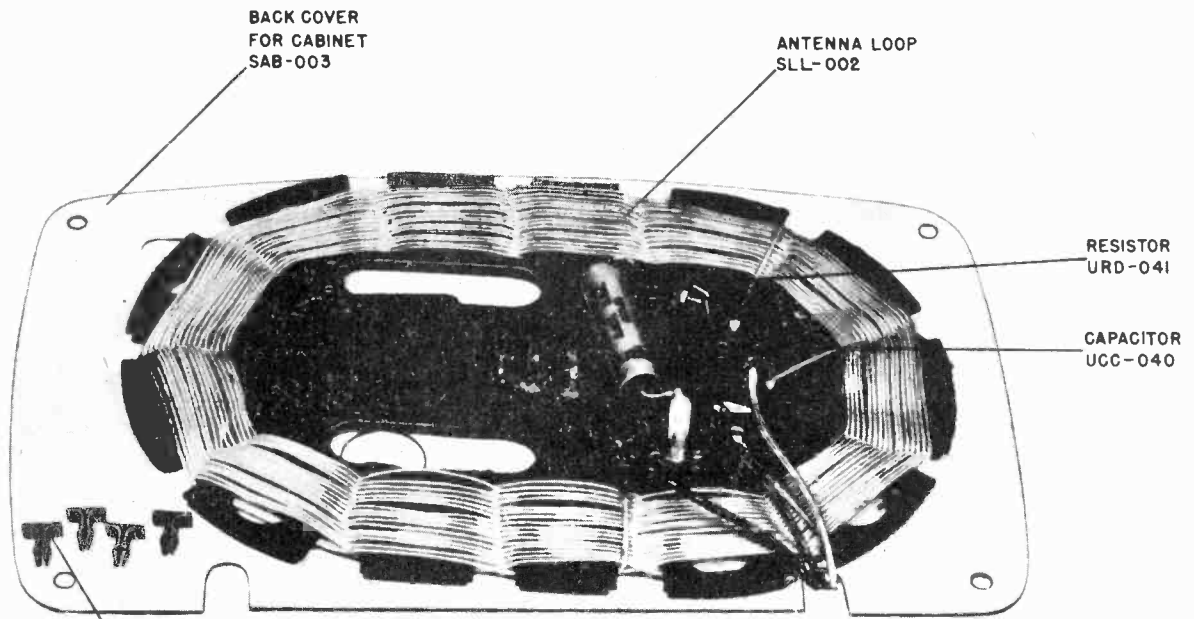
ADDITIONAL PARTS FOR MODEL 43-8179

| | | | | | |
|---------|-----|-----------------|-------------|---------|------|
| UCC-039 | C19 | Paper Capacitor | .005 mf | 600WVDC | |
| UCC-048 | C20 | Paper Capacitor | .1 mf | 400WVDC | |
| UCC-040 | C21 | Paper Capacitor | .01 mf | 400WVDC | |
| URD-113 | R12 | Carbon Resistor | 470,000 ohm | ½ W | ±20% |
| URD-113 | R13 | Carbon Resistor | 470,000 ohm | ½ W | ±20% |

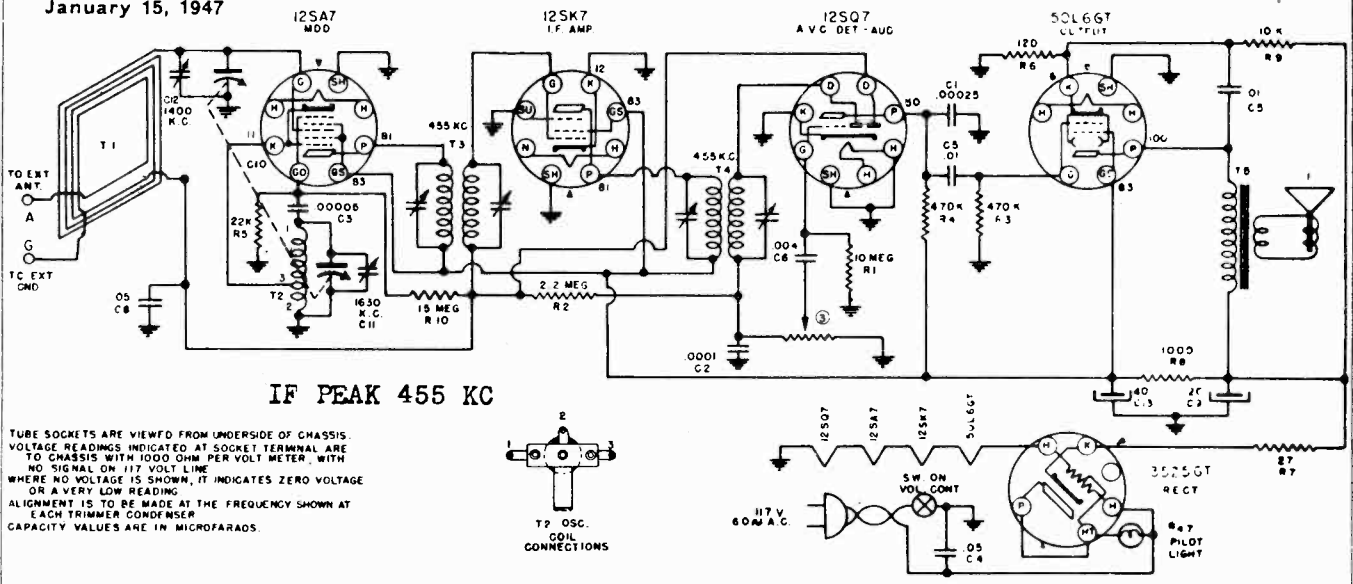
*See listings on pictures

GAMBLE-SKOGMO, INC.

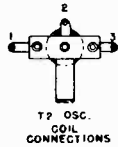
MODELS 43-8177,
43-8178, 43-8179



January 15, 1947



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS INDICATED AT SOCKET TERMINAL ARE TO CHASSIS WITH 1000 OHM PER VOLT METER, WITH NO SIGNAL ON 117 VOLT LINE. WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER. CAPACITY VALUES ARE IN MICROFARADS.



| CODE | PART NO | DESCRIPTION | CODE | PART NO | DESCRIPTION | CODE | PART NO | DESCRIPTION |
|------|-----------|-------------------|------|------------|--|------|---------|---|
| R 1 | 10 MEGOHM | 1/4 WATT RESISTOR | C 1 | .00025 MFD | MICA CONDENSER | T 1 | 82-10 | L'10P ANTENNA |
| R 2 | 22 | " | C 2 | .0001 | " | T 2 | 10-394 | OSCILLATOR COIL |
| R 3 | 470K | " | C 3 | .00005 | " | T 3 | 10-369 | 1ST I.F. TRANSFORMER |
| R 4 | 470K | " | C 4 | .05 MFD. | 400V. TUBULAR CONDENSER | T 4 | 10-370 | 2ND I.F. TRANSFORMER |
| R 5 | 22K | " | C 5 | .01 | " | T 5 | 80-212 | OUTPUT TRANSFORMER USED WITH 78-307A 5PB |
| R 6 | 120 | " | C 6 | .004 | " | 5 | 879-359 | 5" P.W. SPEAKER WITH APO-224 OUTPUT TRANS |
| R 7 | 27 | " | C 7 | | " | U | 79-307A | 5" P.W. SPEAKER |
| R 8 | 1000 | 1/2 WATT | C 8 | .05 | 200V. | | | |
| R 9 | 10K | 1 WATT | C 9 | 18-272 | 70 MFD. 150 W.V. ELECTROLYTIC | | | |
| R 10 | 15 MEG | 1/3 WATT | C 10 | 19-177 | 2 GANG VARIABLE CONDENSER (ALSO C11 & C12) | | | |
| | | | C 13 | 18-280 | 4 MFD. 150 W.V. ELECTROLYTIC | | | |

ALIGNMENT PROCEDURE

EQUIPMENT NECESSARY:

- Signal Generator
- Output Meter
- .1 MFD. Condenser
- .00025 MFD. Condenser, mica
- Insulated Screwdriver

ALIGNMENT FREQUENCIES

- I.F. 455 K.C.
- Osc. 1630 K.C.
- Ant. 1400 K.C.

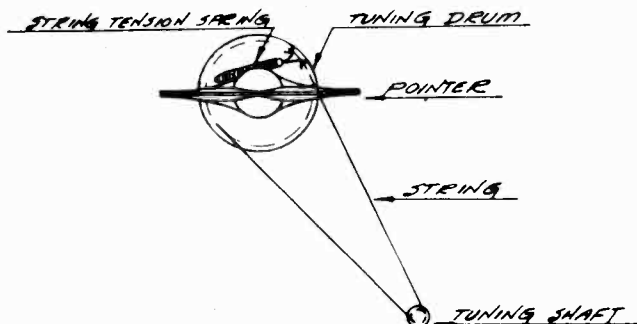
CAUTION: This is an A.C.-D.C. type receiver and when aligning the set it is necessary to isolate the signal generator or the receiver from the line by use of a transformer or by placing a .2 MFD. condenser in both test leads of the signal generator.

| Variable Condenser Setting | Generator Frequency | Dummy Antenna MFD. | Connection to Radio | Trimmer Adjustment | Trimmer Function |
|---------------------------------|---------------------|--------------------|---------------------------------|--------------------|------------------|
| Minimum Capacity (Fully opened) | 455 K.C. | .1 | *Stator of Ant. section of gang | T3-T4 | I.F. |
| Minimum Capacity (Fully opened) | 1630 K.C. | .00025 | **Ant. terminal on loop | C11 | Osc. |
| Tune in signal from generator | 1400 K.C. | .00025 | **Ant. terminal on loop | C12 | Ant. |

*Connect ground side of signal generator lead to chassis.

**Connect ground side of signal generator lead to terminal marked "G" on back of the loop.

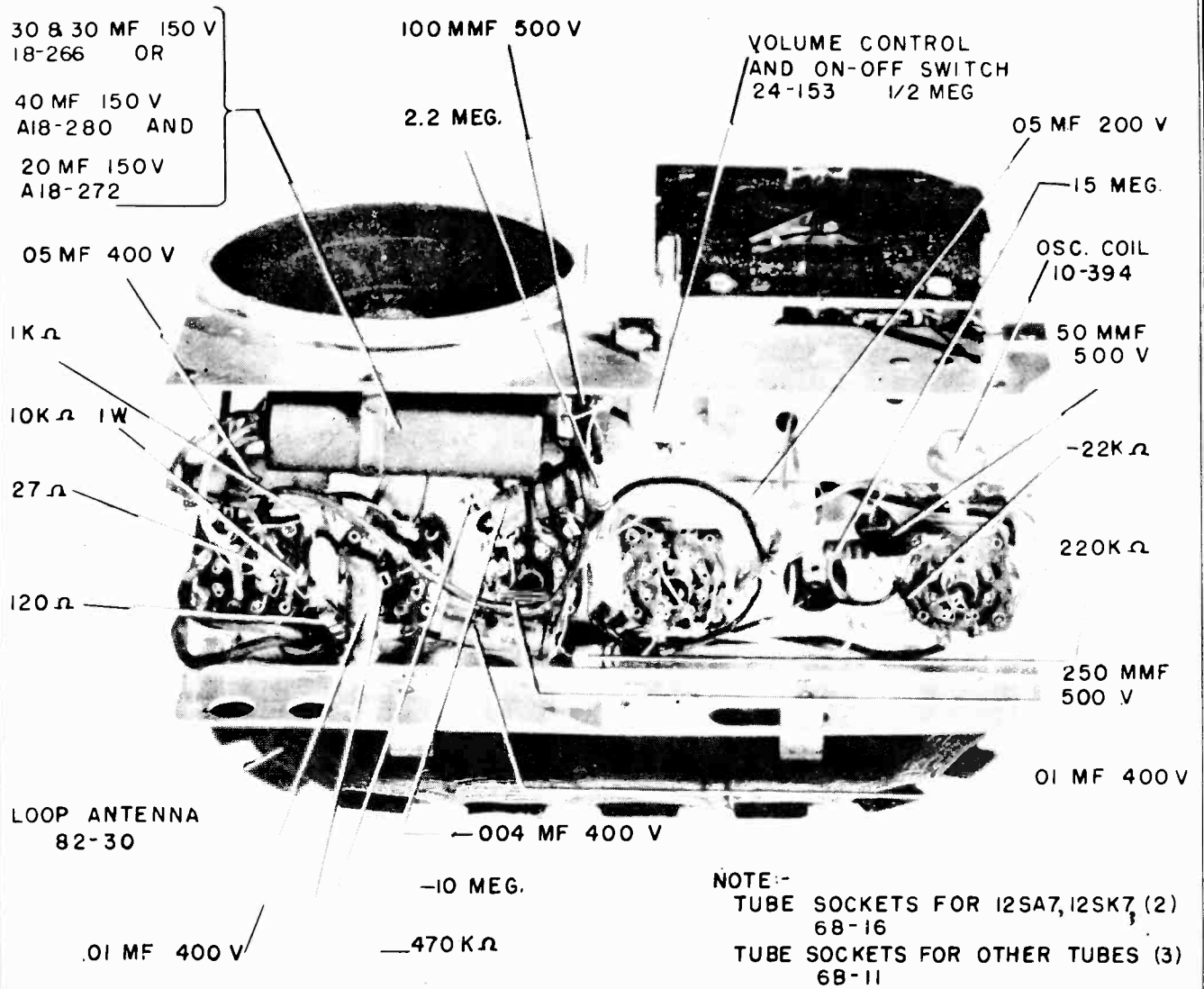
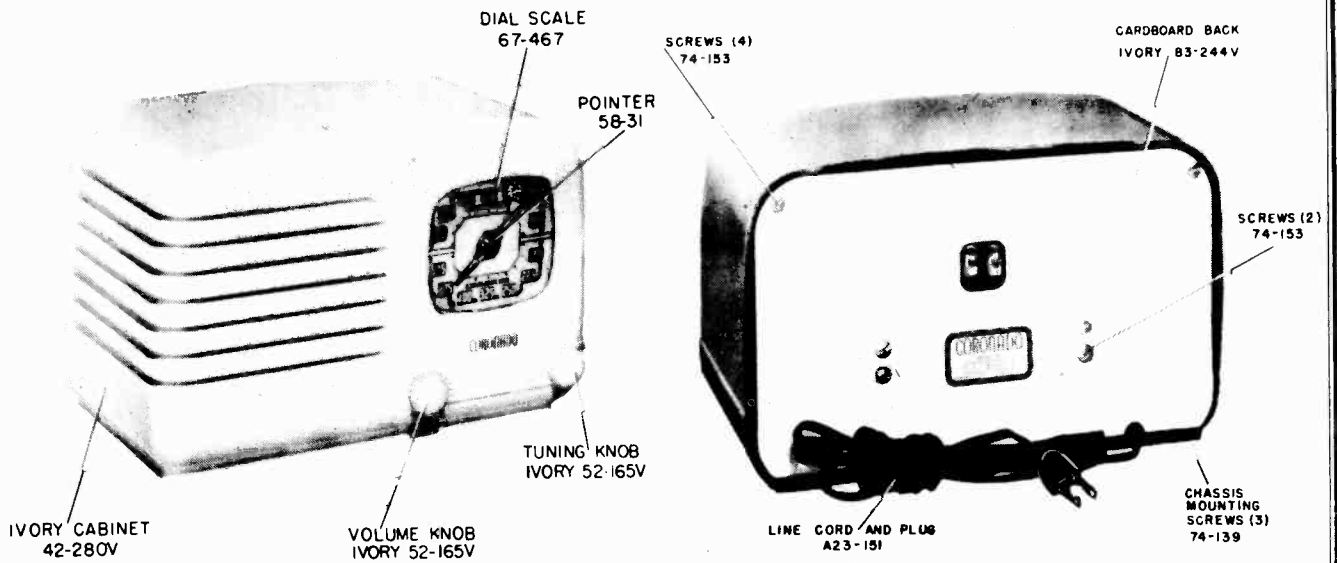
DRIVE CORD REPLACEMENT

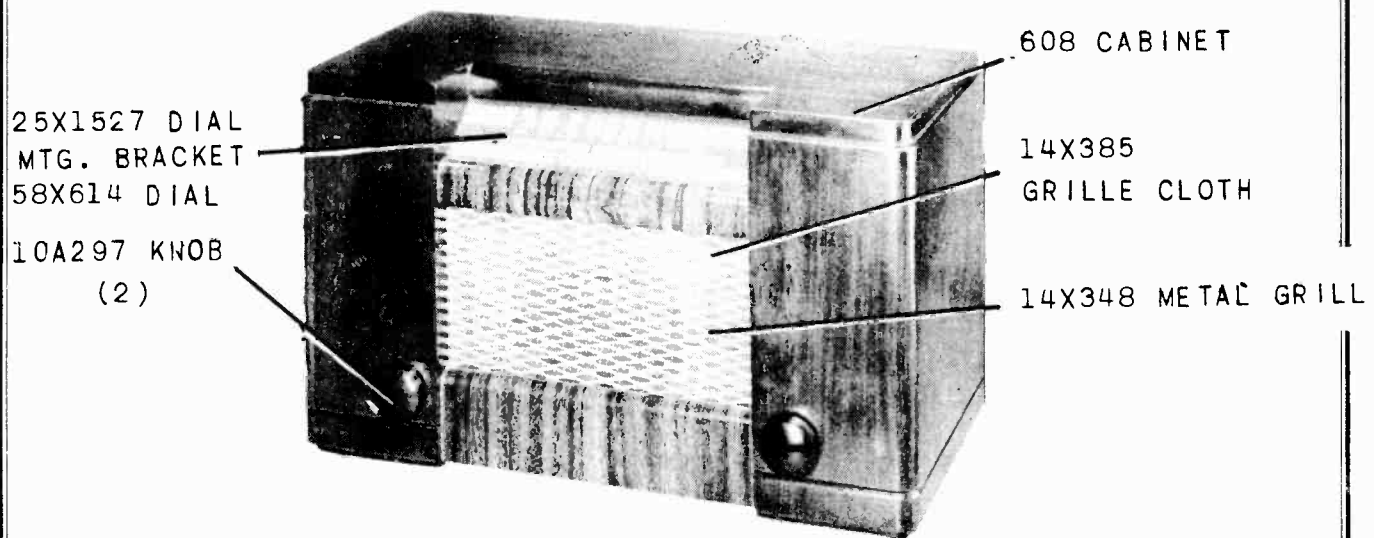


Turn gang condenser to fully open position. Use a new drive cord and fasten one end to the tension spring. Pass drive cord through slot in the drive pulley rim and continue over top of pulley and counter-clockwise around pulley to turning shaft, wrap around 2 1/2 turns, fasten free end to cord tension spring. Cross over cord before fastening.

GAMBLE-SKOGMO, INC.

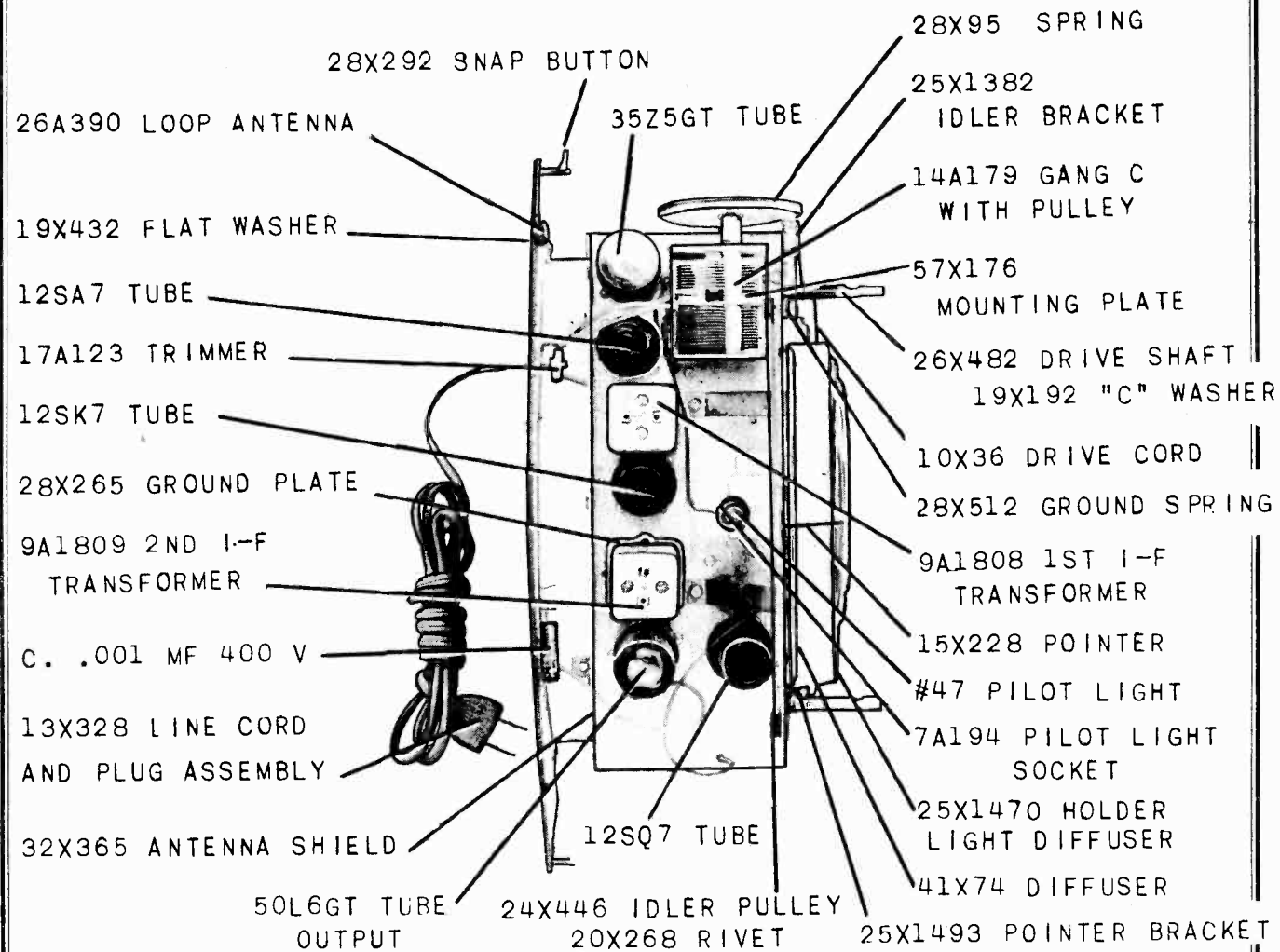
MODEL 43-8180





25X1527 DIAL
MTG. BRACKET
58X614 DIAL
10A297 KNOB
(2)

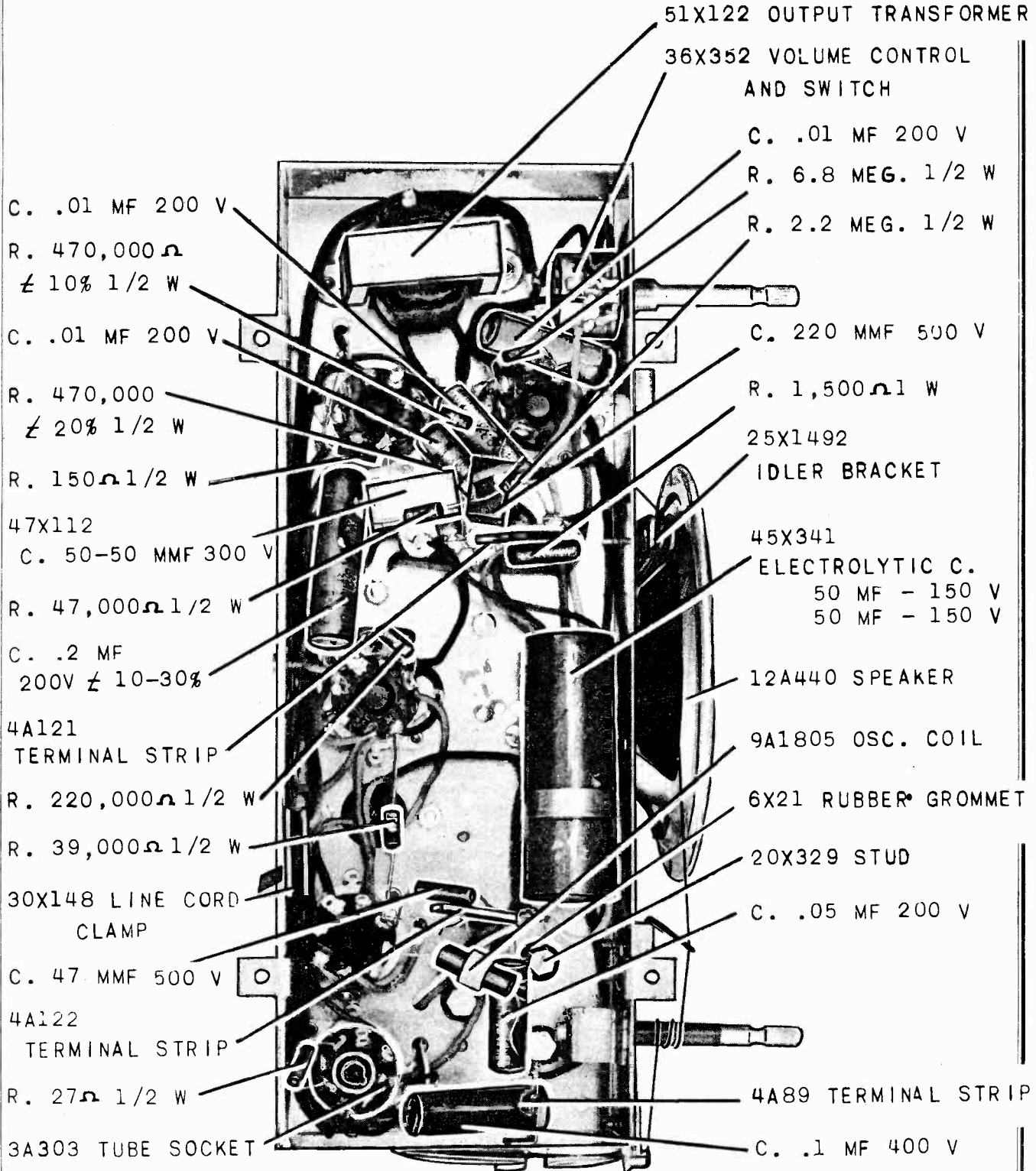
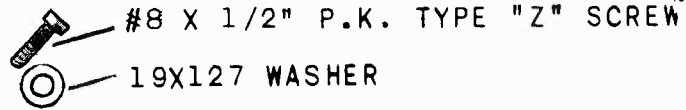
608 CABINET
14X385
GRILLE CLOTH
14X348 METAL GRILL



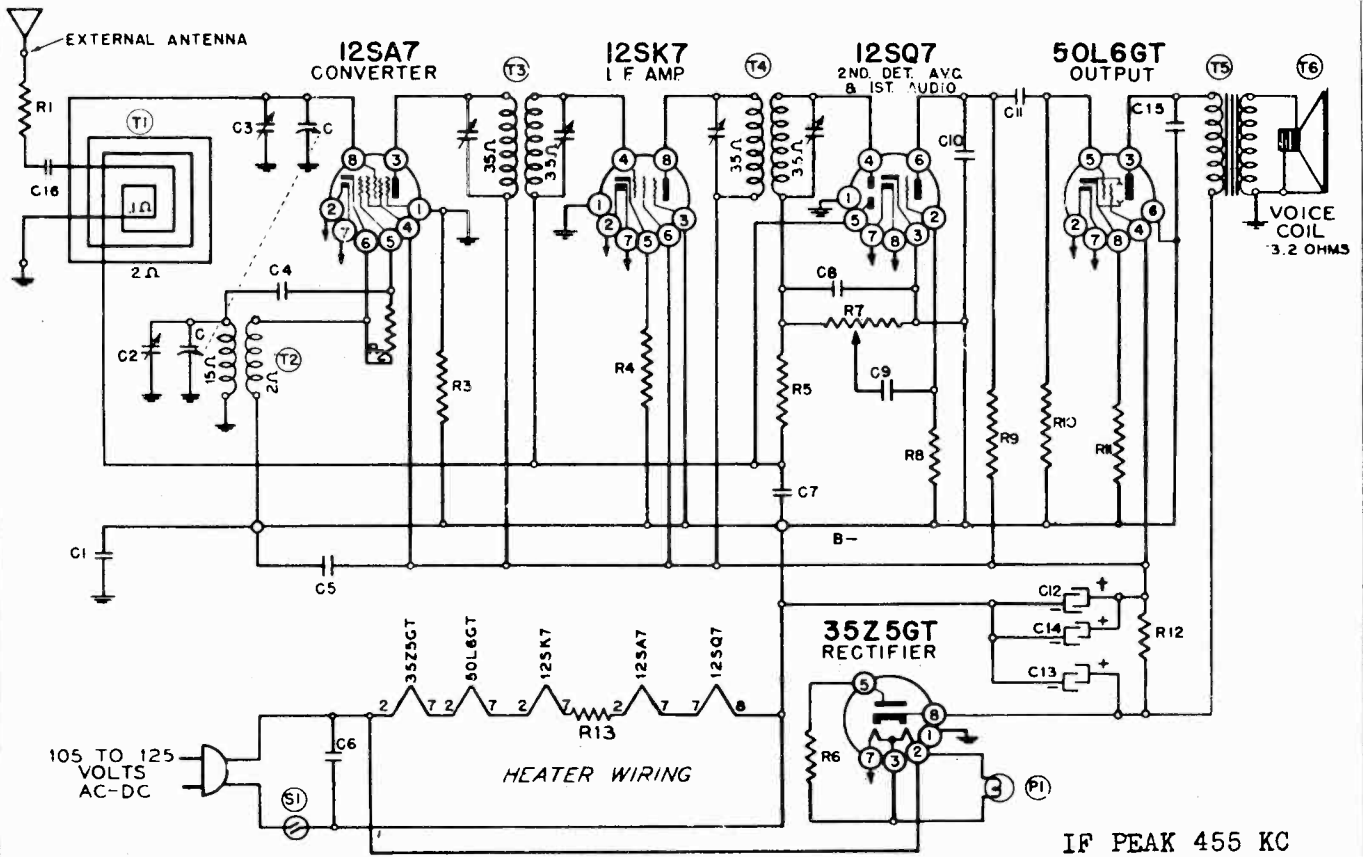
26A390 LOOP ANTENNA
19X432 FLAT WASHER
12SA7 TUBE
17A123 TRIMMER
12SK7 TUBE
28X265 GROUND PLATE
9A1809 2ND I-F TRANSFORMER
C. .001 MF 400 V
13X328 LINE CORD AND PLUG ASSEMBLY
32X365 ANTENNA SHIELD
50L6GT TUBE OUTPUT

28X292 SNAP BUTTON
35Z5GT TUBE
28X95 SPRING
25X1382 IDLER BRACKET
14A179 GANG C WITH PULLEY
57X176 MOUNTING PLATE
26X482 DRIVE SHAFT
19X192 "C" WASHER
10X36 DRIVE CORD
28X512 GROUND SPRING
9A1808 1ST I-F TRANSFORMER
15X228 POINTER
#47 PILOT LIGHT
7A194 PILOT LIGHT SOCKET
25X1470 HOLDER LIGHT DIFFUSER
41X74 DIFFUSER
25X1493 POINTER BRACKET
24X446 IDLER PULLEY
20X268 RIVET

28X95 SPRING
25X1382 IDLER BRACKET
14A179 GANG C WITH PULLEY
57X176 MOUNTING PLATE
26X482 DRIVE SHAFT
19X192 "C" WASHER
10X36 DRIVE CORD
28X512 GROUND SPRING
9A1808 1ST I-F TRANSFORMER
15X228 POINTER
#47 PILOT LIGHT
7A194 PILOT LIGHT SOCKET
25X1470 HOLDER LIGHT DIFFUSER
41X74 DIFFUSER
25X1493 POINTER BRACKET



DECEMBER 30, 1946



IF PEAK 455 KC

Note: Some sets of this model were built with a 2-section electrolytic condenser — a 40-mf section (C13) and a 20-mf section (C12 or C14).

CONDENSERS

- C 2-gang variable
- C1 .15 x 400 volts
- C2 Oscillator trimmer on gang
- C3 Antenna trimmer
- C4 .0002 mica
- C5 .05 x 200 volts
- C6 .1 x 400 volts
- C7 .05 x 200 volts
- C8 .0001 mica
- C9 .002 x 600 volts
- C10 .0005 mica
- C11 .004 x 600 volts
- C12 Electrolytic, 20 x 150 volts

- C13 Electrolytic, 40 x 150 volts
- C14 Electrolytic, 20 x 150 volts
- C15 .02 x 400 volts
- C16 .002 x 600 volts

RESISTORS

- R1 1000 ohms, 20%, ½ watt
- R2 47,000 ohms, 10%, ½ watt
- R3 220,000 ohms, 20%, ½ watt
- R4 47 ohms, 10%, ½ watt
- R5 3.3 megohms, 20%, ½ watt
- R6 22 ohms, 10%, ½ watt
- R7 Volume control, 1 megohm
- R8 10 megohms, 20%, ½ watt
- R9 470,000 ohms, 20%, ½ watt

- R10 680,000 ohms, 20%, ½ watt
- R11 150 ohms, 10%, ½ watt
- R12 1200 ohms, 10%, 1 watt
- R13 33 ohms, 20%, 1 watt

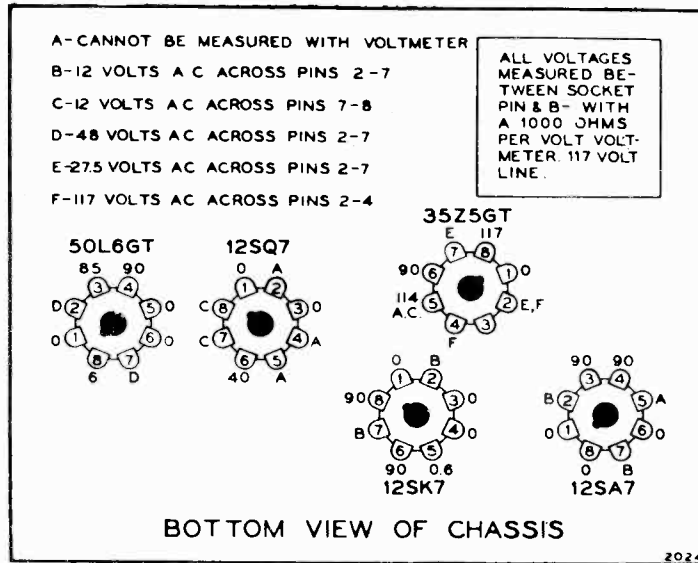
MISCELLANEOUS

- P1 Pilot light, 6-8 volts
- S1 On-off switch on volume control
- T1 Loop antenna assembly
- T2 Oscillator coil
- T3 Input I.F. coil
- T4 Output I.F. coil
- T5 Output transformer
- T6 5-inch P.M. speaker

SPECIFICATIONS

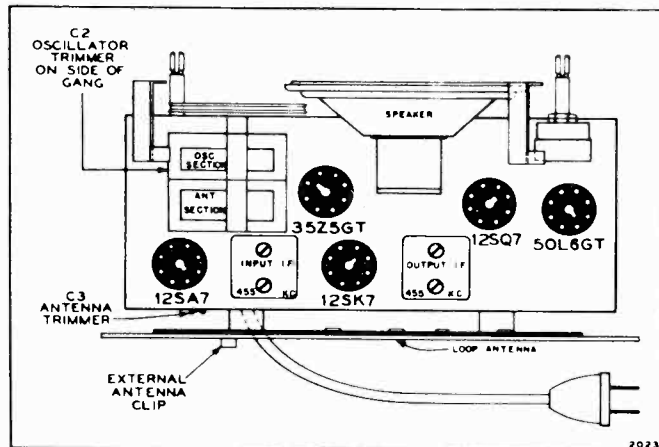
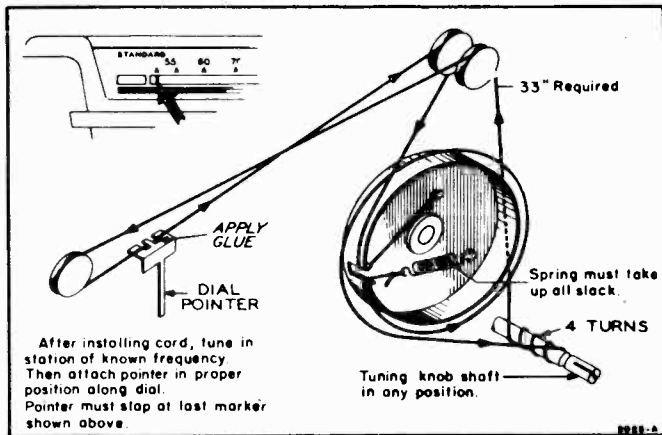
6 Tube Superheterodyne, including rectifier tube
 Power Consumption..... 35 w.
 Power Output..... 0.8 w. undistorted, 1.5 w. maximum
 Selectivity..... 52 kc. broad at 1,000 times signal at 1,000 kc.
 Antenna..... Built-in loop, also provision for external antenna
 Intermediate Frequency..... 455 kc.

Speaker..... 5 in. 0.7 oz. P.M. voice coil imp. 3.2 ohms
 Tuning..... Two-gang capacitor
 Sensitivity..... 30 mv. avg. for 50 mw. output
 Frequency Range..... 530 to 1,650 kc.
 Power Supply..... 105-125 v. D.C., 50-60 cycle A.C., also made for 25 cycles
 Output Transformer..... Impedance ratio 2,500:3.2



DRIVE CORD REPLACEMENT

CHASSIS VIEW



ALIGNMENT PROCEDURE

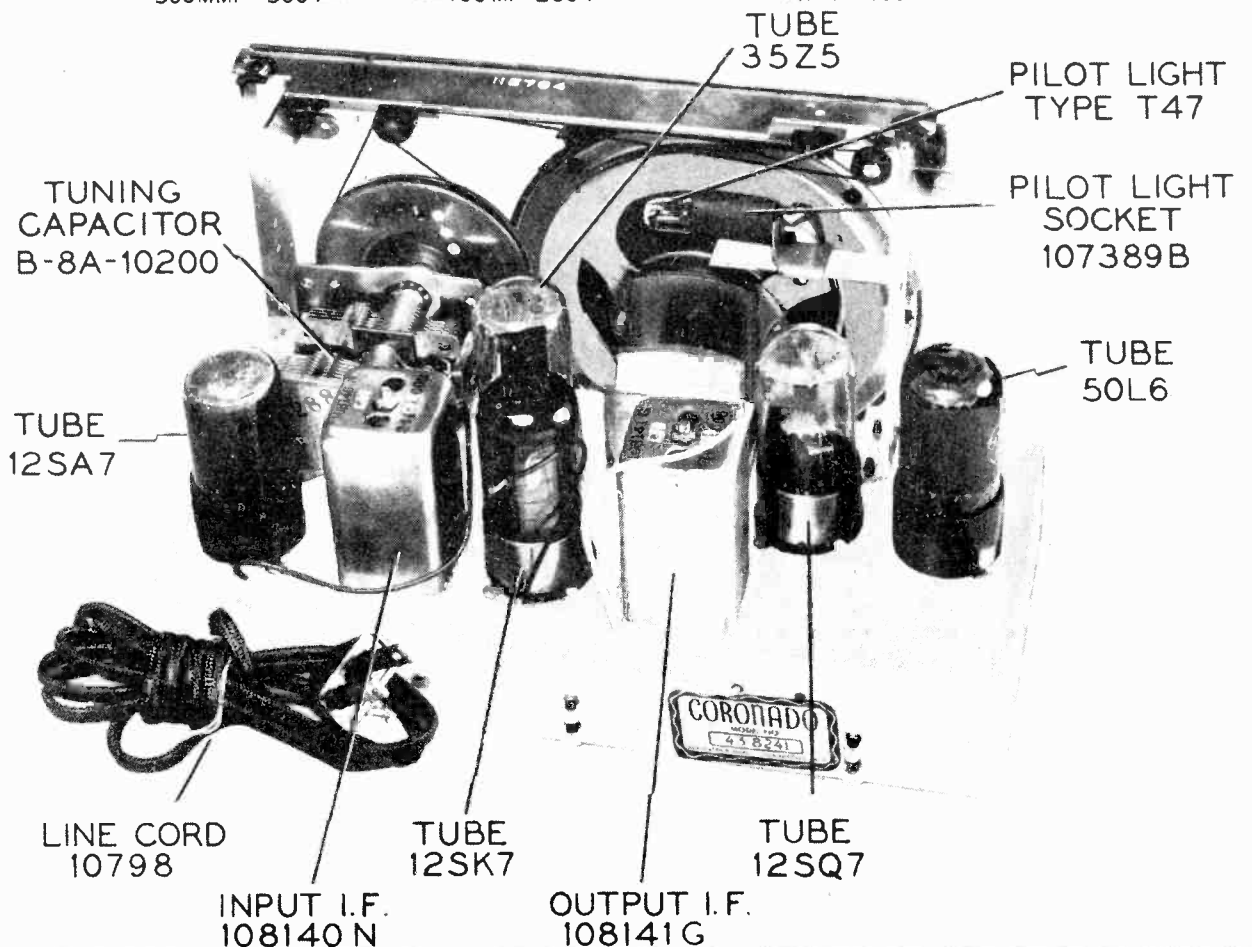
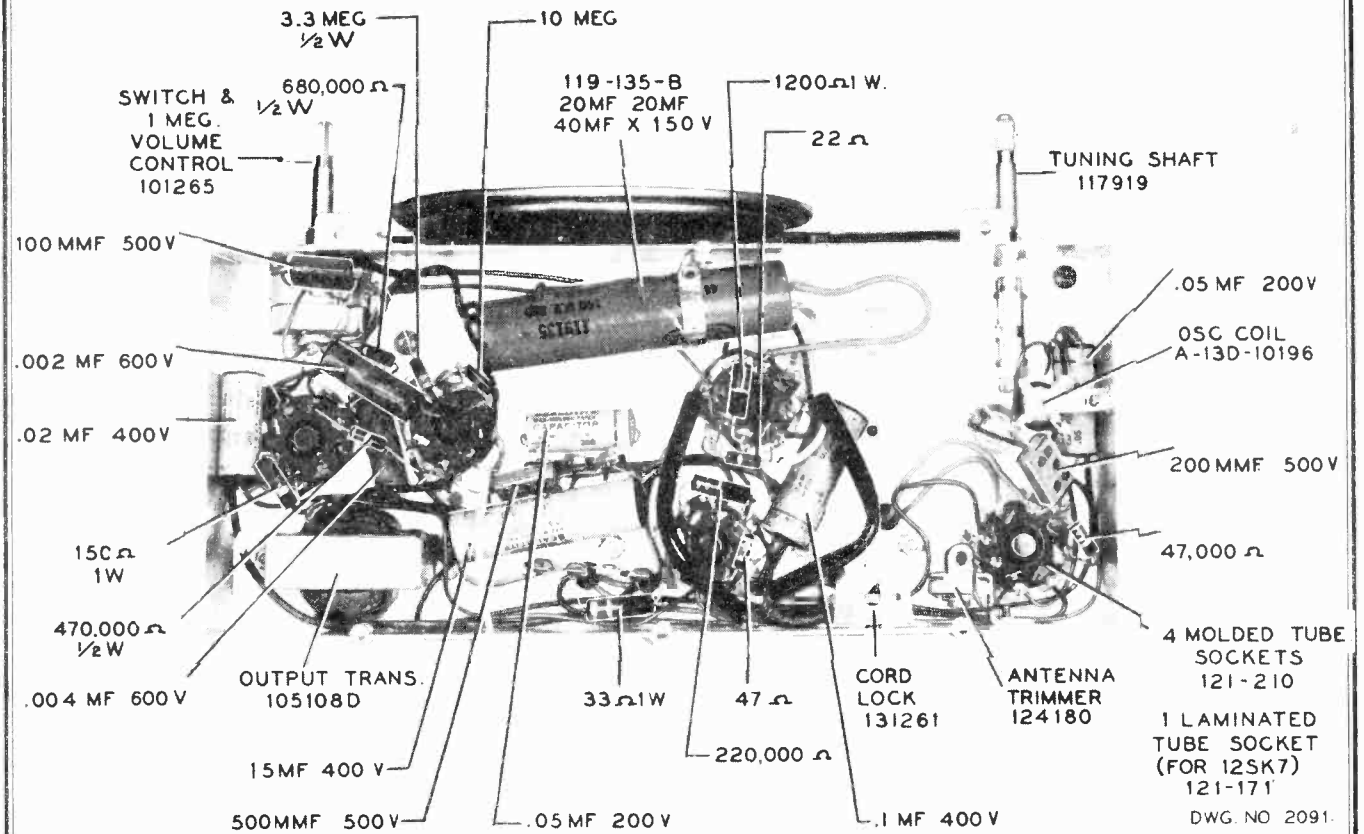
- No aligning adjustments should be attempted until all other possible causes of trouble have been checked.
- The loop antenna should be connected to the radio and in its proper position during all adjustments.
- Turn volume control to maximum (extreme clock-wise) for all adjustments.
- Connect ground post of signal generator to B- of radio through a .1 mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.

| Band | Signal Generator Frequency Setting | Dummy Antenna | Connection to Radio | Tuning Condenser Setting | Adjust for Maximum Output |
|-----------|------------------------------------|---------------|---------------------|--------------------------------------|---|
| I.F. | 455 Kc. | .1 mfd. | Grid of 12SK7 | Rotor full open (plates out of mesh) | 2 trimmers on top of output I.F. (see chassis view) |
| | 455 Kc. | .1 mfd. | Grid of 12SA7 | Rotor full open (plates out of mesh) | 2 trimmers on top of input I.F. (see chassis view) |
| Broadcast | 1650 Kc. | .1 mfd. | Grid of 12SA7 | Rotor full open (plates out of mesh) | Oscillator trimmer C2 on gang (see chassis view) |
| | 1400 Kc. | None | See note below | Set dial at 1400 Kc. | Antenna trimmer C3 (see chassis view) |

Note: Lay output lead of generator in back of loop antenna. Turn up generator output. Loop antenna will pick up energy.

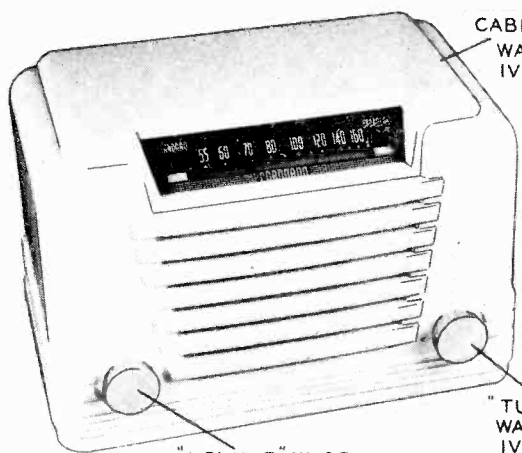
GAMBLE-SKOGMO, INC.

MODELS 43-8240,
43-8241



MODELS 43-8240,
43-8241

GAMBLE-SKOGMO, INC.



CABINET- BAKELITE
WALNUT 128658-36
IVORY 128658-9

2087

"VOLUME" KNOB
WALNUT 128686-37
IVORY 128686-8

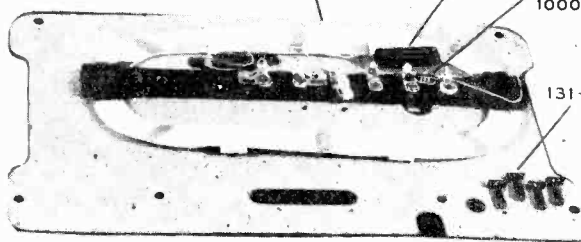
"TUNING" KNOB
WALNUT 128687-37
IVORY 128687-8

COMPLETE ASSEMBLY.
LOOP, RESISTOR, CAPACITOR
& BACK.(SPECIFY BACK COLOR)
IVORY C-13E-10195
OR
WALNUT C-212-11269

C-8D-10778
.002 MF 600 V

C-9B1-13
1000 Ω

131-356



DIAL SCALE
B-6D-10014

DIFFUSER UNDER DIAL
A-6D-10017

DIFFUSER CINCH BUTTONS
A-2M-7758

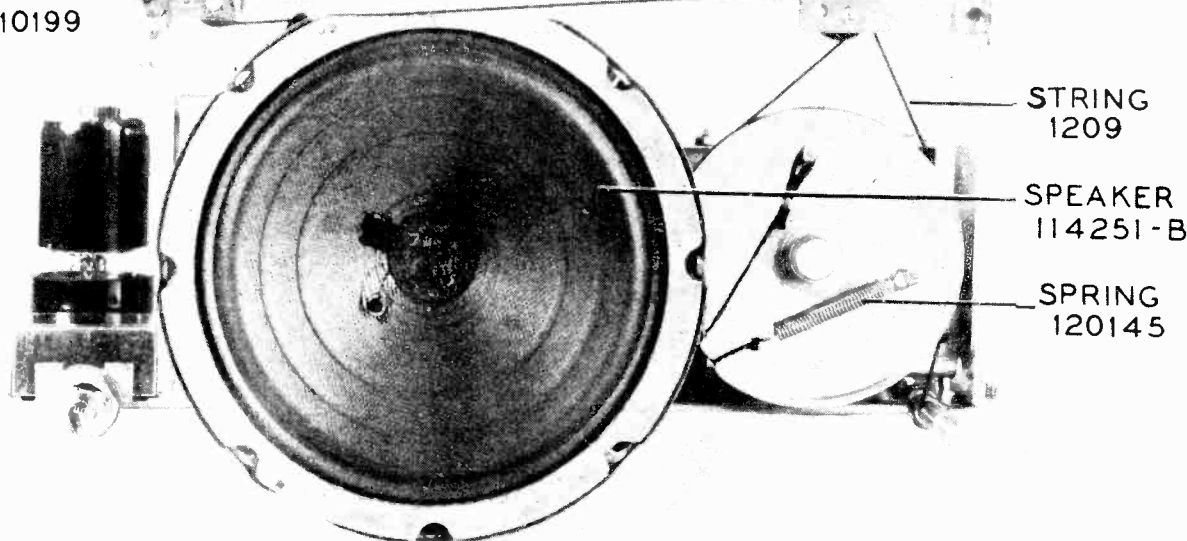


DIAL
POINTER
A-2G-10199

STRING
1209

SPEAKER
114251-B

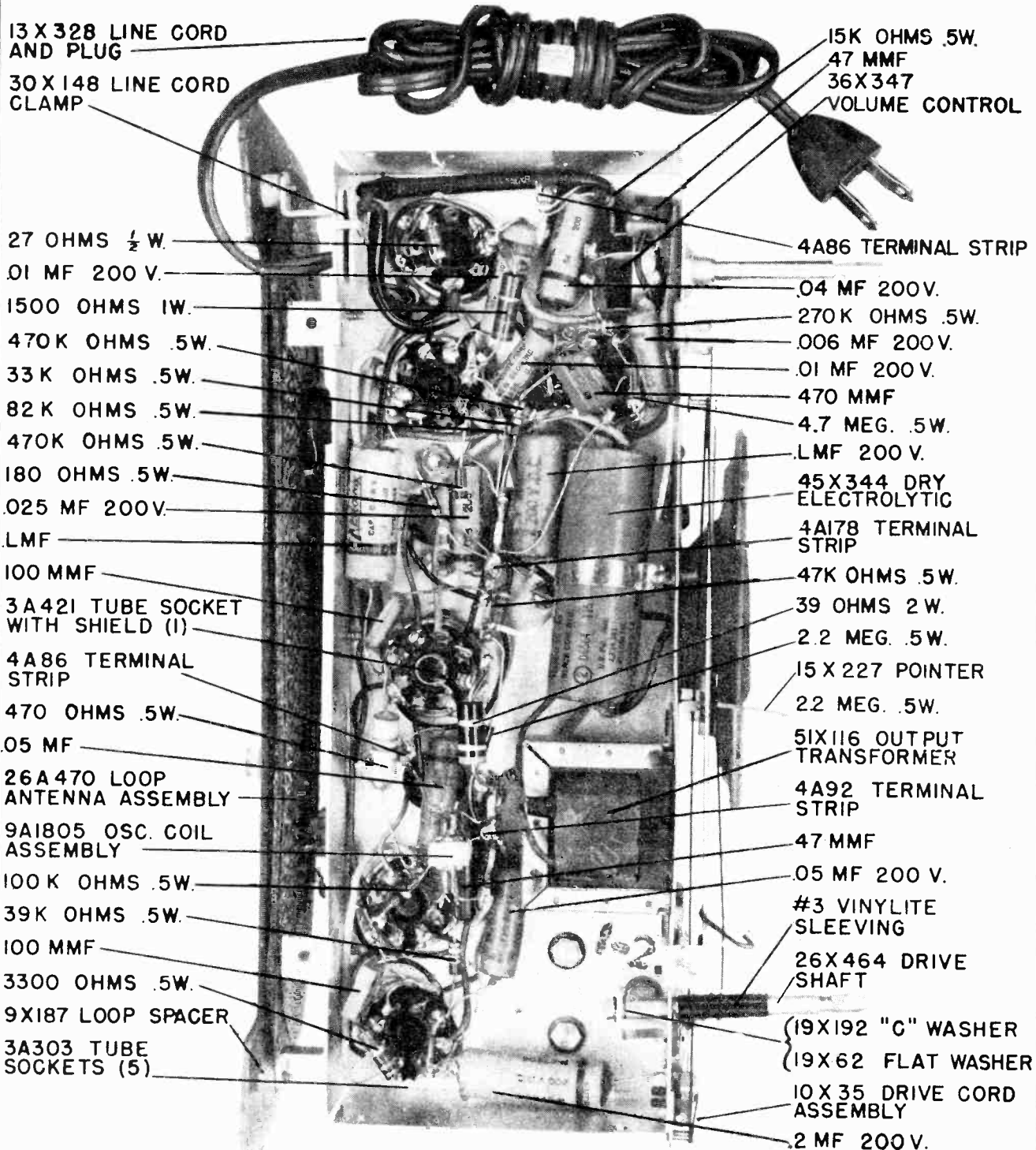
SPRING
120145



SPECIFICATIONS

6 Tube Superheterodyne, including Rectifier Tube.
 Speaker.....5-inch PM Dynamic
 Intermediate Frequency.....455 KC
 Selectivity.....50 KC Broad at 1,000 Times Signal
 Sensitivity (for .05 watt output with external antenna).....15 microvolts average
 Power Consumption.....35 watts (at 117 volts AC)
 Power Output..1.5 watt maximum, .9 watt (10% harmonics)

BOTTOM CHASSIS VIEW



13 X 328 LINE CORD AND PLUG

30 X 148 LINE CORD CLAMP

27 OHMS 1/2 W.

.01 MF 200 V.

1500 OHMS 1W.

470K OHMS .5W.

33 K OHMS .5W.

82 K OHMS .5W.

470K OHMS .5W.

180 OHMS .5W.

.025 MF 200V.

LMF

100 MMF

3A421 TUBE SOCKET WITH SHIELD (1)

4A86 TERMINAL STRIP

470 OHMS .5W.

.05 MF

26A470 LOOP ANTENNA ASSEMBLY

9A1805 OSC. COIL ASSEMBLY

100K OHMS .5W.

39K OHMS .5W.

100 MMF

3300 OHMS .5W.

9X187 LOOP SPACER

3A303 TUBE SOCKETS (5)

15K OHMS .5W.

47 MMF

36X347

VOLUME CONTROL

4A86 TERMINAL STRIP

.04 MF 200V.

270K OHMS .5W.

.006 MF 200V.

.01 MF 200V.

470 MMF

4.7 MEG. .5W.

LMF 200 V.

45X344 DRY ELECTROLYTIC

4A178 TERMINAL STRIP

47K OHMS .5W.

39 OHMS 2W.

2.2 MEG. .5W.

15 X 227 POINTER

2.2 MEG. .5W.

5IX116 OUTPUT TRANSFORMER

4A92 TERMINAL STRIP

47 MMF

.05 MF 200 V.

#3 VINYLITE SLEEVING

26X464 DRIVE SHAFT

26X464 DRIVE SHAFT

26X464 DRIVE SHAFT

26X464 DRIVE SHAFT

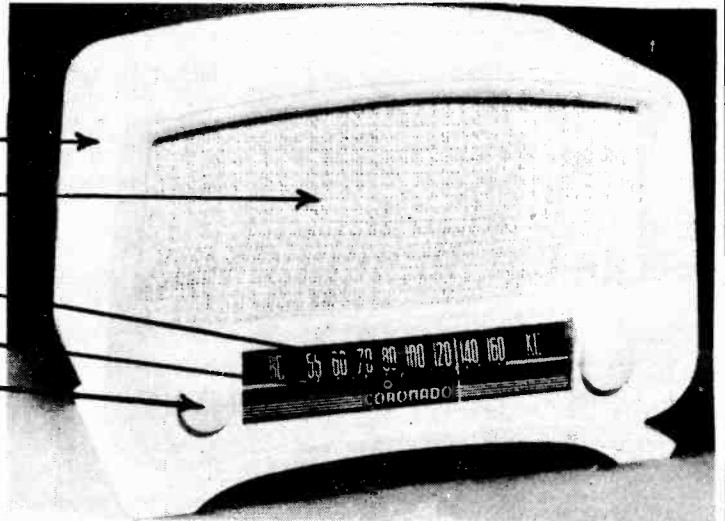
(19X192 "C" WASHER

(19X62 FLAT WASHER

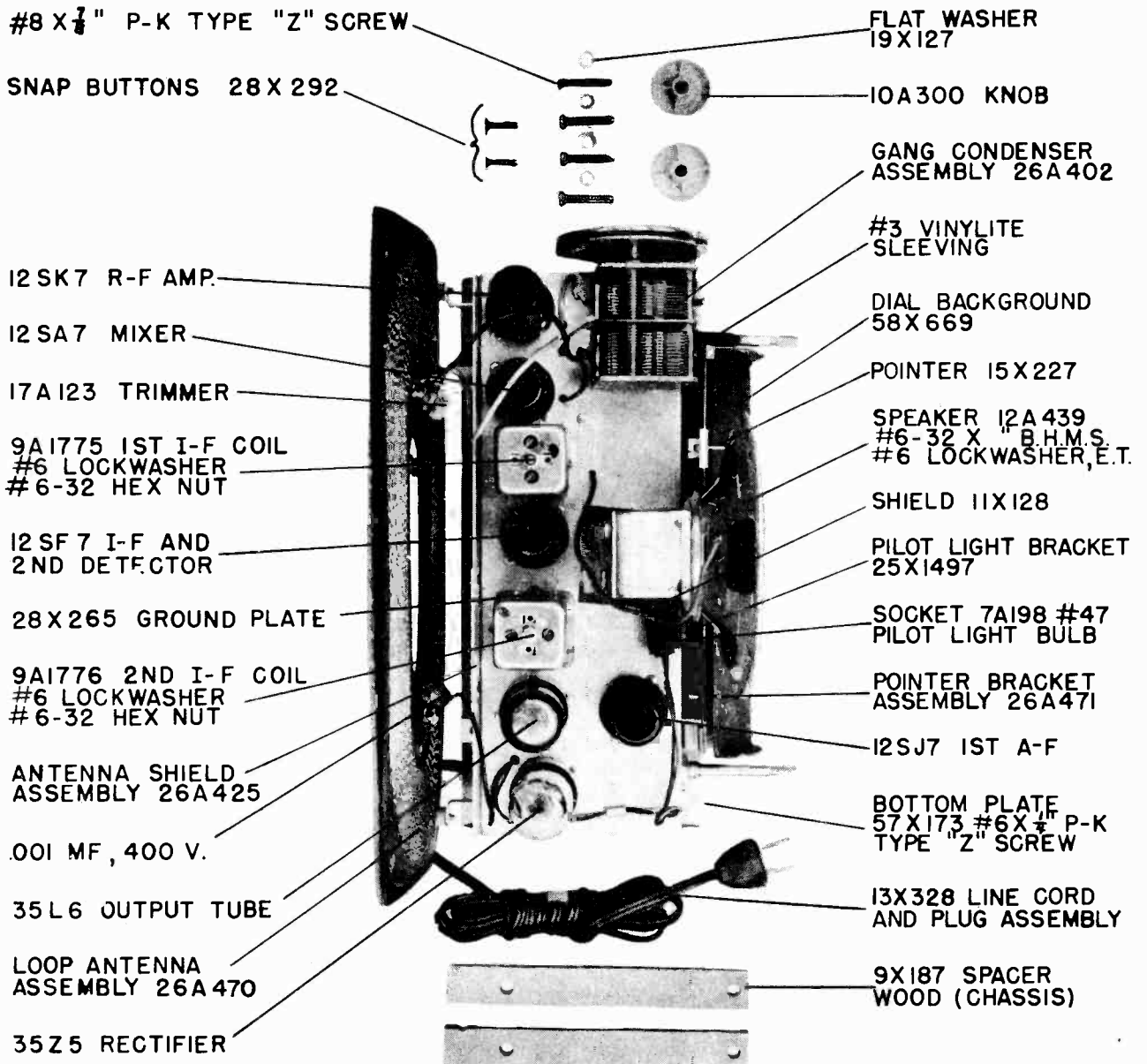
10X35 DRIVE CORD ASSEMBLY

2 MF 200V.

- 55X258 CABINET #616
- 26A424 GRILLE CLOTH
- 15X227 POINTER
- 58X668 DIAL
- 10A300 KNOB

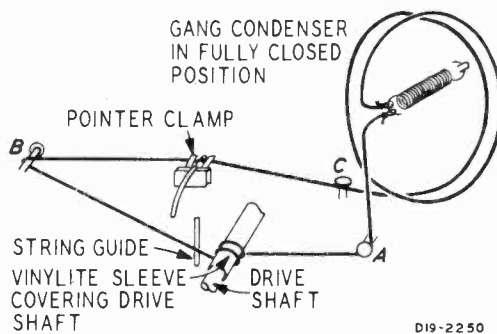
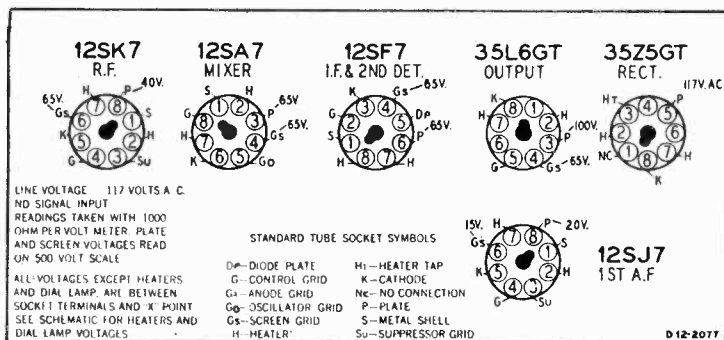


TOP CHASSIS VIEW



MODEL 43-8305

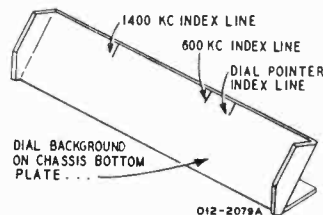
MODEL 43-9751



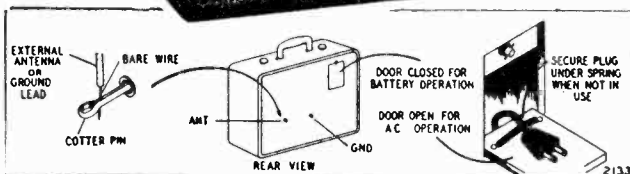
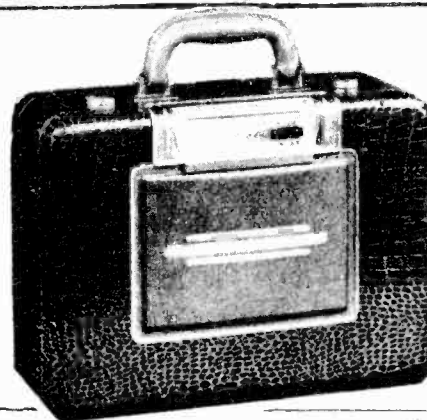
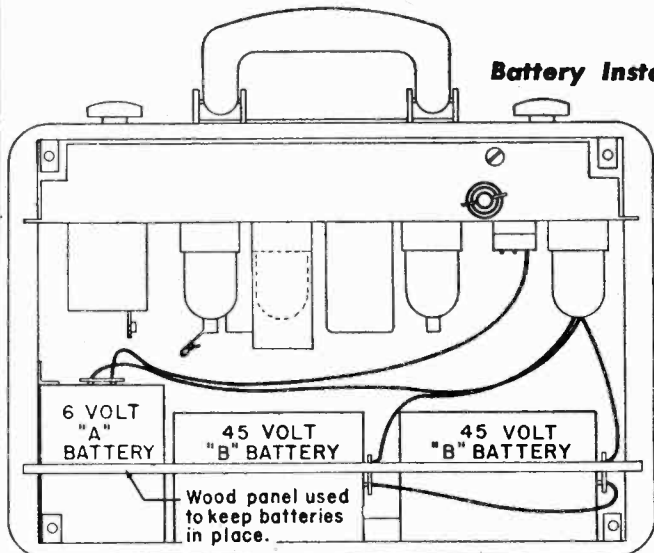
DRIVE CORD REPLACEMENT

Turn the large drive pulley to the maximum counter-clockwise position. Use a new drive cord and fasten one end to the tension spring. Hook the other end of the tension spring over the tab on the drive pulley. Pass the cord through the slot on the drive pulley rim and continue around pulley 1/2 turn counter-clockwise. Pass cord around stud A and wind two turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Pass cord around studs B and C, then under drive pulley and wind 1 1/2 turns counter-clockwise around drive pulley. Stretch tension spring and fasten free end of cord to spring.

Attach the DIAL POINTER to the cord and position as instructed in paragraph DIAL CALIBRATION.



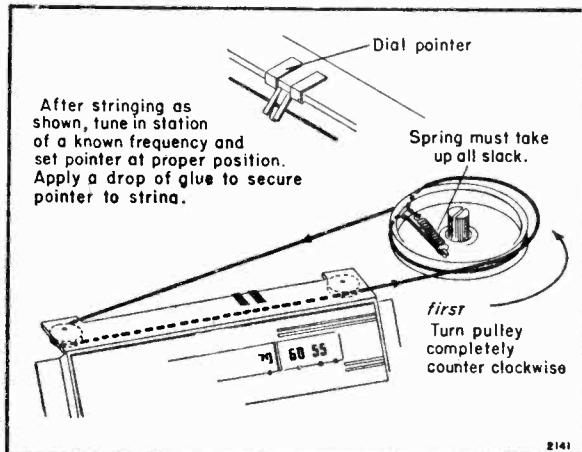
Battery Installation



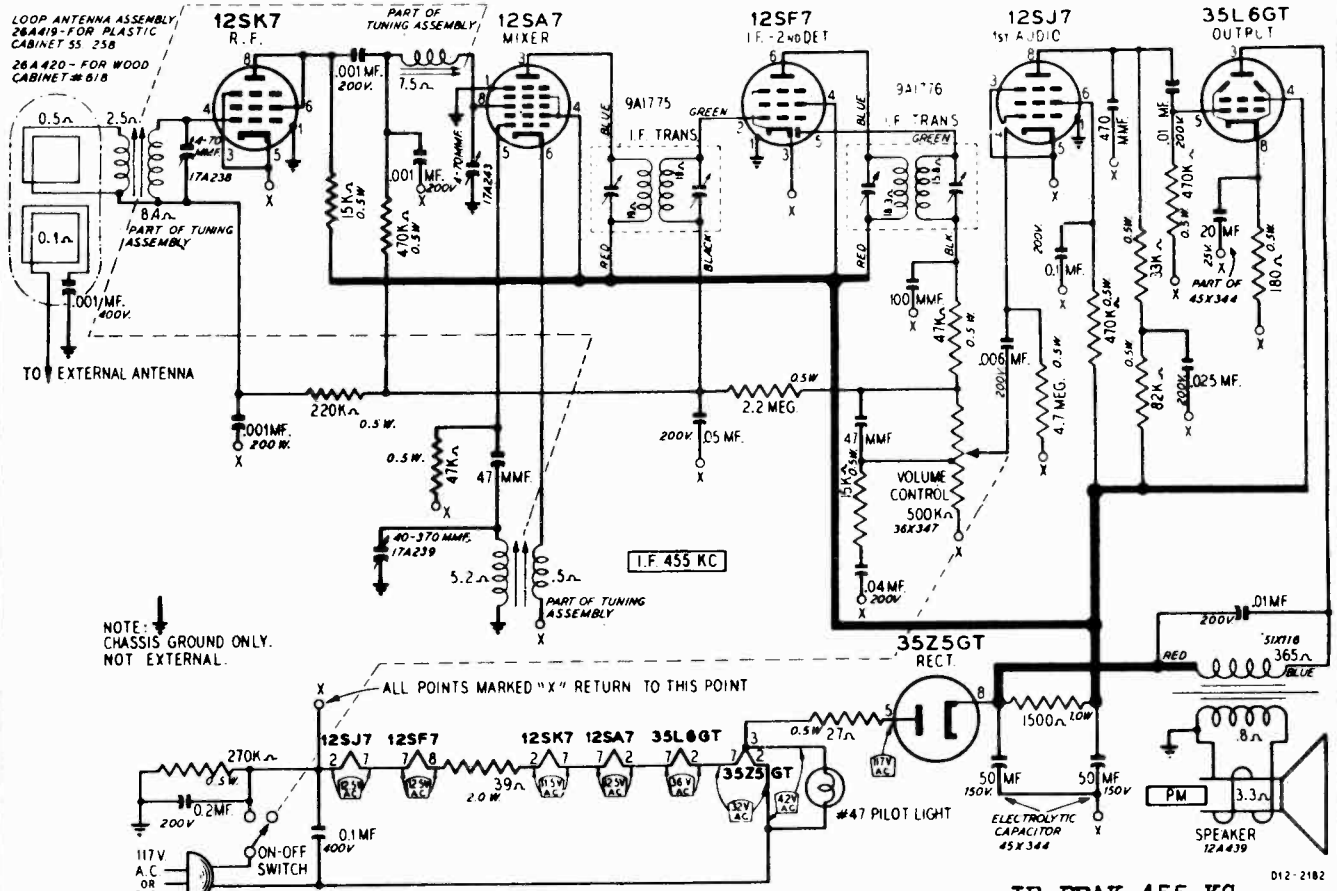
ELECTRICAL SPECIFICATIONS

- Power Supply**..... 105 to 125 volts, DC or 50-60 cycle AC, 30 watts.
Battery: A—6 volts, 58 ma.
 B—90 volts, 9 ma.
- Frequency Range**..... 530 to 1650 kc.
- Intermediate Freq.**..... 455 kc.
- Tuning**..... Two-gang capacitor.
- Antenna**..... Built-in loop. Provisions also for external antenna and ground.
- Speaker**..... 5-inch; P.M.; voice coil impedance 3.2 ohms.
- Power Output**..... 80 milliwatts undistorted.
 180 milliwatts maximum.
- Sensitivity**..... 30 microvolts average for 50-milliwatt output.
- Selectivity**..... 43 kc broad at 1000 times signal at 1000 kc.

DRIVE CORD REPLACEMENT



DECEMBER 30, 1946

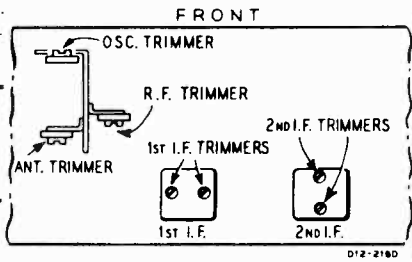


NOTE: CHASSIS GROUND ONLY. NOT EXTERNAL.

ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.
 Volume Control—Maximum All Adjustments.
 Allow Chassis and Signal Generator to "Heat Up" for several minutes.
 Dummy Antennas—.1 mf., 50 mmf.

The equipment in column at right is required for aligning:
 Signal Generator, which will provide an accurately calibrated signal at the test frequencies as listed.
 Output Indicating Meter; Non-Metallic Screwdriver.

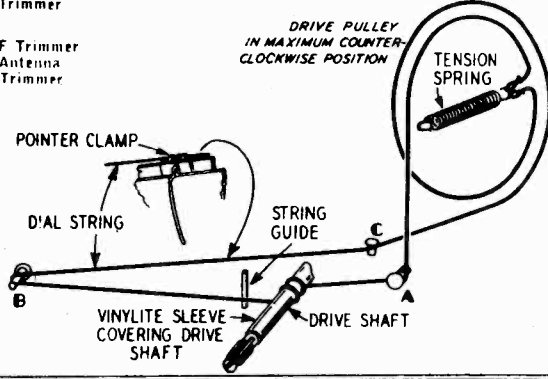


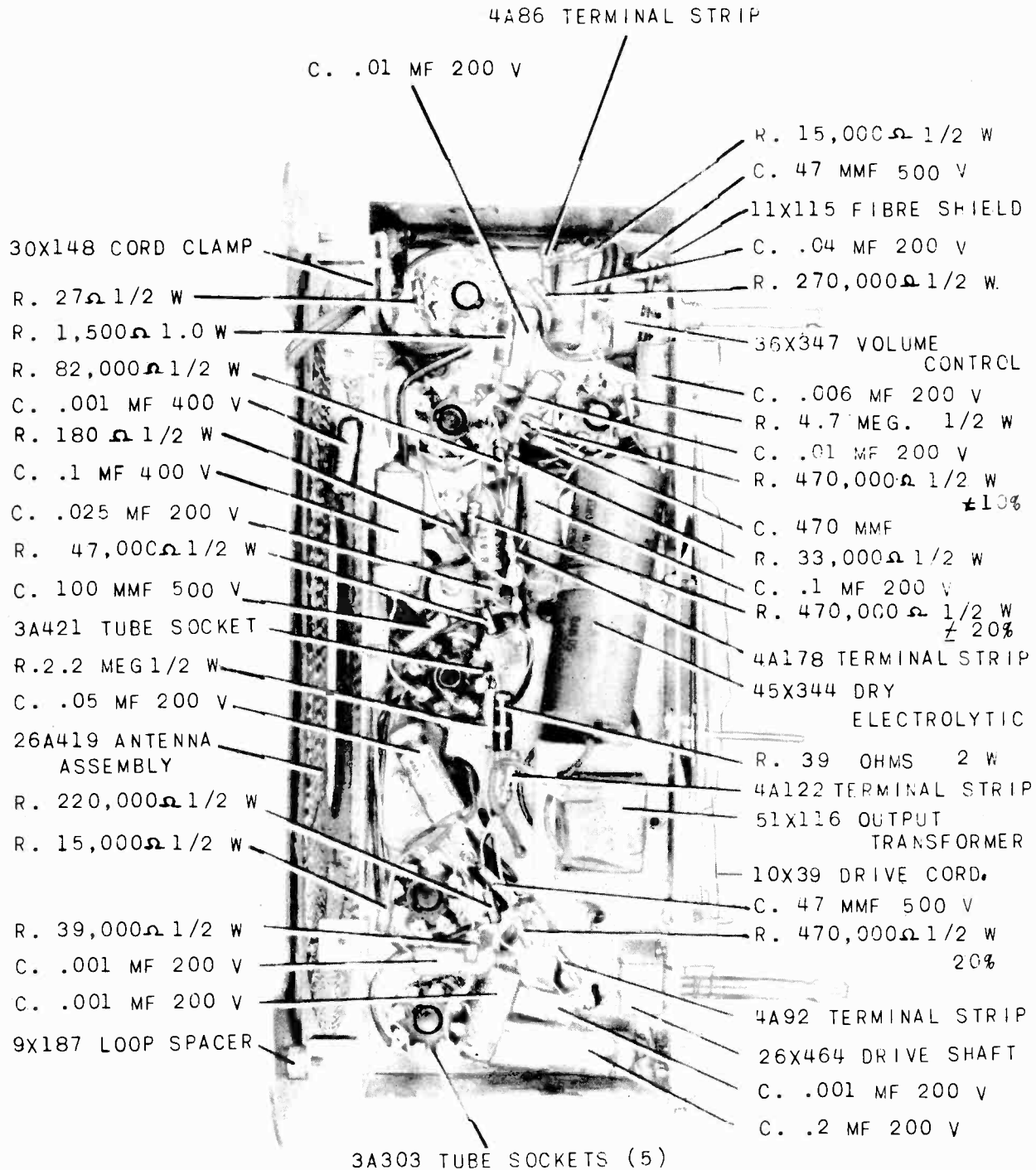
| SIGNAL GENERATOR Frequency Setting | Antenna Connection | Ground Connection | Coupling Capacitor | Dial Setting | Adjust Trimmers to Maximum (See Trimmer Illustration) |
|------------------------------------|---|--------------------------------------|--------------------|--------------------------------|---|
| 455 KC | Control Grid 12SF7 - I.F. (Prong No. 2) | Point "X" 12SK7 - R.F. (Prong No. 3) | .1 mf. | 1600 KC | 2nd I.F. Trimmers |
| 455 KC | Control Grid 12SA7 - 1st Det. (Prong No. 8) | Point "X" 12SK7 - R.F. (Prong No. 3) | .1 mf. | 1600 KC | 1st I.F. Trimmers |
| 1400 KC | External Antenna Clip on Loop | Point "X" 12SK7 - R.F. (Prong No. 3) | 50 mmf. | 1400 KC Index Line. See Note A | Oscillator Trimmer |
| 1400 KC | External Antenna Clip on Loop | Chassis | 50 mmf. | 1400 KC Index Line. See Note A | R-F Trimmer Antenna Trimmer |

DRIVE CORD REPLACEMENT

Turn the large drive pulley to the maximum counter-clockwise position. Use a new drive cord and fasten one end to the tension spring. Hook the other end of the tension spring over the tab on the drive pulley. Hook the other end of the tension spring over the tab on the drive pulley. Pass the cord through the slot on the drive pulley rim and continue around pulley 1/2 turn counter-clockwise. Pass cord around stud A and wind two turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Pass cord around studs B and C, then under drive pulley and wind 1 1/2 turns counter-clockwise around drive pulley. Stretch tension spring and fasten free end of cord to spring.

Attach the dial pointer to the cord and position as instructed in paragraph DIAL CALIBRATION.

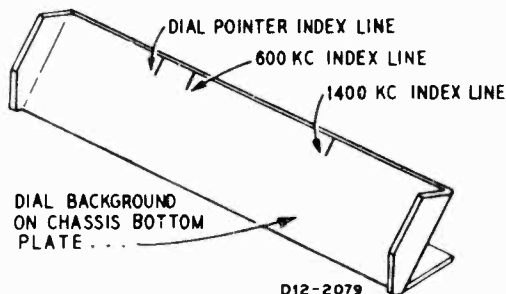
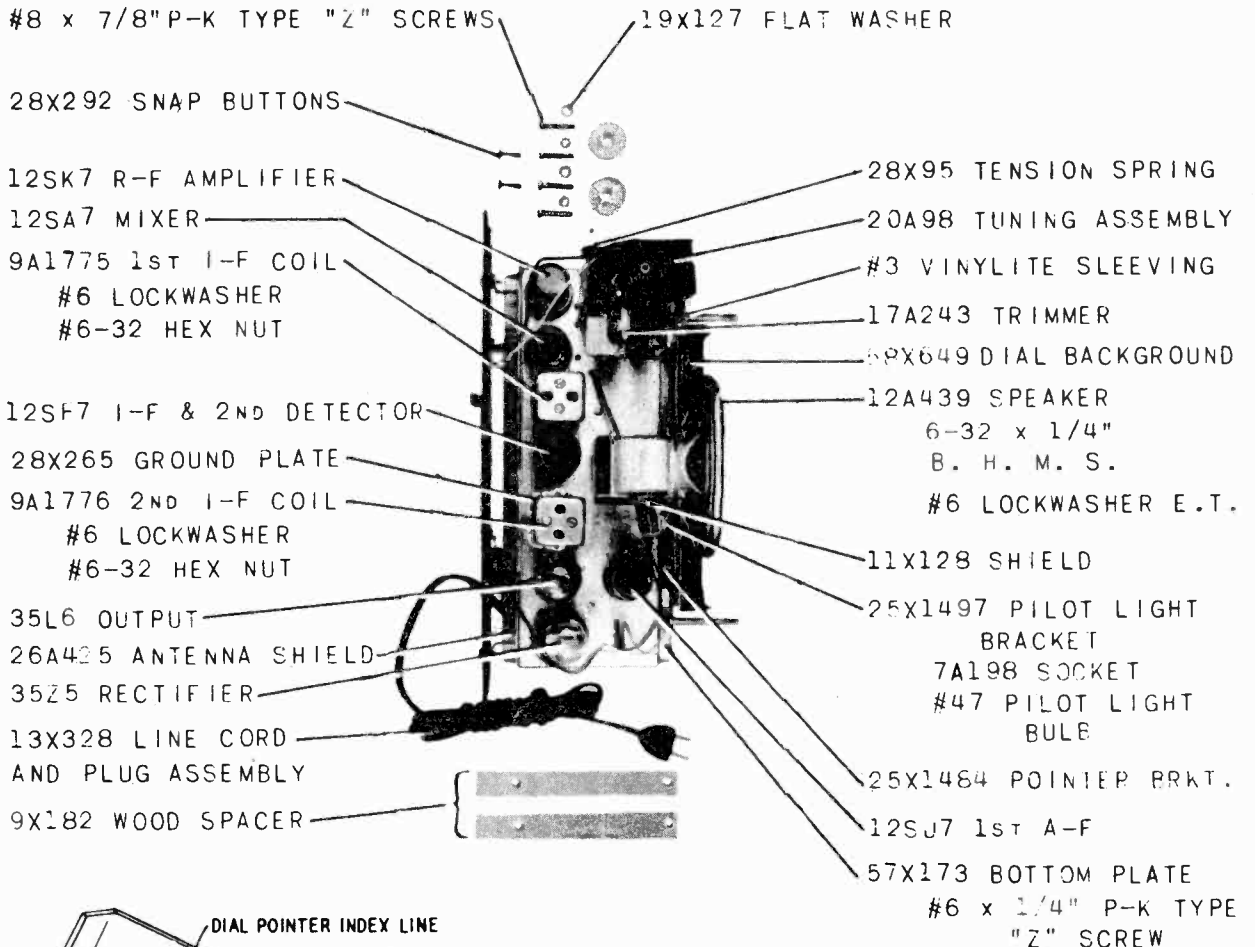
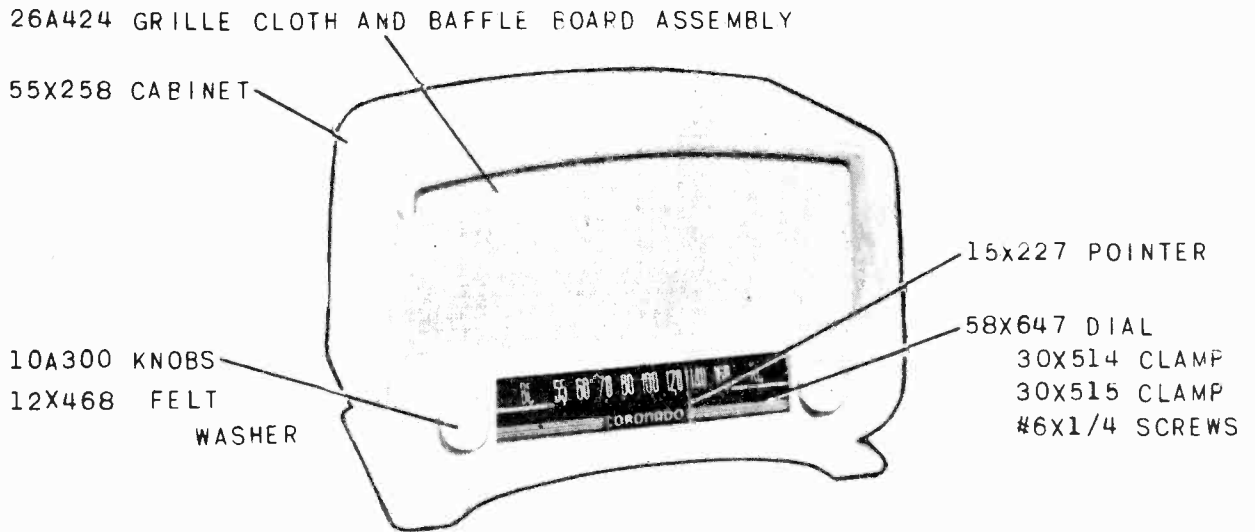




SPECIFICATIONS

6 Tube Superheterodyne, including Rectifier Tube.
 Speaker.....5-inch PM Dynamic
 Intermediate Frequency.....455 KC
 Selectivity.....50 KC Broad at 1,000 Times Signal

Sensitivity (for .05 watt output with external antenna).....15 microvolts average
 Power Consumption......35 watts (at 117 volts AC)
 Power Output...1.5 watt maximum, .9 watt (10% harmonics)



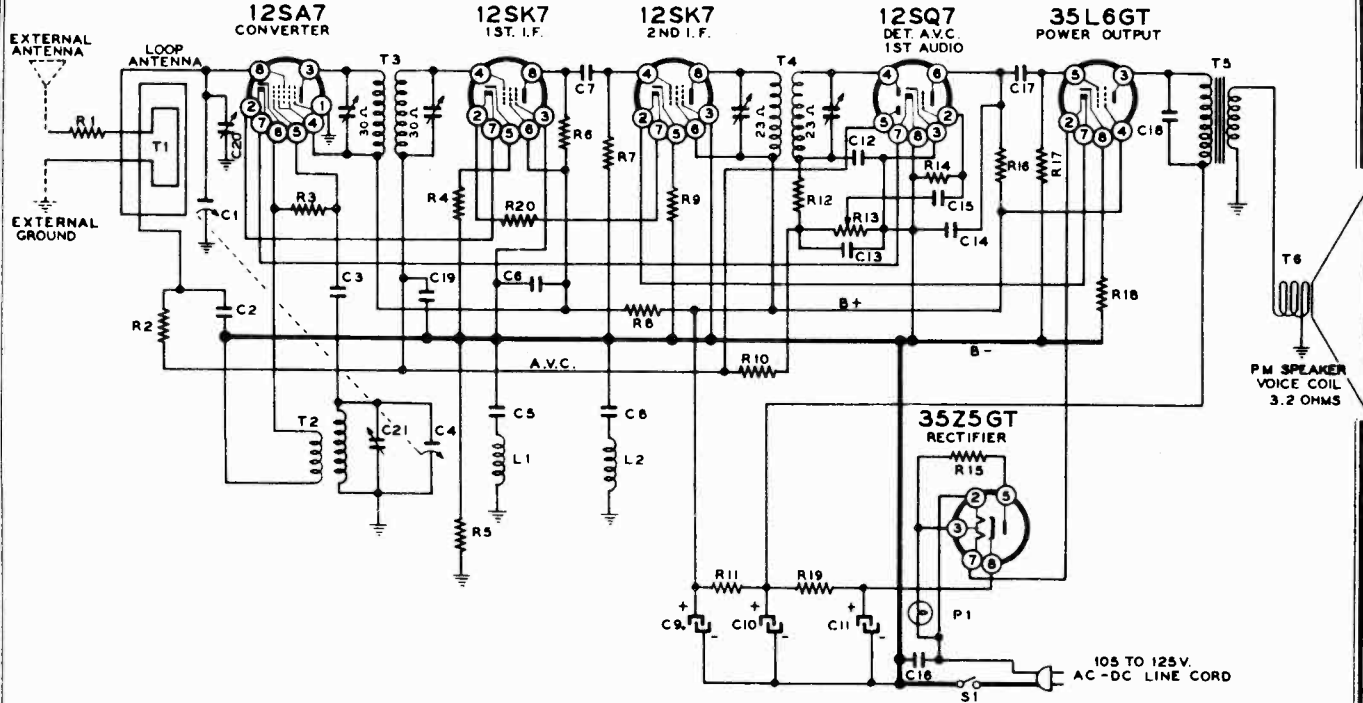
DIAL CALIBRATION

In order to align the receiver, the dial pointer must be positioned on the dial string correctly with reference to the dial. Index lines are provided on the dial background attached to the chassis bottom plate for this purpose.

To position the dial pointer, adjust the radio to the "stop" position at the low frequency end of the dial. The dial pointer should be directly over the dial pointer index line. (See illustration.) If not, move the pointer on the drive cord until it is directly over the index line. The 1400 KC index lines are for use when aligning the receiver.

DECEMBER 18, 1946

IF PEAK 455 KC



SCHEMATIC DIAGRAM LEGEND

RESISTORS

- R1 1000 ohms, 20%, 1/2 watt
- R2 150,000 ohms, 20%, 1/2 watt
- R3 22,000 ohms, 20%, 1/2 watt
- R4 100 ohms, 10%, 1/2 watt
- R5 150,000 ohms, 20%, 1/2 watt
- R6 10,000 ohms, 10%, 1/2 watt
- R7 470,000 ohms, 20%, 1/2 watt
- R8 1000 ohms, 10%, 1/2 watt
- R9 220 ohms, 10%, 1/2 watt
- R10 3.3 megohms, 20%, 1/2 watt
- R11 1200 ohms, 10%, 1 watt
- R12 100,000 ohms, 20%, 1/2 watt
- R13 1 megohm, vol. cont. & switch
- R14 4.7 megohms, 20%, 1/2 watt
- R15 22 ohms, 10%, 1/2 watt
- R16 220,000 ohms, 20%, 1/2 watt
- R17 1 megohm, 20%, 1/2 watt
- R18 150 ohms, 10%, 1/2 watt
- R19 220 ohms, 10%, 1 watt
- R20 33 ohms, 10%, 1 watt

CONDENSERS

- C1 Antenna section of gang
- C2 .05 x 200 volts, 25%
- C3 .0001 mica, 20%
- C4 Oscillator section of gang
- C5 .2 x 400 volts, +30%, -10%
- C6 .1 x 200 volts, 25%
- C7 .0001, mica, 20%
- C8 .02 x 400 volts, 25%
- C9 Electrolytic, 20 x 150 volts
- C10 Electrolytic, 20 x 150 volts
- C11 Electrolytic, 40 x 150 volts
- NOTE: C9, C10, and C11 are in one unit.
- C12 .0001, mica, 20%
- C13 .0001, mica, 20%
- C14 .0001, mica, 20%
- C15 .002 x 600 volts, 25%
- C16 .1 x 400 volts, +50%, -10%
- C17 .02 x 400 volts, 25%
- C18 .02 x 400 volts, 25%

- C19 .05 x 200 volts, 25%
- C20 Antenna trimmer
- C21 Oscillator trimmer

MISCELLANEOUS

- L1 I.F. filter choke
- L2 Filter choke
- P1 Pilot light, 6-8 volts, type T-47
- T1 Loop antenna
- T2 Oscillator coil
- T3 Input I.F. coil
- T4 Output I.F. coil
- T5 Output transformer
- T6 4" x 6" oval P.M. speaker

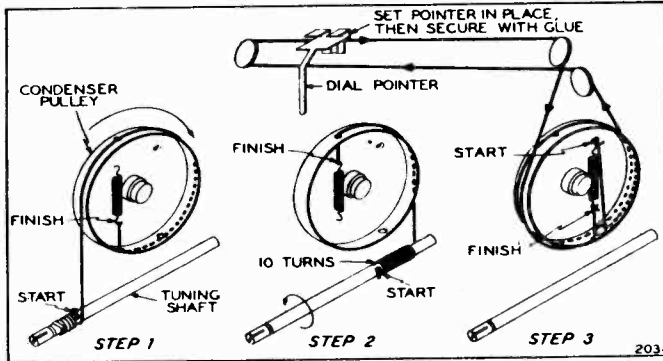
SPECIFICATIONS

6 Tube Superheterodyne, including rectifier tube
 Power Consumption 35 w.
 Power Output 0.74 w. undistorted, 0.9 w. maximum
 Selectivity 51 kc. broad at 1,000 times signal at 1,000 kc.
 Antenna Built-in loop, also provision for external antenna and ground
 Intermediate Frequency 455 kc.

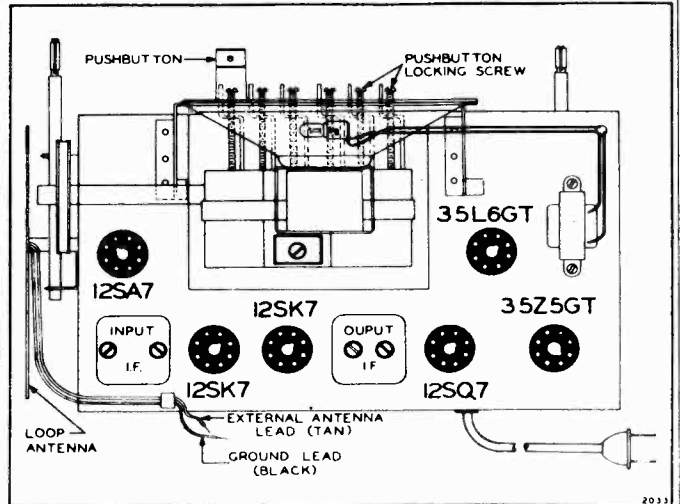
Speaker 4x6 in. 1 oz. P.M. voice coil imp. 3.2 ohms
 Tuning Two-gang capacitor, .6 pushbutton
 Sensitivity 18 mv. avg. for 50 mw. output
 Frequency Range 535 to 1,720 kc.
 Power Supply 105-125 v. D.C., 50-60 cycle A.C., also made for 25 cycles
 Output Transformer Impedance ratio 3,500:3.2

DRIVE CORD REPLACEMENT

CHASSIS VIEW

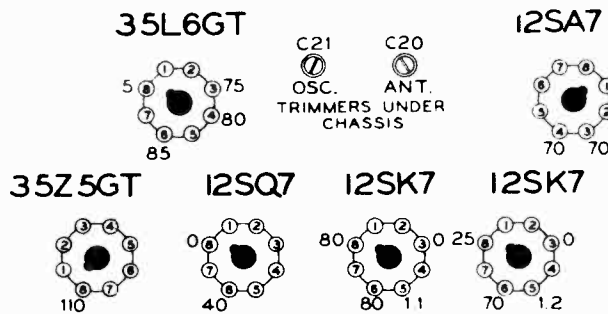


1. Steps 1 and 2 are for tuning shaft, step 3 for dial pointer.
2. Direction and number of turns must be as illustrated.
3. In step 1, first turn condenser pulley to extreme clockwise position (viewing it as shown).
4. In step 3, after installing string, tune to known station and set dial pointer at proper position along dial before glueing.



BOTTOM VIEW OF CHASSIS

MEASUREMENTS TAKEN WITH A HIGH RESISTANCE VOLT-METER, FROM "B-" TO DESIGNATED POINTS.



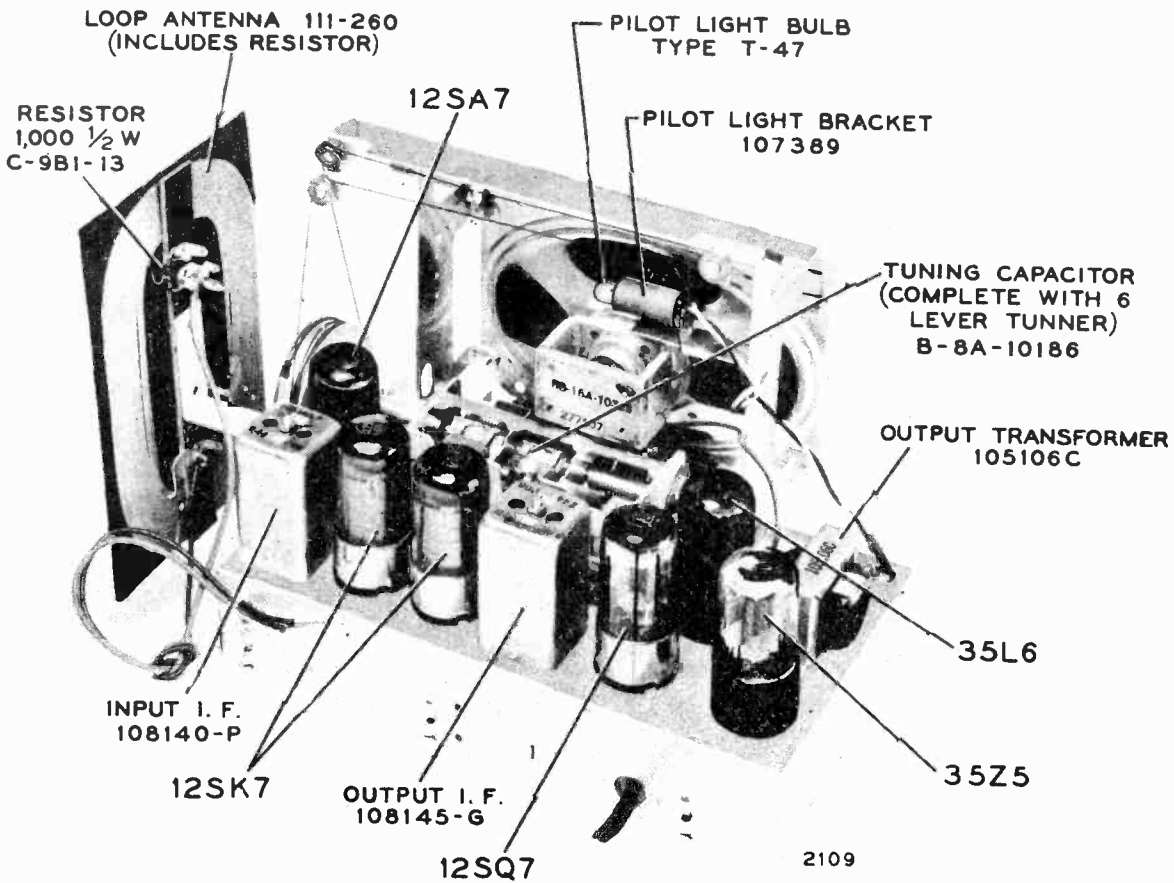
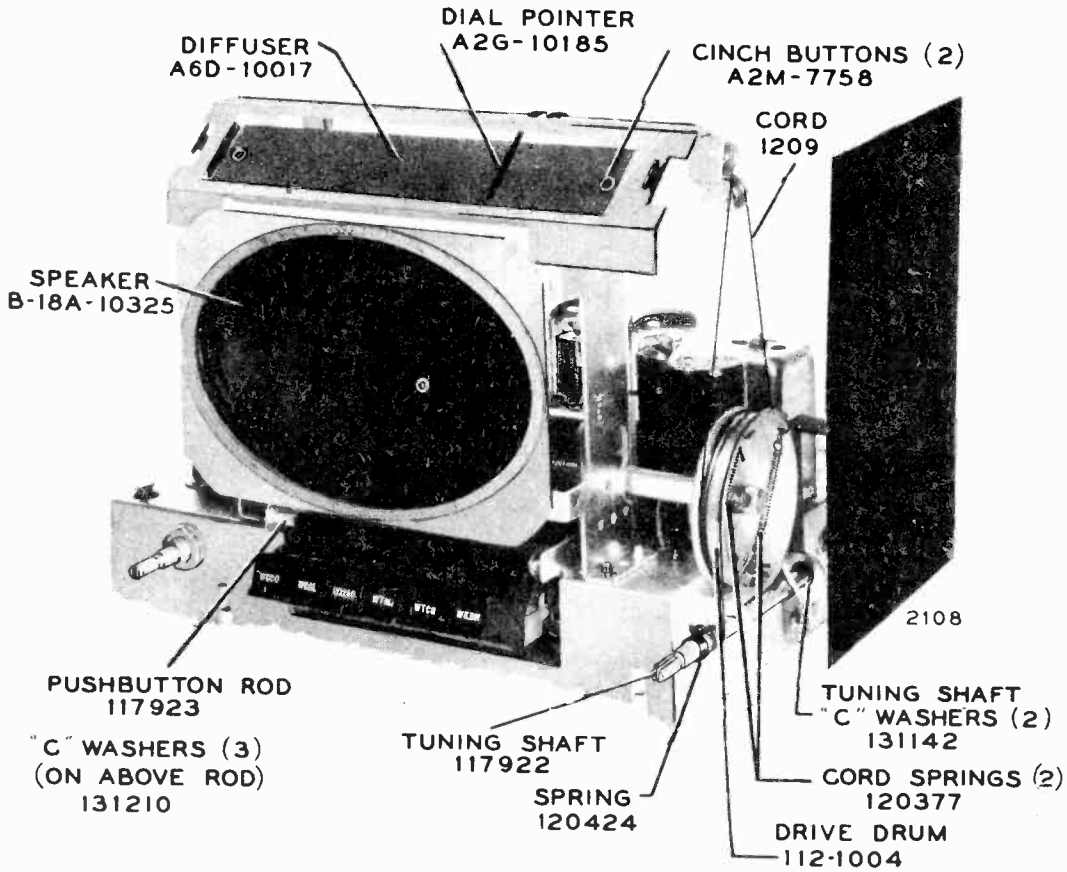
REAR OF CHASSIS

ALIGNMENT PROCEDURE

- No alignment adjustments should be attempted until all other causes of trouble have been checked.
- It is important that during alignment the loop antenna be maintained at the same distance from the chassis as when the chassis is installed in the cabinet.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
- Connect output meter across 3.2-ohm output load (resistor may be substituted for voice coil).
- Turn volume control to maximum for all adjustments.

| Signal Generator | | | | | | |
|------------------|-----------|---------------|----------------------------|-------------------------|---|---|
| Band | Frequency | Dummy Antenna | Connection to Radio | Ground Connection | Tuning Capacitor Setting | Adjust for Maximum Output (in order shown) |
| I.F. | 455 kc | .1 mf | Pin 4 of 12SK7 2nd I.F. | B-* | Rotor full open (plates out of mesh) | Two trimmers on top of output I.F. transformer |
| | 455 kc | .1 mf | Pin 8 of 12SA7 | B-* | Rotor full open (plates out of mesh) | Two trimmers on top of input I.F. transformer |
| BROADCAST | 1720 kc | .1 mf | Pin 8 of 12SA7 | B-* | Rotor full open (plates out of mesh) | Oscillator trimmer C21 (see tube socket view) |
| | 1400 kc | 200 mmf | External antenna lead | External ground lead | Set dial at 1400 kc | Antenna trimmer C20 (see tube socket view) |

*Insert a .1 mf capacitor between ground post of signal generator and B- of set.



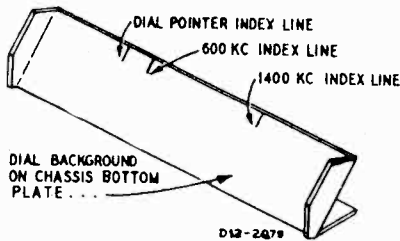
SPECIFICATIONS

6 Tube Superheterodyne, including rectifier tube
 Power Consumption..... 35 w. (at 117 v. A.C.)
 Power Output..... 1.5 w. maximum .9 w. (10% harmonics)
 Selectivity..... 50 kc. broad at 1,000 times signal

Intermediate Frequency..... 455 kc.
 Speaker..... 5 inch P.M. dynamic
 Tuning Frequency Range..... 540 to 1,600 kc.
 Sensitivity..... (for .05 w. output with external antenna) 15 mv. av.

DIAL CALIBRATION

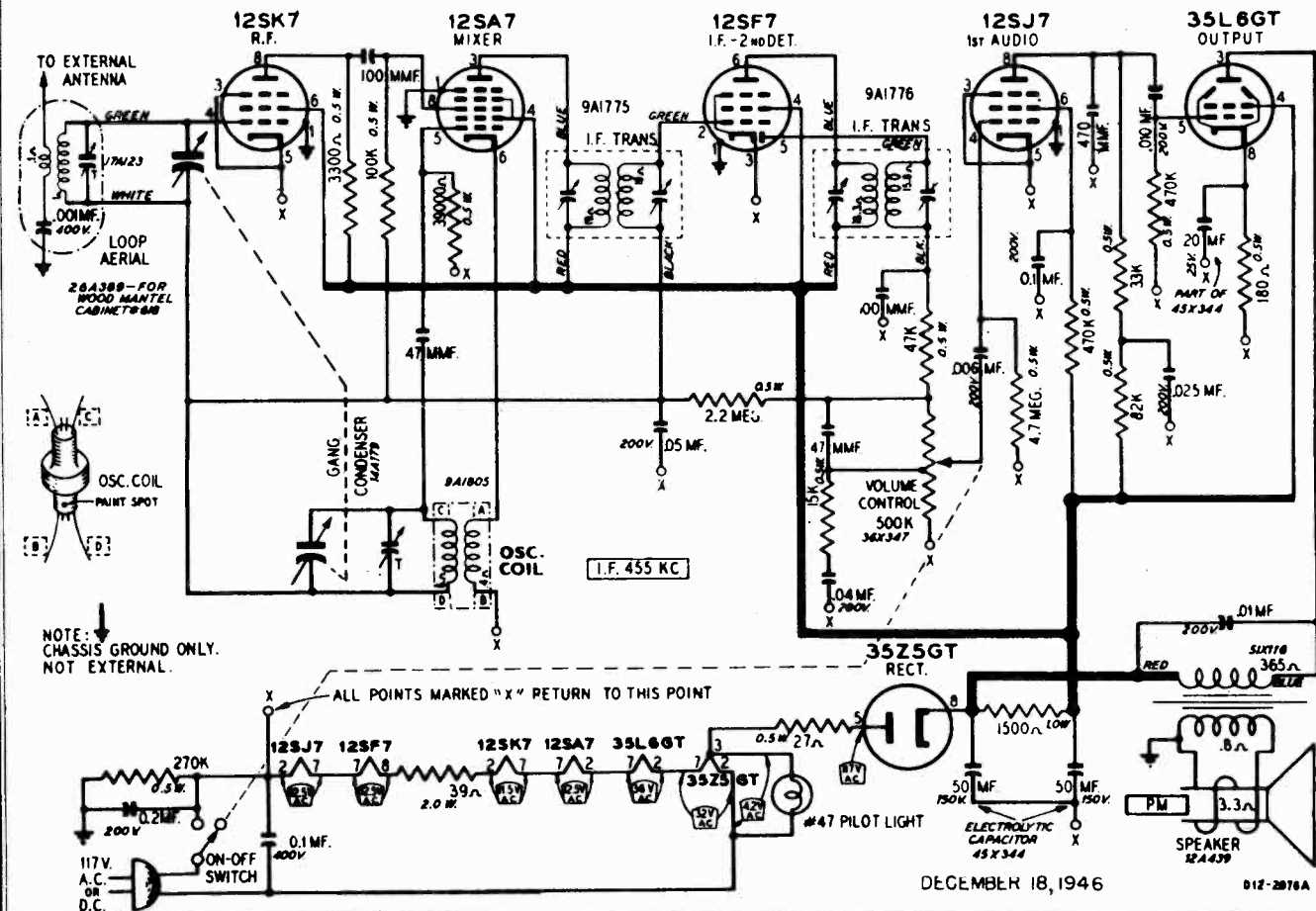
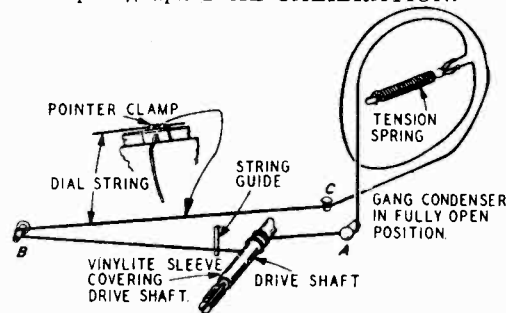
In order to align the receiver, the dial pointer must be positioned on the dial string correctly with reference to the dial. Index lines are provided on the dial background attached to the chassis bottom plate for this purpose. To position the dial pointer, turn the gang condenser to the fully closed position. The dial pointer should be directly over the dial pointer index line. (See illustration). The 600 KC and 1400 KC index lines are for use when aligning the receiver.



DRIVE CORD REPLACEMENT

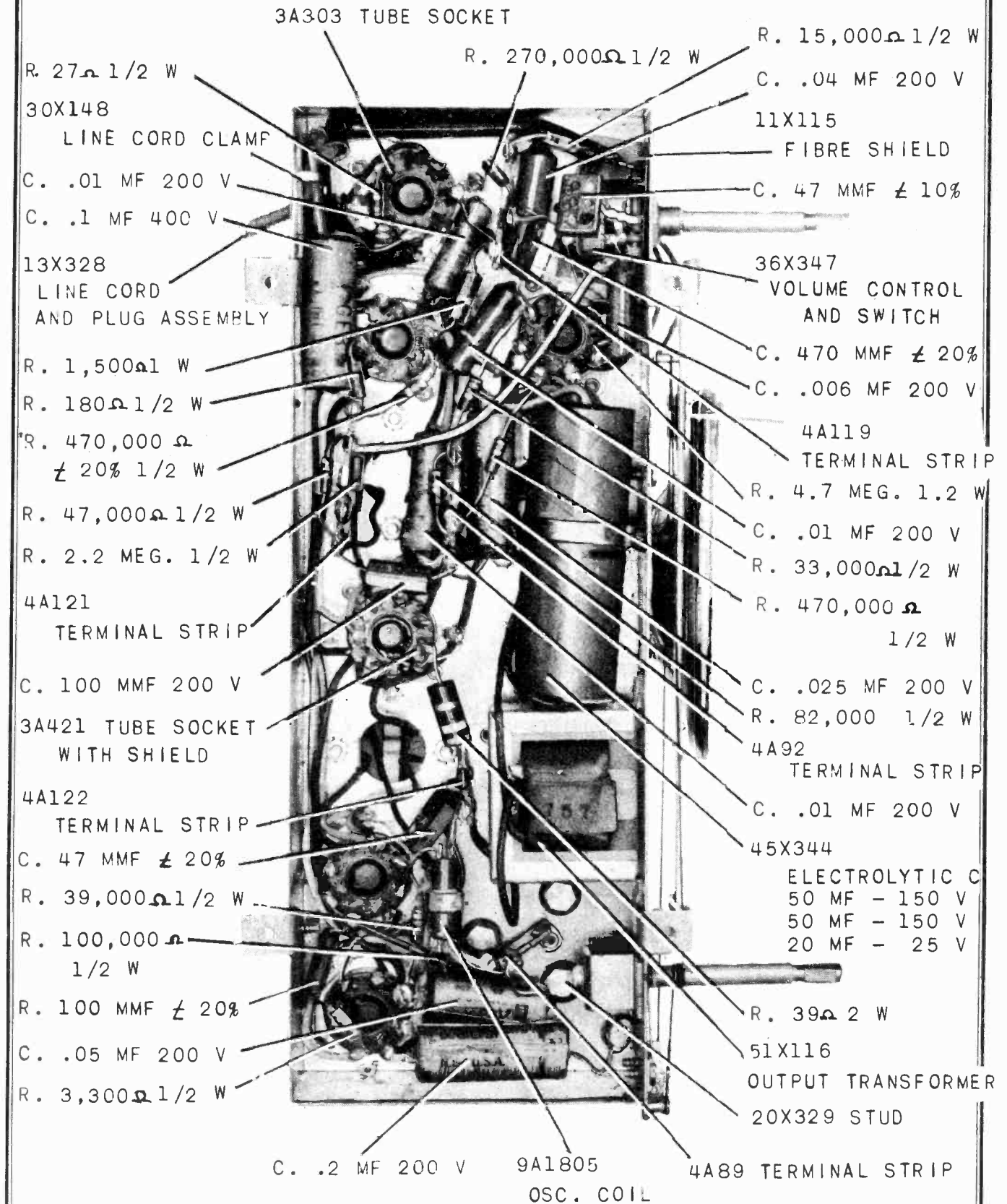
Turn the gang condenser to the fully open position. Use a new drive cord and fasten one end to the tension spring. Hook the other end of the tension spring over the tab on the drive pulley. Pass the cord through the slot on the drive pulley rim and continue around pulley 1/2 turn counterclockwise. Pass cord around stud A and wind two turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Pass cord around studs B and C, then under drive pulley and wind 1 1/2 turns counterclockwise around drive pulley. Stretch tension spring and fasten free end of cord to spring.

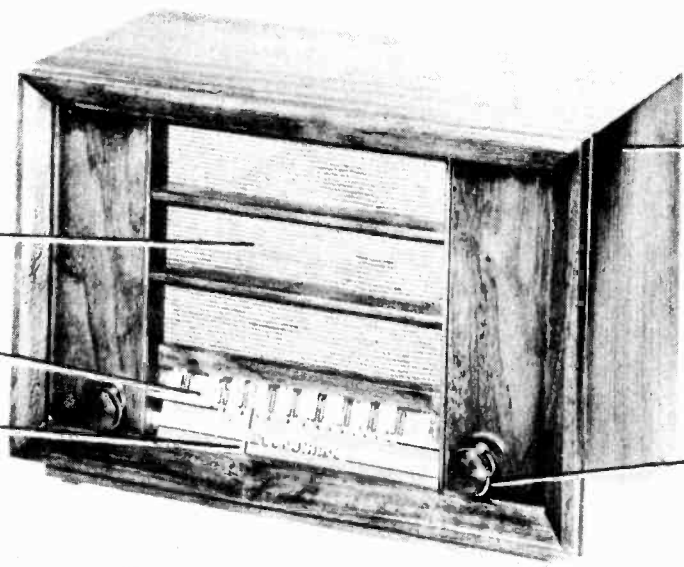
Attach the dial pointer to the cord and position as instructed in paragraph DIAL CALIBRATION.



DECEMBER 18, 1946

D12-2076A





14X360

GRILLE CLOTH

58X606 DIAL

15X227

DIAL POINTER

618 CABINET

10A585 KNOBS

14A179 GANG CAPACITOR WITH PULLEY
6X21 RUBBER GROMMET

28X95 SPRING

28X292 SNAP BUTTON (4)

32-365 ANTENNA SHIELD

12SK7 TUBE

12SA7 TUBE

17A116 TRIMMER

9A1775 1ST
I-F TRANSFORMER

12SF7 TUBE

26A389 LOOP ANTENNA

9A1776 2ND
I-F TRANSFORMER

C. .001 MF 400 V

28X265 GROUND PLATE

19X62 FLAT WASHER

35L6GT TUBE

9X187 SPACER

25X1485

IDLER BRACKET

10X35 DRIVE CORD

28X516 GROUND SPRING

57X176 MTG. PLATE

26X464 DRIVE SHAFT

19X192 "C" WASHER

58X625

DIAL BACKGROUND

25X1484

POINTER BRACKET

12A439 SPEAKER

#47 PILOT LIGHT

25X1497 BRACKET

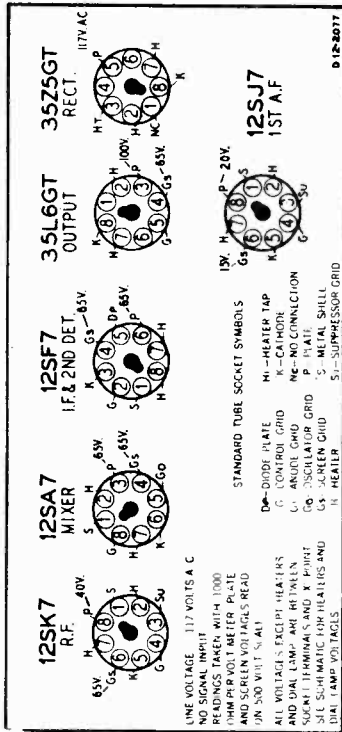
7A189 PILOT LIGHT
SOCKET

57X173 BOTTOM PLATE

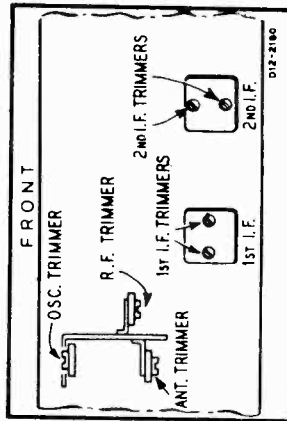
35Z5GT TUBE

12SJ7 TUBE

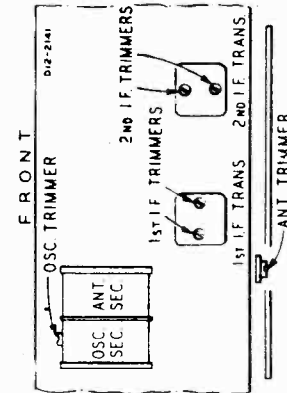
MODEL 43-8470



MODEL 43-8471

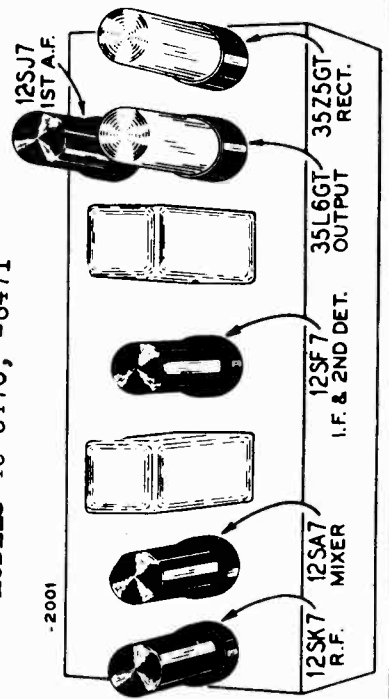


MODEL 43-8470



NOTE: A: Index line is on dial background strip. See DIAL CALIBRATION paragraph.

MODELS 43-8470, -8471



MODEL 43-8470

ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.
Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
The equipment in column at right is required for aligning:

| FREQUENCY SETTING | SIGNAL GENERATOR ANTENNA CONNECTION | DUMMY ANTENNA | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration) |
|-------------------|---|---------------|--|---|
| 455 KC | Control Grid 12SF7 - I.F. (Prong No. 2) | .1 mf. | Turn Rotor to full open | 2nd I.F. Trimmers |
| 455 KC | Control Grid 12SA7 - 1st Det. (Prong No. 8) | .1 mf. | Turn Rotor to full open | 1st I.F. Trimmers |
| 1400 KC | External Antenna Clip on Loop | 50 mmf. | Turn Rotor to 1400 KC Index Line. See Note A | Oscillator Trimmer |
| 1400 KC | External Antenna Clip on Loop | 50 mmf. | Turn Rotor to 1400 KC Index Line. See Note A | Antenna Trimmer |

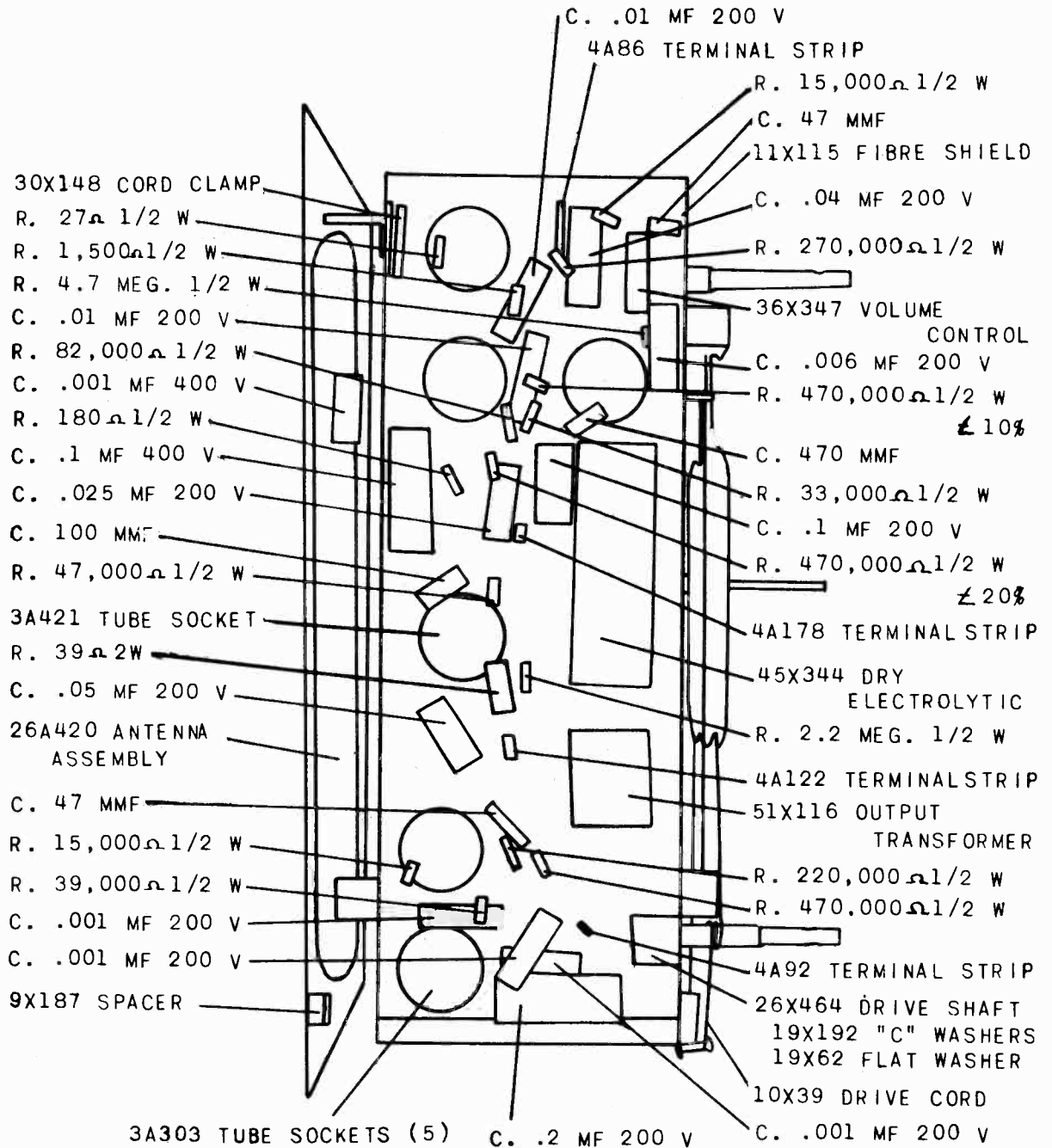
MODEL 43-8471

ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.
Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

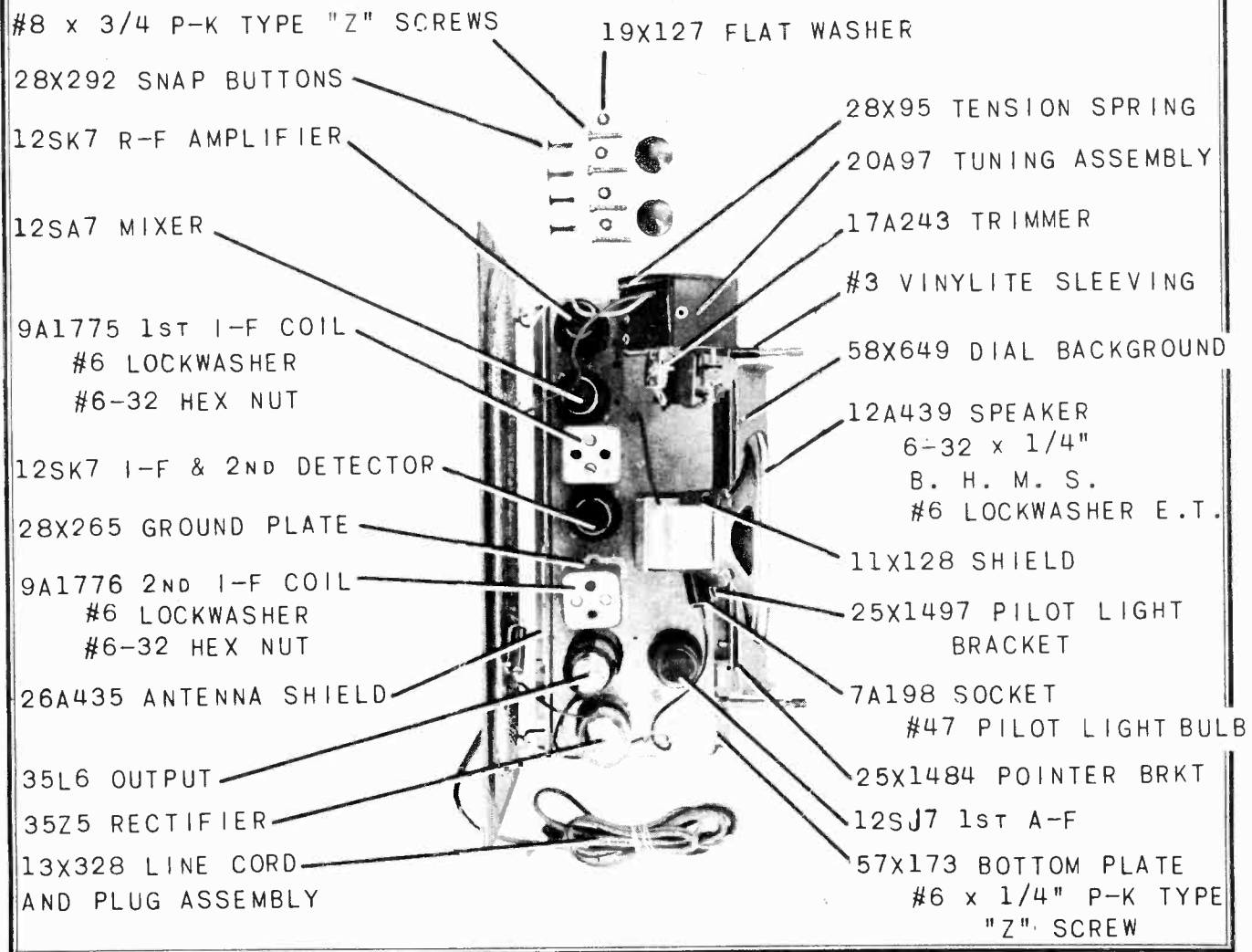
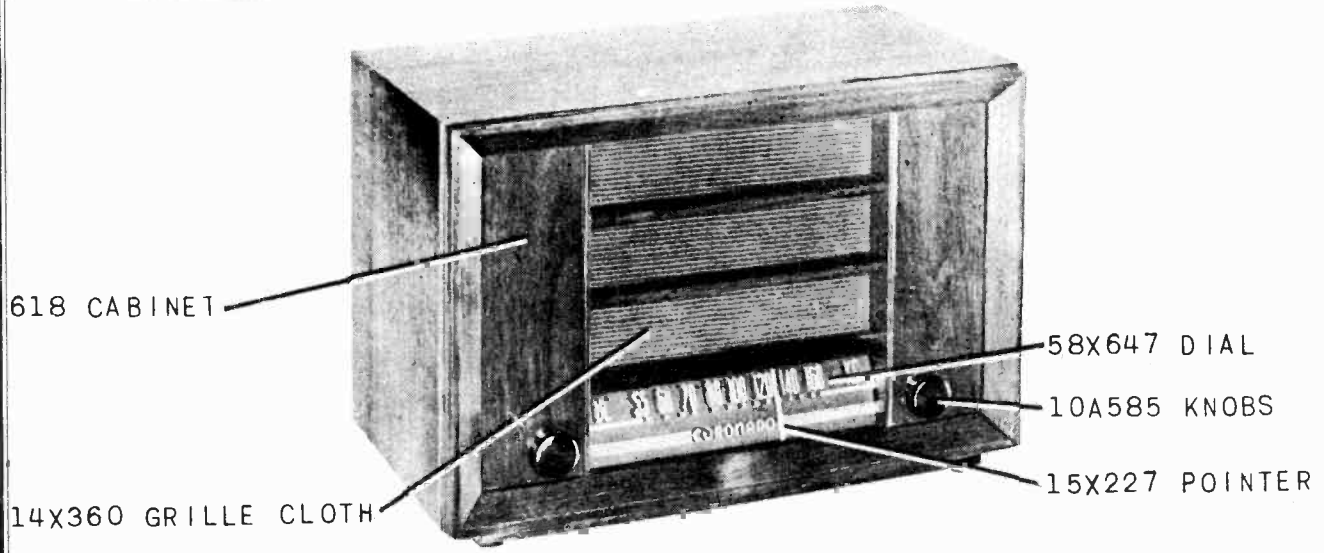
The equipment in column at right is required for aligning:
Signal Generator, which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter: Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 50 mmf.

| SIGNAL GENERATOR Frequency Setting | Antenna Connection | Ground Connection | Coupling Capacitor | Dial Setting | Adjust Trimmers to Maximum (See Trimmer Illustration) |
|------------------------------------|---|--|--------------------|--------------------------------|---|
| 455 KC | Control Grid 12SF7 - I.F. (Prong No. 2) | Point "X" 12SK7 - R.F. (Prong No. 3) | .1 mf. | 1600 KC | 2nd I.F. Trimmers |
| 455 KC | Control Grid 12SA7 - 1st Det. (Prong No. 8) | Point "X" 12SK7 - R.F. (Prong No. 3) | .1 mf. | 1600 KC | 1st I.F. Trimmers |
| 1400 KC | External Antenna Clip on Loop | Point "X" 12SK7 - R.F. (Prong No. 3) | 50 mmf. | 1400 KC Index Line. See Note A | Oscillator Trimmer |
| 1400 KC | External Antenna Clip on Loop | Chassis | 50 mmf. | 1400 KC Index Line. See Note A | R-F Trimmer Antenna Trimmer |

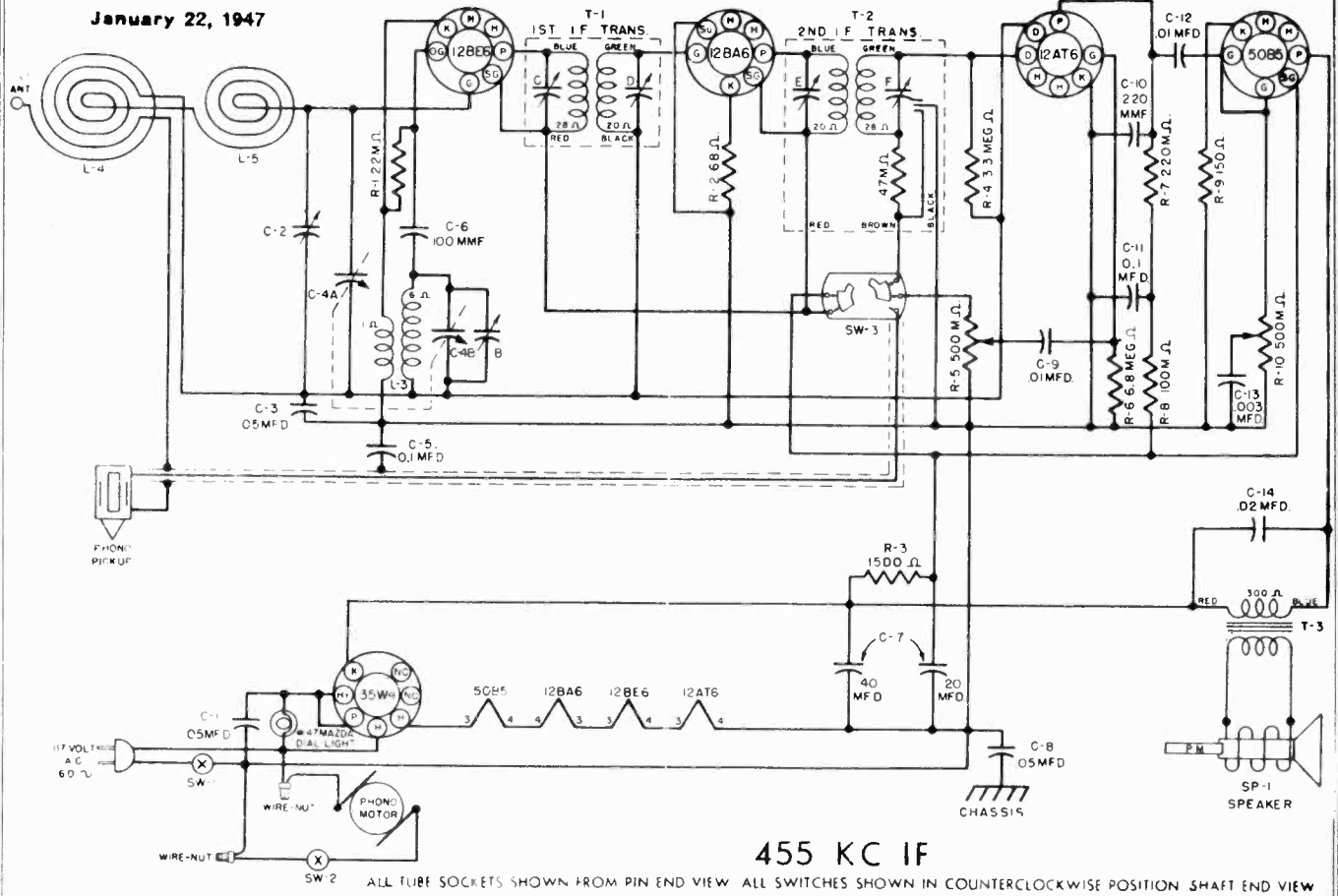


SPECIFICATIONS

| | |
|---|---|
| 6 Tube Superheterodyne, including Rectifier Tube. | Sensitivity (for .05 watt output with external antenna).....15 microvolts average |
| Speaker.....5-inch PM Dynamic | Power Consumption.....35 watts (at 117 volts AC) |
| Intermediate Frequency.....455 KC | Power Output..1.5 watt maximum. .9 watt (10% harmonics) |
| Selectivity.....50 KC Broad at 1,000 Times Signal | |



January 22, 1947



455 KC IF

Electrical and Mechanical Specifications

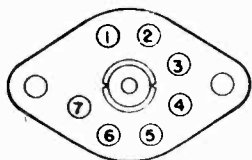
| | | | |
|------------------------|------------------------|----------------------------|------------------------|
| Frequency Range | 540-1600 kc. | V.C. Impedance | 3.2 ohms at 400 cycles |
| Intermediate Frequency | 455 kc. | Power Output (Undistorted) | .8 watt |
| Power Supply | 117 volts AC, 60 cycle | Power Output (Maximum) | 1.5 watts |
| Loudspeaker | 5x7 elliptical type PM | Tuning Drive Ratio | 7 to 1 |

SERVICE PARTS LIST

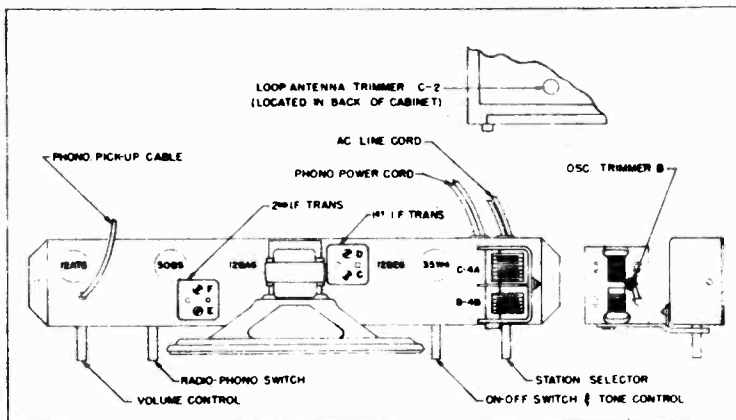
| Symbol | Part No. | Description | Symbol | Part No. | Description |
|-----------|-----------|-------------------------------------|-----------|-----------|-------------------------------------|
| C-3 | BD210503 | Capacitor, Paper, .05 mfd., 200 v. | SW-3 | B-51576-2 | Switch, Radio-Phono |
| C-9, C-12 | BD410103 | Capacitor, Paper, .01 mfd., 400 v. | A-51787 | A-51787 | Spring, for Dial Cable |
| C-5, C-11 | BD410104 | Capacitor, Paper, 0.1 mfd., 400 v. | A-54122 | A-54122 | Button, Plug |
| C-14 | BD410203 | Capacitor, Paper, .02 mfd., 400 v. | R-5 | B-54466-2 | Control, Volume, 500,000 ohm |
| C-1, C-8 | BD410503 | Capacitor, Paper, .05 mfd., 400 v. | T-2 | B-56718-1 | Transformer Assembly, 2nd IF |
| C-13 | BD610302 | Capacitor, Paper, .003 mfd., 600 v. | T-1 | B-56722-1 | Transformer Assembly, 1st IF |
| C-6 | BM74A101 | Capacitor, Mica, 100 mmf. | R-10 | B-57262-6 | Cord, AC Phono. |
| C-10 | BM74A221 | Capacitor, Mica, 220 mmf. | R-10 | B-57841-1 | Control, Tone & Switch, 500,000 ohm |
| R-2 | BR16B680 | Resistor, 68 ohm, 1/2 w. | B-57842 | B-57842 | Coil Assembly, Oscillator |
| R-9 | BR16C151 | Resistor, 150 ohm, 1/2 w. | SP-1 | C-57843 | Speaker, 5x7 PM |
| R-8 | BR17B104 | Resistor, 100,000 ohm, 1/3 w. | B-57848-1 | B-57848-1 | Shaft, Tuning Drive |
| R-1 | BR17B223 | Resistor, 22,000 ohm, 1/2 w. | B-57857-1 | B-57857-1 | Pointer, Dial |
| R-7 | BR17B224 | Resistor, 220,000 ohm, 1/3 w. | B-57858-1 | B-57858-1 | Strip Assembly, Light Diffusing |
| R-4 | BR17B335 | Resistor, 3.3 megohm, 1/2 w. | C-4 | C-57859-1 | Capacitor, Variable |
| R-6 | BR17B685 | Resistor, 6.8 megohm, 1/3 w. | A-57863 | A-57863 | Sheet, Operating and Service |
| R-3 | BR17E152 | Resistor, 1500 ohm, 1 w. | L-4 & L-5 | D-57870 | Coil Assembly, Loop |
| A-2163 | A-2163 | Cable, Drive | C-57872-1 | C-57872-1 | Knob |
| A-6158 | A-6158 | Lamp, Pilot, No. 47 Mazda, 6.3 v. | E-57873-1 | E-57873-1 | Cabinet (1120) |
| A-6182-1 | A-6182-1 | Socket, Dial Light | A-57878 | A-57878 | Clip, Gang Mounting |
| C-7 | B-9564-1 | Cap., Electro., 40-20 mfd., 150 v. | B-57879-1 | B-57879-1 | Capacitor Assembly, Trimmer |
| | A-51163 | Clip, Spring | C-57882-1 | C-57882-1 | Crystal and Indicator, Dial |
| | B-51427-5 | Grommet (large) | B-58069-1 | B-58069-1 | Cord, AC Power |
| | B-51427-8 | Grommet (small) | | | |

SOCKET VOLTAGES

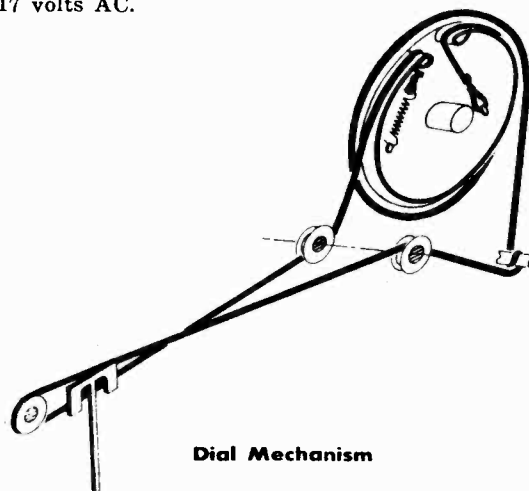
| TUBE | POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|---------------------|----|---|-------|--------|--------|--------|-----|
| 12BE6 | Converter | -5 | 0 | 24 AC | 12 AC | 88 | 88 | 0 |
| 12BA6 | I.F. Amplifier | 0 | 0 | 24 AC | 35 AC | 88 | 88 | 0.7 |
| 12AT6 | 2nd DET.—1st AF—AVC | 0 | 0 | 12 AC | 0 | 0 | 0 | 12 |
| 50B5 | Power Output | 0 | 5 | 85 AC | 35 AC | 115 | 88 | 0 |
| 35W4 | Rectifier | 0 | 0 | 85 AC | 117 AC | 112 AC | 112 AC | 122 |



NOTE: All DC voltages measured with a 1000 ohm-per-volt meter from ON-OFF switch (-B) to socket contact indicated. All AC voltages are measured from ON-OFF switch (-B) to socket contact indicated. All voltages are positive DC unless otherwise marked. Volume Control full on. No signal input. Line voltage 117 volts AC.



Tube Layout



Dial Mechanism

ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

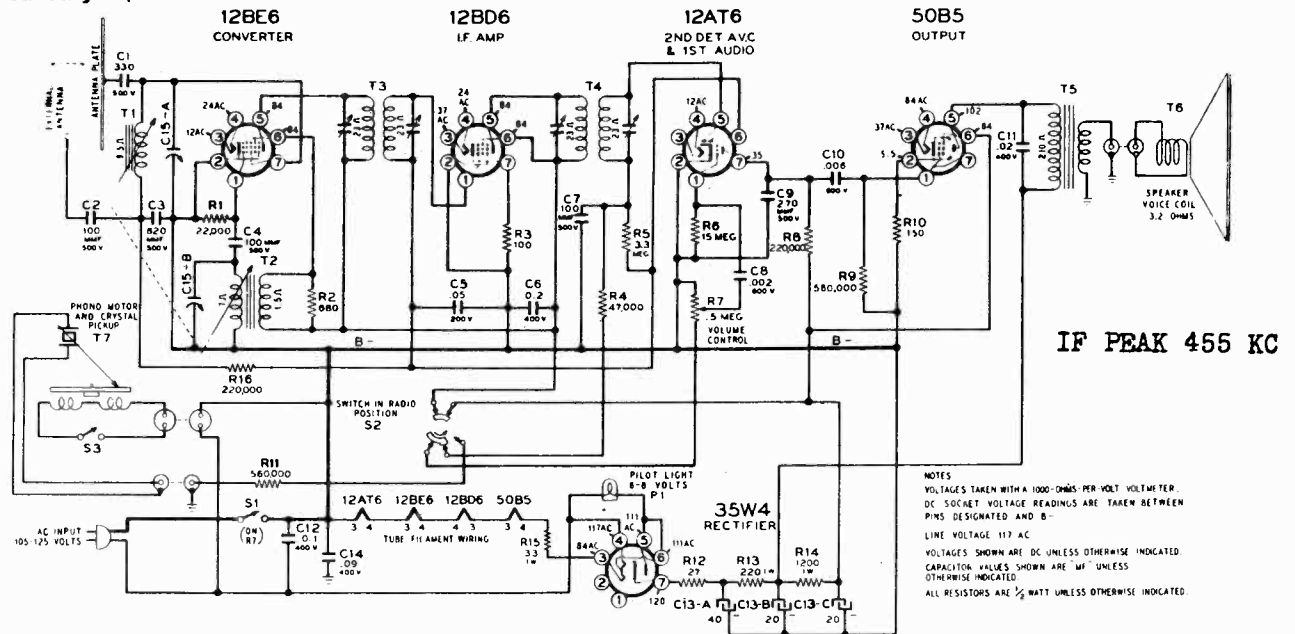
- A signal generator which will provide an accurately calibrated signal at the frequencies listed.
- An output meter.
- A non-metallic screwdriver.
- Dummy antenna: — .1 mfd. — RMA loop.

NOTE: Intermediate Frequency and Oscillator adjustments may be made with the loop disconnected provided a resistor of 10,000 to 50,000 ohms is substituted to close the 12BE6 grid circuit. The loop alignment must be done with the loop and chassis mounted in operating position in the cabinet. A single turn loosely coupled to loop may be substituted for RMA loop.

| GENERATOR | CONNECTION AT RADIO | DUMMY ANTENNA | DIAL | TO TUNE TRIMMERS | REMARKS |
|------------|---------------------|---------------|----------|---------------------|-------------------|
| IF 455 kc. | 12BE6 grid | .1 mfd. | HF end | IF trimmers C D E F | Tune to max. |
| 1620 kc. | 12BE6 grid | RMA loop | HF end | Osc. trimmer B | Set limit of band |
| 1400 kc. | Through loop* | RMA loop | 1400 kc. | Ant. trimmer C-2 | Tune to max. |

* Loop trimmer accessible through back of cabinet.

January 15, 1947



| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

CAPACITORS

| | | |
|--------|------------|---|
| C13-A, | A-8C-10077 | Electrolytic, 40x20x20, 150 volts |
| C13-B, | | |
| C13-C | | |
| C15-A, | A-8E-10723 | Trimmer condenser, dual, antenna and oscillator |
| C15-B | | |
| C14 | C-8D-11251 | .09 mf x 400 volts 10% tubular |
| C6 | C-8D-10942 | .2 mf x 400 volts 10% tubular |
| C5 | C-8D-10770 | .05 mf x 200 volts 20% tubular |
| C10 | C-8D-10785 | .006 mf x 600 volts 20% tubular |
| C8 | C-8D-10789 | .002 mf x 600 volts 20% tubular |
| C11 | C-8D-10774 | .02 mf x 400 volts 20% tubular |
| C12 | C-8D-10760 | .1 mf x 400 volts 10% tubular |
| C1 | C-8F3-119 | 330 mmf x 500 volts 10% mica |
| C3 | C-8F3-247 | 820 mmf x 500 volts 5% mica |
| C9 | C-8F3-118 | 270 mmf x 500 volts 10% mica |
| C2,C4 | C-8F3-113 | 100 mmf x 500 volts 10% mica |
| C7 | | |

RESISTORS

| | | |
|-----|-------------|---------------------------------------|
| R7 | A-10A-10720 | Volume control (500M ohms) and switch |
| S1 | | |
| R15 | C-9B2-44 | 33 ohms, 1 watt, 10% |
| R8 | C-9B1-90 | 220k ohms, 1/2 watt, 10% |
| R13 | C-9B2-54 | 220 ohms, 1 watt, 10% |
| R14 | C-9B2-63 | 1200 ohms, 1 watt, 10% |
| R12 | C-9B1-43 | 27 ohms, 1/2 watt, 10% |
| R4 | C-9B1-82 | 47k ohms, 1/2 watt, 10% |
| R3 | C-9B1-50 | 100 ohms, 1/2 watt, 10% |
| R5 | C-9B1-34 | 3.3 megohms, 1/2 watt, 20% |
| R9 | C-9B1-95 | 560k ohms, 1/2 watt, 10% |
| R11 | | |
| R10 | C-9B1-52 | 150 ohms, 1/2 watt, 10% |
| R6 | C-9B1-302 | 15 megohms, 1/2 watt, 10% |
| R2 | C-9B1-60 | 680 ohms, 1/2 watt, 10% |
| R1 | C-9B1-78 | 22k ohms, 1/2 watt, 10% |

COILS AND TRANSFORMERS

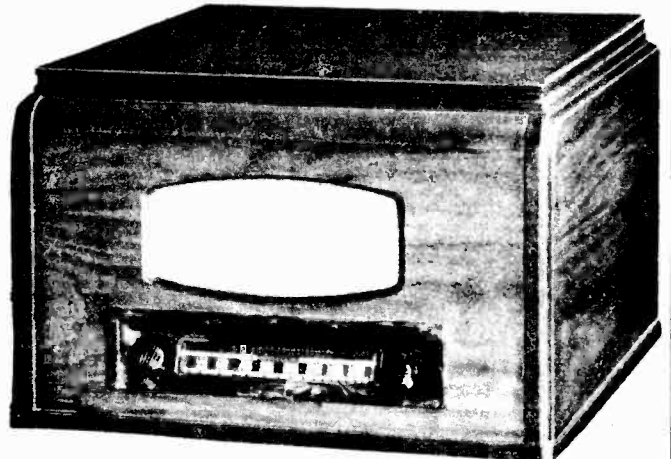
| | | |
|----|---------------|---|
| T1 | C-211-10171 | Tuner unit, permeability tuned, Ant. and Osc. coils |
| T2 | | |
| T3 | B-13A-10728 | Input I.F. transformer |
| T4 | B-13B-10729 | Output I.F. transformer |
| T5 | B-12C-10074-1 | Output*speaker transformer |

DIAL AND TUNING PARTS

| | | |
|---------------|---------------------------|---------------------------------|
| A-6D-10163 | Dial scale | |
| C-5C-10009-48 | Escutcheon for dial | |
| A-5B-10170-1 | Knobs for radio | |
| B-200-10980 | Dial and bracket assembly | |
| A-55A-10093 | Pilot light and bracket | |
| P1 | A-46A-10793 | Pilot light bulb, 6-8 volt type |

MISCELLANEOUS

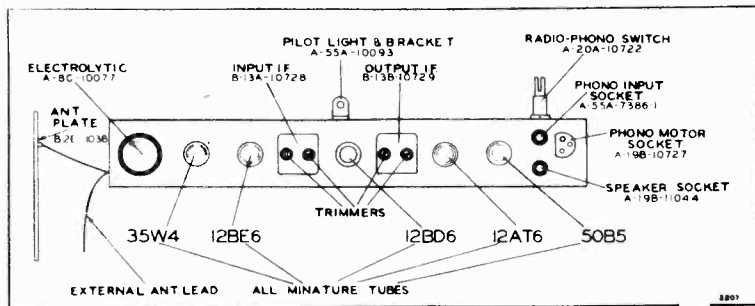
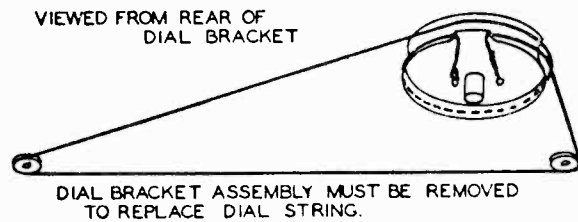
| | | |
|----|--------------|--|
| T6 | B-18A-11089 | 4x6 oval P.M. speaker |
| | A-15C-10717 | Tube socket |
| | A-2H-10718 | Shield base |
| | A-2H-10974 | Tube shield |
| | B-15B-10076 | Mounting base for electrolytic |
| S2 | A-20A-10722 | Radio-phono switch |
| | A-19B-10727 | Phono motor socket |
| | A-55A-7386-1 | Phono input socket |
| | A-19B-11044 | Speaker socket |
| | A-23A-10344 | Line cord lock |
| | B-14M-11085 | A.C. line cord and plug |
| | A-2E-12192 | Needle cup |
| | B-2E-11038 | Antenna plate |
| | A-5B-11239-1 | Knob for radio-phono switch |
| | A-3A-12263 | Extension shaft for radio-phono switch |
| | A-2M-11074 | Spring clamp for shaft |
| | A-2C-10972 | Indicator plate |



ELECTRICAL SPECIFICATIONS

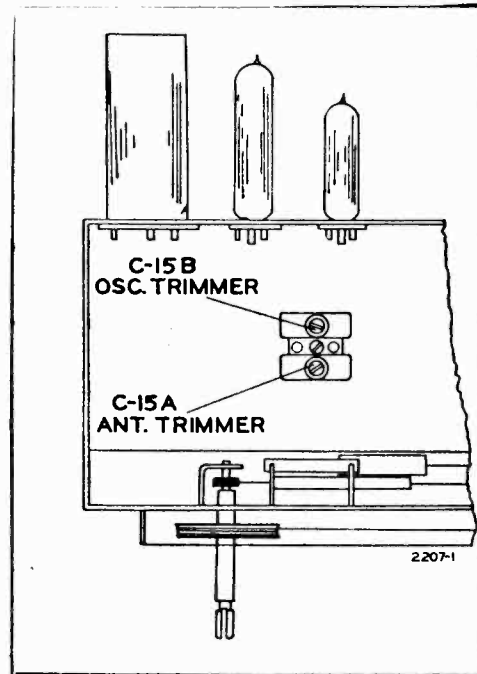
- Power Supply**..... 105-125 volts, 60 cycle AC,
55 watts.
- Frequency Range**..... 535-1720 kc.
- Intermediate Freq**..... 455 kc.
- Antenna**..... Built-in plate; provisions
also for external antenna
connection.
- Tuning**..... Permeability.
- Speaker**..... 4 x 6-inch, P.M., voice coil
impedance 3.2 ohms.
- Power Output**..... 0.75 watt undistorted.
1.1 watts maximum.
- Sensitivity**..... 34 microvolts average for
50-milliwatt output.
- Selectivity**..... 55 kc broad at 1000 times
signal at 1000 kc.

DRIVE CORD REPLACEMENT



43-9201

CHASSIS VIEW



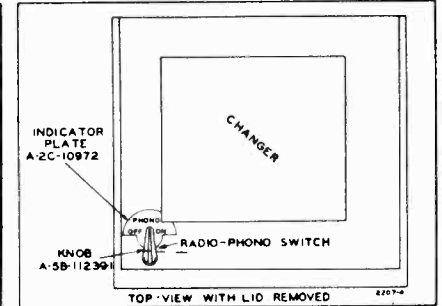
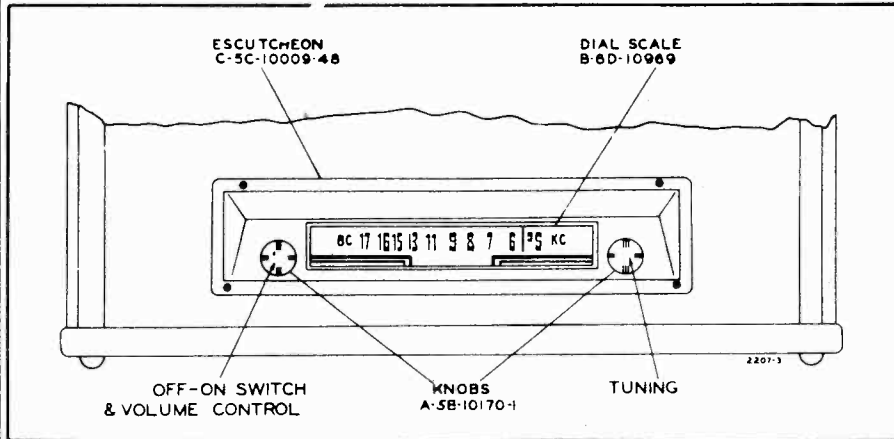
TRIMMER VIEW

ALIGNMENT PROCEDURE

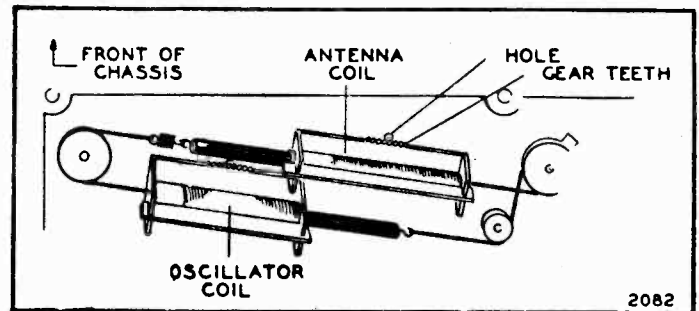
- Output meter across 3.2-ohm output load.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
- Volume control at maximum for all adjustments.
- Connect ground post of signal generator to B- of radio.

| SIGNAL GENERATOR | | | TUNER SETTING | ADJUST FOR MAXIMUM OUTPUT (in order shown) |
|------------------|---------------|-----------------------|----------------------------|--|
| Frequency | Dummy Antenna | Connection to Radio | | |
| 455 kc | .1 mf | Grid (pin 7) of 12BE6 | Iron cores all the way out | Trimmers on output and input I.F. cans |
| 1720 kc | .1 mf | Grid (pin 7) of 12BE6 | Iron cores all the way out | Oscillator trimmer C-15B |
| 1720 kc | 200 mmf | Antenna lead | Iron cores all the way out | Antenna trimmer C-15A |
| 1400 kc | 200 mmf | Antenna lead | Turn dial to 1400 kc | Adjust position of antenna coil (see coil view)* |

*This adjustment and the previous adjustment are interlocking; therefore repeat the two adjustments alternately for best results

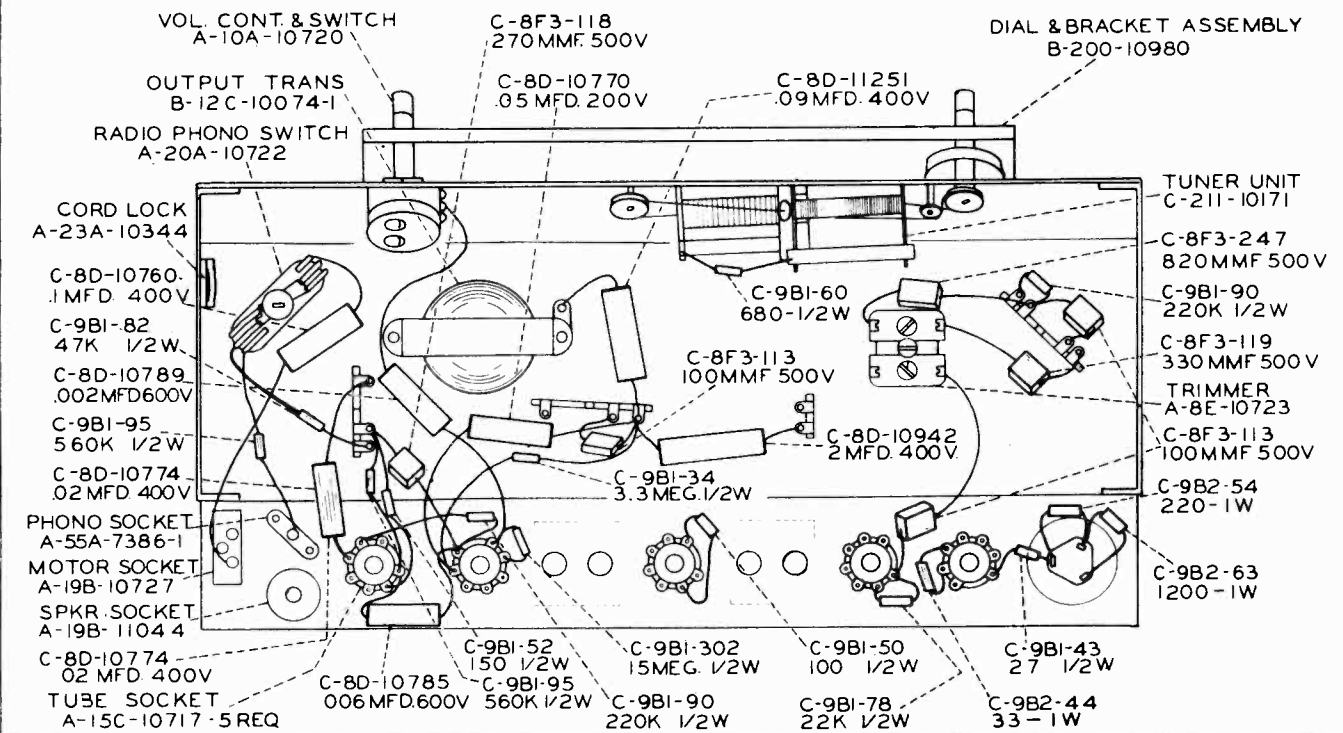


DIAL LIGHT—If the dial lamp burns out the set should not be operated until a new lamp has been installed. Failure to heed this caution may result in a burned-out 35W4 tube. Use only a type T-47 lamp for replacement.

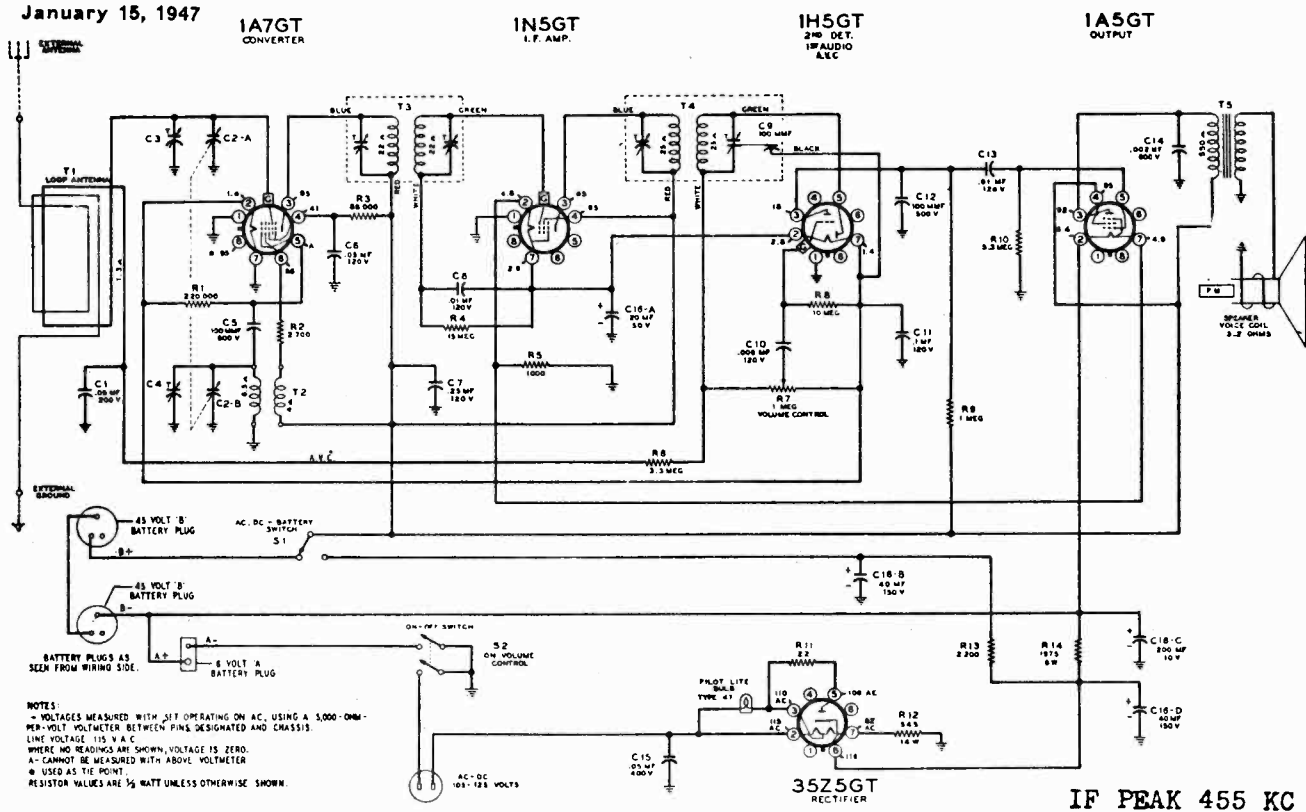


View of Coil Assembly

The antenna coil assembly is movable left to right. When making the adjustment as required in the alignment procedure, move the coil assembly very slowly, either by hand or by pivoting one edge of a screwdriver blade in the hole and engaging the blade in the gear teeth of the coil form.

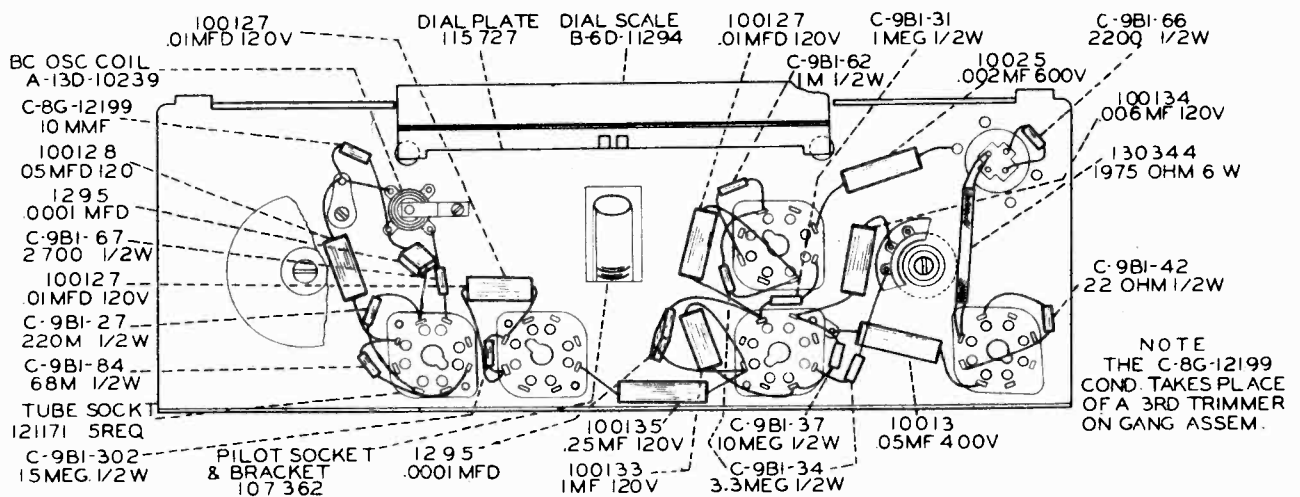
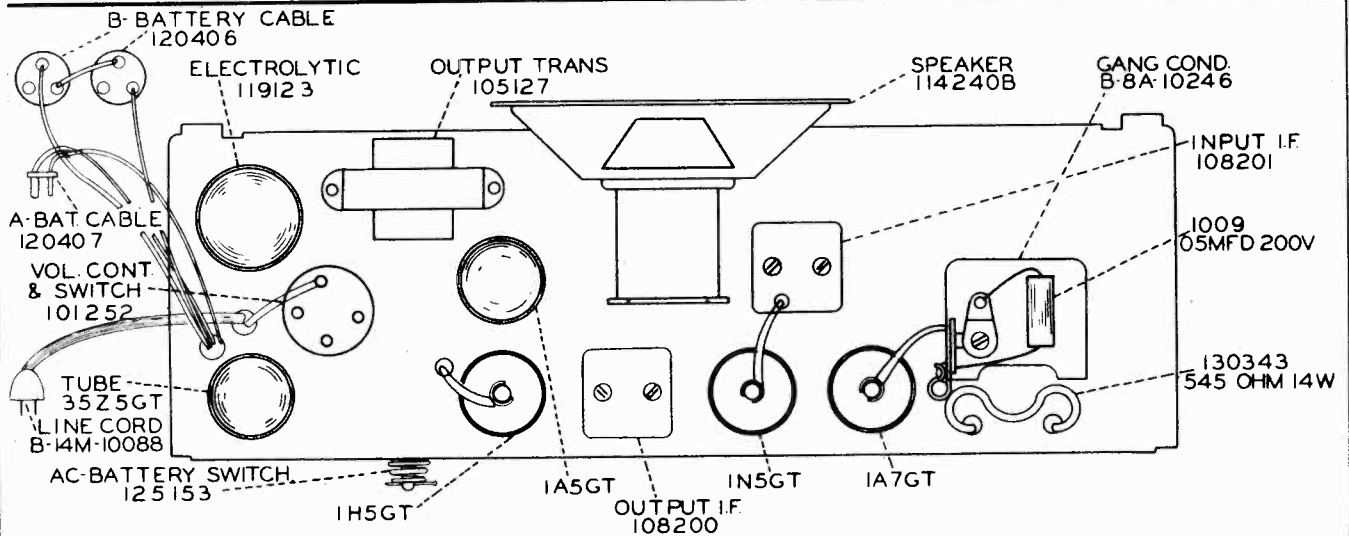


January 15, 1947



NOTES:
 - VOLTAGES MEASURED WITH SET OPERATING ON AC, USING A 5000-ohm PER-VOLT VOLTMETER BETWEEN PINS DESIGNATED AND CHASSIS.
 - LINE VOLTAGE 115 V A.C.
 - WHERE NO READINGS ARE SHOWN, VOLTAGE IS ZERO.
 - A - CANNOT BE MEASURED WITH ABOVE VOLTMETER
 - * USED AS THE POINT.
 - RESISTOR VALUES ARE 1/2 WATT UNLESS OTHERWISE SHOWN.

| Ref. No. | Part No. | Description | Ref. No. | Part No. | Description |
|--------------------|------------|--|-------------------------------|-------------|---|
| CAPACITORS | | | COILS AND TRANSFORMERS | | |
| C1 | 1009 | .05 mf, 200 volts, 25% | T1 | B-13E-10250 | Loop antenna assembly |
| C2-A, C2-B, C3, C4 | B-8A-10246 | Two-gang, including antenna and oscillator trimmers. Range of gang: 14-452 mmf (ant) and 10-198 (osc). | T2 | A-13D-10239 | Oscillator coil |
| C5, C12 | 1295 | 100 mmf, 20%, mica | T3 | 108201 | Input I.F. transformer. Range of trimmers: 53-97 mmf each. |
| C6 | 100128 | .05 mf, 120 volts, 25% | T4, C9 | 108200 | Output I.F. transformer. Range of trimmers: 39-71 mmf each. |
| C7 | 100135 | .25 mf, 120 volts, 25% | T5 | 105127 | Output transformer |
| C8, C13 | 100127 | .01 mf, 120 volts, 25% | MISCELLANEOUS | | |
| C9 | | Approx. 100 mmf. Part of I.F. can | 114240B | | Speaker, 5-inch, P.M. |
| C10 | 100134 | .006 mf, 120 volts, 25% | 120406 | | "B"-battery cable assembly |
| C11 | 100133 | .1 mf, 120 volts, 25% | 120407 | | "A"-battery cable assembly |
| C14 | 10025 | .002 mf, 600 volts, 25% | 121171 | | Tube socket |
| C15 | 10013 | .05 mf, 400 volts, 25% | 125153 | | Line-battery switch |
| C16-A, -B, -C, -D | 119123 | Electrolytic; 20 mf x 50 volts, 40 mf x 150 volts, 200 mf x 10 volts, 40 mf x 150 volts | 120417 | | Spring for line-battery switch |
| RESISTORS * | | | B-14M-10088 | | Line cord and plug |
| R1 | C-9B1-27 | 220,000 ohms, 1/2 watt, 20% | 115396B | | Tube shield |
| R2 | C-9B1-67 | 2,700 ohms, 1/2 watt, 10% | B-6D-10249 | | Dial scale |
| R3 | C-9B1-84 | 68,000 ohms, 1/2 watt, 10% | 112925 | | Diffuser |
| R4 | C-9B1-302 | 15 megohms, 1/2 watt, 20% | A-2M-7758 | | Snap-in rivets for diffuser |
| R5 | C-9B1-62 | 1,000 ohms, 1/2 watt, 10% | B-2M-10383 | | Snap-in rivets for dial scale |
| R6, R10 | C-9B1-34 | 3.3 megohms, 1/2 watt, 20% | 112922 | | Dial pointer |
| R7, S2 | 101252 | Volume control (1 megohm) and on-off switch | B-53A-11340 | | Drive cord for dial pointer (20") |
| R8 | C-9B1-37 | 10 megohms, 1/2 watt, 20% | 120197 | | Spring for drive cord |
| R9 | C-9B1-31 | 1 megohm, 1/2 watt, 20% | 107249 | | Pilot light, 6-8 volts, type T-47 |
| R11 | C-9B1-42 | 22 ohms, 1/2 watt, 10% | 107362 | | Socket assembly for pilot light |
| R12 | 130343 | 545 ohms, 14 watts, 5% | 128641 | | Cabinet back |
| R13 | C-9B1-66 | 2,200 ohms, 1/2 watt, 10% | 120410 | | Spring for securing line cord plug |
| R14 | 130344 | 1,975 ohms, 6 watts, 5% | 112910-2 | | Escutcheon for dial |
| | | | 128643-1 | | Escutcheon for grille |
| | | | 128645-31 | | Knob, tuning |
| | | | 128647-31 | | Knob, volume |
| | | | 131253 | | Snap-in rivet, for trimmer hole |
| | | | 13448B | | Rubber grommet for trimmer hole |



ALIGNMENT PROCEDURE

(Refer to Chassis View on Page 2)

- Output meter across 3.2-ohm output load.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

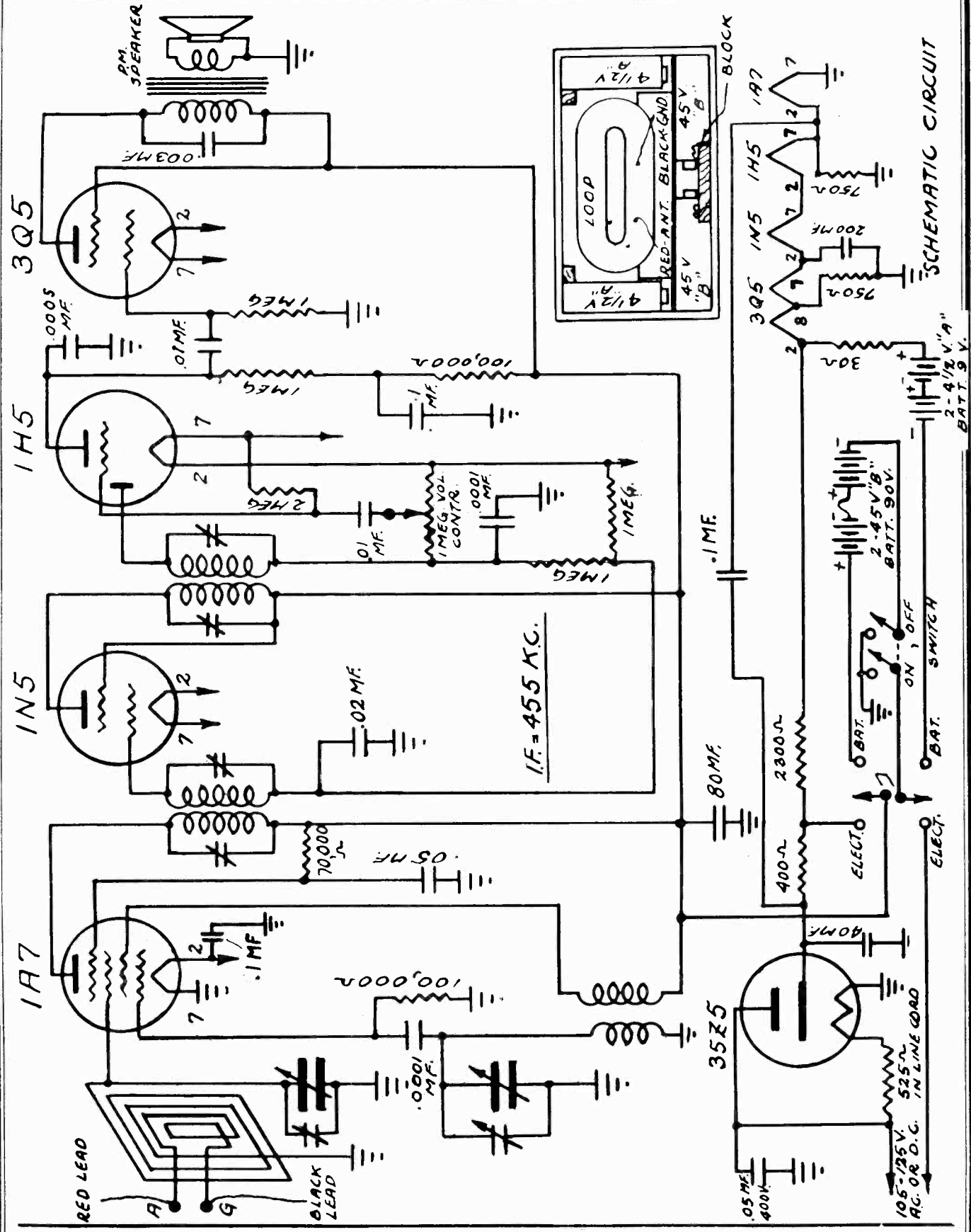
| SIGNAL GENERATOR | | | | TUNER SETTING | ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown) |
|------------------|--------------------|-----------------------|----------------------|--------------------------------------|--|
| Frequency | Coupling Capacitor | Connection to Radio | Ground Connection | | |
| 455 kc | .1 mf | 1A7GT grid cap* | Chassis | Rotor full open (plates out of mesh) | Input and output trimmers on IF cans |
| 1650 kc | .1 mf | 1A7GT grid cap* | Chassis | Rotor full open (plates out of mesh) | Oscillator trimmer C4 |
| 1400 kc† | 200 mmf | External antenna clip | External ground clip | 1400 kc | Antenna trimmer C3 |

* If loop is not connected when making this adjustment, substitute a 1-megohm resistor across the loop leads.

† For this adjustment chassis should be remounted in cabinet and loop connected. Antenna trimmer can be reached through a hole in the side of the cabinet.

GAROD RADIO CORP.

MODELS BP24, BP25



SCHEMATIC CIRCUIT

MODELS BP24, BP25

GAROD RADIO CORP.

This receiver will operate either from batteries contained within the case or from the regular Electric mains (AC or DC) on voltages from 105 to 125. A self-contained antenna is built in and will give good performance from stations not too remote. Where signal strength is poor or where reception from great distances is required, Antenna (A) and Ground (G) leads are provided, (RED-Antenna, BLACK-Ground). These may be reached thru the small door on the rear of the case. An Antenna from 50 to 100 feet long may be used.

BATTERIES - The following batteries are required where no electric power is available:
 4½ Volt "A" - EVEREADY #746, USALITE #683, BURGESS #G-3, RAYOVAC #P-83A or equivalent.
 (3-29/32" X 1-5/16" X 4-11/16") - 2 Required
 45 Volt "B" - EVEREADY #482, USALITE #640, BURGESS #M-30, RAYOVAC #P-5S30 or equivalent.
 (3½" X 1-3/4" X 5-7/16") -2 Required

TO INSTALL BATTERIES - To install batteries, the back of the cabinet must be removed, by loosening the four screws which hold it. Insert the plugs into the corresponding batteries. The "A" batteries are then slid in over the shelf on each side of the chassis with the plugs down. The "B" batteries are placed below the shelf with the plugs facing each other. A block to hold the "B"'s is then screwed down. (See sketch.)

With the ELEC-BATT switch on the front panel in the BATT position, the receiver is now ready for operation as a portable unit. When prolonged operation in the "ELECTRIC" position is contemplated (as during the winter season), it is advisable to remove the batteries and store them in a cool, dry place. DO NOT leave exhausted batteries in the carrying case as chemical action may expand the batteries and make it difficult to remove them.

WAVE BAND: The range covered is as follows:
 182 - 555 Meters (1650 - 540 KC)
 Station frequencies are listed in Newspapers and Radio periodicals.

OPERATION**BATTERY**

After the batteries have been installed in accordance with the instructions given above, set the slide switch on the front of the cabinet to the right.

ELECTRIC

Open the small door on the rear of the cabinet providing access to the power cord which can be plugged into any outlet (105 to 125 Volts AC or DC.) Slide the switch on the front of the cabinet to the left. (Elec)

The receiver may now be operated by turning the LEFT hand knob to the right, (Clockwise). The Volume is turned up and the station tuned in. (Right hand knob.) By rotating the cabinet slowly (when the self-contained loop is used) maximum signal with minimum noise may be obtained. The directional effect is lost when a large antenna is used, but in this case, ample signal is obtained to be heard above the noise level. The volume is adjusted for the desired level.

NOTE:- When this set is to be operated from the 115-125 Volt DC line and no signal can be tuned in with the power switch in the "ELECTRIC" position, reverse the plug in the light socket. When operating on AC, a slight hum may be heard on some stations. Reversing the line plug in the socket will alleviate this condition.

ELECTRICAL SPECIFICATIONS

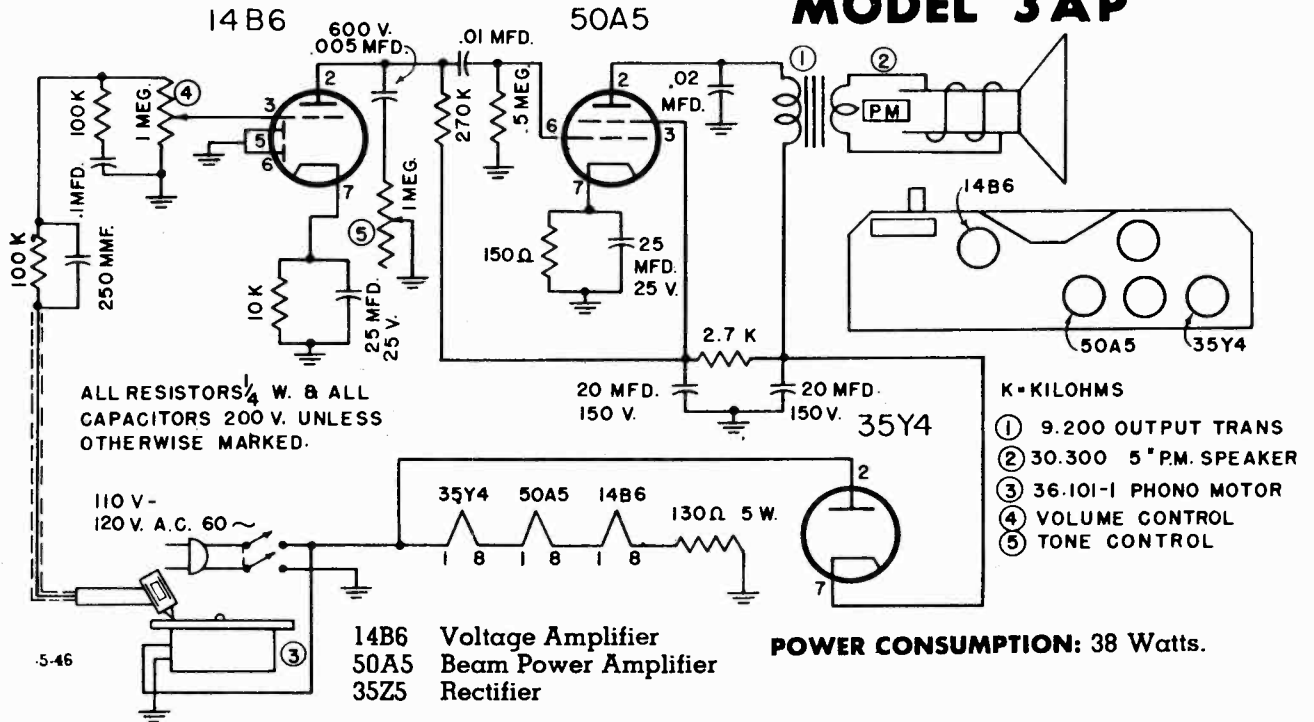
CIRCUIT - Super-heterodyne incorporating Automatic Volume Control and Class "A" beam power output.

TUBES - 1A7GT, 1N5GT, 1H5GT, 3Q5GT, 35Z5GT.

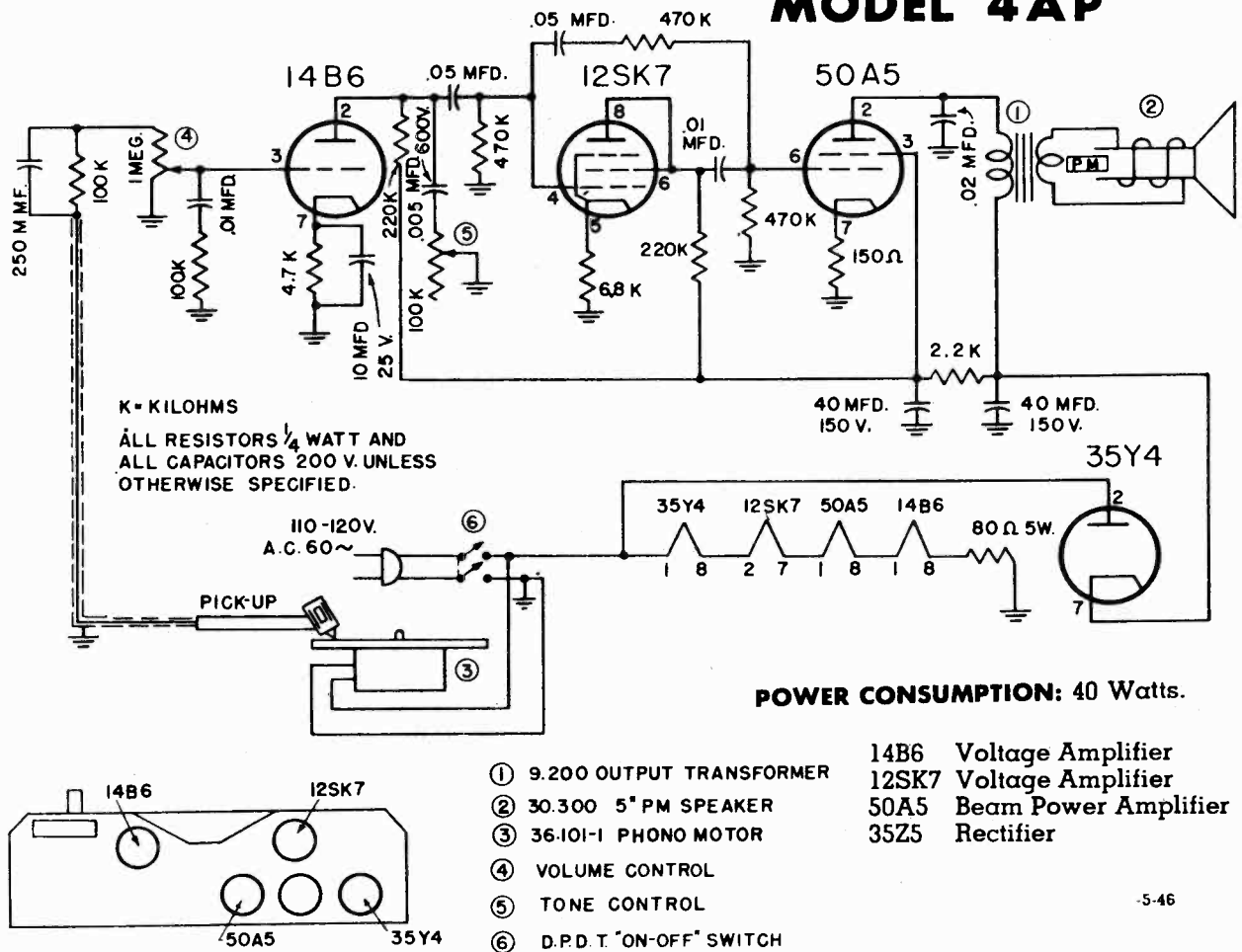
For placement of these tubes, see diagram on the rear of the chassis.

LOUDSPEAKER - 5" PERMANENT MAGNET DYNAMIC.

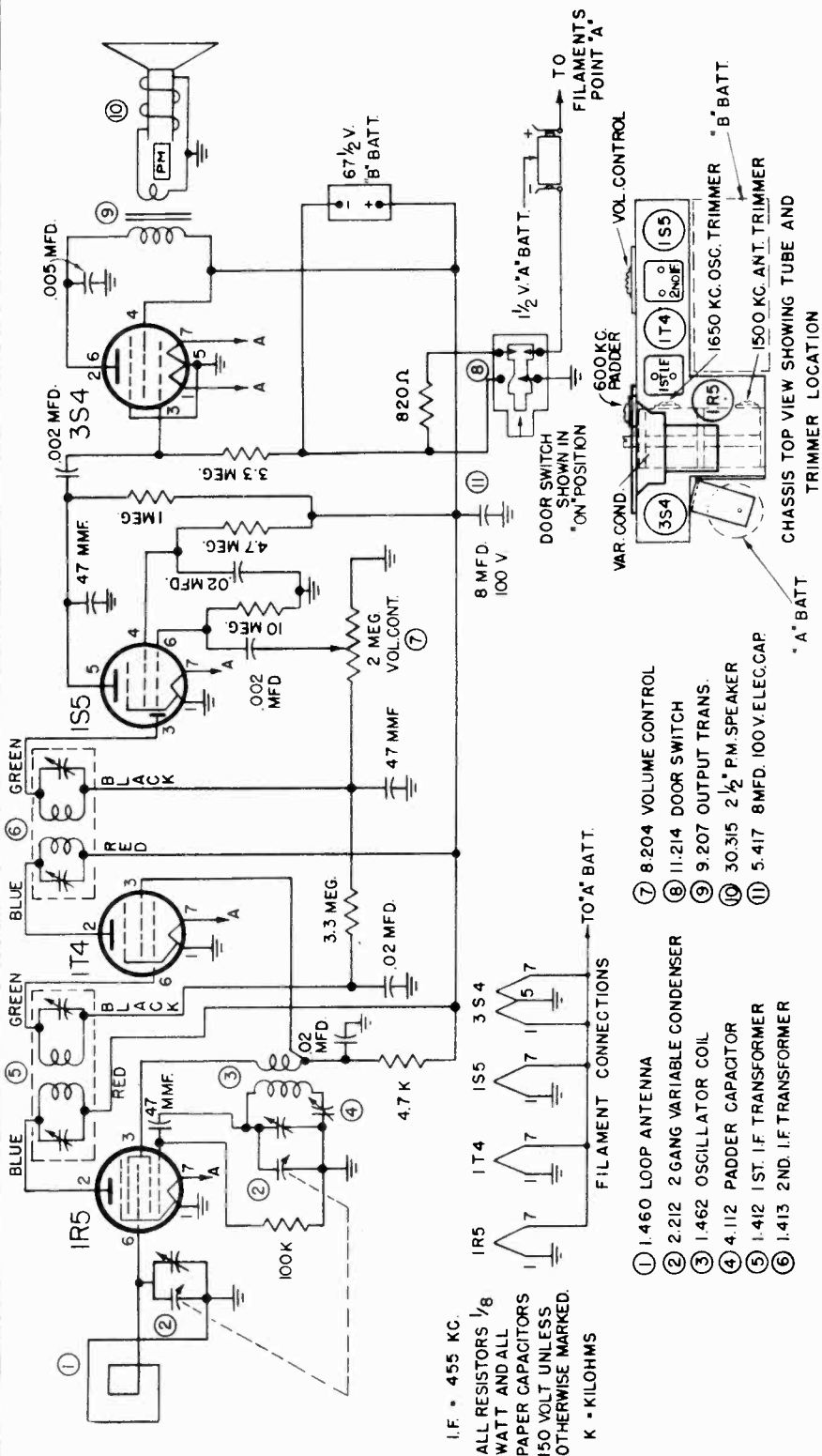
MODEL 3AP



MODEL 4AP



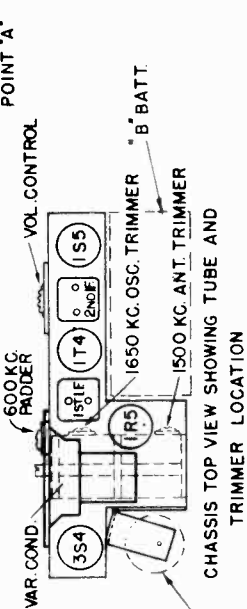
MODELS 4A-1, 4A-2



I.F. • 455 KC.

ALL RESISTORS 1/8 WATT AND ALL PAPER CAPACITORS 150 VOLT UNLESS OTHERWISE MARKED. K = KILOHMS

- ① 1.460 LOOP ANTENNA
- ② 2.212 2-GANG VARIABLE CONDENSER
- ③ 1.462 OSCILLATOR COIL
- ④ 1.412 PADDER CAPACITOR
- ⑤ 1.412 1ST. I.F. TRANSFORMER
- ⑥ 1.413 2ND. I.F. TRANSFORMER
- ⑦ 8.204 VOLUME CONTROL
- ⑧ 11-214 DOOR SWITCH
- ⑨ 9.207 OUTPUT TRANS.
- ⑩ 30.315 2 1/2" P.M. SPEAKER
- ⑪ 5.417 8MFD. 100V. ELEC. CAP



ALIGNMENT: (Receiver removed from cabinet.) Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

- (1) Set the signal generator to 455 KC and connect to the stator lug (rear section) of variable capacitor. Extend the loop leads and solder to the original points. Connect the signal generator ground lead to the chassis. Connect a suitable output meter across the speaker voice coil connections. Turn the volume control to the maximum position. Turn the variable capacitor to the extreme clockwise position (minimum capacity).
- (2) Adjust the trimmers located at the top of the first and second I.F. Transformers for maximum output, as indicated on the output meter.
- (3) Loosely couple the signal generator lead to the loop and set to 1650 KC.
- (4) With the variable capacitor set at minimum capacity, tune in the 1650 KC signal by means of the oscillator trimmer on the variable capacitor (front section).
- (5) Set the signal generator to 1500 KC and turn the tuning control until this frequency is heard. Adjust the antenna trimmer on the variable capacitor (rear section) for maximum output.
- (6) Set the signal generator to 600 KC and turn the tuning control until this frequency is heard. Adjust the oscillator padder located adjacent to the front of the variable capacitor for maximum response while "rocking" the variable capacitor. Recheck the 1500 KC high frequency adjustment until no further improvement can be made.
- (7) Install the chassis into the cabinet and re-adjust the antenna trimmer at 1500 KC.

BATTERY VOLTAGE: This personal receiver is designed for operation from a self contained 1 1/2 volt "A" battery and a 67 1/2 volt "B" battery.

BATTERY REQUIREMENTS: The following batteries are required:

| QUANTITY | TYPE | MANUFACTURER |
|----------|-----------------|--|
| 1 | 1 1/2 volt "A" | Eveready size "D", Burgess No. 2, Ray-O-Vac size "D" or equivalent. |
| 1 | 67 1/2 volt "B" | Eveready # 467, Burgess Type XXD, Ray-O-Vac Type 4367 or equivalent. |

TUNING RANGE: Broadcast 540 to 1650 Kilocycles (180 to 555 meters).
DIAL SCALE: The dial scale is calibrated in kilocycles. Example: Read "60" as 600 KC.

TUBES: The tubes used and their functions are as follows:
 1R5 Converter
 1T4 I.F. Amplifier
 1S5 Detector, AVC and Audio Amp
 3S4 Power Amplifier

For the placement of these tubes, see the diagram showing tube layout.

The following procedure should be followed for the installation of the "A" and "B" batteries (see Fig. 2):

- (a) Remove the back cover by depressing the back cover release button adjacent to the handle while sliding the back upward and out.

CAUTION: In removing the back cover, raise the lock end of the back cover only enough to clear the case edge before sliding the cover toward the strap handle to release the opposite end from the two protruding bottom case tabs that hold it down. Failure to observe this precaution may result in breaking out the two bottom holes from the cover.

- (b) Insert the 1 1/2 volt "A" battery into the spring holder with the protruding center contact at the top of the "A" battery always facing the position shown on the diagram rear of back cover or Fig. 2.
Do not insert the "A" battery in the opposite position in the spring holder.

- (c) Connect the "B" battery contact strip fitted with snap fasteners to the corresponding contacts on the "B" battery.

- (d) Insert the "B" battery into the compartment provided as shown on the diagram rear of back cover or Fig. 2.

- (e) Replace back cover by inserting the two holes at the bottom edge of the back cover into the two protruding case tabs at the rear edge of the case and slide forward while depressing the back cover release button. The receiver is now ready for operation.

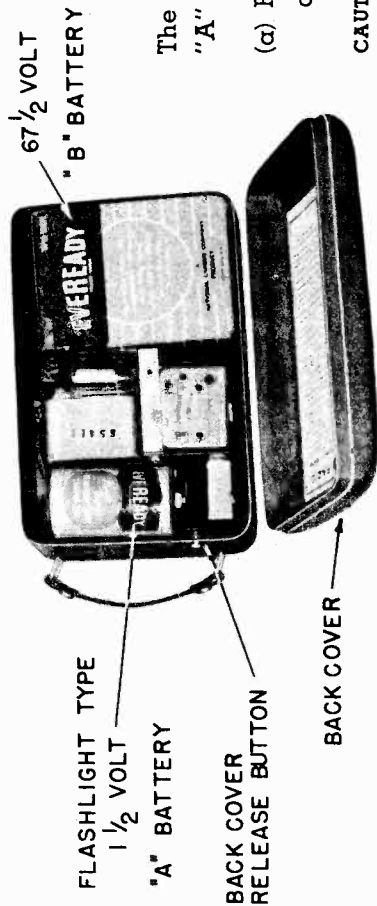
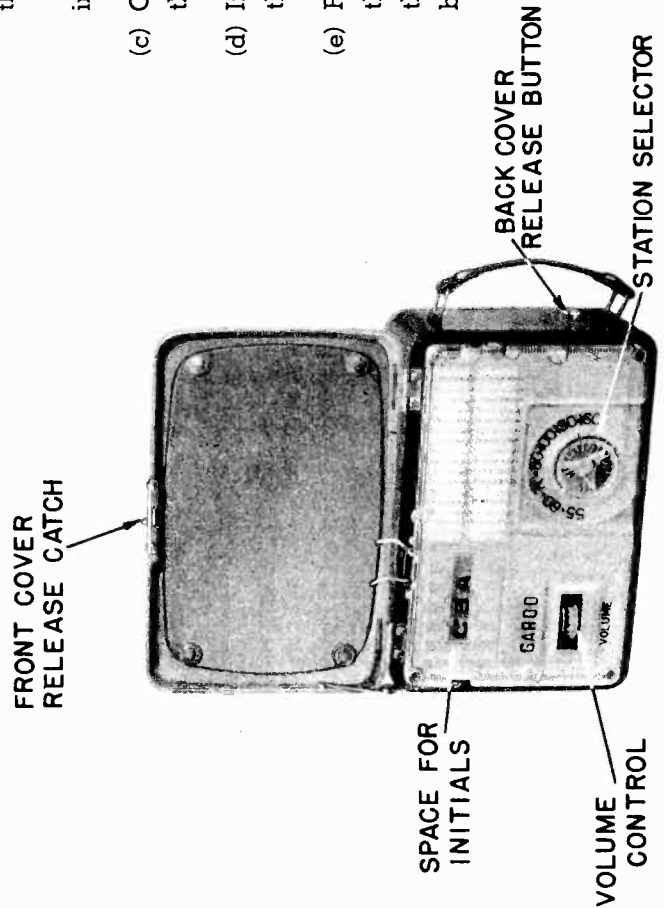
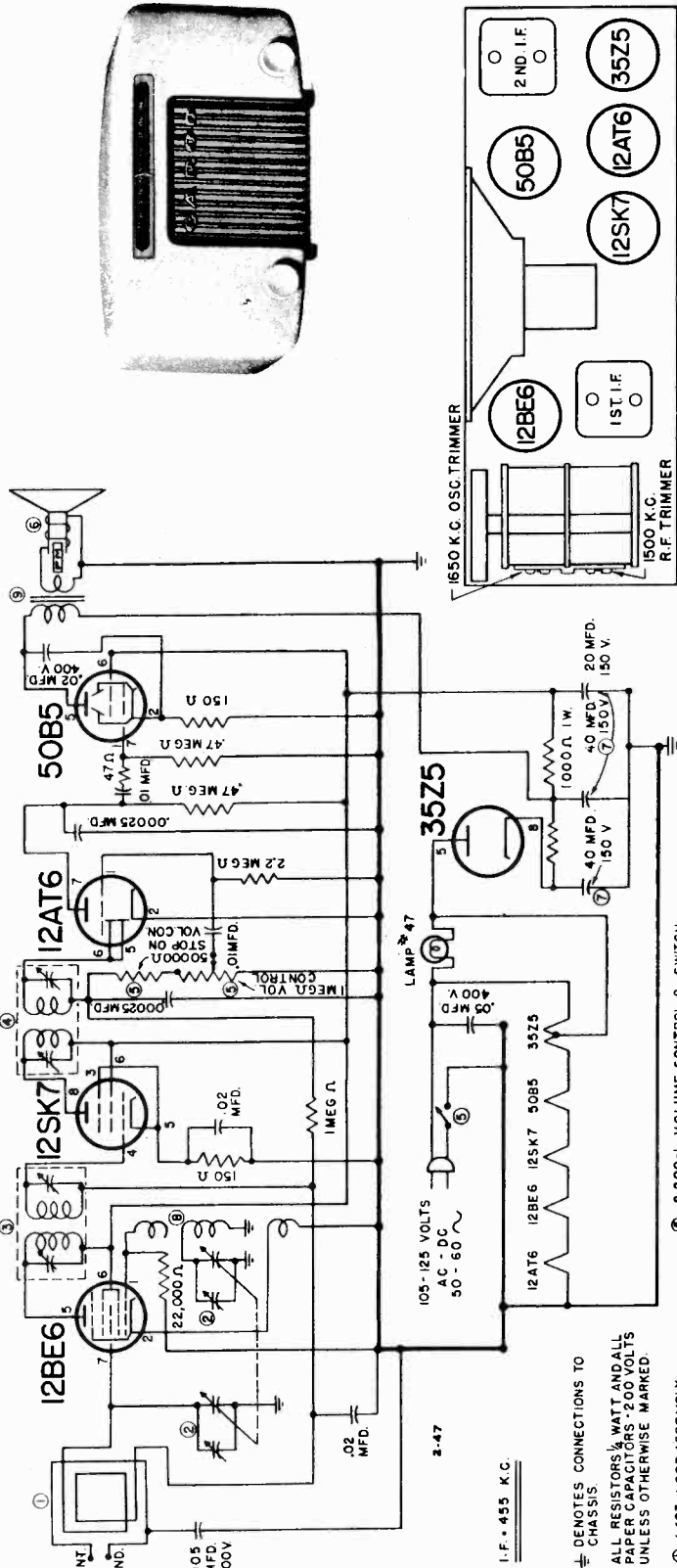
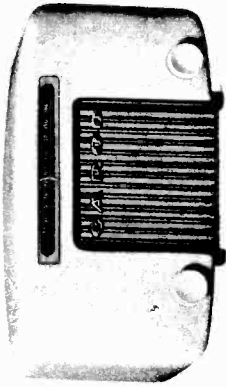


FIG 2 REAR VIEW - BACK COVER REMOVED SHOWING LOCATION OF BATTERIES

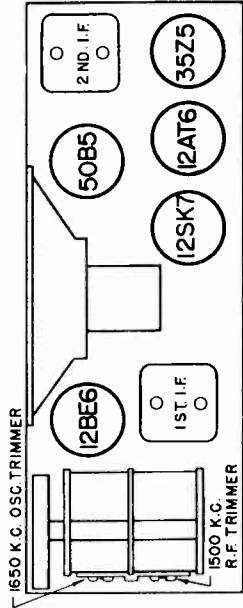


RECEIVER IN OPERATING POSITION

MODEL 5A2-Y



TRIMMER AND TUBE LOCATION DIAGRAM



ALIGNMENT: Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

- (1) Set the Signal Generator to 455 KC and connect to the stator lug on the rear section of the Variable Capacitor. Connect the Signal Generator Ground lead to the chassis. Connect a suitable output meter across the Speaker Voice Coil Connections. Turn the Volume Control to the maximum position. Turn the Variable Capacitor to the extreme clockwise position.
- (2) Adjust the trimmers located at the top of the first and second I. F. Transformers for maximum output as indicated on the Output Meter.
- (3) Loosely couple the Signal Generator lead to the Loop and set to 1650 KC.
- (4) With the Variable Capacitor set at the extreme clockwise position, tune in the 1650 KC signal by means of the Oscillator Trimmer on the Variable Capacitor (front section).

(5) Set the Signal Generator to 1500 KC and turn the Tuning Control so that this frequency is indicated on the dial. Adjust the Antenna Trimmer on the Variable Capacitor (rear section) for maximum output. No other adjustments are necessary.

LINE VOLTAGE: This receiver is designed for operation on 105-125 Volts, 50-60 Cycles, either Alternating or Direct Current (AC-DC).

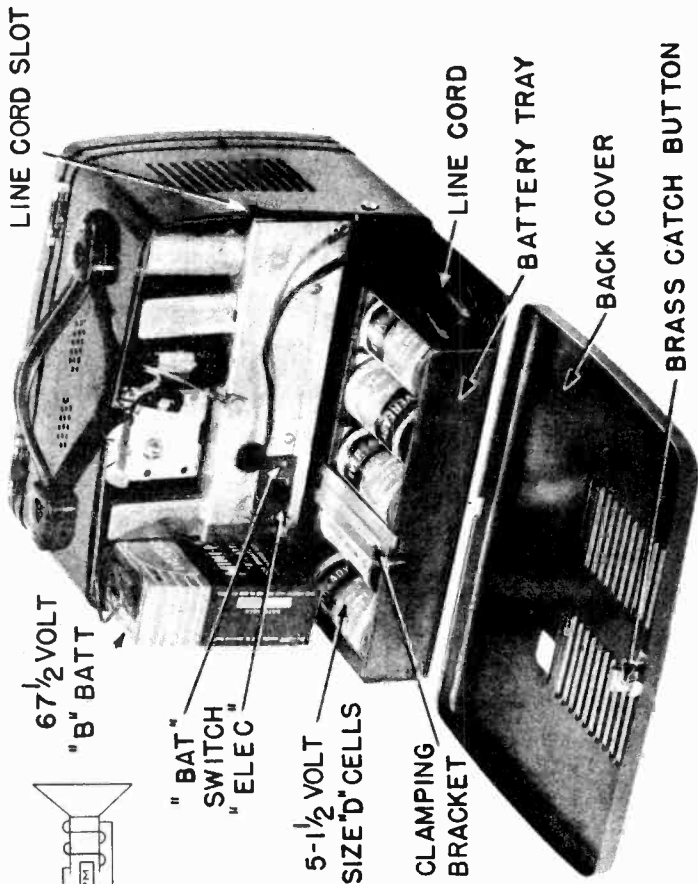
POWER CONSUMPTION: 30 Watts.

TUNING RANGE: Broadcast: 540 to 1650 Kilocycles (180 to 555 meters).

DIAL: The Dial Scale is calibrated in Kilocycles times 10.

TUBES: The tubes used, and their functions, are as follows:

- 12BE6 Converter
- 12SK7 I. F. Amplifier
- 12AT6 Detector, Avc and Audio Amp.
- 50B5 Beam Power Amplifier
- 35Z5GT Rectifier

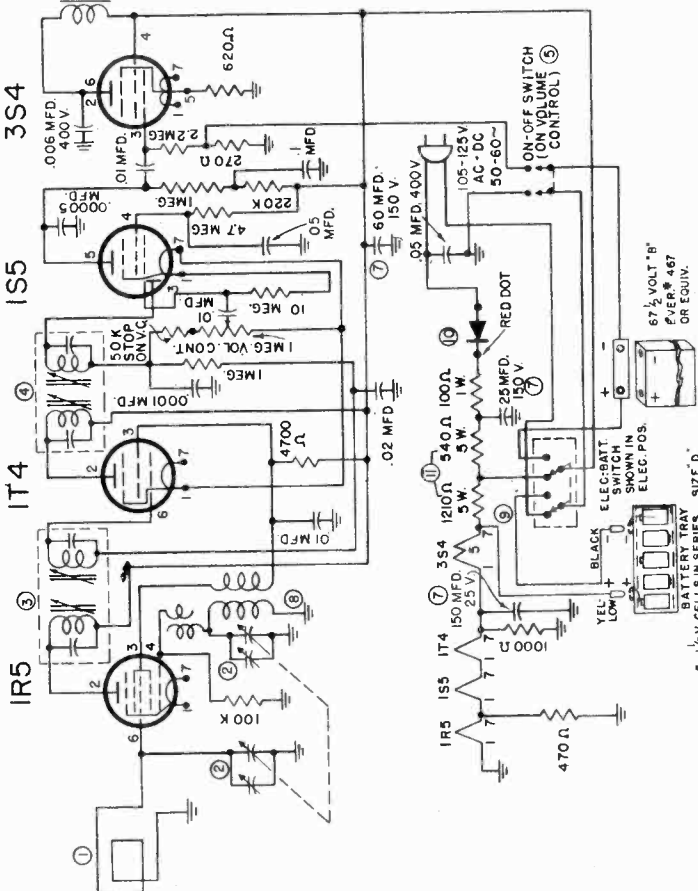


MODEL 5D-5 REAR VIEW



TUBES: The tubes used and their function are as follows:
 IR5 Converter
 1S5 Detector, AVC and Audio Amp.
 1T4 I.F. Amplifier
 3S4 Power Amplifier

For the placement of these tubes, see the diagram showing tube layout.
RECTIFIER: 36-111 Selenium Rectifier.



- ③ 8.200-2 VOLUME CONTROL & SWITCH
- ④ 30.312 5" P.M. SPEAKER & OUTPUT TRANS.
- ⑤ 5.415-3 ELECTROLYTIC CAP. 60-25-150
- ⑥ 1.414 OSCILLATOR COIL
- ⑦ 11.210 ELECTRIC-BATTERY SWITCH
- ⑧ 36.111 5 PL. SELENIUM RECTIFIER

- ① 1.437 LOOP ANTENNA
- ② 2.210 2GANG VARIABLE CONDENSER
- ③ 1.445 1ST I.F. TRANSFORMER
- ④ 1.445 2ND I.F. TRANSFORMER
- ⑤ 6.208-1 METAL CLAD RESISTOR

ALL RESISTORS 1/4 WATT AND ALL PAPER CAPACITORS 200 VOLTS UNLESS OTHERWISE MARKED.
 K = KILOHMS
 I.F. = 455 K C.

BATTERY OR LINE VOLTAGE: This receiver is designed for operation on 105-125 volts, 50-60 cycles either Alternating or Direct Current (AC-DC) and also from self contained batteries.

POWER CONSUMPTION: 20 Watts on Electric Operation.

BATTERY REQUIREMENTS: The following batteries are required for battery operation:

| QUANTITY | TYPE | MANUFACTURER |
|----------|-----------------|---|
| 5 | 1 1/2 volt "A" | Eveready #950, Burgess #2 or equivalent. |
| 1 | 67 1/2 volt "B" | Eveready #467, Burgess #XX45 or equivalent. |

TUNING RANGE: Broadcast 540 to 1650 Kilocycles (180 to 555 meters).
DIAL: The dial scale is calibrated in kilocycles times 10 to correspond with newspaper or periodical listings.

CAUTION: Before releasing back cover for battery installation, disconnect line cord from power receptacle, and set the "Elec-Bat" slide switch at rear of cabinet to "Bat" position.

- (1) The following procedure should be followed in opening the hinged back cover: While depressing the top of the cabinet, at either side of the catch button with the left hand, push the catch button outward with the thumb of the right hand, and allow the back cover to clear the "A" battery tray.
- (2) Slide out "A" battery tray located in compartment below receiver chassis.
- (3) Remove the battery clamping bracket and insert the five 1½ volt Size D "A" batteries polarized as shown on the diagram at the base of the tray. Since all five "A" batteries are connected in series, it is important that intimate contact be made with the end spring contact points, otherwise the receiver will be inoperative. Replace the battery clamping bracket, locating it between the batteries as shown on the photograph on the opposite page.
- (4) Check the insertion of the contact pins at the end of the "black" (minus) and "yellow" (plus) wires from the receiver into "black" and "yellow" marked receptacle contact lugs located at the rear of the battery tray.
- (5) Slide battery tray back into compartment.
- (6) Connect the "B" battery contact strip fitted with snap fasteners to the corresponding contacts on the "B" battery.
- (7) Insert the "B" battery into the compartment on the left side of the receiver.

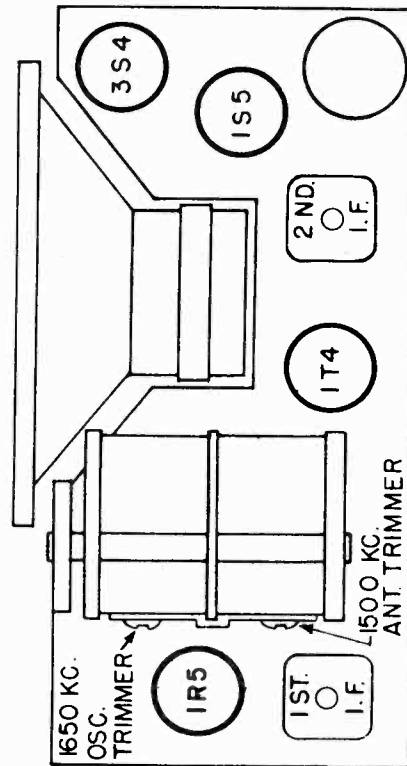
- (8) Close the hinged back cover by depressing the top of the cabinet while sliding the cover forward until the catch button engages into the opening at the top center of the cabinet.

- (9) Reverse the above procedure for replacement of "A" or "B" batteries. The Receiver is now ready for battery operation. When prolonged operation in the "Elec." position is contemplated (as during the winter season), it is advisable to remove the "A" and "B" batteries and store them in a cool dry place. DO NOT leave exhausted "A" batteries in the battery tray as chemical action may expand the batteries and cause leakage of the electrolyte.

Should the battery tray become corroded due to leakage of the electrolyte from the "A" batteries, the bottom of the tray and the contact springs should be cleaned with carbon tet or the battery tray replaced with a new one.

ALIGNMENT: (Electric Operation) Receiver removed from cabinet. Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

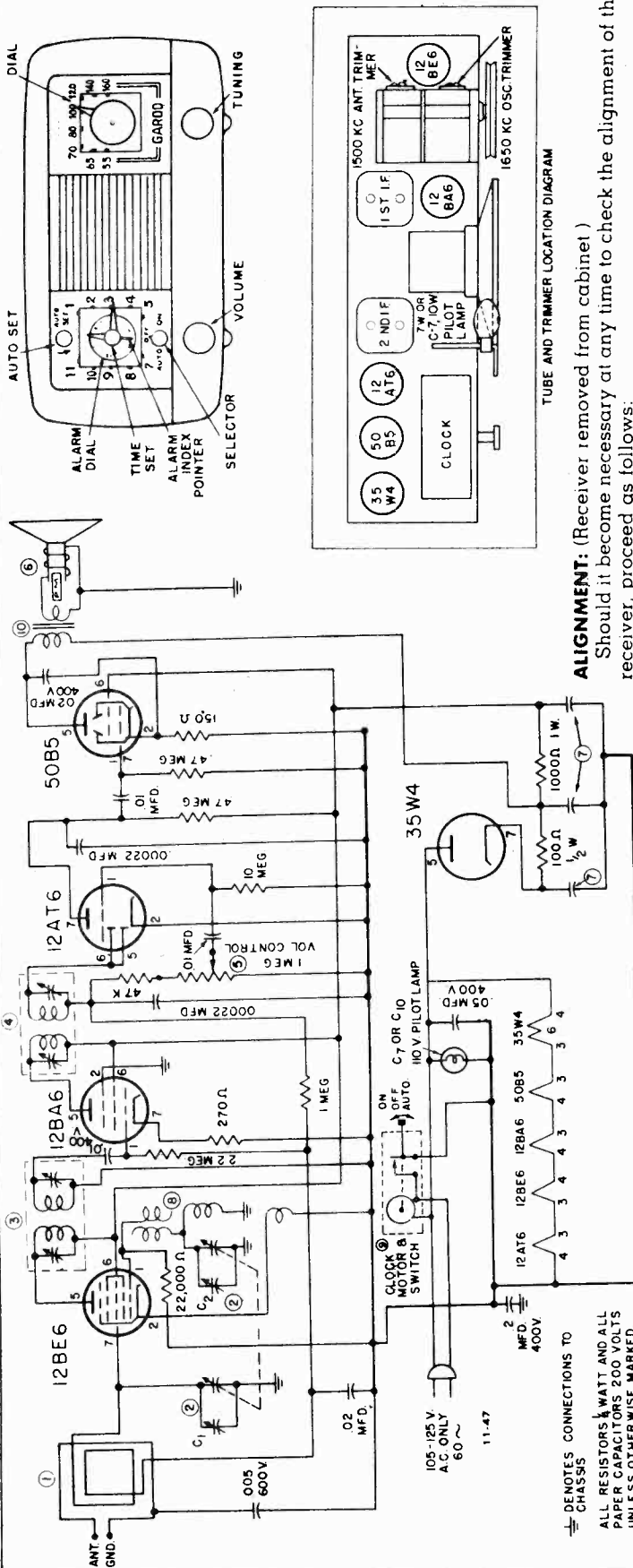
- (1) Set the Signal Generator to 455 KC and connect to the stator lug (rear section of variable capacitor. Extend the loop leads and connect grid lead to the terminal connecting the wire from the Ant. Section of the variable capacitor. Connect the other lead to the chassis. Connect the Signal Generator ground lead to the chassis. Connect a suitable output meter across the Speaker Voice Coil Connections. Turn the Volume Control to the maximum position. Turn the variable capacitor to the extreme counter clockwise position (minimum capacity).
- (2) Adjust the iron cores located at the top and bottom of the first and second I. F. transformers for maximum output as indicated on the output meter.
- (3) Loosely couple the Signal Generator lead to the Loop (open position) and set to 1650 KC.
- (4) With the variable capacitor set at the extreme counter clockwise position (minimum capacity), tune in the 1650 KC signal by means of the oscillator trimmer on the variable capacitor (front section).
- (5) Set the Signal Generator to 1500 KC and turn the tuning control so that this frequency is indicated on the dial. Adjust the antenna trimmer on the variable capacitor (rear section) for maximum output.
- (6) Install the chassis into cabinet and check the dial calibration. If further adjustment is required, remove the two plug buttons on the side of the cabinet adjacent to the variable capacitor and adjust the oscillator trimmer as required. Adjust the antenna trimmer for maximum output and replace plug buttons.



TRIMMER AND TUBE LOCATION DIAGRAM

GAROD RADIO CORP.

MODEL 5RC-1



ALIGNMENT: (Receiver removed from cabinet) Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

- (1) Set the Signal Generator to 455 KC and connect to the stator lug on the rear section of the variable capacitor. Connect the signal generator ground lead to the chassis. Connect a suitable output meter across the speaker voice coil connections. Turn the volume control to the maximum position. Turn the variable capacitor to the extreme clockwise position.
- (2) Adjust the trimmers located at the top of the first and second I.F. Transformers for maximum output as indicated on the output meter.
- (3) Loosely couple the signal generator lead to the loop and set to 1650 KC.
- (4) With the variable capacitor set at the extreme clockwise position, tune in the 1650 KC signal by means of the oscillator trimmer on the variable capacitor (front section).
- (5) Set the signal generator to 1500 KC and turn the tuning control so that this frequency is indicated on the dial. Adjust the antenna trimmer on the variable capacitor (rear section) for maximum output. No other adjustments are necessary.

- ① 1.464 LOOP ANTENNA
- ② 2.213 2 GANG VARIABLE COND.
- ③ 1.259 1ST I.F. TRANSFORMER
- ④ 1.409 2ND I.F. TRANSFORMER
- ⑤ 8.200-11 VOLUME CONTROL
- ⑥ 30.300 OR 30.316 P.M. SPEAKER
- ⑦ 5.415-1 ELECTROLYTIC CAP. 20-20-20 MFD
- ⑧ 1.402-1 OSCILLATOR COIL
- ⑨ 36.113 TELECHROM CLOCK ASSEMBLY

TO OPERATE THE RADIO: Turn the Selector knob located at the bottom of the clock face so that its index points to on. This turns on the power to the radio. Next, turn the Volume control knob at the bottom left of the cabinet about half-way in the clockwise direction, or to the right. Wait a few seconds for the tubes to warm up. Turn the Tuning control knob so that the dial pointer indicates the frequency of the desired station. Tuning carefully for best and clearest reception.

To turn the radio off, turn the Selector knob so that the index points to the upright or center position.

TO OPERATE YOUR "RADALARM" RADIO AS A MUSICAL ALARM: You may set your clock radio to automatically turn on a program you wish to hear during the next eleven hours. Proceed by tuning in the station which will carry the program desired. Then set the Volume control knob at the level you want, as for the regular radio operation. Turn the Auto set knob at the top of the clock face, which rotates the disc forming the alarm dial of the clock.

Stop rotation when the time you desire the radio to go on is directly under the short index pointer on the opposite end of the hour hand. Now turn the Selector knob so that the index points to Auto—that is points to the left.

After setting the alarm, if you wish to return to normal radio operation, turn the Selector knob so that the index points to on. Then operate the radio as described in preceding paragraphs. Be sure to turn the Selector knob back to the Auto position if you want a program to be turned on automatically.

TUBES: The tubes used, and their function are as follows:

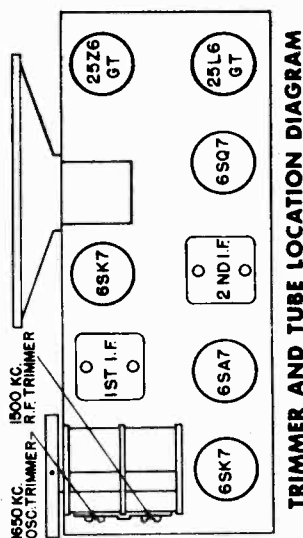
- 12BE6 Converter
- 12BA6 I.F. Amplifier
- 50B5 Beam Power Amplifier
- 35W4 Rectifier

LINE VOLTAGE: This clock-radio receiver is designed for operation on 105-125 volts, 60 cycles alternating current only.

POWER CONSUMPTION: 40 Watts.

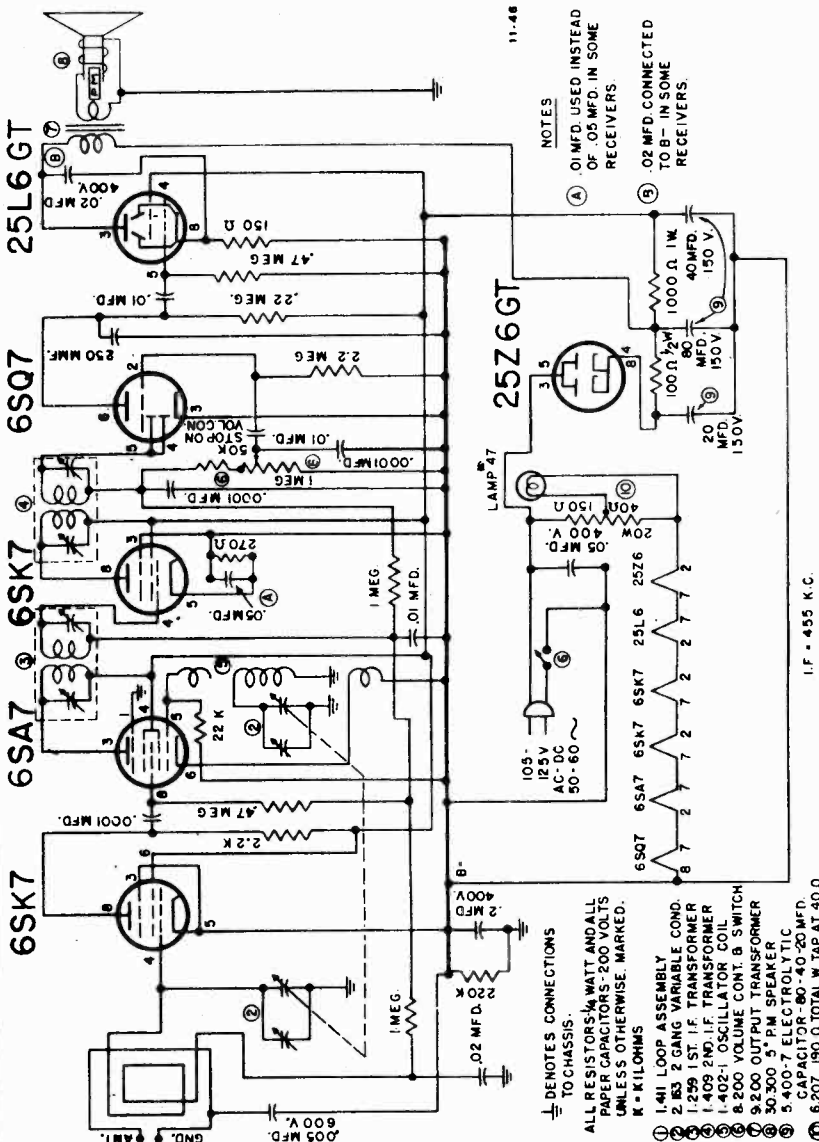
TUNING RANGE: Broadcast: 540 to 1650 Kilocycles (180 to 555 Meters).

DIAL: The dial scale is calibrated in kilocycles. Example: Read 60 as 600 KC.



TUBES: The tubes used, and their functions, are as follows:

- 6SK7 R. F. Amplifier
- 6SA7 Converter
- 6SK7 I. F. Amplifier
- 6SQ7 Detector, Avc and Audio Amp.
- 25L6GT Beam Power Amplifier
- 25Z6GT Rectifier



ALIGNMENT: Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

- (1) Set the Signal Generator to 455 KC and connect to the grid of the 6SK7 R. F. Amplifier, or to the Stator Lug on the rear section of the Variable Capacitor. Connect the Signal Generator Ground Lead to a "-B" point underneath the chassis. Connect a suitable output meter across the Speaker Voice Coil Connections. First turn the Volume Control to the maximum position. Turn the Variable Capacitor to the extreme clockwise position.
- (2) Adjust the trimmers located at the top of the first and second I. F. Transformers for maximum output as indicated on the Output Meter.
- (3) Loosely couple the Signal Generator lead to the Loop and set to 1650 KC.
- (4) With the Variable Capacitor set at the extreme clockwise position, tune in the 1650 KC signal by means of the Oscillator Trimmer on the Variable Capacitor (front section).

(5) Set the Signal Generator to 1500 KC and turn the Tuning Control so that this frequency is indicated on the dial. Adjust the Antenna Trimmer on the Variable Capacitor (rear section) for maximum output. No other adjustments are necessary.

LINE VOLTAGE: This receiver is designed for operation on 105-125 Volts, 50-60 Cycles, either Alternating or Direct Current (AC-DC)

POWER CONSUMPTION: 30 Watts.

TUNING RANGE: Broadcast: 540 to 1650 Kilocycles (180 to 555 meters).

DIAL: The Dial Scale is calibrated in Kilocycles.

GENERAL ELECTRIC CO.

MODELS MUSAPHONIC 41, 42, 43, 44, 45

ELECTRICAL RATING:

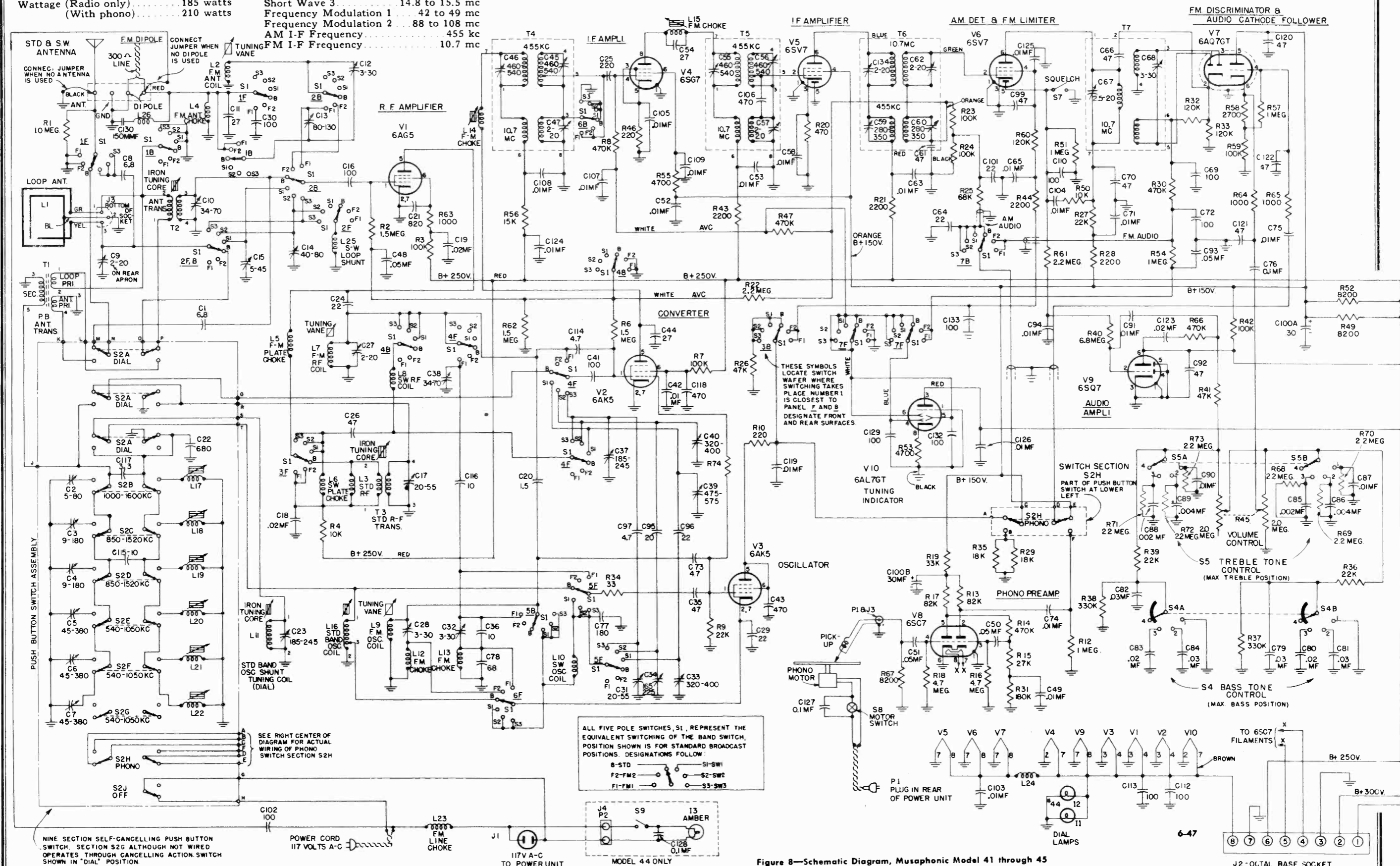
Voltage 105-125 v. a-c
Frequency (All Models) 60 cycles
Models 42 and 44 available in .50 cycles
Wattage (Radio only) 185 watts
(With phono) 210 watts

OPERATING FREQUENCIES:

Standard Band 540 to 1600 kc
Short Wave 1 9.4 to 9.8 mc
Short Wave 2 11.5 to 12.0 mc
Short Wave 3 14.8 to 15.5 mc
Frequency Modulation 1 42 to 49 mc
Frequency Modulation 2 88 to 108 mc
AM I-F Frequency 455 kc
TUNING FM I-F Frequency 10.7 mc

ANTENNA INPUTS:

Broadcast and Short Wave conventional antenna
FM 300-ohm input for folded dipole

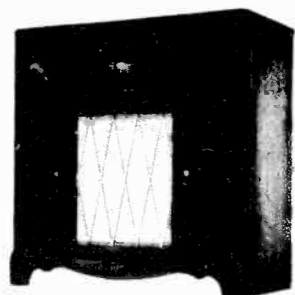


ALL FIVE POLE SWITCHES, S1, REPRESENT THE EQUIVALENT SWITCHING OF THE BAND SWITCH, POSITION SHOWN IS FOR STANDARD BROADCAST POSITIONS. DESIGNATIONS FOLLOW:
8-STD S1-SW1
F2-FM2 S2-SW2
F1-FM1 S3-SW3

Figure 8—Schematic Diagram, Musaphonic Model 41 through 45

GENERAL ELECTRIC CO.

MODEL 417A



CABINET:

| | |
|----------|------------|
| Model | 417A |
| Material | Wood |
| Color | Mahogany |
| Height | 35 in. |
| Width | 35 in. |
| Depth | 17 1/2 in. |

ELECTRICAL RATING (INPUT):

| | | |
|-----------|-----------|-----------|
| | Rating A5 | Rating A6 |
| Voltage | 100-125 | 100-125 |
| Frequency | 50 cycles | 60 cycles |
| Wattage | 105 | 105 |

OPERATING FREQUENCIES:

| | |
|------------------------|-----------------|
| Standard Band | 540 to 1600 kc |
| Short Wave 1 | 9.4 to 9.9 mc |
| Short Wave 2 | 11.6 to 12.1 mc |
| Frequency Modulation 1 | 42 to 50 mc |
| Frequency Modulation 2 | 88 to 108 mc |
| AM I-F Frequency | 455 kc |
| FM I-F Frequency | 10.7 mc |

POWER OUTPUT (117 volts line):

| | |
|-------------|-----------|
| Undistorted | 4.0 watts |
| Maximum | 5.5 watts |

LOUDSPEAKER:

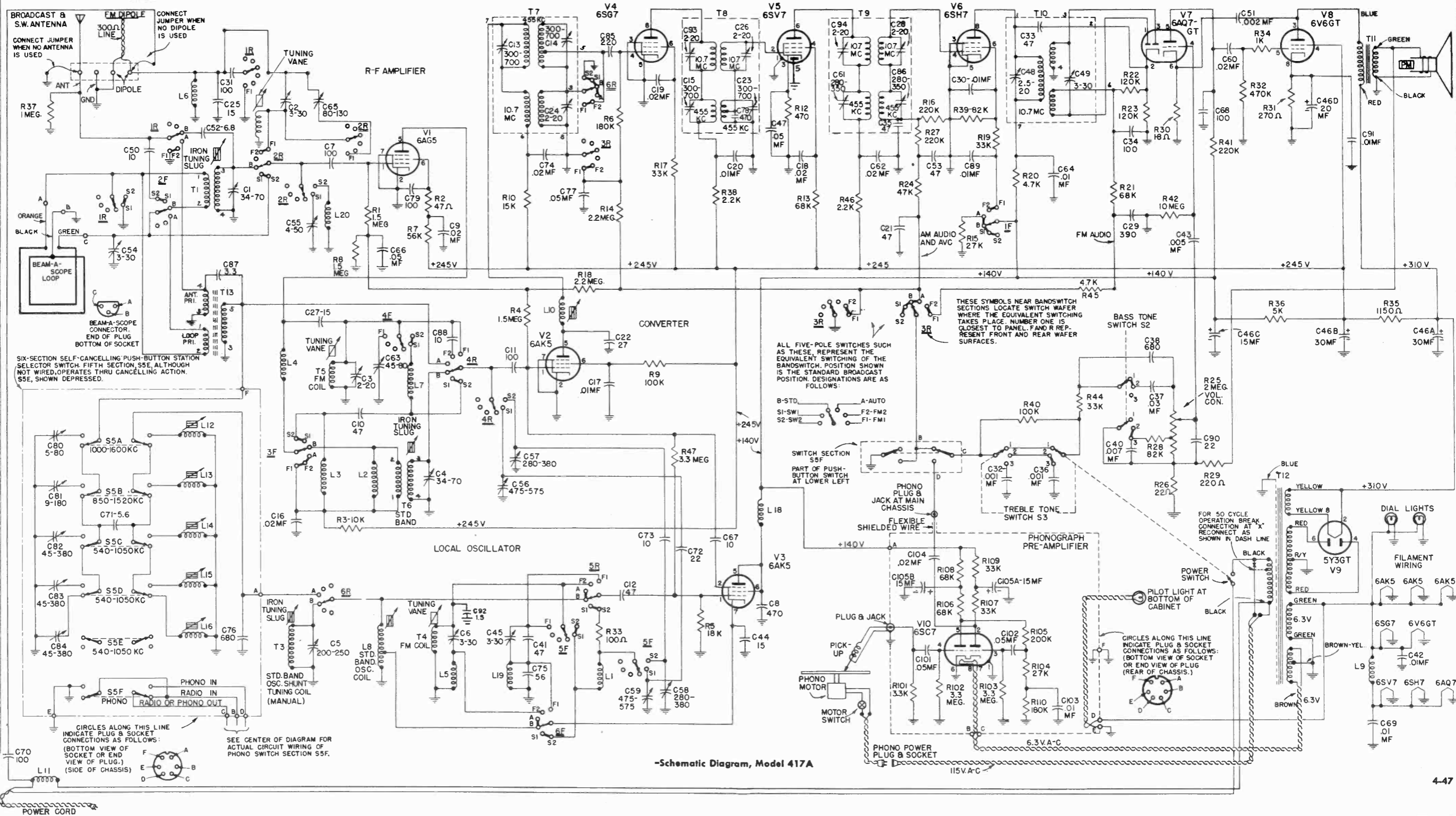
| | |
|--------------------------------|-----------|
| Type | Alnico PM |
| Size | 12 inches |
| Voice Coil Impedance (400 cps) | 8 ohms |

ANTENNA INPUTS:

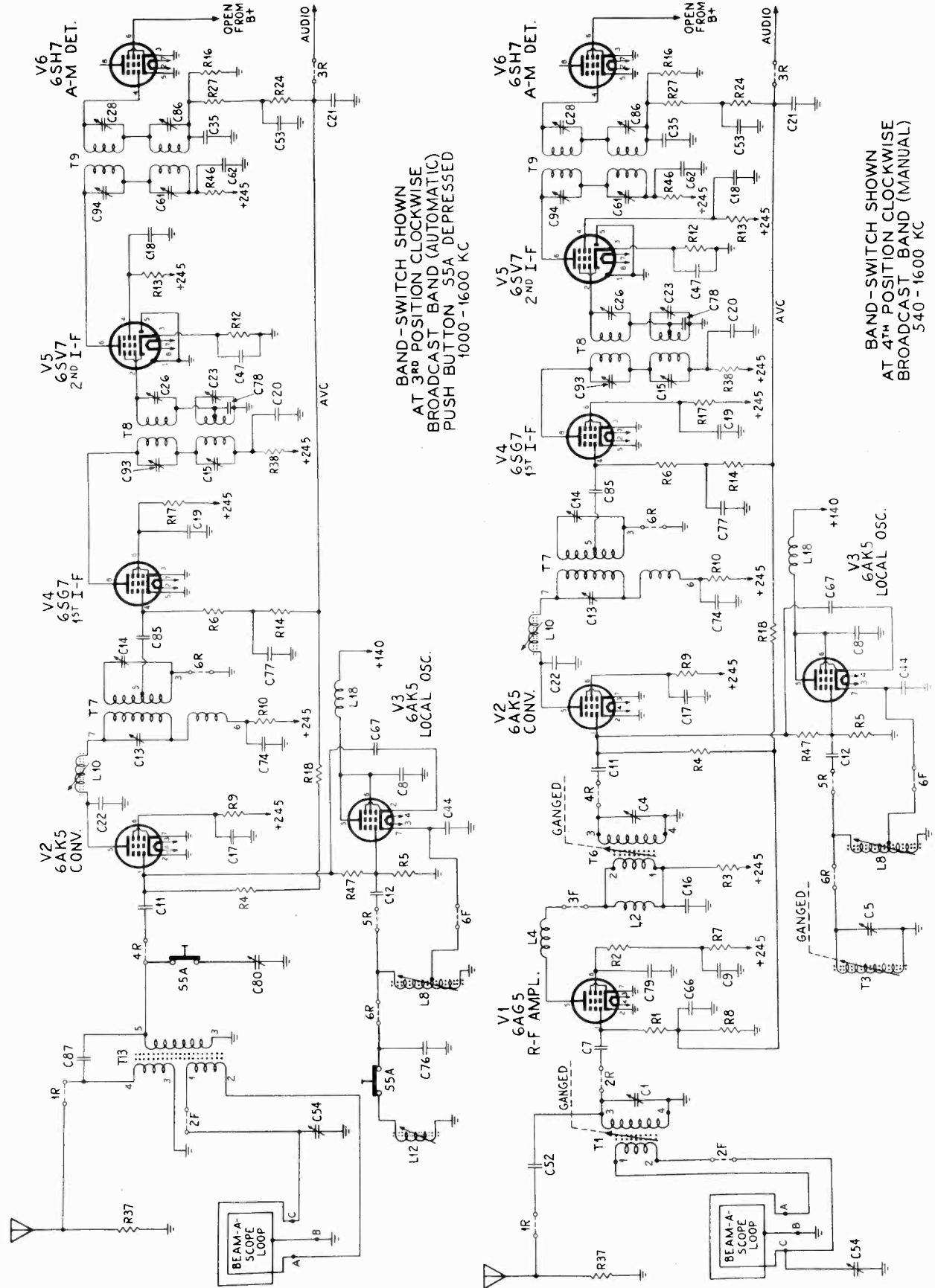
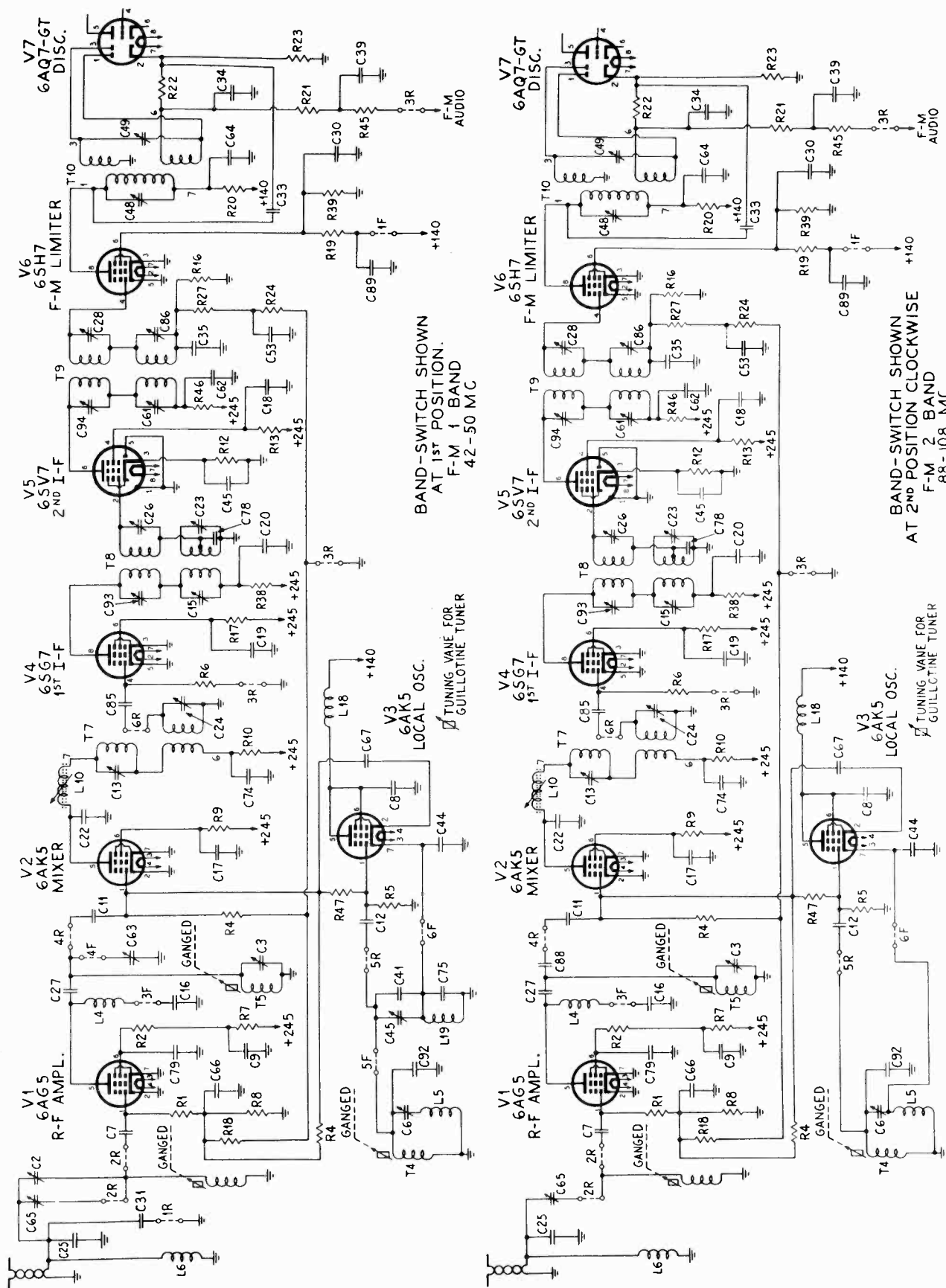
Broadcast and Short Wave—conventional antenna
FM—300-ohm input for folded dipole

PHONOGRAPH PICK-UP:

| | |
|----------------|---------------------|
| Type | Variable Reluctance |
| D-C Resistance | 250 ohms |

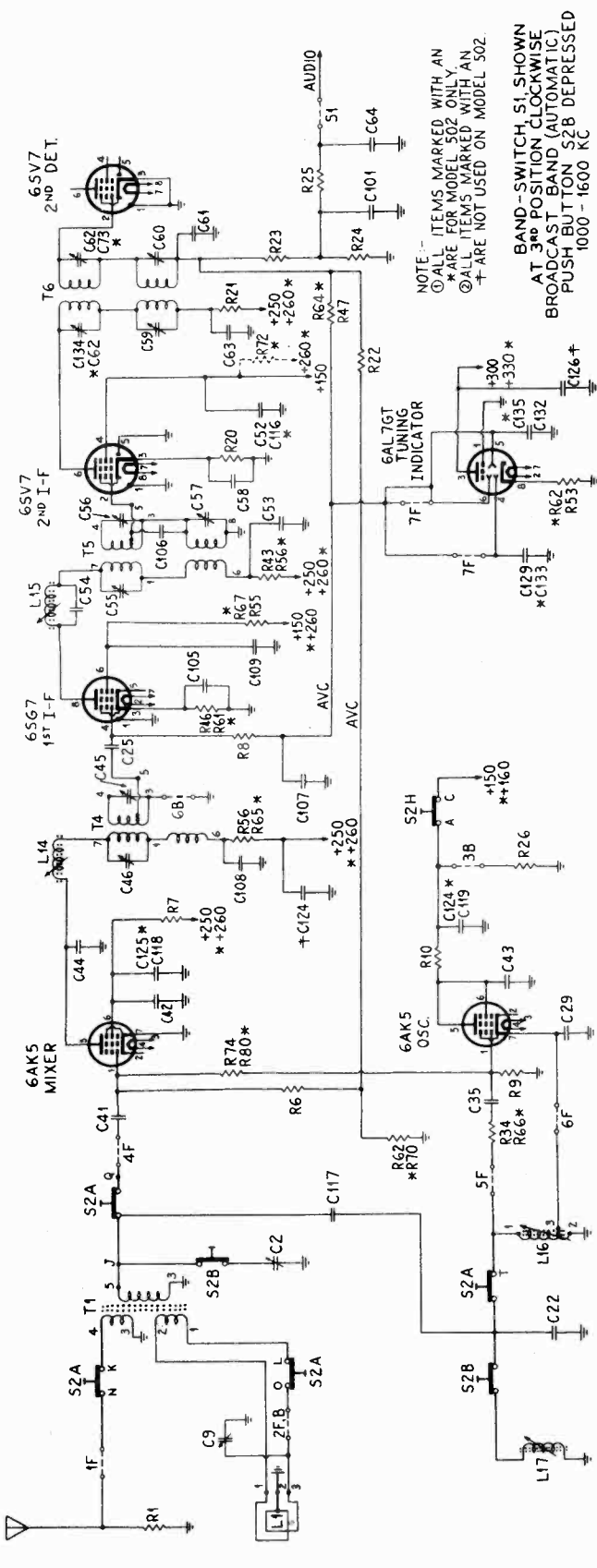
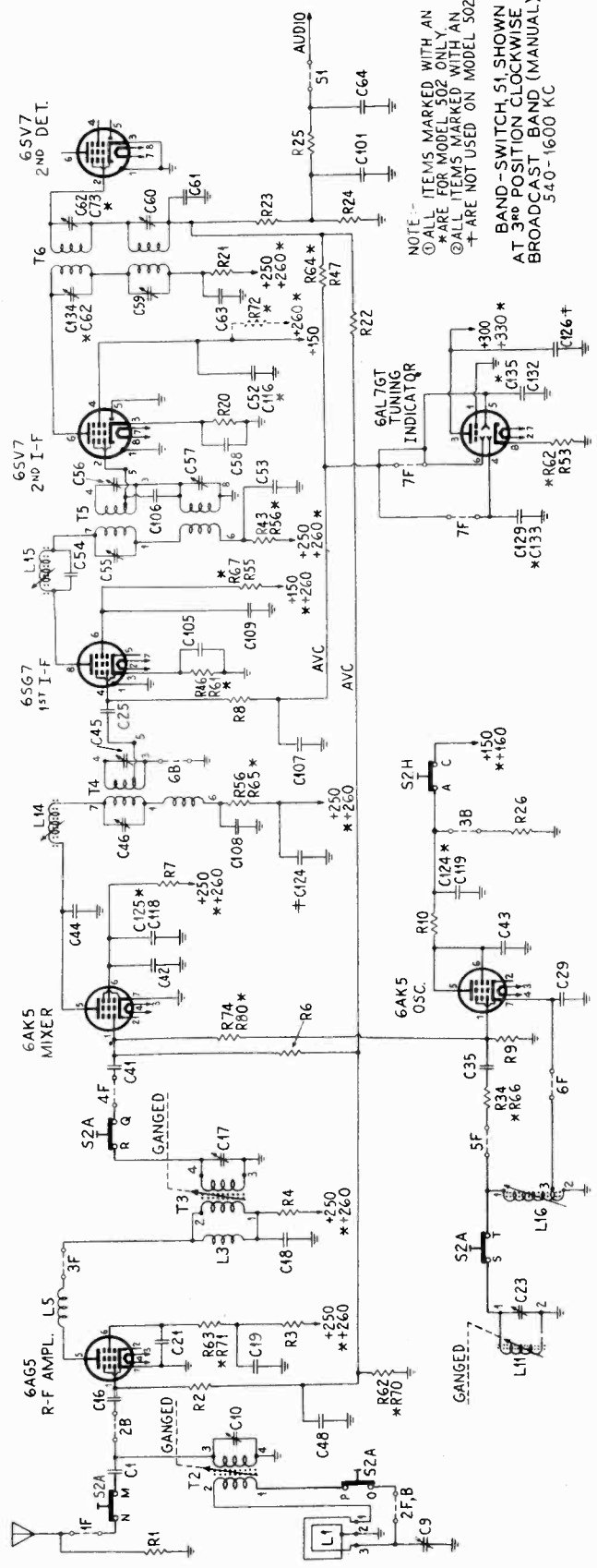


-Schematic Diagram, Model 417A



GENERAL ELECTRIC CO.

MODELS MUSAPHONIC
41, 42, 43, 44, 45
MODEL 502.

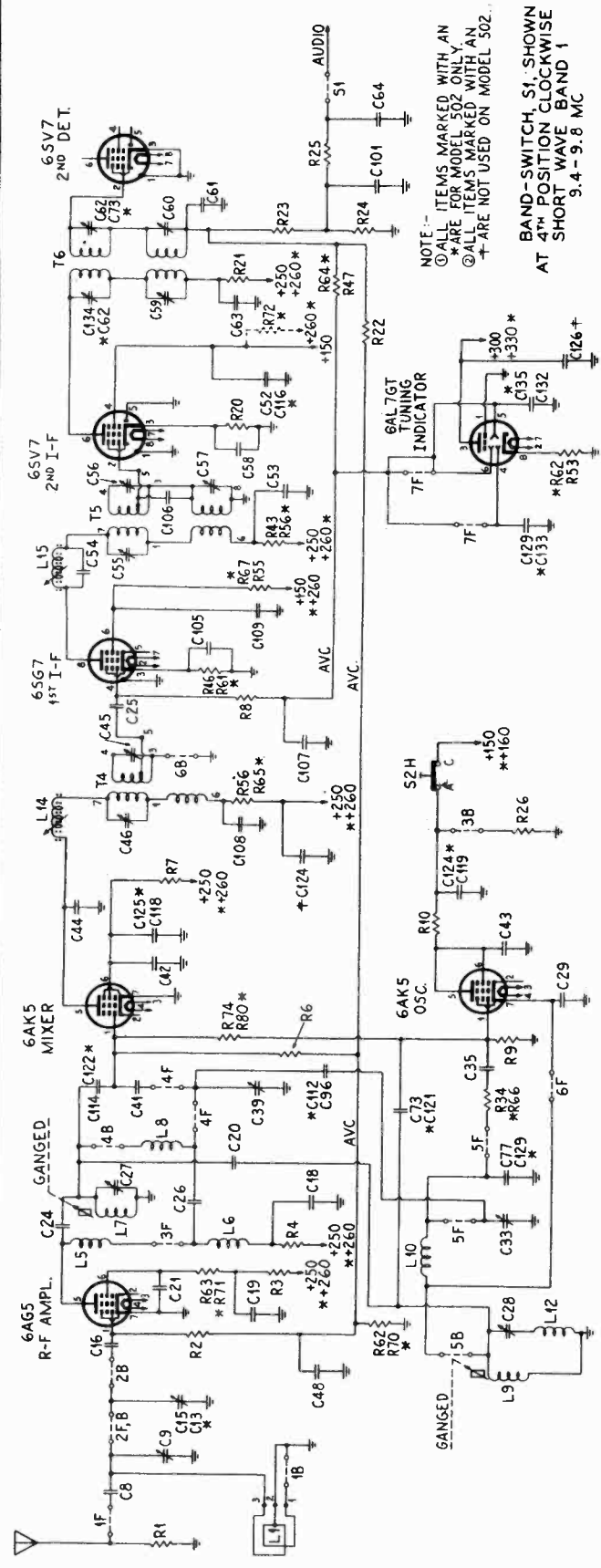


NOTE:—
 (O) ALL ITEMS MARKED WITH AN O ARE FOR MODEL 502 ONLY.
 (A) ALL ITEMS MARKED WITH AN A ARE NOT USED ON MODEL 502.
 (S) BAND-SWITCH, S1 SHOWN AT 3RD POSITION CLOCKWISE BROADCAST BAND (MANUAL) 540-1600 KC

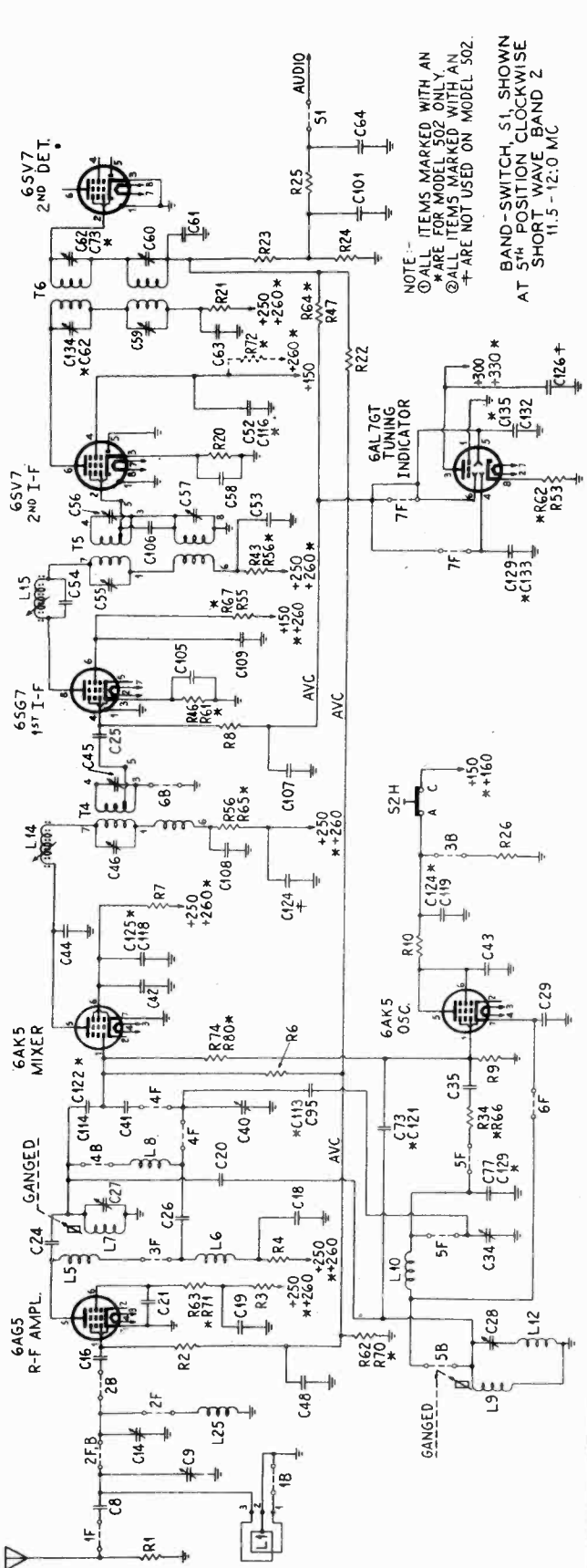
NOTE:—
 (O) ALL ITEMS MARKED WITH AN O ARE FOR MODEL 502 ONLY.
 (A) ALL ITEMS MARKED WITH AN A ARE NOT USED ON MODEL 502.
 (S) BAND-SWITCH, S1 SHOWN AT 3RD POSITION CLOCKWISE BROADCAST BAND (AUTOMATIC) PUSH BUTTON S2B DEPRESSED 1000-1600 KC

MODELS MUSAPHONIC
41, 42, 43, 44, 45
MODEL 502

GENERAL ELECTRIC CO.



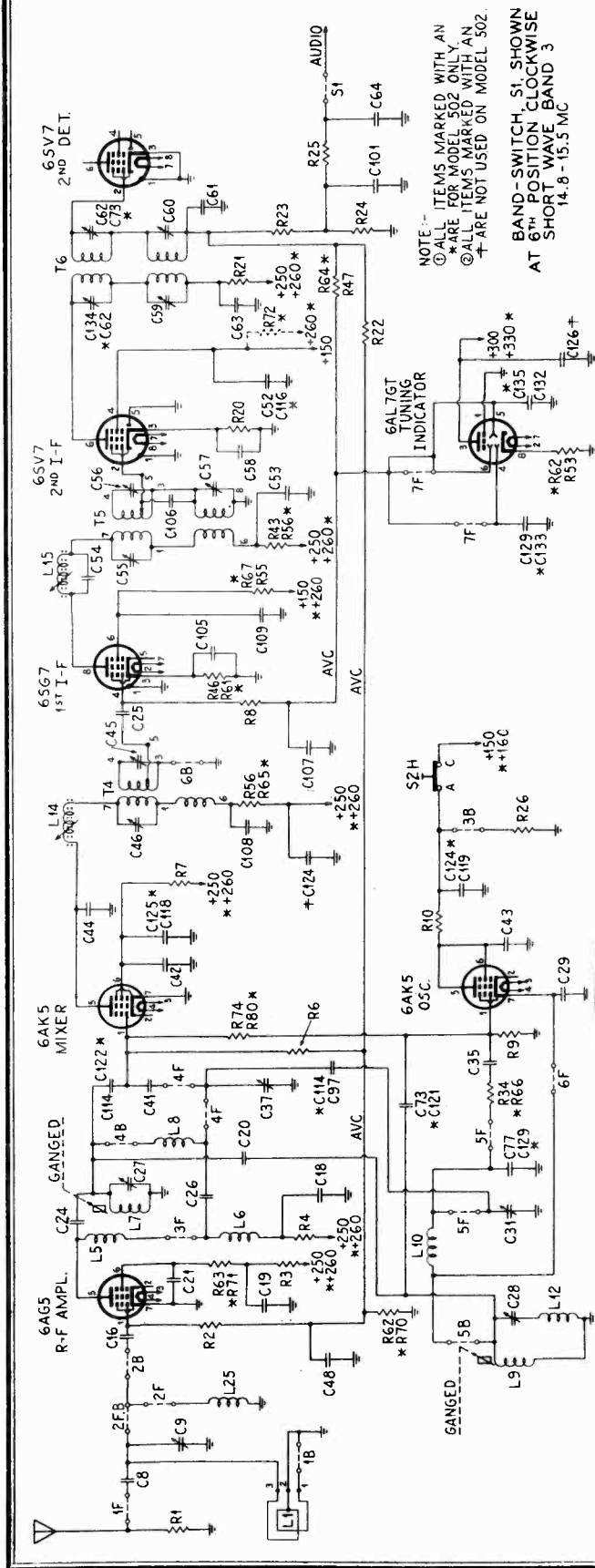
NOTE: -
 (1) ALL ITEMS MARKED WITH AN (1) ARE FOR MODEL 502 ONLY.
 (2) ALL ITEMS MARKED WITH AN (2) ARE NOT USED ON MODEL 502.
 BAND-SWITCH, S1, SHOWN AT 4TH POSITION CLOCKWISE 9.4-9.8 MC



NOTE: -
 (1) ALL ITEMS MARKED WITH AN (1) ARE FOR MODEL 502 ONLY.
 (2) ALL ITEMS MARKED WITH AN (2) ARE NOT USED ON MODEL 502.
 BAND-SWITCH, S1, SHOWN AT 5TH POSITION CLOCKWISE 11.5-12.0 MC

GENERAL ELECTRIC CO.

MODELS MUSAPHONIC
41, 42, 43, 44, 45
MODEL 502



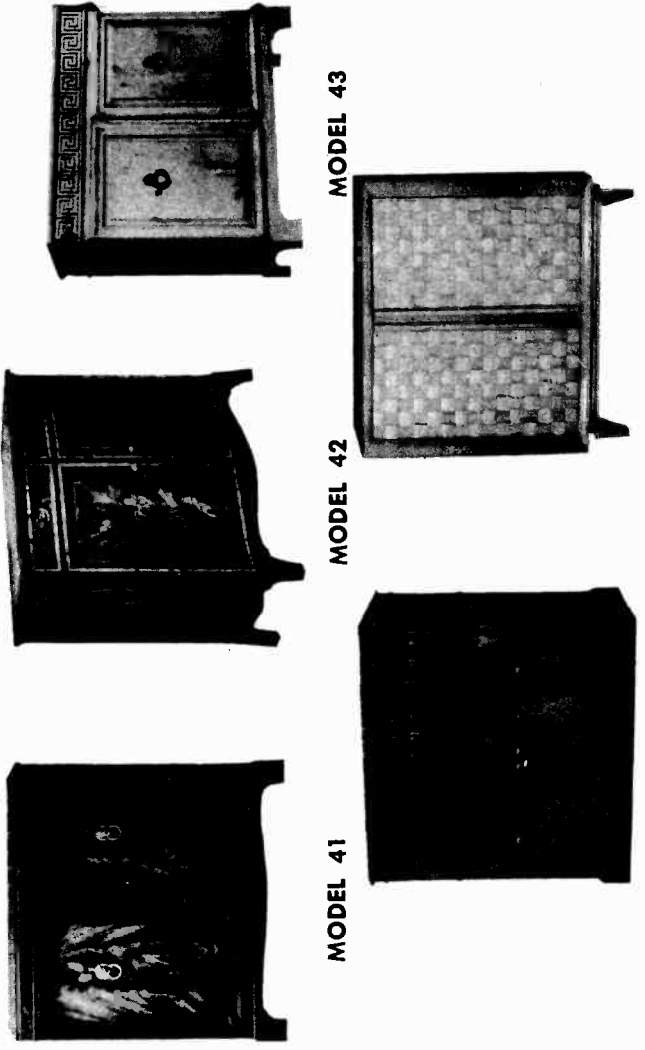
NOTE:—
 ① ALL ITEMS MARKED WITH AN * ARE FOR MODEL 502 ONLY.
 ② ALL ITEMS MARKED WITH AN † ARE NOT USED ON MODEL 502.

BAND-SWITCH, S1, SHOWN AT 6TH POSITION CLOCKWISE AT SHORT WAVE BAND 3 14.8-15.5 MC

SPECIFICATIONS

| Model | Name | Material | Color | Height | Width | Depth |
|-------|-----------------|-------------|-------------------|----------|----------|---------|
| 41 | St. James | Walnut | Walnut | 35 1/16" | 36 1/16" | 18 1/8" |
| | Berkeley Square | Mahogany | Mahogany | 35 1/16" | 36 1/16" | 18 1/8" |
| | Hanover | Mahogany | Blonde Mahogany | 35 1/16" | 36 1/16" | 18 1/8" |
| 42 | Stockton | Mahogany | Mahogany | 36 3/8" | 37 5/16" | 20 3/8" |
| 43 | Standish | Knotty Pine | Knotty Pine | 36 9/16" | 36 3/8" | 18 3/8" |
| 44 | Otley | Walnut | Walnut | 37 3/8" | 39 3/8" | 19 3/8" |
| | St. Martin's | Mahogany | Mahogany | 37 3/8" | 39 3/8" | 19 3/8" |
| | Claydon | Mahogany | Cham-pagne Finish | 37 3/8" | 39 3/8" | 19 3/8" |
| 45 | Westchester | Ash | Ash | 41 3/8" | 43" | 19" |

CABINET:



MODEL 41

MODEL 42

MODEL 43

MODEL 44

MODEL 45

MODELS MUSAPHONIC
41, 42, 43, 44, 45

GENERAL ELECTRIC CO.

GENERAL INFORMATION

INTRODUCTION

The information contained in this service note covers the MUSAPHONIC Models 41 thru 45 completely except for the record player.

THE TUNING SYSTEM

The "r-f end" of the receiver is unusual in a number of respects. Variable inductance tuning is employed instead of using a conventional tuning capacitor. This design makes possible two distinct advantages. First, it provides a high efficiency FM circuit in the 88 to 108 megacycle range which would not be possible with the more conventional methods of tuning. Second, it provides stable shortwave spread-bands which tune as easily as the broadcast band. Other advantages are also obtained but the two mentioned above are the most important.

Tuning is accomplished by an "elevator" which consists of a rigid plastic horizontal plate raised and lowered by means of a windlass controlled by the tuning knob at the panel. From this plate are suspended three powdered iron cores which tune the broadcast r-f, converter, and oscillator coils; and three tuning "vanes" which tune three low-inductance circuits. These latter circuits are employed in both FM bands and both shortwave bands with the exception of the antenna circuit for the shortwave spread-bands when a broad tuned antenna coil is used and the r-f guillotine tuner is switched out. They are called "guillotine" tuners because of their appearance.

FACTS ABOUT "GUILLOTINE" TUNING

The "guillotine" tuners are designed primarily for the 88-108 megacycle FM band where special technique is needed to realize high gain and circuit stability. Ordinary coils, tuned by a variable capacitor are inefficient at these frequencies, first, because of the low inductances required to reach these frequencies when a variable tuning capacitor is employed and, second, because shunt capacity reduces the gain of the amplifier circuit; shunt capacity must be kept very low. Another disadvantage of standard tuning arrangements at these frequencies is that common coupling is obtained through the shaft of a ganged tuning capacitor unless insulated single sections are used (cumbersome and costly). Common coupling of this type tends to cause oscillation or general instability and precludes high gain per stage. The guillotines make possible short leads, completely isolated sections, stable tuning, high Q circuits, low shunt capacity, and location of each tuner in the best physical and electrical position in the assembly. Furthermore, since the shunt capacity is small and the inductance is consequently at its highest corresponding value, the additional unavoidable inductance introduced in the wiring, band switch, etc., produces a minimum of circuit losses and unbalance.

The guillotine tuner consists of a heavy, silver-plated, two-turn square coil, rigidly supported between two plastic posts. A flat, solid vane slides up and down between the two turns. It is guided in grooves in the plastic posts so that it passes between the two sections of the coil without touching them. The posts are so moulded and the coil so constructed that the whole assembly is held rigidly at a predetermined spacing. The tuning vane is raised and lowered by the tuning elevator. When the elevator is all the way up (set tuned to lowest frequency), the vane is completely above the coil which then acts as a simple two-turn coil. As the set is tuned toward the higher frequencies, the vane moves downward into the field of the coil until, finally, it is all the way in. The vane reduces the inductance of the coil through two principles. First, it acts as a shorted turn, and thus reduces inductance directly; second, it provides a barrier between the two turns of the coil which reduces the mutual coupling and thus also reduces inductance.

The tuners described above are identified as L2, L7, and L9 on the schematic diagram.

FM BANDS

Guillotine tuners L2, L7, and L9 are used as the tuned circuits for the r-f amplifier, converter, and local oscillator respectively, in both FM bands. In the higher frequency band, the tuner is used with only a small shunt trimmer for adjusting distributed capacity. In the lower band, a higher value shunt trimmer is used to reduce the frequency. The layout of band switch, tuners, and tube sockets is arranged to give the shortest possible leads when the FM bands are in use. The lead length in the other bands is not nearly so critical.

| Part No. | Symbol | Description |
|------------------------------------|--|---------------------------------------|
| UNIVERSAL REPLACEMENT PARTS | | |
| UCC-035 | C208 | CAPACITOR—.001 mfd., 500 v., paper |
| UCC-036 | C85, 88 | CAPACITOR—.002 mfd., 600 v., paper |
| UCC-040 | C42, 49, 52, 53, 58, 63, 65, 71, 74, 75, 87, 90, 91, 94, 103, 104, 105, 107, 108, 109, 119, 124, 125, 126, 207 | CAPACITOR—.01 mfd., 600 v., paper |
| UCC-041 | C19, 18, 80, 83, 123, 209 | CAPACITOR—.02 mfd., 600 v., paper |
| UCC-042 | C79, 81, 82, 84 | CAPACITOR—.03 mfd., 600 v., paper |
| UCC-045 | C48, 50, 51, 93, 205, 206 | CAPACITOR—.05 mfd., 600 v., paper |
| UCC-048 | C76 | CAPACITOR—.10 mfd., 600 v., paper |
| UCC-056 | C203 | CAPACITOR—.002 mfd., 500 v., paper |
| UCG-2048 | C22 | CAPACITOR 680 mmf., mica |
| UCN-502 | C20 | CAPACITOR 1.5 mmf., ceramic |
| UCN-505 | C97 | CAPACITOR 4.7 mmf., ceramic |
| UCN-506 | C1, 8 | CAPACITOR 6.8 mmf., ceramic |
| UCN-1504 | C117 | CAPACITOR 3.3 mmf., ceramic |
| UCN-1530 | C21 | CAPACITOR 820 mmf., mica |
| UCU-012 | C64, 101 | CAPACITOR 22 mmf., mica |
| UCU-020 | C92 | CAPACITOR 47 mmf., mica |
| UCU-028 | C72, 102, 110, 133 | CAPACITOR 100 mmf., mica |
| UCU-520 | C26, 61, 66, 70, 99, 120, 121, 122 | CAPACITOR—47 mmf., mica |
| UCU-536 | C25 | CAPACITOR—220 mmf., mica |
| UCU-544 | C43, 106, 118 | CAPACITOR—470 mmf., mica |
| UCU-1504 | C95, 113, 115 | CAPACITOR—10 mmf., mica |
| UCU-1512 | C96 | CAPACITOR—22 mmf., mica |
| UCU-1532 | C30, 130 | CAPACITOR—150 mmf., mica |
| UCW-012 | C24 | CAPACITOR—22 mmf., ceramic |
| UCW-1004 | C36, 116 | CAPACITOR—10 mmf., ceramic |
| UCW-1014 | C11, 44, 54 | CAPACITOR—27 mmf., ceramic |
| UCW-1024 | C78 | CAPACITOR—68 mmf., ceramic |
| UCW-1028 | C69 | CAPACITOR—100 mmf., ceramic |
| UDL-005 | 11, 2 | PILOT LITE |
| UDL-008 | 1201 | PILOT LITE—Bayonet base |
| UJB-027 | | ANTENNA TERMINAL BOARD |
| UOP-101 | | SPEAKER—10-inch PM speaker |
| URD-013 | R34 | RESISTOR—33 ohms, 1/2 w., carbon |
| URD-025 | R207, 208, 211, 212 | RESISTOR—100 ohms, 1/2 w., carbon |
| URD-033 | R10, 46 | RESISTOR 220 ohms, 1/2 w., carbon |
| URD-041 | R20 | RESISTOR 470 ohms, 1/2 w., carbon |
| URD-049 | R63, 64, 65, 71, 204, 206, 209, 210 | RESISTOR 1000 ohms, 1/2 w., carbon |
| URD-055 | R222 | RESISTOR—1800 ohms, 1/2 w., carbon |
| URD-057 | R21, 28, 43, 44 | RESISTOR 2200 ohms, 1/2 w., carbon |
| URD-059 | R58, 217 | RESISTOR—2700 ohms, 1/2 w., carbon |
| URD-065 | R53, 55 | RESISTOR—4700 ohms, 1/2 w., carbon |
| URD-071 | R49, 52, 67, 217, 31 | RESISTOR—8200 ohms, 1/2 w., carbon |
| URD-077 | R56 | RESISTOR—15,000 ohms, 1/2 w., carbon |
| URD-079 | R221 | RESISTOR—18,000 ohms, 1/2 w., carbon |
| URD-081 | R9, 27, 36, 39 | RESISTOR—22,000 ohms, 1/2 w., carbon |
| URD-083 | R15 | RESISTOR—27,000 ohms, 1/2 w., carbon |
| URD-085 | R19, 215, 219 | RESISTOR—33,000 ohms, 1/2 w., carbon |
| URD-089 | R216, 41 | RESISTOR 47,000 ohms, 1/2 w., carbon |
| URD-093 | R25 | RESISTOR 68,000 ohms, 1/2 w., carbon |
| URD-095 | R13, 17 | RESISTOR 82,000 ohms, 1/2 w., carbon |
| URD-097 | R3, 7, 23, 24, 42, 59 | RESISTOR 100,000 ohms, 1/2 w., carbon |
| URD-099 | R32, 33, 60 | RESISTOR—120,000 ohms, 1/2 w., carbon |
| URD-103 | R31 | RESISTOR—180,000 ohms, 1/2 w., carbon |
| URD-105 | R203, 205 | RESISTOR—220,000 ohms, 1/2 w., carbon |
| URD-109 | R37, 38 | RESISTOR—330,000 ohms, 1/2 w., carbon |
| URD-127 | R8, 14, 30, 47, 66 | RESISTOR—470 ohms, 1/2 w., carbon |
| URD-121 | R1, 12, 54, 57, 51, 218, 220 | RESISTOR—1.0 meg., 1/2 w., carbon |
| URD-125 | R2, 6, 62 | RESISTOR—1.5 meg., 1/2 w., carbon |
| URD-129 | R22, 61, 68, 69, 70, 71, 72, 73 | RESISTOR—2.2 meg., 1/2 w., carbon |
| URD-133 | R74, 80 | RESISTOR—3.3 meg., 1/2 w., carbon |
| URD-137 | R16, 18 | RESISTOR—4.7 meg., 1/2 w., carbon |
| URD-141 | R40 | RESISTOR—6.8 meg., 1/2 w., carbon |
| URE-067 | R214 | RESISTOR—5600 ohms, 1 w., carbon |
| URE-073 | R50, 4 | RESISTOR—10,000 ohms, 1 w., carbon |
| URE-089 | R26 | RESISTOR—47,000 ohms, 1 w., carbon |
| URF-079 | R29, 35 | RESISTOR—18,000 ohms, 2 w., carbon |

SHORTWAVE SPREAD-BANDS

Band spread tuning in the shortwave bands is obtained in the converter and oscillator circuits by inserting the guillotine tuners in series with a higher inductance so that the two inductances together form the "L" part of the shortwave tuned circuit. The small percentage change in inductance obtained in the tuner provides smooth, wide, and stable tuning. The "C" part of the tuned circuit consists primarily of a shunt trimmer. Switching from one shortwave band to the other is accomplished by selecting a different shunt trimmer.

The converter grid circuit, as an example, includes L8 and L7 in series in the SW1, SW2 and SW3 bands. Tuner L7 is in the ground end of the circuit and the signal is fed into the grid end through C26. The shunt tuning capacity is C37, C39, or C40, depending upon which of the three shortwave bands is used. Additional oscillator coupling capacitors C95, C96 and C97 are also added to compensate for the lower coupling through C20 when the higher shunt capacitors are in the circuit.

In the r-f stage, a section of the loop is used as the grid circuit. It is tuned for resonance by a shunt capacitor (C9, C14, or C15) and a shunt inductance (L25). Because a tuned circuit of this type is inherently broad, tuning through the relatively narrow spread-band offers little advantage and is not done.

STANDARD BROADCAST BAND

When manual tuning is employed (band switch in STD position), the receiver employs an r-f stage, a converter, and an oscillator, all of which are tuned by iron slugs suspended from the tuning elevator. When push buttons are used, the r-f stage is not used. Instead, a separate antenna coil is used which couples the antenna and loop directly into the converter. A separate coil is used in order to make the tuning circuit independent of the dial tuning mechanism so that it may be tuned by trimmers in the push-button assembly.

Switching from manual to push-button tuning is accomplished in the oscillator by using an oscillator coil which is tuned by a separate shunt inductance. In manual tuning, the inductance is one which is tuned by the tuning elevator. In push-button tuning, a fixed shunt capacity C22 plus one of a series of push-button selected coils tunes the oscillator.

I-F AMPLIFIER

The i-f amplifier consists of a composite 455 kc and 10.7 mc circuit. The electrical changes required to transfer between AM and FM service are made by the band switch. When the switch is in either the FM1 or FM2 position, the amplifier operates at 10.7 megacycles and delivers the i-f signal into an FM discriminator circuit. When the switch is in any of the other positions, the amplifier operates at 455 kc. Screen voltage is removed from the tube which acted as an FM limiter and this tube then acts as an AM diode detector.

Thus, the AM audio signal appears across R24 while the FM audio signal appears across R32. A section of the band switch switches the audio input circuit from one to the other. The AVC bus is also shorted out for FM.

REPLACEMENT OF DRIVE CORDS

Dial Stringing

Push the tuning elevator all the way down and string the dial as shown in Figure 1. This illustration shows the stringing as viewed from behind the dial scale, as you would see it when working on it. The numbers and arrows indicate the progression of the dial cord from start to finish. Notice that the dial cord, in progressive steps 9, 10, 11, and 12, is made to travel behind the start and end of cord stringing, as viewed in Figure 1. The procedure will be easier if pulley C is by-passed until the rest of the work is finished after which the cord can be pulled tight over that pulley. During the procedure, locate the two brass eyelets so that they fall between pulleys A and B. When finished, crimp the eyelets on the cord in the proper positions to act as minimum and maximum stops for the tuning mechanism. Insert pins through the cord and glue to prevent eyelets from moving. Clip the pointer on the cable halfway between the eyelets.

Separate detail drawings are given to show the three different methods of attaching the ends of the cord. The arrangement with the standard helical spring was used in some earlier production receivers. If the cord and spring are to be replaced, the Type 1 spring should be used. It fits the same drum and is an improved type. The Type 2 spring should be used with the later type of drum (with two tabs). When stringing the mechanism with either the Type 1 or Type 2 spring, load the spring by pulling the hook over the projection at the other end of the spring, string the dial and, as a final step, release the hook so that it pulls up the slack in the dial cord.

Elevator Stringing

The step-by-step procedure for stringing the elevator windlass is shown in Figure 2, a rear view of the mechanism. Start by inserting the metallic cord in slot as shown in Step 1. Observe that the cord is measured five inches from end of loop to where it enters the slot. Now bring the loop end around the pulley counterclockwise, as in Step 2. Next, thread loop through hole in elevator top plate, fastening it to the hoist cord tension spring, as viewed in Step 3. Steps 4, 5, 6, and 7 show how the free end of cord progresses on the pulley, going clockwise and that each turn is laid progressively one in back of the other and in back of the vertical section, going to the tension spring in tuner plate. In Step 6, pass the free end of cord down through the hole in chassis, grasping its end with long-nosed pliers and drawing tension on cord while running elevator completely down to the bottom. Keeping tension on cord and forcing large dial drive drum so that hoist cord

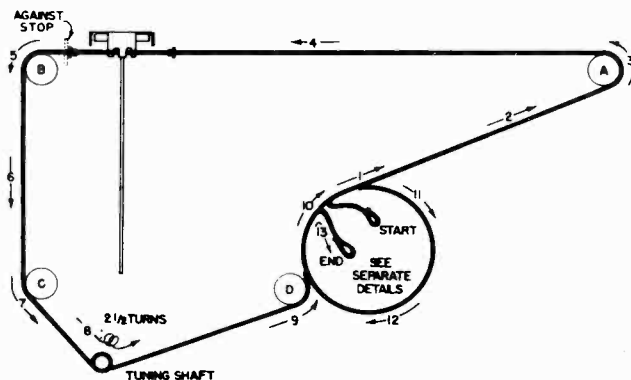


Figure 1—Dial Stringing Diagram Showing Spring Details at Right

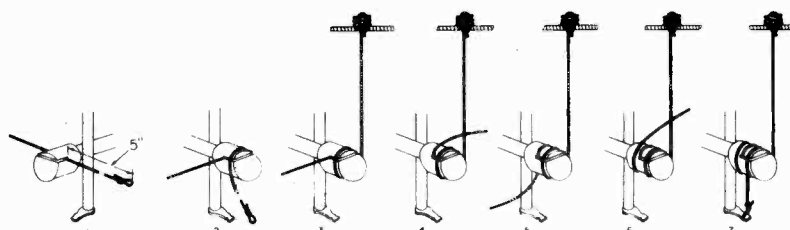
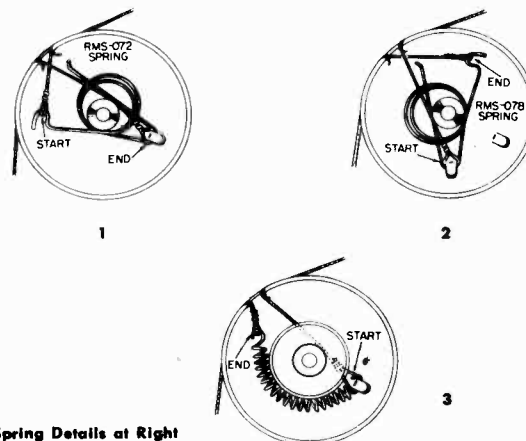


Figure 2—Elevator Windlass Stringing Procedure

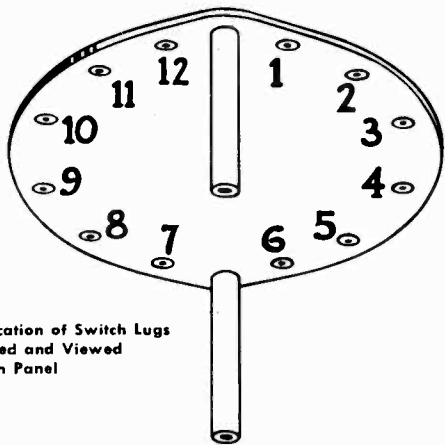


Figure 3—Identification of Switch Lugs
—Set Inverted and Viewed
from Panel

spring is compressed, complete Step 7 making a one turn loop of the cord's free end around the lug shown on end of elevator shaft, and solder.

Concluding Comments

After replacing the dial cord or the elevator cord, it may be found that some correction in relative positioning is needed. This can be done by loosening the setscrews in the large drive pulley directly behind the dial scale and repositioning it on the shaft. The object, of course, is to permit the tuning control to drive the elevator through its full tuning range. Slight

errors in final setting are not serious since leeway is provided in the location of the dial pointer itself.

WIRING OF BAND SWITCH

In order to facilitate repair, replacement, and circuit tracing, a table and diagrams are supplied with reference to the connections made in the band switch. If used properly, these will be of invaluable aid. The remarks which follow are intended to clarify the make-up of the tables and diagrams—read them carefully before using the table.

The table is broken down into seven parts, one for each switch wafer. Section 1 is nearest the front and Section 7 is the rearmost wafer.

Individual lugs on each wafer are numbered from 1 to 12, depending upon their position on the wafer. The method of numbering is illustrated in Figure 3. In determining the number, turn the chassis upside down and look from the front toward the rear of the chassis. Thus, lugs 1 and 12 are the ones which are at the bottom when the set is in its normal position; lugs 3 and 4 are on the side with the broadcast band coils; and lugs 9 and 10 are on the side with the 6AK5 tubes. The numbering refers to lugs whether they be on the front or rear of the wafer.

Figure 6 shows the physical location of various components and terminals to which reference is made in the table.

In those cases where a component symbol number is given in column two, instead of a wire, that component is connected by its own lead wire directly to the switch lug and the connection of the other end of the component is given in the last column.

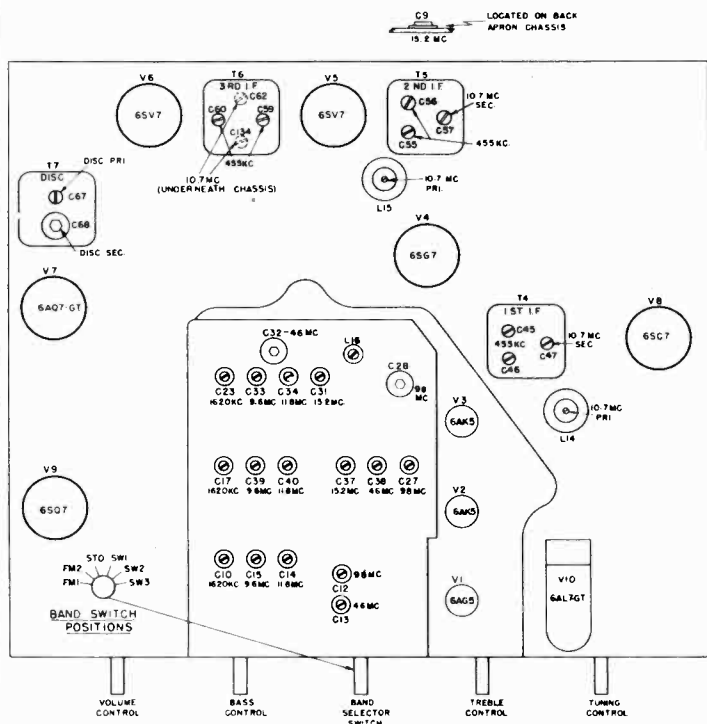


Figure 9—Location of Tubes and Adjusters

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed have a tolerance of $\pm 20\%$. AM IF measurements should be taken with low signal so that AVC is not effective. R-f measurements should be made by measuring the d-c voltage developed at the r-f tube grid (V1) or converter tube grid (V2) by rectification of the signal.

(1) R-F and I-F Stage Gains

Signal applied through IRE dummy antenna:

| | |
|-------------------------|---------------|
| Antenna post to V1 grid | 3 @ 1000 kc |
| Antenna post to V1 grid | 2.5 @ 9.6 mc |
| Antenna post to V1 grid | 2.0 @ 11.8 mc |
| Antenna post to V1 grid | 2.0 @ 15.2 mc |

Signal applied through 300 ohms, including signal generator impedance.

| | |
|-----------------------------|-------------|
| Dipole terminals to V1 grid | 1.5 @ 45 mc |
| Dipole terminals to V1 grid | 1.5 @ 98 mc |

These checks made with oscillator tube (V3) removed:

| | |
|--------------------|--------------|
| V1 grid to V2 grid | 10 @ 1000 kc |
| V1 grid to V2 grid | 6 @ 9.6 mc |
| V1 grid to V2 grid | 7 @ 11.8 mc |
| V1 grid to V2 grid | 12 @ 15.2 mc |
| V1 grid to V2 grid | 7 @ 45 mc |
| V1 grid to V2 grid | 6 @ 98 mc |

These checks with oscillator tube (V3) removed:

| | |
|--------------------|--------------|
| V2 grid to V4 grid | 24 @ 455 kc |
| V2 grid to V4 grid | 42 @ 10.7 mc |
| V4 grid to V5 grid | 17 @ 455 kc |
| V4 grid to V5 grid | 56 @ 10.7 mc |
| V5 grid to V6 grid | 50 @ 455 kc |
| V5 grid to V6 grid | 20 @ 10.7 mc |

(2) Audio Gain

.065 volts at 400 cps to V7 grid with volume control set at maximum will give approximately $\frac{1}{2}$ -watt output across the speaker voice coil.

0.35 volts at 400 cps at input of power amplifier chassis (V201, pin 4) will give approximately $\frac{1}{2}$ -watt output across the speaker voice coil.

(3) Oscillator Grid Bias

D-c voltage developed across R9 (average):

| | |
|------------------|------------------|
| 12 v. @ 1000 kc | 6.5 v. @ 15.2 mc |
| 2.8 v. @ 9.6 mc | 4.6 v. @ 45 mc |
| 4.7 v. @ 11.8 mc | 3.5 v. @ 98 mc |

(4) Socket Pin Voltages

Figures 10 and 11 show typical tube pin voltages. All readings should be made from the pins to ground unless otherwise indicated.

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MODELS MUSAPHONIC
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WIRING OF BAND SWITCH

(Wire length given from end to end before stripping)

SECTION 1

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|---|--|
| 1 | Insulated green wire, 13/4" lg. | Antenna terminal at rear of chassis |
| 2-3 | | |
| 3 | | |
| 4 | Capacitor C8 | Switch section 2, lug 11 |
| 5 | | |
| 6 | (Front lug) capacitor C30 (Rear lug) short copper strap | Chassis Trimmer C12, lug nearer T2 |
| **7 | a. C11 b. One side of 300-ohm transmission line | Tube socket V1, pin 2 Hot dipole terminal at rear of chassis |
| 8 | | |
| 9 | a. Short bus with spaghetti, 1 3/4" long b. Short bus with spaghetti | Chassis Section 1, terminal 12 |
| 10 | Insulated white wire, 5 1/2" long | Dial switch 52-A terminal N |
| 11 | a. Insulated green wire, 3 3/4" lg. b. Insulated orange wire, 6" lg. c. Insulated green wire, 12 3/4" lg. | Antenna transformer T2, terminal 2 Push-button transformer T1, terminal 2 Loop socket J3, at rear of chassis, terminal 1 |
| 12 | See lug 9 above | |

SECTION 2

| | | |
|------|---|---|
| 1 | Choke, L25 | Ground on band switch shield |
| 2 | a. Insulated green wire, 3 3/4" lg. b. Capacitor, C1 | Trimmer C10, lug nearer T2 Section 2, lug 12 |
| 3 | Insulated green wire, 2 1/4" lg. | Trimmer C15, lug nearer T2 |
| 4 | Insulated green wire, 2" long | Trimmer C14, lug nearer T2 |
| 5 | | |
| 6 | Short copper strap | Trimmer C13, lug nearer tube V1 |
| 7 | Short copper strap | Tuner L2, terminal nearer rear of chassis |
| 8 | Capacitor C16 | Tube socket V1, pin 1 |
| 9 | | |
| 10 | Insulated brown wire, 6" lg. | Dial switch 52-A, terminal O |
| **11 | a. Insulated yellow wire, 12 3/4" long b. See section 1, lug 4 | Loop socket J3 at rear of chassis, terminal 3 |
| 12 | a. Insulated blue wire, 6 1/2" lg. b. See lug 2, above | Dial switch 52-A, terminal M |

SECTION 3

| | | |
|-------|---|--|
| 1 | | |
| 2 | a. Choke, L6 b. Capacitor, C18 c. Insulated red wire, 3" long d. Insulated red wire, 5 3/4" long | Switch section 3, lug 9 Ground on band switch shield RF transformer T3, terminal 1 Terminal strip 1, terminal 2 |
| 3 | Insulated green wire 2 1/4" long | RF transformer T3, terminal 2 |
| 4-5 | | |
| 5 | | |
| 6 | Short bus with spaghetti, 1 3/4" long | Terminal strip 2, terminal 4 |
| 7 | Insulated yellow wire, 16" lg. | Resistor R44 on terminal board on chassis rear apron |
| 8 | a. Resistor R10 b. Copacitor, C119 c. Insulated blue wire, 8 1/4" lg. | Tube socket V3, pin 5 Ground lug on band switch shield Push-button switch 52H, terminal A |
| 9 | a. See lug 2 (a), above b. Capacitor C26 | Section 4, lug 11 |
| 10 | Resistor, R26 | Ground lug on terminal strip 2 |
| 11-12 | | |

SECTION 4

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|---|---|
| 1 | Copper strap with tubing, 3" long | Trimmer C38, lug nearer L7 |
| 2 | Copper strap with tubing, 2 1/2" long | Coil L8, terminal 2 |
| 3 | Insulated brown wire, 7" lg. | Dial switch 52A, terminal Q |
| 4 | Insulated green wire, 2 1/4" lg. | Trimmer C39, lug nearer T3 |
| 5 | Insulated green wire, 2" long | Trimmer C40, lug nearer T3 |
| 6 | Short copper strap | Trimmer C37, lug nearer L7 |
| 7 | Short copper strap | Tuner L7, rear terminal |
| 8 | Capacitor, C41 | Tube socket V2, pin 1 |
| 9 | Bus with spaghetti, 2" long | Ground lug on terminal strip 2 |
| 10 | Insulated white wire, 2 1/2" lg. | Terminal strip 2, terminal 1 |
| 11 | a. See section 3, lug 9 b. Copper strap with tubing, 3 1/2" long | Coil L8, terminal 1 |
| 12 | | |

SECTION 5

| | | |
|----|---|---|
| 1 | a. Bus with spaghetti, 2" long b. Capacitor C36 | Section 5, lug 6 Section 6, lug 1 |
| 2 | a. Insulated green wire, 2 3/4" lg. b. Insulated blue wire, 6 1/2" lg. | Broadcast oscillator coil L16, terminal 1 Dial switch 52A, terminal T |
| 3 | Insulated green wire, 2 1/2" lg. | Trimmer C33, lug nearer L11 |
| 4 | Insulated green wire, 2" lg. | Trimmer C34, lug nearer L11 |
| 5 | a. Capacitor, C97 b. Copper strap with tubing, 2" lg. | Trimmer C37, lug nearer T3 Trimmer C31, lug nearer L16 |
| 6 | a. See lug 1(a) above b. Capacitor, C116 c. Copper strap with tubing, 3 3/4" long | Trimmer C38, lug nearer tuner L7 Air trimmer C32, right-hand terminal* |
| 7 | Short copper strap | Tuner L9, left-hand terminal* |
| 8 | Resistor R34 | Capacitor, C35 |
| 9 | | |
| 10 | a. Short copper strap b. Copper strap with tubing, 3 1/2" long | Section 6, lug 11 SW oscillator coil L10, terminal 2 |
| 11 | a. Capacitor C77 b. Copper strap with tubing, 3" lg. | Chassis ground SW oscillator coil L10, terminal 1 |
| 12 | | |

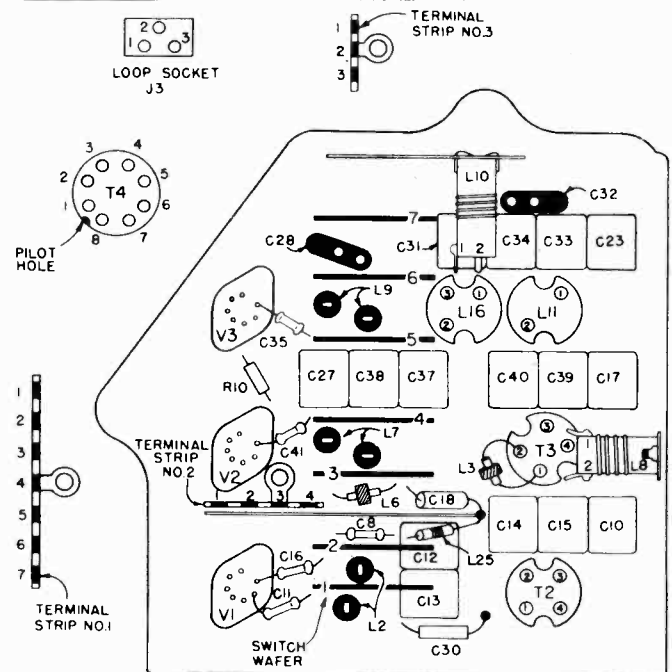


Figure 6—Physical Location of Components Listed in Band Switch Wiring Table

MODELS MUSAPHONIC
41, 42, 43, 44, 45

GENERAL ELECTRIC CO.

SECTION 6

WIRING OF BAND SWITCH (Cont'd)

SECTION 7

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|--|
| 1 | a. See section 5, lug 1 b. Capacitor C78 c. Copper strap with tubing, 6" lg. | Tuner L9, right-hand terminal* Air trimmer C32, left-hand terminal* |
| 2 | Insulated black wire, 5/4" lg. | 1st IF transformer T4, terminal 8 |
| 3 | Insulated green wire, 2 1/4" lg. | Broadcast oscillator coil L16, terminal 3 |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | Short copper strap | Air trimmer C28, right-hand terminal* |
| 8 | Copper strap, 2" long | Tube socket V3, pin 7 |
| 9 | Insulated green wire, 3 1/2" lg. | 1st IF transformer T4, terminal 5 |
| 10 | Insulated yellow wire, 4 1/4" lg. | 1st IF transformer T4, terminal 3 |
| 11 | See section 5, lug 10(a) | |
| 12 | | |

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|---|---|
| 1 | | |
| 2 | Shielded green wire, 1 3/4" lg. | Discriminator audio output at R30 |
| 3 | | |
| 4 | Insulated blue wire of tuning eye cable | Tuning eye tube socket V10, pin 4 |
| 5 | | |
| 6 | Insulated blue wire, 4" lg. | Terminal strip 3, terminal 3 |
| 7 | Bus wire with spaghetti, 2" lg. | Trimmer C31, terminal nearer C32 |
| 8 | | |
| 9 | | |
| 10 | Shielded green wire, 8 3/4" lg. | Phano switch S2H, terminal E |
| 11 | Insulated green wire, 10 1/2" lg. | Resistor R54 on main chassis |
| 12 | Shielded green wire, 11 1/4" lg. | AM audio output at R25 |

* Lacking from front, chassis inverted.
** Double lug (front and rear) soldered together.

ALIGNMENT

EQUIPMENT REQUIRED:

1. Test oscillator with tone modulation. (See Table.)
2. D-c voltmeter or microammeter. (See Notes 2 and 3.)
3. A-c voltmeter, 1.41 volts. (See Note 6.)
4. Insulated hex wrench, 1/4-inch.
5. .01 mfd. paper capacitor.
6. 400-ohm, 1/2 watt resistor.
7. 200 mmf. mica capacitor.

| Step | Signal Generator Frequency | Signal Input Point | Band Switch | Dial Setting | Adjust | See Note | Remarks |
|------|----------------------------|--------------------|-------------|--------------|--------|----------|---------|
|------|----------------------------|--------------------|-------------|--------------|--------|----------|---------|

AM IF ALIGNMENT

| | | | | | | | |
|---|--------|---------------------|-----|-------|----------------|---------|--|
| 1 | 455 kc | Conv. grid directly | STD | ..... | Peak C60 & C59 | 4, 5, 6 | |
| 2 | 455 kc | Conv. grid directly | STD | ..... | Peak C56 & C55 | 4, 5, 6 | |
| 3 | 455 kc | Conv. grid directly | STD | ..... | Peak C45 & C46 | 4, 5, 6 | |

FM IF ALIGNMENT

| | | | | | | | |
|---|--------------|---------------------------|-----|-------|------------------|---------|---|
| 4 | 10.7 mc | 2nd 6SV7 grid thru .01 mf | FM1 | ..... | C68 for zero** | 1, 2 | Adjust C68 for zero meter reading. Apply 1-volt signal input. |
| 5 | ..... | 2nd 6SV7 grid thru .01 mf | FM1 | ..... | Signal Generator | 1, 2 | Detune signal generator to point of maximum meter reading. |
| 6 | As in step 5 | 2nd 6SV7 grid thru .01 mf | FM1 | ..... | Peak C67 | 1, 2 | |
| 7 | 10.7 mc | 1st 6SV7 grid thru .01 mf | FM1 | ..... | Peak C62 & C134 | 1, 3 | 6AQ7GT tube removed from socket. |
| 8 | 10.7 mc | 6SG7 grid thru .01 mf | FM1 | ..... | Peak C57 & L15 | 1, 3 | 6AQ7GT tube removed from socket. |
| 9 | 10.7 mc | Conv. grid directly | FM1 | ..... | Peak C47 & L14 | 1, 3, 4 | 6AQ7GT tube removed from socket. |

FM RF ALIGNMENT

| | | | | | | | |
|----|-------|------------------|-----|-------------------------|------------|-------------|--|
| 10 | 98 mc | DIPOLE terminals | FM2 | 98 mc—3.55 to 3.65 in.* | Peak C28** | 1, 3, 7, 10 | Set dial accurately—then adjust C28. |
| 11 | 98 mc | DIPOLE terminals | FM2 | For max. output | Peak C27 | 1, 3, 8 | Tune dial for maximum output—then peak C27 while rocking dial. |
| 12 | 98 mc | DIPOLE terminals | FM2 | Do not change | Peak C12 | 1, 3 | |
| 13 | 46 mc | DIPOLE terminals | FM1 | 46 mc—3.25 to 3.35 in.* | Peak C32** | 1, 3, 7, 10 | Set dial accurately—then adjust C32. |
| 14 | 46 mc | DIPOLE terminals | FM1 | For max. output | Peak C38 | 1, 3, 8 | Tune dial for maximum output then peak C38 while rocking dial. |
| 15 | 46 mc | DIPOLE terminals | FM1 | Do not change | Peak C13 | 1, 3 | |

* Important! See Note 7.
** Use insulated hex wrench, 1/4 inch.

GENERAL ELECTRIC CO.

MODELS MUSAPHONIC
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ALIGNMENT TABLE (Cont'd)

| Step | Signal Generator Frequency | Signal Input Point | Band Switch | Dial Setting | Adjust | See Note | Remarks |
|----------------------------------|----------------------------|-----------------------|-------------|-----------------------------|-------------------------|-------------|--|
| SW RF ALIGNMENT | | | | | | | |
| 16 | 15.2 mc | Antenna thru 400-ohms | SW3 | 15.2 mc—3.7 to 3.8 in.* | Peak C31 | 5, 6, 7, 10 | Set dial accurately—then adjust C31. |
| 17 | 15.2 mc | Antenna thru 400-ohms | SW3 | Do not change | Peak C37 | 5, 6, 8 | Peak C37 while rocking dial. |
| SW RF ALIGNMENT continued | | | | | | | |
| 18 | 15.2 mc | Antenna thru 400-ohms | SW3 | Do not change | Peak C9 | 5, 6, 11 | C9 is located on back apron of chassis |
| 19 | 11.8 mc | Antenna thru 400-ohms | SW2 | 11.8 mc—3.35 to 3.45 in.* | Peak C34 | 5, 6, 7, 10 | Set dial accurately—then adjust C34 |
| 20 | 11.8 mc | Antenna thru 400-ohms | SW2 | Do not change | Peak C40 | 5, 6, 8 | Peak C40 while rocking dial. |
| 21 | 11.8 mc | Antenna thru 400-ohms | SW2 | Do not change | Peak C14 | 5, 6, 11 | |
| 22 | 9.6 mc | Antenna thru 400-ohms | SW1 | 9.6 mc—4.0 to 4.1 in.* | Peak C33 | 5, 6, 7, 10 | Set dial accurately—then adjust C33. |
| 23 | 9.6 mc | Antenna thru 400-ohms | SW1 | Do not change | Peak C39 | 5, 6, 8 | Peak C39 while rocking dial. |
| 24 | 9.6 mc | Antenna thru 400-ohms | SW1 | Do not change | Peak C15 | 5, 6, 11 | |
| BROADCAST RF ALIGNMENT | | | | | | | |
| 25 | 1620 kc | Antenna thru 200 mmf | STD | Extreme right-hand position | Peak C23 | 5, 6 | |
| 26 | 1620 kc | Antenna thru 200 mmf | STD | Extreme right-hand position | Peak C17 | 5, 6 | |
| 27 | 1620 kc | Antenna thru 200 mmf | STD | Extreme right-hand position | Peak C10 | 5, 6, 11 | |
| 28 | 1500 kc | Antenna thru 200 mmf | STD | 1500 kc—1.35 to 1.45 in.* | Osc. coil L11 iron slug | 5, 6, 7, 9 | L11 iron slug is the rear one on left side. |
| 29 | 1000 kc | Antenna thru 200 mmf | STD | For max. output | R-F coil, T3 iron slug | 5, 6, 9 | T3 iron slug is the center one on left side. |
| 30 | 1000 kc | Antenna thru 200 mmf | STD | Do not change | Ant. coil, T2 iron slug | 5, 6, 9 | T2 iron slug is the front one on left side. |
| 31 | 580 kc | Antenna thru 200 mmf | STD | For max. output | Peak L16 | 5, 6, 8 | Peak L16 while rocking dial. |
| 32 | | | | | | | Repeat steps 25-31. |

* Important! See Note 7

Notes in Connection with Alignment Table:

- Use *unmodulated* signal.
- Connect 20,000 ohms-per-volt meter from junction of R30 and C72 to chassis. Use ten-volt scale (steps 4-6).
- Connect 20,000 ohms-per-volt meter from grid (pin 2) of 6SV7 LIMITER to chassis with a 200,000-ohm resistor connected in series. The resistor must be connected directly to the grid so that capacity loading will be negligible and so that the meter is isolated from the i-f signal voltage. Keep signal generator output down so that the meter indicates not more than one volt at the grid (5 microamperes through 200,000 ohms) (alignment steps 7 to 15).
- Connect signal generator directly to the converter grid at some convenient point. The generator lead must be shielded up to this connection so that not more than $\frac{1}{16}$ inch of exposed lead exists. Ground the shield solidly by clamping it firmly to the chassis or a shield as close to the connection as possible. (Steps 1-3, 9.)
- Use 400-cycle modulation.
- Connect a standard output meter across the speaker voice coil. Turn volume control fully on. Keep signal generator output down so that the meter indicates not more than $\frac{1}{2}$ watt output (1.41 volts) during alignment.
- If dial scale is not available, index pointer as follows: Turn pointer to right-hand limit of travel. Mark the dial backplate at a reference edge of the pointer slider. Then set pointer by turning dial knob until the indicated dimension exists between the reference edge and the mark.
- "Rocking" consists of adjusting the indicated adjuster while turning the dial a small amount back-and-forth through peak output. The object is to find the maximum peak. Rocking is necessary and is permissible only when interlocking circuits are being adjusted.
- The main iron tuning slugs are suspended from the left side of the tuning "elevator." They are individually adjustable by loosening the locknut and turning the supporting screw into which the suspending wire is soldered.
- Two oscillator settings may give response. The higher frequency response point is the correct one; the other is the image. If in doubt, start with the trimmer screw loosened completely and adjust for the *first* response.
- Loop antenna must be plugged in when aligning antenna trimmers C9, C10, C14, and C15.

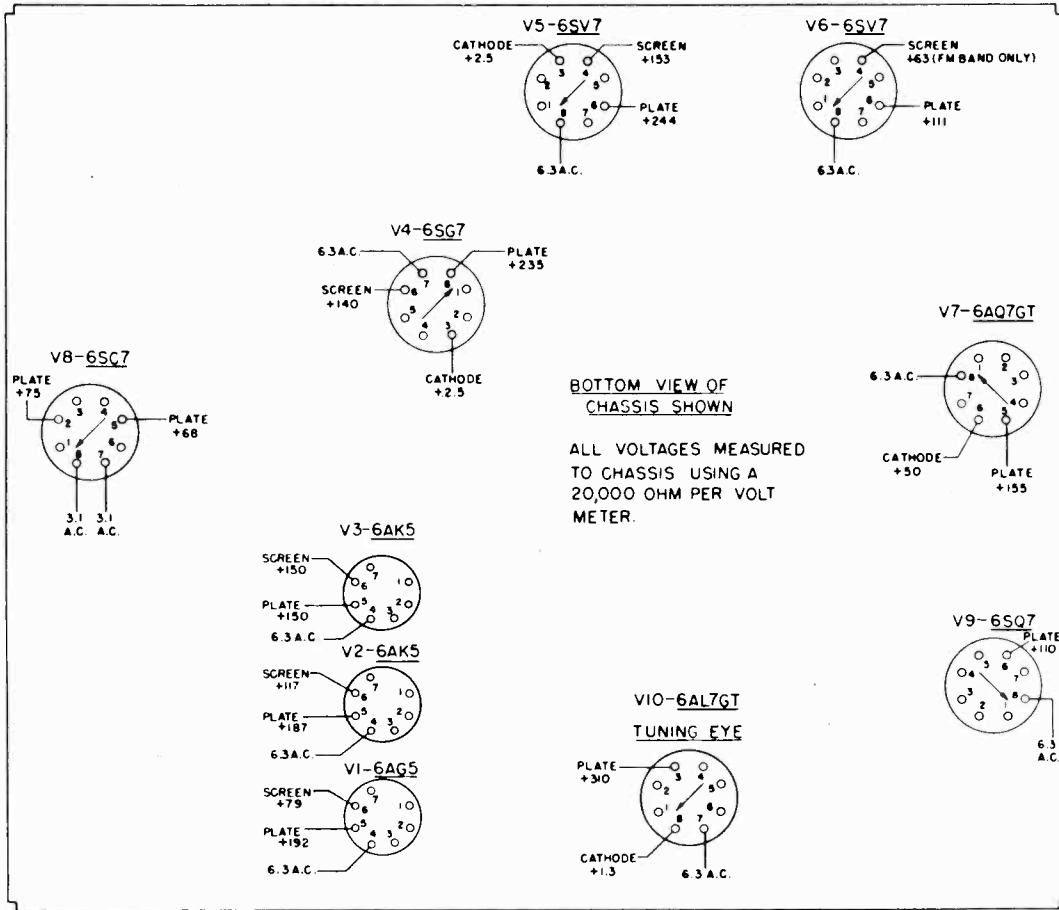
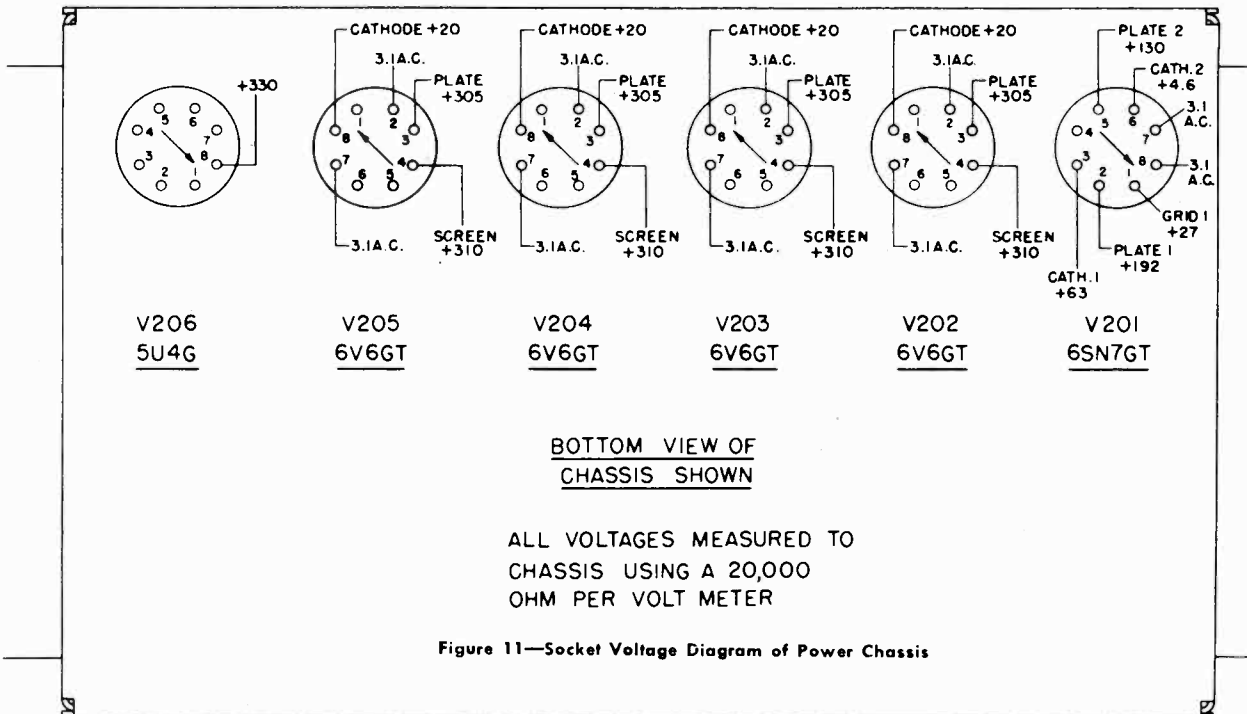


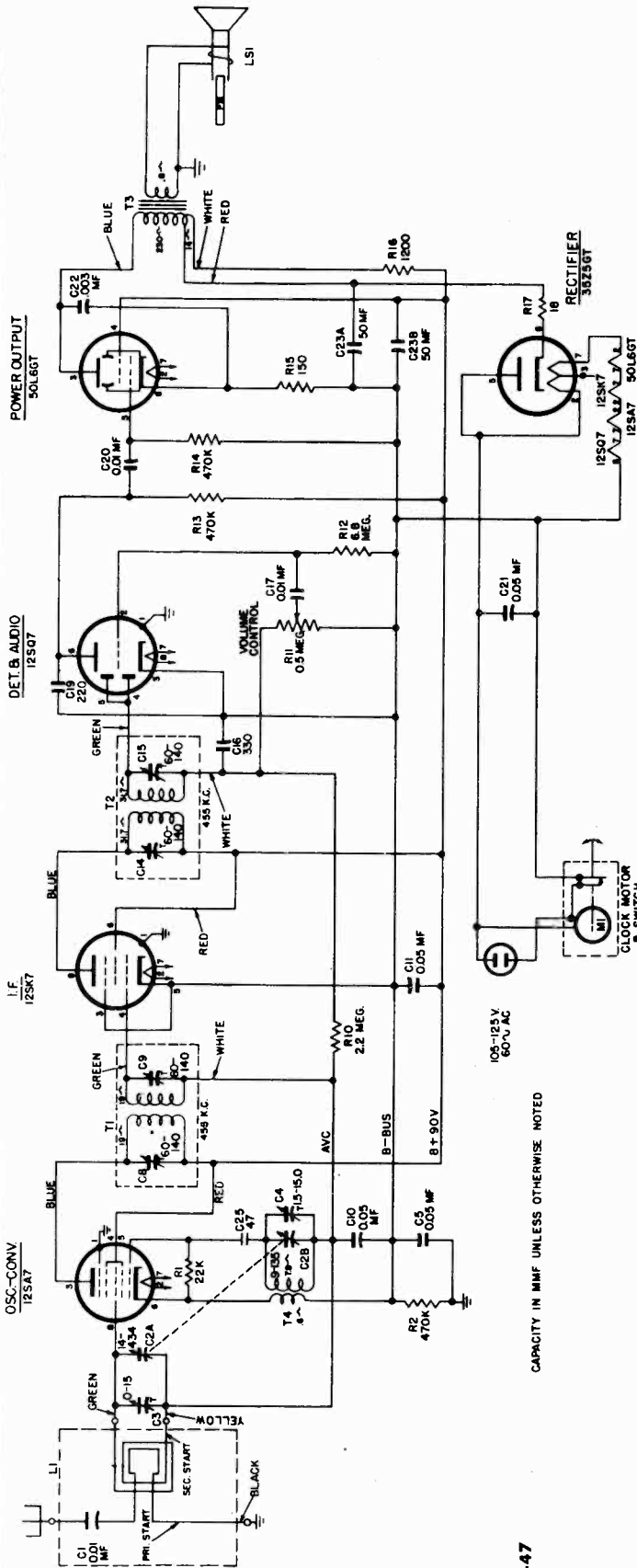
Figure 10—Socket Voltage Diagram of Main Chassis



GENERAL ELECTRIC CO.

MODELS MUSAPHONIC
41, 42, 43, 44, 45

| Part No. | Symbol | Description | Part No. | Symbol | Description |
|--------------------------------------|-------------------------------|---|---|------------|--|
| SPECIALIZED REPLACEMENT PARTS | | | SPECIALIZED REPLACEMENT PARTS (Cont'd) | | |
| RAB-028 | L1 | LOOP AND BACK ASSEMBLY—Model 41, Walnut | RJS-065 | | SOCKET—Pilot light socket and leads |
| RAB-029 | L1 | LOOP AND BACK ASSEMBLY—Model 41, Mahogany | RJS-066 | | MOUNTING PLATE—Electrolytic mounting plate, on SPU chassis |
| RAB-030 | L1 | LOOP AND BACK ASSEMBLY—Model 41, Blonde Mahogany | RJS-073 | | SOCKET—Phono-lite socket |
| RAB-031 | L1 | LOOP AND BACK ASSEMBLY—Model 42, Mahogany | RJS-085 | J3 | SOCKET—Tube socket for V8 |
| RAB-032 | L1 | LOOP AND BACK ASSEMBLY—Model 43, Knotty Pine | RJX-003 | P202 | RECEPTACLE—Phono input |
| RAB-033 | L1 | LOOP AND BACK ASSEMBLY—Model 44, Walnut | RJX-005 | | PLUG—4-pin amphenol for pilot light and speaker cable |
| RAB-034 | L1 | LOOP AND BACK ASSEMBLY—Model 44, Mahogany | RJX-006 | | PLUG RECEPTACLE AND LOCK RING—For power receptacle on main chassis |
| RAB-035 | L1 | LOOP AND BACK ASSEMBLY—Model 44, Champagne Finish Mahogany | RLA-006 | T1 | B.C.P.B. ANTENNA TRANSFORMER |
| RAB-042 | L1 | LOOP AND BACK ASSEMBLY—Model 42, Mahogany, 50 cycles | RLA-009 | T2 | COIL—Broadcast band antenna coil |
| RAB-044 | L1 | BACK AND LOOP ASSEMBLY—Model 45 | RLA-012 | L4, 13, 28 | COIL—FM antenna choke, FM oscillator cathode choke, oscillator cathode choke |
| RAD-018 | | BRACKET—Band switch (front) | RLB-006 | T3 | COIL—Broadcast band RF coil |
| RAD-019 | | BRACKET—Band switch (rear) | RLB-008 | L6 | COIL—SW band RF plate choke coil |
| RAD-020 | | BRACKET—For coil on rear bracket of band switch | RLB-009 | L3 | COIL—Broadcast RF primary dummy |
| RAD-023 | | MOUNTING BRACKET—Dial scale | RLC-015 | L10 | COIL—SW oscillator loading coil |
| RAL-001 | | BEZEL—Dark | RLC-016 | L16 | COIL—Broadcast band oscillator shunt coil |
| RAL-002 | | BEZEL—Light | RLC-017 | L8 | COIL—SW band RF loading coil |
| RAX-014 | | BRACKET AND ROLLER FORK ASSEMBLY—For tuning hoist | RLF-003 | L24 | CHOKE—IF filament choke |
| RCC-038 | C86, 89 | CAPACITOR—0.04 mfd., 600 v., paper | RLF-010 | L201 | CHOKE—Filter for power supply |
| RCE-019 | C201A, B, C, D | CAPACITOR—30 mfd., 15 mfd., 30 mfd., electrolytic | RLI-005 | L23 | CHOKE—FM power line choke |
| RCE-032 | C100A, C100B | CAPACITOR—30 mfd., 400 v., electrolytic | RLI-002 | L12 | CHOKE—FM oscillator cathode choke |
| RCM-001 | C127 | CAPACITOR—0.01 mfd., metal cased | RLI-018 | L25 | COIL—SW2 loop shunt coil |
| RCM-002 | C128 | CAPACITOR—0.01 mfd., metal cased | RLP-005 | L14, 15 | CHOKE—IF plate choke |
| RCW-024 | C29 | CAPACITOR—44 mmf., ceramic | RLP-008 | L5, 26 | COIL—FM choke, RF plate and IF wavetrap |
| RCW-025 | C73, 114 | CAPACITOR—4.7 mmf., ceramic | RLP-018 | L5 | COIL—FM RF plate choke |
| RCW-1028 | C11, 16, 41, 113, 129, 132 | CAPACITOR—100 mmf., ceramic | RLX-002 | | COIL AND MOUNTING BRACKET ASSEMBLY—For push buttons |
| RCX-012 | C2, 3, 4, 5, 6 | TRIMMER STRIP—Push button | RLX-003 | | TRIMMER STRIP BRACKET AND COIL ASSEMBLY—For push buttons |
| RCX-024 | C12, 13 | TRIMMER STRIP—3.30 mmf., 80-130 mmf., trimmer capacitor | RMC-012 | | CLAMP—For holding cover on RF unit |
| RCX-025 | C23, 31, 33, 34 | TRIMMER STRIP—185-245 mmf., 20-55 mmf., 320-400 mmf., 165-225 mmf., trimmer capacitor | RMC-013 | | CLIP—Support for clamp, holding cover on RF unit |
| RCX-026 | C17, 39, 40 | TRIMMER STRIP—20-55 mmf., 475-575 mmf., 320-400 mmf., trimmer capacitor | RMF-003 | | CLIP—For tube shield on 6AQ7GT |
| RCX-027 | C27, 37, 38 | TRIMMER STRIP—2.20 mmf., 185-245 mmf., 34-70 mmf., trimmer capacitor | RMM-009 | | SPACER—Metal sleeve on hoist pulley shaft |
| RCX-028 | C10, 14, 15 | TRIMMER STRIP—34-70 mmf., 40-80 mmf., 5-45 mmf., trimmer capacitor | RMM-010 | | VANE—Tuner vane for FM coils L2 and L7 |
| RCY-011 | C9 | CAPACITOR—2.20 mmf., trimmer | RMM-011 | | VANE—Tuner vane for FM oscillator coil L9 |
| RCY-017 | C28, 32 | TRIMMER STRIP—3.30 mmf., 3.30 mmf., trimmer capacitor | RMM-034 | | SHIELD—Lite shield for bezel |
| RDB-006 | | KEY—Push-button key (brown) | RMM-035 | | SHIELD—Tube shield for 6AQ7GT |
| RDB-007 | | KEY—Push-button key (tan) | RMM-036 | | SUPPORT—Fibre support for push-button coils |
| RDC-019 | | CORD—Hoist cord, 6 1/4 inches long | RMM-037 | | DRAWER SLIDES—Cabinet drawer slides |
| RDC-025 | | DRIVE CORD ASSEMBLY | RMR-002 | | ROLLER—Presses against hoist shaft |
| RDF-003 | | FELT WASHER—(Dark), for control knobs | RMS-039 | | WASHER—C washer for idler pulley shaft |
| RDF-006 | | FELT WASHER—(Light), for control knobs | RMS-040 | | SPRING—Flat spring against hoist pulley shaft |
| RDF-008 | | FELT STRIP—Dial scale | RMS-041 | | SPRING—Wire spring against hoist pulley shaft |
| RDK-042 | | KNOB—(Plain) Pine, Blonde Mahogany, and Champagne | RMS-042 | | SPRING—Hoist cord tension spring |
| RDK-043 | | KNOB—(Plain) Mahogany | RMS-043 | | SCREW—Iron core adjusting screw |
| RDK-044 | | KNOB—(Plain) Walnut | RMS-044 | | SCREW—Guide wire connecting tuning vanes to adjustment screws |
| RDK-045 | | KNOB—(Arrow) Pine, Blonde Mahogany, and Champagne | RMS-076 | | SCREW—For tuning vane adjustment |
| RDK-046 | | KNOB—(Arrow) Mahogany | RMS-078 | | SPRING—Type 2 dial cord spring (late production) |
| RDK-047 | | KNOB—(Arrow) Walnut | RMU-030 | | SHAFT—For mounting push-button keys |
| RDK-092 | | KNOB—(Plain) for Model 45 only | RMU-031 | | SHAFT—Tuning shaft |
| RDK-080 | | KNOB—(Arrow) for Model 45 only | RMW-013 | | FLYWHEEL—Less setscrew |
| RDP-025 | | POINTER ASSEMBLY—Model 43 only | RMW-016 | | PULLEY—Main tuning drum |
| RDP-026 | | POINTER ASSEMBLY—Models 41, 42, 44, 45 | RMW-018 | | PULLEY—Hoist |
| RDS-013 | | DIAL SCALE ASSEMBLY | RMW-032 | | PULLEY—Idler pulley for dial cord |
| RDS-045 | | SCALE—Dial scale | RMX-006 | | CABLE ASSEMBLY—For tuning eye |
| RDX-020 | S6, L17, 18, L19, 20, 21, L22 | PUSH BUTTON SWITCH ASSEMBLY | RMX-018 | | FLYWHEEL—With setscrew |
| REI-006 | | IRON CORE—AM tuning | RMX-019 | | PULLEY—Hoist pulley and shaft |
| RHE-001 | | EYELET—For connecting FM coil links | RMX-021 | | TUNER TOP PLATE AND SHAFT ASSEMBLY |
| RHG-007 | | GROMMET—Rubber grommet for tuning eye cable | RRC-026 | | BRACKET AND SPRING ASSEMBLY—For push buttons |
| RHG-008 | | GROMMET—Rubber grommet for tuner plate | RRC-027 | | TONE CONTROL ASSEMBLY—Bass |
| RHG-009 | | GROMMET—Rubber grommet for tuner plate near tuning shaft | RRC-050 | R45A, B | TONE CONTROL ASSEMBLY—Treble |
| RHG-010 | | GROMMET—For 6SC7 tube socket | RR-001 | R202A, B | RESISTOR—2 meg., dual potentiometer |
| RHM-012 | | CUSHION—Dial scale | RRW-016 | R201 | RESISTOR—900 ohms, 6 w., 150 ohms, 6 w., wirewound |
| RHM-024 | | LINK—Hoist link, holding end of hoist cord | RSP-004 | | RESISTOR—100 ohms, 2 w., variable resistor |
| RHM-025 | | RING—Retaining ring for shaft, mounting push-button keys | RSP-006 | | SWITCH—Push-button switch |
| RHN-004 | | NUT—Hex nut for tuning vane adjustment | RSS-003 | S7 | PLUG—Loop plug |
| RJC-001 | | CONTACT PIN—For speaker connection | RSW-029 | S1 | SWITCH—Squelch switch |
| RJJ-001 | | RECEPTACLE—Receptacle for octal plug on receiver chassis | RSX-010 | | SWITCH—Band change switch |
| RJJ-002 | J3 | RECEPTACLE—For loop | RTD-001 | T7 | SWITCH ASSEMBLY—Phono-lite |
| RJJ-003 | | RECEPTACLE—6AL7 tuning eye socket | RTL-017 | T4 | FM DISCRIMINATOR TRANSFORMER |
| RJP-004 | P1 | PLUG—Male phono input, from preamplifier | RTL-022 | T5 | BC 1st IF TRANSFORMER |
| RJP-006 | J1 | SHELL—For loop plug | RTL-043 | T6 | BC 2nd IF TRANSFORMER |
| RJP-007 | | RECEPTACLE—117 v. a.c. output to SPU chassis | RTO-026 | T202 | BROADCAST 3rd IF TRANSFORMER |
| RJP-008 | | PLUG—On power cable | RTP-035 | T201 | TRANSFORMER—Audio output to speakers |
| RJP-009 | J201 | RECEPTACLE—Special power unit a.c. | RTP-036 | | TRANSFORMER—Power transformer, 60 cycles |
| RJP-015 | J202 | RECEPTACLE—For pilot light and speaker cable plug | RWL-004 | | TRANSFORMER—Power transformer, 50 cycles |
| RJS-012 | | MOUNTING PLATE—For mounting electrolytic on SPU chassis | RWM-001 | P201 | CORD AND PLUG—For 117 v. a.c. to main chassis |
| RJS-017 | J203 | TUBE SOCKET—Octal base socket on SPU chassis | RWM-003 | P201 | CORD—Cord and plug for 117 v. a.c. to special power unit, Model 41 and 42 |
| RJS-030 | | SOCKET—For tubes V4, V5, V6, and V7 | RWM-004 | P201 | CORD—Cord and plug for 117 v. a.c. to special power unit, Model 43 |
| RJS-044 | | TUBE SOCKET—Tube socket for V1, V2, and V3 | RWM-005 | P201 | CORD—Cord and plug for 117 v. a.c. to special power unit, Model 44 |
| RJS-052 | | SOCKET—Tube socket for V9, V201, V202, V203, V204, V205, and V206 | RYC-006 | | CORD—Cord and plug for 117 v. a.c. to special power unit, Model 45 |
| | | | RYC-007 | | TAB—Push-button key tab (phono) |
| | | | RYC-008 | | STATION CALL LETTERS—For push-button keys |
| | | | | | TAB—Push-button key tab (OFF) |



10-47
CAPACITY IN MMF UNLESS OTHERWISE NOTED

Fig. 2. Schematic Diagram, Models 60 and 62

CABINET:

| | |
|--------|------------|
| Model | 60 |
| Color | Mahogany |
| Height | 6 3/8 in. |
| Width | 10 1/2 in. |
| Depth | 5 3/8 in. |

ELECTRICAL RATING (INPUT):

| | |
|-----------|--------------------|
| Voltage | 105-125 volts, a-c |
| Frequency | 60 cycles |
| Wattage | 35 watts |

OPERATING FREQUENCIES:

| | |
|------------------------|-------------|
| Intermediate Frequency | 455 kc |
| Broadcast Band | 540-1600 kc |

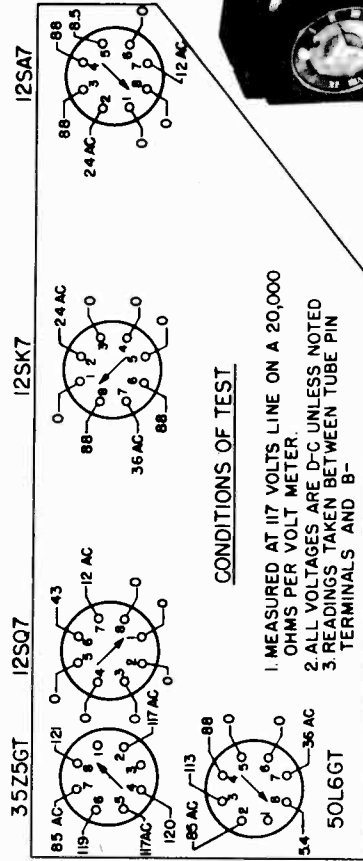
POWER OUTPUT:

| | |
|-------------|-----|
| Undistorted | 1.2 |
| Maximum | 2.0 |

LOUDSPEAKER:

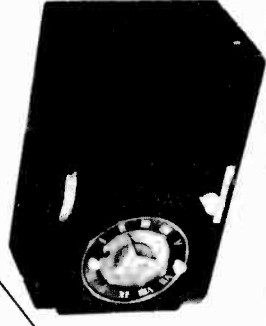
| | |
|-----------------------------------|-----------|
| Type | Alnico PM |
| Outside Cone Diameter | 4-inch |
| Voice Coil Impedance (400 cycles) | 3.5 ohms |

CAUTION: One side of the power line is connected to B-. Avoid any ground connections direct to B-. Use an isolating transformer when making service adjustments with the chassis removed from the cabinet.



VIEWED FROM BOTTOM OF CHASSIS

Fig. 3. Socket Voltages



RADIO CIRCUIT ALIGNMENT

ALIGNMENT FREQUENCIES:

- R-F 1500 kc
- I-F 455 kc

EQUIPMENT REQUIRED:

1. Test oscillator with tone modulation.
2. A-c output meter, 1 1/2 volts full scale.
3. 0.05 mf. paper capacitor.
4. 200 mmf. mica capacitor.
5. Insulated screwdriver.

PROCEDURE—GENERAL:

1. With the tuning scale control wheel turned so that the gang condenser plates are fully meshed, the index should read approximately 1 1/2-inch to the right of the 550 kc scale calibration mark. If it does not, remove the control wheel from the gang condenser shaft and replace it for correct position. **CAUTION:** Do not attempt to correct the position by rotating the wheel on the shaft as this will cause the knob to slip.
2. For i-f alignment, it is necessary to remove the chassis from the cabinet.
3. Connect the output meter across the loudspeaker voice coil terminals.
4. Keep radio volume control at maximum and attenuate the test oscillator signal output so that the output meter reading never exceeds 1.0 volt.
5. Connect the capacitor as listed in column 2 between the output "High Side" of the test oscillator and the point of input specified.

ALIGNMENT CHART

| Step | Connect Test Oscillator to— | Test Osc. Setting | Dial Drum Setting | Adjust Trimmers for Maximum Output |
|------|---|-------------------|-------------------|--------------------------------------|
| 1 | 12SK7 grid (4) in series with 0.05 mf. cap. | 455 kc | 1600 kc | 2nd i-f trans. trimmers, C14 and C15 |
| 2 | 12SA7 grid (8) in series with 0.05 mf. cap. | 455 kc | 1600 kc | 1st i-f trans. trimmers, C8 and C9 |
| 3 | Antenna Post in series with 200 mmf. cap. | 1500 kc | 1500 kc | C4 (oscillator) |
| 4 | Antenna Post in series with 200 mmf. cap. | 1500 kc | 1500 kc | C3 (antenna) |

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20%. Readings taken with low signal input so that AVC is not effective.

- (1) R-F and I-F Stage Gains.
Antenna Post to 12SA7 Grid 2 @ 1000 kc
12SA7 Grid to 12SK7 Grid 50 @ 455 kc
12SK7 Grid to 12SQ7 Diode Plate 70 @ 455 kc
- (2) Audio Gain.
0.15 volts at 400 cycles across the volume control (R11) with control set at maximum will give approximately 1/2-watt output across the loudspeaker, LS1, voice coil.
- (3) Oscillator Grid Bias.
D-c voltage developed across the oscillator grid leak (R1) averages 8.5 volts at 1000 kc.
- (4) Socket Pin Voltages.
Figure 3 shows voltages from all tube pins to B— unless otherwise specified. Voltage readings much higher or lower than those specified may help localize defective components or tubes.

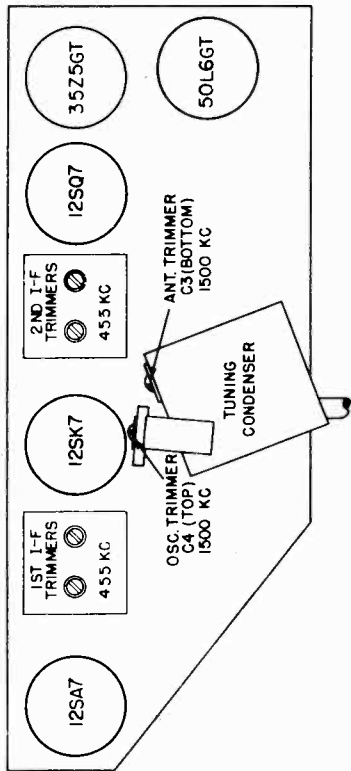


Fig. 1. Tube and Trimmer Location

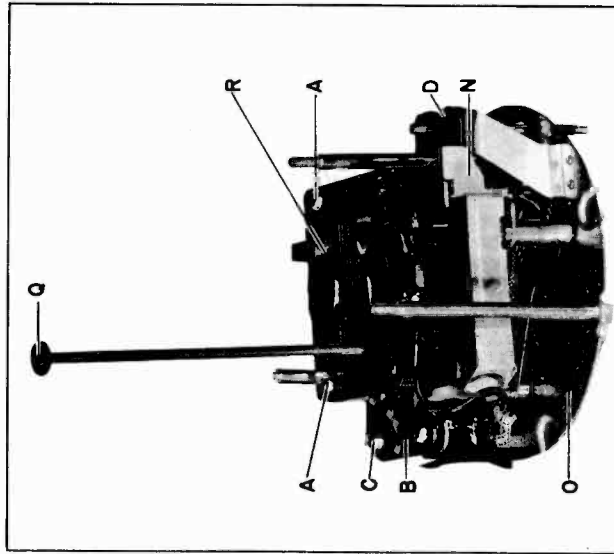
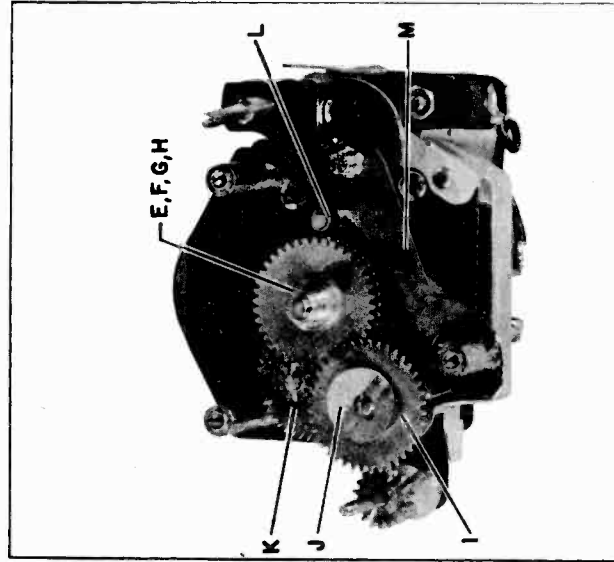
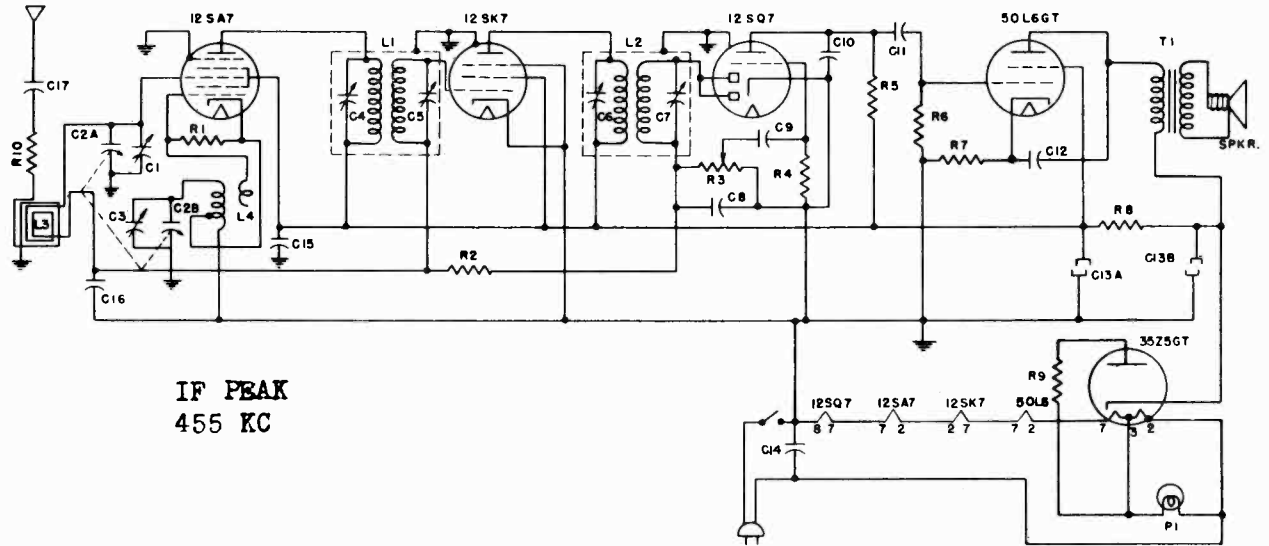


Fig. 4. Clock Part Identification



GENERAL ELECTRIC CO.

MODELS YRB 79-1,
YRB 79-2, YRB 83-1



IF PEAK
455 KC

Fig. 3. Schematic Diagram

PARTS DESCRIPTION LIST

MODELS YRB 83-1, YRB 79-1, YRB 79-2

| Symbol | Description | Symbol | Description | Symbol | Description |
|--------|--------------------------------------|--------|-------------------------|--------|-----------------------------|
| C1 | Antenna trimmer condenser | C14 | .05 mfd paper capacitor | R1 | 22,000 ohm carbon resistor |
| C2A | Tuning condenser, antenna section | C15 | .05 mfd paper capacitor | R2 | 2.2 megohm carbon resistor |
| C2B | Tuning condenser, oscillator section | C16 | .05 mfd paper capacitor | R3 | Volume control, .5 megohm |
| C3 | Oscillator trimmer condenser | C17 | .01 mfd paper capacitor | R4 | 4.7 megohm carbon resistor |
| C8 | 220 mmfd mica capacitor | L1 | 1st I.F. transformer | R5 | 470,000 ohm carbon resistor |
| C9 | .005 mfd paper capacitor | L2 | 2nd I.F. transformer | R6 | 470,000 ohm carbon resistor |
| C10 | 220 mmfd mica capacitor | L3 | Loop assembly | R7 | 150 ohm carbon resistor |
| C11 | .01 mfd paper capacitor | L4 | Oscillator coil | R8 | 2700 ohm carbon resistor |
| C12 | .02 mfd paper capacitor | P1 | Pilot lamp | R9 | 18-ohm carbon resistor |
| C13A | 30 mfd electrolytic capacitor | T1 | Output transformer | R10 | 470 ohm carbon resistor |
| C13B | 30 mfd electrolytic capacitor | | | | |

REPLACEMENT PARTS LIST

MODELS YRB 83-1, YRB 79-1, YRB 79-2

| Stock No. | Description | Stock No. | Description |
|--|--|--|---|
| SPECIALIZED G-E REPLACEMENT PARTS | | | |
| SAB 004 | Back cover, Model YRB 83-1 | SMW 001 | Pulley, dial drive wood |
| SAB 005 | Back cover, Models YRB 79-1, 79-2 | SRC 003 | Volume control, 0.5 megohm with power switch |
| SAU 007 | Cabinet, Model YRB 79-1 | STL 001 | Transformer, 1st I.F. |
| SAU 008 | Cabinet, Model YRB 79-2 | STL 002 | Transformer, 2nd I.F. |
| SAV 004 | Cabinet, Model YRB 83-1 | STO 001 | Transformer, output |
| SCE 002 | Capacitor, filter electrolytic, 30-30 mfd, 150 volts, C13A, C13B | SWL 001 | Power cord |
| SCT 002 | Capacitor, tuning, C2A, C2B | UNIVERSAL G-E REPLACEMENT PARTS | |
| SDC 001 | Dial drive cord | UCC 039 | Capacitor, .005 mfd paper, C9 |
| SDK 001 | Knob, Model YRB 83-1 | UCC 040 | Capacitor, .01 mfd paper, C17 |
| SDK 010 | Knob, Model YRB 79-1 | UCC 041 | Capacitor, .02 mfd paper, C12 |
| SDK 011 | Knob, Model YRB 79-2 | UCC 045 | Capacitor, .05 mfd paper, C14, C15, C16 |
| SDP 001 | Pointer, Dial scale | UCU 1036 | Capacitor, 220 mmfd mica, C8, C10 |
| SDS 004 | Dial scale, Model YRB 83-1 | UDL 013 | Pilot lamp, Mazda 51 |
| SDS 005 | Dial scale, Models YRB 79-1, 79-2 | UOP 526 | Speaker, 5 1/4-in. PM dynamic |
| SHC 001 | Hair pin cotter for dial drive | URD 007 | Resistor, 18 ohm 1/2 watt carbon, R9 |
| SJP 002 | Connector, female to speaker | URD 029 | Resistor, 150 ohm 1/2 watt carbon, R7 |
| SJS 001 | Pilot lamp socket | URD 041 | Resistor, 470 ohm 1/2 watt carbon, R10 |
| SJS 003 | Socket, octal tube | URD 081 | Resistor, 22,000 ohm 1/2 watt carbon, R1 |
| SLC 001 | Oscillator coil | URD 113 | Resistor, 470,000 ohm 1/2 watt carbon, R5, R6 |
| SLL 001 | Antenna loop | URD 129 | Resistor, 2.2 megohm 1/2 watt carbon, R2 |
| SMF 003 | Fastener, back cover to cabinet | URD 137 | Resistor, 4.7 megohm 1/2 watt carbon, R4 |
| SM S001 | Spring, dial drive drum | URE 059 | Resistor, 2700 ohm 1 watt carbon, R8 |
| SMU 001 | Shaft, dial drive | | |
| SMF 002 | Snap button | | |

MODELS YRB 79-1,
YRB 79-2, YRB 83-1

GENERAL ELECTRIC CO.

Rating: 105-125 volts d-c
105-125 volts 40-60 cycles a-c
28 watts at 117 volts

Tuning Frequency Range:540-1720 KC

Intermediate Frequency:455 KC

LOUDSPEAKER "ALNICO V" MAGNET DYNAMIC

Outside Cone Diameter.....5 1/4 in.
Voice Coil Impedance (400 cycles).....3.2 ohms

TUBES

Converter and Oscillator.....12SA7
I.F. Amplifier.....12SK7
Det. Audio, AVC.....12SQ7
Power Output.....50L6GT
Rectifier.....35Z5GT
Pilot Lamp.....GE 51

GENERAL INFORMATION

Model YRB 83-1 is a 5-tube (including rectifier) super-heterodyne receiver in a distinctively styled wood cabinet; Models YRB 79-1 and YRB 79-2 are of rich brown or ivory plastic cabinets. These receivers incorporate built-in antenna automatic volume control, oversize permanent magnet speaker, and beam power output.

ALIGNMENT PROCEDURE

ALIGNMENT FREQUENCIES

I.F.....455 KC
R.F.....1720 and 1500 KC

The location of all trimmers is shown in Fig. 1.

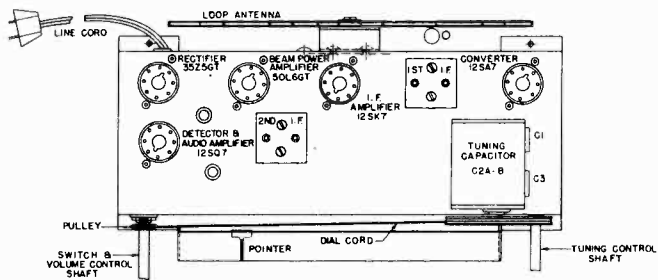


Fig. 1. Tube and Trimmer Location

I.F. ALIGNMENT

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the converter grid through a .05 mfd capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. ALIGNMENT

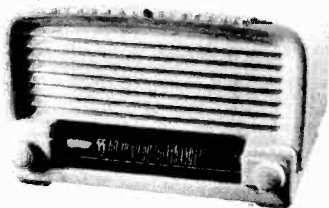
Apply the R.F. alignment signals through a standard I.R.E. dummy antenna to the receiver antenna post. With the gang condenser wide open, align the oscillator trimmer (C17B) to 1720 KC. Change the generator signal to 1500 KC, tune the receiver to the signal and peak antenna trimmer (C17A) for maximum output.

PRECAUTION

If the signal generator is A-C operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended, as A-C through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

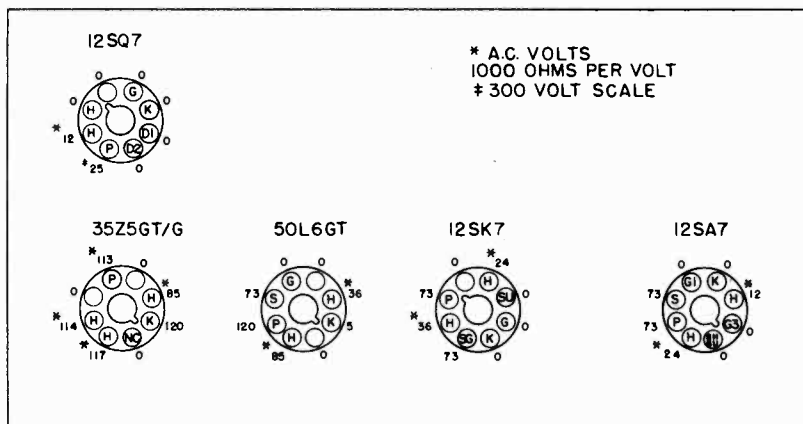


Model YRB 83-1



Model YRB 79-2

FRONT OF CHASSIS



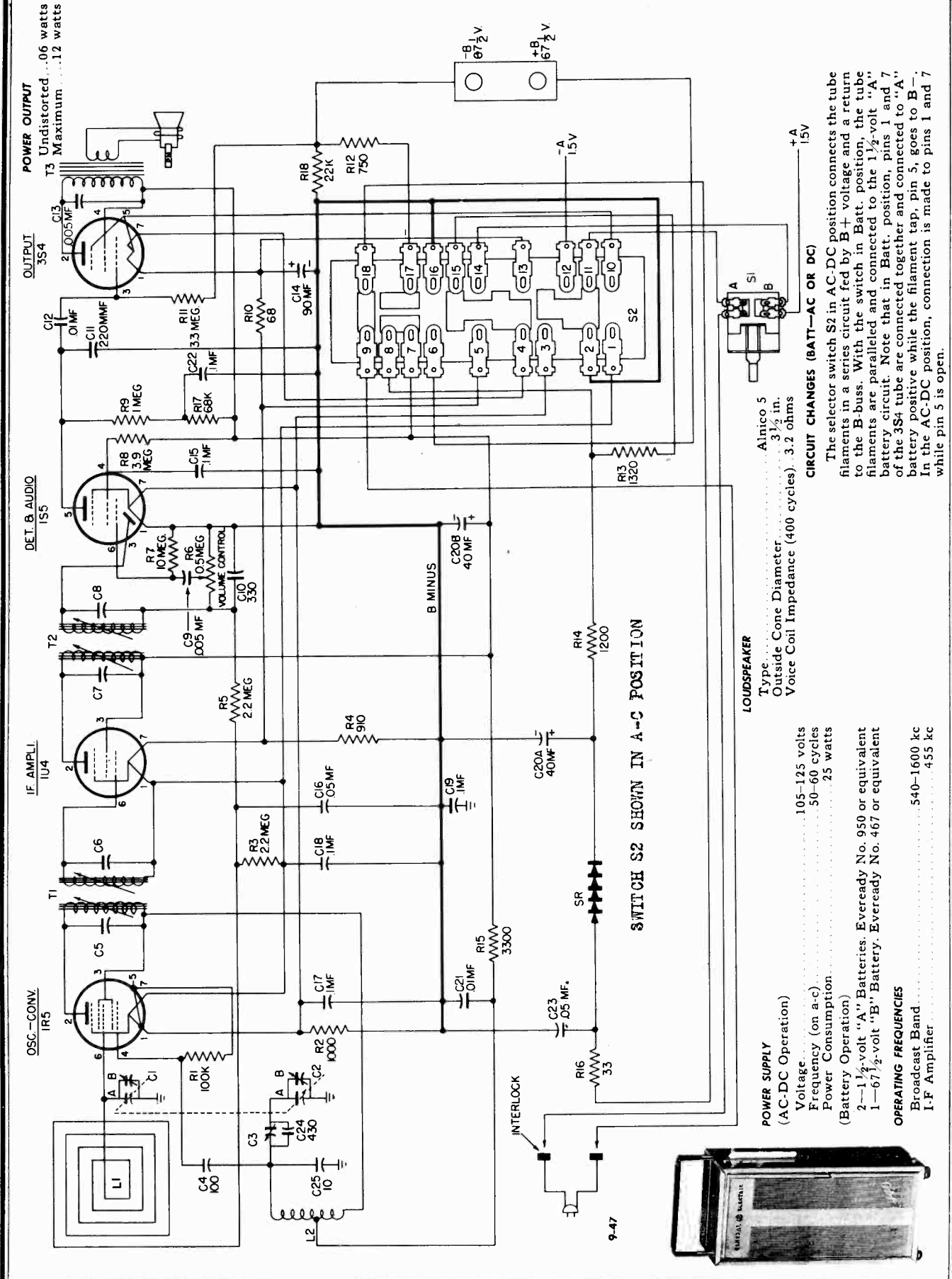
BOTTOM VIEW OF CHASSIS

LINE VOLTS - 117

VOL. CONT. MAX.

NO SIGNAL

Fig. 2. Socket Voltage Diagram



MODEL 140

CABINET INTERLOCK

Primarily as a safety device, so that contact with live wires and short circuits be avoided, the interlock provides a means by which the AC-DC power cord circuit is broken when the receiver chassis is taken out from the cabinet for battery replacement or receiver servicing.

The interlock receptacle is mounted in the top of and on the right side of the cabinet, while the interlock plug is mounted in the top of the receiver chassis so that its pins align with the receptacle.

BATTERY—AC OR DC SELECTOR SWITCH

A selector switch S2 located on the front of the panel near the bottom selects operation from the internal battery source, in the position marked "Batt." The other position of the selector switch marked AC-DC prepares the receiver for operation from the external power outlet for which a power cord and plug is provided.

DOOR SWITCH

The door switch S1-A, -B functions as the on-off switch in the receiver. S1-A, -B operates so that when the cabinet door is closed the "A" battery positive lead circuit is broken by contacts S1-B, and one side of the AC-DC power cord circuit is broken by contacts S1-A.

ELECTRICAL CIRCUIT ALIGNMENT

ALIGNMENT FREQUENCIES

R-F 1620, 1500 and 580 kc
 I-F 455 kc

EQUIPMENT REQUIRED

1. Test oscillator with tone modulation.
2. A-c output meter.
3. .05 mfd. paper capacitor.
4. Insulated screwdriver.
5. Insulated screwdriver blade with flexible coupling.

ALIGNMENT PROCEDURE

1. The alignment procedure is given in table form. The major part of alignment will be made with the chassis removed from the cabinet. The location of i-f and r-f adjustments is shown in Figure 2. There are two adjustments for each i-f transformer, one in the top, the other in the bottom. To adjust the bottom slugs, it will be necessary to use an insulated screwdriver blade with some form of flexible coupling.

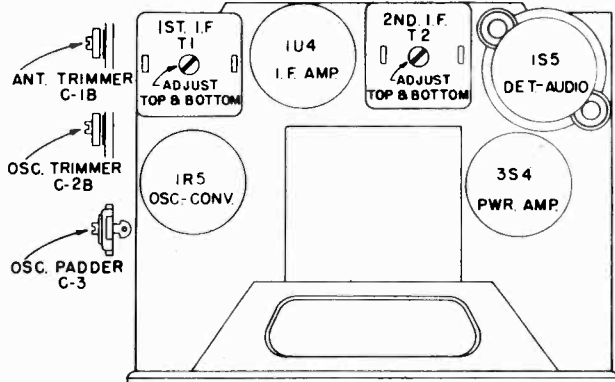
2. The output meter should be connected across the voice coil terminals on the speaker. The low side of the test oscillator output should be connected to the chassis ground; the high side of the oscillator output should be connected as indicated in the Alignment Chart. During the entire alignment procedure, the volume control should be at its maximum (clockwise) position. The test oscillator should be attenuated so that the output meter reading doesn't exceed 1/2 volt.

3. For alignment of the oscillator trimmer, oscillator padder and converter trimmer the input signal should be inductively coupled to the radio loop antenna, L1, by connecting a four-turn, six-inch diameter loop of bell wire across the signal generator output terminals, and then locate the loop about one foot from the radio loop antenna. To prevent possible errors in peak readings, the position of the loop with respect to the radio loop antenna should not be changed during any one set of adjustments.

4. In step 6 of the Alignment Chart, "Rocking-in" of the oscillator's padder consists of turning the dial back-and-forth through signal for maximum while peaking the oscillator padder.

5. Since the cabinet has a definite effect upon the alignment because of its shielding of r-f components, it will be necessary to "touch-up" the converter trimmer after the major alignment is completed and the chassis assembled back into the cabinet. It is obvious that the adjustment must be made while the chassis is exposed and the output readings taken with the chassis and cabinet assembled.

Rather than adjust the trimmer at random, it would be helpful to learn whether more or less capacity is necessary. This can be done by wanding the radio antenna loop for an indicated gain. "Wanding" is the procedure where more or less gain will be indicated by an increase or decrease in output when a shorted one-turn loop is coupled to the radio antenna loop. If a gain is indicated the trimmer capacity must be decreased. In a similar manner, a field of powdered iron cores may be coupled to the loop. In this case a gain would indicate that capacity must be increased. When no gain is apparent with either the shorted turn wand or the iron field wand, the adjustment of the trimmer is peaked.



ANT. TRIMMER C1B AND OSC. TRIMMER C-2B LOCATED ON FRAME OF GANGED TUNING CAPACITOR C1A & C2A, OSCILLATOR PADDER NEAR TUNING CAPACITOR

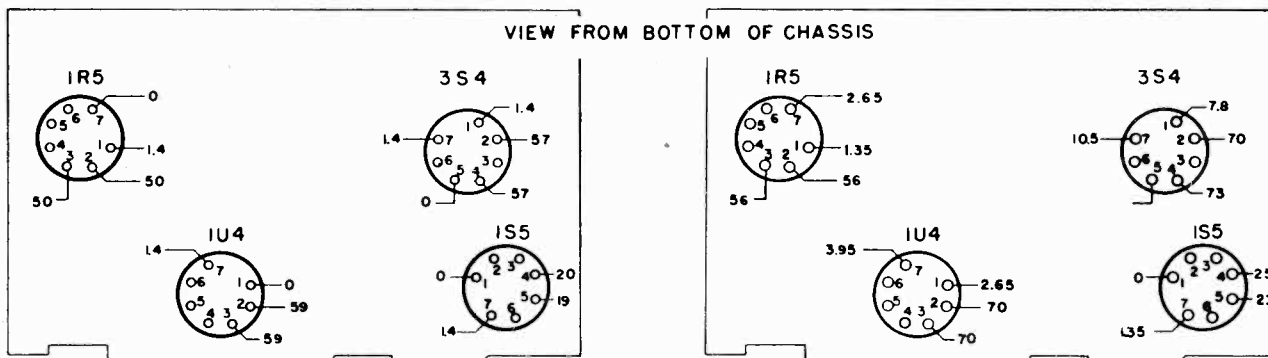
Fig. 2. Tube and Trimmer Location

ALIGNMENT CHART

| Step | Connect Test Oscillator to | Test Oscillator Setting | Radio Dial Setting | Adjust for Maximum Output |
|----------------------|--|-------------------------|-----------------------|---|
| I-F ALIGNMENT | | | | |
| 1 | 1U4 i-f grid (pin 6) in series with .05 mfd. | 455 kc | 550 kc | 2nd i-f transformer (T2) cores |
| 2 | Conv. trimmer lug C1-B in series with .05 mfd. | 455 kc | 550 kc | 1st i-f transformer (T1) cores |
| 3 | Repeat steps 1 and 2 | | | |
| R-F ALIGNMENT | | | | |
| 4 | Inductively coupled | 1620 kc | Max. freq. cond. open | Oscillator trimmer, C2-B. |
| 5 | Inductively coupled | 1500 kc | 1500 kc | Converter trimmer, C1-B. |
| 6 | Inductively coupled | 580 kc | For max. | Rock-in oscillator padder, C3 (see General Procedure, 4). |
| 7 | Inductively coupled | 1500 kc | 1500 kc | Converter trimmer, C1-B. |

GENERAL ELECTRIC CO.

MODEL 140



CONDITION OF TEST
RECEIVER POWERED BY BATTERY SUPPLY
MEASURED WITH 20000 OHM/VOLT METER
ALL VOLTAGES TAKEN BETWEEN SOCKET PIN 8 & B SWITCH S-2 IN BATTERY POSITION

Fig. 3. Socket Voltage Diagram

CONDITION OF TEST
RECEIVER POWERED BY AC-DC LINE 117 V.
MEASURED WITH 20,000 OHM/VOLT METER
ALL VOLTAGES TAKEN BETWEEN SOCKET PIN 8 & B SWITCH S-2 IN AC-DC POSITION

Fig. 4. Socket Voltage Diagram

STAGE GAIN AND VOLTAGE CHECKS

Stage gain by vacuum tube voltmeter or similar measuring devices may be used to check circuit performances and isolate trouble. The gain values listed may have tolerances of 20 per cent. Readings should be taken with low signal input so that AVC is not effective.

(1) R-F STAGE GAINS.

IR5 conv. grid to 1U4 i-f grid 28 at 1000 kc
1U4 i-f grid for .05 w. output 3600 uv at 455 kc

(2) AUDIO GAIN.

.040 volt at 400 cycles across volume control (R6) with control set at maximum will give approximately .05 watt output across speaker voice coil.

(3) D-c voltage developed across oscillator grid resistor R1 averages 16.2 volts at 1000 kc.

(4) SOCKET PIN VOLTAGES.

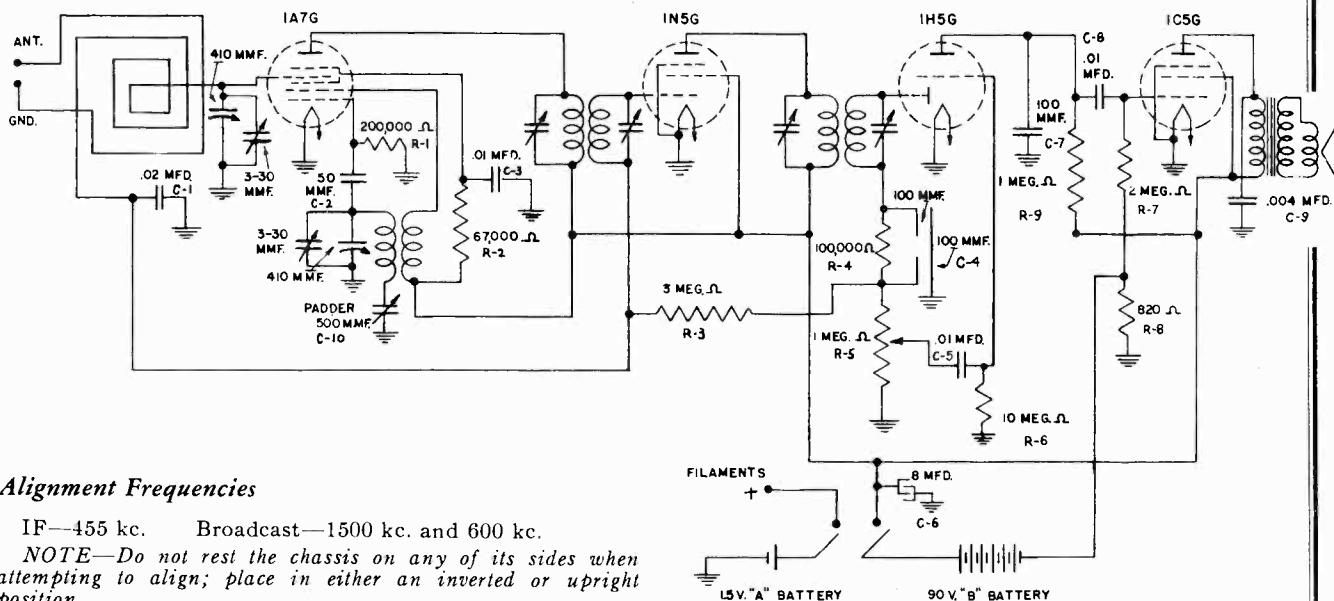
Figures 3 and 4 show voltages from all tube pins to B-. Voltage readings much lower than those specified may help localize defective components or tubes.

| Cat. No. | Symbol | Description |
|--------------------------------------|-------------|--|
| UNIVERSAL REPLACEMENT PARTS | | |
| UCC-028 | C23 | CAPACITOR—.05 mf., 400 v., paper |
| UCC-048 | C19 | CAPACITOR—.1 mf., 600 v., paper |
| UCG-543 | C24 | CAPACITOR—430 mmf., silver mica |
| UCU-528 | C4 | CAPACITOR—100 mmf., mica |
| UCU-536 | C11 | CAPACITOR—220 mmf., mica |
| UCU-540 | C10 | CAPACITOR—330 mmf., mica |
| URD-1146 | R10 | RESISTOR—68 ohms, 1/2 w., carbon |
| SPECIALIZED REPLACEMENT PARTS | | |
| RAC-046 | | COVER—(Plastic) for cabinet door |
| RAD-027 | | DOOR—For cabinet (with loop connecting strips only) |
| RAD-028 | | DOOR—Door access to power cord, (less hinge) |
| RAT-007 | | CABINET ASSEMBLY—Complete with handle assembly, handle retainers, interlock receptacle, and trim |
| RAX-016 | | DOOR ASSEMBLY—With loop L1 |
| RAX-017 | | DOOR ASSEMBLY—Door access to power cord, with hinge and tab |
| RCC-075 | C12, 21 | CAPACITOR—.01 mf., 400 v., paper |
| RCC-076 | C9, 13 | CAPACITOR—.005 mf., paper |
| RCC-077 | C15, 17, 18 | CAPACITOR—.1 mf., paper |
| RCC-078 | C16 | CAPACITOR—.05 mf., paper |
| RCE-051 | C20A, B | CAPACITOR—40 mf., electrolytic |
| RCE-052 | C14 | CAPACITOR—90 mf., electrolytic |
| RCT-023 | C1, 2 | CAPACITOR—Tuning capacitor |
| RCW-020 | C25 | CAPACITOR—10 mmf., ceramic |
| RCY-030 | C3 | CAPACITOR—Oscillator padder |
| RDE-026 | | ESCUTCHEON |
| RDK-098 | | KNOB ASSEMBLY—Door knob and lock spring |
| RDK-099 | | KNOB ASSEMBLY—Knob with spring for volume or tuning control |
| REC-001 | | CONNECTOR—Contact strip for "B" battery |
| REX-004 | | RECTIFIER ASSEMBLY |
| RHC-008 | | CLIP—For mounting C20A, B, 40 mf. dual electrolytic capacitor |
| RHC-013 | | COTTER PIN—(Hair pin type) inserted in tube socket shield |
| RHF-002 | | FELT FOOT—On bottom of receiver |
| RHG-014 | | GROMMET—Fibre grommet for power cord |
| RHH-007 | | RETAINER—Plastic handle retainer (right) |
| RHH-008 | | RETAINER—Plastic handle retainer (left) |
| RHI-002 | | HINGE—Cabinet door top hinge |
| RHI-003 | | HINGE—Cabinet door bottom hinge |

| Cat. No. | Symbol | Description |
|--|--------|---|
| SPECIALIZED REPLACEMENT PARTS (Cont.) | | |
| RHI-004 | | HINGE—For door to cord access |
| RHS-010 | | SHIELD—Tube shield for 1S5 tube |
| RHY-006 | | HANDLE ASSEMBLY—With retainers and cover |
| RII-002 | | BARRIER—Fibre strip insulator between switch S2 and chassis |
| RII-003 | | SHIELD—Fibre strip insulator between switch S2 and escutcheon |
| RII-004 | | STRIP—Insulating strip (insulates right side of chassis from cabinet) |
| RII-005 | | STRIP—Insulating strip (insulates left side of chassis from cabinet) |
| RII-007 | | BARRIER—Fibre insulating barrier insulating rectifier from chassis |
| RJJ-006 | | RECEPTACLE ASSEMBLY—Female interlock mounted on cabinet |
| RJP-017 | | PLUG ASSEMBLY—Male interlock plug, fits into female interlock receptacle |
| RJS-090 | | SOCKET—Tube socket for 1R5, 1U4 and 3S4 |
| RJS-091 | | SOCKET—Tube socket for 1S5 (rubber mounted) |
| RLC-054 | | COIL—Oscillator |
| RLL-024 | L2 | LOOP—Antenna loop only |
| RMC-018 | L1 | BATTERY CUP ASSEMBLY—"A" battery negative connector |
| RMX-103 | | BRACKET ASSEMBLY—(With shield barrier) for mounting volume control and tuning capacitor |
| RMX-104 | | BATTERY CONNECTOR ASSEMBLY—Consists of one copper and two fibre strips ("A" positive) |
| ROP-012 | | LOUDSPEAKER |
| RRC-055 | R6 | RESISTOR—5 meg., volume control |
| RRH-061 | R15 | RESISTOR—3300 ohms, 1/2 w., carbon |
| RRH-081 | R18 | RESISTOR—22,000 ohms, 1/2 w., carbon |
| RRH-093 | R17 | RESISTOR—68,000 ohms, 1/2 w., carbon |
| RRH-097 | R1 | RESISTOR—100,000 ohms, 1/2 w., carbon |
| RRH-121 | R9 | RESISTOR—1 meg., 1/2 w., carbon |
| RRH-129 | R3, 5 | RESISTOR—2.2 meg., 1/2 w., carbon |
| RRH-133 | R11 | RESISTOR—3.3 meg., 1/2 w., carbon |
| RRH-135 | R8 | RESISTOR—3.9 meg., 1/2 w., carbon |
| RRH-145 | R7 | RESISTOR—10 meg., 1/2 w., carbon |
| RRH-1046 | R12 | RESISTOR—750 ohms, 1/2 w., carbon |
| RRH-1048 | R4 | RESISTOR—910 ohms, 1/2 w., carbon |
| RRH-1049 | R2 | RESISTOR—1000 ohms, 1/2 w., carbon |
| RRM-001 | R16 | RESISTOR—33 ohms, 3 w., carbon |
| RRW-019 | R14 | RESISTOR—1200 ohms, w.w. |
| RRW-020 | R13 | RESISTOR—1320 ohms, w.w. |
| RSW-034 | S2 | SWITCH—AC-DC battery switch |
| RSW-035 | S1A, B | SWITCH—Power switch |
| RTL-052 | T1, 3 | TRANSFORMER—I-F transformer |
| RTO-034 | T3 | TRANSFORMER—Output transformer |
| RWL-015 | | CORD—Power cord |

GENERAL ELECTRIC CO.

MODEL GB-400



Alignment Frequencies

IF—455 kc. Broadcast—1500 kc. and 600 kc.

NOTE—Do not rest the chassis on any of its sides when attempting to align; place in either an inverted or upright position.

IF Alignment

To align the IF, it will be necessary to remove the chassis from the cabinet. Connect an output meter across the voice coil. Set the volume control for maximum.

Adjust the test oscillator to 455 kc. and apply the signal to the control grid of the 1A7G tube through a .05 mfd. capacitor. Do not remove the grid lead from the 1A7G tube. Keep the test oscillator output as low as possible to give a readable output. Adjust all four IF trimmers for maximum output.

RF Alignment

The following alignment should be made with the receiver fastened in the case. Turn the receiver to its inverted position and make trimmer and padder alignments through the holes provided in the bottom of the case.

Connect the ground lead of the signal generator to the receiver chassis and the other lead to the receiver antenna terminal (located underneath cabinet). A dummy antenna consisting of a 250 mmf. capacitor in series with 200 ohms should be connected in the antenna lead of the signal generator. Apply a 600 kc. modulated signal and adjust the oscillator padder for a maximum output while rocking the gang condenser in vicinity of 600 kc. mark on the dial.

Using the same dummy antenna with a 1500 kc. signal generator input, adjust the oscillator trimmer for a maximum output. Now remove signal generator leads, tune in a station at approximately the 1500 kc. point on dial and then peak the RF trimmer for a maximum signal.



SERVICE DATA

Physical Specifications

| | |
|--------|--------------|
| Model | GB-400 |
| Height | 9 3/8 inches |
| Width | 13 inches |
| Depth | 8 1/4 inches |

Tuning Control Drive Ratio 1:1

Batteries Required

- 1—1 1/2-volt "A" battery (Eveready No. 741 or equivalent).
- 2—45-volt "B" batteries (Eveready No. 762 or equivalent).

Tuning Frequency Range 540-1600 kc.

Alignment Frequency

| | |
|----|------------------|
| IF | 455 kc. |
| RF | 600 and 1500 kc. |

Loud-speaker—Permanent Magnet

| | |
|----------------------------------|----------|
| Over-all diameter | 5 inch |
| Cone Coil Impedance (400 cycles) | 3.0 ohms |

Tubes

| | |
|--------------------------|---------|
| Converter and Oscillator | GE-1A7G |
| IF Amplifier | GE-1N5G |
| Detector and 1st Audio | GE-1H5G |
| Power Amplifier | GE-1C5G |

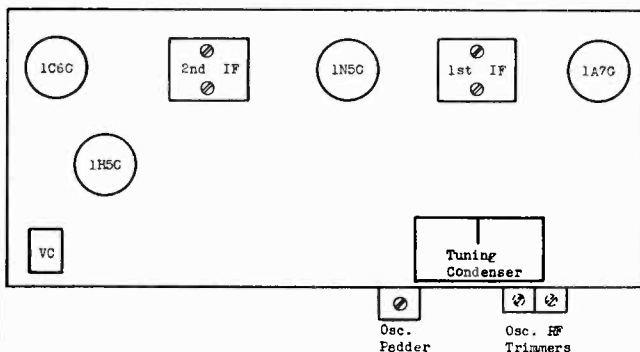


Fig. 1. Trimmer Location

GENERAL ELECTRIC CO.

MODEL LB-673

SERVICE INFORMATION

Voltages—Line 117 Volts AC and DC. Power Consumption 20 Watts.
 Plate (3) 1N5GT R.F. tube to common ground 90 volts
 Screen (4) of 1N5GT R.F. tube to common ground 90 volts
 Plate (3) of 1A7GT Converter tube to common ground 90 volts
 Oscillator Plate (6) of 1A7GT Converter tube to com gnd 90 v.
 Screen (4) of 1A7GT Converter tube to common ground 50 volts
 Plate (3) of 1N5GT I.F. tube to common ground 90 volts
 Screen (4) of 1N5GT I.F. tube to common ground 90 volts
 Plate (3) of 1H5GT Detector & 1st Audio Tube (approx.) 25 v.
 Plate (3) of 3Q5GT Power A.F. Tube 90 volts
 Screen (4) of 3Q5GT Power A.F. Tube 90 volts
 Cathode (8) of 3Z5GT Rectifier Tube 120 volts
 Heater (2) & (7) of 1N5GT R. F. Tube 1.35-1.4 volts DC
 Heater (2) & (7) of 1A7GT Converter Tube 1.35-1.4 volts DC
 Heater (2) & (7) of 1N5GT I. F. Tube 1.35-1.4 volts DC
 Heater (2) & (7) of 1H5GT Det. & 1st Aud. 1.35-1.4 volts DC
 Heater (7) & (8) of 3Q5GT Power A. F. Tube 1.35-1.4 volts DC
 Heater (8) & (2) of 3Q5GT Power A. F. Tube 1.35-1.4 volts DC
 Heater (2) & (7) of 3Z5GT Rectifier Tube 36-42 volts AC

necessary to use two "A" batteries and two "B" batteries in each receiver.

To connect the batteries to the receiver, open the back and place the batteries in the proper position, as shown on the label, which is inside of the cabinet. Insert battery plugs firmly into their respective battery sockets.

ANTENNA

This receiver is equipped with a removable Interceptor Beam-a-Scope that has a flexible cable attached. This permits the Beam-a-Scope to be removed from the back of the cabinet and placed at a remote point, such as the window of an automobile or train, etc. The flexible cable is to extend through the opening in the top of the back cover.

Two suction cups are attached to the hinges of the Beam-a-Scope which permit suitable temporary fastening to the window. The Beam-a-Scope may be set at the desired angle giving best reception. When the Beam-a-Scope is inserted into the cabinet, the two slide rails permit it to be placed on the back, and the cable of the Beam-a-Scope may be wrapped around the two suction cups.
 LINE CORD POSITION: A small box between the batteries houses the line cord.

TYPE BATTERIES

The "A" battery recommended is the Eveready Type No. 746 or equivalent, and the type "B" battery recommended is the Eveready No. 482 or equivalent. It is

MODEL LB-673
 REPLACEMENT PARTS LIST

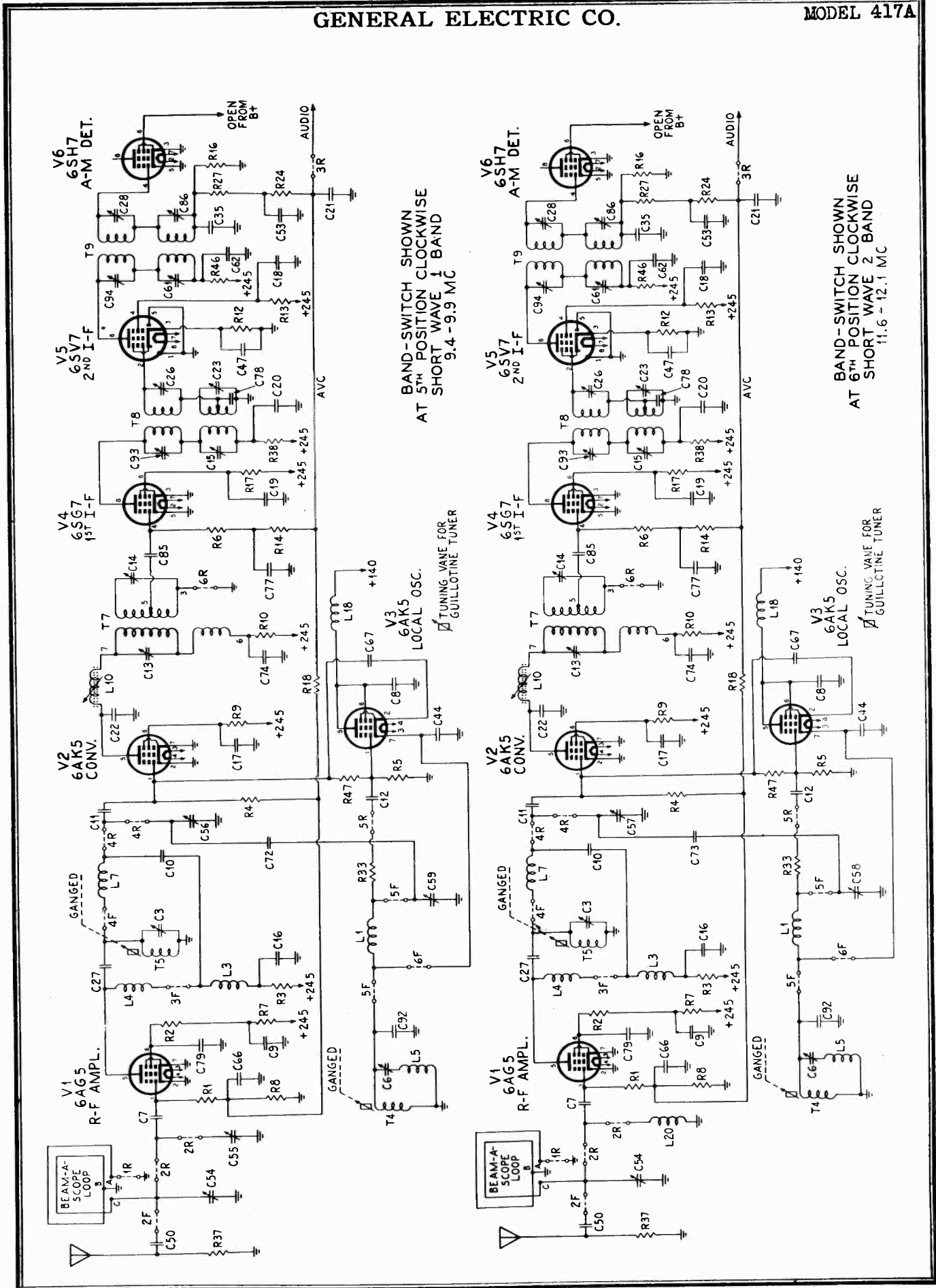
| G. E. Part Number | Part Name | Description | G. E. Part Number | Part Name | Description |
|-------------------|--------------|------------------------------------|-------------------|--------------|--------------------------------|
| RL-390-W | Coil | Antenna Choke | *RQ-1300-W | Resistor | " 50M Ohm 1/4 W. (Pkg.5) |
| RT-3038-W | Transformer | 1st I. F. Transformer | *RQ-1331 | Resistor | " 1 Meg. Ohm 1/4 W. (Pkg.5) |
| RT-3039-W | Transformer | 2nd I. F. Transformer | *RQ-1343 | Resistor | " 3 Meg. Ohm 1/4 W. (Pkg.5) |
| RL-5006-W | Beam-a-Scope | Loop Antenna | *RQ-1355 | Resistor | " 10 Meg. Ohm 1/4 W. (Pkg.5) |
| RL-2084-W | Coil | Oscillator | *RQ-1303 | Resistor | " 68,000 Ohm 1/4 W. (Pkg.5) |
| RL-175-W | Coil | Interstage R. F. Coil | *RQ-1259 | Resistor | " 1,000 Ohm 1/2 W. (Pkg.5) |
| RC-7078-W | Condenser | Tuning (3 gang) | RR-368-W | Resistor | Wire Wound—2100 Ohm |
| RC-5213-W | Condenser | Comb. Electrolytic 40+20 Mfd. 150V | RR-369-W | Resistor | Wire Wound—70 Ohm |
| *RC-009 | Condenser | Tubular .001 mfd. 400V | RC-8249-W | Cord | Resistor Line Cord |
| *RC-011 | Condenser | Tubular .002 mfd. 400V | RC-8250-W | Cable | Battery Cable |
| *RC-072 | Condenser | Tubular .05 mfd. 200V | RD-789-W | | Glass Dial Scale |
| *RC-146-W | Condenser | Tubular .25 mfd. 100V | RS-1097-W | Speaker | 5" P.M. with Output Trans. |
| *RC-092 | Condenser | Tubular .05 mfd. 400V | RT-4034-W | | Output Transformer for Speaker |
| *RC-193 | Condenser | Tubular .008 mfd. 400V | RC-9058-W | | Speaker Cone |
| *RC-136 | Condenser | Tubular .25 mfd. 200V | *RS-238 | Tube Socket | 8 Prong Octal 1 5/16" |
| *RC-235 | Condenser | Mica 100 mmfd. | RX-114 | Suction Cups | For Beam-a-Scope (Pkg. 2) |
| *RC-259 | Condenser | Mica 250 mmfd. | *RS-3084-W | Switch | Battery-electric switch |
| RV-151-W | | Volume Control & Switch | RK-1076-W | Knob | Indicator Knob (with dot) |
| *RQ-1263 | Resistor | Carbon 1500 Ohm 1/4 W. (Pkg.5) | RK-1077-W | Knob | Tuning Knob |
| *RQ-1253 | Resistor | " 560 Ohm 1/4 W. (Pkg.5) | RP-1037-W | Pointer | Dial Pointer |
| *RQ-1314 | Resistor | " 200M Ohm 1/4 W. (Pkg.5) | | | |

*Used on previous receivers.

REPLACEMENT PARTS LIST MODEL GB-400

| Stock No. | Description | Stock No. | Description |
|-----------|--|-----------|--|
| RB-1001W | BOARD—Ant.-Gnd. terminal board | *RQ-1303 | RESISTOR—67,000 ohm, 1/2-w. carbon (R-2) (Pkg. 5) |
| *RC-018 | CAPACITOR—.004 mfd. 600 V. paper (C-9) | *RQ-1307 | RESISTOR—100,000 ohm, 1/2-w. carbon (R-4) (Pkg. 5) |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-3, 5, 8) | *RQ-1315 | RESISTOR—200,000 ohm, 1/2-w. carbon (R-1) (Pkg. 5) |
| *RC-048 | CAPACITOR—.02 mfd. 600 V. paper (C-1) | *RQ-1331 | RESISTOR—1.0 megohm, 1/2-w. carbon (R-9) (Pkg. 5) |
| *RC-216 | CAPACITOR—50 mmf., mica (C-2) | *RQ-1339 | RESISTOR—2.2 megohm, 1/2-w. carbon (R-7) (Pkg. 5) |
| *RC-235 | CAPACITOR—100 mmf., mica (C-7) | *RQ-1343 | RESISTOR—3.0 megohm, 1/2-w. carbon (R-3) (Pkg. 5) |
| RC-237W | CAPACITOR—Dual 100 mmf., mica (C-4) | *RQ-1355 | RESISTOR—10 megohm, 1/2-w. carbon (R-6) (Pkg. 5) |
| RC-738W | CONDENSER—Tuning condenser | RS-197W | SHIELD—1N5 tube shield |
| *RC-5118 | CAPACITOR—8 mfd. 150 V. dry electrolytic (C-6) | RS-198W | SHIELD—1A7 tube shield |
| RC-6504W | CAPACITOR—Oscillator padding capacitor | *RS-200 | SOCKET—Octal base tube socket (Pkg. 5) |
| RC-6505W | CAPACITOR—Dual osc. & RF trimmer | *RS-223 | SOCKET—1H5 tube socket (Pkg. 5) |
| RC-8110W | CABLE—Battery cable and plugs | RS-241W | SOCKET—Speaker socket |
| RC-9002W | CONE—Speaker cone | RS-1003W | SPEAKER—5-inch P.M. speaker |
| RD-096W | SCALE—Dial scale | RT-299W | TRANSFORMER—1st IF transformer |
| RD-097W | SCALE—Volume scale | RT-300W | TRANSFORMER—2nd IF transformer |
| RL-076W | COIL—Antenna—RF coil (loop) | RT-455W | TRANSFORMER—Output transformer |
| RL-280W | COIL—Oscillator coil | RV-059W | VOLUME CONTROL—1.0 megohm volume control (R-5) |
| *RQ-1257 | RESISTOR—820 ohm, 1/2-w. carbon (R-8) (Pkg. 5) | | |

* Used on previous production receivers.



MODEL 417A

GENERAL ELECTRIC CO.

ALIGNMENT

EQUIPMENT REQUIRED:

1. Test Oscillator with tone modulation. (See Table.)
2. D-C Voltmeter or Microammeter. (See notes 2 and 3.)
3. A-C Voltmeter, 2 volts. (See note 6.)
4. Insulated hex wrench, 1/4". (See steps 1, 10, 13.)
5. .01 MF Paper Capacitor. (See steps 1 to 5.)

6. 400-ohm, 1/2-watt resistor. (See steps 16 to 21.)
7. 200 mmf. mica capacitor. (See steps 22 to 28.)

Important detailed instructions and references in connection with the alignment table which follows are keyed in by means of column 7, headed "See Note." The notes are included in numerical order after the table. They are important—refer to them carefully.

ALIGNMENT TABLE

| Step | Signal Generator Frequency | Signal Input Point | Band Switch | Dial Setting | Adjust | See Note | Remarks |
|------------------------|----------------------------|-----------------------|-------------|-------------------------|------------------|-------------|---|
| FM IF ALIGNMENT | | | | | | | |
| 1 | 10.7 mc | 6SH7 grid thru .01 mf | FM1 | ..... | C49 for zero** | 1, 2 | Adjust C49 for zero meter reading. Apply 1-volt signal input. |
| 2 | See last column | 6SH7 grid thru .01 mf | FM1 | ..... | Signal Generator | 1, 2 | Detune signal generator to point of maximum meter reading. |
| 3 | As in step 2 | 6SG7 grid thru .01 mf | FM1 | ..... | Peak C48 | 1, 2 | |
| 4 | 10.7 mc | 6SV7 grid thru .01 mf | FM1 | ..... | Peak C28 & C94 | 1, 3 | 6AQ7GT tube removed from its socket. |
| 5 | 10.7 mc | 6SG7 grid thru .01 mf | FM1 | ..... | Peak C26 & C93 | 1, 3 | 6AQ7GT tube removed from its socket. |
| 6 | 10.7 mc | Conv. grid directly | FM1 | ..... | Peak C24 & L-10 | 1, 3, 4 | 6AQ7GT tube removed from its socket. |
| AM IF ALIGNMENT | | | | | | | |
| 7 | 455 kc | Conv. grid directly | STD | ..... | Peak C86 & C61 | 5, 6 | |
| 8 | 455 kc | Conv. grid directly | STD | ..... | Peak C15 & C23 | 5, 6 | |
| 9 | 455 kc | Conv. grid directly | STD | ..... | Peak C13 & C14 | 5, 6 | |
| FM RF ALIGNMENT | | | | | | | |
| 10 | 88 mc | DIPOLE terminals | FM2 | 88 mc—6.8 to 6.9 in.* | Peak C6** | 1, 3, 7, 10 | Set dial accurately—then adjust C6. |
| 11 | 98 mc | DIPOLE terminals | FM2 | For max. output | Peak C3 | 1, 3, 8 | Tune dial for maximum output, then peak C3 while rocking dial. |
| 12 | 98 mc | DIPOLE terminals | FM2 | Do not change | Peak C2 | 1, 3 | |
| 13 | 43 mc | DIPOLE terminals | FM1 | 43 mc—6 to 6.1 in.* | Peak C45** | 1, 3, 7 | Set dial accurately—then adjust C45. |
| 14 | 46 mc | DIPOLE terminals | FM1 | For max. output | Peak C63 | 1, 3, 8 | Tune dial for maximum output, then peak C63 while rocking dial. |
| 15 | 46 mc | DIPOLE terminals | FM1 | Do not change | Peak C65 | 1, 3 | |
| SW RF ALIGNMENT | | | | | | | |
| 16 | 11.8 mc | Antenna thru 400 ohms | SW2 | 11.8 mc—4.5 to 4.6 in.* | Peak C58 | 5, 6, 7, 10 | Set dial accurately—then adjust C58. |
| 17 | 11.8 mc | Antenna thru 400 ohms | SW2 | Do not change | Peak C57 | 5, 6, 8 | Peak C57 while rocking dial. |
| 18 | 11.8 mc | Antenna thru 400 ohms | SW2 | Do not change | Peak C54 | 5, 6 | C54 is located on back apron of chassis. |
| 19 | 9.6 mc | Antenna thru 400 ohms | SW1 | 9.6 mc—4.5 to 4.6 in.* | Peak C59 | 5, 6, 7, 10 | Set dial accurately—then adjust C59. |
| 20 | 9.6 mc | Antenna thru 400 ohms | SW1 | Do not change | Peak C56 | 5, 6, 8 | Peak C56 while rocking dial. |
| 21 | 9.6 mc | Antenna thru 400 ohms | SW1 | Do not change | Peak C55 | 5, 6 | |

* Important! See Note 7.

**Use insulated hex wrench, 1/4".

GENERAL ELECTRIC CO.

MODEL 417A

ALIGNMENT TABLE (Cont'd)

| Step | Signal Generator Frequency | Signal Input Point | Band Switch | Dial Setting | Adjust | See Note | Remarks |
|-------------------------------|----------------------------|---------------------|-------------|-----------------------------|-------------------------|------------|---|
| BROADCAST RF ALIGNMENT | | | | | | | |
| 22 | 1620 kc | Antenna via 200 mmf | STD | Extreme right-hand position | Peak C5 | 5, 6 | |
| 23 | 1620 kc | Antenna via 200 mmf | STD | Extreme right-hand position | Peak C4 | 5, 6 | |
| 24 | 1620 kc | Antenna via 200 mmf | STD | Extreme right-hand position | Peak C1 | 5, 6 | |
| 25 | 1500 kc | Antenna via 200 mmf | STD | 1500 kc—1.4 to 1.5 in.* | Osc. Coil T3 iron slug | 5, 6, 7, 9 | T3 iron slug is the rear one on the left side. Adjust for peak. |
| 26 | 1000 kc | Antenna via 200 mmf | STD | For max. output | Conv. coil T6 iron slug | 5, 6, 9 | T6 iron slug is the center one on the left side. Adjust for peak. |
| 27 | 1000 kc | Antenna via 200 mmf | STD | Do not change | R-F coil T1 iron slug | 5, 6, 9 | T1 iron slug is the front one on the left side. Adjust for peak. |
| 28 | 580 kc | Antenna via 200 mmf | STD | For max. output | Peak L8 | 5, 6, 8 | Peak L8 while rocking dial. |
| 29 | | | | | | | Repeat steps 22 to 28. |

* Important! See Note 7.

Notes in Connection with Alignment Table

1. Use *unmodulated* signal.
2. Connect 20,000-ohm-per-volt meter from junction of R21 and C29 to chassis. Use ten-volt scale. (Steps 1-3.)
3. Connect 20,000-ohm-per-volt meter from grid pin 4 of 6SH7 to chassis with a 200,000-ohm resistor in series. The resistor must be connected directly to the grid so that capacity loading will be negligible and so that the meter is isolated from the i-f signal voltage. Keep signal generator output down so that the meter indicates not more than one volt at the grid (5 micro-amperes through 200,000 ohms). (Alignment steps 4 to 6, 10, to 15).
4. Connect signal generator directly to the converter grid at some convenient point. The generator lead must be shielded up to this connection so that not more than $\frac{1}{16}$ inch of exposed lead exists. Ground the shield solidly by clamping it firmly to the chassis or a shield as close to the connection as possible. (Steps 6-9)
5. Use 400-cycle modulation. (Steps 7 to 9, 16 to 28.)
6. Connect a standard output meter across speaker voice coil. Turn volume control fully on. Keep signal generator output down so that the meter indicates not more than $\frac{1}{2}$ -watt output (2 volts) during alignment. (Steps 7 to 9, 16 to 28.)
7. If dial scale is not available, index pointer as follows: Turn pointer to right-hand limit of travel. Mark the dial back plate at a reference edge of the pointer slider. Then set pointer by turning dial knob until the indicated dimension exists between the reference edge and the mark.
8. "Rocking" consists of adjusting the indicated adjuster while turning the dial a small amount back and forth through peak output. The object is to find the maximum peak. Rocking is necessary and is permissible only when interlocking circuits are being adjusted.
9. The main tuning iron slugs are suspended from the left side of the tuning "elevator." They are individually adjustable by loosening the locknut and turning the supporting screw into which the suspending wire is soldered.
10. Two oscillator settings will give response. The higher frequency response point is the correct one; the other is the image. If in doubt, start with the trimmer screw loosened completely and adjust for the *first* response.

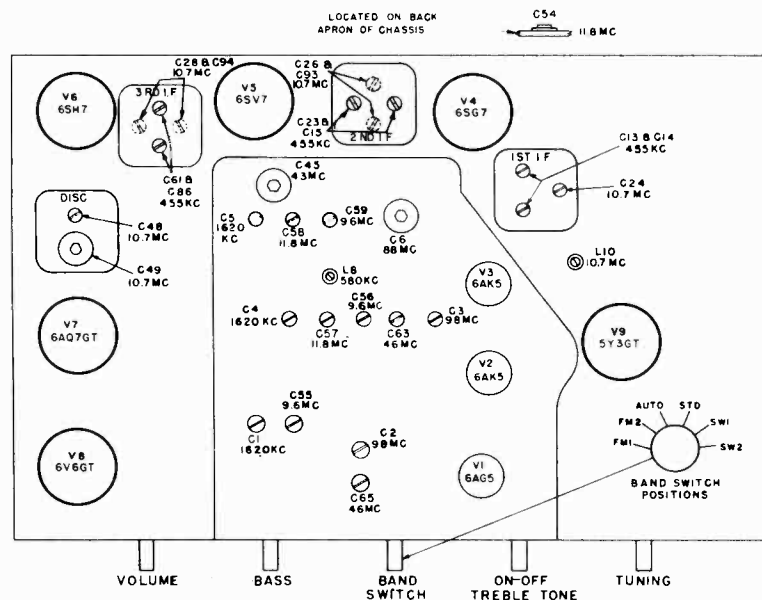


Figure 7—Location of Tubes and Adjusters

WIRING OF BAND SWITCH

(Wire length given from end to end before stripping)

SECTION 1

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|--|
| 1 | Insulated wire, 5" lg. | Antenna transformer T13, terminal 4 |
| 2 | a. Insulated wire, 11 1/4" lg. b. Insulated wire, 8" lg. c. Capacitor C50 | Antenna terminal at rear of chassis Switch Section 1, lug 6 Switch Section 2, lug 1 |
| 3 | Capacitor C52 | Switch Section 2, lug 3 |
| 4 | a. Insulated wire, 1 1/2" lg. b. Insulated wire, 14" lg. c. Insulated wire, 5 1/2" lg. | Antenna transformer T1, terminal 1 Beam-a-scope plug, terminal A Antenna transformer T13, terminal 2 |
| 5 | a. Short bare bus b. Resistor R15 | Ground lug on C65 Switch Section 1, lug 11 |
| 6 | See lug 2b, above | |
| 7 | Insulated wire, 11" lg. | Terminal strip 1, lug 4 |
| 8 | Capacitor C31 | Front terminal of T2 |
| 9 | a. Insulated wire, 9" lg. b. Insulated wire, 7" lg. | Terminal strip 2, lug 5 Filter capacitor, C46C |
| 11 | See lug 5b, above | |

SECTION 2

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|---|
| 1 | See Section 1, lug 2c | |
| 3 | a. Insulated wire, 2 1/2" lg. b. See Section 1, lug 3 | Trimmer C1, lug nearer T1 |
| 4 | Insulated wire, 1 1/2" lg. | Trimmer C55, lug nearer T1 |
| 5 | Coil L20 | Ground lug on trimmer C2 |
| 6 | Short bare bus | Trimmer C65, left-hand terminal* |
| 7 | Short bare bus | Trimmer C2, left-hand terminal* |
| 8 | Capacitor C7 | Tube socket V1, pin 1 |
| 9 | Insulated wire, 4" lg. | Antenna transformer T13, terminal 1 |
| 10 | Insulated wire, 3 1/2" lg. | Antenna transformer T1, terminal 2 |
| 11** | Insulated wire, 11 1/2" lg. | Beam-a-scope plug, terminal C |

SECTION 3

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|---|
| 1 | Shielded wire, 8 3/4" lg. | Terminal strip 2, lug 6 |
| 2 | Insulated wire, 1 1/2" lg. | Switch Section 3, lug 12 |
| 3 | a. Insulated wire, 2 1/2" lg. b. Capacitor C16 c. Choke L3 | Converter coil T6, terminal 1 Ground lug on terminal strip 3 Switch Section 3, lug 11 |
| 4 | Insulated wire, 7 1/2" lg. | Terminal strip 2, lug 3 |
| 5 | Insulated wire, 1 3/8" lg. | Converter coil T6, terminal 2 |
| 6 | Short bus with spaghetti | Chassis |
| 7 | Short bare bus | Terminal strip 3, lug 4 |
| 10 | Shielded wire, 10 1/2" lg. | Terminal strip 2, lug 2 |
| 11 | a. See lug 3c, above b. Capacitor C10 | Switch Section 4, lug 3 |
| 12 | a. See lug 2, above b. Shielded wire, 7 3/4" lg. | Push-button socket, terminal B |

* Looking from front, chassis inverted.
** Double lug (front and rear) soldered together.

SECTION 4

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|---|--|
| 1 | a. Insulated wire, 5 1/2" lg. b. Insulated wire, 7 1/4" lg. | Antenna transformer T13, terminal Push-button socket, terminal F |
| 2 | Insulated wire, 2 1/2" lg. | Trimmer C4, lug nearer T6 |
| 3 | a. See Section 3, lug 11b b. Short bus with spaghetti c. Short jumper | Coil L7, terminal 2 (toward front) Switch Section 4, lug 4 (adjacent) |
| 4 | See lug 3c, directly above | |
| 5** | Short bare bus | Trimmer C63, lug nearer front |
| 6 | Capacitor C88 | Tuner T5, left-hand terminal* |
| 7 | Short bare bus | Tuner T5, left-hand terminal |
| 8 | Capacitor C11 | Tube socket V2, pin 1 |
| 9 | a. Capacitor C72 b. Insulated wire, 2 1/2" lg. | Section 5, lug 11 Trimmer C56, front terminal |
| 10 | a. Capacitor C73 b. Insulated wire, 2 1/2" lg. | Section 5, lug 12 Trimmer C57, front terminal |
| 12 | Bus with spaghetti, 2 1/2" lg. | Coil L7, terminal 1 |

SECTION 5

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|---|
| 1 | a. Bus with spaghetti, 1 3/4" lg. b. Resistor R33 | Coil L1, terminal 1 Section 5, lug 4 |
| 2 | a. Insulated wire, 3" lg. b. Insulated wire, 1 1/4" lg. | Coil L8, terminal 1 Section 6, lug 4 |
| 4 | See Section 5, lug 1b | |
| 5 | Bus with spaghetti, 3" lg. | Coil L1, terminal 2 |
| 6 | a. Bus with spaghetti, 3" lg. b. Bus with spaghetti, 1 1/2" lg. | Capacitor C45, left-hand terminal* Section 5, lug 10 |
| 7** | Short bare bus | Tuner T4, left-hand terminal* |
| 8 | Capacitor C12 | Tube socket V3, pin 1 |
| 9 | Insulated wire, 4" lg. | Trimmer C5, lug nearer T3 |
| 10 | a. See Section 5, lug 6b b. Capacitor C41 | Section 6, lug 6 |
| 11 | a. Insulated wire, 3 3/4" lg. b. See Section 4, lug 9a | Trimmer C59, lug nearer front |
| 12 | a. Insulated wire, 3 1/2" lg. b. See Section 4, lug 10a | Trimmer C58, lug nearer front |

SECTION 6

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|---|
| 1 | Insulated wire, 4 1/2" lg. | I-F transformer T7, terminal 8 |
| 2 | Bus with spaghetti, 1 1/2" lg. | Coil L1, terminal 2 |
| 4 | See Section 5, lug 2b | |
| 5 | Insulated wire, 12" lg. | Push-button socket, terminal A |
| 6 | a. Bus with spaghetti, 2" lg. b. Capacitor C75 c. See Section 5, lug 10b | Trimmer C45, center terminal Ground at C59 |
| 7 | Short bare bus | Trimmer C6, center terminal |
| 8 | Bare bus, 1" lg. | Tube socket V3, pin 7 |
| 9 | Insulated wire, 2 1/4" lg. | I-F transformer T7, terminal 5 |
| 10 | Insulated wire, 2 3/4" lg. | I-F transformer T7, terminal 3 |
| 12 | Insulated wire, 3 1/2" lg. | Coil L8, terminal 3 |

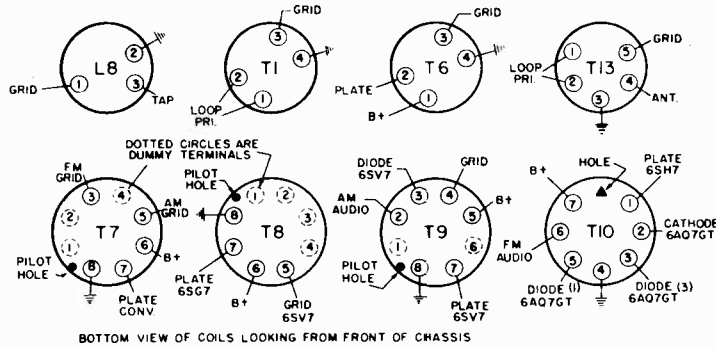


Figure 3—Terminal Identification of Coil Assemblies
(Numbers correspond with schematic)

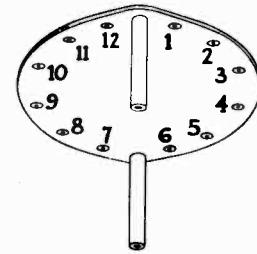


Figure 5—Identification of Switch Lugs
—Set Inverted and Viewed from Panel

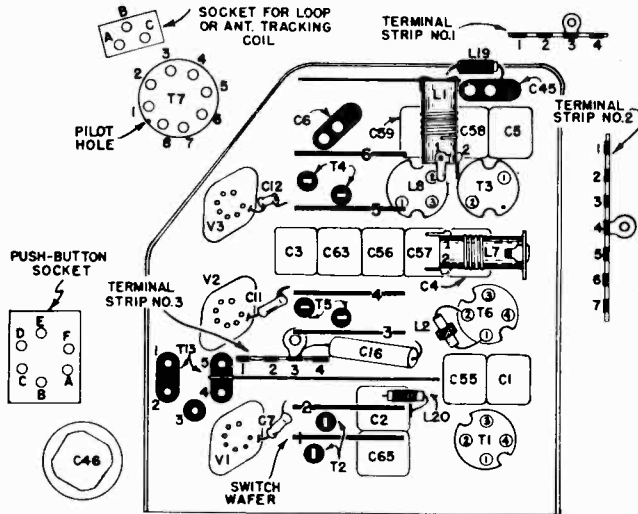


Figure 4—Physical Location of Components
Listed in Band Switch Wiring Table

TUBE COMPLEMENT:

| | |
|---------------------------------|-----------|
| R-F Amplifier | 6AG5 |
| Converter | 6AK5 |
| Oscillator | 6AK5 |
| 1st I-F Amplifier | 6SG7 |
| 2nd I-F Amplifier | 6SV7 |
| FM Limiter—AM Detector | 6SH7 |
| Discriminator—1st A-F Amplifier | 6AQ7-GT |
| Power Amplifier | 6V6GT |
| Phono Pre-Amplifier | 6SC7 |
| Rectifier | 5Y3GT |
| Dial Lamp (2) | GE No. 44 |
| Pilot Lamp (bottom of cabinet) | GE No. 47 |

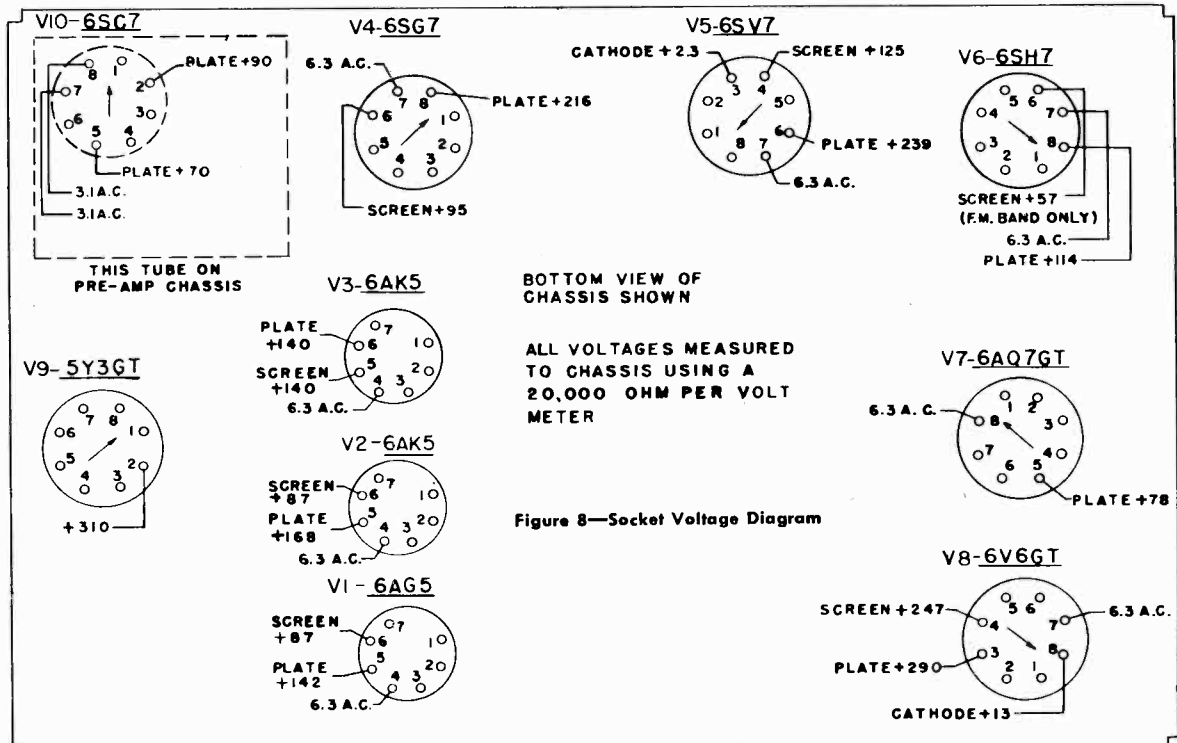


Figure 8—Socket Voltage Diagram

GENERAL INFORMATION

INTRODUCTION

The information contained in this service note covers the Model 417A completely except for the record player.

THE TUNING SYSTEM

The "r-f end" of the receiver is unusual in a number of respects. Variable inductance tuning is employed instead of using a conventional tuning capacitor. This design makes possible two distinct advantages. First, it provides a high efficiency FM circuit in the 88 to 108 megacycle range which would not be possible with the more conventional methods of tuning. Second, it provides stable short-wave spread-bands which tune as easily as the broadcast band. Other advantages are also obtained but the two mentioned above are the most important.

Tuning is accomplished by an "elevator" which consists of a rigid plastic horizontal plate raised and lowered by means of a windlass controlled by the tuning knob at the panel. From this plate are suspended three powdered iron cores which tune the broadcast r-f, converter, and oscillator coils; and three tuning "vanes" which tune three low-inductance circuits. These latter circuits are employed in both FM bands and both short-wave bands with the exception of the antenna circuit for the short-wave spread-bands when a broad tuned antenna coil is used and the r-f guillotine tuner is switched out. They are called "guillotine" tuners because of their appearance.

FACTS ABOUT "GUILLOTINE" TUNING

The "guillotine" tuners are designed primarily for the 88-108 megacycle FM band where special technique is needed to realize high gain and circuit stability. Ordinary coils, tuned by a variable capacitor, are inefficient at these frequencies, first, because of the low inductances required to reach these frequencies when a variable tuning capacitor is employed and, second, because shunt capacity reduces the gain of the amplifier circuit; shunt capacity must be kept very low. Another disadvantage of standard tuning arrangements at these frequencies is that common coupling is obtained through the shaft of a ganged tuning capacitor unless insulated single sections are used (cumbersome and costly). Common coupling of this type tends to cause oscillation or general instability and precludes high gain per stage. The guillotines make possible short leads, completely isolated sections, stable tuning, high Q circuits, low shunt capacity, and location of each tuner in the best physical and electrical position in the assembly. Furthermore, since the shunt capacity is small and the inductance is consequently at its highest corresponding value, the additional unavoidable inductance introduced in the wiring, band switch, etc., produces a minimum of circuit losses and unbalance.

The guillotine tuner consists of a heavy, silver-plated, two-turn square coil, rigidly supported between two plastic posts. A flat, solid vane slides up and down between the two turns. It is guided in grooves in the plastic posts so that it passes between the two sections of the coil without touching them. The posts are so moulded and the coil so constructed that the whole assembly is held rigidly at a predetermined spacing. The tuning vane is raised and lowered by the tuning elevator. When the elevator is all the way up (set tuned to lowest frequency), the vane is completely above the coil which then acts as a simple two-turn coil. As the set is tuned toward the higher frequencies, the vane moves downward into the field of the coil until, finally, it is all the way in. The vane reduces the inductance of the coil through two principles. First, it acts as a shorted turn, and thus reduces inductance directly; second, it provides a barrier between the two turns of the coil which reduces the mutual coupling and thus also reduces inductance.

The tuners described above are identified as T2, T4, and T5, on the schematic diagram.

FM BANDS

Guillotine tuners T2, T5, and T4 are used as the tuned circuits for the r-f amplifier, converter, and local oscillator respectively, in both FM bands. In the higher frequency band, the tuner is used with only a small shunt trimmer for adjusting distributed capacity. In the lower band, a higher value shunt trimmer is used to reduce the frequency. The layout of band switch, tuners, and tube sockets is arranged to give the shortest possible leads when the FM bands are in use. The lead length in the other bands is not nearly so critical.

SHORT-WAVE SPREAD-BANDS

Bandspread tuning in the short-wave bands is obtained in the converter and oscillator circuits by inserting the guillotine tuners in series with a higher inductance so that the two inductances together form the "L" part of the short-wave tuned circuit. The small percentage change in inductance obtained in the tuner provides smooth, wide, and stable

tuning. The "C" part of the tuned circuit consists primarily of a shunt trimmer. Switching from one short-wave band to the other is accomplished by selecting a different shunt trimmer.

The converter grid circuit, as an example, includes L7 and T5 in series in both the SW1 and SW2 bands. Tuner T5 is in the ground end of the circuit and the signal is fed into the grid and through C10. The shunt tuning capacity is either C56 or C57, depending upon which of the two short-wave bands is used. Additional oscillator coupling capacitors, C72 or C73, are also added to compensate for the lower coupling through C67 when the higher shunt capacitors are in the circuit.

In the r-f stage, a section of the loop is used as the grid circuit. It is tuned for resonance by a shunt capacitor (C54 and C55) and a shunt inductance (L20). Because a tuned circuit of this type is inherently broad, tuning through the relatively narrow spread-band offers little advantage and is not done.

STANDARD BROADCAST BAND

When manual tuning is employed (Band Switch in STD position), the receiver employs an r-f stage, a converter, and an oscillator, all of which are tuned by iron slugs suspended from the tuning elevator. In the automatic position (Band Switch in the AUTO position), the r-f stage is not used. Instead, a separate antenna coil is used which couples the antenna and loop directly into the converter. A separate coil is used in order to make the tuning circuit independent of the dial tuning mechanism so that it may be tuned by trimmers in the push-button assembly.

Switching from manual to automatic tuning is accomplished in the oscillator by using an oscillator coil which is tuned by a separate shunt inductance. In manual tuning, the inductance is one which is tuned by the tuning elevator. In automatic tuning, a fixed shunt capacity (C-76) plus one of a series of push-button selected coils tunes the oscillator.

I-F AMPLIFIER

The i-f amplifier consists of a composite 455 kc and 10.7 mc circuit. The electrical changes required to transfer between AM and FM service are made by the Band Switch. When the switch is in either the FM1 or FM2 position, the amplifier operates at 10.7 megacycles and delivers the i-f signal into an FM discriminator circuit. When the switch is in any of the other positions, the amplifier operates at 455 kc. Screen voltage is removed from the tube which acted as an FM limiter and this tube then acts as an AM diode detector. Thus, the AM audio signal appears across R16 while the FM audio signal appears across R22. A section of the Band Switch switches the audio input circuit from one to the other. The AVC bus is also shorted out for FM.

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20%. Readings taken with low signal so that AVC is not effective.

(1) R-F and I-F Stage Gains

Signal applied through IRE dummy antenna:
Antenna post to V1 grid 4 @ 1000 kc
Antenna post to V1 grid 2 @ 9.6 mc
Antenna post to V1 grid 2 @ 11.8 mc

Signal applied through 300 ohms, including signal generator impedance:
Dipole terminals to V1 grid 1.5 @ 45 mc
Dipole terminals to V1 grid 2 @ 98 mc

These checks with oscillator tube (V3) removed:
V1 grid to V2 grid 13 @ 1000 kc
V1 grid to V2 grid 6 @ 9.6 mc
V1 grid to V2 grid 9 @ 11.8 mc
V1 grid to V2 grid 13 @ 45 mc
V1 grid to V2 grid 10 @ 98 mc

These checks with oscillator tube (V3) removed:
V2 grid to V4 grid 23 @ 455 kc
V2 grid to V4 grid 37 @ 10.7 mc
V4 grid to V5 grid 23 @ 455 kc
V4 grid to V5 grid 60 @ 10.7 mc
V5 grid to V6 grid 40 @ 455 kc
V5 grid to V6 grid 25 @ 10.7 mc

(2) Audio Gain

.07 volts at 400 cps across volume control with control set at maximum will give approximately 1/2 watt output across the speaker voice coil.

(3) Oscillator Grid Bias

D-c voltage developed across R5 (average):
13 v. @ 1000 kc 2.7 v. @ 11.8 mc
2.7 v. @ 9.6 mc 5.5 v. @ 45 mc
7 v. @ 98 mc

(4) Socket Pin Voltages

Fig. 8 shows typical tube pin voltages. All readings should be made from the pins to ground unless otherwise indicated.

REPLACEMENT OF DRIVE CORDS

DIAL STRINGING:

Push the tuning elevator all the way down and string the dial as shown in Figure 1. This illustration shows the stringing as viewed from behind the dial scale, as you would see it when working on it. The numbers and arrows indicate the progression of the dial cord from start to finish. Notice that the dial cord, in progressive steps 9, 10, 11, and 12, is made to travel behind the start and end of cord stringing, as viewed in Figure 1. The procedure will be easier if pulley C is bypassed until the rest of the work is finished after which the cord can be pulled tight over that pulley. During the procedure, locate the two brass eyelets so that they fall between pulleys A and B. When finished, crimp the eyelets on the cord in the proper positions to act as minimum and maximum stops for the tuning mechanism and clip the pointer on the cable half-way between the eyelets.

Separate detail drawings are given to show the three different methods of attaching the ends of the cord. The arrangement with the standard helical spring was used in some earlier production receivers. If the cord and spring are to be replaced, the Type 1 spring should be used. It fits the same drum and is an improved type. The Type 2 spring should be used with the later type of drum (with two tabs). When stringing the mechanism with either the Type 1 or Type 2 spring, load the spring by pulling the hook over the projection at the other end of the spring, string the dial and, as a final step, release the hook so that it pulls up the slack in the dial cord.

Elevator Stringing

The step-by-step procedure for stringing the elevator windlass is shown in Figure 2, a rear view of the mechanism. Start by inserting the metallic cord in slot as shown in Step 1. Observe that the cord is measured five inches from end of loop to where it enters the slot. Now bring the loop end around the pulley counterclockwise, as in Step 2. Next, thread loop through hole in elevator top plate, fastening it to the hoist cord tension spring, as viewed in Step 3. Steps 4, 5, 6, and 7 show how the free end of cord progresses on the pulley, going clockwise and that each turn is laid progressively one in back of the other and in back of the vertical section, going to the tension spring in tuner plate. In Step 6, pass the free end of cord down through the hole in chassis, grasping its

end with long-nosed pliers and drawing tension on cord while running elevator completely down to the bottom. Keeping tension on cord and forcing large dial drive drum so that hoist cord spring is compressed, complete Step 7 making a one turn loop of the cord's free end around the lug shown on end of elevator shaft and solder.

Concluding Comment

After replacing the dial cord or the elevator cord, it may be found that some correction in relative positioning is needed. This can be done by loosening the set screws in the large drive pulley directly behind the dial scale and re-positioning it on the shaft. The object, of course, is to permit the tuning control to drive the elevator through its full tuning range. Slight errors in final setting are not serious since leeway is provided in the location of the dial pointer itself.

WIRING OF BAND SWITCH

In order to facilitate repair, replacement, and circuit tracing, a table and diagrams are supplied with reference to the connections made in the band switch. If used properly, these will be of invaluable aid. The remarks which follow are intended to clarify the make-up of the tables and diagrams—read them carefully before using the table.

The table is broken down into six parts, one for each switch wafer. Section 1 is nearest the front and section 6 is the rear-most wafer.

Individual lugs on each wafer are numbered from 1 to 12, depending upon their position on the wafer. The method of numbering is illustrated in Figure 5. In determining the number, turn the chassis upside down and look from the front toward the rear of the chassis. Thus, lugs 1 and 12 are the ones which are at the bottom when the set is in its normal position; lugs 3 and 4 are on the side with the broadcast band coils; and lugs 9 and 10 are on the side with the 6AK5 tubes. The numbering refers to lugs whether they be on the front or rear of the wafer.

Figure 4 shows the physical location of various components and terminals to which reference is made in the table.

In those cases where a component symbol number is given in column two, instead of a wire, that component is connected by its own lead wire directly to the switch lug and the connection of the other end of the component is given in the last column.

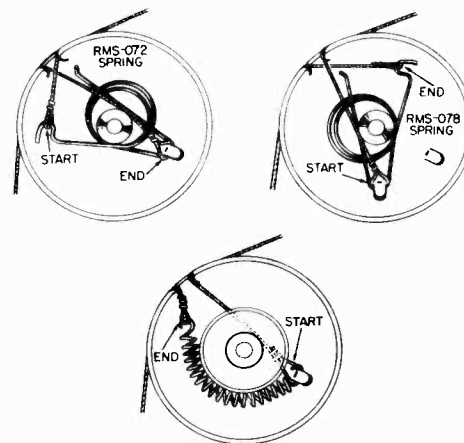
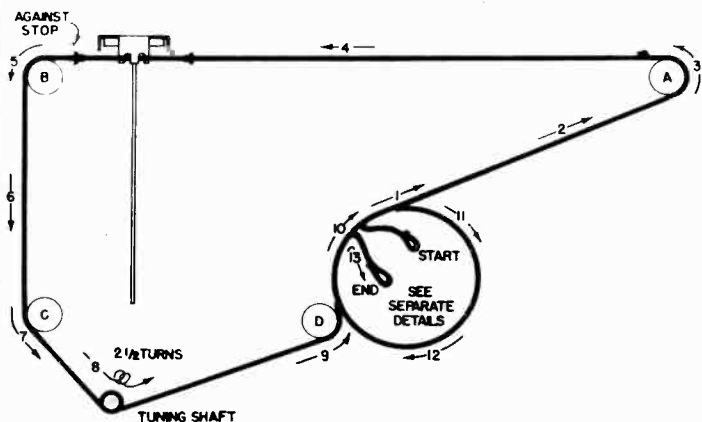


Figure 1—Dial Stringing Diagram Showing Later Production Springs

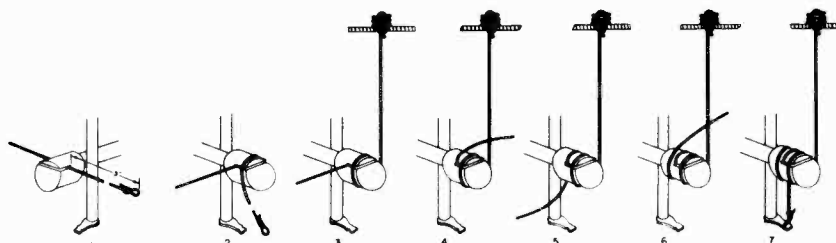


Figure 2—Elevator Windlass Stringing Procedure

REPLACEMENT PARTS LIST

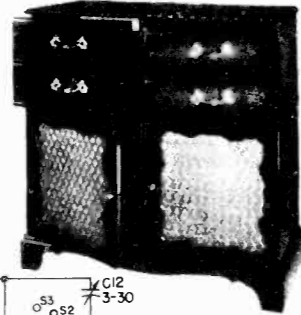
| Part No. | Symbol | Description | Part No. | Symbol | Description |
|--------------------------------------|---|--|----------|--------|---|
| UNIVERSAL REPLACEMENT PARTS | | | | | |
| UCC-039 | C43 | CAPACITOR—005 mfd., 600 v., paper | RCY-017 | C6, 45 | CAPACITOR—3-30 mmf., air trimmer |
| UCC-040 | C17, 30, 64, 69, 89, 91, 103, C9, 18, 74, 104 | CAPACITOR—.01 mfd., 600 v., paper | RDB-001 | | PUSHBUTTON—Black pushbutton used at bottom of strip only |
| UCC-041 | C37 | CAPACITOR—.02 mfd., 600 v., paper | RDB-004 | | PUSHBUTTON—Black pushbutton used in upper five positions only |
| UCC-042 | C47, 66, 77, 101, 102 | CAPACITOR—.03 mfd., 600 v., paper | RDC-019 | | CORD—Hoist cord 6 1/4" long |
| UCC-045 | C71, 107, 106 | CAPACITOR—.05 mfd., 600 v., paper | RDC-021 | | CORD—Drive cord 40 1/4" |
| UCG-2048 | C25 | CAPACITOR—680 mmfd., 500 v., silver mica | RDE-019 | | ESCUTCHEON—For dial scale and pushbuttons |
| UCU-506 | C52 | CAPACITOR—6.8 mmf., ceramic | RDE-021 | | BACK PLATE—Large metal panel plate |
| UCU-020 | C21, 53 | CAPACITOR—47 mmf., 500 v., mica | RDE-003 | | KNOB—Black knob, plain |
| UCU-028 | C68 | CAPACITOR—100 mmf., 500 v., mica | RDC-004 | | KNOB—Black control knob with pointer |
| UCU-048 | C38 | CAPACITOR—680 mmf., 500 v., mica | RDK-032 | | ESCUTCHEON ORNAMENT—Left-hand plastic escutcheon ornament |
| UCU-520 | C70, 119 | CAPACITOR—47 mmf., mica | RDO-001 | | POINTNER—Dial pointer and slide |
| UCU-528 | C70, 79, 31 | CAPACITOR—100 mmf., 500 v., mica | RDP-016 | | POINTNER—Dial pointer |
| UCU-536 | C85 | CAPACITOR—220 mmf., 500 v., mica | RDS-018 | | SCALE—Tuning dial scale |
| UCU-1042 | C29 | CAPACITOR—390 mmfd., 500 v., mica | REX-002 | | CORE—Iron core with glass tubing for broadcast antenna, r-f, and oscillator coils |
| UCU-1504 | C73 | CAPACITOR—200 mmfd., mica | RHC-007 | | PIN—Hairpin cotter for securing shaft through pushbuttons |
| UCU-1512 | C72, 90 | CAPACITOR—220 mmfd., 500 v., mica | RHC-009 | | PIN—Hairpin cotter for idler wheel |
| UCU-1544 | C50 | CAPACITOR—470 mmfd., mica | RHC-010 | | SPRING CLIP—Holds FM coil assembly |
| UCW-1004 | C70 | CAPACITOR—10 mmf., ceramic | RHE-001 | | EYELET—For connecting FM coil links |
| UCW-1014 | C22 | CAPACITOR—27 mmf., ceramic | RHM-016 | | CLIP—Mounting clip for L1 and L7 |
| UCW-1020 | C41 | CAPACITOR—47 mmf., ceramic | RHM-024 | | LINK—Hoist link holding end of hoist cord |
| UCW-1028 | C34 | CAPACITOR—100 mmf., ceramic | RHM-025 | | RING—Retaining ring for flywheel |
| UCW-2022 | C75 | CAPACITOR—56 mmf., ceramic | RHM-026 | | COIL LINK—Rectangular coil link for assembling FM coils T2 and T5 |
| UIC-001 | | CEMENT—Speaker cone replacement cement | RHM-027 | | COIL LINK—Rectangular coil link for assembling FM coil, T4 |
| UJB-014 | | TERMINALS—4 lug terminal strip | RII-001 | | POST—Mycalox posts for assembling all FM coils |
| UJB-018 | | TERMINALS—2 lug terminal strip | RJC-001 | | CONTACT PIN—For speaker connection |
| UOP-1230 | | SPEAKER—12-in. permanent magnet speaker | RJJ-004 | | RECEPTACLE—Pre-amp. and pushbutton receptacle |
| UOX-002 | | CONE—Loudspeaker replacement cone assembly | RJP-002 | | PLUG—Six-prong pre-amp. power plug |
| URD-007 | R30 | RESISTOR—180 ohms, 1/2 w., carbon | RJP-003 | | PLUG—Phono power male plug |
| URD-009 | R26 | RESISTOR—22 ohms, 1/2 w., carbon | RJP-004 | | PLUG—Male phono plug from pre-amplifier |
| URD-017 | R2 | RESISTOR—47 ohms, 1/2 w., carbon | RJP-005 | | PLUG—Plug and cover for pushbutton cable |
| URD-025 | R33 | RESISTOR—100 ohms, 1/2 w., carbon | RJP-010 | | SOCKET—Phono input socket |
| URD-033 | R29 | RESISTOR—220 ohms, 1/2 w., carbon | RJP-011 | | PLUG—Shipping screw hole plug |
| URD-041 | R12 | RESISTOR—470 ohms, 1/2 w., carbon | RJS-003 | | SOCKET—Octal socket for V5, V6, and V7 |
| URD-049 | R34 | RESISTOR—1000 ohms, 1/2 w., carbon | RJS-012 | | PLATE—For mounting electrolytic |
| URD-057 | R38, 46 | RESISTOR—2200 ohms, 1/2 w., carbon | RJS-027 | | SOCKET—Dial light socket |
| URD-061 | R101 | RESISTOR—3300 ohms, 1/2 w., carbon | RJS-030 | | SOCKET—Octal socket for V4, V8, and V9 |
| URD-065 | R20, 45 | RESISTOR—4700 ohms, 1/2 w., carbon | RJS-044 | | TUBE SOCKET—Tube socket for V1, V2, and V3 |
| URD-077 | R10 | RESISTOR—15,000 ohms, 1/2 w., carbon | RJS-049 | | SOCKET—Phono power female socket |
| URD-083 | R104 | RESISTOR—27,000 ohms, 1/2 w., carbon | RLA-009 | | RECEPTACLE—3 pin receptacle for Beam-a-scope |
| URD-085 | R19, 44 | RESISTOR—33,000 ohms, 1/2 w., carbon | RLA-011 | | PLUG—Plug attached to Beam-a-scope |
| URD-089 | R24 | RESISTOR—47,000 ohms, 1/2 w., carbon | RLB-005 | | COIL—Broadcast band antenna coil |
| URD-091 | R7 | RESISTOR—56,000 ohms, 1/2 w., carbon | RLB-006 | | COIL—FM antenna choke coil |
| URD-093 | R13, 21 | RESISTOR—68,000 ohms, 1/2 w., carbon | RLB-007 | | COIL—FM oscillator cathode choke coil |
| URD-095 | R28, 39 | RESISTOR—82,000 ohms, 1/2 w., carbon | RLB-008 | | COIL—SW band RF plate choke coil |
| URD-097 | R9, 40 | RESISTOR—100,000 ohms, 1/2 w., carbon | RLB-009 | | COIL—Broadcast band plate choke dummy |
| URD-099 | R22, 23 | RESISTOR—120,000 ohms, 1/2 w., carbon | RLB-010 | | COIL—FM RF plate choke coil |
| URD-103 | R6 | RESISTOR—180,000 ohms, 1/2 w., carbon | RLC-013 | | COIL—FM band oscillator coil |
| URD-105 | R16, 27, 41 | RESISTOR—220,000 ohms, 1/2 w., carbon | RLC-014 | | COIL—Broadcast band oscillator coil |
| URD-113 | R35 | RESISTOR—470,000 ohms, 1/2 w., carbon | RLC-015 | | COIL—SW oscillator loading coil |
| URD-121 | R37 | RESISTOR—1.0 meg., 1/2 w., carbon | RLC-016 | | COIL—Broadcast band oscillator shunt coil |
| URD-125 | R1, 4, 8 | RESISTOR—1.5 meg., 1/2 w., carbon | RLC-017 | | COIL—SW band RF loading coil |
| URD-129 | R14, 18 | RESISTOR—2.2 meg., 1/2 w., carbon | RLF-003 | | COIL—Filament choke coil |
| URD-133 | R47, 102, 103 | RESISTOR—3.3 meg., 1/2 w., carbon | RLI-002 | | CHOKO—Power line choke |
| URD-145 | R42 | RESISTOR—10.0 meg., 1/2 w., carbon | RLP-004 | | COIL—FM IF plate coil |
| URD-1079 | R5 | RESISTOR—18,000 ohms, 1/2 w., carbon | RLP-006 | | COIL—Oscillator plate choke coil |
| URD-1104 | R105 | RESISTOR—200,000 ohms, 1/2 w., carbon | RMC-012 | | CLAMP—For holding cover on RF unit |
| URE-035 | R31 | RESISTOR—270 ohms, 1 w., carbon | RMC-013 | | CLIP—Support for clamp RMC-012 |
| URE-073 | R15 | RESISTOR—10,000 ohms, 1 w., carbon | RMC-014 | | CLIP—For holding shielded phono cable |
| URE-083 | R15 | RESISTOR—27,000 ohms, 1 w., carbon | RMM-009 | | SCREW—Metal sleeve on hoist pulley shaft |
| URE-085 | R17 | RESISTOR—33,000 ohms, 1 w., carbon | RMM-010 | | VANE—Tuner vane for FM coils T2 and T5 |
| SPECIALIZED REPLACEMENT PARTS | | | | | |
| RAB-021 | L17 | BEAM-A-SCOPE—Cabinet back and loop assembly | RMM-011 | | VANE—Tuner vane for FM oscillator coil, T4 |
| RAD-016 | L12, 13, 14, 15, 16 | BRACKET—For band switch mounting at front | RMM-015 | | SUPPORT—Cabinet drop-lead support |
| RAX-007 | | COIL—Pushbutton coils mounted on bracket | RMR-002 | | ROLLER—Presses against hoist shaft |
| RAX-008 | | BRACKET—Bracket and roller fork for elevator shaft | RMS-032 | | SPRING—Maintains pushbutton tension |
| RCC-001 | C40 | CAPACITOR—007 mfd., 600 v., paper | RMS-039 | | WASHER—"C" washer on idler pulley |
| RCC-035 | C32, 36 | CAPACITOR—.001 mfd., 600 v., paper | RMS-040 | | SPRING—Flat spring against hoist pulley shaft |
| RCC-040 | C20 | CAPACITOR—.01 mfd., 600 v., paper | RMS-041 | | SPRING—Wire spring against hoist pulley shaft |
| RCC-041 | C16, 19, 60, 62 | CAPACITOR—.02 mfd., 600 v., paper | RMS-042 | | SPRING—Hoist cord tension spring |
| RCC-056 | C51 | CAPACITOR—002 mfd., 1000 v., paper | RMS-043 | | SCREW—Iron core adjusting screw |
| RCE-029 | C46A, C46B, C46C, C46D | CAPACITOR—30 mfd., 400 v., dry electrolytic | RMS-044 | | SPRING—Guide wire spring in elevator plate |
| RCE-030 | C105A, C105B, C12 | CAPACITOR—20 mfd., 25 v., dry electrolytic | RMS-078 | | SPRING—Type 1 dial cord spring (earlier production) |
| RCW-001 | C67, 88 | CAPACITOR—15 mfd., 350 v., dry electrolytic | RMU-016 | | SPRING—Type 2 dial cord spring (later production) |
| RCW-013 | C67, 88 | CAPACITOR—47 mfd., ceramic | RMW-016 | | SHAFT—Manual tuning shaft |
| RCW-014 | C25, 27, 44 | CAPACITOR—10 mmf., ceramic | RMW-017 | | SHAFT—Main tuning drum |
| RCW-015 | C87 | CAPACITOR—15 mmf., ceramic | RMX-018 | | PULLEY—Small idler pulley |
| RCW-017 | C92 | CAPACITOR—3.3 mmf., ceramic | RMX-019 | | FLYWHEEL—Flywheel with setscrew |
| RCW-060 | C71 | CAPACITOR—1.5 mmf., ceramic | RMX-021 | | PULLEY—Hoist pulley and shaft |
| RCW-1028 | C7, 11 | CAPACITOR—5.6 mmf., ceramic | RRC-014 | | PLATE AND SHAFT—Elevator top plate and vertical shaft |
| RCX-011 | C80 | CAPACITOR—100 mmf., pushbutton antenna trimmer | RRC-031 | | VOLUME CONTROL—2 meg. potentiometer tapped at 1 meg. |
| | C81 | CAPACITOR—9-180 mmf., pushbutton antenna trimmer | RRW-010 | | SWITCH—Bass tone switch |
| | C82 | CAPACITOR—45-380 mmf., pushbutton antenna trimmer | RSP-002 | | RESISTOR—1150 and 5000 ohm, w.w. |
| | C83 | CAPACITOR—45-380 mmf., pushbutton antenna trimmer | RSW-023 | | SWITCH—Pushbutton switch |
| | C84 | CAPACITOR—45-380 mmf., pushbutton antenna trimmer | RSX-003 | | SWITCH—Band change switch |
| RCX-016 | C5 | CAPACITOR—200-250 mmf., trimmer capacitor | RTL-001 | | SWITCH—Trebble tone and power switch |
| | C58 | CAPACITOR—280-380 mmf., trimmer capacitor | RTL-017 | | TRANSFORMER—Discriminator |
| | C59 | CAPACITOR—475-575 mmf., trimmer capacitor | RTL-044 | | TRANSFORMER—1st I-F transformer |
| RCX-022 | C3 | CAPACITOR—2-20 mmf., trimmer capacitor | RTL-045 | | TRANSFORMER—2nd I-F transformer |
| | C4 | CAPACITOR—34-70 mmf., trimmer capacitor | RTO-012 | | TRANSFORMER—3rd I-F transformer |
| | C56 | CAPACITOR—475-575 mmf., trimmer capacitor | RTP-020 | | TRANSFORMER—Output transformer |
| | C57 | CAPACITOR—280-380 mmf., trimmer capacitor | RWL-004 | | TRANSFORMER—Power transformer |
| | C63 | CAPACITOR—45-80 mmf., trimmer capacitor | RWX-004 | | CORD—Power cord |
| RCX-023 | C1 | CAPACITOR—34-70 mmf., trimmer capacitor | RYC-003 | | WIRE—Guide wire for pointer. |
| | C5 | CAPACITOR—4-50 mmf., trimmer capacitor | | | STATION LIST—Call letter cards |
| RCX-024 | C2 | CAPACITOR—4-30 mmf., trimmer capacitor | | | |
| | C55 | CAPACITOR—80-130 mmf., trimmer capacitor | | | |
| RCY-011 | C34 | CAPACITOR—3-30 mmf., trimmer for loop | | | |

GENERAL ELECTRIC CO.

MODEL 502

CABINET:

Model 502
 Material Wood
 Color Mahogany
 Height 34 3/4 in.
 Width 33 7/8 in.
 Depth 18 1/4 in.



ELECTRICAL RATING:

| | Rating A5 | Rating A6 |
|----------------------|-----------|-----------|
| Voltage | 105-125 | 105-125 |
| Frequency | 50 cycles | 60 cycles |
| Wattage (Radio only) | 110 watts | 110 watts |
| Wattage (With phono) | 135 watts | 135 watts |

OPERATING FREQUENCIES:

| | | | |
|------------------------|-------------|---------------------------|--------------|
| Frequency Modulation 1 | 42-49 mc | Shortwave 2 | 11.5-12.0 mc |
| Frequency Modulation 2 | 88-108 mc | Shortwave 3 | 14.8-15.5 mc |
| Broadcast | 540-1600 kc | AM Intermediate Frequency | 455 kc |
| Shortwave 1 | 9.4-9.8 mc | FM Intermediate Frequency | 10.7 mc |

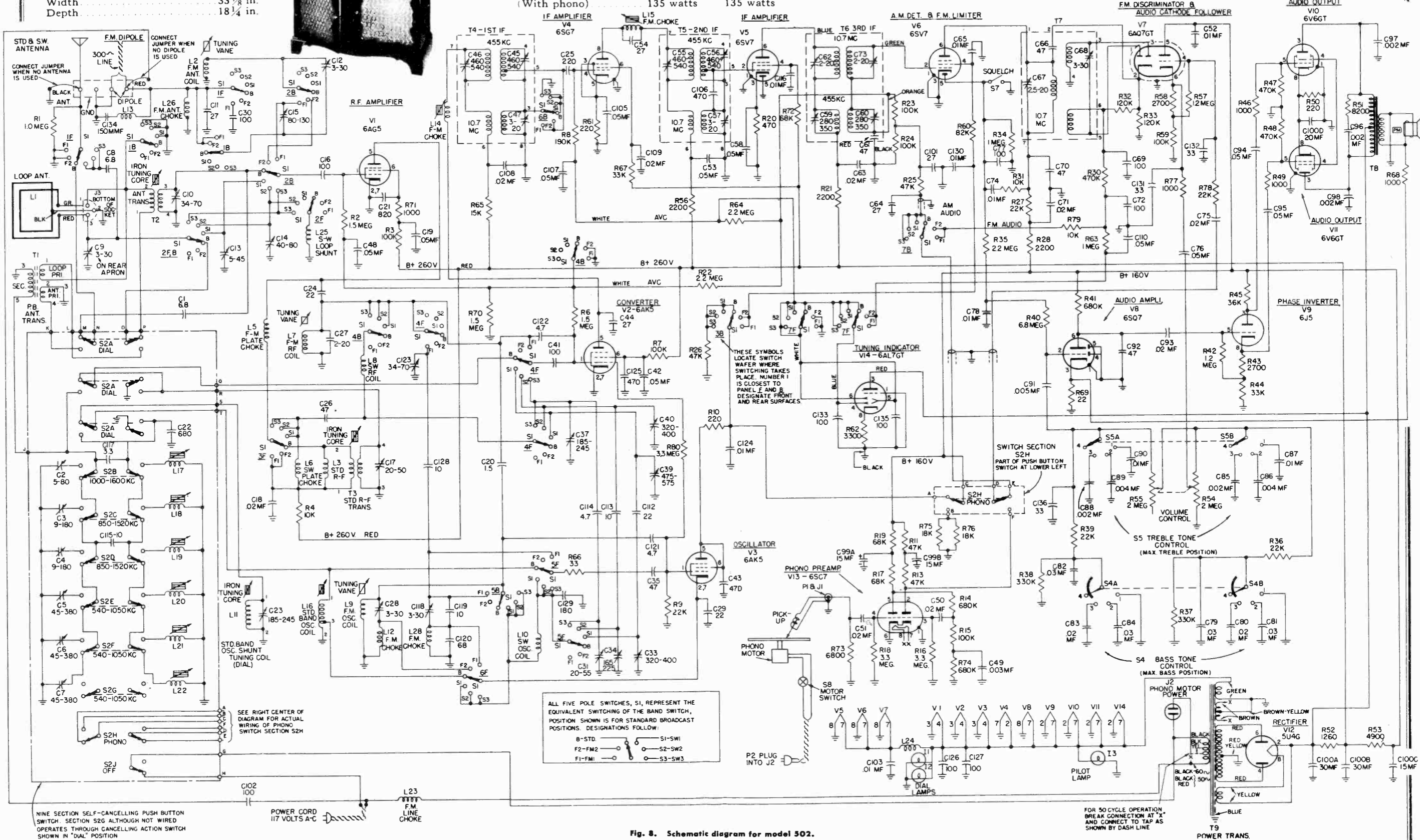


Fig. 8. Schematic diagram for model 502.

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For similar circuit and tuner notes see Models 41 to 45, RECORD CHANGER: GE Model P4, RCD. CH. 17-5 pages 17-4 through 17-8

ALIGNMENT

EQUIPMENT REQUIRED:

1. Test oscillator with tone modulation. (See Table.)
2. D-c voltmeter or microammeter. (See Notes 2 and 3.)
3. A-c voltmeter, 2.0 volts. (See Note 6.)
4. Insulated hex wrench, 1/4-inch.
5. .01 mfd. paper capacitor.
6. 400-ohm, 1/2 watt resistor.
7. 200 mmf. mica capacitor.

ALIGNMENT TABLE

| Step | Signal Generator Frequency | Signal Input Point | Band Switch | Dial Setting | Adjust | See Note | Remarks |
|------------------------|----------------------------|---------------------------|-------------|---------------------------|------------------|-------------|---|
| AM-IF ALIGNMENT | | | | | | | |
| 1 | 455 kc | Conv. grid directly | STD | — | Peak C60 & C59 | 4, 5, 6 | |
| 2 | 455 kc | Conv. grid directly | STD | — | Peak C56 & C55 | 4, 5, 6 | |
| 3 | 455 kc | Conv. grid directly | STD | — | Peak C45 & C46 | 4, 5, 6 | |
| FM-IF ALIGNMENT | | | | | | | |
| 4 | 10.7 mc | 2nd 6SV7 grid thru .01 mf | FM1 | — | C68 for zero** | 1, 2 | Adjust C68 for zero meter reading. Apply 1 volt signal input. |
| 5 | — | 2nd 6SV7 grid thru .01 mf | FM1 | — | Signal Generator | 1, 2 | Detune signal generator to point of maximum meter reading. |
| 6* | As in step 5 | 2nd 6SV7 grid thru .01 mf | FM1 | — | Peak C67 | 1, 2 | |
| 7 | 10.7 mc | 1st 6SV7 grid thru .01 mf | FM1 | — | Peak C62 & C73 | 1, 3 | 6AQ7GT tube removed from socket. |
| 8 | 10.7 mc | 6SG7 grid thru .01 mf | FM1 | — | Peak C57 & L15 | 1, 3 | 6AQ7GT tube removed from socket. |
| 9 | 10.7 mc | Conv. grid directly | FM1 | — | Peak C47 & L14 | 1, 3, 4 | 6AQ7GT tube removed from socket. |
| FM-RF ALIGNMENT | | | | | | | |
| 10 | 98 mc | DIPOLE terminals | FM2 | 98 mc—3.55 to 3.65 in.* | Peak C28** | 1, 3, 7, 10 | Set dial accurately—then adjust C28. |
| 11 | 98 mc | DIPOLE terminals | FM2 | For max. output | Peak C27 | 1, 3, 8 | Tune dial for maximum output—then peak C27 while rocking dial. |
| 12 | 98 mc | DIPOLE terminals | FM2 | Do not change | Peak C12 | 1, 3 | |
| 13 | 46 mc | DIPOLE terminals | FM1 | 46 mc—3.25 to 3.35 in.* | Peak C118** | 1, 3, 7, 10 | Set dial accurately—then adjust C118. |
| 14 | 46 mc | DIPOLE terminals | FM1 | For max. output | Peak C123 | 1, 3, 8 | Tune dial for maximum output—then peak C123 while rocking dial. |
| 15 | 46 mc | DIPOLE terminals | FM1 | Do not change | Peak C15 | 1, 3 | |
| SW-RF ALIGNMENT | | | | | | | |
| 16 | 15.2 mc | Antenna thru 400 ohms | SW3 | 15.2 mc—3.7 to 3.8 in.* | Peak C31 | 5, 6, 7, 10 | Set dial accurately—then adjust C31. |
| 17 | 15.2 mc | Antenna thru 400 ohms | SW3 | Do not change | Peak C37 | 5, 6, 8 | Peak C37 while rocking dial. |
| 18 | 15.2 mc | Antenna thru 400 ohms | SW3 | Do not change | Peak C9 | 5, 6, 11 | C9 is located on back apron of chassis. |
| 19 | 11.8 mc | Antenna thru 400 ohms | SW2 | 11.8 mc—3.35 to 3.45 in.* | Peak C34 | 5, 6, 7, 10 | Set dial accurately—then adjust C34 |

*Important! See Note 7.

**Use insulated hex wrench, 1/4".

ALIGNMENT TABLE (Cont'd)

| Step | Signal Generator Frequency | Signal Input Point | Band Switch | Dial Setting | Adjust | See Note | Remarks |
|---------------------------------|----------------------------|-----------------------|-------------|-----------------------------|-------------------------|-------------|--|
| SW-RF ALIGNMENT (Cont'd) | | | | | | | |
| 20 | 11.8 mc | Antenna thru 400 ohms | SW2 | Do not change | Peak C40 | 5, 6, 8 | Peak C40 while rocking dial. |
| 21 | 11.8 mc | Antenna thru 400 ohms | SW2 | Do not change | Peak C14 | 5, 6, 11 | |
| 22 | 9.6 mc | Antenna thru 400 ohms | SW1 | 9.6 mc—4.0 to 4.1 in.* | Peak C33 | 5, 6, 7, 10 | Set dial accurately—then adjust C33. |
| 23 | 9.6 mc | Antenna thru 400 ohms | SW1 | Do not change | Peak C39 | 5, 6, 8 | Peak C39 while rocking dial. |
| 24 | 9.6 mc | Antenna thru 400 ohms | SW1 | Do not change | Peak C13 | 5, 6, 11 | |
| BROADCAST RF ALIGNMENT | | | | | | | |
| 25 | 1620 kc | Antenna thru 200 mmf | STD | Extreme right-hand position | Peak C23 | 5, 6 | |
| 26 | 1620 kc | Antenna thru 200 mmf | STD | Extreme right-hand position | Peak C17 | 5, 6 | |
| 27 | 1620 kc | Antenna thru 200 mmf | STD | Extreme right-hand position | Peak C10 | 5, 6, 11 | |
| 28 | 1500 kc | Antenna thru 200 mmf | STD | 1500 kc—1.35 to 1.45 in.* | Osc. coil L11 iron slug | 5, 6, 7, 9 | L11 iron slug is the rear one on left side. |
| 29 | 1000 kc | Antenna thru 200 mmf | STD | For max. output | R-F coil, T3 iron slug | 5, 6, 9 | T3 iron slug is the center one on left side. |
| 30 | 1000 kc | Antenna thru 200 mmf | STD | Do not change | Ant. coil, T2 iron slug | 5, 6, 9 | T2 iron slug is the front one on left side. |
| 31 | 580 kc | Antenna thru 200 mmf | STD | For max. output | Peak L16 | 5, 6, 8 | Peak L16 while rocking dial. |
| 32 | | | | | | | Repeat steps 25-31. |

* Important! See Note 7.

** Use insulated hex wrench, 1/4".

Notes in Connection with Alignment Table

1. Use unmodulated signal.
2. Connect 20,000 ohms-per-volt meter from junction of R30 and C72 to chassis. Use ten volt scale (steps 4-6).
3. Connect 20,000 ohms-per-volt meter from grid (pin 2) of 6SV7 LIMITER to chassis with a 200,000-ohm resistor connected in series. The resistor must be connected directly to the grid so that capacity loading will be negligible and so that the meter is isolated from the i-f signal voltage. Keep signal generator output down so that the meter indicates not more than one volt at the grid (5 microamperes through 200,000 ohms) (alignment steps 7 to 15).
4. Connect signal generator directly to the converter grid at some convenient point. The generator lead must be shielded up to this connection so that not more than 1/16 inch of exposed lead exists. Ground the shield solidly by clamping it firmly to the chassis or a shield as close to the connection as possible. (Steps 1-3, 9.)
5. Use 400-cycle modulation.
6. Connect a standard output meter across the speaker voice coil. Turn volume control fully on. Keep signal generator

output down so that the meter indicates not more than 1/2 watt output (2.0 volts) during alignment.

7. If dial scale is not available, index pointer as follows: Turn pointer to right-hand limit of travel. Mark the dial backplate at a reference edge of the pointer slider. Then set pointer by turning dial knob until the indicated dimension exists between the reference edge and the mark.

8. "Rocking" consists of adjusting the indicated adjuster while turning the dial a small amount back-and-forth through peak output. The object is to find the maximum peak. Rocking is necessary and is permissible only when interlocking circuits are being adjusted.

9. The main iron tuning slugs are suspended from the left side of the tuning "elevator." They are individually adjustable by loosening the locknut and turning the supporting screw into which the suspending wire is soldered.

10. Two oscillator settings may give response. The higher frequency response point is the correct one; the other is the image. If in doubt, start with the trimmer screw loosened completely and adjust for the first response.

11. Loop antenna must be plugged in when aligning antenna trimmers C9, C10, 13, and C14.

GENERAL ELECTRIC CO.

MODEL 502

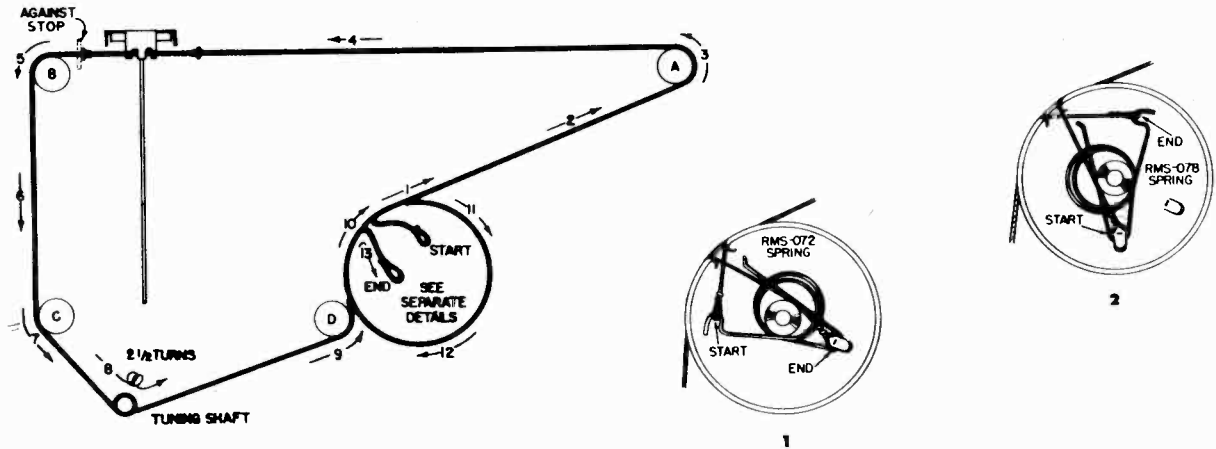


Fig. 1. Dial stringing diagram showing spring details at right.

POWER OUTPUT (117 volts line):

Undistorted 10 watts
 Maximum 12 watts

LOUDSPEAKER:

Type Alnico PM
 Size 12 inches
 Voice Coil Impedance 8 ohms

ANTENNA INPUTS:

Broadcast and Shortwave Conventional antenna
 FM 300-ohm input for folded dipole

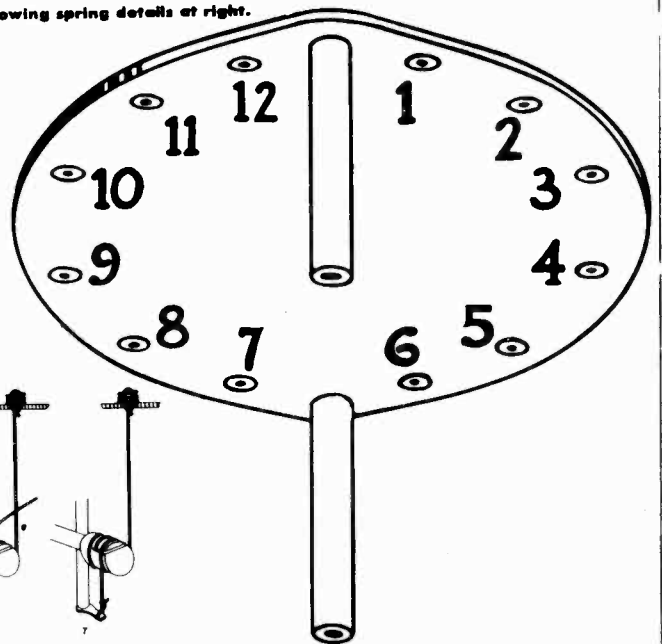


Fig. 3. Identification of switch lugs set inverted and viewed from panel.

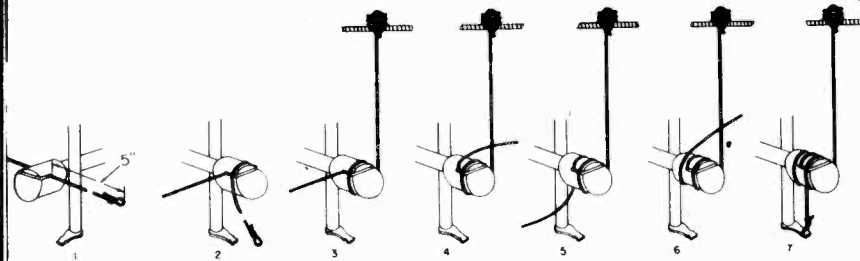


Fig. 2. Elevator windless stringing procedure.

PHONOGRAPH PICK-UP:

Type Variable reluctance
 D-c Resistance 250 ohms

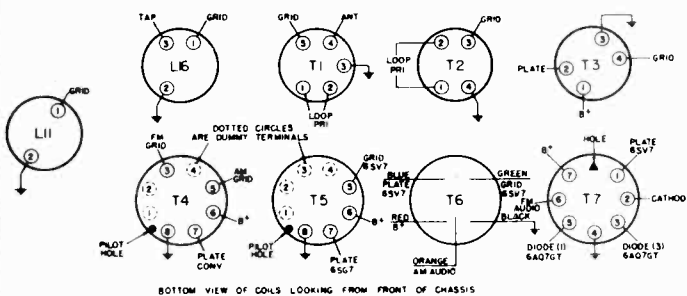


Fig. 4. Terminal identification of coil assemblies (Numbers correspond with schematic).

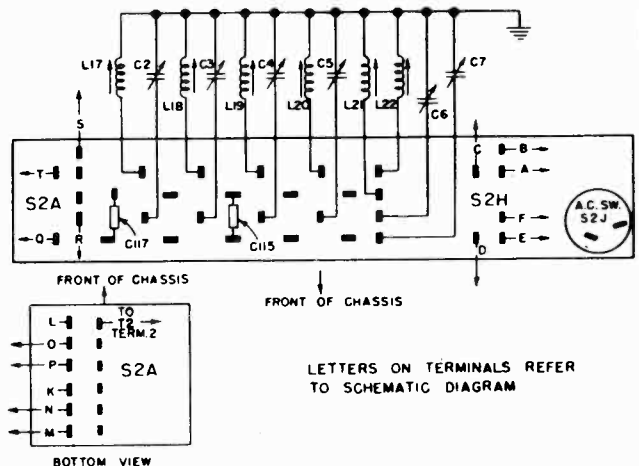


Fig. 7. Wiring of push-button switch.

MODEL 502

GENERAL ELECTRIC CO.

WIRING OF BAND SWITCH

SECTION 1 Wire length given from end to end before stripping SECTION 4

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|--|
| 1 | Insulated green wire, 13/4" long | Antenna terminal at rear of chassis |
| 2-3 | | |
| 3 | | |
| 4 | Capacitor C8 | Switch section 2, lug 11 |
| 5 | | |
| 6 | (Front lug) capacitor C30 (Rear lug) short copper strap | Chassis Trimmer C12, lug nearer T2 |
| **7 | a. C11 b. One side of 300-ohm transmission line | Tube socket V1, pin 2 Hot dipole terminal at rear of chassis |
| 8 | | |
| 9 | a. Short bus with spaghetti, 1 1/4" long b. Short bus with spaghetti | Chassis Section 1, terminal 12 |
| 10 | Insulated white wire, 5 1/2" long | Dial switch S2-A terminal N |
| 11 | a. Insulated green wire, 3 3/4" long b. Insulated orange wire, 6" long c. Insulated green wire, 12 3/4" long | Antenna transformer T2, terminal 2 Push-button transformer T1, terminal 2 Loop socket J3, at rear of chassis, terminal 1 |
| 12 | See lug 9 above | |

SECTION 2

| 1 | Choke, L25 | Ground on band switch shield |
|------|---|---|
| 2 | a. Insulated green wire, 3 3/4" long b. Capacitor, C1 | Trimmer C10, lug nearer T2 Section 2, lug 12 |
| 3 | Insulated green wire, 2 1/4" long | Trimmer C13, lug nearer T2 |
| 4 | Insulated green wire, 2" long | Trimmer C14, lug nearer T2 |
| 5 | | |
| 6 | Short copper strap | Trimmer C15, lug nearer tube V1 |
| 7 | Short copper strap | Tuner L2, terminal nearer rear of chassis |
| 8 | Capacitor C16 | Tube socket V1, pin 1 |
| 9 | | |
| 10 | Insulated brown wire, 6" long | Dial switch S2-A, terminal O |
| **11 | a. Insulated yellow wire, 12 3/4" long b. See section 1, lug 4 | Loop socket J3 at rear of chassis, terminal 3 |
| 12 | a. Insulated blue wire, 6 1/2" long b. See lug 2, above | Dial switch S2-A, terminal M |

SECTION 3

| 1 | | |
|-------|---|--|
| 2 | a. Choke, L6 b. Capacitor, C18 c. Insulated red wire, 3" long d. Insulated red wire, 5 3/4" long | Switch section 3, lug 9 Ground on band switch shield RF transformer T3, terminal 1 Terminal strip 1, terminal 2 |
| 3 | Insulated green wire, 2 1/4" long | RF transformer T3, terminal 2 |
| 4 | | |
| 5 | | |
| 6 | Short bus with spaghetti, 1 1/4" long | Terminal strip 2, terminal 4 |
| 7 | Insulated yellow wire, 16" long | Resistor R60 on terminal board on chassis rear apron |
| 8 | a. Resistor, R10 b. Capacitor, C124 c. Insulated blue wire, 8 1/4" long | Tube socket V3, pin 5 Ground lug on band switch shield Push-button switch S2H, terminal A |
| 9 | a. See lug 2 (a), above b. Capacitor, C26 | Section 4, lug 11 |
| 10 | Resistor, R26 | Ground lug on terminal strip 2 |
| 11-12 | | |

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|---|---|
| 1 | Copper strap with tubing, 3" long | Trimmer C123, lug nearer L7 |
| 2 | Copper strap with tubing, 2 1/2" long | Coil L8, terminal 2 |
| 3 | Insulated brown wire, 7" long | Dial switch S2A, terminal Q |
| 4 | Insulated green wire, 2 1/4" long | Trimmer C39, lug nearer T3 |
| 5 | Insulated green wire, 2" long | Trimmer C40, lug nearer T3 |
| 6 | Short copper strap | Trimmer C37, lug nearer L7 |
| 7 | Short copper strap | Tuner L7, rear terminal |
| 8 | Capacitor, C41 | Tube socket, V2, pin 1 |
| 9 | Bus with spaghetti, 2" long | Ground lug on terminal strip 2 |
| 10 | Insulated white wire, 2 1/2" long | Terminal strip 2, terminal 1 |
| 11 | a. See section 3, lug 9 b. Copper strap with tubing, 3 1/2" long | Coil L8, terminal 1 |
| 12 | | |

SECTION 5

| 1 | a. Bus with spaghetti, 2" long b. Capacitor, C119 | Section 5, lug 6 Section 6, lug 1 |
|----|--|--|
| 2 | a. Insulated green wire, 2 3/4" long b. Insulated blue wire, 6 1/2" long | Broadcast oscillator coil, L16, terminal 1 Dial switch S2A, terminal T |
| 3 | Insulated green wire, 2 1/2" long | Trimmer C33, lug nearer L11 |
| 4 | Insulated green wire, 2" long | Trimmer C34, lug nearer L11 |
| 5 | a. Capcitor, C114 b. Copper strap with tubing, 2" long | Trimmer C37, lug nearer T3 Trimmer C31, lug nearer L16 |
| 6 | a. See lug 1 (a) above b. Capacitor, C128 c. Copper strap with tubing, 3 3/4" long | Trimmer C123, lug nearer tuner L7 Air trimmer C118, right-hand terminal* |
| 7 | Short copper strap | Tuner L9, left-hand terminal* |
| 8 | Resistor, R66 | Capacitor, C35 |
| 9 | | |
| 10 | a. Short copper strap b. Copper strap with tubing, 3 1/2" long | Section 6, lug 11 SW oscillator coil L10, terminal 2 |
| 11 | a. Capacitor, C129 b. Copper strap with tubing, 3" long | Chassis ground SW oscillator coil L10, terminal 1 |
| 12 | | |

*Looking from front, chassis inverted.
**Double lug (front and rear) soldered together.

SECTION 6

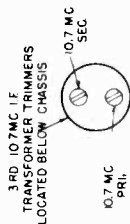
| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|--|---|
| 1 | a. See section 5, lug 1 b. Capacitor C120 c. Copper strap with tubing, 6" long | Tuner L9, right-hand terminal* Air trimmer C118, left-hand terminal* |
| 2 | Insulated black wire, 5 1/4" long | 1st IF transformer T4, terminal 8 |
| 3 | Insulated green wire, 2 1/4" long | Broadcast oscillator coil L16, terminal 3 |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | Short copper strap | Air trimmer C28, right-hand terminal* |
| 8 | Copper strap, 2" long | Tube socket V3, pin 7 |
| 9 | Insulated orange wire, 3 1/2" long | 1st IF transformer T4, terminal 5 |
| 10 | Insulated green wire, 4 1/4" long | 1st IF transformer T4, terminal 3 |
| 11 | See section 5, lug 10(a) | |
| 12 | | |

SECTION 7 WIRING OF BAND SWITCH (CONT'D)

| At this lug— | —connect this— | —the other end of which is connected to this— |
|--------------|---|---|
| 1 | Shielded blue wire, 8 1/4" long | Phono switch S2H, terminal E |
| 2 | Shielded blue wire, 8 1/4" long | Resistor R63 on main chassis |
| 3 | Insulated blue wire, 1 1/2" long | AM audio output at R25 |
| 4 | Insulated blue wire of tuning eye cable | Discriminator audio output at R79 |
| 5 | Insulated white wire, 5 1/2" long | Tuning eye tube socket V10, pin 4 |
| 6 | Insulated white wire, 5 1/2" long | Terminal strip 3, terminal 3 |
| 7 | Bus wire with spaghetti, 2" long | Trimmer C31, terminal nearer C118 |
| 8 | | |

| | | |
|----|-----------------------------------|------------------------------|
| 9 | Shielded green wire, 8 3/4" long | Phono switch S2H, terminal E |
| 10 | Insulated blue wire, 14" long | Resistor R63 on main chassis |
| 11 | Shielded green wire, 11 1/4" long | AM audio output at R25 |
| 12 | Shielded green wire, 11 1/4" long | AM audio output at R25 |

*Looking from front, chassis inverted.
 **Double lug (front and rear) soldered together.



TERMINAL (INSULATED FROM STRIP NO.3 GROUND)

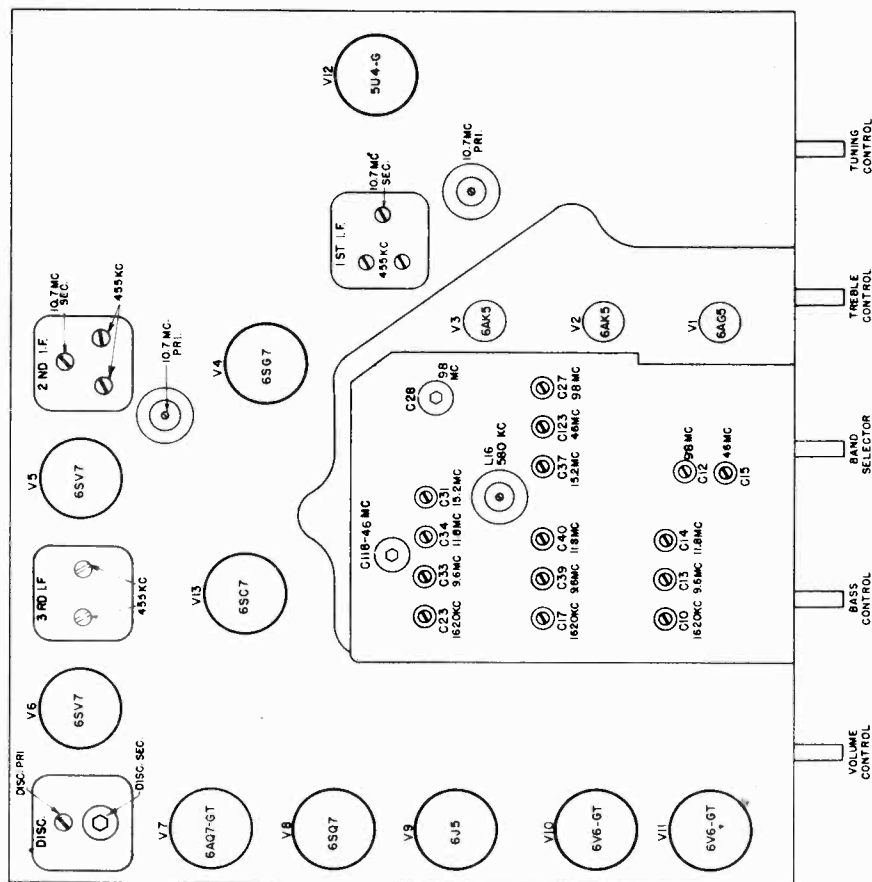
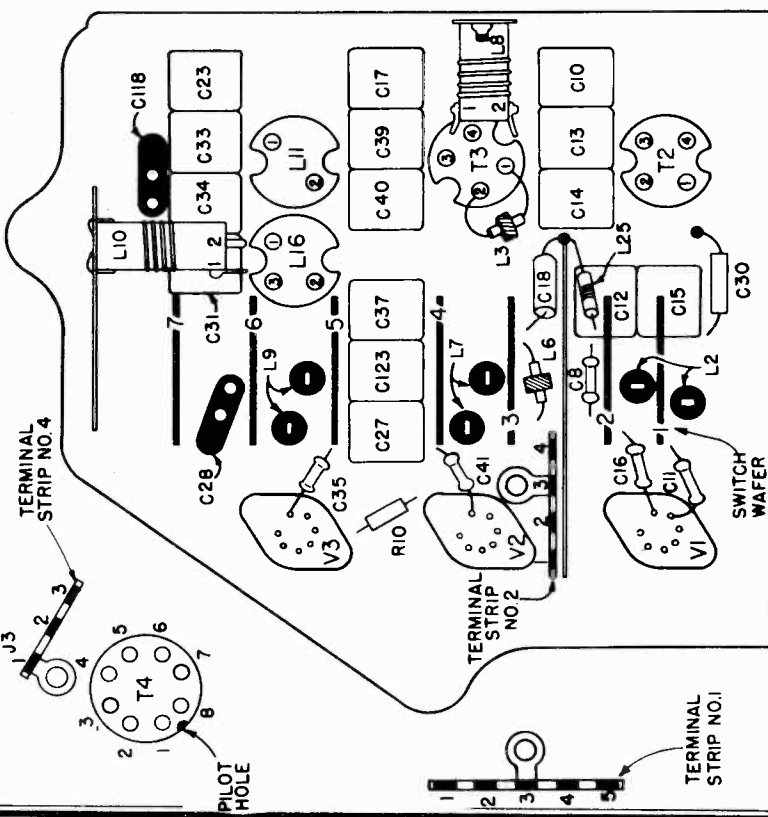
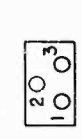


Fig. 9. Location of tubes and trimmers.

Fig. 5. Physical location of components listed in band switch wiring table.

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed have a tolerance of $\pm 20\%$. AM i-f measurements should be taken with low signal so that AVC is not effective. R-f measurements should be made by measuring the d-c voltage developed at the r-f tube grid (V1) or converter tube grid (V2) by rectification of the signal.

(1) R-F AND I-F STAGE GAINS

Signal applied through IRE dummy antenna:

- Antenna post to V1 grid 3 @ 1000 kc
- Antenna post to V1 grid 1.5 @ 9.6 mc
- Antenna post to V1 grid 1.3 @ 11.8 mc
- Antenna post to V1 grid 1.2 @ 15.2 mc

Signal applied through 300 ohms, including signal generator impedance:

- Dipole terminals to V1 grid 1.5 @ 45 mc
- Dipole terminals to V1 grid 1.0 @ 98 mc

These checks made with oscillator tube (V3) removed:

- V1 grid to V2 grid 10 @ 1000 kc
- V1 grid to V2 grid 6 @ 9.6 mc
- V1 grid to V2 grid 7 @ 11.8 mc
- V1 grid to V2 grid 11 @ 15.2 mc

- V1 grid to V2 grid 7 @ 45 mc
- V1 grid to V2 grid 6 @ 98 mc
- V2 grid to V4 grid 24 @ 455 kc
- V2 grid to V4 grid 30 @ 10.7 mc
- V4 grid to V5 grid 17 @ 455 kc
- V4 grid to V5 grid 56 @ 10.7 mc
- V5 grid to V6 grid 50 @ 455 kc
- V5 grid to V6 grid 20 @ 10.7 mc

(2) AUDIO GAIN

12 volts at 400 cps to V7 grid with volume control set at maximum will give approximately $\frac{1}{2}$ watt output across the speaker voice coil.

10 volts at 400 cps at grid of V8 will give approximately $\frac{1}{2}$ watt output across the speaker voice coil.

(3) OSCILLATOR GRID BIAS

D-c voltage developed across R9 (average):

- 12 v. @ 1000 kc 6.5 @ 15.2 mc
- 2.8 v. @ 9.6 mc 4.6 @ 45 mc
- 4.7 v. @ 11.8 mc 3.0 @ 98 mc

(4) SOCKET PIN VOLTAGES

Figure 6 shows typical tube pin voltages. All readings should be made from the pins to ground unless otherwise indicated.

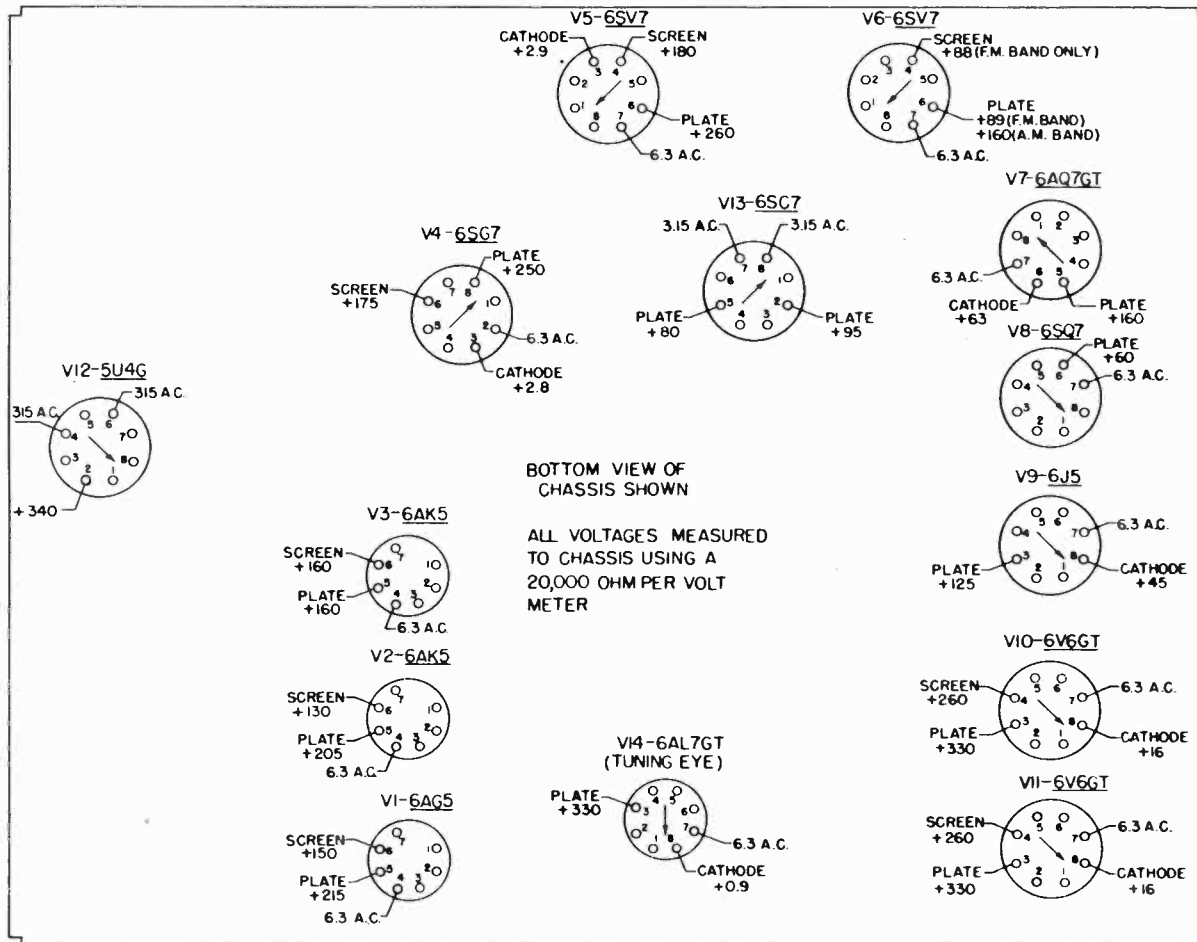


Fig. 6. Socket voltage diagram.

MODEL 502—REPLACEMENT PARTS LIST

| CAT. NO. | SYMBOL | DESCRIPTION | CAT. NO. | SYMBOL | DESCRIPTION |
|------------------------------------|---|---------------------------------------|------------------------------------|-------------------|---|
| UNIVERSAL REPLACEMENT PARTS | | | UNIVERSAL REPLACEMENT PARTS | | |
| UCC-036 | C85, 88 | CAPACITOR—.002 mfd., 600 v., paper | RCX-012 | C2, 3, 4, 5, 6, 7 | TRIMMER STRIP—Push button |
| UCC-037 | C49 | CAPACITOR—.003 mfd., 600 v., paper | RCX-021 | | TRIMMER STRIP AND COIL ASSEMBLY—Push button |
| UCC-039 | C91 | CAPACITOR—.005 mfd., 600 v., paper | RCX-024 | C12, 15 | TRIMMER STRIP ASSEMBLY—3-30 mmf., 80-130 mmf., trimmer capacitor |
| UCC-040 | C52, 65, 74, 78, 87, 90, 103, 116, 124 | CAPACITOR—.01 mfd., 600 v., paper | RCX-025 | C23, 31, 33, 34 | TRIMMER STRIP—185-245 mmf., 20-55 mmf., 320-400 mmf., 165-225 mmf., trimmer capacitor |
| UCC-041 | C18, 50, 51, 63, 71, 75, 80, 83, 93, 108, 109 | CAPACITOR—.02 mfd., 600 v., paper | RCX-026 | C17, 39, 40 | TRIMMER STRIP—20-55 mmf., 475-575 mmf., 320-400 mmf., trimmer capacitor |
| UCC-042 | C79, 81, 82, 84 | CAPACITOR—.03 mfd., 600 v., paper | RCX-027 | C27, 37, 123 | TRIMMER STRIP—2-20 mmf., 185-245 mmf., 34-70 mmf., trimmer capacitor |
| UCC-045 | C48, 53, 76, 105, 107, 110, 58, 19, 42 | CAPACITOR—.05 mfd., 600 v., paper | RCX-028 | C10, 13, 14 | TRIMMER STRIP—34-70 mmf., 40-80 mmf., 5-45 mmf., trimmer capacitor |
| UCG-3034 | C129 | CAPACITOR—180 mmf., mica | RCY-011 | C9 | TRIMMER STRIP—3-30 trimmer |
| UCN-502 | C20 | CAPACITOR—1.5 mmf., ceramic | RCY-017 | C28, 118 | TRIMMER STRIP—3-30 mmf., 3-30 mmf., trimmer capacitor |
| UCN-505 | C114 | CAPACITOR—4.7 mmf., ceramic | RDB-008 | | PUSH BUTTON—Mahogany |
| UCN-506 | C1, 8 | CAPACITOR—6.8 mmf., ceramic | RDC-025 | | DRIVE CORD ASSEMBLY |
| UCN-1550 | C21 | CAPACITOR—820 mmf., ceramic | RDF-003 | | WASHER—Felt for control knobs |
| UCU-020 | C92 | CAPACITOR—47 mmf., mica | RDK-036 | | KNOB—Mahogany (plain) |
| UCU-028 | C77, 102 | CAPACITOR—100 mmf., mica | RDK-039 | | KNOB—Mahogany (arrow) |
| UCU-516 | C131, 132, 136 | CAPACITOR—33 mmf., mica | RDP-026 | | POINTER—Assembly |
| UCU-520 | C26, 70 | CAPACITOR—47 mmf., mica | RLA-021 | | SCALE—Dial scale |
| UCU-528 | C72 | CAPACITOR—100 mmf., mica | RDS-028 | | SCALE ASSEMBLY—Dial |
| UCU-536 | C25 | CAPACITOR—220 mmf., mica | RDX-019 | S2 | SWITCH ASSEMBLY—Push button |
| UCU-544 | C43, 125 | CAPACITOR—470 mmf., mica | RDI-006 | | IRON CORE—AM tuning |
| UCU-1014 | C64, 101 | CAPACITOR—27 mmf., mica | RHE-001 | | EYELET—For connecting FM links |
| UCU-1504 | C113, 115 | CAPACITOR—10 mmf., mica | RHM-024 | | LINK—Hoist link, holding end of hoist cord |
| UCU-1512 | C112 | CAPACITOR—22 mmf., mica | RHN-004 | | NUT—Hex nut for tuning vane adjustment |
| UCU-1532 | C134 | CAPACITOR—150 mmf., mica | RJP-004 | P1 | PLUG—Phono, male |
| UCW-012 | C24 | CAPACITOR—22 mmf., ceramic | RJP-006 | | PLUG—Three-prong loop plug |
| UCW-1004 | C119, 128 | CAPACITOR—10 mmf., ceramic | RJP-007 | J2 | RECEPTACLE—110 v. |
| UCW-1014 | C44, 54 | CAPACITOR—27 mmf., ceramic | RJP-008 | | SOCKET—Tuning eye |
| UCW-1024 | C120 | CAPACITOR—68 mmf., ceramic | RJS-012 | | MOUNTING PLATE—For C99 |
| UCW-1028 | C69 | CAPACITOR—100 mmf., ceramic | RJS-034 | | SOCKET—Pilot light |
| UCW-1504 | C117 | CAPACITOR—3.3 mmf., ceramic | RJS-037 | | MOUNTING PLATE—For C100 |
| UDL-005 | I1, 2 | PILOT LIGHT—Mazda No. 44 | RJS-044 | | TUBE SOCKET—For V1, V2, and V3 |
| UDL-008 | I3 | PILOT LIGHT—Mazda No. 47 | RJS-051 | | SOCKET—Three prong at rear of chassis |
| UOP-1230 | R69 | SPEAKER—12-inch speaker | RJS-053 | | SOCKET—Tube |
| URD-009 | R66 | RESISTOR—22 ohms, 1/2 w., carbon | RJS-054 | | SOCKET—Tube |
| URD-013 | R10, 61 | RESISTOR—33 ohms, 1/2 w., carbon | RJS-065 | | SOCKET—Dial light socket and leads |
| URD-033 | R20 | RESISTOR—220 ohms, 1/2 w., carbon | RJX-003 | I1 | JACK—Phono |
| URD-041 | R46, 49, 68, 71, 77 | RESISTOR—470 ohms, 1/2 w., carbon | RLA-006 | T1 | TRANSFORMER—B.C.P.B. antenna |
| URD-049 | R21, 28, 56 | RESISTOR—1000 ohms, 1/2 w., carbon | RLA-009 | L26, 28 | TRANSFORMER—B.C. antenna transformer |
| URD-059 | R43, 58 | RESISTOR—2200 ohms, 1/2 w., carbon | RLA-012 | | CHOKE—FM antenna choke, FM oscillator cathode choke |
| URD-061 | R62 | RESISTOR—2700 ohms, 1/2 w., carbon | RLA-025 | L17, 18, 19 | COILS—Push-button oscillator tuning coils |
| URD-069 | R73 | RESISTOR—3300 ohms, 1/2 w., carbon | RLB-006 | L20, 21, 22 | COILS—Push-button oscillator tuning coils |
| URD-073 | R31, 79 | RESISTOR—6800 ohms, 1/2 w., carbon | RLB-008 | T3 | COIL—Broadcast band r-f coil |
| URD-077 | R65 | RESISTOR—10,000 ohms, 1/2 w., carbon | RLB-009 | L6 | COIL—SW band r-f plate choke coil |
| URD-081 | R9, 27, 36, 39, 78 | RESISTOR—15,000 ohms, 1/2 w., carbon | RLC-014 | L3 | COIL—Broadcast r-f primary dummy |
| URD-085 | R44, 67 | RESISTOR—22,000 ohms, 1/2 w., carbon | RLC-015 | L11 | COIL—Broadcast band oscillator shunt tuning coil |
| URD-089 | R11, 13, 25 | RESISTOR—33,000 ohms, 1/2 w., carbon | RLC-016 | L10 | COIL—SW oscillator coil |
| URD-093 | R17, 19, 72 | RESISTOR—47,000 ohms, 1/2 w., carbon | RLC-017 | L16 | COIL—Broadcast band oscillator coil |
| URD-095 | R60 | RESISTOR—68,000 ohms, 1/2 w., carbon | RLC-018 | L8 | COIL—SW r-f coil |
| URD-097 | R3, 7, 15, 23, 24, 59 | RESISTOR—82,000 ohms, 1/2 w., carbon | RLF-007 | L24 | COIL—i-f filament choke |
| URD-099 | R32, 33 | RESISTOR—100,000 ohms, 1/2 w., carbon | RLI-002 | L23 | COIL—FM power line choke |
| URD-103 | R8 | RESISTOR—120,000 ohms, 1/2 w., carbon | RLI-005 | L12 | COIL—FM oscillator cathode choke |
| URD-109 | R37, 38 | RESISTOR—180,000 ohms, 1/2 w., carbon | RLI-018 | L25 | COIL—SW loop shunt coil |
| URD-113 | R30, 47, 48 | RESISTOR—330,000 ohms, 1/2 w., carbon | RLP-005 | L14, 15 | COIL—i-f plate choke |
| URD-117 | R14, 41, 74 | RESISTOR—470,000 ohms, 1/2 w., carbon | RLP-008 | L5, 13 | COIL—FM r-f plate choke and i-f wavetrap inductance |
| URD-121 | R1, 34, 63 | RESISTOR—680,000 ohms, 1/2 w., carbon | RMM-010 | | VANE—Tuner vane for coils L2 and L7 |
| URD-123 | R42, 57 | RESISTOR—1 meg., 1/2 w., carbon | RMM-011 | | VANE—Tuner vane for oscillator coil L9 |
| URD-125 | R2, 6, 70 | RESISTOR—1.2 meg., 1/2 w., carbon | RMN-016 | | PULLEY—Drive pulley |
| URD-129 | R22, 35, 64 | RESISTOR—1.5 meg., 1/2 w., carbon | RMR-002 | | ROLLER—Presses against hoist shaft |
| URD-133 | R16, 18, 80 | RESISTOR—2.2 meg., 1/2 w., carbon | RMS-040 | | SPRING—Flat spring against hoist pulley shaft |
| URD-141 | R40 | RESISTOR—3.3 meg., 1/2 w., carbon | RMS-041 | | SPRING—Wire spring against hoist pulley shaft |
| URD-1086 | R45 | RESISTOR—6.8 meg., 1/2 w., carbon | RMS-042 | | SPRING—Hoist cord tension spring |
| URE-071 | R51 | RESISTOR—36,000 ohms, 1/2 w., carbon | RMS-043 | | SCREW—Iron core adjusting screw |
| URE-073 | R4 | RESISTOR—82,000 ohms, 1 w., carbon | RMS-044 | | SPRING—Guide wire connecting tuning vanes to adjustment screws |
| URE-089 | R26 | RESISTOR—10,000 ohms, 1 w., carbon | RMS-076 | | SCREW—For tuning vane adjustment |
| URF-035 | R50 | RESISTOR—47,000 ohms, 1 w., carbon | RMS-078 | | SPRING—Type 2 dial cord spring |
| URF-075 | | RESISTOR—220 ohms, 2 w., carbon | RMW-013 | | FLYWHEEL—Less setscrew |
| RAB-024 | | back assembly, 50 cycle | RMW-018 | | PULLEY—Hoist pulley |
| RAB-025 | | back assembly, 60 cycle | RMS-042 | | PULLEY—Hoist pulley and shaft |
| RAD-014 | | d switch front | RMX-021 | | TUNER—Top plate and shaft assembly |
| RAD-015 | | d switch rear | RPX-010 | | PHONO PICK-UP—Less tone arm |
| RAD-024 | | coil on rear bracket of band | RRC-019 | R54, 55 | VOLUME CONTROL—2 meg., dual |
| | | ht bezel | RRW-004 | R52, 53 | RESISTOR—Wirewound |
| | | ROLLER—Fork assembly for | RSS-003 | S7 | SWITCH—Squelch switch |
| | | 04 mfd., 600 v., paper | RSW-016 | S5 | SWITCH—Treble wafer switch |
| | | 0 mmf., mica | RSW-017 | S4 | SWITCH—Bass wafer switch |
| | | 5 mfd., 600 v., paper | RTD-001 | T7 | TRANSFORMER—FM discriminator transformer |
| | | 32 mfd., 1000 v., paper | RTL-017 | T4 | TRANSFORMER—1st i-f transformer |
| | | mfd., dual electrolytic | RTL-019 | T6 | TRANSFORMER—3rd i-f transformer |
| | | 000 mmf., ceramic | RTL-022 | T5 | TRANSFORMER—2nd i-f transformer |
| | | mmf., ceramic | RTO-014 | T8 | TRANSFORMER—Output transformer |
| | | 1 mmf., ceramic | RTP-023 | T9 | TRANSFORMER—Power transformer, 60 cycle |
| | | mmf., ceramic | RTP-032 | T10 | TRANSFORMER—Power transformer, 50 cycle |
| | | | RWL-004 | | CORD AND PLUG—For 117 v. a-c to main chassis |
| | | | | | MANUAL LIST |
| | | | RYC-002 | | TAB—Push-button key tab (phono) |
| | | | RYC-006 | | STATION CALL LETTERS—For push-button keys |
| | | | RYC-007 | | TAB—Push-button key tab (OFF) |
| | | | RYC-008 | | |

849

Vic Fricke Radio Service

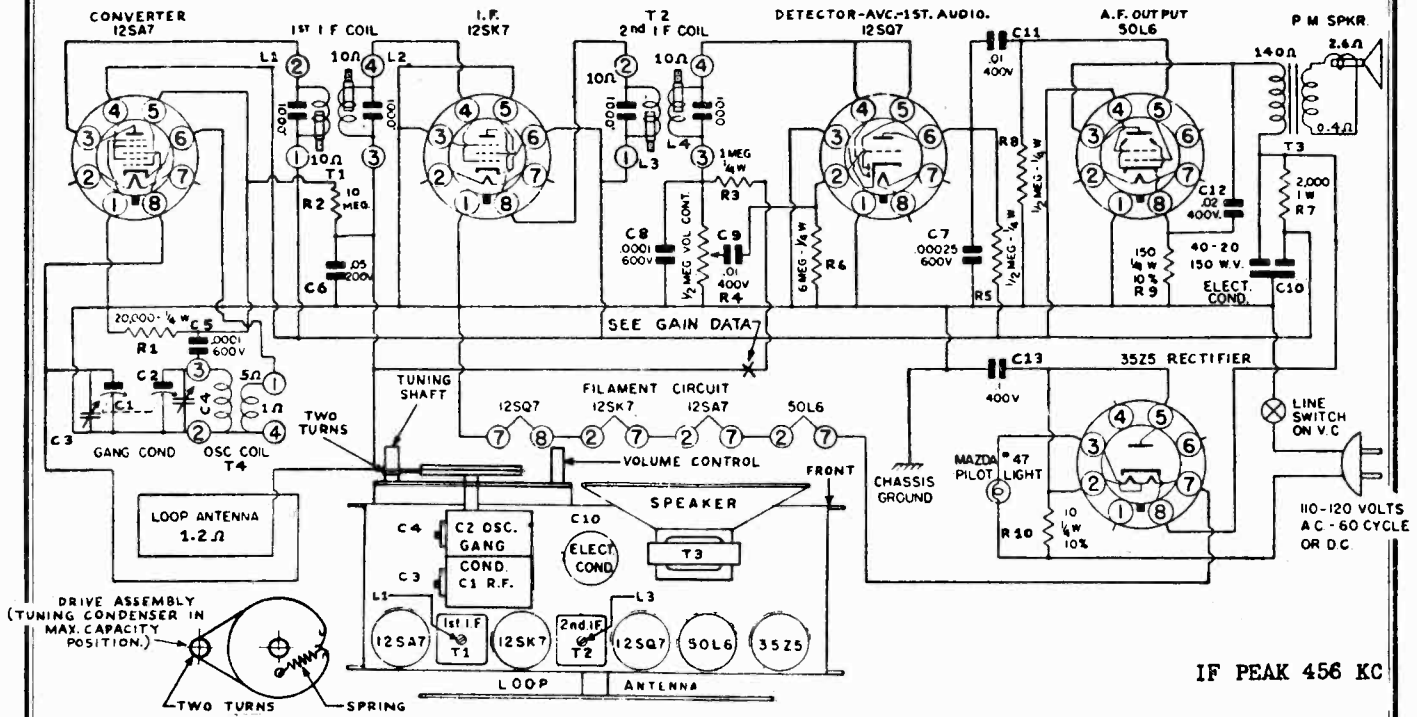
HOME - AUTO

365 E. MAIN STREET HILLSBORO, OREGON

NOT RESPONSIBLE FOR GOODS LEFT OVER 30 DAYS

GENERAL IMPLEMENT CORP.

MODEL 1A5

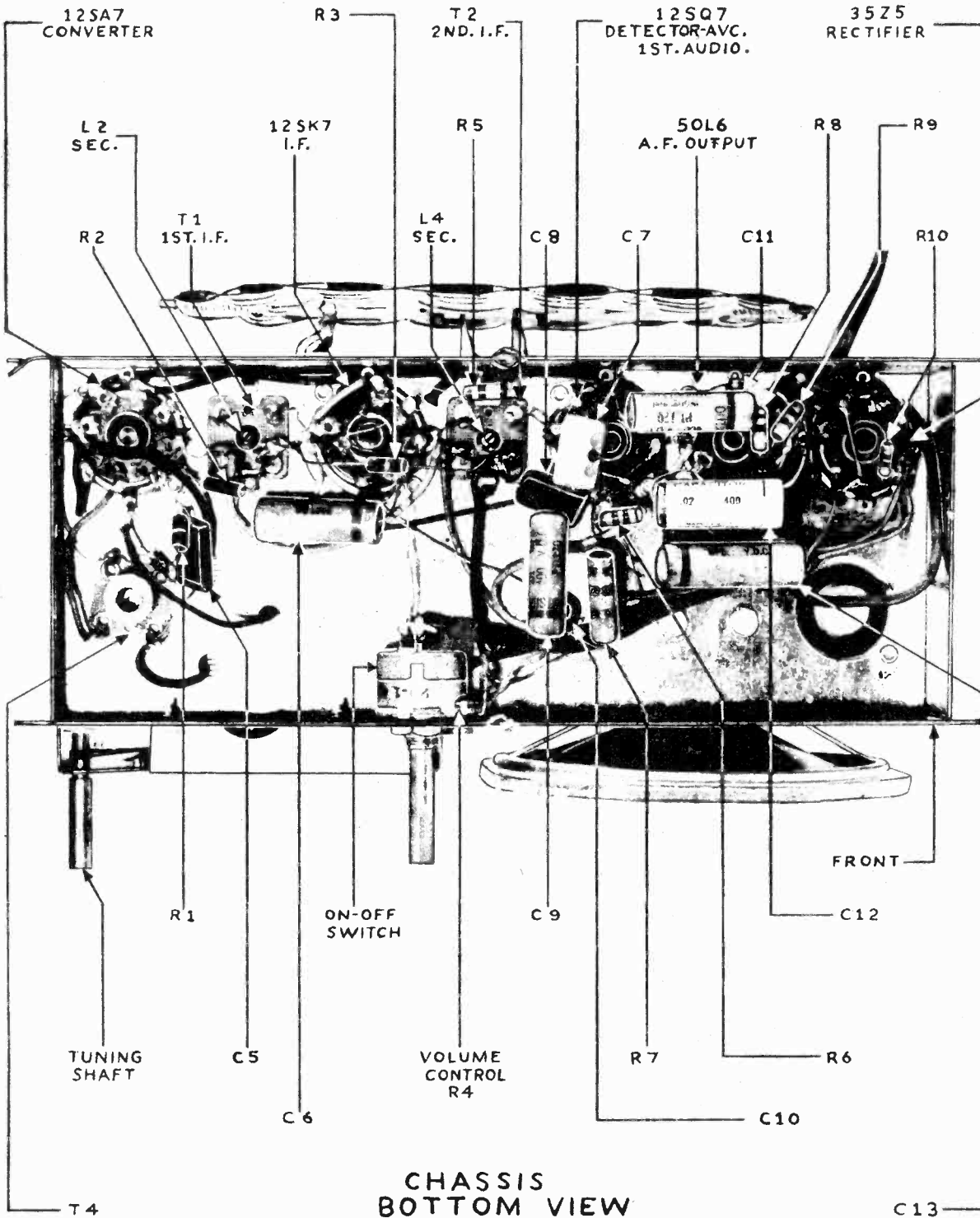


IF PEAK 456 KC

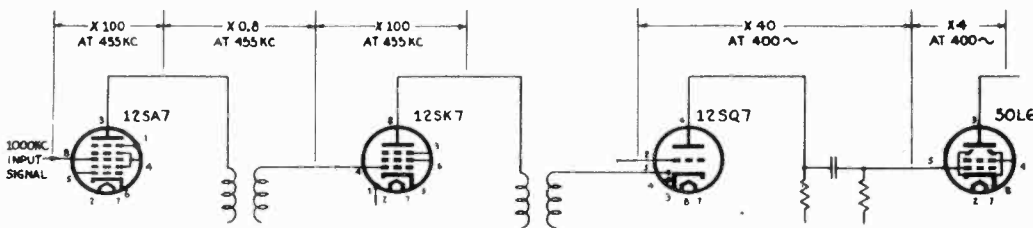
ALIGNMENT

The chassis must be removed from the cabinet in order to align this receiver. Connect the output meter across the voice coil. Connect the signal generator to the standard Hazeltine Loop Model 1150, and couple loosely to the receiver loop. Set the receiver volume control at maximum. The tuning condenser plates should be fully meshed when the dial pointer is at the index mark at the low frequency end of the dial. The signal generator output should at all times be just sufficient to obtain a minimum deflection on the output meter. Set the signal generator to 456 Kc and adjust the i-f trimmers for maximum meter deflection in the following sequence: L4, L3, L2, L1. Set the generator and receiver to 1600 Kc and adjust the oscillator trimmer C4 for maximum output. Set the generator and receiver to 1400 Kc and adjust the loop trimmer C3 for maximum output.

| TUBE | PIN | VTVM | D-C VOLTAGE | | RESISTANCE | TUBE | PIN | VTVM | D-C VOLTAGE | | RESISTANCE |
|-------|-----|------|----------------------|--------------------|------------|------|-----|------|----------------------|--------------------|------------|
| | | | 20,000 OHMS PER VOLT | 1000 OHMS PER VOLT | | | | | 20,000 OHMS PER VOLT | 1000 OHMS PER VOLT | |
| 12SA7 | 1 | 0 | 0 | 0 | 0 | 50L6 | 4 | -1 | -0.45 | -0.4 | 5,000,000 |
| | 2 | 0 | 0 | 0 | -28 | | 5 | -0.7 | -0.5 | -0.2 | 500,000 |
| | 3 | +80 | +90 | +80 | 5,000,000 | | 6 | +54 | +48 | +42 | 5,000,000 |
| | 4 | +80 | +80 | +80 | 5,000,000 | | 7 | 0 | 0 | 0 | 15 |
| | 5 | -6 | -5.6 | -2.6 | 19,000 | | 8 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 40 | | 2 | 0 | 0 | 0 | 40 |
| | 8 | -1 | -0.4 | -0.4 | 5,000,000 | | 3 | +125 | +120 | +120 | 5,000,000 |
| 12SK7 | 1 | 0 | 0 | 0 | 0 | 3525 | 4 | +80 | +80 | +80 | 5,000,000 |
| | 2 | 0 | 0 | 0 | 16 | | 5 | 0 | 0 | 0 | 450,000 |
| | 3 | 0 | 0 | 0 | 0 | | 6 | 0 | 0 | 0 | INFINITE |
| | 4 | -1 | -0.4 | -0.4 | 5,000,000 | | 7 | 0 | 0 | 0 | 90 |
| | 5 | 0 | 0 | 0 | 0 | | 8 | +5.2 | +5 | +5 | 140 |
| | 6 | +80 | +80 | +78 | 5,000,000 | | 1 | 0 | 0 | 0 | INFINITE |
| | 7 | 0 | 0 | 0 | 26 | | 2 | 0 | 0 | 0 | 120 |
| | 8 | +80 | +80 | +78 | 5,000,000 | | 3 | 0 | 0 | 0 | 120 |
| 12SQ7 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | INFINITE | |
| | 2 | -1.2 | -0.8 | -0.5 | 10,000,000 | 5 | 0 | 0 | 0 | 120 | |
| | 3 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 120 | |
| | | | | | | 7 | 0 | 0 | 0 | 90 | |
| | | | | | | 3 | 130 | 125 | 125 | 5,000,000 | |



CHASSIS
BOTTOM VIEW



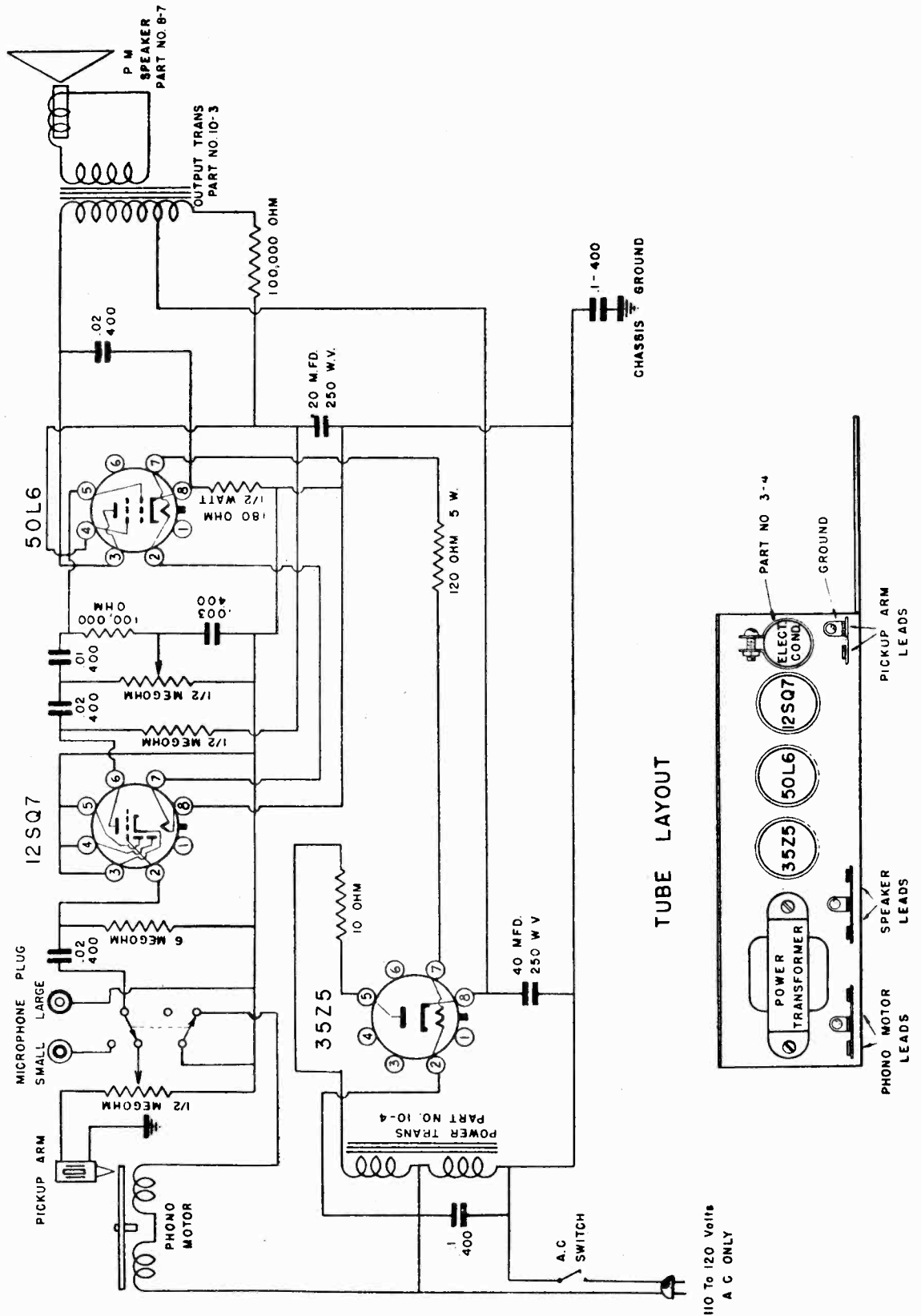
APPROXIMATE
GAIN PER STAGE
DATA

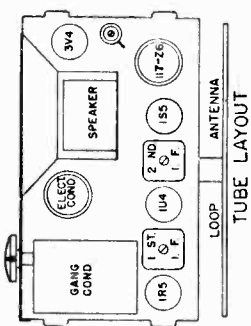
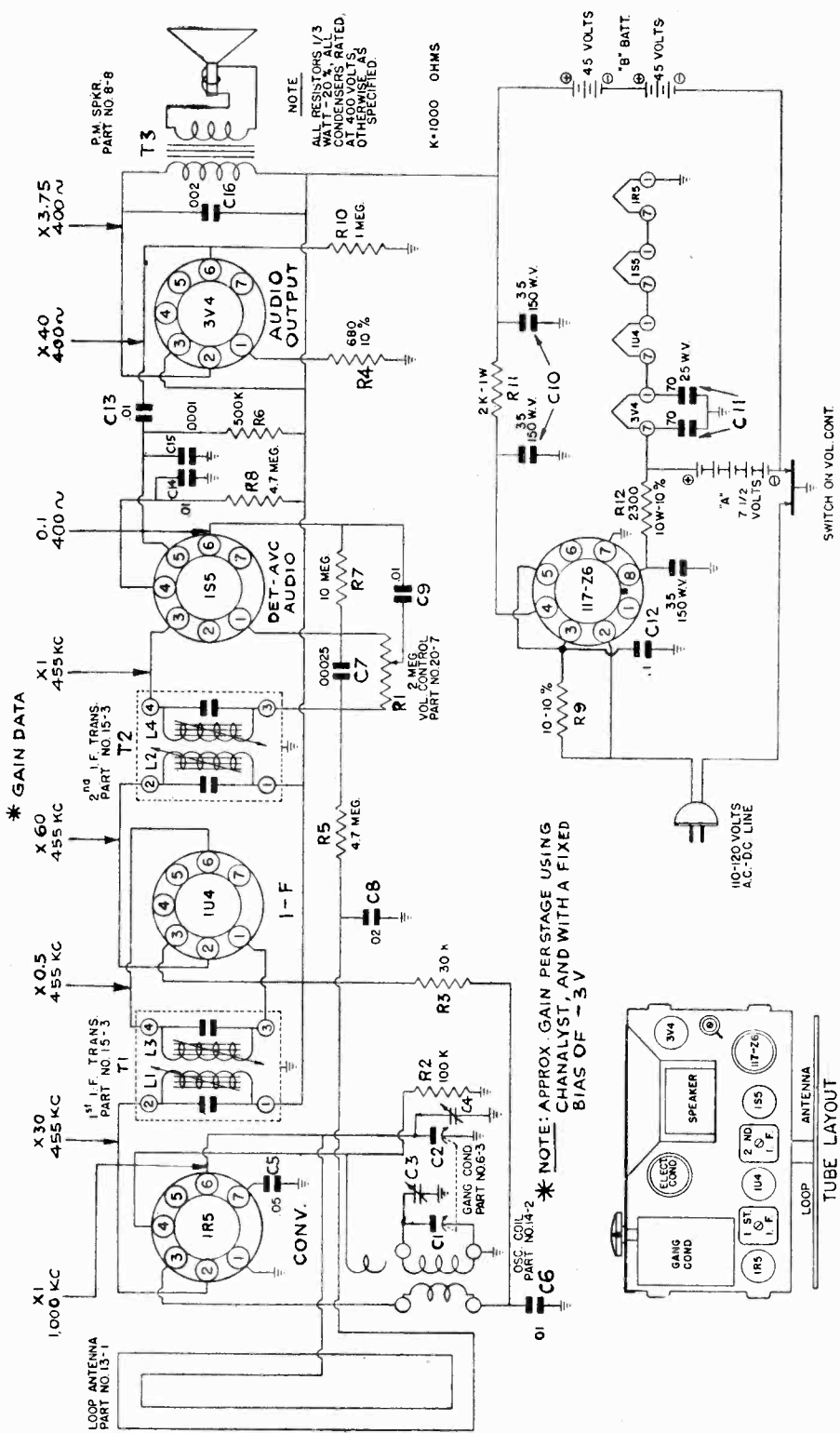
IN MAKING GAIN PER STAGE
MEASUREMENTS, CIRCUIT
WAS OPENED AT POINT X TO
STOP AVC ACTION, AND A
3-VOLT BATTERY CONNECTED
BETWEEN THIS POINT AND
GROUND.

GENERAL TELEV. & RADIO CORP.

MODELS 20A3A,
20A3P

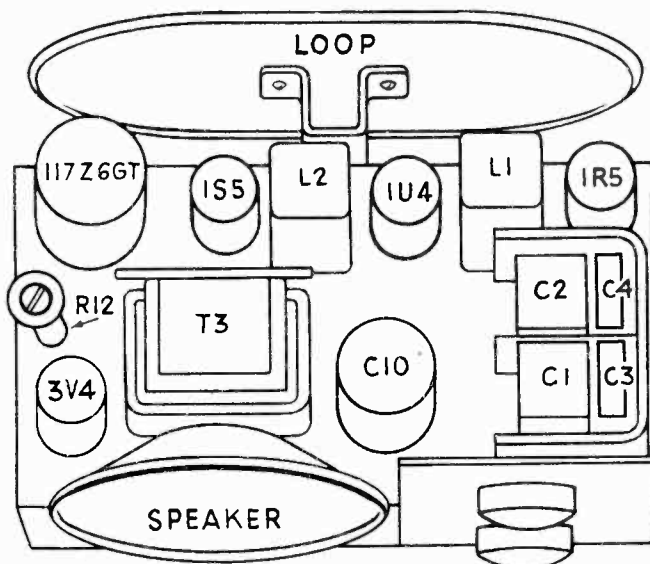
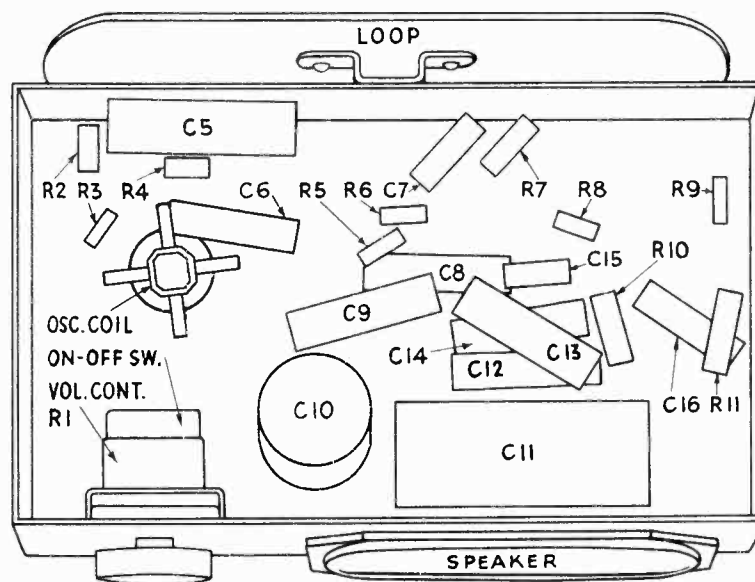
MODEL 20A3A OR 20A3P
PHONO AMPLIFIER





GENERAL TELEV. AND RADIO CORP.

MODEL 26B5



ALIGNMENT

The chassis is removed from the cabinet in order to align this receiver.

Connect the output meter across the voice coil. Connect the signal generator to the standard Hazeltine loop, Model 1150, and couple loosely to the receiver loop. Set the receiver volume control to maximum. The tuning condenser plates should be fully meshed when the dial pointer is at the index mark at the low frequency end of the dial. The signal generator output should be sufficient to give a readable deflection on the output meter.

Set the signal generator to 455 kc. Adjust the I.F. tuning slugs, L4, L3, L2, L1, for maximum output on the output meter. Set the signal generator and receiver to 1600 kc and adjust the oscillator trimmer C4 for maximum output. Set the signal generator and receiver to 1400 kc and adjust R.F. trimmer C3 for maximum output.

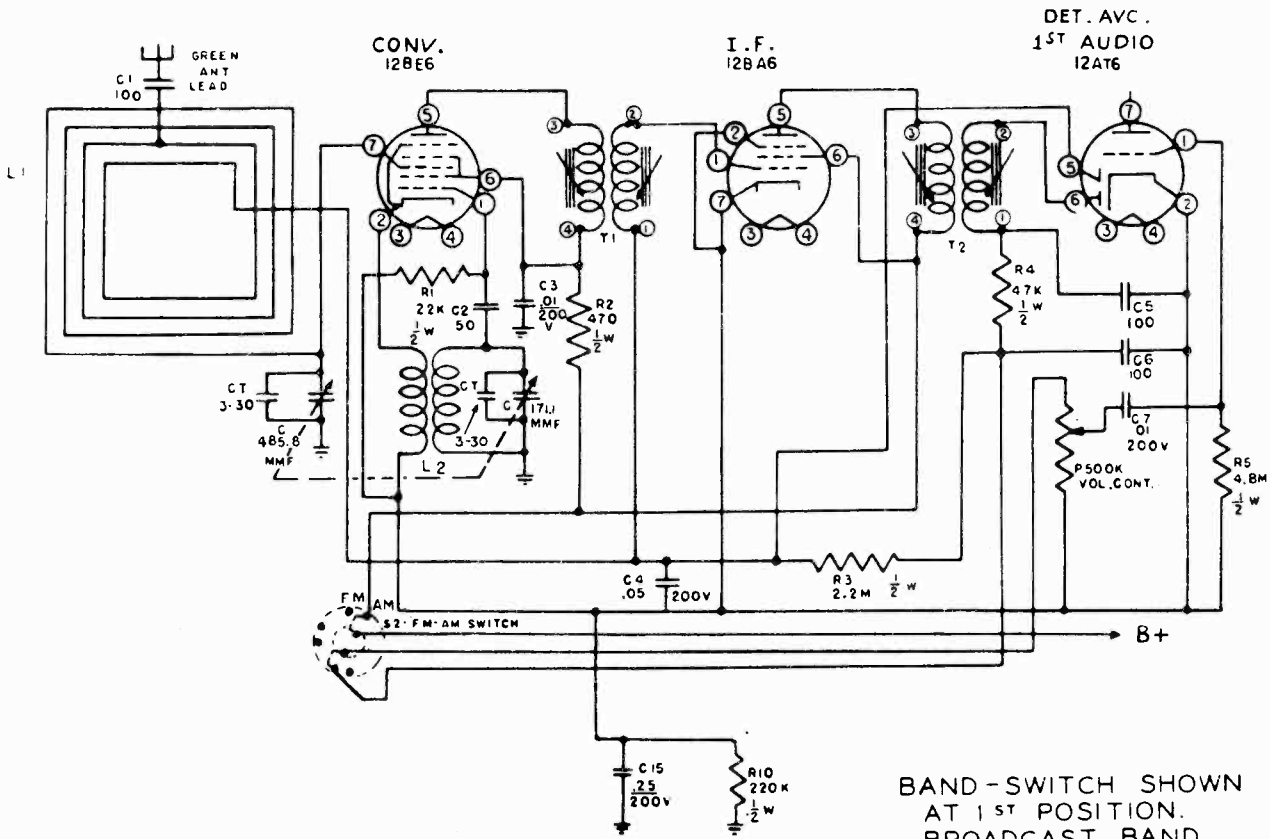
MODEL 26B5

GENERAL TELEV. AND RADIO CORP.

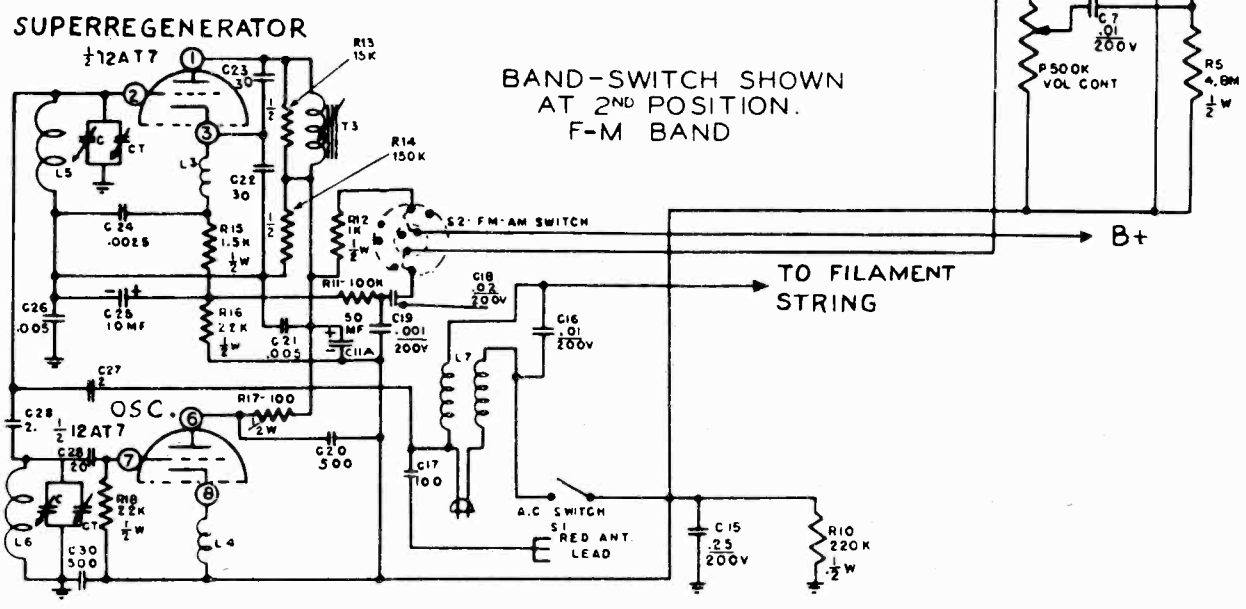
GENERAL TELEVISION MODEL 26B5

| TUBE | PIN | VTVM | 20,000 P.V. | 1,000 P.V. | RESISTANCE |
|------------------------------|-----|------|----------------|---------------|--------------|
| IR5 Conv | 1 | 0 | 0 | 0 | 0 |
| | 2 | 105 | 105 | 105 | Over 5 megs |
| | 3 | 44 | 44 | 42 | Over 5 megs |
| | 4 | -5 | -2.6 | 0 | 100 K |
| | 5 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 5.5 megs |
| | 7 | 1.7 | 1.7 | 1.7 | 12 Ω |
| IU4 I.F. Ampl | 1 | 3.3 | 3.3 | 3.3 | 22 Ω |
| | 2 | 105 | 105 | 105 | Over 5 megs |
| | 3 | 105 | 105 | 105 | Over 5 megs |
| | 4 | 0.6 | 0.1 | 0 | 5.5 megs |
| | 5 | 3.6 | 3.6 | 3.6 | 22 Ω |
| | 6 | 3.3 | 3.3 | 3.3 | 34 Ω |
| | 7 | 5 | 5 | 5 | 34 Ω |
| IS5 Det. AVC Audio Amp | 1 | 1.7 | 1.7 | 1.7 | 12 Ω |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 1.2 | 0.2 | 0 | 1.7 megs |
| | 4 | 23 | 20 | 3 | 5.5 megs |
| | 5 | 46 | 42 | 12 | Over 5 megs |
| | 6 | 1.1 | 0 | 0 | 8 megs |
| | 7 | 3.3 | 3.3 | 3.3 | 22 Ω |
| 3V4 Audio Output | 1 | 5 | 5 | 5 | 32 Ω |
| | 2 | 100 | 100 | 100 | Over 5 megs |
| | 3 | 105 | 105 | 105 | Over 5 megs |
| | 4 | 105 | 105 | 105 | Over 5 megs |
| | 5 | - | - | - | - |
| | 6 | 0 | 0 | 0 | 1 meg |
| | 7 | 8 | 8 | 8 | 52 Ω |
| 117Z6 Rect | 1 | 0 | 0 | 0 | 0 |
| | 2 | AC | AC | AC | 235 Ω |
| | 3 | AC | AC | AC | 240 Ω |
| | 4 | 135 | 135 | 135 | Over 5 megs |
| | 5 | AC | AC | AC | 240 Ω |
| | 6 | 105 | 105 | 105 | Over 5 megs |
| | 7 | 0 | 0 | 0 | 0 |
| | 8 | 120 | 120 | 120 | Over 5 megs |

All values are positive unless indicated otherwise.

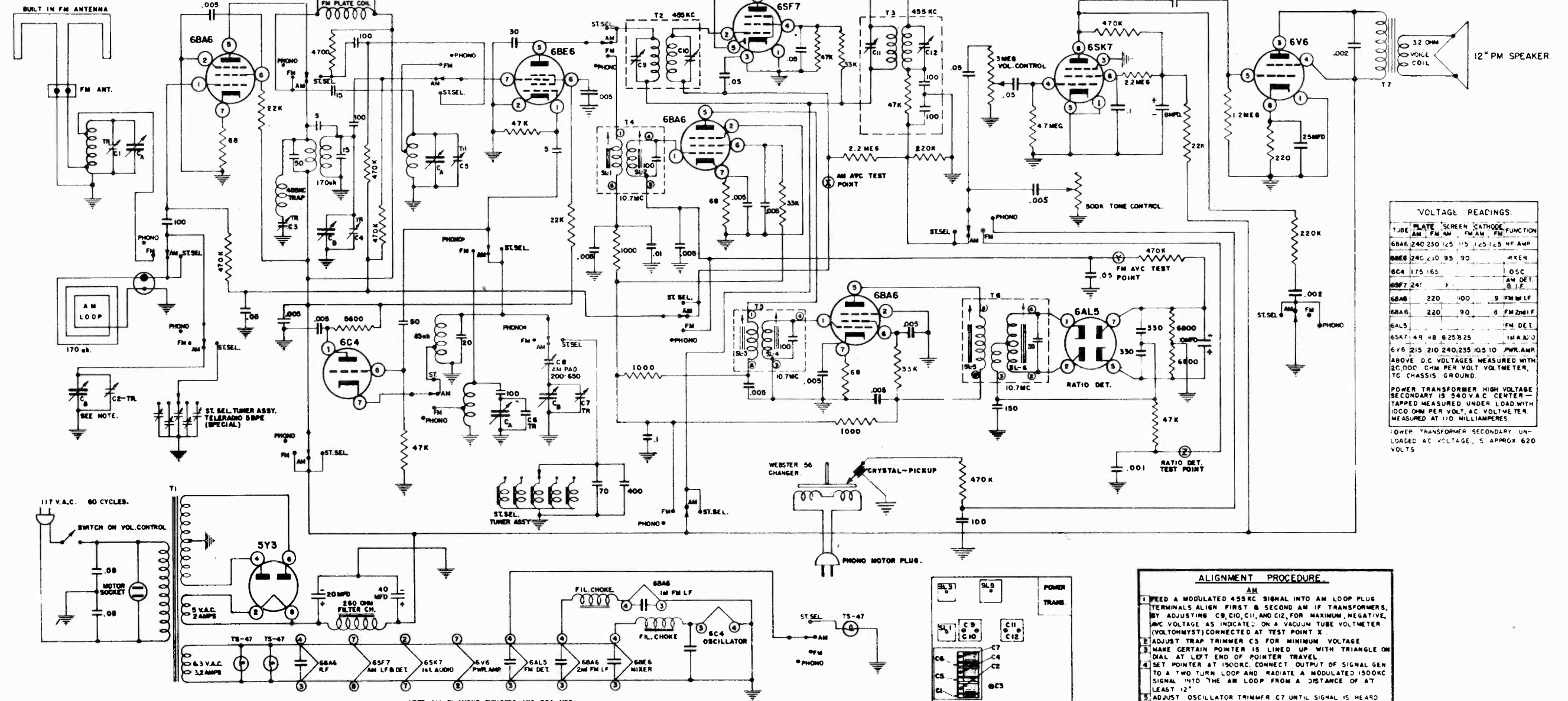


BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND



BAND-SWITCH SHOWN AT 2ND POSITION. F-M BAND

DISCONNECT BUILT IN FM ANT. AND CONNECT OUTSIDE FM ANT. FOR IMPROVED FM RECEPTION. INPUT IMPEDANCE = 300 OHMS.



VOLTAGE READINGS

| TUBE | PLATE | SCREEN | CATHODE | FUNCTION |
|------|-------|--------|---------|--------------------|
| 6BA6 | 240 | 230 | 125 | 115 125 125 HF AMP |
| 6BE6 | 240 | 230 | 95 | 90 MIXER |
| 6C4 | 175 | 165 | | OSC |
| 6SF7 | 240 | | | AM DET |
| 6BA6 | 220 | 100 | 9 | FM MIF |
| 6BA6 | 220 | 90 | 8 | FM 2nd IF |
| 6AL5 | | | | FM DET |
| 6SK7 | 49 | 48 | 8 | 25/25 |
| 6V6 | 215 | 210 | 240/235 | 105/10 |

POWER TRANSFORMER HIGH VOLTAGE SECONDARY IS 340 V.A.C. CENTER-TAPPED MEASURED UNDER LOAD WITH 1000 OHM PER VOLT AC VOLTMETER MEASURED AT 110 MILLIAMPERES.

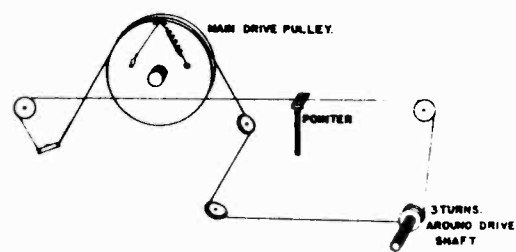
POWER TRANSFORMER SECONDARY UNLOADED AC VOLTAGE IS APPROX 620 VOLTS

- ALIGNMENT PROCEDURE**
1. FEED A MODULATED 455 KC SIGNAL INTO AM LOOP PLUS TERMINALS ALIGN FIRST & SECOND AM IF TRANSFORMERS, BY ADJUSTING C9, C10, C11, AND C12 FOR MAXIMUM NEGATIVE AVC VOLTAGE AS INDICATED ON A VACUUM TUBE VOLTMETER (VOLTMETER) CONNECTED AT TEST POINT X.
 2. ADJUST TRAP TRIMMER C3 FOR MINIMUM VOLTAGE.
 3. MAKE CERTAIN POINTER IS LINED UP WITH TRIANGLE ON DIAL AT LEFT END OF POINTER TRAVEL.
 4. SET POINTER AT 1500 KC, CONNECT OUTPUT OF SIGNAL GEN TO A TWO TURN LOOP AND RADIATE A MODULATED 1500 KC SIGNAL INTO THE AM LOOP FROM A DISTANCE OF AT LEAST 12".
 5. ADJUST OSCILLATOR TRIMMER C7 UNTIL SIGNAL IS HEARD.
 6. ADJUST RF AND ANT TRIMMERS C2 AND C4 FOR MAXIMUM AVC VOLTAGE.
 7. SET POINTER AND GENERATOR AT 600 KC AND ADJUST C8 AM OSCILLATOR PAD UNTIL SIGNAL IS HEARD.
 8. ROCK GANG AND ADJUST C6 FOR MAX AVC VOLTAGE.
 9. RECHECK OSC TRIMMER C7 AT 1500 KC.
- FM**
1. SET BANDSWITCH TO FM POSITION.
 2. FEED AN UNMODULATED 10.7 MC SIGNAL INTO 6BE6 GRID (PIN 7) WITH 6C4 OSCILLATOR TUBE REMOVED. ADJUST SL1, 2, 3, 4, 5 FOR MAXIMUM NEGATIVE VOLTAGE AS INDICATED AT TEST POINT Y. OUTPUT OF SIGNAL GEN SHOULD BE SET FOR FINAL PEAKING, SO THAT AVC VOLTAGE DOES NOT EXCEED -1.5 VOLTS.
 3. ADJUST SL6 FOR 0 DC VOLTAGE BALANCE AT TEST POINT Z. SWITCH VOLTMETER FROM PLUS TO MINUS VOLTS AND CHECK FOR 0 VOLTAGE IN EACH POSITION.
 4. REPLACE OSC TUBE AND SET POINTER TO 10.7 MC. FEED A 10.7 MC SIGNAL INTO FM ANT TERMINALS, ON BACK OF CHASSIS, IN SERIES WITH 4.270 OHM RESISTOR.
 5. ADJUST OSC TRIMMER C6 UNTIL SIGNAL IS HEARD.
 6. ADJUST ANT-RF TRIMMERS C1, C5 FOR MAXIMUM AVC VOLTAGE.
 7. RECHECK C6, C1, C5 FOR MAX. AVC VOLTAGE.

NOTE: C8 = 3 GANG VARIABLE 485mmfd per section
 CA = 3 " " 15 mmfd per section.

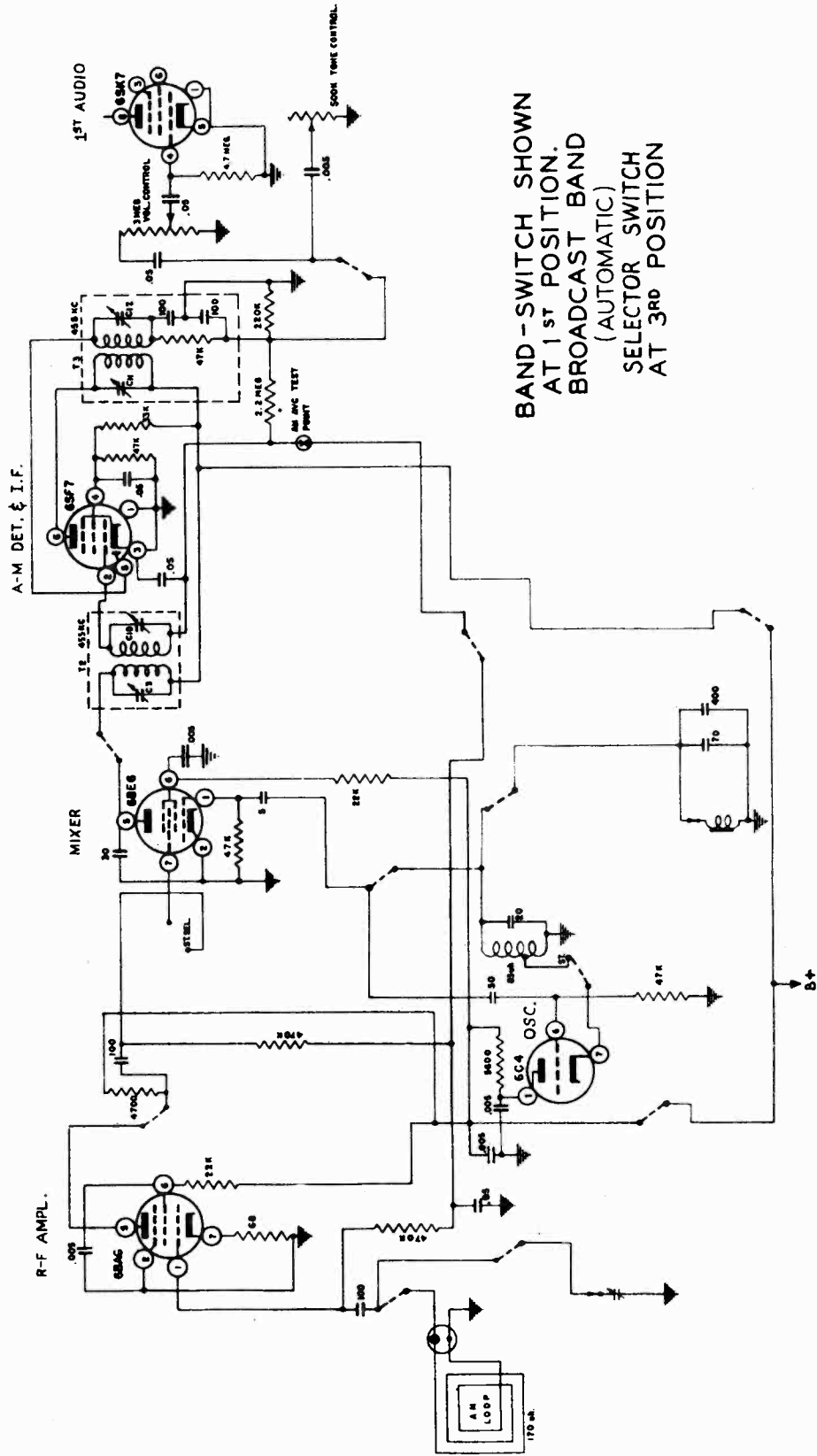
ALL CONDENSERS SMALLER THAN .001 MFD ARE SHOWN IN MFD UNLESS NOTED

NOTE: ALL FILAMENT BYPASSES ARE .005 MFD

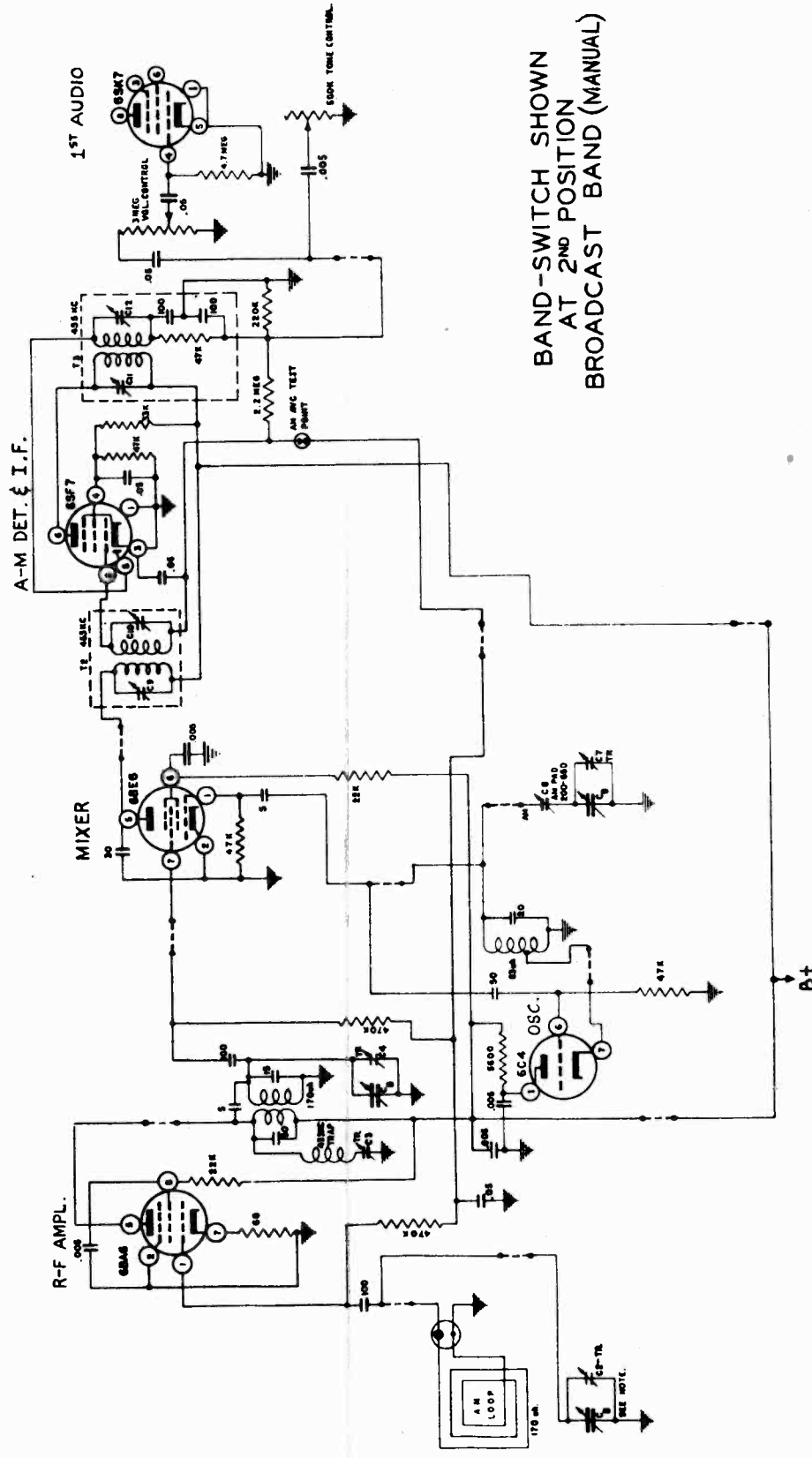


"clarified schematics"

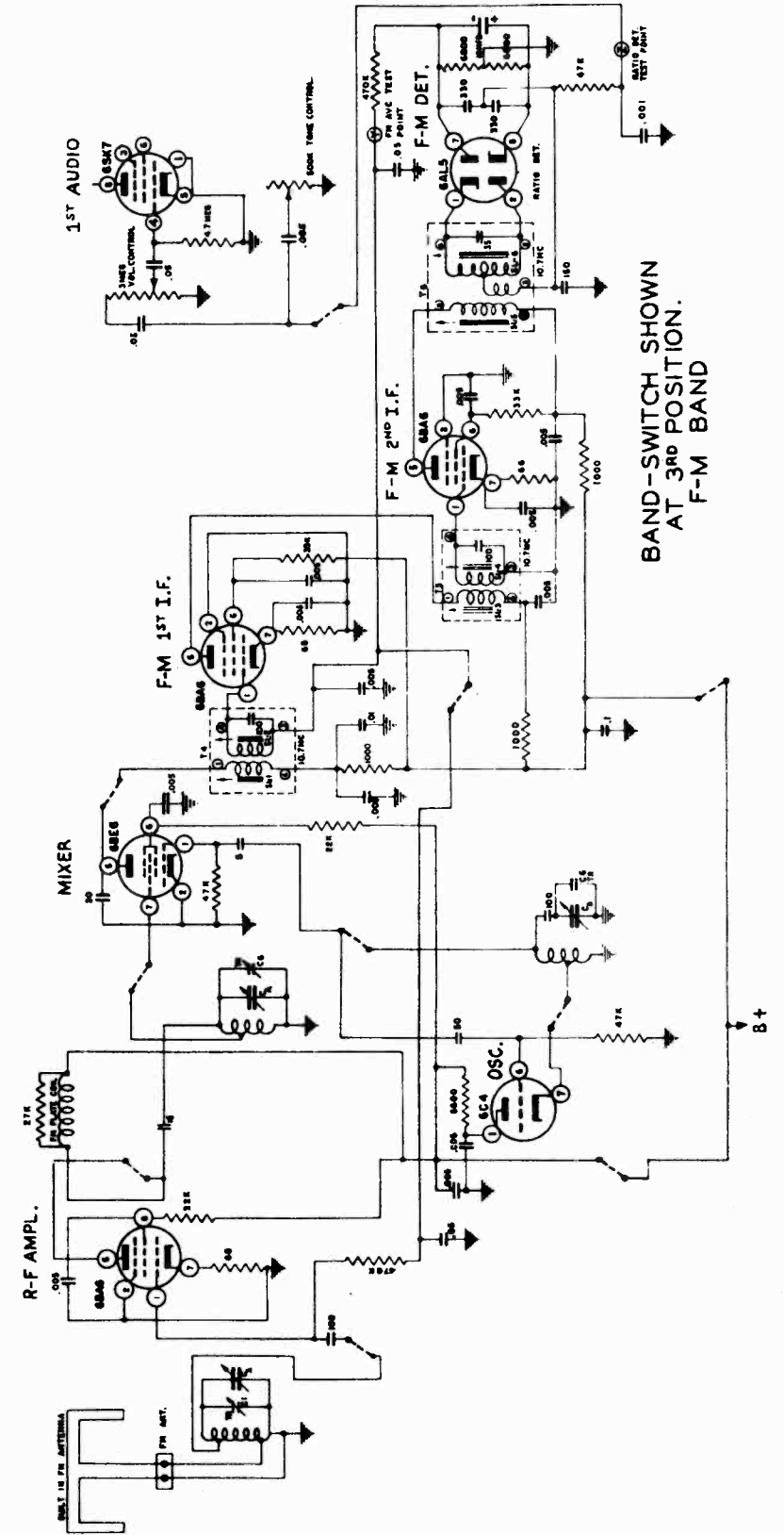
GILFILLAN BROS., INC.



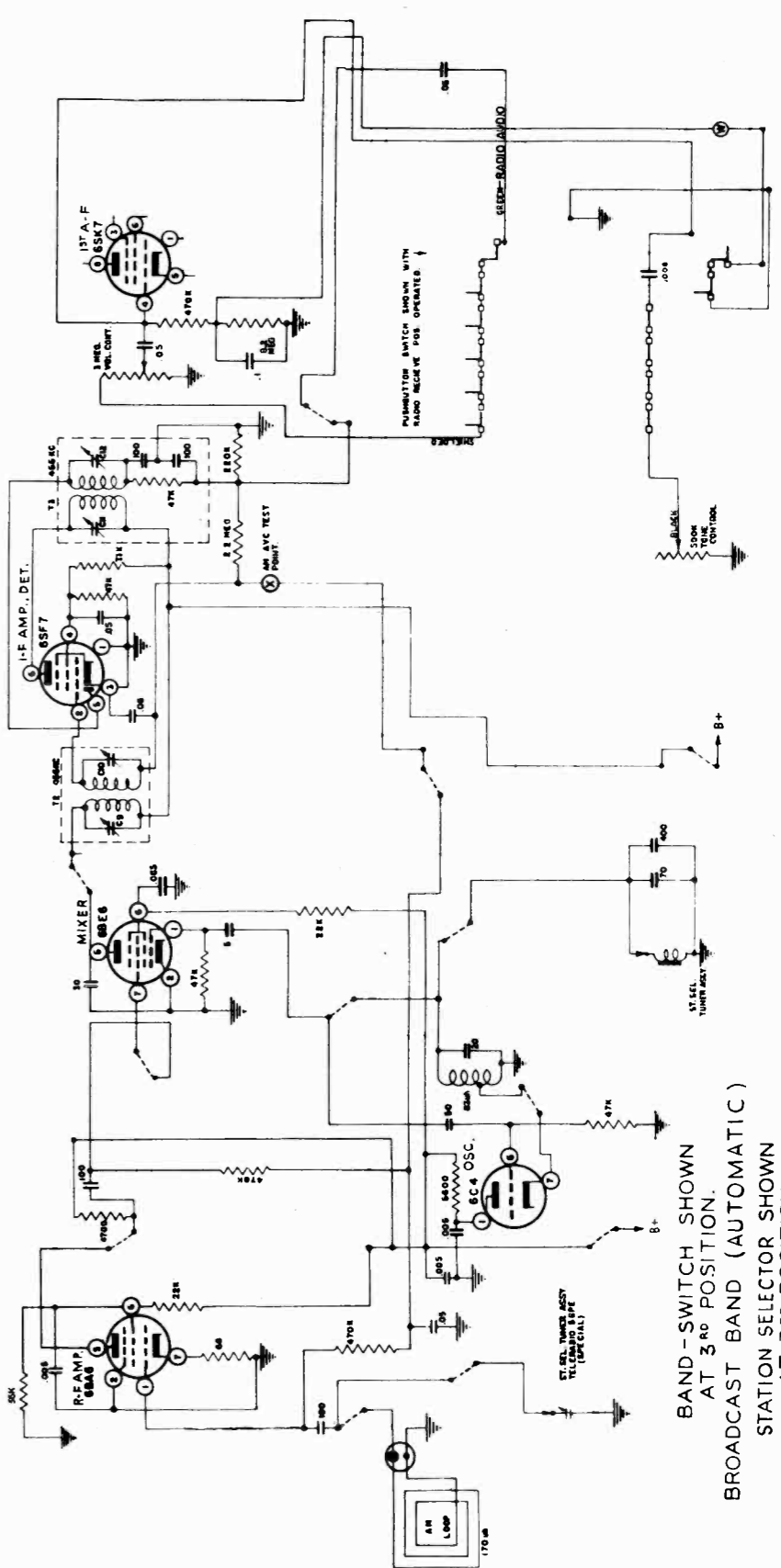
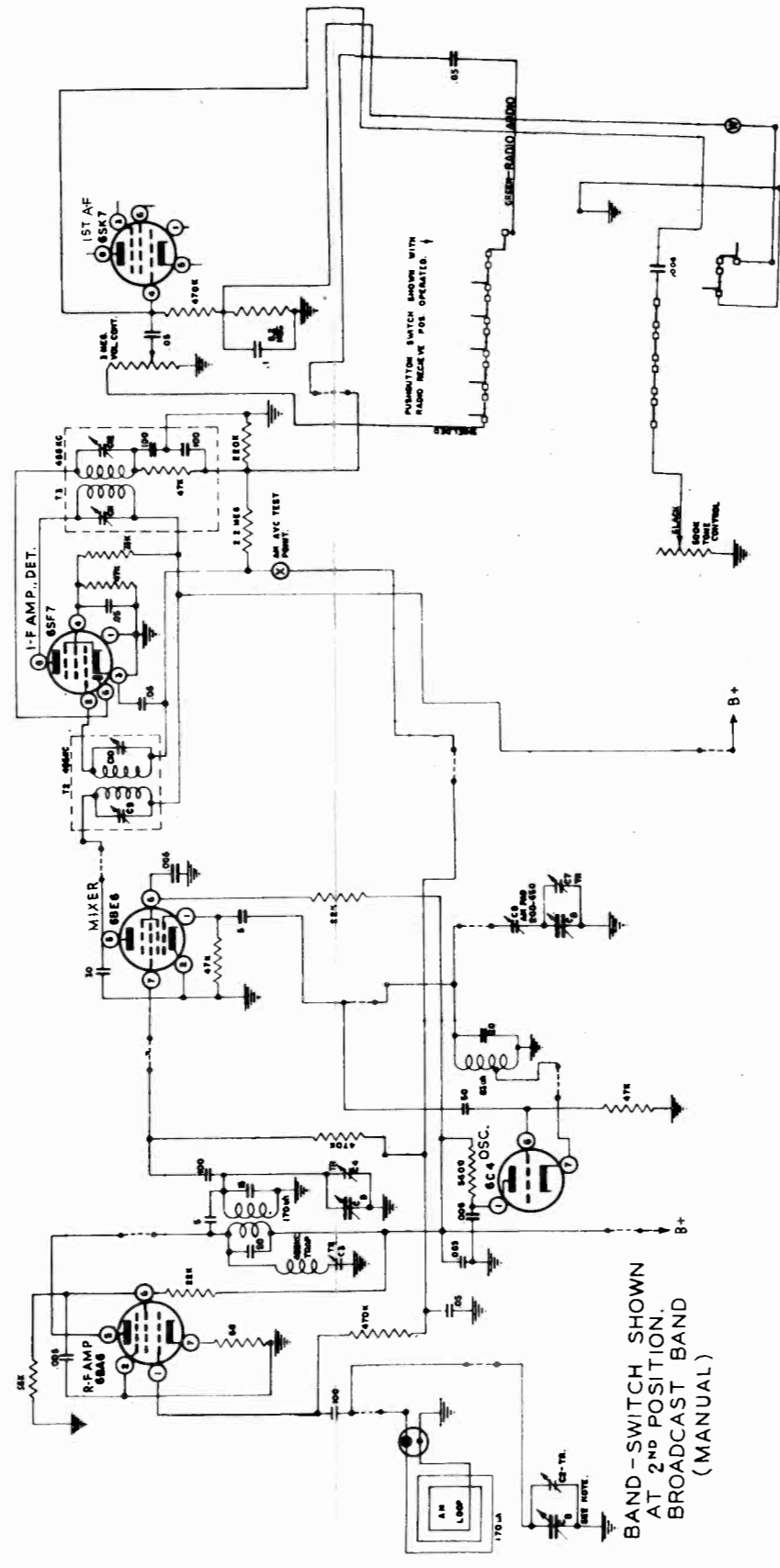
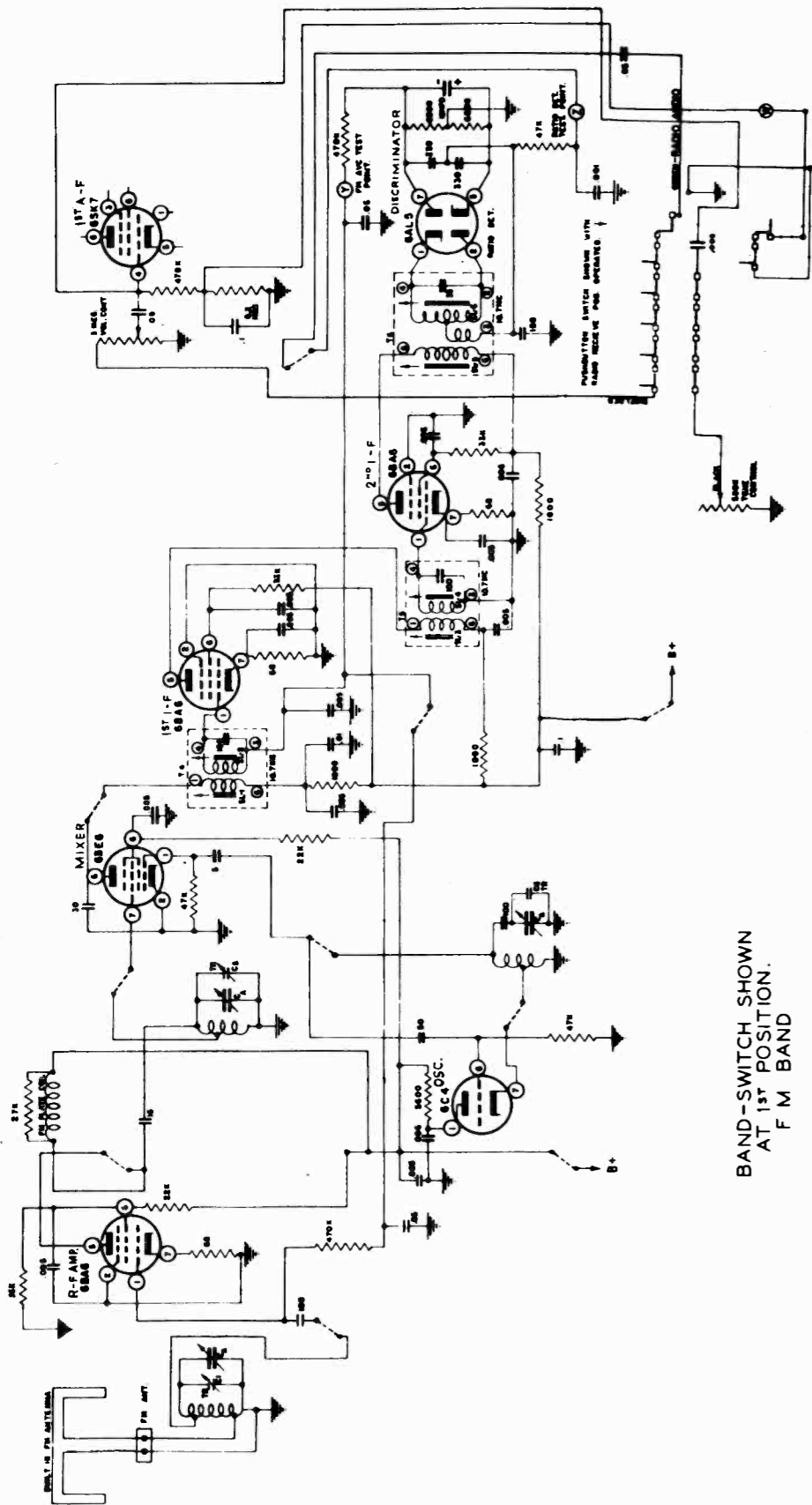
BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
(AUTOMATIC)
SELECTOR SWITCH
AT 3RD POSITION



BAND-SWITCH SHOWN
AT 2ND POSITION
BROADCAST BAND (MANUAL)

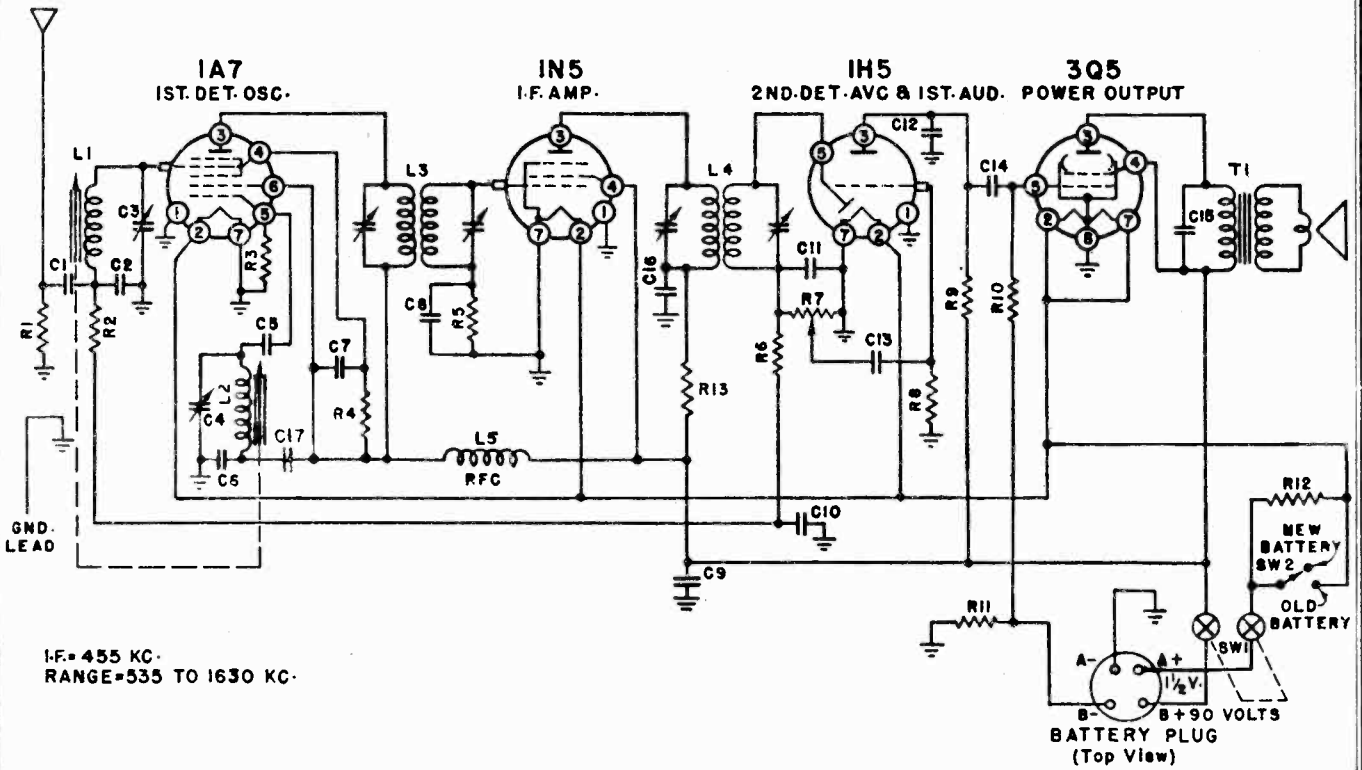


BAND-SWITCH SHOWN
AT 3RD POSITION.
F-M BAND



THE B. F. GOODRICH COMPANY

MODEL R743-W



I.F. = 455 KC.
RANGE = 535 TO 1630 KC.

ALIGNMENT PROCEDURE

IMPORTANT—Check to see that dial pointer reaches each end of dial scale when Station Selector Control is turned from one end to the other.

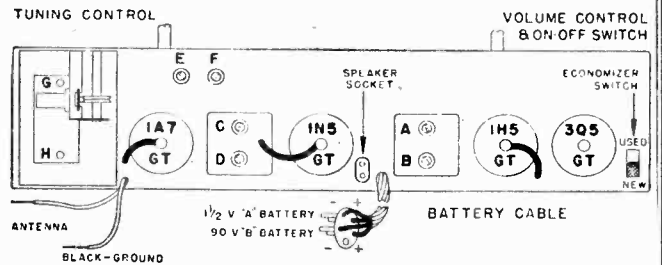
Volume control—Maximum for all adjustments.

Connect radio chassis to ground post of signal generator with a short heavy lead.

Connect dummy antenna value in series with generator output lead, when needed (see below).

Connect output meter across voice coil of speaker.

Allow chassis and signal generator to warm up for several minutes.



● Use lowest Output setting of Signal Generator capable of producing adequate Output Meter indication and then proceed as indicated in the chart below.

| Band | Signal Generator Frequency | Dummy Antenna | Connection to Radio | Receiver Dial Setting | Trimmers Adjusted (In Order Shown) | Trimmer Function | Type of Adjustment |
|------------|----------------------------|---------------|---------------------|----------------------------|--|--------------------|--------------------------|
| I. F. | 455 KC. | .1 MFD. | Grid of 1A7 (Cap) | High frequency end of dial | A-B—2nd I.F. | Output I.F. | Adjust to maximum output |
| | 455 KC. | .1 MFD. | Grid of 1A7 (Cap) | High frequency end of dial | C-D—1st I.F. | Input I.F. | Adjust to maximum output |
| BROAD-CAST | 1630 KC. | .0002 MFD. | Antenna Lead | High frequency end of dial | E—(See note below) F—(See note below) | Oscillator Antenna | Adjust to maximum output |
| | 1300 KC. | .0002 MFD. | Antenna Lead | 1300 KC. | G H | Oscillator Antenna | Adjust to maximum output |

NOTE: Before adjusting trimmers "E" and "F", make sure that each iron core is 1/8" or more outside of its coil form. If necessary, turn adjustments "G" and "H" to accomplish this.

POWER SUPPLY

This receiver is designed to operate on a single unit Ensign AB48, Ray-O-Vac No. AB-82, Burgess 17G-D60, Eveready 748, Bond 0528 or General 60DL-11L Battery. No other batteries are required as this battery is a combination 90 volt "B" battery and a 1½ volt "A" battery. The life of this battery is approximately 750 hours. The "A" and "B" sections are so proportioned that equal life may be expected from both. The "A" section will give satisfactory performance as low as 1.2 volts and the "B" section as low as 68 volts. This battery life may be expected with an average usage of several hours daily. If the reception becomes weak when the Economizer Switch is in the "USED" position, a new battery should be installed. A battery compartment is provided in the rear of the cabinet, and the battery cable simply plugs into the battery.

ANTENNA

Use a standard outside antenna whose length, including the lead-in, is at least 50 feet. There are two leads extending from the rear of the chassis at the left hand side. Connect

the antenna to the "colored" lead and the ground to the "black" lead.

GROUND

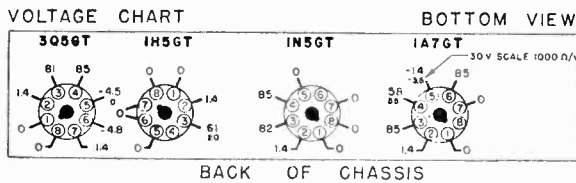
IT IS NECESSARY THAT A GOOD GROUND BE EMPLOYED WITH THIS TYPE OF RECEIVER. Water pipes make a very desirable ground connection. The ground wire is to be connected to the "black" lead at the rear of the chassis. All connections must be tight and clean.

ECONOMIZER SWITCH

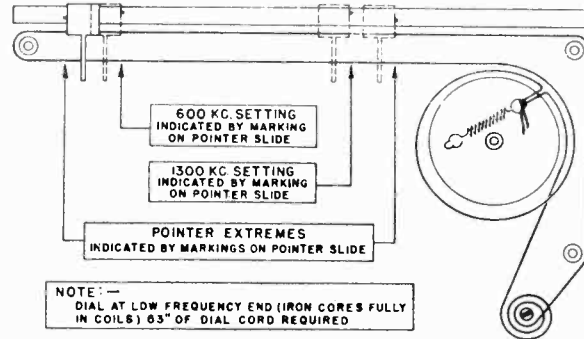
The battery Economizer Switch is located on the top of the chassis, right side (see figure on last page of this instruction folder or model label on chassis). ALWAYS HAVE THIS ECONOMIZER SWITCH IN THE "NEW" BATTERY POSITION WHEN THE RADIO IS NEW OR AFTER A NEW BATTERY HAS BEEN INSTALLED. When the volume or tone of stations decreases noticeably (after 200 or 300 hours of actual use), this switch should be pushed forward to the "USED" battery position.

VOLTAGE DATA

All readings made between tube socket terminals and chassis. Voltages indicated have been obtained using a Vacuum Tube Voltmeter. A second voltage reading is shown made with a 1000 ohm-per-volt meter, when use of this instrument would result in appreciably lower readings. The voltages were measured using a fresh battery, volume control full on, dial at the high frequency end, and no signal.



POINTER SETTINGS AND DIAL CORD STRINGING



REPLACEMENT PARTS

CONDENSERS

| Symbol | Description | Part No. |
|--------|--------------------------|----------|
| C1 | Paper, .01 mfd., 400 V. | 64B1-25 |
| C2 | Mica, .0008 mfd. ±10% | 65B5-31 |
| C3 | Trimmer, Antenna | 66A10-1 |
| C4 | Trimmer, Oscillator | |
| C5 | Mica, .0001 mfd. ±20% | 65B7-17 |
| C6 | Mica, .0008 mfd. ±10% | 65B5-31 |
| C7 | Paper, .01 mfd., 400 V. | 64B1-25 |
| C8 | Paper, .002 mfd., 600 V. | 64B1-14 |
| C9 | Elect., 4 mfd., 150 V. | 67A4-2 |
| C10 | Paper, .05 mfd., 200 V. | 64B1-32 |
| C11 | Mica, .00025 mfd. ±20% | 65B7-22 |
| C12 | Mica, .00025 mfd. ±20% | 65B7-22 |
| C13 | Paper, .01 mfd., 400 V. | 64B1-25 |
| C14 | Paper, .01 mfd., 400 V. | 64B1-25 |
| C15 | Paper, .005 mfd., 600 V. | 64B1-12 |
| C16 | Paper, .01 mfd., 400 V. | 64B1-25 |
| C17 | Paper, .01 mfd., 400 V. | 64B1-25 |

RESISTORS

| | | |
|-----|----------------------------------|----------|
| R1 | 15,000 ohm ±10%, ½W. | 60B8-153 |
| R2 | 470,000 ohm ±10%, ¼W. | 60B2-474 |
| R3 | 220,000 ohm ±10%, ½W. | 60B8-224 |
| R4 | 33,000 ohm ±10%, ½W. | 60B8-333 |
| R5 | 4,700,000 ohm ±10%, ¼W. | 60B2-475 |
| R6 | 2,200,000 ohm ±10%, ¼W. | 60B2-225 |
| R7 | 1 megohm Volume Control & Switch | 75B1-1 |
| R8 | 4,700,000 ohm ±10%, ¼W. | 60B2-475 |
| R9 | 1,000,000 ohm ±10%, ¼W. | 60B2-105 |
| R10 | 1,000,000 ohm ±10%, ¼W. | 60B2-105 |
| R11 | 390 ohm ±10%, ¼W. | 60B2-391 |
| R12 | 0.75 ohm ±10%, ½W. (Wire) | 61A2-1 |
| R13 | 2200 ohm ±10%, ¼W. | 60B2-222 |

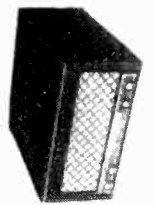
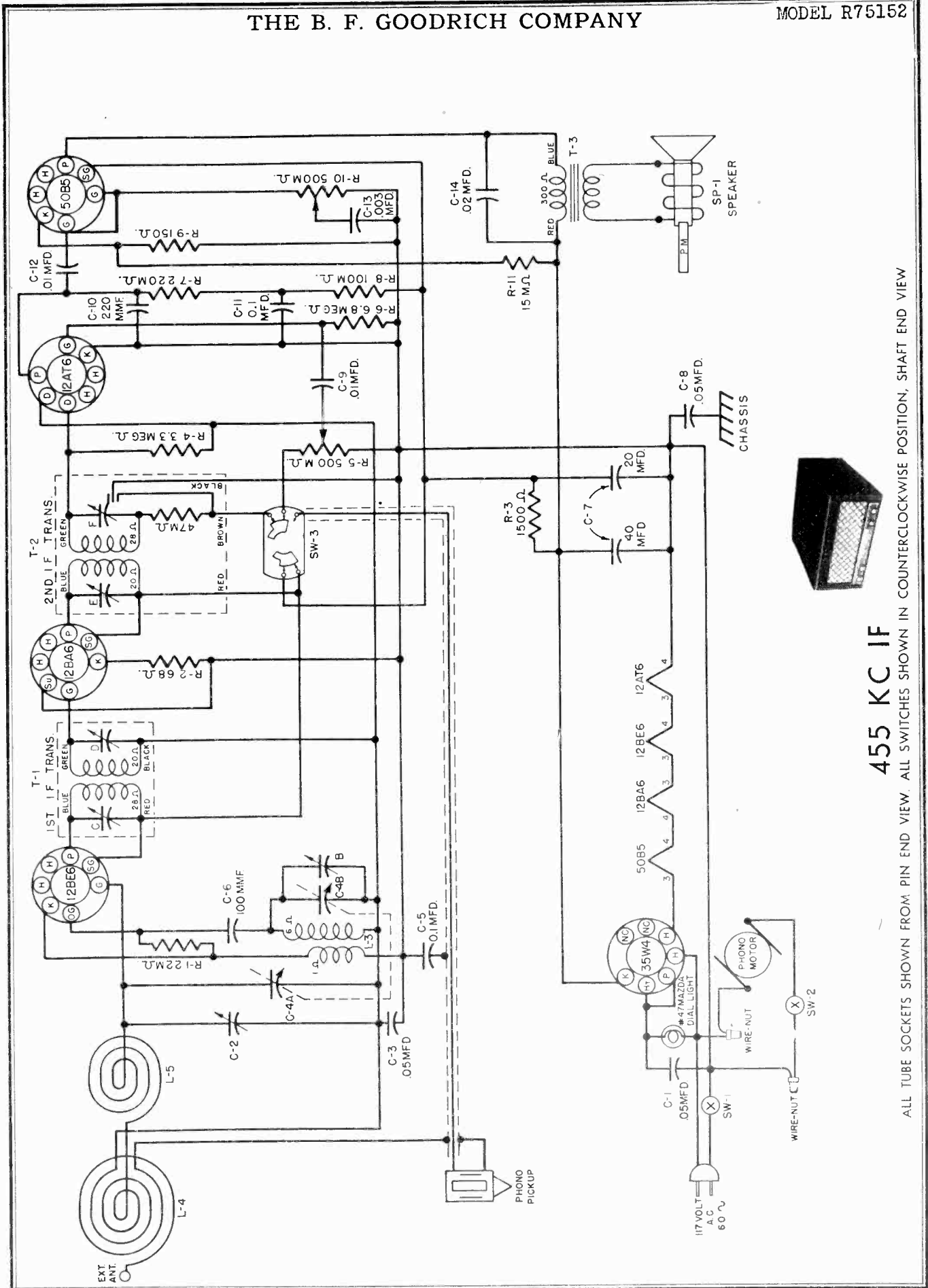
TRANSFORMERS AND COILS

| | | |
|----|----------------------|---------|
| L1 | Antenna Coil | AC105-1 |
| L2 | Oscillator Coil | A1020 |
| L3 | 1st I.F. Transformer | 72B5 |
| L4 | 2nd I.F. Transformer | 72B6 |
| L5 | Choke Coil (RF) | AB103-1 |
| T1 | Output Transformer | 98A5 |

MISCELLANEOUS

| Description | Part No. |
|--|------------|
| Background, Dial | X22C5-1 |
| Cabinet, R743-W | 34D10 |
| Cable, Battery (complete with plug) | A1026 |
| Cap, Grid | 90A1-2 |
| Clip, Baffle Mounting | 2B10-21-68 |
| Clip, Dial Glass | 18A2 |
| Cord, Dial (5" on tuner and 63" on dial drive) | 50A1-3 |
| Dial Scale, glass | 21B25-2 |
| Drum and Hub, Tuning | A1035 |
| Escutcheon | 23A8-1 |
| Iron Slug, with wire (Oscillator) | 71B1-3 |
| Iron Slug, with wire (Antenna) | 71B1-4 |
| Knob | 33A7-2 |
| Plug, Battery, 5 Prong | 88A4-4 |
| Pointer, Dial | 25A9-1 |
| Pulley, Fibre Dial | 17A1-3 |
| Screw Studs (for iron cores) | 27A4 |
| Shaft, Tuning | 28A1-1 |
| Shaft and Pulley (Tuner) | A1040 |
| Shield, Tube | 87A8 |
| Socket, Octal Tube | 87A5-1 |
| Socket, Speaker | 87A4-3 |
| Speaker and Output Transformer | 78B15-2 |
| Spring, Dial Drum Cord Tension | 19B1-7 |
| Spring, Hairpin (To hold Ant. or Osc. coil) | 19A3-1 |
| Spring, Tuner Slide Cord Tension | 19B1-8 |
| Spring, Tuner, back bearing takeup | 19A6 |
| Spring, Tuner, front bearing takeup | 19A5 |
| Spring, Tuner Slide Pressure | 18A9 |
| Switch, SPST (Economizer) SW2 | 77B1-6 |
| Washer, C | 4A4-1 |
| Washer, spring (coils) | 4A6-12-0 |
| Washer, spring (shaft) | 4A6-3-0 |

THE B. F. GOODRICH COMPANY



455 KC IF

ALL TUBE SOCKETS SHOWN FROM PIN END VIEW. ALL SWITCHES SHOWN IN COUNTERCLOCKWISE POSITION, SHAFT END VIEW

MODEL R75152

THE B. F. GOODRICH COMPANY

ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

1. A signal generator which will provide an accurately calibrated signal at the frequencies listed.
2. An output meter.
3. A non-metallic screwdriver.
4. Dummy antenna: — .1 mfd. — RMA loop.

NOTE: Intermediate Frequency and Oscillator adjustments may be made with the loop disconnected provided a resistor of 10,000 to 50,000 ohms is substituted to close the 12BE6 grid circuit. The loop alignment must be done with the loop and chassis mounted in operating position in the cabinet. A single turn loosely coupled to loop may be substituted for RMA loop.

| GENERATOR | CONNECTION AT RADIO | DUMMY ANTENNA | DIAL | TO TUNE TRIMMERS | REMARKS |
|------------|---------------------|---------------|----------|------------------------|-------------------|
| IF 455 kc. | 12BE6 grid | .1 mfd. | HF end | IF trimmers C D E F | Tune to max. |
| 1620 kc. | 12BE6 grid | RMA loop | HF end | Osc. trimmer B | Set limit of band |
| 1400 kc. | Through loop* | RMA loop | 1400 kc. | Ant. trimmer C-2 | Tune to max. |

* Loop trimmer accessible through back of cabinet.

SERVICE PARTS LIST

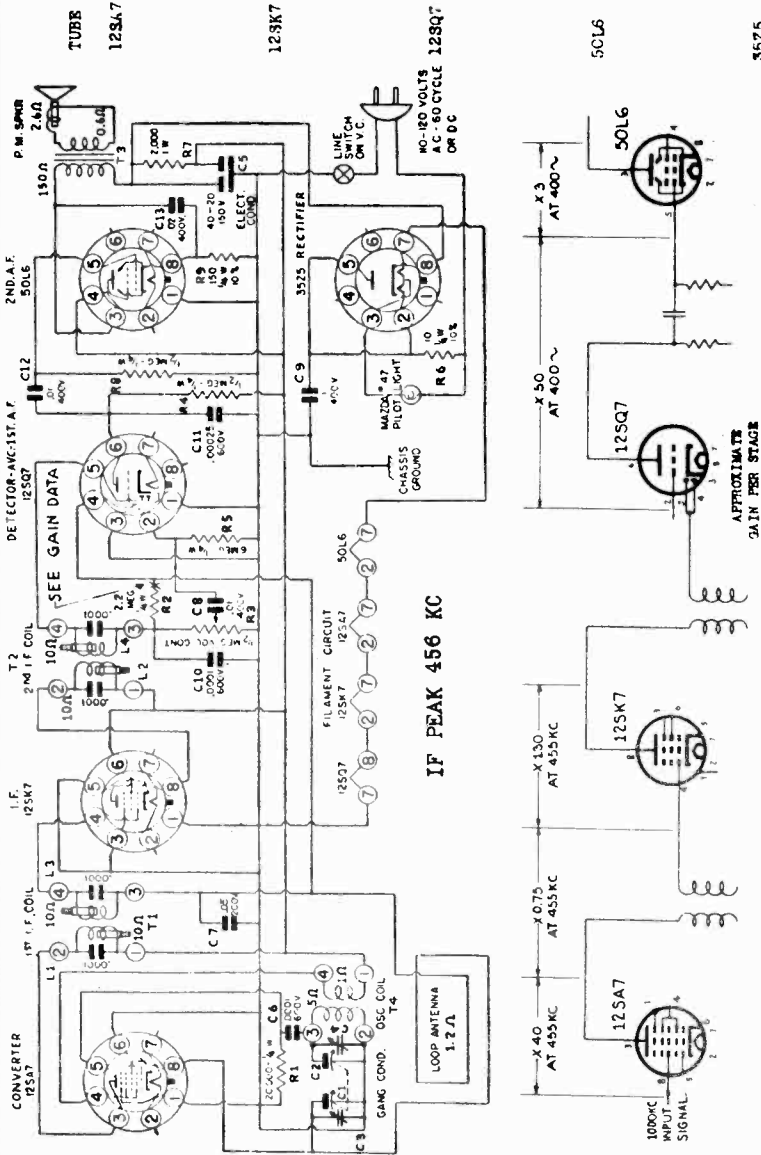
| Symbol | Part No. | Description | Symbol | Part No. | Description |
|-----------|----------|-------------------------------------|-----------|-----------|---------------------------------|
| C-3 | BD210503 | Capacitor, Paper, .05 mfd., 200 v. | | B-51427-5 | Grommet (large) |
| C-9, C-12 | BD410103 | Capacitor, Paper, .01 mfd., 400 v. | | B-51427-8 | Grommet (small) |
| C-5, C-11 | BD410104 | Capacitor, Paper, 0.1 mfd., 400 v. | SW-3 | B-51576-2 | Switch, Radio-Phono |
| C-14 | BD410203 | Capacitor, Paper, .02 mfd., 400 v. | | A-51787 | Spring, for Dial Cable |
| C-1, C-8 | BD410503 | Capacitor, Paper, .05 mfd., 400 v. | | A-54122 | Button, Plug |
| C-13 | BD610302 | Capacitor, Paper, .003 mfd., 600 v. | R-5 | B-54466-2 | Control, Volume, 500,000 ohm |
| C-6 | BM74A101 | Capacitor, Mica, 100 mmf. | T-2 | B-56718-1 | Transformer Assembly, 2nd IF |
| C-10 | BM74A221 | Capacitor, Mica, 220 mmf. | T-1 | B-56722-1 | Transformer Assembly, 1st IF |
| R-2 | BR16B680 | Resistor, 68 ohm, ½ w. | R-10 | B-57841-1 | Cord, AC Phono. |
| R-9 | BR16C151 | Resistor, 150 ohm, ½ w. | B-57842 | B-57842 | Coil Assembly, Oscillator |
| R-8 | BR17B104 | Resistor, 100,000 ohm, ½ w. | C-57843 | C-57843 | Speaker, 5x7 PM |
| R-1 | BR17B223 | Resistor, 22,000 ohm, ½ w. | B-57848-1 | B-57848-1 | Shaft, Tuning Drive |
| R-7 | BR17B224 | Resistor, 22,000 ohm, ½ w. | B-57857-1 | B-57857-1 | Pointer, Dial |
| R-4 | BR17B335 | Resistor, 3.3 megohm, ½ w. | B-57858-1 | B-57858-1 | Strip Assembly, Light Diffusing |
| R-6 | BR17B685 | Resistor, 6.8 megohm, ½ w. | C-4 | C-57859-1 | Capacitor, Variable |
| R-3 | BR17E152 | Resistor, 1500 ohm, 1 w. | L-4 & L-5 | D-57870 | Coil Assembly, Loop |
| R-11 | BR17E153 | Resistor, 15,000 ohm, 1 w. | | C-57872-1 | Knob |
| A-2163 | A-2163 | Cable, Drive | | A-57878 | Clip, Gang Mounting |
| A-6158 | A-6158 | Lamp, Pilot, No. 47 Mazda, 6.3 v. | C-2 | B-57879-1 | Capacitor Assembly, Trimmer |
| A-6182-1 | A-6182-1 | Socket, Dial Light | | C-59414 | Crystal and Indicator, Dial |
| B-9564-1 | B-9564-1 | Cap., Electro., 40-20 mfd., 150 v. | | B-58069-1 | Cord, AC Power |
| A-51163 | A-51163 | Clip, Spring | | | |

Order parts not listed by specifying (1) Part Name, (2) Model Number (inc. number following dash) and (3) Run Number.

MODEL 75434

THE B. F. GOODRICH COMPANY

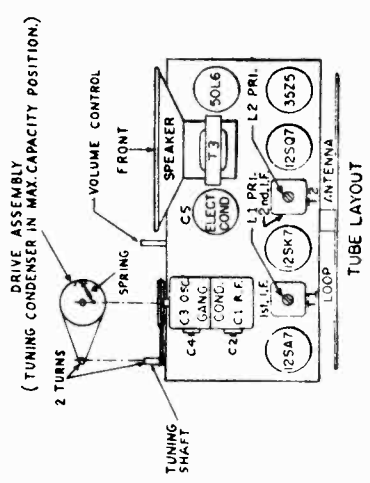
| TUBE | PIN | VTM | 20,000 OHMS PER VOLT | 1000 OHMS PER VOLT | RESISTANCE |
|-------|-----|------|----------------------|--------------------|------------|
| 12SA7 | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 24 |
| | 3 | +80 | +78 | +78 | INFINITE |
| | 4 | +80 | +78 | +78 | INFINITE |
| | 5 | -9.5 | -4.8 | -4.8 | 20,000 |
| | 6 | 0 | 0 | 0 | 1 |
| | 7 | 0 | 0 | 0 | 40 |
| | 8 | -1.5 | -0.8 | -0.2 | 1,200,000 |
| 12SK7 | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 12 |
| | 3 | 0 | 0 | 0 | 0 |
| | 4 | -1.5 | -0.5 | -0.2 | 1,200,000 |
| | 5 | 0 | 0 | 0 | 0 |
| | 6 | +30 | +78 | +78 | INFINITE |
| | 7 | 0 | 0 | 0 | 28 |
| | 8 | +80 | +78 | +78 | INFINITE |
| 12SQ7 | 1 | 0 | 0 | 0 | 0 |
| | 2 | -0.5 | -0.4 | -0.2 | 6,000,000 |
| | 3 | 0 | 0 | 0 | 0 |
| | 4 | -0.5 | -0.4 | -0.2 | 400,000 |
| | 5 | -0.5 | -0.4 | -0.2 | 400,000 |
| | 6 | +46 | +40 | +40 | INFINITE |
| | 7 | 0 | 0 | 0 | 14 |
| | 8 | 0 | 0 | 0 | 0 |
| 50L6 | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 40 |
| | 4 | +120 | +120 | +120 | INFINITE |
| | 5 | +80 | +78 | +78 | 460,000 |
| | 6 | 0 | 0 | 0 | INFINITE |
| | 7 | 0 | 0 | 0 | 90 |
| | 8 | +4.5 | +4.5 | +4.5 | 150 |
| 35Z5 | 1 | 0 | 0 | 0 | INFINITE |
| | 2 | 0 | 0 | 0 | 120 |
| | 3 | 0 | 0 | 0 | 120 |
| | 4 | 0 | 0 | 0 | INFINITE |
| | 5 | 0 | 0 | 0 | 120 |
| | 6 | 0 | 0 | 0 | 120 |
| | 7 | 0 | 0 | 0 | 90 |
| | 8 | +120 | +120 | +120 | INFINITE |



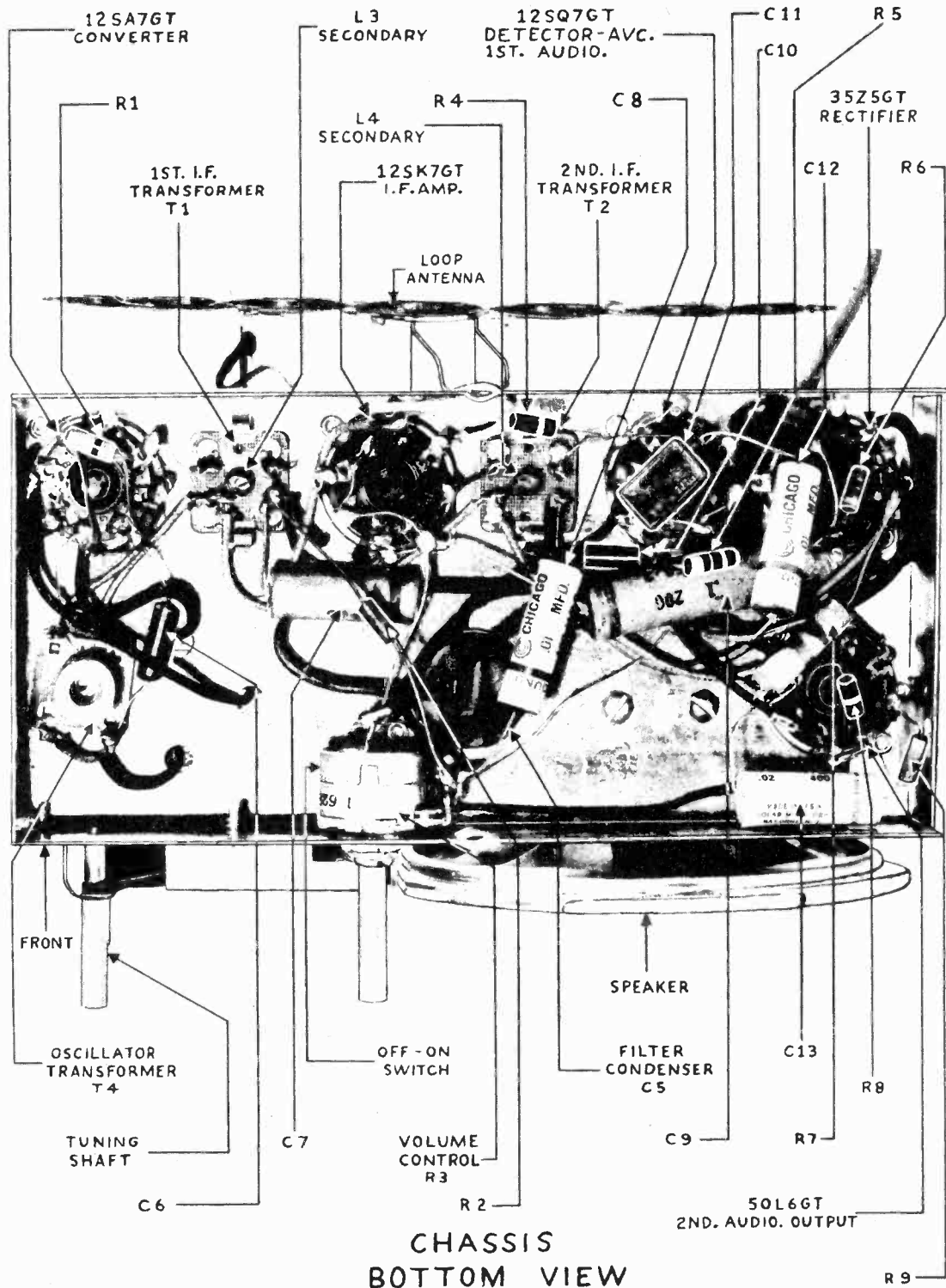
IN MAKING GAIN PER STAGE MEASUREMENTS, CIRCUIT WAS OPENED AT POINT X TO STOP AVC ACTION AND A 3-VOLT BATTERY CONNECTED BETWEEN THIS POINT AND GROUND

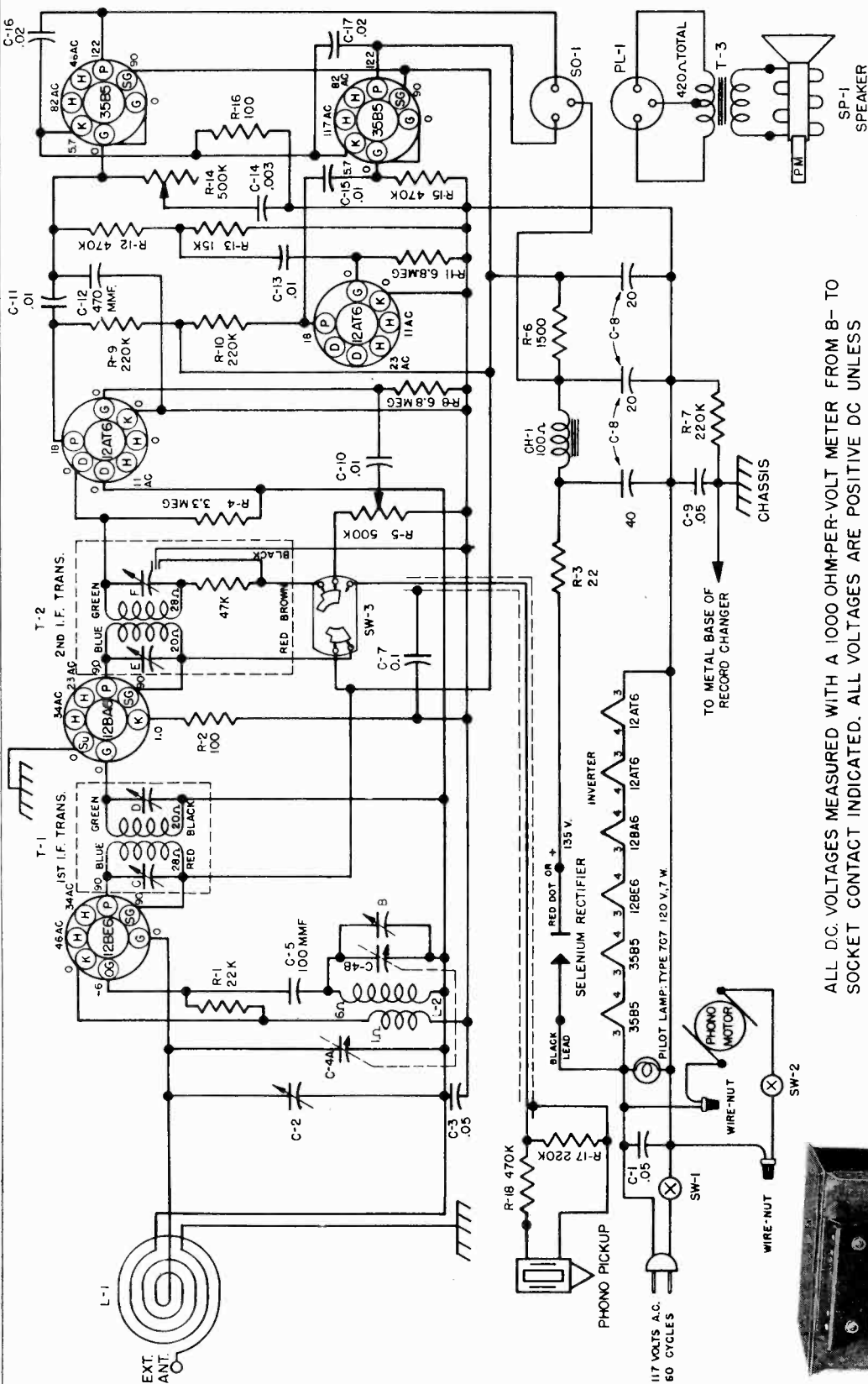
ALIGNMENT

The chassis must be removed from the cabinet in order to align this receiver. Connect the output meter across the voice coil. Connect the signal generator to the Standard Hazeltine Model 1150 loop, and couple loosely to the receiver loop. Set the receiver volume control at maximum. The tuning condenser plates should be fully meshed when the dial pointer is at the index mark at the low frequency end of the dial. The signal generator output should at all times be just sufficient to obtain a minimum deflection on the output meter. Set the signal generator to 456 Kc. Adjust the i-f trimmers for maximum meter deflection in the following sequence: L4, L2, L3, L1. Set the generator and receiver to 1600 Kc and adjust oscillator trimmer C4 for maximum output. Set the generator and receiver to 1400 Kc and adjust loop trimmer C3 for maximum output.



THE B. F. GOODRICH COMPANY





ALL D.C. VOLTAGES MEASURED WITH A 1000 OHM-PER-VOLT METER FROM B- TO SOCKET CONTACT INDICATED. ALL VOLTAGES ARE POSITIVE DC UNLESS OTHERWISE NOTED.

VOLUME CONTROL FULL ON. NO SIGNAL INPUT.

RADIO-PHONO SWITCH SHOWN IN RADIO POSITION, SHAFT END VIEW.

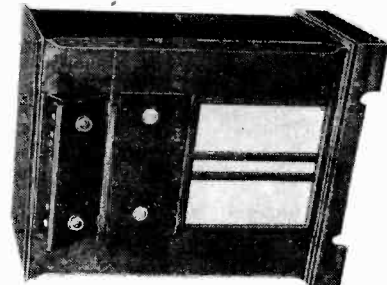
ALL TUBE SOCKETS SHOWN FROM PIN END VIEW.

455 KC IF

RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE NOTED.

"K" EQUALS 1000 OHMS, "MEG" EQUALS 1,000,000 OHMS.

CAPACITY VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.



ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

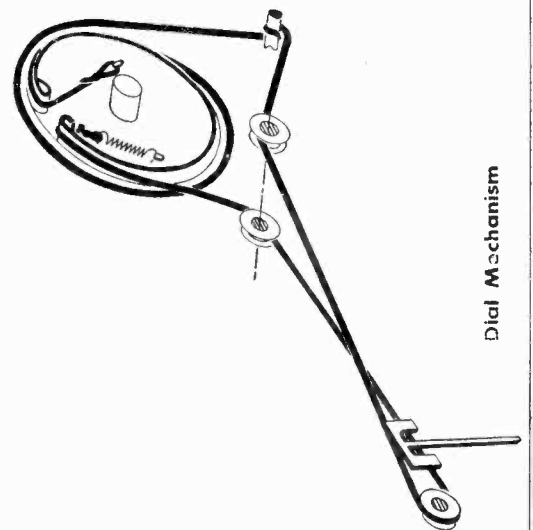
1. A signal generator which will provide an accurately calibrated signal at the frequencies listed.
2. An output meter.
3. A non-metallic screwdriver.
4. Dummy antenna: —.1 mfd. — RMA loop.

NOTE: Intermediate Frequency and Oscillator adjustments may be made with the loop disconnected provided a resistor of 10,000 to 50,000 ohms is substituted to close the 12BE6 grid circuit. The loop alignment must be done with the loop and chassis mounted in operating position in the cabinet. A single turn loosely coupled to loop may be substituted for RMA loop.

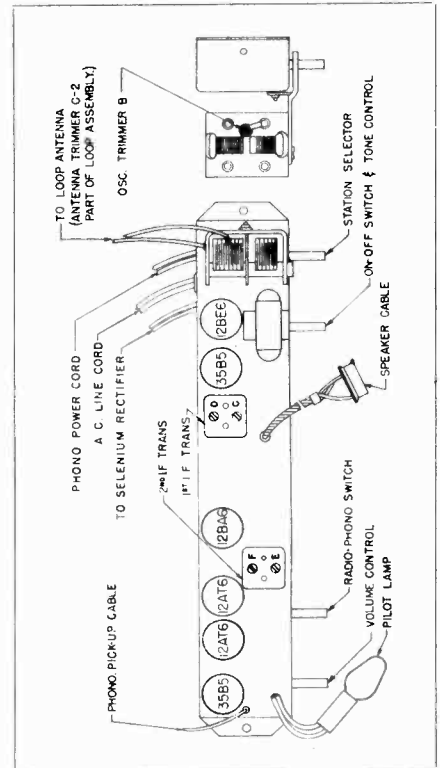
| GENERATOR | CONNECTION AT RADIO | DUMMY ANTENNA | DIAL | TO TUNE TRIMMERS | REMARKS |
|------------|---------------------|---------------|----------|------------------------|-------------------|
| IF 455 kc. | 12BE6 grid | .1 mfd. | HF end | IF trimmers C D E F | Tune to max. |
| 1620 kc. | 12BE6 grid | RMA loop | HF end | Osc. trimmer B | Set limit of band |
| 1400 kc. | Through loop | RMA loop | 1400 kc. | Ant. trimmer C-2 | Tune to max. |

Electrical and Mechanical Specifications

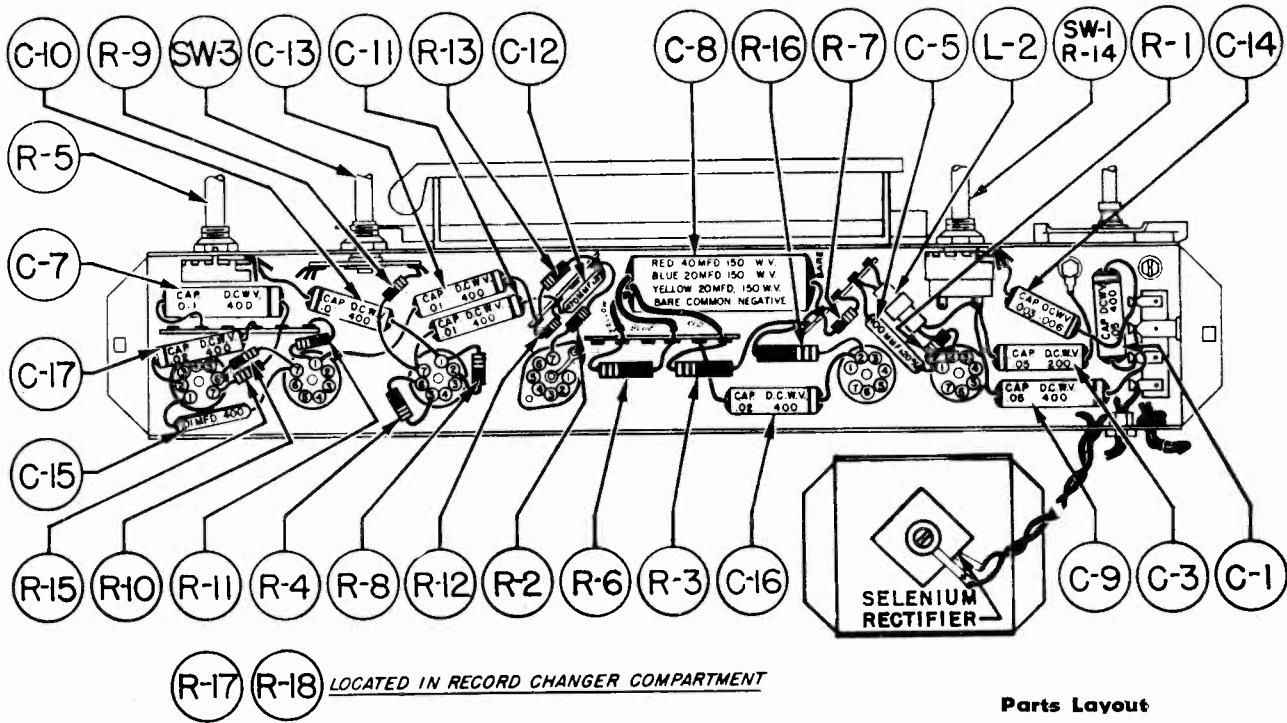
Frequency Range 540-1600 kc. V.C. Impedance 3.2 ohms at 400 cycles
 Intermediate Frequency 455 kc. Power Output (Undistorted) 2 watts
 Power Supply 105 to 125 volts AC, 60 cycle Power Output (Maximum) 3.2 watts
 Loudspeaker 10-inch, PM Tuning Drive Ratio 7 to 1



Dial Mechanism



Tube Layout



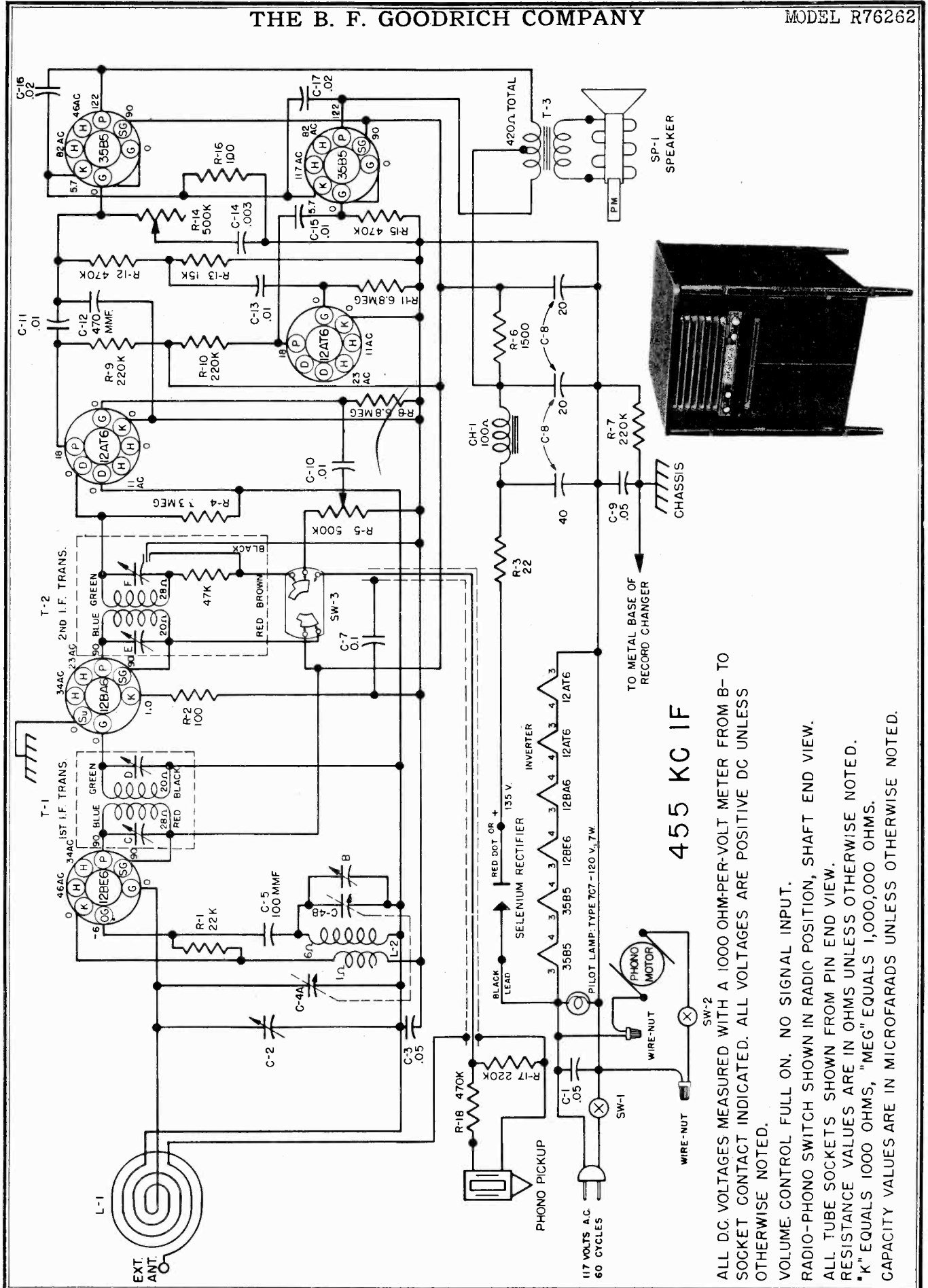
Parts Layout

TUBE COMPLEMENT

- 1—12BE6 Converter tube
- 1—12BA6 IF Amplifier tube
- 1—12AT6 Detector—AVC—First Audio tube
- 1—12AT6 Phase Inverter
- 2—35B5 Power Output tubes

SERVICE PARTS LIST

| Symbol | Part No. | Description | Symbol | Part No. | Description |
|--------------|----------|---|----------------|----------|-------------------------------|
| | E59413-1 | Cabinet | | B51524-5 | Lead Shielded |
| C-4 | C57859-1 | Capacitor, Variable | | A58723 | Needle, Osmium Point |
| | A2163 | Cable, Dial | | B57857-1 | Pointer, Dial |
| C-8 | B55487-1 | Cap., Elect. 40-20-20 mfd., 150v. | | A9027 | Pulley, Idler |
| C-15 | BC31B103 | Cap., Mold. Paper .01 mfd., 400v. | | A58612 | Rectifier, Selenium |
| C-3 | BD210503 | Cap., Paper .05 mfd., 200v. | | A58700 | Retainer, Dial Crystal |
| C-10, 11, 13 | BD41013 | Cap., Paper .01 mfd., 400v. | R-2 | BR16B101 | Resistor, 100 ohm, 1/2 w. |
| C-7 | BD410104 | Cap., Paper 0.1 mfd., 400v. | R-16 | BR16E101 | Resistor, 100 ohm, 1w. |
| C-16, 17 | BD410203 | Cap., Paper .02 mfd., 400v. | R-13 | BR16B153 | Resistor, 15,000 ohm, 1/2 w. |
| C-1, 9 | BD410503 | Cap., Paper .05 mfd., 400v. | R-12, 18 | BR16B474 | Resistor, 470,000 ohm, 1/2 w. |
| C-14 | BD610302 | Cap., Paper .003 mfd., 600v. | R-1 | BR17B223 | Resistor, 22,000 ohm, 1/2 w. |
| C-5 | BM74A101 | Cap., Mica 100 mmf. | R-7, 9, 10, 17 | BR17B224 | Resistor, 220,000 ohm, 1/2 w. |
| C-12 | BM74A471 | Cap., Mica 470 mmf. | R-4 | BR17B335 | Resistor, 3.3 megohm, 1/2 w. |
| | B55823 | Carton, Complete | R-15 | BR17B474 | Resistor, 470,000 ohm, 1/2 w. |
| CH-1 | B58635-1 | Choke, Filter | R-8, 11 | BR17B685 | Resistor, 6.8 megohm, 1/2 w. |
| L-2 | B57842 | Coil Assy., Osc. | R-6 | BR17E152 | Resistor, 1,500 ohm, 1w. |
| L-1 | C59420 | Coil Assy., Loop | R-3 | BR17E220 | Resistor, 22 ohm, 1w. |
| R-5 | B54466-2 | Control, Pot. 500 000 ohm, (V.C.) | | B57848-1 | Shaft, Drive |
| R-14 | B57841-1 | Control, Pot. & Sw. 500,000 ohm, (T.C.) | | B55440-1 | Socket, Dial Light |
| | C-59414 | Crystal & Indicator, Dial | SO-1 | B59417-1 | Socket & Cable Assy. |
| | B57262-8 | Cord, (A.C. Phono) | SP-1 | C59415 | Speaker, 10-inch PM |
| | B58069-3 | Cord, Power | | C58711-1 | Strip, Light Diffusing |
| | C59416-1 | Knob, Magnifying Insert | SW-3 | B51576-2 | Switch, (Radio-Phono) |
| | A55431 | Lamp, Pilot, 7w., 120v. | T-2 | B56718-2 | Transformer Assy., 2nd IF |
| | | | T-1 | B56722-2 | Transformer Assy., 1st IF |



455 KC IF

ALL D.C. VOLTAGES MEASURED WITH A 1000 OHM-PER-VOLT METER FROM B- TO SOCKET CONTACT INDICATED. ALL VOLTAGES ARE POSITIVE DC UNLESS OTHERWISE NOTED.

VOLUME CONTROL FULL ON. NO SIGNAL INPUT.

RADIO-PHONO SWITCH SHOWN IN RADIO POSITION, SHAFT END VIEW.

ALL TUBE SOCKETS SHOWN FROM PIN END VIEW.

RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE NOTED.

*"K" EQUALS 1000 OHMS, "MEG" EQUALS 1,000,000 OHMS.

CAPACITY VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.

ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

1. A signal generator which will provide an accurately calibrated signal at the frequencies listed.
2. An output meter.
3. A non-metallic screwdriver.
4. Dummy antenna: — .1 mfd. — RMA loop.

NOTE: Intermediate Frequency and Oscillator adjustments may be made with the loop disconnected provided a resistor of 10,000 to 50,000 ohms is substituted to close the 12BE6 grid circuit. The loop alignment must be done with the loop and chassis mounted in operating position in the cabinet. A single turn loosely coupled to loop may be substituted for RMA loop.

| GENERATOR | CONNECTION AT RADIO | DUMMY ANTENNA | DIAL | TO TUNE TRIMMERS | REMARKS |
|------------|---------------------|---------------|----------|------------------------|-------------------|
| IF 455 kc. | 12BE6 grid | .1 mfd. | HF end | IF trimmers C D E F | Tune to max. |
| 1620 kc. | 12BE6 grid | RMA loop | HF end | Osc. trimmer B | Set limit of band |
| 1400 kc. | Through loop* | RMA loop | 1400 kc. | Ant. trimmer C-2 | Tune to max. |

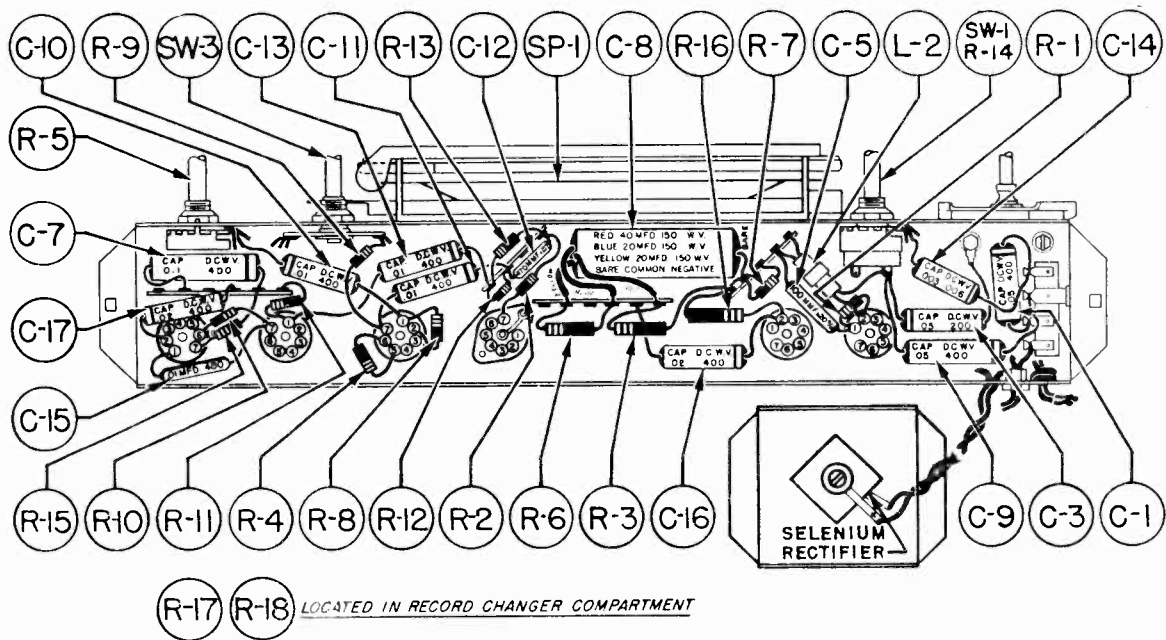
* Loop trimmer accessible through back of cabinet drawer.

Electrical and Mechanical Specifications

| | | | |
|-----------------------------|-------------------------------|---------------------------------|------------------------|
| Frequency Range..... | 540-1600 kc. | V.C. Impedance..... | 3.2 ohms at 400 cycles |
| Intermediate Frequency..... | 455 kc. | Power Output (Undistorted)..... | 2 watts |
| Power Supply..... | 105 to 125 volts AC, 60 cycle | Power Output (Maximum)..... | 3.2 watts |
| Loudspeaker..... | 5x7 elliptical type PM | Tuning Drive Ratio..... | 7 to 1 |

TUBE COMPLEMENT

- | | |
|---------------------------------------|---------------------------|
| 1—12BE6 Converter tube | 1—12AT6 Phase Inverter |
| 1—12BA6 IF Amplifier tube | 2—35B5 Power Output tubes |
| 1—12AT6 Detector—AVC—First Audio tube | 1—35W4 Rectifier tube |

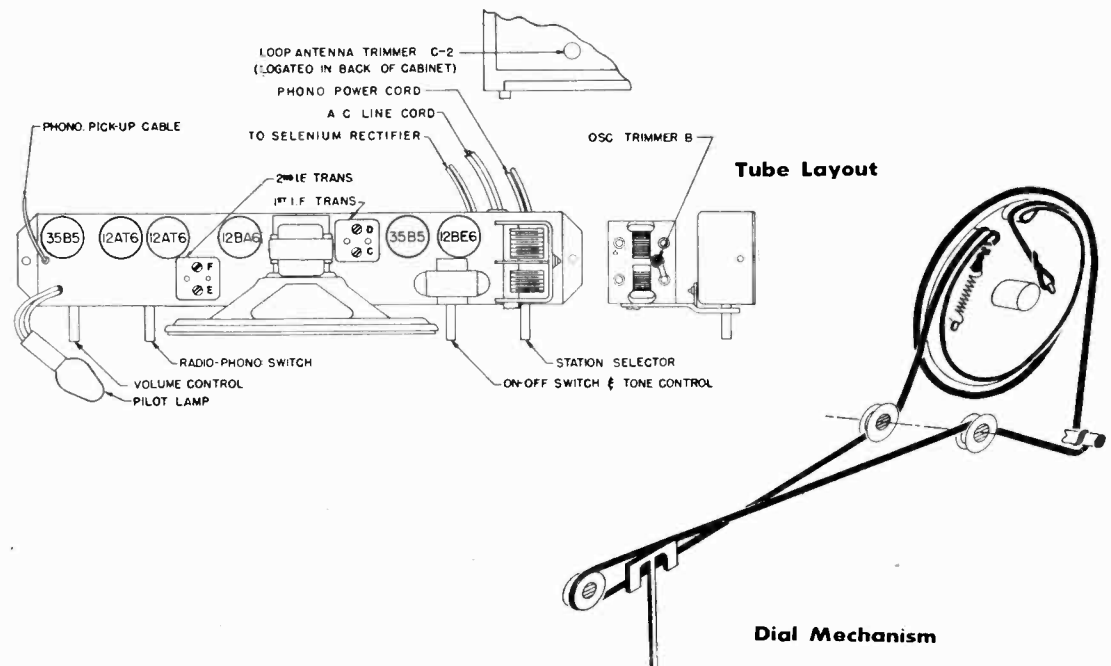


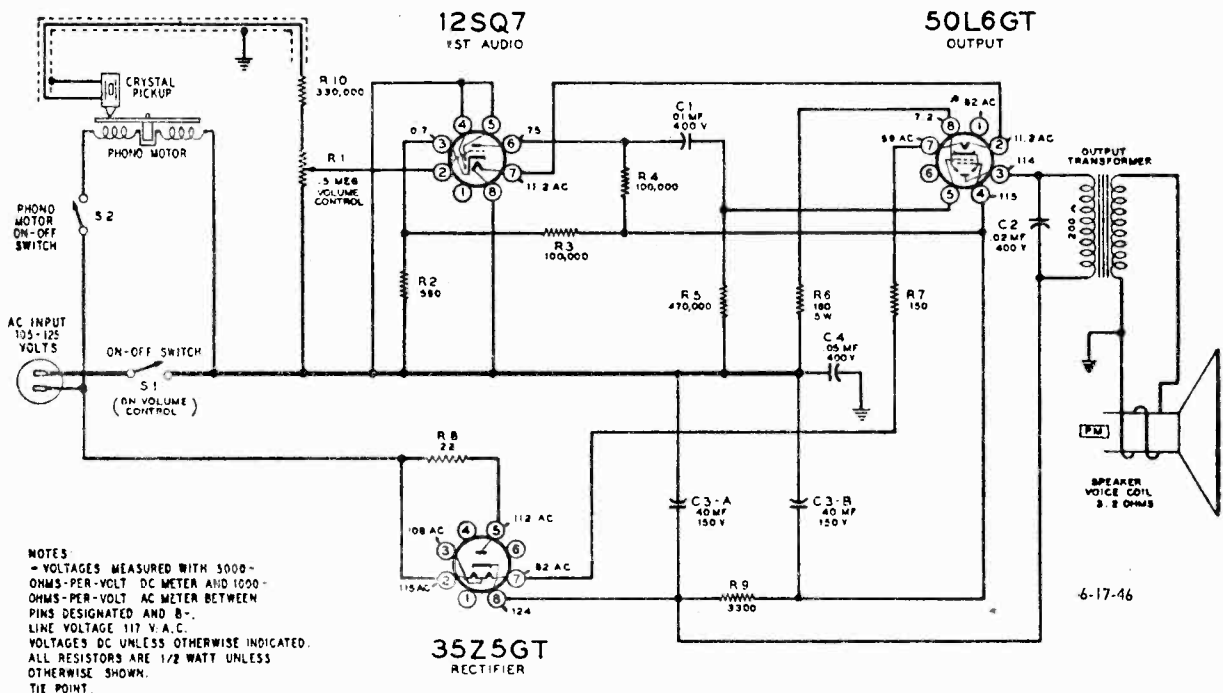
(R-17) (R-18) LOCATED IN RECORD CHANGER COMPARTMENT

Parts Layout

SERVICE PARTS LI.

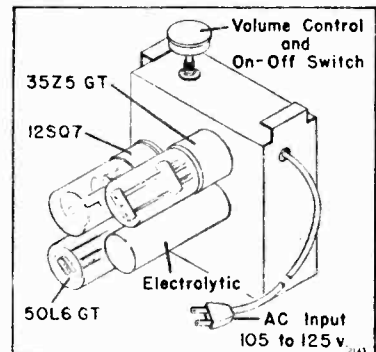
| Symbol | Part No. | Description | Symbol | Part No. | Description |
|-----------------|-----------|--|-------------------|-----------|--|
| | E58626-1 | Cabinet | | A-58612 | Rectifier, Selenium..... |
| C-2 | B-57879-1 | Cap., Assy. Trimmer..... | | B-57857-1 | Pointer, Dial..... |
| C-3 | BD210503 | Cap., Paper, .05 mfd., 200 v. | | A-9027 | Pulley Idler..... |
| C-4 | C-57859-1 | Cap., Var., 2 Sec. Tuning.... | | A-55431 | Lamp, Pilot, 7 w., 120 v..... |
| C-5 | BM74A101 | Cap., Mica, 100 mmf..... | R-1 | BR17B223 | Resistor, 22,000 ohm, 1/3 w... |
| C-7 | BD410104 | Cap., Paper, 0.1 mfd., 400 v. | R-2 | BR16B101 | Resistor, 100 ohm, 1/3 w..... |
| C-8 | B-55487-1 | Cap., Electro., 40-20-20 mfd., 150 v..... | R-3 | BR17E220 | Resistor, 22 ohm, 1 w..... |
| C-1, 9 | BD410503 | Cap., Paper, .05 mfd., 400 v. | R-4 | BR17B335 | Resistor, 3.3 megohm, 1/3 w. |
| C-12 | BM74A471 | Cap., Mica, 470 mmf..... | R-6 | BR17E152 | Resistor, 1500 ohm, 1 w..... |
| C-10, 11, 13 | BD410103 | Cap., Paper, .01 mfd., 400 v. | R-8, 11 | BR17B685 | Resistor, 6.8 megohm, 1/3 w. |
| C-14 | BD610302 | Cap., Paper, .003 mfd., 600 v. | R-12 | BR16B474 | Resistor, 470,000 ohm, 1/3 w. |
| C-15 | BC31B103 | Cap., Molded Paper, .01 mfd., 400 v..... | R-13 | BR16B153 | Resistor, 15,000 ohm, 1/3 w... |
| C-16, 17 | BD410203 | Cap., Paper, .02 mfd., 400 v. | R-14 | B-57841-1 | Control, Pot. and Sw. 500,000 ohm (T.C.)..... |
| CH-1 | B-58635-1 | Choke, Filter..... | R-16 | BR16E101 | Resistor, 100 ohm, 1 w..... |
| L-1 | D-57870 | Coil Assy., Loop..... | R-7, 9, 10, 17 | BR17B224 | Resistor, 220,000 ohm, 1/3 w. |
| L-2 | B-57842 | Coil Assy., Oscillator..... | R-15, 18 | BR17B474 | Resistor, 470,000 ohm, 1/3 w. |
| | B-57262-6 | Cord, A.C. Phono..... | SP-1 | C-58621 | Speaker, 5x7-inch, P.M..... |
| | B-58069 | Cord, Power, 8 ft..... | | B-57848-1 | Shaft, Drive..... |
| R-5 | B-54466-2 | Control, Pot., 500,000 ohm (V.C.) | | A-50147 | Spring, Conical..... |
| | C-59414 | Crystal and Indicator Dial.. | | C-58711-1 | Strip, Light Diffusing..... |
| | C-59416-1 | Knob, Magnifying Insert..... | SW-3 | B-51576-2 | Switch (Radio-Phono.)..... |
| | | | T-1 | B-56722-2 | Transformer Assy., 1st I.F... |
| | | | T-2 | B-56718-2 | Transformer Assy., 2nd I.F. |





NOTES
 - VOLTAGES MEASURED WITH 3000-
 OHMS-PER-VOLT DC METER AND 1000-
 OHMS-PER-VOLT AC METER BETWEEN
 PINS DESIGNATED AND B-
 LINE VOLTAGE 117 V. A.C.
 VOLTAGES DC UNLESS OTHERWISE INDICATED.
 ALL RESISTORS ARE 1/2 WATT UNLESS
 OTHERWISE SHOWN.
 TIE POINT.

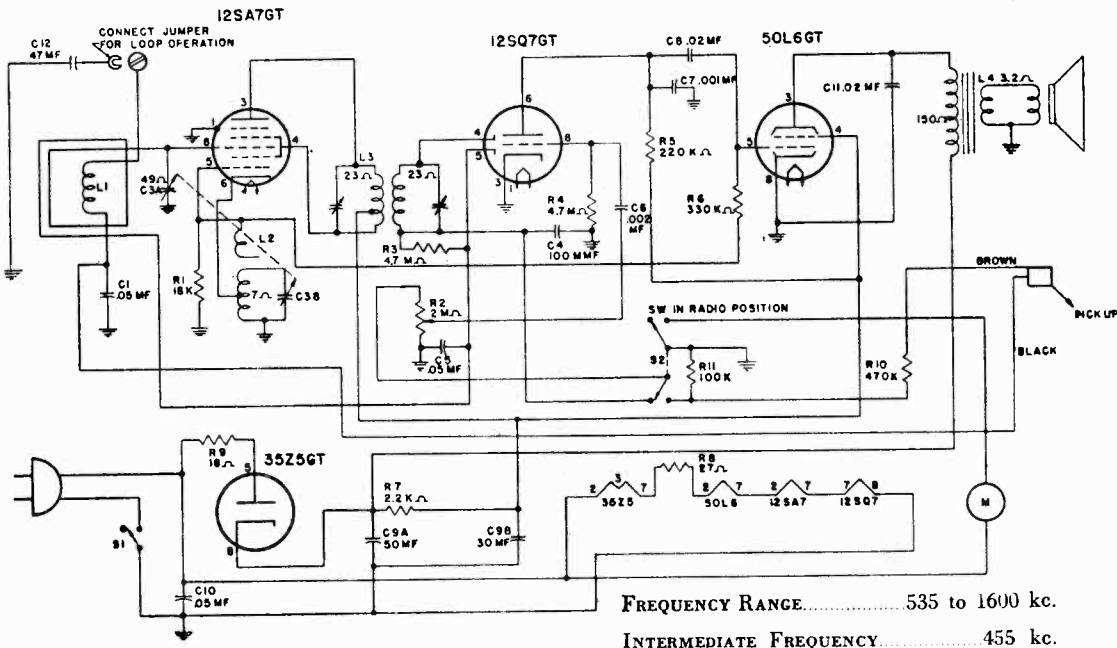
- Power Supply**..... 105 to 125 volts AC, 60 cycles, 50 watts.
- Power Output**..... 0.75 watt undistorted (0.6 volt input).
1.8 watts maximum.
- Speaker**..... 5-inch (or 4-inch x 6-inch oval), P. M.,
voice coil impedance 3.2 ohms.



Amplifier Chassis

| Ref. No. | Part No. | Description |
|-------------------|----------------------------------|---|
| CAPACITORS | | |
| C1 | C-8D-10761 | .01 mf, 400 volts, 20% |
| C2 | C-8D-10774 | .02 mf, 400 volts, 20% |
| C3-A, B | A-8C-11415-1 or A-8C-11119 | Electrolytic; 40 mf x 150 volts, 40 mf x 150 volts |
| C4 | C-8D-10813 | .05 mf, 400 volts, 20% |
| RESISTORS* | | |
| R1, S1 | A-10A-11377 | Volume control (500,000 ohms) and on-off switch |
| R2 | C-9B1-59 | 560 ohms, 1/2 watt, 10% |
| R3 | C-9B1-86 | 100,000 ohms, 1/2 watt, 10% |
| R4 | C-9B1-25 | 100,000 ohms, 1/2 watt, 20% |
| R5 | C-9B1-29 | 470,000 ohms, 1/2 watt, 20% |
| R6 | A-9C-11355 | 160 ohms, 5 watts, 10%, wirewound |
| R7 | C-9B1-8 | 150 ohms, 1/2 watt, 20% |
| R8 | C-9B1-3 | 22 ohms, 1/2 watt, 20% |
| R9 | C-9B1-16 | 3300 ohms, 1/2 watt, 20% |
| R10 | C-9B1-28 | 330,000 ohms, 1/2 watt, 20% |

- MISCELLANEOUS**
- B-12C-10074-3 Output transformer
 - B-14M-10088 Line cord and plug
 - A-15B-10440 Tube socket
 - A-49A-11356 Tube retainer (for 12AT6)
 - A-49A-11357 Tube retainer (for 35W4, 50B5)
 - B-18A-10952-1 Speaker, 5-inch, P. M.
or
 - B-18A-11381 Speaker, 4-inch x 6-inch oval, P. M.
 - D-21H-10816 Phono motor and turntable
 - 48C-11884 Pick-up arm, less mounting base and
crystal cartridge
 - 23B-11886 Mounting base for pick-up arm
 - 8K-11885 Crystal cartridge
 - S2 A-20C-10317 Phono motor on-off switch
 - 202-11360 Cabinet
 - B-2K-11364 Grille
 - A-5B-11370-17 Knob
 - A-25B-11390 Rubber feet



Alignment Procedure

- Output meter across 3.2-ohm output load.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
- Volume control at maximum for all adjustments.
- Chassis must be removed from cabinet for proper alignment.

| Frequency | Dummy Antenna | Connection to Radio | Condenser Setting | Adjust Trimmers to Maximum Output (in order shown) |
|-----------|---------------|---------------------------------|--|--|
| 455 kc | .1 mf | Variable Condenser R.F. Section | Any | Trimmers on I.F. can |
| 1590 kc | * * | * * | Condenser at Minimum Capacity-Plates Out of Mesh | Oscillator trimmer |
| 1590 kc | * * | * * | Condenser at Minimum Capacity-Plates Out of Mesh | Antenna trimmer |

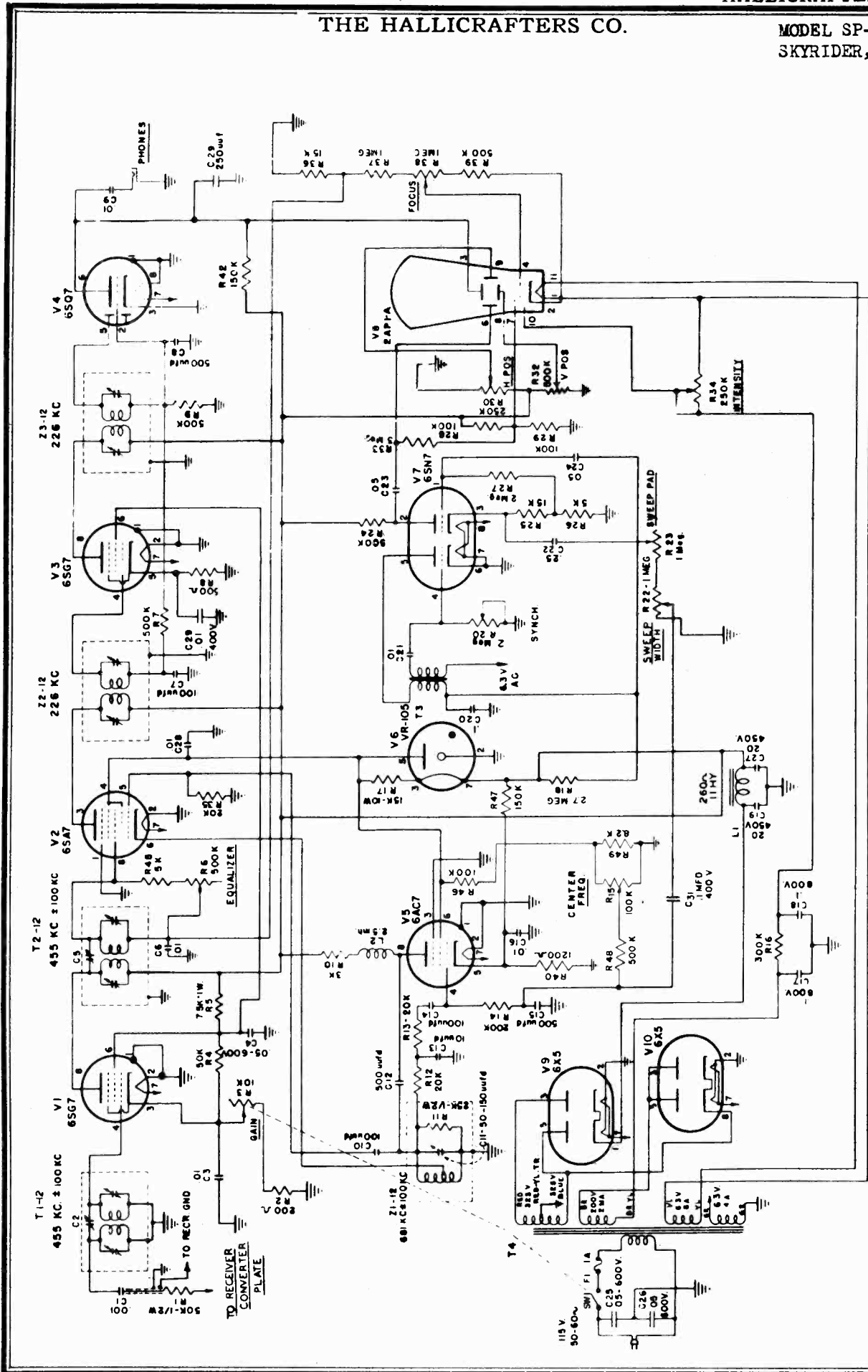
* * Run a wire from the output terminal of the generator near the receiver. However, no connection is made between the signal generator and the receiver.

PARTS LIST

| Schematic Location | Part No. | Description | Schematic Location | Part No. | Description |
|--------------------|----------|---|--------------------|----------|-------------------------------|
| | T-470 | Cabinet, Wood | L2 | 28184 | Coil Oscillator |
| L1 | 28186 | Back Cover with Loop | | 39160 | Knob, Tuning |
| C1, C10 | | Condenser, Paper, .05 Mfd. 400 V. | | 39161 | Knob Volume, or Phone-Radio |
| C6 | | Condenser, Paper, .002 Mfd. 400 V. | R1 | | Resistor, 18K ohms, 1/4 W. |
| C8, C11 | | Condenser, Paper, .02 Mfd. 400 V. | R3, R4 | | Resistor, 4.7 Megohms, 1/4 W. |
| C5 | | Condenser, Paper, .05 Mfd. 200 V. | R5, R10 | | Resistor, 220K ohms, 1/4 W. |
| C7 | | Condenser, Paper, .001 Mfd. 500 V. | R7 | | Resistor, 2200 ohms, 2 W. |
| C4 | | Ceramic, 100 Mmfd. | R9 | | Resistor, 18 ohms, 1/2 W. |
| C12 | | Ceramic, 47 Mmfd. | R6 | | Resistor, 330K ohms, 1/4 W. |
| C3 | 1675 | Condenser, Variable Air - 2 Gang | R11 | | Resistor, 100K ohms, 1/4 W. |
| C9 | 2073 | Condenser, Electrolytic 50-30 Mfd. 150 V. | R8 | | Resistor, 27 ohms, 1/2 W. |
| R2 | 2480 | Control, Volume with Switch, 2 Megohms Cord, Line 6' long | L4 | 5877 | Speaker & Output Transformer |
| | | | | 3376 | Transformer, I.F. |

THE HALLICRAFTERS CO.

MODEL SP-44
SKYRIDER, PANORAMIC

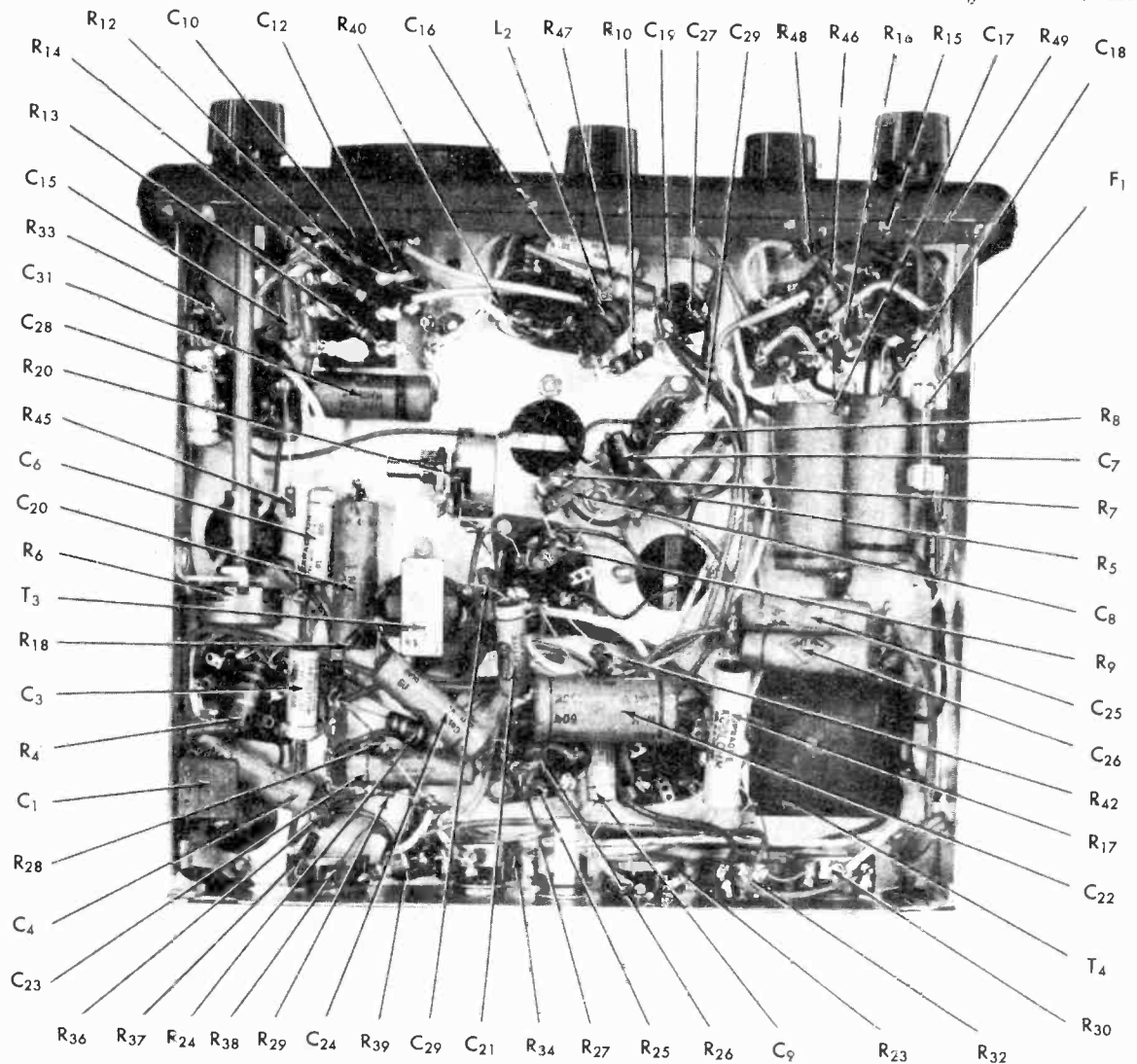


- NOTES
- 1 ALL CONDENSER VALUES ARE IN μ F, EXCEPT AS NOTED
 - 2 RESISTOR VALUES DESIGNATED "K" ARE IN THOUSANDS (OHMS)
 - 3 C19 AND C27 CAN BE 2×15 MFD. -450V

April 1947

THE HALLICRAFTERS CO.

MODEL SP-44
Skyrider Panoramic



Bottom view of chassis showing components location

REAR PANEL CONNECTIONS: Consists of a line cord with plug, phone jack for monitoring purposes, and R-F coupling cable to companion receiver.

POWER SUPPLY DATA: 105-125 volts AC, 50-60 cycles, power drain is approximately 55 watts.

TUBE TYPES AND FUNCTIONS: 6SG7 R-F amplifier, 6SA7 converter, 6SG7 I-F amplifier, 6SQ7 detector-video amplifier, 6AC7 reactor, VR-105 voltage regulator, 6SN7 saw tooth generator and amplifier, 2AP1 cathode ray tube, 6X5 low voltage rectifier, 6X5 high voltage rectifier.



Compensates for varying preselector characteristics of receiver.

Controls bandwidth coverage from 200 kc down to zero.

Controls height of cathode ray tube deflections and audio output level.

Maintains "pip" of signal heard through receiver over center zero mark also tunes adapter through 200kc.

Skyrider Panoramic Model SP-44, view showing operating controls.

THE HALLICRAFTERS CO.

MODEL SP-44
Skyrider Panoramic

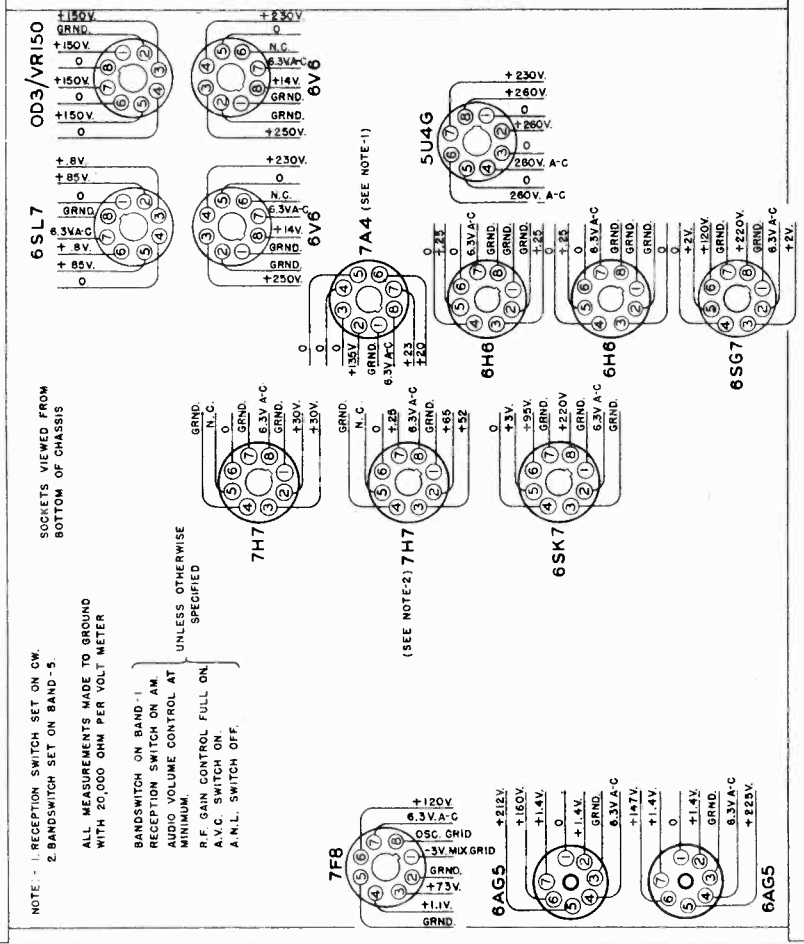
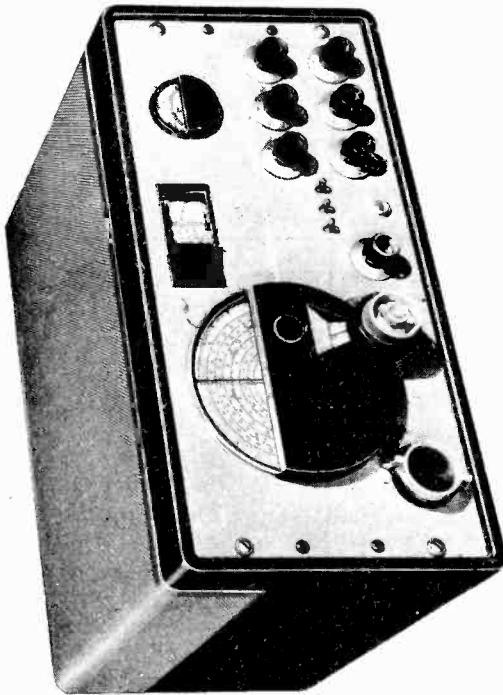
| Alignment of | Signal Generator Output | Position of Controls | Procedure |
|-------------------------|--|--|--|
| I.F. Amplifier | 226KC unmodulated to pin #8 of V2. | SWEEPWIDTH at zero position. CENTER FREQ. turned extreme counter-clockwise. | Entire baseline deflects upward. Adjust the trimmers in the I.F. transformers (Z2-12, Z3-12) for maximum deflection. |
| F.M. Oscillator | 455KC (or I.F. of the receiver) unmodulated to pin #8 of V2. | SWEEPWIDTH at maximum. SWEEP PAD set half way. CENTER FREQ. at center or zero position. | A "pip" will appear on the screen. Adjust the trimmer in the oscillator transformer Z1-12, to bring "pip" to the center of the screen. Turn the SWEEPWIDTH control to almost zero for more accurate indications of proper trimmer adjustment. Return the SWEEPWIDTH control to maximum and adjust the HORIZONTAL POSITION control so that the "pip" is directly over the zero mark on the screen. |
| Linearity of Sweep | 355KC - 555KC (or I.F. of the receiver ± 100 KC) unmodulated to pin #8 of V2. | SWEEPWIDTH at maximum. CENTER FREQ. at center or zero position. | Set the signal generator for 555KC (or receiver I.F. +100KC) and bring the "pip" to the -100KC mark by means of the SWEEP PAD. Shift the signal generator frequency to 355KC (or receiver I.F. -100KC). The "pip" should be at the +100KC mark. If the linearity is incorrect, the deflections appear more than 10KC or $\frac{1}{2}$ division from each end with 455KC or I.F. deflection in the center of the screen. Some correction is possible by trial and error adjustment of the oscillator trimmer (Z1-12) and the CENTER FREQ. control. If after the adjustment is made the CENTER FREQ. control knob is off center for a 455KC (or receiver I.F.) deflection at the zero mark on the screen, unscrew and reset the knob to the center position. |
| R.F. Bandpass Amplifier | 365KC - 545KC (or I.F. of receiver ± 90 KC) unmodulated to a 50K resistor in series with the full length of input cable to the PANADAPTOR. | Set GAIN to maximum. Turn EQUALIZER fully clockwise. Set CENTER FREQ. control to zero. | Set the signal generator at 545KC (or receiver I.F. +90). Back off the side side trimmers on both R.F. transformers (T1-12, T2-12) and align the top trimmers for maximum deflection. Shift signal generator to 365KC (or receiver I.F. -90) and tune the two side trimmers for maximum deflection. Repeat both adjustments. The ratio of the peak to center heights (peak to valley) should be greater than 20:1. |

MODEL SX-42

THE HALLICRAFTERS CO.

| FREQUENCY COVERAGE: | TYPE OF RECEPTION |
|-------------------------------|-------------------|
| BAND 1 540 to 1620 kilocycles | AM/CW |
| 2 1.62 to 5 megacycles | AM/CW |
| 3 5 to 15 megacycles | AM/CW |
| 4 15 to 30 megacycles | AM/CW |
| 5 27 to 55 megacycles | AM/FM/CW |
| 6 55 to 110 megacycles | AM/FM/CW |

Adequate overlap is provided at ends of all bands.



HOW TO RESTRING DIAL CORD

To restring the main tuning dial cord, cut a 25" length of 18 lb. test dial cord and tie one end to the tension spring of the main tuning capacitor drive pulley at position "1", Fig. #2. Follow the numbers "1" through "14", wind the cord on the pulley and knob drive shaft. At position "14", stretch the tension spring and tie cord securely. Cut off excess cord. To restring the bandspread tuning dial cord, follow the same procedure as explained above except start at position "A" and proceed through position "N" on tension spring.

VOLTAGE CHART

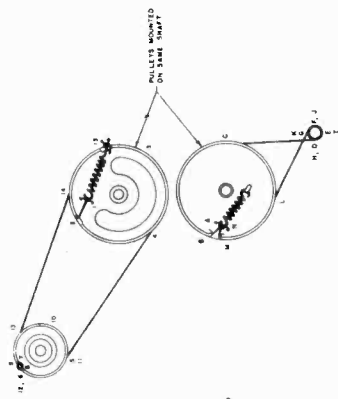
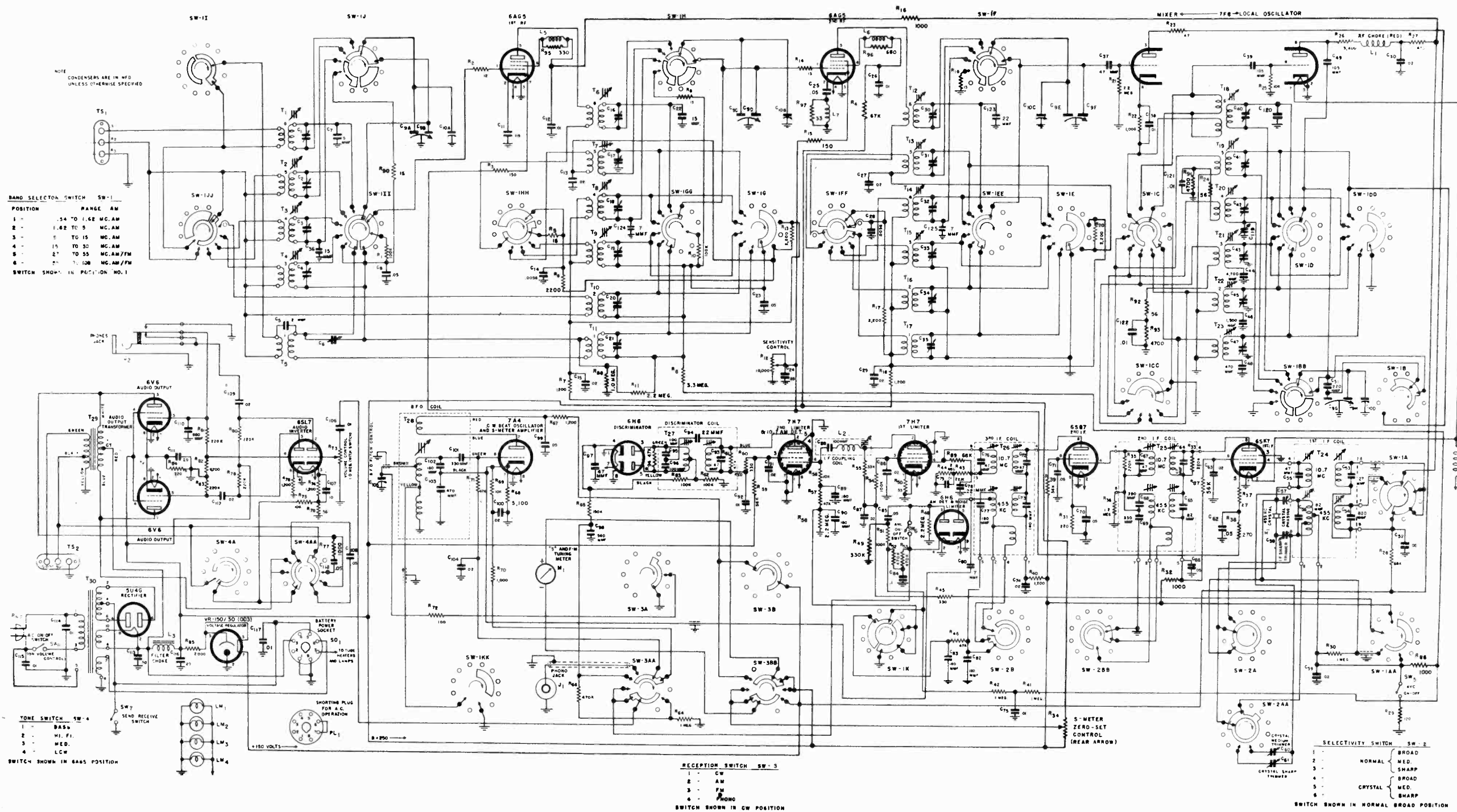


FIG. 2. DIAL CABLE STRINGING PROCEDURE

THE HALLICRAFTERS CO.

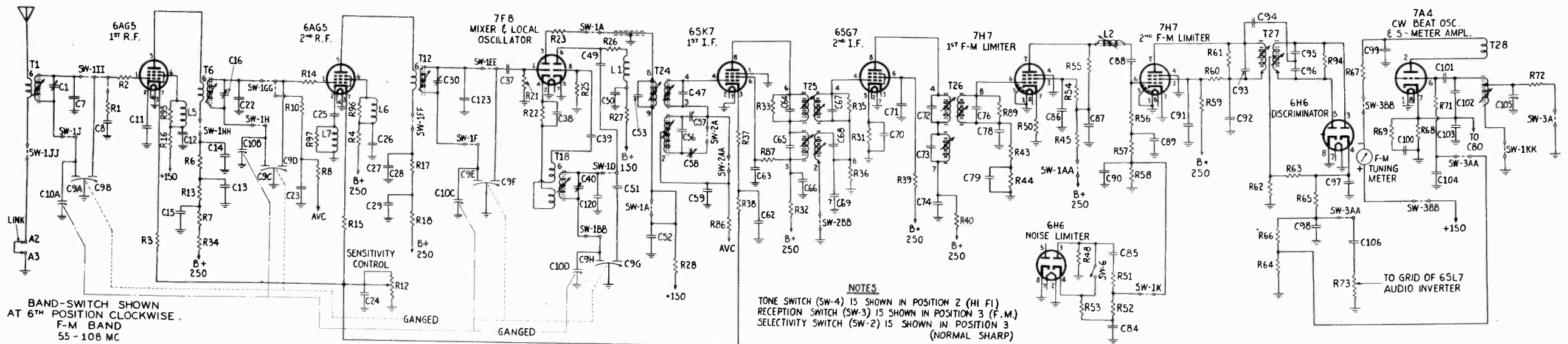
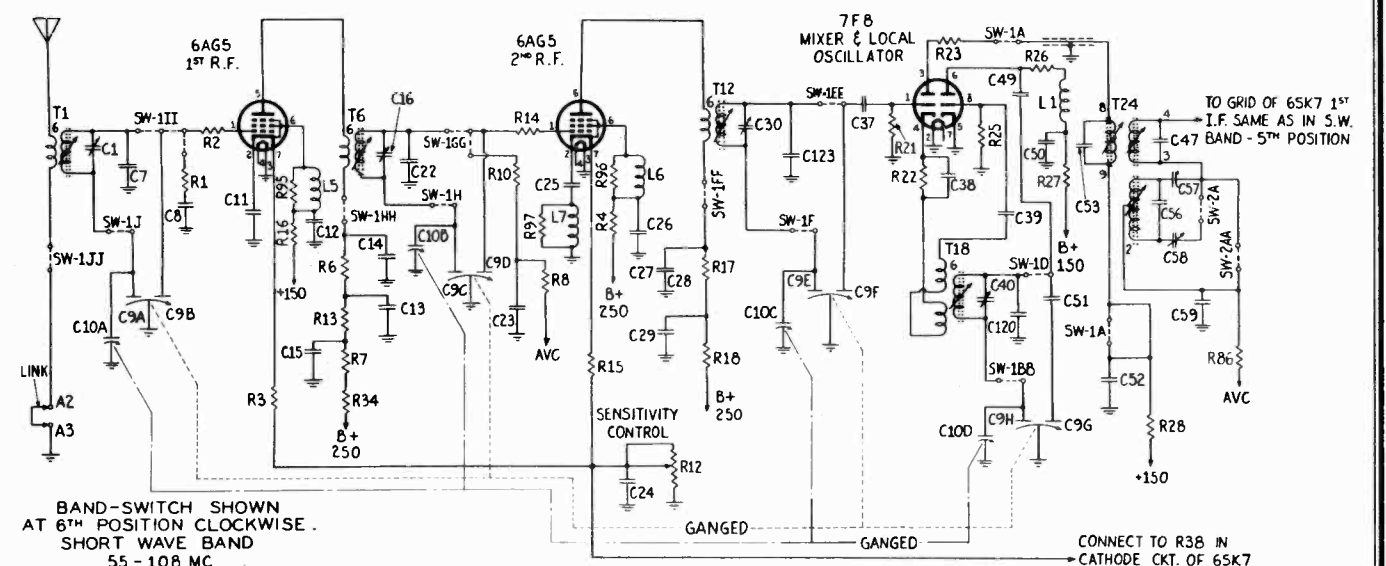
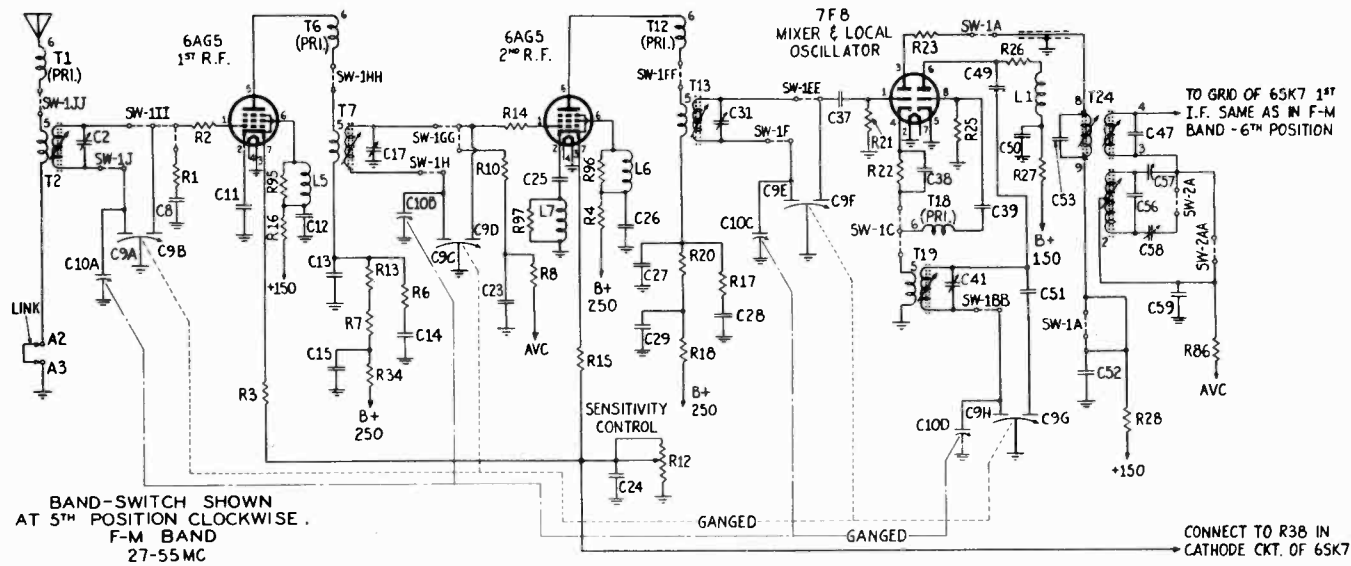
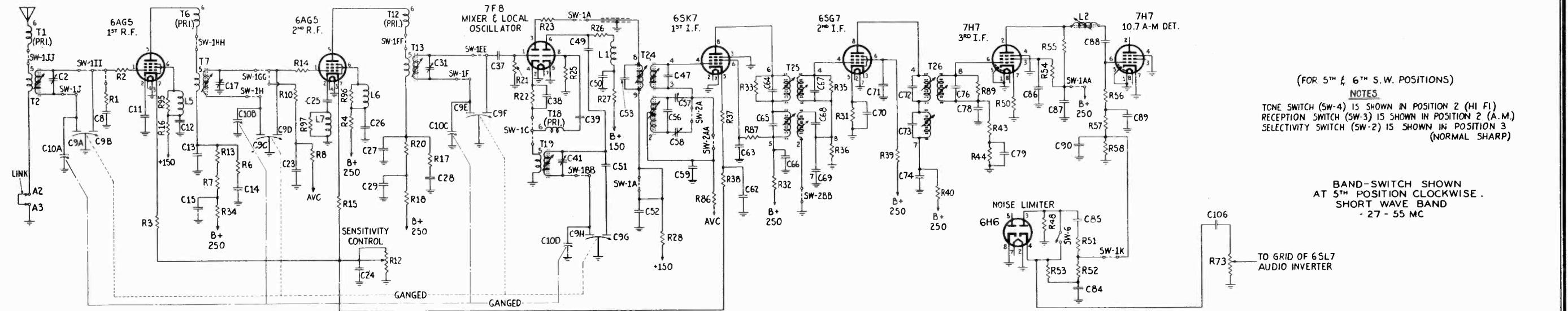
MODEL SX-42

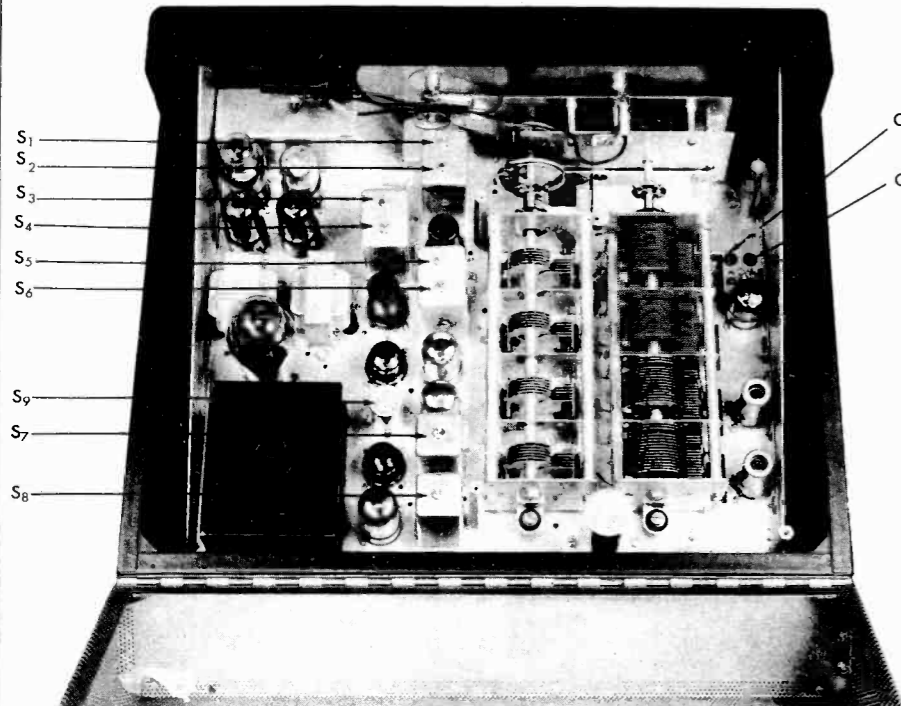


DC operation - filament 6.3 volts at 5 amperes; "B" supply 270 volts at 150 ma. (The 6 volt battery drain for vibrator type supply for "B" voltage will run about 16 amperes.)

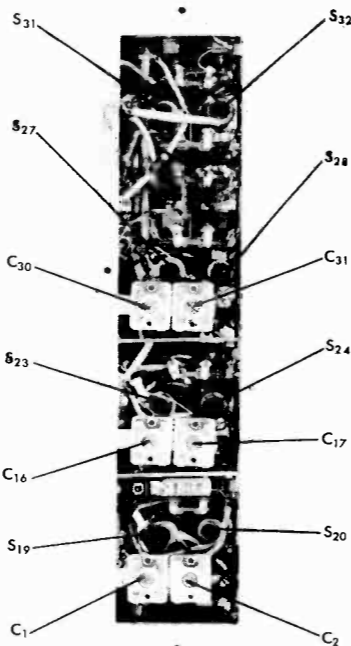
POWER SUPPLY DATA: AC operation - 105 to 125 volts, 50/60 cycles single phase source. (Also 110/130/150/220/250 volt, 25 to 60 cycles single phase source with special power transformer available, Halli-crafters part no. 52C131.) Power consumption is 110 watts at 117 volts a-c.

REAR PANEL CONNECTIONS: Consists of AC line cord with plug, antenna and ground connector strip, speaker connector strip, phono input jack, and d-c power input socket.

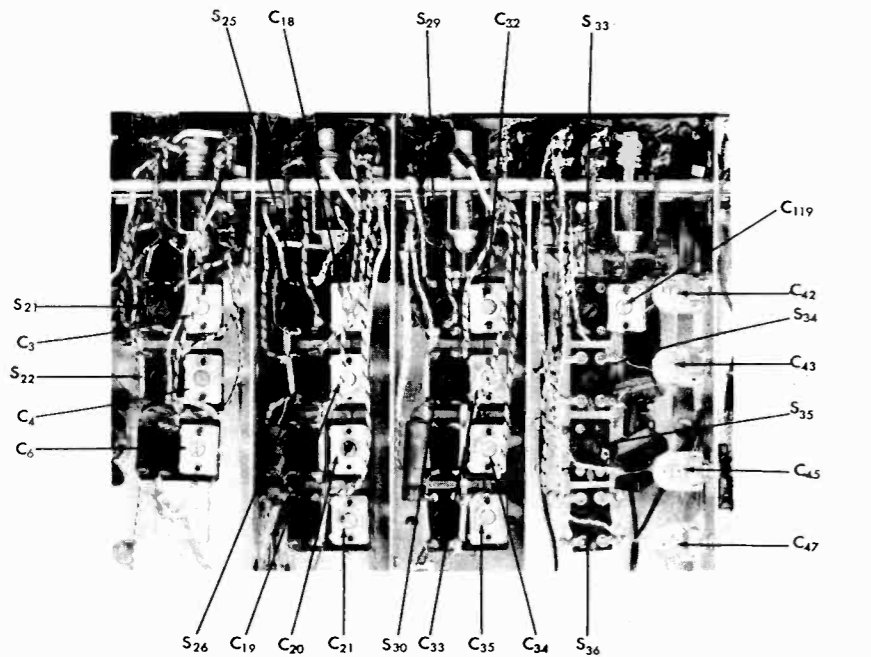




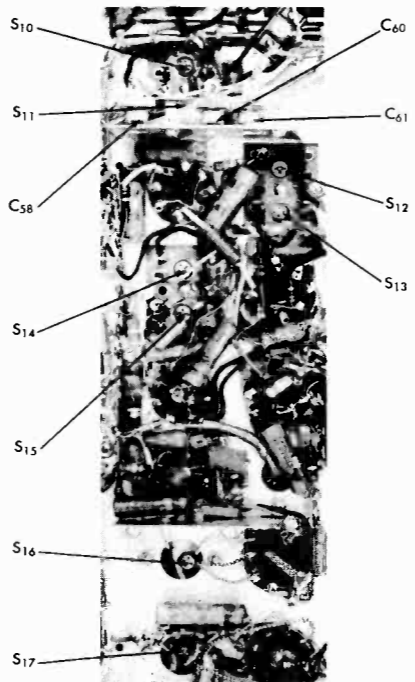
TOP VIEW



SIDE VIEW



BOTTOM VIEW



BOTTOM VIEW

TOP, BOTTOM AND SIDE VIEWS SHOWING ADJUSTMENT POINTS

ALIGNMENT INSTRUCTIONS

- EQUIPMENT:**
- Signal generator capable of the ranges indicated in the alignment chart, including a 400 cycle audio modulator.
 - Output meter capable of handling 1.5 watts of audio power.
 - Standard RFA dummy antenna—Consisting of a 200 MF cond in series with a 80 oh R.F. choke substituted by a 400 MF condenser in series with 300 OHM resistor.
 - Non-metallic screw driver.
 - One 300 ohm carbon resistor (Dummy ant for bands #5 and 6.)
- CONNECTIONS:** Connect the generator "cold" lead to the receiver chassis; the "hot" lead is connected as indicated in the chart. Connect the output meter across the 500 ohm speaker terminals.
- CONTROL SETTINGS:** Turn VOLUME control clockwise and allow about 15 minutes for tubes to heat up, then set the receiver controls as follows:
- VOLUME maximum BANDS/HEAD zero
 SENSITIVITY maximum RECEPTION AVC
 NOISE LIMITER off CRYSTAL PHASING 0
 TUNE FITCH 0
 *SELECTIVITY crystal RECEIVE-STANDBY receive sharp
- * For f-m alignment set RECEPTION control at FM and SELECTIVITY switch at normal broadcast.

RADIO RECEIVER MODEL SX-42 I-F ALIGNMENT INSTRUCTIONS

- 455 K.C. I-F ALIGNMENT:**
- Set Controls as follows:
 - Bandswitch on #1 Band.
 - M.T. Dial set to approximately 1 m.c.
 - R. F. gain full on.
 - AVL off, AVC off, Standby on.
 - PH-AM switch on AM.
 - Tone control on Hi-Fi.
 - Turn on BFO and adjust pitch control knob until a signal is heard and then adjust slug S₁ until the beat note is heard. Continue turning S₁ until the beat note is zero beat with the generator signal.
 - Increase generator output until a signal is heard and then align slugs S₁, S₃, S₅, S₁₀, S₁₂ and S₁₄ for maximum output.
 - Turn on BFO and adjust pitch control knob to zero and then adjust slug S₈ until the beat note is heard. Continue turning S₈ until the beat note is zero beat with the generator signal.
 - Next adjust pitch control knob until the BFO note is about 1000 cycles off zero beat.
 - Turn selectivity knob to broadcast crystal and while slowly adjusting S₁₀, "rock" the signal generator until the output, as observed on the output meter, decreases and then slowly increases. Turn signal generator to the other side of zero beat and adjust crystal phasing knob for the null point.
 - Crystal phasing is left now in this position for this and following adjustments. At the point of minimum output, the slug S₁₀ is correctly set. This occurs between two maximum outputs, one with slug turned further in, and one with slug turned further out.
 - Next turn to sharp crystal and with C₆₁ at near minimum capacity, slowly turn trimmer in generator and adjust for maximum output meter reading. It may be necessary to reduce the slug S₁₀ to prevent needle on output meter from striking right hand stop. This is done by turning the generator sensitivity control down as well as reducing generator output to prevent overload. Volume control is left full on. After maximum output has been reached from the sharp crystal adjustment, turn trimmer further inward until a drop of about 2 DB occurs. At this point the sharp crystal will give very good selectivity without sacrificing too much gain.
 - Next, tune I-F generator to exact crystal frequency and by using the R.F. sensitivity control, adjust for an output meter reading of about 3/4 of full scale reading. Now turn to broadcast crystal and note the drop and its reading on the output meter. Then switch to medium crystal and with C₆₀ at near minimum capacity, slowly adjust trimmer for increase in capacity, while rocking generator. When the output meter reaches the point that is

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|----------|---|----------------------------|
| TS-1 | TERMINAL STRIPS | 89A567 |
| TS-2 | Antenna-ground connections Same as TS-1; speaker connections | |
| M-1 | METER | |
| | Carrier level; tuning meter | BBE100 |
| X-1 | CRYSTALS | |
| | 455 Kc crystal assembly | 19A123 |
| J-1 | JACKS | |
| J-2 | PHONE JACK PHONES JACK | 36A020 36B030 |
| | CHOKES AND COILS | |
| L-1 | R-f choke; oscillator | 53B008 |
| L-2 | I-f coupling coil | 53B104 |
| L-3 | Filter choke | 53B067 |
| L-4 | R-f choke; filament | 53B009 |
| L-5 | Screen choke | 53A117 |
| L-6 | Screen choke | 53A116 |
| L-7 | Cathode Choke | 53A118 |
| | LINK CORD | |
| | A-c line cord with two prong plug | 67A078 |
| | SOCKETS | |
| | Tube sockets; octal type; plain | 6A035 |
| | Tube sockets; midget ceramic | 6A108 |
| | Tube sockets; Lokal type; bakelite | 6A213 |
| | Tube sockets; Lokal type; mica | 6A223 |
| | Pilot light socket; main tuning | 6A258 |
| | Pilot light socket; logging | 6A250 |
| | Pilot light socket; bandspread | 6A260 |
| | Pilot light socket; tuning meter | 6A262 |
| | KNOBS | |
| | VOLUME control knob assembly | 15A060 |
| | PITCH CONTROL and CRYSTAL PHASING knob assembly | 15A061 |
| | RECEPTION control knob assembly | 15A045 |
| | SELECTIVITY control knob assembly | 15A063 |
| | GEN control knob assembly | 15A062 |
| | AVC control knob assembly | 15A064 |
| | MAIN TUNING control knob assembly | 15A067 |
| | MAIN TUNING and dial assembly C-100 Div. | 41A043 |
| | BANDSPREAD knob | 15A264 |
| | MISCELLANEOUS COMPONENTS | |
| | Tube shield (Miniature tube) | 6A065 |
| | Adjustable tuning core | 77A068 |
| | Gear drive assembly | 71C177 |
| | Main tuning dial | 83C265 |
| | Bandspread dial | 83B267 |
| | Bandspread dial escutcheon less window | 78B19 |
| | Bandspread escutcheon window | 22A160 |
| | Main tuning dial escutcheon less pointer | 70080 |
| | Main tuning pointer | 82A110 |
| | Main tuning escutcheon fastener clip | 76A364 |
| | Bandspread escutcheon fastener clip | 76A300 |

THE HALLICRAFTERS CO.

| DUMMY ANT. IN SERIES WITH SIG. GENERATOR | CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER | SIGNAL GEN. FREQUENCY SETTING | BAND SWITCH SETTING | RECEIVER ADJUST. SLUG, PADDER, OR TRIMMER NO. | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT - MAKE ADJUSTMENT FOR: | BAND SPREAD SETTING |
|--|---|-------------------------------|---------------------|---|---------------------|---|---------------------|
| RMA | A-1 ON ANT. STRIP AND GROUND | 28 MC | 15-30 | C42 | osc. | Calibration | 28 MC |
| RMA | " | 18 MC | 15-30 | S38 | osc. | Calibration | Zero |

BAND #4 ADJUSTMENT

NOTE: If the above two adjustments have been made correctly, it will be found that 28 MC on the band-spread dial will be exactly on calibration when the main tuning dial is set on the 10 meter band-spread dot. Now turn the bandspread dial to 29 MC and note if 29 MC falls high or low in calibration. If 29 MC is high in calibration trimmer C19 must be set at a higher capacity, after which the above two calibration adjustments must be repeated. If 29 MC is low in calibration trimmer C19 must be decreased in capacity, after which the above two calibration adjustments must be repeated.

| | | | | | | | |
|-----|------------------------------|-------|-------|-----|-------|-------------|------|
| RMA | A-1 ON ANT. STRIP AND GROUND | 28 MC | 15-30 | C3 | ant. | Max. Output | Zero |
| RMA | " | 28 MC | 15-30 | C18 | r-f | Max. Output | Zero |
| RMA | " | 18 MC | 15-30 | C32 | mixer | Max. Output | Zero |
| RMA | " | 18 MC | 15-30 | S21 | ant. | Max. Output | Zero |
| RMA | " | 18 MC | 15-30 | S26 | r-f | Max. Output | Zero |
| RMA | " | 18 MC | 15-30 | S29 | mixer | Max. Output | Zero |

BAND #5 ADJUSTMENT

| | | | | | | | | |
|----------|------------------------------|-------|-------|---------|-----|-------|-------------|-------|
| 300 ohms | A-1 ON ANT. STRIP AND GROUND | 50 MC | 28-55 | 6 Meter | C41 | osc. | Calibration | 50 MC |
| 300 ohms | " | 30 MC | 28-55 | RS dot | S32 | osc. | Calibration | Zero |
| 300 ohms | " | 50 MC | 28-55 | 50 MC | C2 | ant. | Max. Output | Zero |
| 300 ohms | " | 50 MC | 28-55 | 50 MC | C17 | r-f | Max. Output | Zero |
| 300 ohms | " | 50 MC | 28-55 | 50 MC | C31 | mixer | Max. Output | Zero |
| 300 ohms | " | 30 MC | 28-55 | 30 MC | S30 | ant. | Max. Output | Zero |
| 300 ohms | " | 30 MC | 28-55 | 30 MC | S24 | r-f | Max. Output | Zero |
| 300 ohms | " | 30 MC | 28-55 | 30 MC | S28 | mixer | Max. Output | Zero |

NOTE: Remove plate from left side of chassis for Band #5 and #6 R.F. adjustment.

BAND #6 ADJUSTMENT

| | | | | | | | | |
|----------|------------------------------|--------|--------|--------|-----|-------|-------------|------|
| 300 ohms | A-1 ON ANT. STRIP AND GROUND | 105 MC | 55-108 | 105 MC | C40 | osc. | Calibration | Zero |
| 300 ohms | " | 60 MC | 55-108 | 60 MC | S31 | osc. | Calibration | Zero |
| 300 ohms | " | 105 MC | 55-108 | 105 MC | C1 | ant. | Max. Output | Zero |
| 300 ohms | " | 105 MC | 55-108 | 105 MC | C16 | r-f | Max. Output | Zero |
| 300 ohms | " | 105 MC | 55-108 | 105 MC | C50 | mixer | Max. Output | Zero |
| 300 ohms | " | 60 MC | 55-108 | 60 MC | S19 | ant. | Max. Output | Zero |
| 300 ohms | " | 60 MC | 55-108 | 60 MC | S23 | r-f | Max. Output | Zero |
| 300 ohms | " | 60 MC | 55-108 | 60 MC | S27 | mixer | Max. Output | Zero |

generator for maximum output (adjust R-F sensitivity control for a suitable reading). When the signal generator is on exact crystal frequency, switch over to sharp I-F and repeat slugs S1, S9, S8, S12, S14, and C58 for maximum output.

ceived, switch over to Cw on and adjust Slug S17 (after having set the pitch control knob to zero on dial) for zero beat. The BFO adjustment is now complete.

E. Switch to FM position on AM-FM switch and adjust slug S16 for maximum output. Then adjust slug S7 for null, or minimum output, as indicated on output meter. Next, slowly rock signal generator either side of 10.7 mc. and observe the maximum output readings obtained. If the outputs, either side of centering slug S16, they may be equalized by adjusting slug S16. When the balance has been obtained the FM adjustment is complete. Note: Make sure that the output meter is not off full scale when checking balance. Control this by reducing R-F sensitivity.

about midway between the output reading in sharp crystal and in broad crystal, the medium crystal adjustment is complete.

J. Return to sharp crystal and rock signal

10.7 M.C. I-F ALIGNMENT:
A. Set controls as follows: Bandswitch on #5 Band, M.T. Dial about center scale, FM-AM switch on AM-ANI off, AVC off, Tone Control on Hi Fi- AF gain at maximum, R.F. gain at maximum.

B. Same as "B" in 455 K.C. I-F alignment.

C. Increase generator output (set at 10.7 mc) until a signal is heard and adjust slugs S1, S2, S9, S13, S15 for maximum output. As the signal increases, reduce generator output to prevent overloading. After S1, S2, S9, S13, S15 are set for maximum output, then set slugs S2, S11, for maximum output. Do not readjust the slugs S1, S2, S9, S13, S15.

D. With a moderately loud signal now being re-

R. P. ALIGNMENT

| DUMMY ANT. IN SERIES WITH SIG. GENERATOR | CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER | SIGNAL GEN. FREQUENCY SETTING | BAND SWITCH SETTING | RECEIVER ADJUST. SLUG, PADDER, OR TRIMMER NO. | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT - MAKE ADJUSTMENT FOR: |
|--|---|-------------------------------|---------------------|---|---------------------|---|
| RMA | A-1 ON ANT. STRIP AND GROUND | 1.4 MC | .54-1.62 | C47 | osc. | Calibration At zero |
| RMA | " | .6 MC | .54-1.62 | S36 | osc. | Calibration At zero |
| RMA | " | 1.4 MC | .54-1.62 | C6 | ant. | Max. Output At zero |
| RMA | " | 1.4 MC | .54-1.62 | C31 | band pass | Max. Output At zero |
| RMA | " | 1.4 MC | .54-1.62 | C35 | mixer | Max. Output At zero |

BAND #1 ADJUSTMENT

| | | | | | | | | |
|-----|------------------------------|--------|----------|--------|-----|-------|-------------|---------|
| RMA | A-1 ON ANT. STRIP AND GROUND | 4.0 MC | 1.62-5.0 | 4.0 MC | C45 | osc. | Calibration | At zero |
| RMA | " | 2.0 MC | 1.62-5.0 | 2.0 MC | S35 | osc. | Calibration | At zero |
| RMA | " | 4.0 MC | 1.62-5.0 | 4.0 MC | C20 | ant. | Max. Output | At zero |
| RMA | " | 4.0 MC | 1.62-5.0 | 4.0 MC | C34 | mixer | Max. Output | At zero |

BAND #2 ADJUSTMENT

| | | | | | | | | |
|-----|------------------------------|---------|------|---------|-----|-------|-------------|---------|
| RMA | A-1 ON ANT. STRIP AND GROUND | 14.0 MC | 5-15 | 14.0 MC | C43 | osc. | Calibration | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S34 | osc. | Calibration | At zero |
| RMA | " | 14.0 MC | 5-15 | 14.0 MC | C4 | ant. | Max. Output | At zero |
| RMA | " | 14.0 MC | 5-15 | 14.0 MC | C19 | r-f | Max. Output | At zero |
| RMA | " | 14.0 MC | 5-15 | 14.0 MC | C33 | mixer | Max. Output | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S22 | ant. | Max. Output | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S26 | r-f | Max. Output | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S30 | mixer | Max. Output | At zero |

BAND #3 ADJUSTMENT

| | | | | | | | | |
|-----|------------------------------|---------|------|---------|-----|-------|-------------|---------|
| RMA | A-1 ON ANT. STRIP AND GROUND | 14.0 MC | 5-15 | 14.0 MC | C43 | osc. | Calibration | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S34 | osc. | Calibration | At zero |
| RMA | " | 14.0 MC | 5-15 | 14.0 MC | C4 | ant. | Max. Output | At zero |
| RMA | " | 14.0 MC | 5-15 | 14.0 MC | C19 | r-f | Max. Output | At zero |
| RMA | " | 14.0 MC | 5-15 | 14.0 MC | C33 | mixer | Max. Output | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S22 | ant. | Max. Output | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S26 | r-f | Max. Output | At zero |
| RMA | " | 7.0 MC | 5-15 | 7.0 MC | S30 | mixer | Max. Output | At zero |

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|------------------|--|----------------------------|
| R-52, 59, 66 | Resistor (470,000 ohm 20% 1/2 watt) Carbon | RC20AE47M |
| R-54 | Resistor (100,000 ohm 10% 1/2 watt) Carbon | RC20AE104K |
| R-55 | Resistor (85,000 ohm 10% 1/2 watt) Carbon | RC20AE85K |
| R-56 | Resistor (150,000 ohm 10% 1/2 watt) Carbon | RC20AE150K |
| R-57 | Resistor (150,000 ohm 10% 1/2 watt) Carbon | RC20AE154K |
| R-58 | Resistor (5100 ohm 5% 1/2 watt) Carbon | RC20AE512J |
| R-72 | Resistor (100 ohm 10% 1/2 watt) Carbon | RC20AE101J |
| R-73 | Volume Control (1 meg. pot. 1/2 watt) includes power switch SW-8 | 251A549 |
| R-75, 24, 26 | Resistor (100 ohm 10% 1/2 watt) Carbon | RC20AE100K |
| R-77 | Resistor (100 ohm 10% 1/2 watt) Carbon | RC20AE102K |
| R-79, 80, 81, 83 | Resistor (220,000 ohm 10% 1/2 watt) Carbon | RC20AE220K |
| R-82 | Resistor (8800 ohm 10% 1/2 watt) Carbon | RC20AE882K |
| R-84 | Resistor (220 ohm 10% 1/2 watt) Carbon | RC20AE221K |
| R-85 | Resistor (2000 ohm 5% 10 watt) Wirewound | 24B5352D |
| R-89 | Resistor (68,000 ohm 10% 1/2 watt) Carbon | RC20AE68K |
| R-90 | Resistor (15 ohm 20% 1/2 watt) Carbon | RC20AE15K |
| R-91, 96 | Resistor (470 ohm 10% 1/2 watt) Carbon | RC20AE472K |
| R-96 | Resistor (680 ohm 20% 1/2 watt) Carbon | RC20AE681M |

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|-----------|---------------------------------|----------------------------|
| L-1, 2, 3 | 5-8 volt; 250 ma; basecoat type | 39A018 |
| L-4 | 6-8 volt; 150 ma; basecoat type | 39A019 |

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|----------|----------------------|----------------------------|
| PL-1 | Shorting plug; octal | 35A015 |

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|------------|--|----------------------------|
| SW-1 | Band Selector | 600241 |
| SW-2 | Selectivity | 60A234 |
| SW-3 | Reception | 60C235 |
| SW-4 | Tone | 60C236 |
| SW-5, 6, 7 | AVC, Noise Limiter, Receiver-Standby toggle with bat handle; SPST | 60A138 |
| SW-8 | Power-off; not a replaceable part; shown for reference only; part of volume control R-73 | |

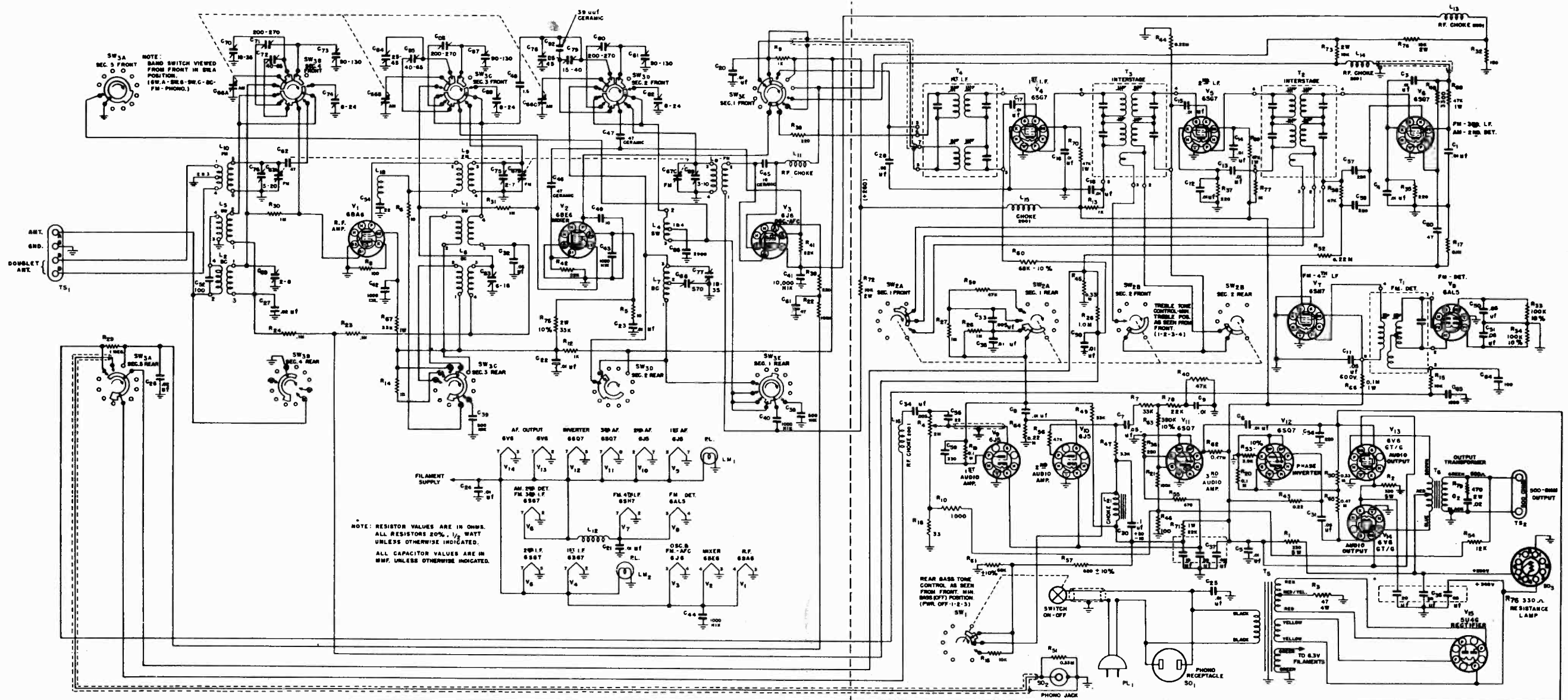
TRANSFORMERS

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|----------|---------------------------|----------------------------|
| T-1 | Antenna Coil; Band #6 | 51B859 |
| T-2 | Antenna Coil; Band #5 | 51B858 |
| T-3 | Antenna Coil; Band #4 | 51B857 |
| T-4 | Antenna Coil; Band #3 | 51B856 |
| T-5 | Antenna Coil; Band #1 | 51B855 |
| T-6 | R-F Coil; Band #6 | 51B854 |
| T-7 | R-F Coil; Band #5 | 51B853 |
| T-8 | R-F Coil; Band #4 | 51B852 |
| T-9 | R-F Coil; Band #3 | 51B851 |
| T-10 | R-F Coil; Band #2 | 51B850 |
| T-11 | R-F Coil; Band #1 | 51B849 |
| T-12 | Converter Coil; Band #6 | 51B848 |
| T-13 | Converter Coil; Band #5 | 51B847 |
| T-14 | Converter Coil; Band #4 | 51B846 |
| T-15 | Converter Coil; Band #3 | 51B845 |
| T-16 | Converter Coil; Band #1 | 51B844 |
| T-17 | Converter Coil; Band #6 | 51B843 |
| T-18 | Oscillator Coil; Band #5 | 51B842 |
| T-19 | Oscillator Coil; Band #4 | 51B841 |
| T-20 | Oscillator Coil; Band #3 | 51B840 |
| T-21 | Oscillator Coil; Band #2 | 51B839 |
| T-22 | Oscillator Coil; Band #1 | 51B838 |
| T-23 | Oscillator Coil; Band #6 | 51B837 |
| T-24 | Oscillator Coil; Band #5 | 51B836 |
| T-25 | Oscillator Coil; Band #4 | 51B835 |
| T-26 | Oscillator Coil; Band #3 | 51B834 |
| T-27 | Oscillator Coil; Band #2 | 51B833 |
| T-28 | Oscillator Coil; Band #1 | 51B832 |
| T-29 | 1st I-F Transformer | 50C198 |
| T-30 | 2nd I-F Transformer | 50C199 |
| T-31 | 3rd I-F Transformer | 50C197 |
| T-32 | Discriminator Transformer | 50C196 |
| T-33 | BFO Transformer | 54C032 |
| T-34 | Audio Output Transformer | 55B077 |
| T-35 | Power Transformer | 56C141 |

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|--|--|--|
| C-1, 2, 16, 17, 30, 31 | Trimmer, dual mounting assembly | 44B165 |
| C-3, 4, 6, 18, 19, 20, 21, 32, 33 | R-F Trimmer (2-6 mmf) Ceramic | 44B179 |
| C-5 | Capacitor (2 mmf 10% Milled Bakelite) | 461002 |
| C-7 | Capacitor (5 mmf 1.5 mmf 10% 00075 T.C.) Ceramic | CC20UK150K |
| C-8 | Capacitor (5 mmf 10% 00075 T.C.) Ceramic | 46A094 |
| C-9, 11, 23, 25 | Capacitor (47 mmf 10% Paper) | CM20A47PK |
| C-10 | Capacitor (47 mmf 10% 500V) Paper | CM20A47PK |
| C-12, 26 | Capacitor (.01 mfd +40-15% 400V) Paper | CM20K111J |
| C-13, 15, 27, 28, 50, 59, 63, 74, 96, 87, 91, 100, 104, 108 & 112 | Capacitor (.02 mfd +40-15% 400V) Paper | 44A078 |
| C-20, 28 | Capacitor (5600 mmf 20% 500V) Mica | 44A077 |
| C-21, 29 | Capacitor (15 mfd 10% 200V) T.C.) Ceramic | CM20K150K |
| C-24 | Capacitor (.25 mfd +40-15% 200V) Paper | 46A094 |
| C-37, 97 | Capacitor (47 mmf 10% 500V) Paper | CM20A47PK |
| C-38 | Capacitor (.01 mfd 150V) Paper | CM20K111J |
| C-39, 49 | Capacitor (110 mmf 5% 00075 T.C.) Ceramic | 44A078 |
| C-40, 41 | Capacitor (100 mmf 5% 00075 T.C.) Ceramic | 44A078 |
| C-43, 45 | Capacitor (6-8 mmf) Mica | 44A077 |
| C-44 | Capacitor (2-700 mmf 2% 500V) Mica | CM20A272K |
| C-46 | Capacitor (1500 mmf 2% 500V) Mica | CM20A150K |
| C-47 | Capacitor (4-80 mmf) Ceramic | CM20A47JG |
| C-48 | Capacitor (470 mmf 2% 500V) Mica | CM20A47JG |
| C-51, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 64, 65, 66, 67, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 92, 93, 94, 95, 98, 99, 101, 102, 103, 105, 106, 107, 109, 110, 111, 113, 116, 114, 115, 117 | Capacitor (.05 mfd +40-15% 200V) Paper Capacitor (.01 mfd +40-15% 200V) Paper Capacitor (122 mmf 10% 500V) Mica Capacitor (760 mmf 10% 500V) Mica Capacitor (1.1 mfd +40-15% 200V) Mica Capacitor (1.1 mfd +40-15% 200V) Paper Capacitor (10 mfd +75-10% 25V) Electrolytic Capacitor (680 mmf 10% 500V) Mica Capacitor (Electrolytic 10 mfd 25V) Paper Capacitor (22 mmf 10% 00075) Ceramic | 46A050J 48A064 44B164 46A105J 46A105J CM20K107K CM20A181K 46A0104 CM25A561K 45A064 CM25A681K 46A103J CM20K220K |

RESISTORS

| REF. NO. | DESCRIPTION | HALLICRAFTER'S PART NUMBER |
|--|---|--|
| R-1, 10, 21 | Resistor (1,000,000 ohm 20% 1/2 watt) Carbon | RC20AE104M |
| R-2 | Resistor (12 ohm 10% 1/2 watt) Carbon | RC20AE120K |
| R-3, 15 | Resistor (150 ohm 10% 1/2 watt) Carbon | RC20AE151K |
| R-5, 9, 14, 19 | Resistor (47,000 ohm 10% 1/2 watt) Carbon | RC20AE470K |
| R-6, 13, 17, 20 | Resistor (2200 ohm 20% 1/2 watt) Carbon | RC20AE222K |
| R-7, 18, 40, 67, 74 & 78 | Resistor (1200 ohm 10% 1/2 watt) Carbon | RC20AE122K |
| R-12 | Sensitivity Control (10,000 ohm Pot. 1/2 watt) | 25A549 |
| R-16, 22, 26, 70, 86 | Resistor (1000 ohm 20% 1/2 watt) Carbon | RC20AE102M |
| R-21, 48, 58 | Resistor (2.2 megohm 20% 1/2 watt) Carbon | RC20AE222M |
| R-22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117 | Resistor (10,000 ohm 10% 1/2 watt) Carbon Resistor (5600 ohm 10% 1/2 watt) Carbon Resistor (470 ohm 20% 1/2 watt) Carbon Resistor (68,000 ohm 10% 1/2 watt) Carbon Resistor (120 ohm 10% 1/2 watt) Carbon Resistor (220 ohm 10% 1/2 watt) Carbon Variable resistor (5000 ohm) 'S' type Resistor (1.2 megohm 10% 1/2 watt) Carbon Resistor (87 ohm 10% 1/2 watt) Carbon Resistor (56,000 ohm 10% 1/2 watt) Carbon Resistor (2,400 ohm 10% 1/2 watt) Carbon Resistor (500 ohm 20% 1/2 watt) Carbon Resistor (330 ohm 20% 1/2 watt) Carbon Resistor (47,000 ohm 10% 1/2 watt) Carbon Resistor (530 ohm 10% 1/2 watt) Carbon Resistor (33 ohm 10% 1/2 watt) Carbon | RC20AE104M RC20AE120K RC20AE151K RC20AE470K RC20AE222K RC20AE122K 25A549 RC20AE102M RC20AE222M RC20AE103K RC20AE562K RC20AE471M RC20AE682K RC20AE121K RC20AE121K RC20AE121K 25C022 RC20AE126K RC20AE270K RC20AE271K RC20AE560K RC20AE560K RC20AE500M RC20AE501M RC20AE501M RC20AE470K RC20AE334K RC20AE334K |



Tubes Fifteen
 Speaker output impedance . . . 500 ohms.
 Antenna Provisions for external long wire antenna for AM bands and a folded dipole (300-ohm) for FM band.
 Tuning Manual and mechanical push buttons. (Five channels for AM and five channels for FM.)
 Tuning Range (BC) 540kc - 1700 kc.
 (A) 15 mc - 18 mc.
 (B) 9 mc - 12 mc.
 (C) 5.8 mc - 18 mc.
 (FM) 88 mc - 108 mc.

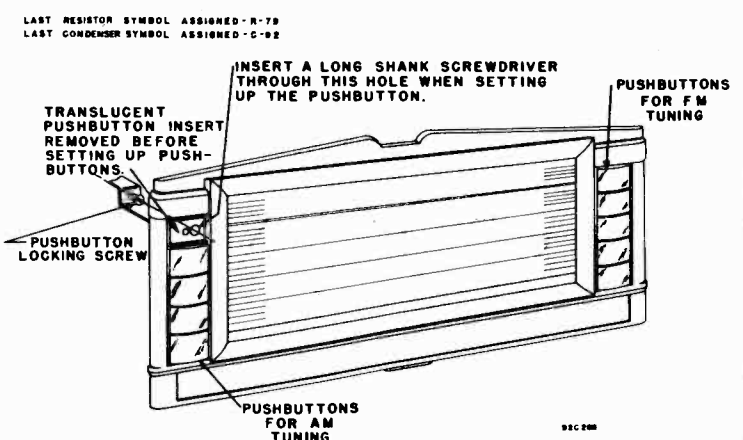


Fig. 1. View showing pushbutton setup.

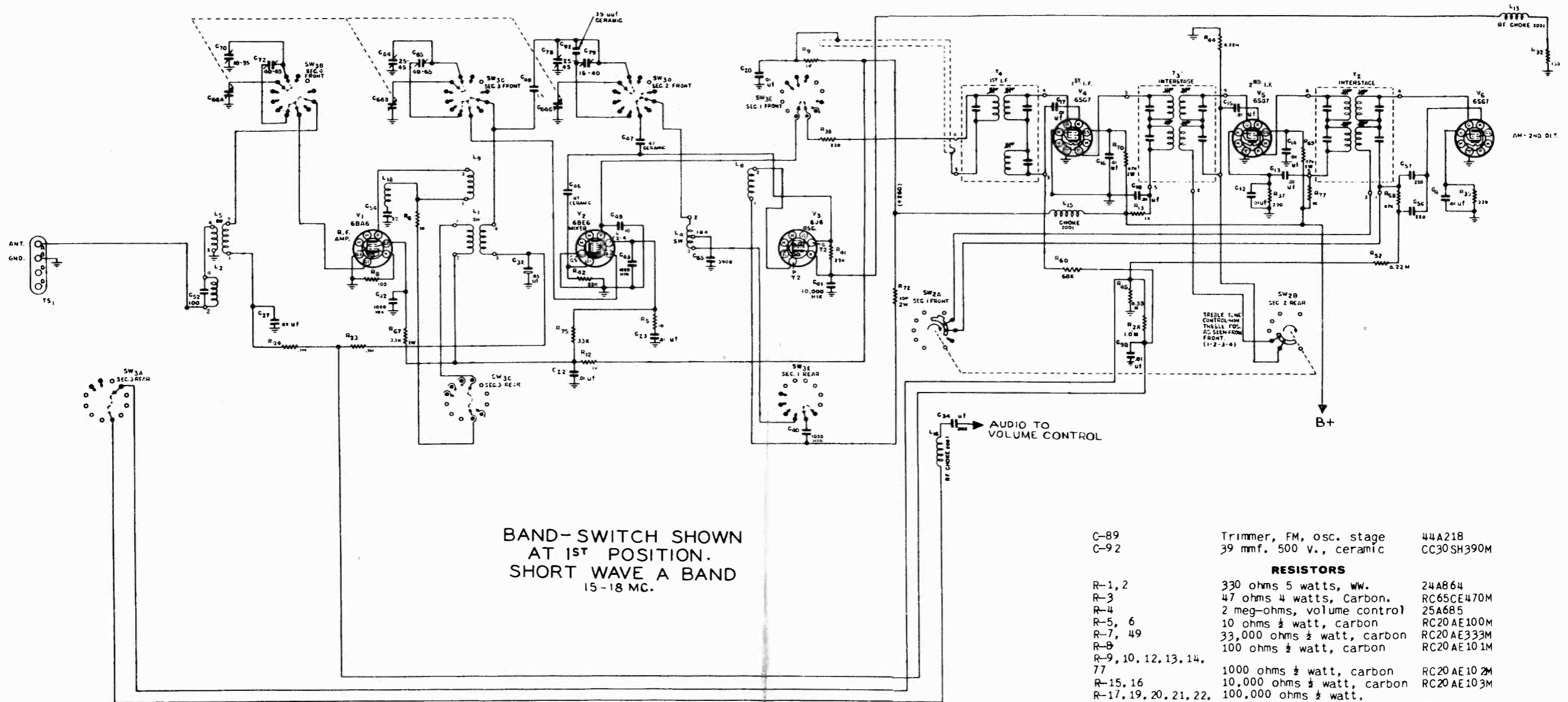
BUTTON SETTING:

- Note - Insulate the muting switch springs before setting the AM buttons.
1. Select any one pushbutton.
 2. Pull translucent insert straight out.
 3. Insert screw driver blade through large hole of pushbutton into slot of locking screw. (See Fig. 1).
 4. Loosen locking screw about one-half turn. (Not more than one full turn.)
 5. With pushbutton depressed, carefully tune in desired station with the manual control and tighten the locking screw.

I.F. (AM) 455 kc.
 I.F. (FM) 10.7 mc.
 Power Supply 105-125 V. 60 cycles A.C.
 Power Consumption 180 watts.



MODEL S-47



BAND-SWITCH SHOWN AT 1ST POSITION. SHORT WAVE A BAND 15-18 MC.

SERVICE PARTS LIST

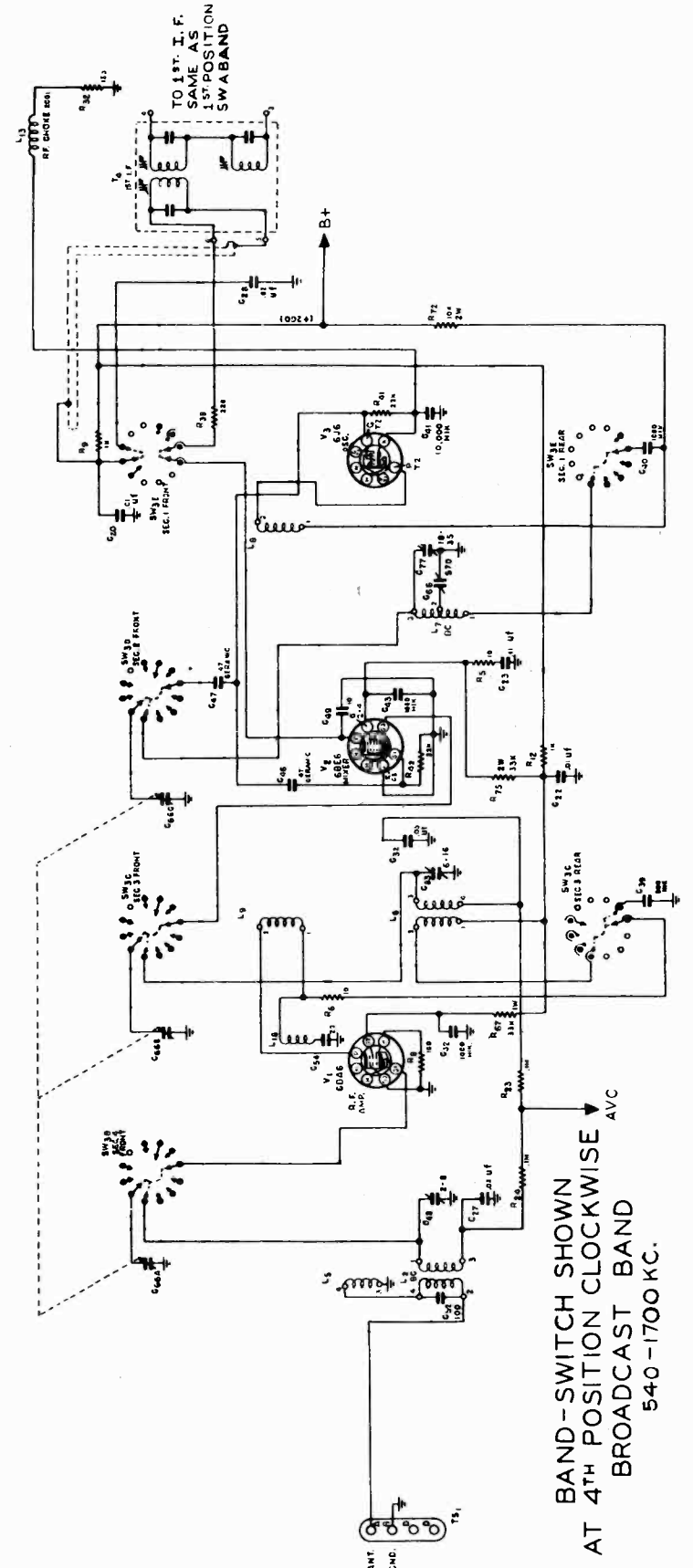
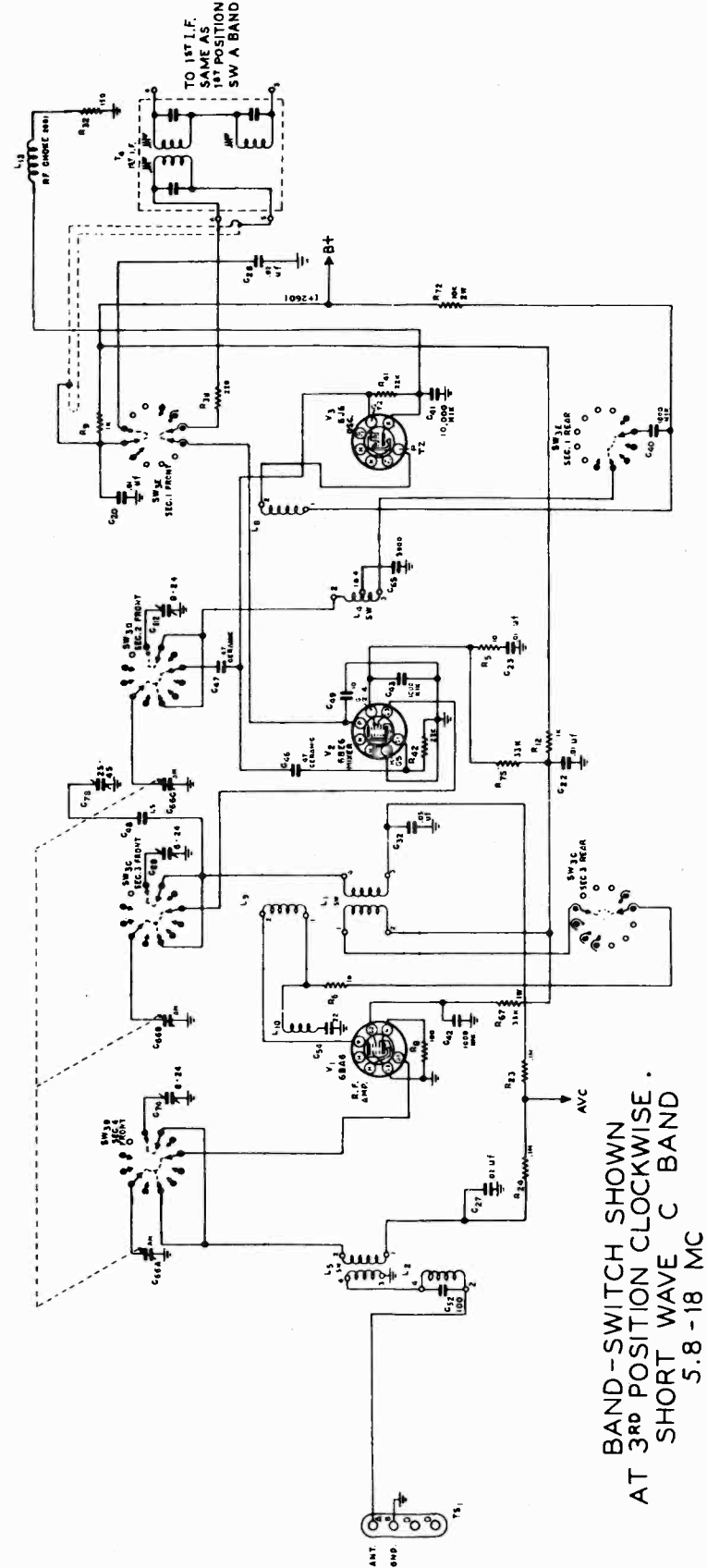
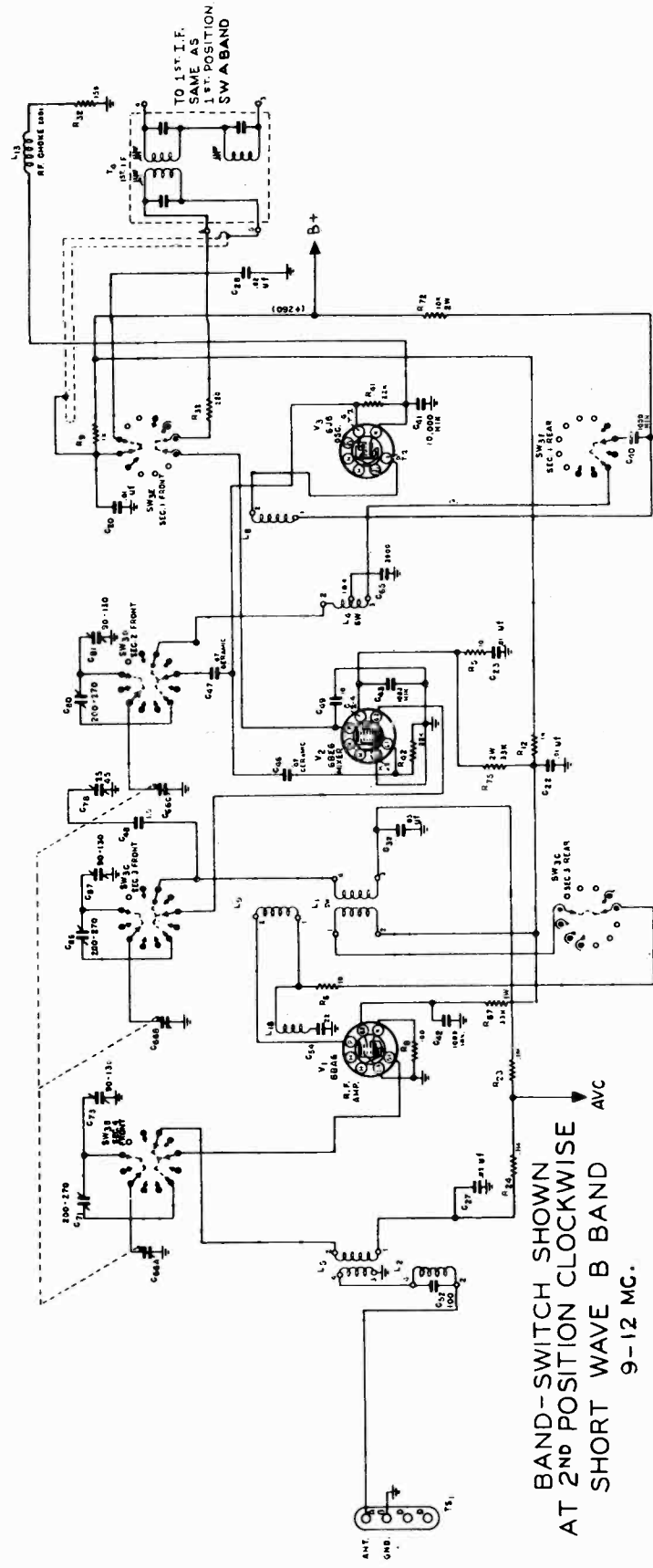
| REF. NO. | DESCRIPTION | HALLICRAFTERS PART NUMBER |
|---|---|---------------------------|
| CAPACITORS | | |
| C-1, 3, 4, 5, 6, 8, 9, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 35, 90 | .01 mfd 600 v., tubular paper | 46AZ103F |
| C-2, 26, 27, 28 | .02 mfd 600 v., tubular paper | 46AY203F |
| C-7, 11, 31, 32, 50, 51 | .05 mfd 600 v., tubular paper | 46AY503F |
| C-25 | .01 mfd 600 v., molded paper | 46AG103J |
| C-30 | .1 mfd 200 v., tubular paper | 46AU104H |
| C-33 | .005 mfd 600 v., tubular paper | 46AZ502J |
| C-34 | .003 mfd 600 v., tubular paper | 46AZ302J |
| C-36 | 60-20 mfd 450 v., 20 mfd. 30 v. electrolytic | 45B099 |
| C-37 | 40-10 mfd 450 v., 20 mfd. 30 v., electrolytic | 45B100 |

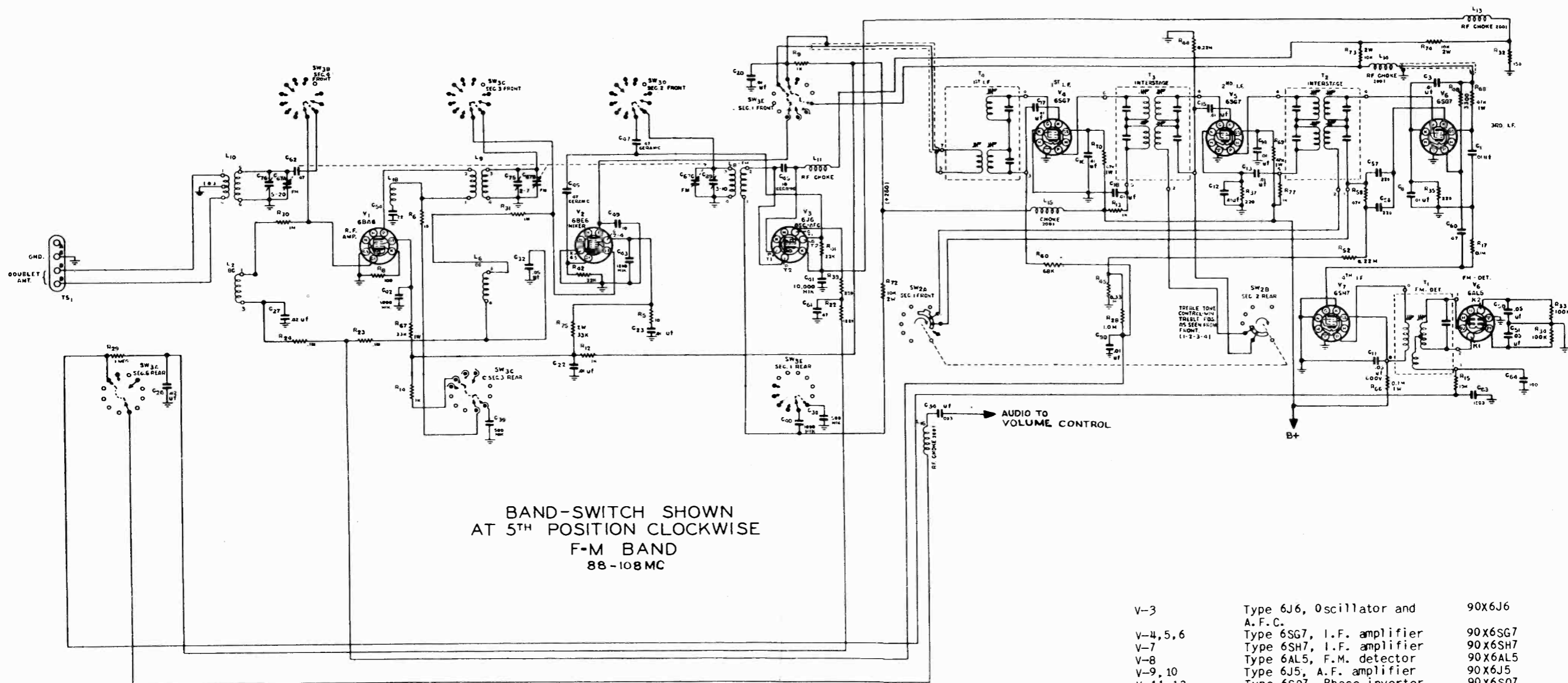
| | | |
|--------------------------|--------------------------------|------------|
| C-38, 39 | 500 mmf 500 v., ceramic | 47A147 |
| C-40, 42, 43, 44 | 1000 mmf 500 v., ceramic | 47A148 |
| C-41 | 10,000 mmf. 150 v., ceramic | 47B32103N1 |
| C-45 | 10 mmf 500 v., ceramic | 47A149 |
| C-46, 47 | 47 mmf 500 v., ceramic | 47A150 |
| C-48 | 1.5 mmf., ceramic | 47A160-3 |
| C-49 | 10 mmf 500 v., mica | CM20A100K |
| C-52, 64 | 100 mmf 500 v., mica | CM20A101M |
| C-54 | 22 mmf 500 v., mica. | CM20A220K |
| C-55 | 22 mmf 500 v., mica. | CM20A220M |
| C-56, 57, 58 | 220 mmf 500 v., mica. | CM20A221M |
| C-59 | 330 mmf 500 v., mica. | CM20A331M |
| C-60, 61, 62 | 47 mmf 500 v., mica | CM20A470M |
| C-63 | .001 mfd 500 v., mica. | CM30A102M |
| C-65 | .0039 mfd 500 v., mica. | CM35A392J |
| C-66 | Tuning condenser, "AM" | 48C176 |
| C-67 | Tuning condenser, "FM" | 48C175 |
| C-68 | 570 mmf. trimmer. | 44A189 |
| C-69, 70, 71, 72, 73, 74 | Trimmer assembly, ant. stage. | 44B190 |
| C-75 | Trimmer, FM, mixer stage. | 44A192 |
| C-76 | Trimmer, FM, ant. stage. | 44A194 |
| C-77, 78, 79, 80, 81, 82 | Trimmer assembly, osc. stage. | 44B195 |
| C-83, 84, 85, 86, 87, 88 | Trimmer assembly, mixer stage. | 44B196 |

| | | |
|------|-------------------------|------------|
| C-89 | Trimmer, FM, osc. stage | 44A218 |
| C-92 | 39 mmf. 500 v., ceramic | CC30SH390M |

RESISTORS

| | | |
|------------------------------|-------------------------------|------------|
| R-1, 2 | 330 ohms 5 watts, WW. | 24A864 |
| R-3 | 47 ohms 4 watts, Carbon. | RC65CE470M |
| R-4 | 2 meg-ohms, volume control | 25A685 |
| R-5, 6 | 10 ohms 1/2 watt, carbon | RC20AE100M |
| R-7, 49 | 33,000 ohms 1/2 watt, carbon | RC20AE333M |
| R-8 | 100 ohms 1/2 watt, carbon | RC20AE101M |
| R-9, 10, 12, 13, 14, 77 | 1000 ohms 1/2 watt, carbon | RC20AE102M |
| R-15, 16 | 10,000 ohms 1/2 watt, carbon | RC20AE103M |
| R-17, 19, 20, 21, 22, 23, 24 | 100,000 ohms 1/2 watt, carbon | RC20AE104M |
| R-18 | 33 ohms 1/2 watt, carbon | RC20AE330M |
| R-26, 27, 28, 29, 30, 31 | 1 meg-ohm 1/2 watt, carbon | RC20AE105M |
| R-32 | 150 ohms 1/2 watt, carbon | RC20AE151M |
| R-33, 34 | 100,000 ohms 1/2 watt, carbon | RC20AE104K |
| R-35, 36, 37, 38, 39 | 220 ohms 1/2 watt, carbon | RC20AE221M |
| R-40, 58, 59 | 47,000 ohms 1/2 watt, carbon. | RC20AD473M |
| R-41, 42, 78 | 22,000 ohms 1/2 watt, carbon | RC20AE223M |
| R-43, 44, 52, 64 | 220,000 ohms 1/2 watt, carbon | RC20AE224M |
| R-45, 50, 51 | 330,000 ohms 1/2 watt, carbon | RC20AE334M |
| R-46 | 100 ohms 1/2 watt, carbon | RC20AE101K |
| R-47, 48 | 3300 ohms 1/2 watt, carbon | RC20AE332M |
| R-53 | 3900 ohms 1/2 watt, carbon | RC20AE392K |
| R-54 | 12,000 ohms 1/2 watt, carbon | RC20AE123K |
| R-55 | 470 ohms 1/2 watt, carbon | RC20AE471M |
| R-56 | 4700 ohms 1/2 watt, carbon | RC20AE472M |
| R-57 | 820 ohms 1/2 watt, carbon | RC20AE821K |
| R-60, 61 | 68,000 ohms 1/2 watt, carbon. | RC20AE683K |
| R-62, 65 | 470,000 ohms 1/2 watt, carbon | RC20AE474M |
| R-63 | 390,000 ohms 1/2 watt, carbon | RC20AE394K |
| R-66 | 100,000 ohms 1 watt, carbon | RC30AE104M |
| R-67 | 33,000 ohms 1 watt, carbon. | RC30AE333M |
| R-68, 69, 70 | 47,000 ohms 1 watt, carbon. | RC30AE473M |
| R-71 | 22,000 ohms 1 watt, carbon | RC30AE223M |
| R-72, 73, 74 | 10,000 ohms 2 watt, carbon | RC40AE103M |

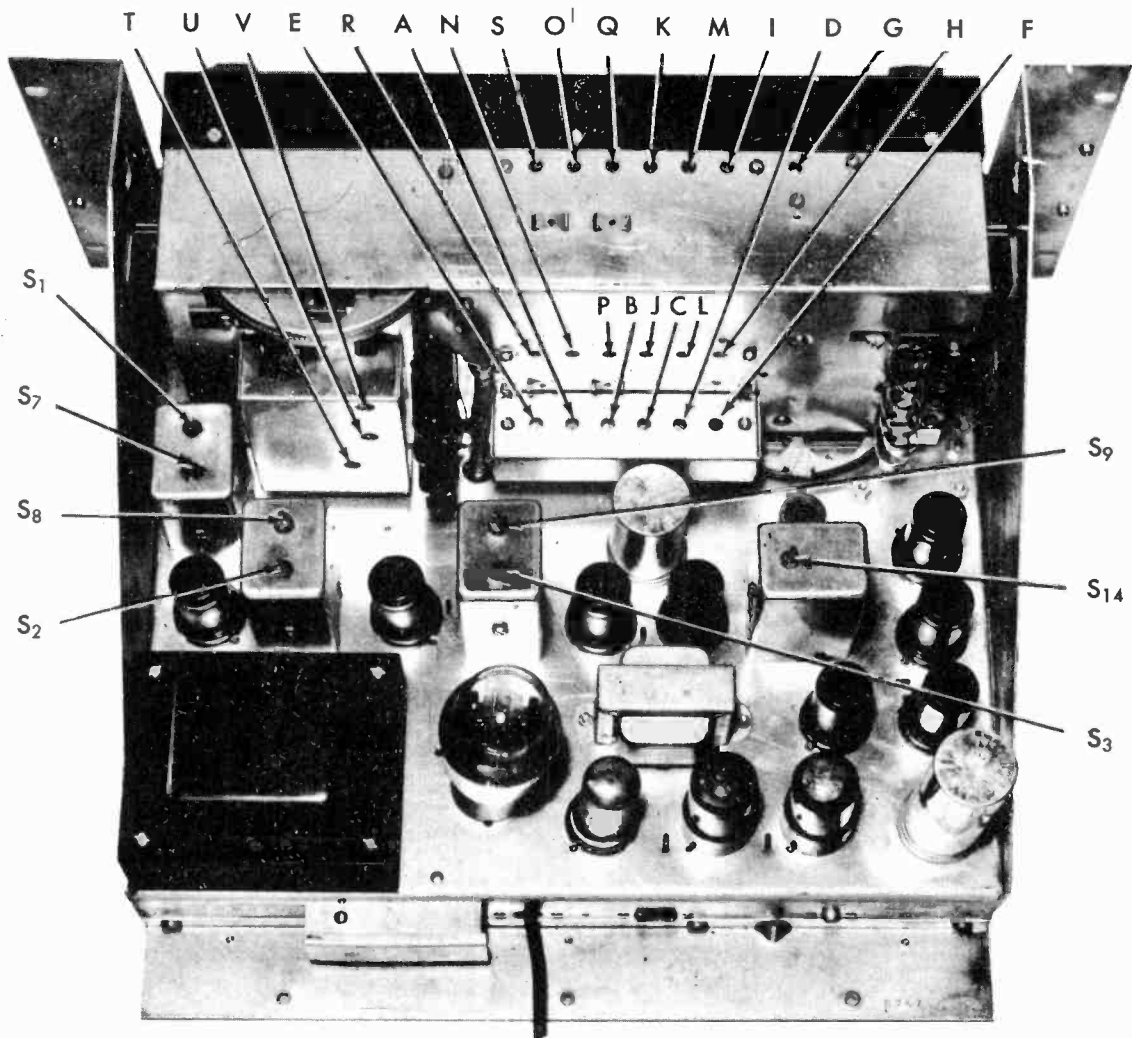




BAND-SWITCH SHOWN
AT 5TH POSITION CLOCKWISE
F-M BAND
88-108 MC

SERVICE PARTS LIST (Continued)

| REF NO | DESCRIPTION | HALLICRAFTER'S PART NUMBER | DESCRIPTION | PART NUMBER | DESCRIPTION | PART NUMBER | | |
|-------------------------------|------------------------------|----------------------------|--------------------------|--------------------------------|-------------|------------------------------------|---------------------------------|---------|
| R-75 | 33,000 ohms 2 watts, carbon | RC40AE333K | L-13, 14, 15, 16 | R.F. choke | 53A106 | V-3 | Type 6J6, Oscillator and A.F.C. | 90X6J6 |
| R-76 | 330 ohms, plug-in ballast | 24B870 | L-18 | R.F. choke, ant. stage plate | 53A115 | V-4, 5, 6 | Type 6SG7, I.F. amplifier | 90X6SG7 |
| R-79 | 470 ohms 2 watts, carbon | RC40AE471M | L-21 | Audio choke | 56B082 | V-7 | Type 6SH7, I.F. amplifier | 90X6SH7 |
| TRANSFORMERS AND COILS | | | SWITCHES | | | MISCELLANEOUS COMPONENTS | | |
| T-1 | Transformer, FM detector | 50C208 | SW-1 | Power & Bass tone switch ass'y | 60B307 | Shield base, tube (miniature tube) | 69A169 | |
| T-2, 3 | Transformer, interstage I.F. | 50C209 | SW-2 | Treble switch ass'y. | 60B264 | Shield, tube (miniature tube) | 69A104 | |
| T-4 | Transformer, 1st. I.F. | 50C210 | SW-3 | Band switch | 60C266 | Spring, tube retainer | 75A076 | |
| T-5 | Transformer, power | 57C151 | SW-4 | Muting switch | 18A092 | Carriage, pointer | 67B645 | |
| T-6 | Transformer, audio output | 55B096 | PLUGS AND LAMPS | | | Pointer, FM | 82B138 | |
| L-1 | Mixer coil for SW band | 51B905 | PL-1 | Line cord and plug | 87B1625 | Pointer, AM | 82B143 | |
| L-2 | Antenna coil for BC band | 51B955 | SO-1 | Receptacle, phono motor | 10A015 | Spring, pointer | 75A132 | |
| L-4 | Oscillator coil for SW band | 51B908 | SO-2 | Jack, phono pick-up | 36A034 | Push-button (black) | 17B028-1 | |
| L-5 | Antenna coil for SW band | 51B909 | SO-3 | Receptacle, ballast | 6A190 | Insert, push-button, lucite | 17A027 | |
| L-6 | Mixer coil for BC band | 51B910 | TUBES AND SOCKETS | | | Insert, push-button, metal | 17A029 | |
| L-7 | Oscillator coil for BC band | 51B911 | V-1 | Type 6BA6, Antenna | 90X6BA6 | Call letters | 17A025-1 | |
| L-8 | Oscillator coil for FM band | 51B914 | V-2 | Type 6BE6, Mixer | 90X6BE6 | Spring, dial | 75A006 | |
| L-9 | Mixer coil for FM band | 51B915 | | | | Cord, dial | 38A017 | |
| L-10 | Antenna coil for FM band | 51B916 | | | | Escutcheon | 70D39-1 | |
| L-11 | Plate choke, osc. stage | 53B008 | | | | Dial glass, upper | 22B184 | |
| L-12 | Filament choke | 53B009 | | | | Dial glass, lower | 22B193 | |
| | | | | | | Knob | 15A131 | |
| | | | | | | Terminal strip, antenna | 88A277 | |
| | | | | | | Terminal strip, speaker | 88A334-1 | |
| | | | | | | Shield, speaker terminal | 69C173 | |



Top view showing alignment points.

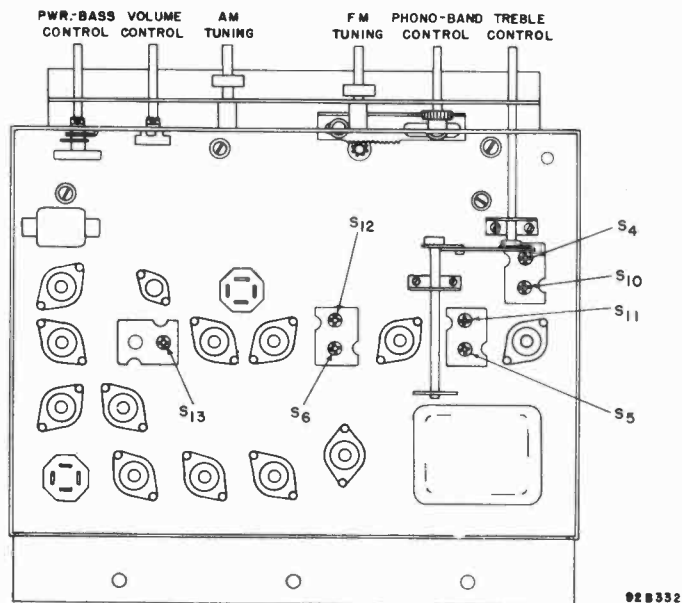
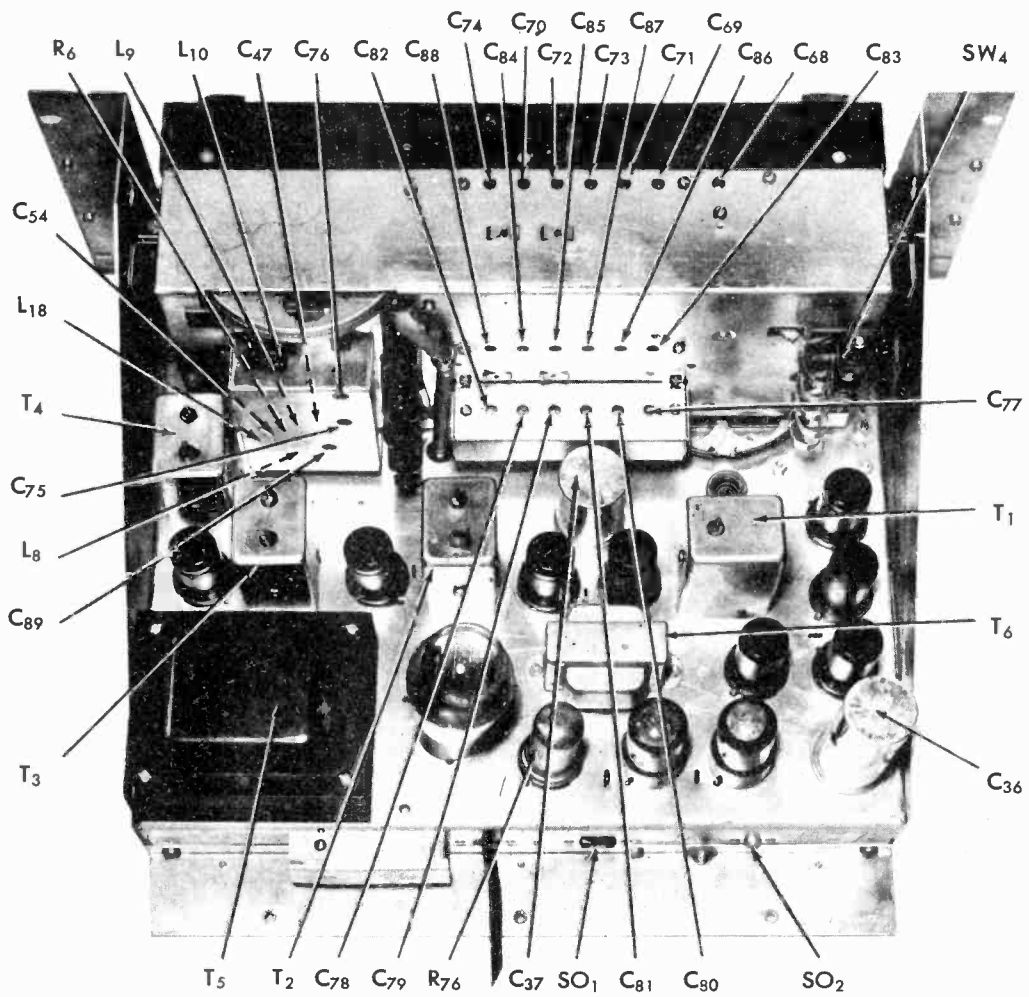


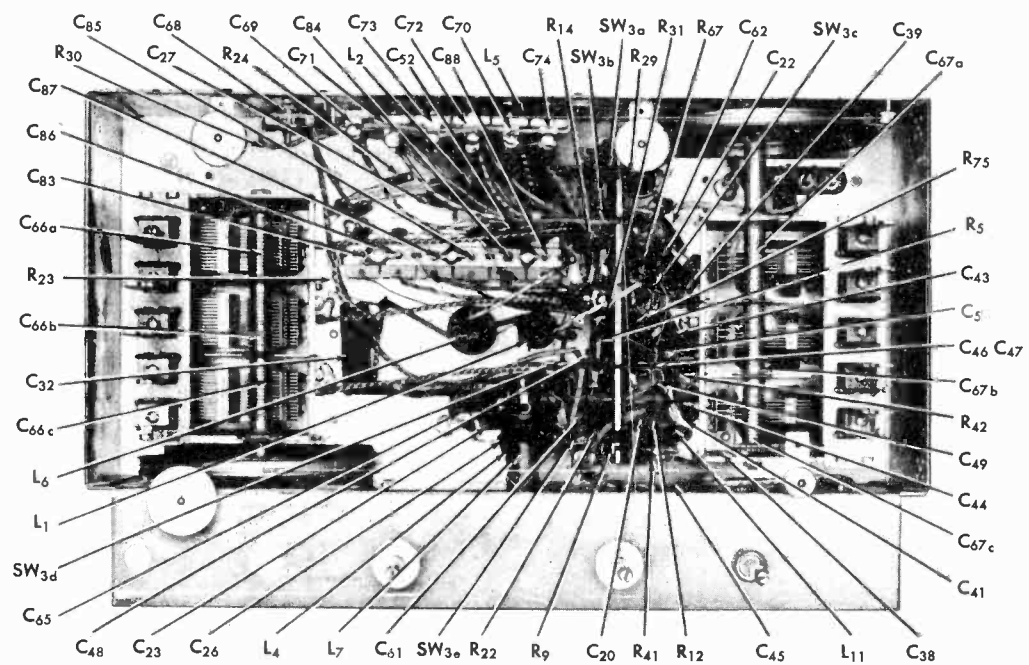
Fig. 5. Bottom view showing alignment points.

THE HALLICRAFTERS CO.

MODEL S-47



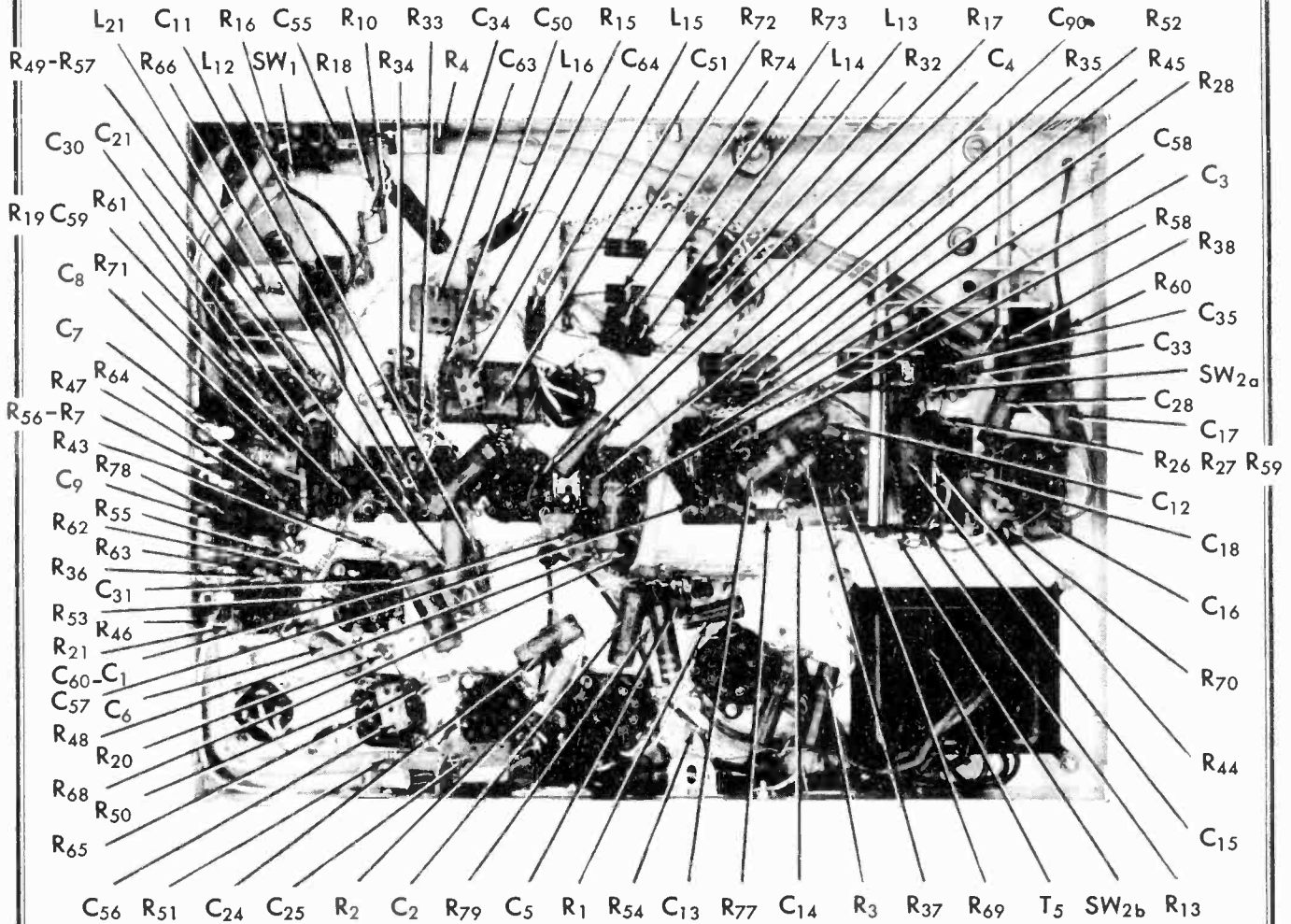
Top view showing component location.



Front view of R.F. chassis showing component location.

THE HALLICRAFTERS CO.

MODEL S-47



Bottom view of receiver showing component location.

INSERTING CALL LETTERS INTO TRANSLUCENT INSERT ASSEMBLY:

1. Slide out metal insert from translucent insert assembly. (See Fig. 2).
2. Insert call letter tab.
3. Replace metal insert.
4. Replace translucent insert assembly into push-button.

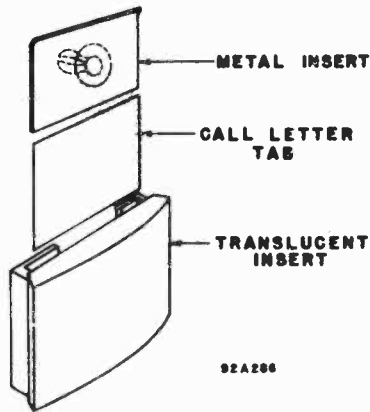
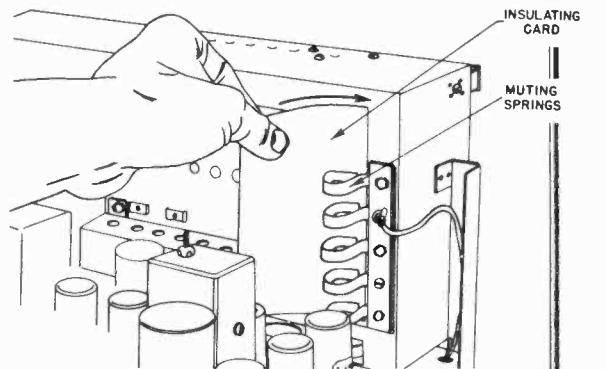


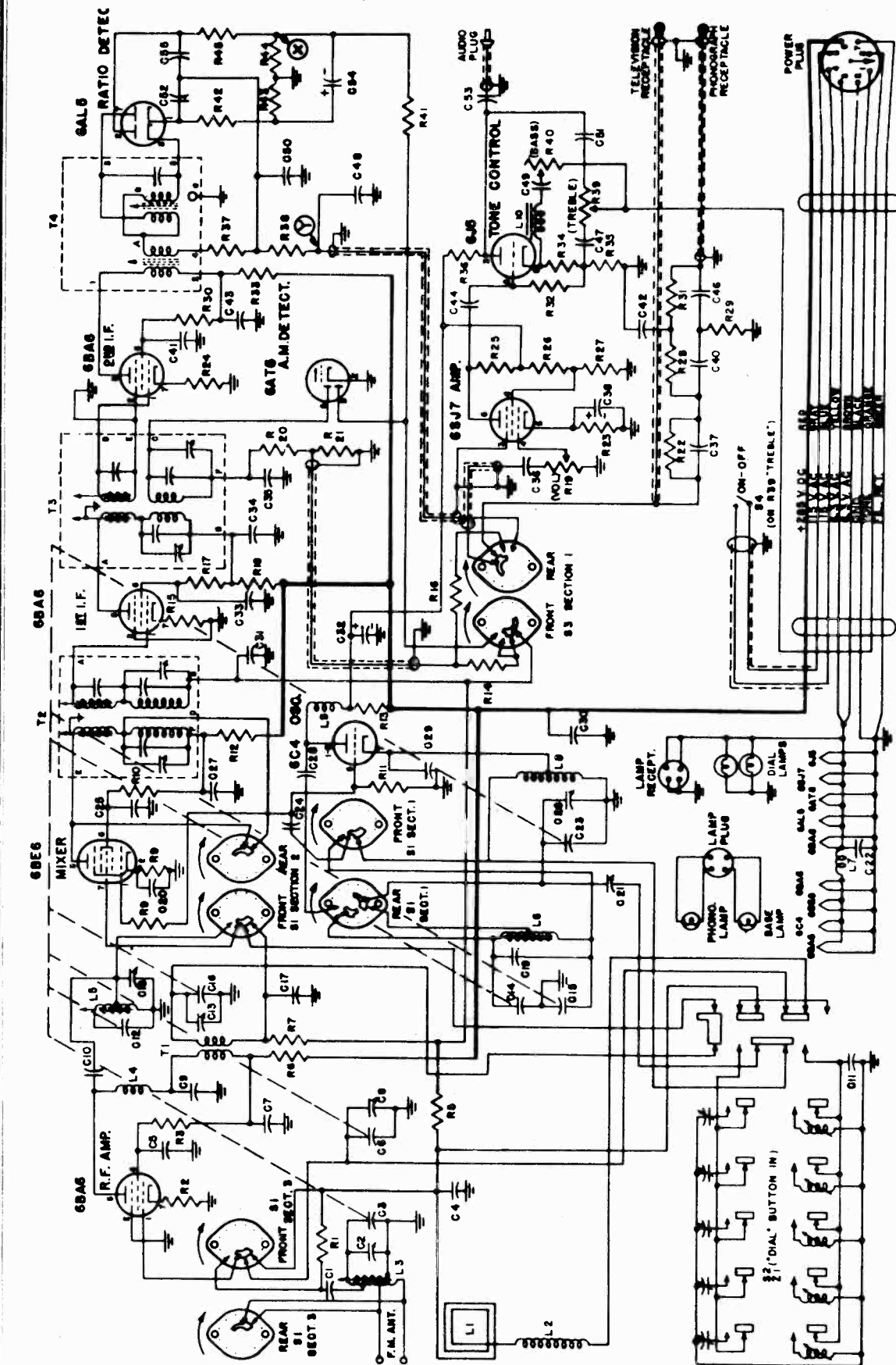
Fig. 2. View showing call letter installation.



Insulating the muting switch contacts

HOFFMAN RADIO CORP.

MODELS B502, chassis 113,
B504, chassis 123



SPECIFICATIONS

| | | |
|---------------------------|-------------------|----------------------------------|
| TUNING RANGES | 535 Kc to 1650 Kc | |
| Broadcast Band | 88 Mc to 108 Mc | 170 Ma |
| FM Band | | 75 Ma |
| INTERMEDIATE FREQUENCIES: | | |
| Broadcast Band | 455 Kc | |
| FM Band | 10.7 Mc | |
| | | NORMAL OPERATING CURRENTS |
| | | 5U4G Cathode Current |
| | | 6V6 Cathode Current (both tubes) |

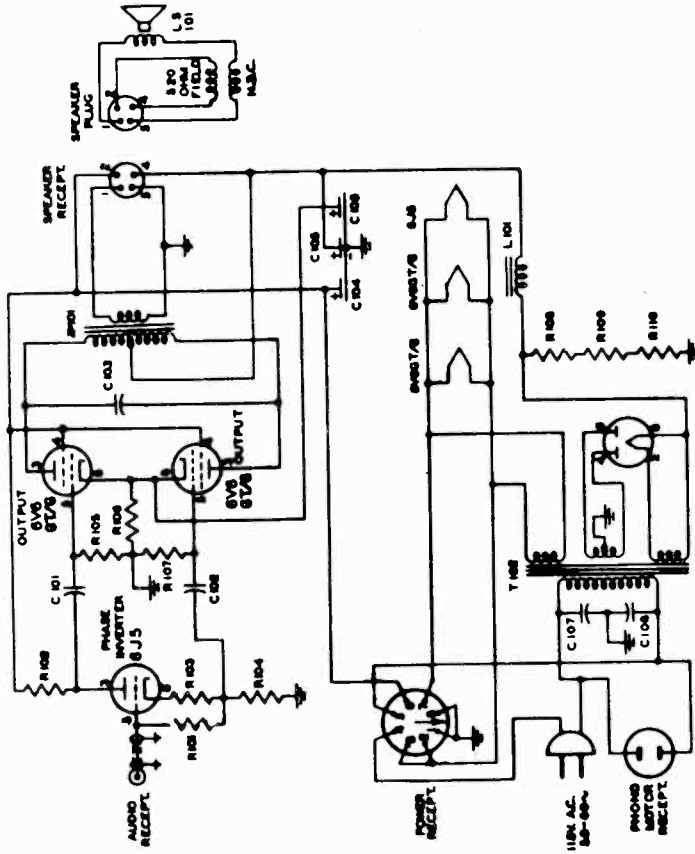


Fig. 5—Power Supply Schematic Diagram

| SYMBOL | DESCRIPTION | HOFFMAN NO. |
|------------|--|-------------|
| C101, C102 | .05 Mfd. 400 Volt Tub. Paper | 4101 |
| C103 | 470 Mmf. ±20% Mica | 4003 |
| C104, C105 | 20/20 Mfd. 450V. 20 Mfd. 25V. Electrolytic | 4200 |
| C106 | .01 Mfd. 600 Volt, Metal Case | 4105 |
| C107, C108 | 1 Meg. ±20% ½ Watt | 4513 |
| R101 | 47000 Ohm ±10% ½ Watt | 4559 |
| R102, R104 | 2200 Ohm ±20% ½ Watt | 4512 |
| R103 | .22 Meg. ±20% ½ Watt | 4500 |
| R105, R107 | 220 Ohm ±20% 3 Watt W.W. | 4706 |
| R106, R109 | 10,000 Ohm ±10% 2 Watt | 4503 |
| L101 | Filter Choke | 5116 |
| T101 | Audio Output Transformer | 5108 |
| T102 | Power Transformer | 5007 |
| LS101 | Speaker—12" Electrodynamic | 9044 |

*Prices Subject To Change Without Notice

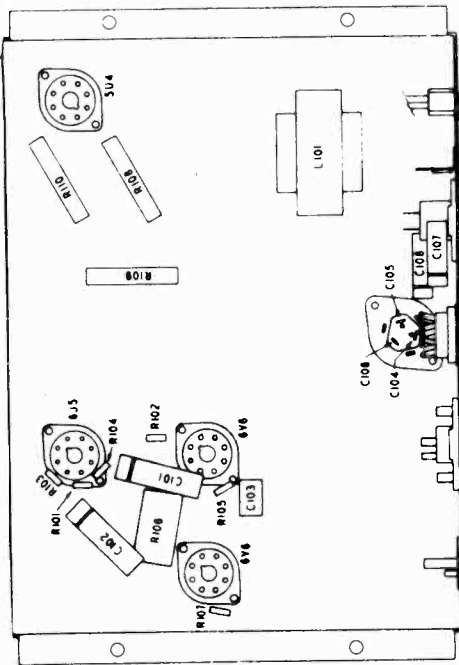
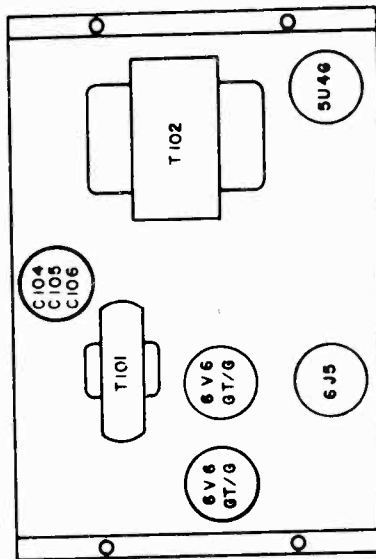


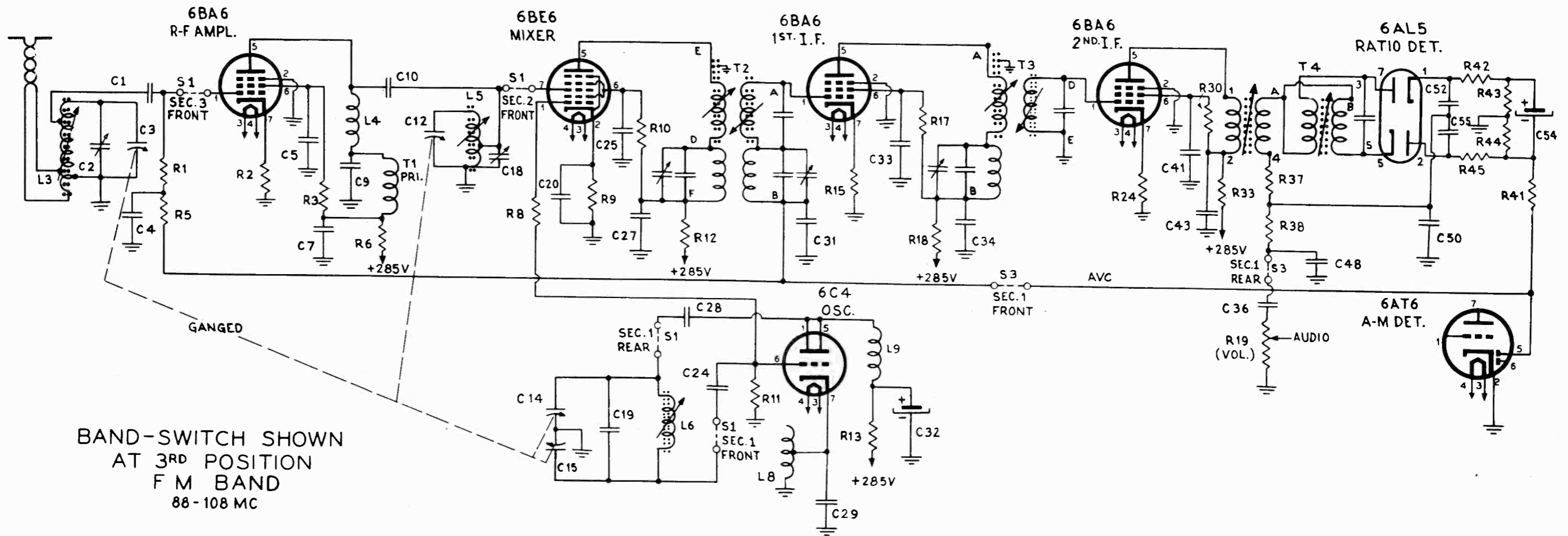
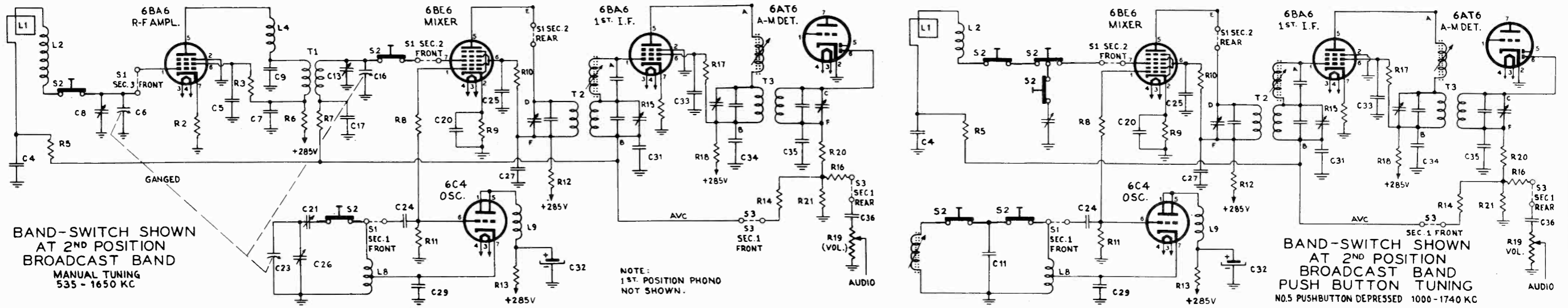
Fig. 4—Bottom of Power Supply Chassis



Power Supply Chassis

AUTOMATIC RECORD CHANGER

The automatic record changer used with this receiver is a Webster Model 56



NOTE

IT IS PARTICULARLY IMPORTANT THAT AM ALIGNMENT BE DONE BEFORE FM ALIGNMENT THIS IS TO AVOID POSSIBLE INTERACTION BETWEEN FM AND AM ADJUSTMENTS.

AM ALIGNMENT

I.F. ALIGNMENT:

1. Set tuning condenser on high frequency end of tuning range (minimum capacity)
2. Set band switch to AM position.
3. Depress Manual pushbutton.
4. Turn receiver on and let it warm up for fifteen minutes or longer in order to minimize drift effects.
5. Connect output meter across speaker voice coil and set meter on lowest range, but not below 2.5 volt scale.
6. Connect output of signal generator to stator of C16 (see schematic diagram and chassis layout) through a .1 mfd. condenser; connect ground side of generator directly to chassis of receiver. Set signal generator on 455 Kc modulated.
7. Adjust I.F. trimmers on T2 and T3 for maximum reading on the output meter. Keep the meter reading on the lower half of the scale.

(NOTE: The above mentioned trimmers are on the top of their respective I.F. cans and are not to be confused with the iron core adjustments also coming out of the tops of the FM IF cans. Keep the signal generator output low and the volume control on the receiver wide open during adjustment.)

R.F. ALIGNMENT:

After following the steps outlined above for I.F. alignment, proceed as follows:

1. Connect signal generator to "hot" side of loop through a .1 mfd condenser and a 400 ohm resistor in series.
2. Set signal generator to 1650 Kc (modulated) and adjust oscillator trimmer (C26) to signal frequency. (Tuning gang should be at minimum capacity setting for this adjustment).
3. Set signal generator to 535 Kc. (Modulated) and adjust oscillator padder (C21) to signal frequency. (Gang should be at maximum capacity setting for this adjustment).
4. Repeat steps 2 and 3 to insure correct adjustment.
5. Set signal generator to 1400 Kc. (modulated). Tune signal in by rotating condenser gang until signal is heard. Adjust trimmers C8 and C13 for maximum reading on output meter. Keep signal generator output low so that meter reading is on lower half of scale.

FM ALIGNMENT

I.F. ALIGNMENT:

1. Set band switch in the FM position.
2. Set tuning condenser to high frequency end of tuning range (minimum capacity).
3. Solder a 5,000 ohm 1/2 w. carbon resistor between terminals A and B of T2. Solder another 5,000 ohm 1/2 w. carbon resistor between terminals D and E of transformer T3. DO NOT USE WIRE WOUND RESISTORS.
4. Connect the negative side of a 20,000 ohm/volt D.C. voltmeter or vacuum tube voltmeter to point "X" on diagram. Connect the positive side of meter to ground.
5. Connect output of signal generator directly to stator of C12. Adjust signal generator to 10.7 Mc.
6. Adjust the tuning slugs on transformers T2 and T3 for maximum output. (Note: There are two slugs on each I.F. transformer, one on the top of the can and one on the bottom of the can under the chassis. It is desirable to make this adjustment with an insulated alignment screw driver.) While making the above adjustments, keep the output of the signal generator low so that the D.C. reading on the meter is always between 1/2 volt and 1 volt.
7. Adjust the iron slug on the top only of T4 for maximum reading on the meter as outlined in step 6 above.
8. Remove meter lead from point "X" and connect to point "Y". Set meter to most sensitive D.C. voltage range.
9. Adjust the iron slug on the bottom only of T4 for a zero reading on the meter. It will be noted that as this slug is adjusted the meter will go from a positive indication

to a negative indication. Proper adjustment is obtained when the meter is at the zero point between negative and positive swings of the meter. (CAUTION: This adjustment must be made with an insulated alignment screw driver).

NOTE

The above adjustments must be made in sequence and the operator should take particular care that the frequency setting on the signal generator is not touched during alignment. BE SURE THAT THE TWO 5,000 OHM RESISTORS ARE REMOVED FROM THE CIRCUIT AFTER I.F. ALIGNMENT IS COMPLETED. The above adjustments should be made on the basis of meter readings only and no attention should be paid to what is heard coming out of the speaker.

R.F. ALIGNMENT:

1. Set tuning condenser to 100 Mc on the dial.
2. Set band switch to FM position.
3. Connect DC voltmeter to point "X" as outlined above in step 4.
4. Connect output of signal generator to antenna terminals on receiver through 150-ohm carbon resistors. One resistor should be connected in series with the "hot" side of the signal generator and the other resistor should be connected in series with the ground side of the generator. Set signal generator on 100 Mc.
5. Adjust tuning slug on L6 for maximum indication on meter.
6. Set signal generator to 90 Mc.
7. Tune set by rotating gang condenser until meter reads maximum. Now adjust tuning slugs on L3 and L5 for maximum meter reading. While making the above adjustments keep the output on the signal generator low so that the meter reading is between 1/2 volt and 1 volt.
8. Set signal generator to 106 Mc.
9. Tune set by rotating gang condenser until meter reads maximum. Now adjust tubular trimmers C2 and C18 for maximum meter reading.
10. Repeat steps 6 through 9 inclusive twice for proper alignment.

CAUTION: The above adjustments should be made on the basis of meter readings only and no attention should be paid to what is heard coming out of the speaker.

PUSHBUTTON ADJUSTMENTS

The frequency ranges for the pushbuttons are given in figure 2. A layout of the pushbutton adjustments is shown in Figure 3. Note that in this figure, pushbutton number 1 is now to the extreme right, since the pushbutton assembly is being viewed from the rear. To make pushbutton adjustments, proceed as follows:

1. Turn the receiver on and let it warm up for fifteen minutes or longer in order to minimize drift effects.
2. Depress the DIAL pushbutton and tune in the station which is to be set on pushbutton number 1.
3. Now depress pushbutton number 1 and adjust tuning slug 1a and trimmer 1b (Figure 3) until the station is accurately tuned in again.



| PUSHBUTTON NO. | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------------------------|-----|-----|-----|------|------|------|
| FREQUENCY RANGE IN KILOCYCLES | 890 | 930 | 970 | 1010 | 1050 | 1090 |
| | 890 | 890 | 890 | 890 | 890 | 890 |

Figure 2—Pushbutton Frequencies

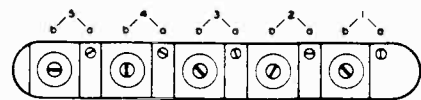


Figure 3—Pushbutton Adjustments

POWER SUPPLY CHASSIS

| Pin No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|---|---------|------|--------|------|--------|--------|---------|
| 6J5 | 0 | 0 | +190 | — | +65* | +80 | 6.3 AC | +85 |
| 6V6 | 0 | 0 | +310 | +285 | 0 | — | 6.3 AC | +16.5 |
| 6V6 | 0 | 0 | +310 | +285 | 0 | — | 6.3 AC | +16.5 |
| 5U4 | 0 | +335 | — | 370 AC | — | 370 AC | — | +335 |
| | | 5.0 AC★ | | | | | | 5.0 AC★ |

D.C. voltages measured with 20,000 ohm/volt meter.

A.C. voltages measured with 1000 ohm/volt meter.

*Measured with V.T.V.M. (subject to wide variations because of tubes and V.T.V.M. used).

All voltages measured with reference to chassis except as follows:

★Measured between pin numbers 2 and 8 on 5U4 socket.

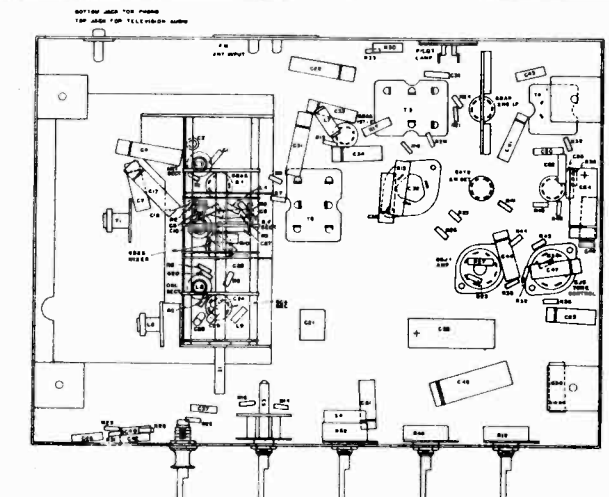
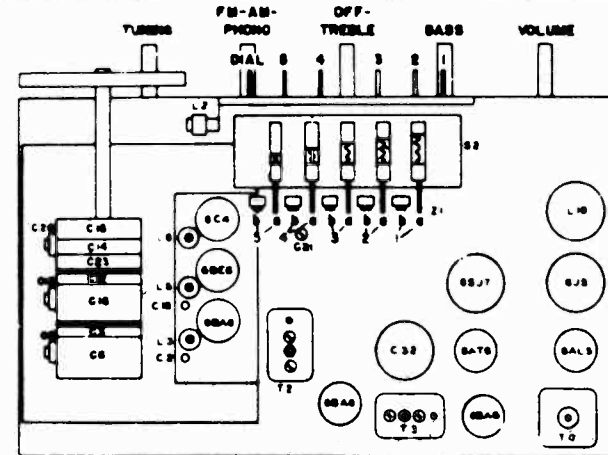
NOTE: Above readings are obtained with no signal input to receiver and band switch in phono position.

NORMAL OPERATING VOLTAGES

The following tables list the normal operating voltages to be expected at the various tube socket terminals.

TUNER CHASSIS

| Pin No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------------|------|-------|-------|------|------|------|------|------|
| 6BA6 (R.F.) | -4* | 0 | 6.3AC | 0 | +260 | +97 | +1.0 | — |
| 6BE6 (Conv.) | -14* | -4 | 6.3AC | 0 | +270 | +65 | -4* | — |
| 6C4 (Osc.) | +230 | — | 6.3AC | 0 | +230 | -14* | 0 | — |
| 6BA6 (1st I.F.) | -4* | 0 | 6.3AC | 0 | +260 | +97 | +1.0 | — |
| 6BA6 (2nd I.F.) | 0 | 0 | 6.3AC | 0 | +260 | +93 | +1.0 | — |
| 6AL5 Ratio Det. | +5* | -5* | 6.3AC | 0 | +25* | — | +25* | — |
| 6AT6 AM Det. | — | 0 | 6.3AC | 0 | -5* | -5* | — | — |
| 6S17 A.F. | 0 | 6.3AC | 0 | 0 | +1.0 | +23 | 0 | +155 |
| 6J5 Tone Control | 0 | 6.3AC | +180 | +230 | +40* | +44 | 0 | +50 |



Tuner Chassis

| SYMBOL | DESCRIPTION | HOFFMAN NO. | DESCRIPTION | HOFFMAN NO. |
|---------------------------------|------------------------------------|-------------|-------------------|------------------------------------|
| C1, C9, C10, C28, C35, C37 | 100 Mmf. ±10% Ceramic | 4012 | C49 | .5 Mfd. 200 Volt Tub. Paper |
| C2, C18 | 1 - 8 Mmf. Trimmer | 4315 | C54 | 5 Mfd. 50 Volt Electrolytic |
| C3, C6, C12, C14, C15, C16, C23 | 3 Sect. Variable with Split Stator | 4408 | C43 | 2300 Mmf. ±5% Mica |
| C4, C17, C22, C31 | .05 Mfd. 200 Volt Tub. Paper | 4100 | R1 | .27 Meg. ±20% 1/2 Watt |
| C5, C25 | 470 Mmf. ±20% Mica | 4003 | R2, R9, R15, R24 | 56 Ohm ±10% 1/2 Watt |
| C7, C30, C34, C44, C51, C53 | .01 Mfd. 400 Volt Tub. Paper | 4112 | R3, R10, R17, R30 | 33,000 Ohm ±20% 1 Watt |
| C8, C13, C26 | 1.8 - 30 Mmf. Trimmer | 4313 | R5, R7 | .1 Meg. ±20% 1/2 Watt |
| C11 | 500 Mmf. ±5% Silver Mica | 4004 | R6, R12, R18, R33 | 1500 Ohm ±20% 1/2 Watt |
| C19 | 50 Mmf. ±2% Ceramic | 4023 | R8 | 22 Ohm ±20% 1/2 Watt |
| C20 | 220 Mmf. ±20% Ceramic | 4026 | R11, R35, R36 | 22,000 Ohm ±20% 1/2 Watt |
| C21 | 110-560 Mmf. Trimmer | 4301 | R13 | 4700 Ohm ±20% 2 Watt |
| C24 | 22 Mmf. ±10% Ceramic | 4021 | R14 | 2.2 Meg. ±20% 1/2 Watt |
| C27 | 5000 Mmf. (Min.) Ceramic | 4029 | R16, R32 | 1 Meg. ±20% 1/2 Watt |
| C29 | 50 Mmf. ±20% Ceramic | 4031 | R19 | .5 Meg. Pot. (Volume) |
| C32 | 20 Mfd. 450 Volt Electrolytic | 4207 | R20, R38 | 47,000 Ohm ±20% 1/2 Watt |
| C33, C41 | .001 Mfd. 600 Volt Tub. Paper | 4104 | R21 | .68 Meg. ±20% 1/2 Watt |
| C36 | .02 Mfd. 400 Volt Tub. Paper | 4106 | R22 | 4.7 Meg. ±20% 1/2 Watt |
| C38 | 25 Mfd. 25 Volt Electrolytic | 4205 | R23, R34 | 2200 Ohm ±20% 1/2 Watt |
| C40, C46, C50, C52, C55 | 330 Mmf. ±5% Mica | 4010 | R25 | 22 Meg. ±20% 1/2 Watt |
| C42 | 650 Mmf. ±5% Mica | 4011 | R26 | .12 Meg. ±10% 1/2 Watt |
| C47 | .005 Mfd. 600 Volt Tub. Paper | 4102 | R27 | 15,000 Ohm ±20% 1/2 Watt |
| C48 | .002 Mfd. 600 Volt Tub. Paper | 4118 | R28, R31 | 47,000 Ohm ±10% 1/2 Watt |
| | | | R29 | 22,000 Ohm ±5% 1/2 Watt |
| | | | R37 | 120 Ohm ±10% 1/2 Watt |
| | | | R39 | .25 Meg. Pot. With Switch (Treble) |
| | | | R40 | 50,000 Ohm Pot. (Bass) |
| | | | 4110 | |
| | | | 4209 | |
| | | | 4006 | .47 Meg. ±20% 1/2 Watt |
| | | | 4545 | 390 Ohm ±10% 1/2 Watt |
| | | | 4561 | 6800 Ohm ±10% 1/2 Watt |
| | | | 4556 | Loop Antenna |
| | | | | Antenna Coil—Broadcast |
| | | | | L1 |
| | | | | L2 |
| | | | | L3 |
| | | | | L4, L9 |
| | | | | L5 |
| | | | | L6 |
| | | | | L7 |
| | | | | L8 |
| | | | | L10 |
| | | | | S1 |
| | | | | S2 |
| | | | | S3 |
| | | | | T1 |
| | | | | T2 |
| | | | | T3 |
| | | | | T4 |
| | | | | Z1 |

Bottom of Tuner Chassis

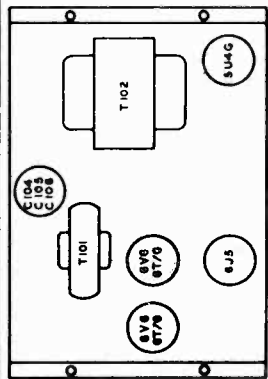
| | | |
|----------|-----------------------------|-------|
| R41 | .47 Meg. ±20% 1/2 Watt | 4506 |
| R42, R45 | 390 Ohm ±10% 1/2 Watt | 4549 |
| R43, R44 | 6800 Ohm ±10% 1/2 Watt | 4557 |
| L1 | Loop Antenna | 55210 |
| L2 | Antenna Coil—Broadcast | 5265 |
| L3 | Coil—F.M. Ant. | 5253 |
| L4, L9 | Coil—R.F. | 5254 |
| L5 | Coil—F.M. R.F. | 5252 |
| L6 | Coil—F.M. Osc. | 5251 |
| L7 | Coil—F.M. R.F. | 5266 |
| L8 | Coil—B.C. Osc. | 5263 |
| L10 | Choke—Bass | 5103 |
| S1 | Band Switch (R.F.) | 6014 |
| S2 | Pushbutton Switch Assem. | 6004 |
| S3 | Band Switch (Audio) | 6015 |
| T1 | Transformer—R.F. Interstage | 5264 |
| T2 | Transformer—1st I.F. | 5272 |
| T3 | Transformer—2nd I.F. | 5273 |
| T4 | Transformer—Ratio Detect. | 5270 |
| Z1 | Pushbutton Tuning Assembly | 55200 |

HOFFMAN RADIO CORP.

MODEL B504
Chassis 123

| SYMBOL | DESCRIPTION | HOFFMAN NO. |
|------------------|-------------------------------------|-------------|
| C101, C102 | 05 Mfd. 400 Volt, Tubular Paper | 4101 |
| C103 | 470 Mfd. 20%, Mica | 4003 |
| C104, C105, C106 | 20 Mfd. 25V, 20 Mfd. 450V. Electro. | 4200 |
| C107 | 100 Mfd. 50V, Tubular Paper | 4105 |
| C108 | 005 Mfd. 600 Volt, Tubular Paper | 4100 |
| C109 | 005 Mfd. 600 Volt, Tubular Paper | 4105 |
| R101, R114 | 1 Mca. 20% 1/2 Watt | 4513 |
| R102, R104 | 47000 Ohm 10% 1/2 Watt | 4559 |
| R103 | 2200 Ohm 20% 1/2 Watt | 4512 |
| R107, R111, R112 | 22 Mca. 20% 1/2 Watt | 4500 |
| R106 | 220 Ohm 20% 3 Watt W. W. | 4705 |
| R108, R109, R110 | 10,000 Ohm 10% 2 Watt | 4503 |
| R113 | 47 Mca. 20% 1/2 Watt | 4506 |
| R115 | 47 Mca. 20% 1/2 Watt | 4506 |
| T101 | Filter Choke, Transformer | 5116 |
| T102 | Power Transformer | 5009 |
| L5101 | Speaker—12" Electrodynamic | 5044 |

| SYMBOL | DESCRIPTION | HOFFMAN NO. |
|-------------|------------------------------------|-------------|
| C1 | 25 Mfd. 25 Volt, Electrolytic | 4203 |
| C3, C4 | 01 Mfd. 400 Volt, Electrolytic | 4102 |
| C5 | 01 Mfd. 400 Volt, Tubular Paper | 4102 |
| C6 | 005 Mfd. 600 Volt, Tubular Paper | 4106 |
| R1 | 2500 Ohm 20% 1/2 Watt | 4512 |
| R2 | 47000 Ohm 10% 1/2 Watt | 4515 |
| R3 | 47000 Ohm 10% 1/2 Watt | 4515 |
| R4 | 5 Megohm Pentaprocure | 4506 |
| R5 | 10 Megohm 20% 1/2 Watt | 4505 |
| R6 | 22 Megohm 20% 1/2 Watt | 4500 |
| R7 | 10 Ohm 20% 1/2 Watt Wire Wound | 4707 |
| R8, R9, R10 | 1.0 Megohm 20% 1/2 Watt | 4516 |
| R11 | 1 Megohm 20% 1/2 Watt | 4511 |
| S1 | Monitor on-off Switch (Part of R4) | 6003 |
| S2 | Recorder on-off Switch | 4708 |
| R12 | 5 Ohm 20% 1/2 Watt Wire Wound | 4708 |



Power Supply Chassis

RECORDER CHASSIS
 Microphone AMP 6S17
 Audio AMP 6SQ7
 Volume Level Indicator 6U5/6G5
 Power Supply 115 V.A.C. 50-60 C.P.S.
 Power Consumption (incl. Phono) 185 Watts
 Undistorted Audio Output 14 Watts

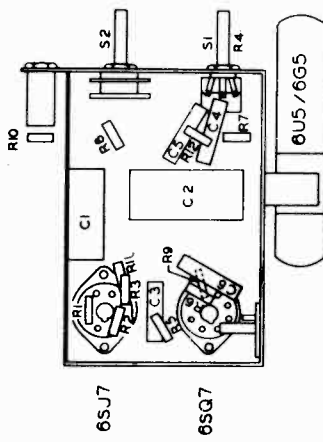
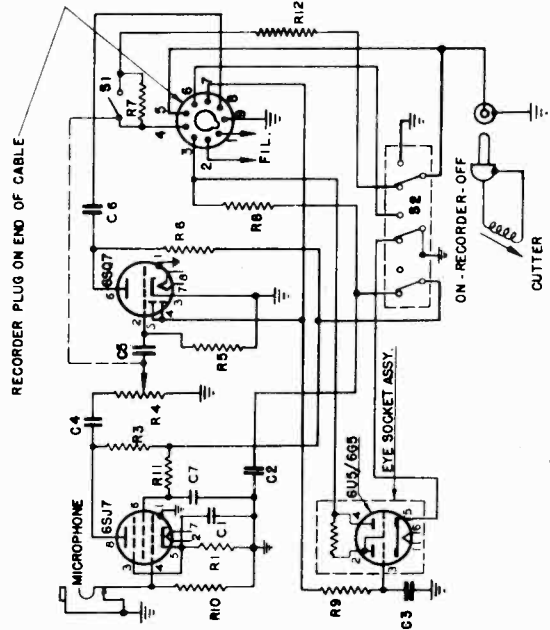
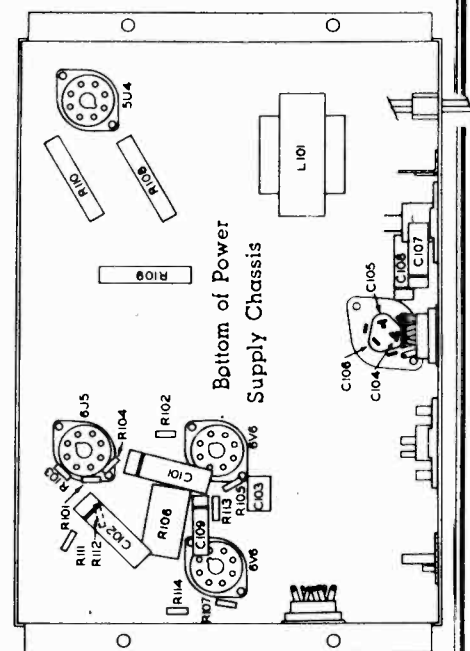


Fig. 6. Bottom of Recorder Chassis



Recorder Schematic Diagram

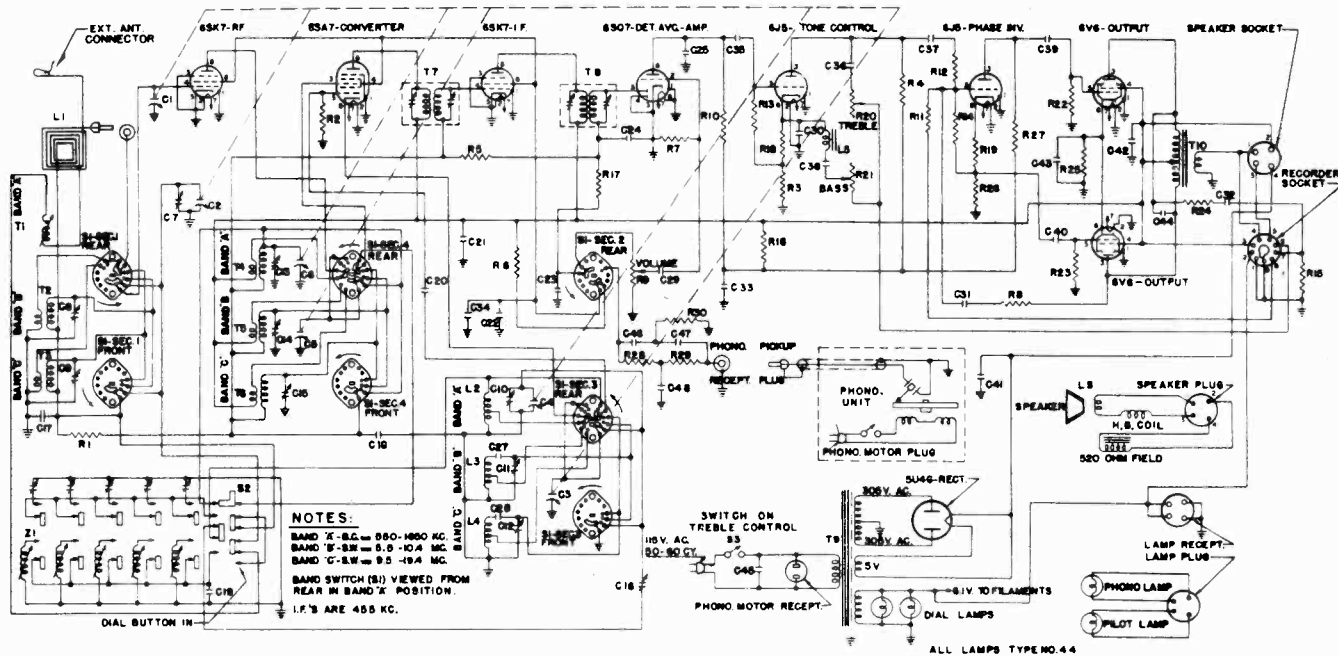


Power Supply Schematic Diagram

| RECORDER CHASSIS | | RECORDER CHASSIS | | | | | | |
|------------------|------|------------------|------|------|------|------|------|-------|
| Pin No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 6S17 | 0 | 33AC | +1.1 | 0 | +1.1 | +17 | 33AC | +49 |
| 6SQ7 | 0 | -4 | 0 | -5 | -5 | +100 | 33AC | 3.3AC |
| 6U5/6G5 | 33AC | +60 | -5 | +290 | 0 | 33AC | | |

All Voltages measured with reference to chassis with No Signal input.

MODEL B503, chassis 115 HOFFMAN RADIO CORP.



NORMAL OPERATING VOLTAGES

The following table lists the normal operating voltages to be expected at the various tube socket terminals.

(Tuner Chassis) **NORMAL OPERATING CURRENTS**

5U4G Cathode Current 115 Ma.
6V6 Cathode Current (both tubes) 70 Ma.

TUNER CHASSIS

| PIN NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|---|-----------------|------|--------|-----------|--------|--------|-----------------|
| 6SK7 (R.F.) | 0 | 0 | 0 | -1 | 0 | +95 | 6.2 AC | +290 |
| 6SA7 (Conv.) | 0 | 0 | +290 | +95 | -5 to -10 | 0 | 6.2 AC | -15 |
| 6SK7 (I.F.) | 0 | 0 | 0 | -15 | 0 | +95 | 6.2 AC | +290 |
| 6SQ7 | 0 | -2 | 0 | -25 | 0 | +75 | 6.2 AC | 0 |
| 6J5 (Tone) | 0 | 0 | +130 | 0 | +20 □ | 0 | 6.2 AC | +22 |
| 6J5 (Inverter) | 0 | 0 | +105 | 0 | +50 # | 0 | 6.2 AC | +43 |
| 6V6 | 0 | 0 | +290 | +290 | 0 | 0 | 6.2 AC | +17 |
| 6V6 | 0 | 0 | +290 | +290 | 0 | 0 | 6.2 AC | +17 |
| 5U4G | 0 | +350 5.2 AC* | 0 | 335 AC | 0 | 335 AC | 0 | +350 5.2 AC* |

DC voltages measured with 20,000 ohm/volt meter.
A.C. voltages measured with 1,000 ohm/volt meter.
Line voltage 117.

measured at junction of R13 and R16.
□ measured at junction of R15 and R17.

All voltages measured with reference to chassis except as follows:

* measured between pins 2 and 8; not to chassis.

NOTE The above readings are obtained with no signal input to receiver and band switch in position "A".

RECORDER CHASSIS

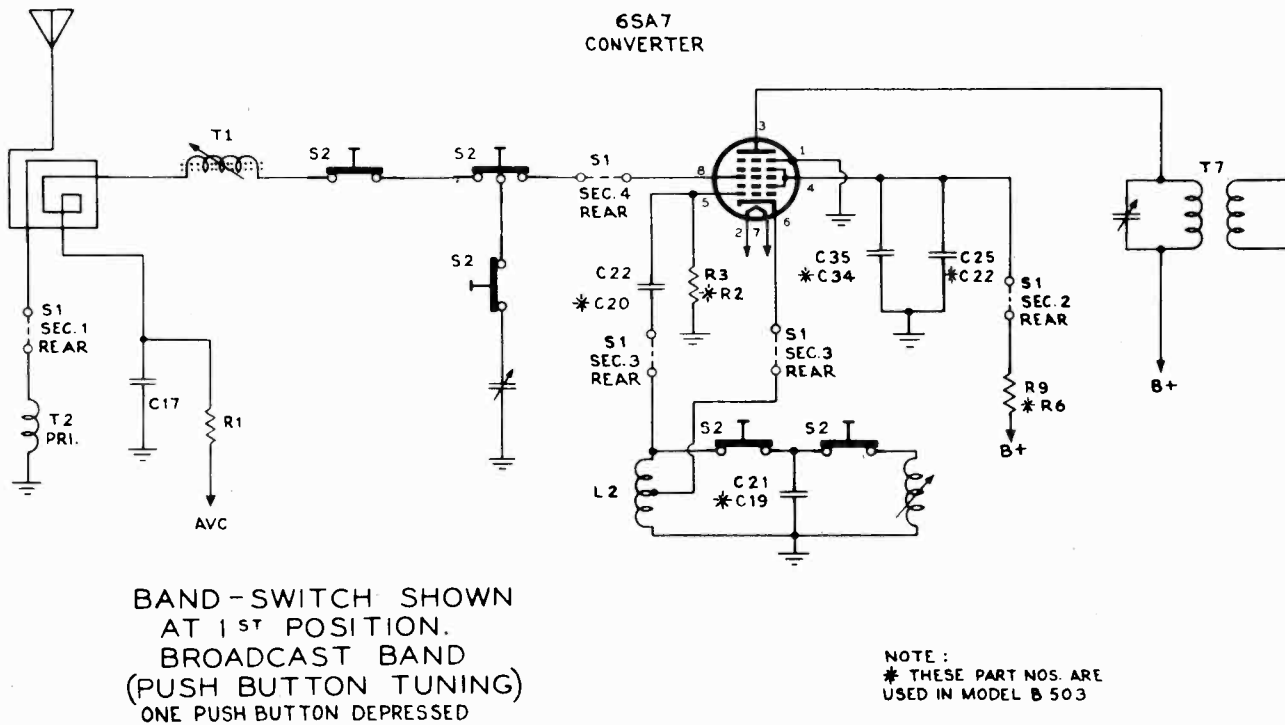
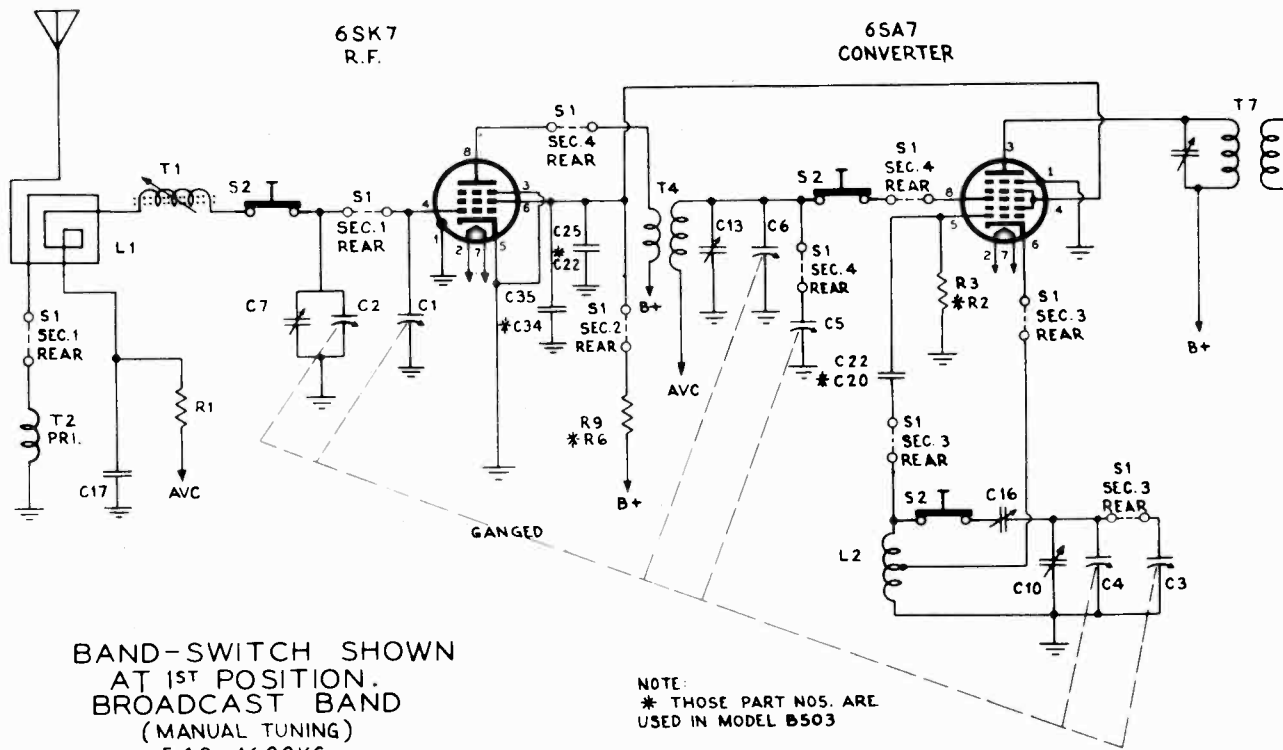
| Pin No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|--------|--------|----|------|----|-----|---|--------|
| 6SJ7 | 0 | 6.1 AC | +9 | 0 | +9 | +15 | 0 | +48 |
| 6SQ7 | 0 | -3 | 0 | -4 | -4 | +93 | 0 | 6.1 AC |
| 6U5/6G5 | 6.1 AC | +33 | -3 | +260 | 0 | 0 | 0 | 0 |

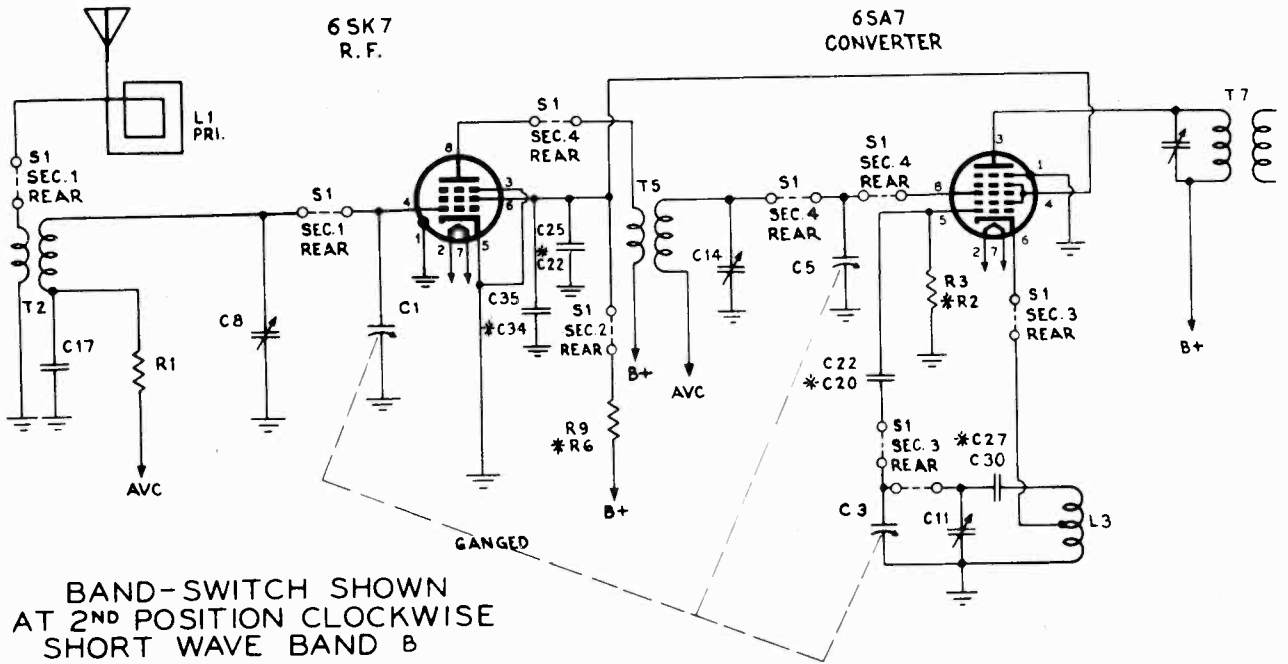
All voltages measured with reference to chassis with no signal input.

"clarified schematics"

MODELS B503,
B1000

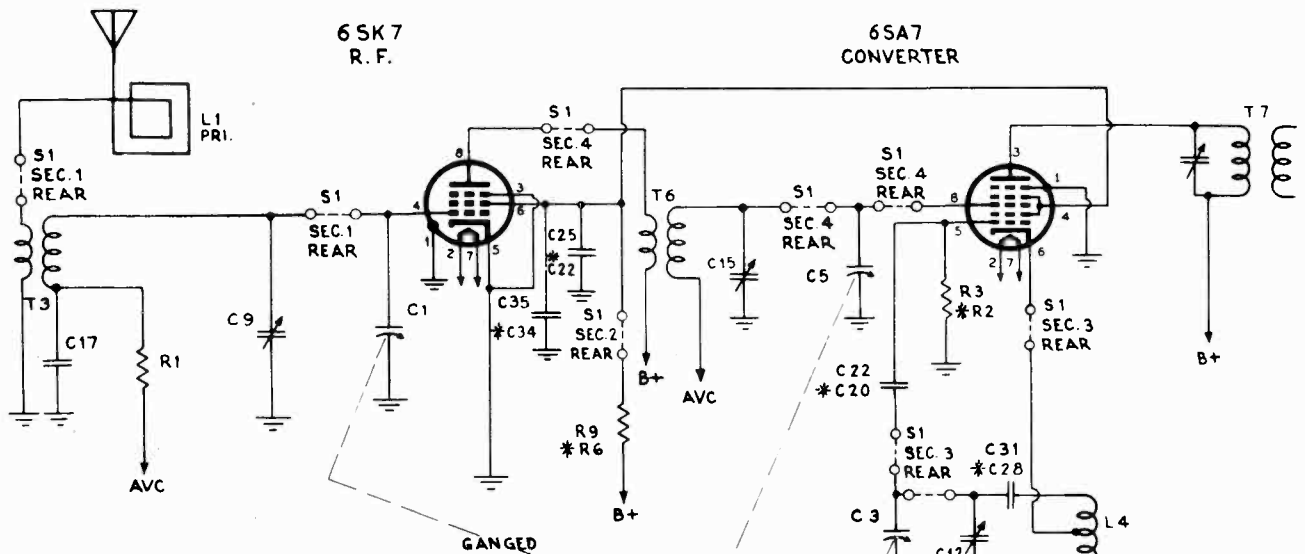
HOFFMAN RADIO CORP.





BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
SHORT WAVE BAND B
5.6 - 10.4 MC.

NOTE:
* THOSE PART NOS. ARE
USED IN MODEL B503

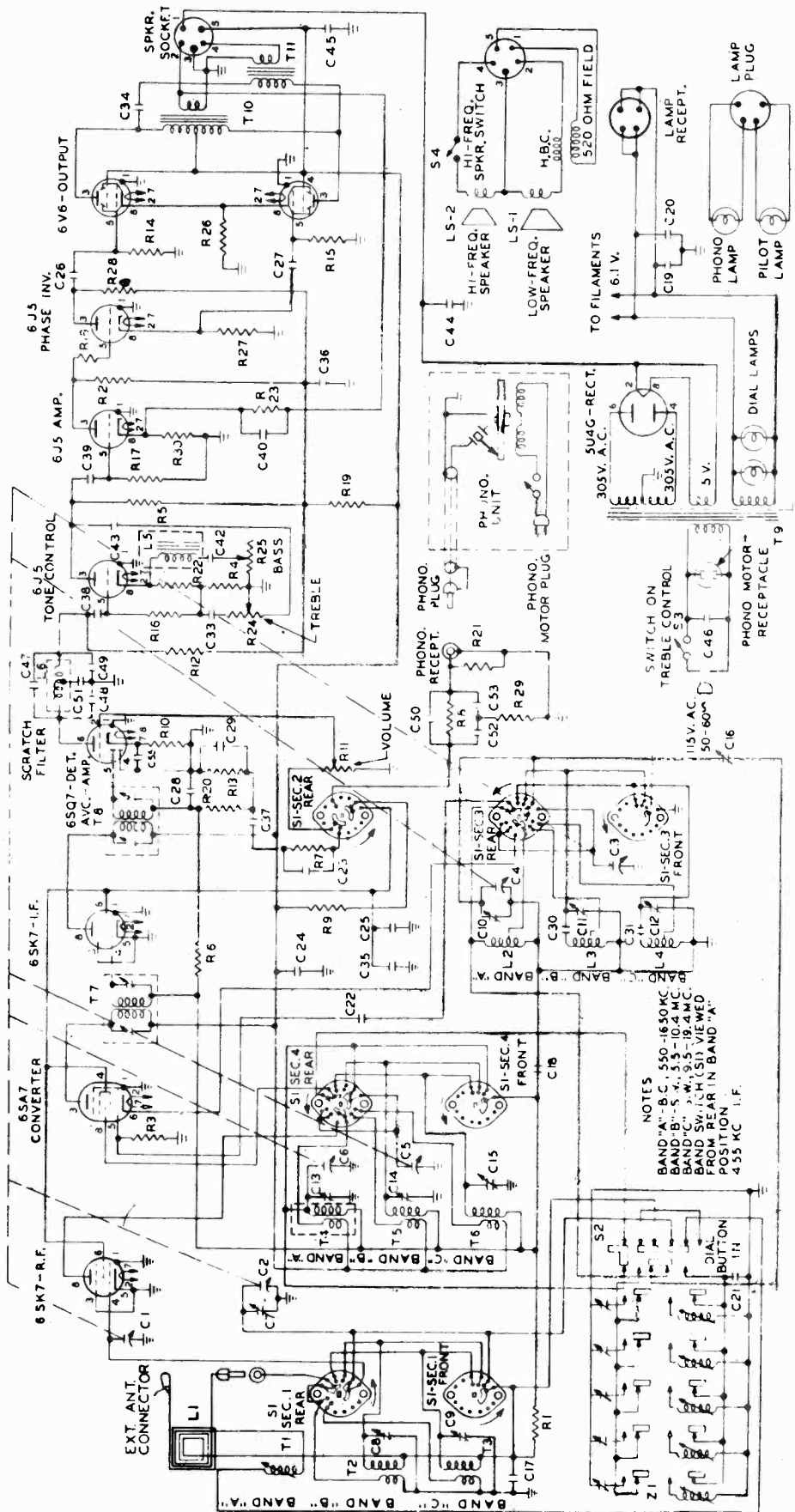


BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE
SHORT WAVE BAND C
9.4 - 19.4 MC.

NOTE:
* THOSE PART NOS. ARE
USED IN MODEL B503

HOFFMAN RADIO CORP.

MODEL B1000,
Chassis 114



ALL LAMPS
TYPE NO. 44

HOFFMAN RADIO CORP.

MODEL B1000

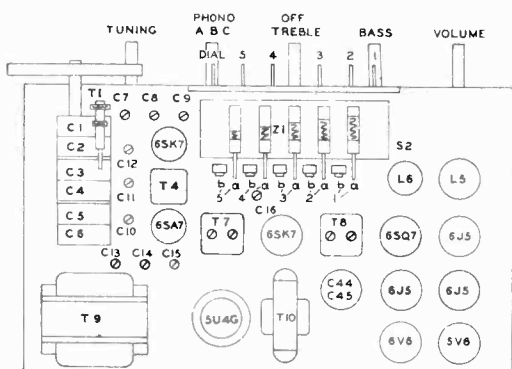
NORMAL OPERATING VOLTAGES

The following table lists the normal operating voltages to be expected at the various tube socket terminals.

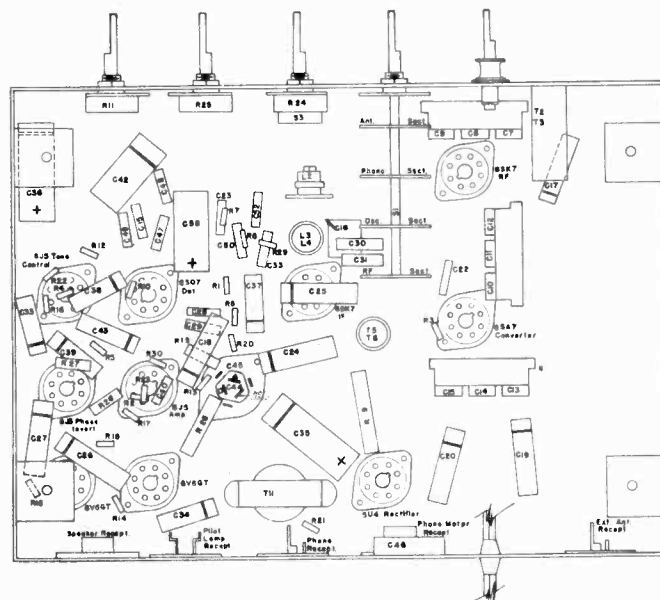
| PIN NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------|---|--------|------|--------|------|--------|--------|--------|
| 6SK7 | 0 | 6.2 AC | 0 | -4 | 0 | +103 | 6.2 AC | +270 |
| 6SA7 | 0 | 6.2 AC | +270 | +103 | -5.3 | 0 | 6.2 AC | -3 |
| 6SK7 | 0 | 6.2 AC | 0 | -3 | 0 | +103 | 6.2 AC | +270 |
| 6SQ7 | 0 | 0 | +8 | -2.3 | 0 | +103 | 6.2 AC | 6.2 AC |
| 6J5 (Tone) | 0 | 6.2 AC | +113 | 0 | +7 | +30 | 6.2 AC | +6.8 |
| 6J5 (Audio) | 0 | 6.2 AC | +22 | 0 | 0 | +125 | 6.2 AC | +1.1 |
| 6J5 (Inv.) | 0 | 6.2 AC | +102 | 0 | +4 | 0 | 6.2 AC | +26 |
| 6V6GT | 0 | 6.2 AC | +260 | +270 | 0 | 0 | 6.2 AC | +16 |
| 6V6GT | 0 | 6.2 AC | +260 | +270 | 0 | 0 | 6.2 AC | +16 |
| Su4G | 0 | +340 | 0 | 310 AC | 0 | 310 AC | +103 | +340 |

D.C. voltages measured with 20,000 ohm/volt meter.
A.C. voltages measured with 1.00 ohm/volt meter.
Line voltage 117.
All voltages measured with reference to chassis.

NOTE: The above readings are obtained with no signal input to receiver and band switch in position "A".



Top of Chassis



Bottom of Chassis

| SYMBOL | DESCRIPTION | HOFFMAN No. |
|-----------------------|---|-------------|
| C1, C2, C3-C4, C5, C6 | Three-Section Variable with Split Stator—160-260, 160-260, 160-260 Mmf. | 4403 |
| C7, C8, C9 | Three-Section Trimmer Assembly—Ant. | 4300 |
| C10, C11, C12 | Three-Section Trimmer Assembly—Osc. | 4300 |
| C13, C14, C15 | Three-Section Trimmer Assembly—B.F. | 4300 |
| C16 | 110-560 Mmf., Padder, Band "A" | 4301 |
| C17, C18, C19, C20 | 05 Mfd., 200 Volt, Tubular Paper | 4100 |
| C21 | 500 Mmf., 5% Silver Mica | 4004 |
| C22 | 47 Mmf., 10% Mica | 4007 |
| C24, C25, C26, C27 | 05 Mfd., 100 Volt, Tubular Paper | 4101 |
| C28, C29, C29 | 100 Mmf., 20% Mica | 4000 |
| C30 | 1050 Mmf., 5% Mica | 4005 |
| C31 | 2300 Mmf., 5% Mica | 4006 |
| C33, C34 | 005 Mfd., 600 Volt, Tubular Paper | 4102 |
| C35, C36 | 10 Mfd., 450 Volt, Tubular Electrolytic | 4203 |
| C37, C39 | 01 Mfd., 400 Volt, Tubular Paper | 4112 |
| C40 | 470 Mmf., 20% Mica | 4003 |
| C42 | 2 Mfd., 200 Volt, Tubular Paper | 4108 |
| C43 | 02 Mfd., 400 Volt, Tubular Paper | 4106 |
| C44, C45 | 20-20-20 Mfd., 450-25V, Electrolytic | 4200 |
| C46 | 01 Mfd., 600 Volt, Tubular Paper—Metal Can | 4105 |
| C47, C48, C49, C50 | 330 Mmf., 5% Mica | 4010 |
| C51 | 650 Mmf., 5% Mica | 4011 |
| C52, C53 | 1500 Mmf., 5% Mica | 4016 |
| C58 | 001 Mfd., 600 Volt, Tubular Paper | 4104 |
| L1 | Loop Antenna Assembly | 55210 |
| L2 | Oscillator Coil (Band "A") | 5215 |
| L3, L4 | Oscillator Coil (Bands "B" and "C") | 5218 |
| L5 | Choke Bass Boost | 5113 |
| LS-1 | 12" Loudspeaker, Electrodynamic, Bass | 9036 |
| LS-2 | 5" Loudspeaker, P.M., Hi-Frequency | 9035 |
| R1 | 1 Megohm 20% 1/2 Watt | 4511 |
| R3, R4 | 22,000 Ohm 20% 1/2 Watt | 4501 |
| R6, R8 | 2.2 Megohm 20% 1/2 Watt | 4502 |
| R9 | 10,000 Ohm 10% 2 Watt | 4503 |
| R10, R22 | 2,200 Ohm 20% 1/2 Watt | 4512 |
| R11 | 5 Megohm Potentiometer—Volume Control | 4804 |
| R2, R13, R14, R15 | 22 Megohm 20% 1/2 Watt | 4500 |
| R16, R17, R7 | 1 Megohm 20% 1/2 Watt | 4513 |
| R19 | 47,000 Ohm 20% 1 Watt | 4516 |
| R20, R12 | 47,000 Ohm 20% 1/2 Watt | 4504 |
| R18 | 4.7 Megohm 20% 1/2 Watt | 4514 |
| R23, R5 | 10,000 ohm 20% 1/2 Watt | 4515 |
| R24 | 25 Meg. Pot with Switch—Treble Control | 4805 |
| R25 | 50,000 Ohm Potentiometer—Bass Control | 4806 |
| R26 | 220 Ohm 20% 3 Watt | 4519 |
| R27, R28, R29 | 47,000 Ohm 5% 1/2 Watt | 4537 |
| R30 | 4700 Ohm 20% 1/2 Watt | 4543 |
| S1 | Band Change Switch | 6005 |
| S2 | Pushbutton Switch Assembly | 6004 |
| S3 | On-Off Switch (on treble Control) | |
| T1 | Antenna Coil (Band "A") | 5220 |
| T2, T3 | Antenna Coil (Bands "B" and "C") | 5217 |
| T4 | R.F. Coil, Shielded (Band "A") | 5216 |
| T5, T6 | R.F. Coil (Bands "B" and "C") | 5219 |
| T7 | Input I.F. Transformer | 5213 |
| T8 | Output I.F. Transformer | 5214 |
| T9 | Power Transformer | 5001 |
| T10 | Audio Output Transformer—Bass Speaker | 5115 |
| T11 | Audio Output Transformer—Hi-Frequency Spr. | 5100 |
| Z1 | Pushbutton Tuning Assembly | 55200 |
| L6 | Scratch Filter Choke | 5114 |
| S4 | Speaker Switch, Hi-Frequency | 6001 |
| C55 | 25 Mfd. 25 Volt, Electrolytic | 4205 |
| R21 | 47 Meg. 20% 1/2 Watt | 4506 |

SPECIFICATIONS

TUNING RANGES:
 Band "A" 540 Kc to 1600 Kc
 Band "B" 5.6 Mc to 10.4 Mc
 Band "C" 9.4 Mc to 19.4 Mc
 Intermediate Frequency 455 Kc
 Power Supply 115 V. A.C. 50-60 C.P.S.
 Power Consumption (incl. phono.) 127 Watts
 Undistorted Audio Output 12 Watts

NORMAL OPERATING CURRENTS

SU4G Cathode Current 115 Ma
 6V6 Cathode Current (both tubes) 70Ma



| PUSHBUTTON NO. | 1 | 2 | 3 | 4 | 5 |
|-------------------------------|------------|------------|------------|------------|--------------|
| FREQUENCY RANGE IN KILOCYCLES | 890 TO 990 | 890 TO 990 | 870 TO 970 | 850 TO 950 | 1880 TO 1700 |

Pushbutton Frequencies

AUTOMATIC RECORD CHANGER

The automatic record changer used with this receiver is a Webster Model 56.

CAUTION:

No alignment adjustments should be attempted without first thoroughly checking over all other possible causes of trouble such as defective tubes, resistors, and condensers.

MODELS 472C, 472F
MODELS 472AC, 472AF

HOWARD RADIO CO

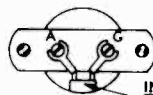
ALIGNMENT CHART USING MODULATED GENERATOR

| SEE DUMMY GEN. CHART | SIG. GEN. CONNECTION | GEN. FREQ. | BAND SW. POSITION | DIAL SETTING | ORDER OF SLUG AND TRIMMER ADJUSTMENTS | TRIMMER OR SLUG FUNCTION | SEE NOTES BELOW |
|----------------------|--|------------|-------------------|--------------|---------------------------------------|----------------------------|-----------------|
| 2 | Point ① on Circuit Diagram | 455 KC. | AM | Gang Closed | ① ② ③ ④ Green Dots | A.M.I.F. | A & B |
| 1 | Ant. Post at rear of chassis, loop connected | 1400 KC. | AM | 1400 KC. | ⑤ ⑥ | A.M. - Osc. and R.F. Trim. | C & D |
| 2 | Point ① on Circuit Diagram | 10.7 MC. | FM | Gang Closed | ⑦ | F.M. Det. Adj. | E & F |
| 2 | Point ① on Circuit Diagram | 10.7 MC. | FM | Gang Closed | ⑧ Adjust to zero Voltage | F.M. Det. Adj. | G |
| 2 | Point ① on Circuit Diagram | 10.7 MC. | FM | Gang Closed | ⑨ ⑩ ⑪ ⑫ ⑬ (Red Dots) | F.M. - I.F. | H |
| 3 | Ant. and Grd. Back of Chassis | 105 MC. | FM | 105 MC. | ⑭ ⑮ | Osc. and R.F. F.M. | I & J |
| 3 | Ant. and Gnd. Back of Chassis | 90 MC. | FM | 90 MC. | ⑯ | F.M. - R.F. Ind. Adj. | K & L |
| 3 | Ant. and Gnd. Back of Chassis | 101 MC. | FM | 101 MC. | ⑰ | F.M. Ind. Adj. | M |

POWER SUPPLY: (Standard Models) 105-120 V. 60 cycle. Consumption 65 watts 18 watts phono motor.

ANTENNA SYSTEM: Built in loop for AM reception. Built in FM dipole. In sections remote from broadcast stations an external antenna from 25 to 100 feet long and connected to the (A) terminal on the back of the receiver may improve pickup. If FM Reception is other than local or interference is experienced on the FM Band an outside dipole is recommended, in which case the FM Ant. will act as broadcast aerial.

ANTENNA AND GROUND TERMINALS



INTERNAL FM ANTENNA
CONNECT TO A & G.

FOR EXTERNAL DIPOLE ANTENNA —
DISCONNECT INTERNAL ANTENNA
AND CONNECT TRANSMISSION
LINE TO A & G.

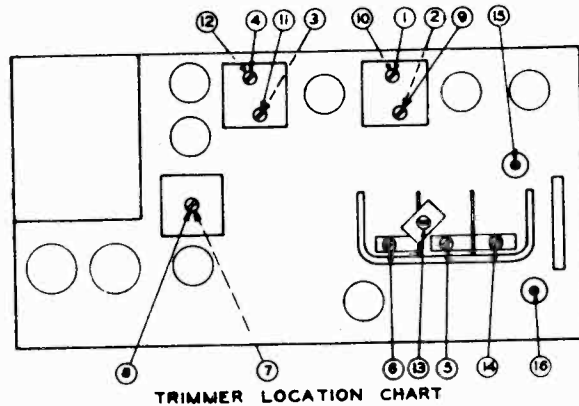
TUNING RANGES:

AM - 535. to 1650. KC.
FM - 88. to 108. MC.

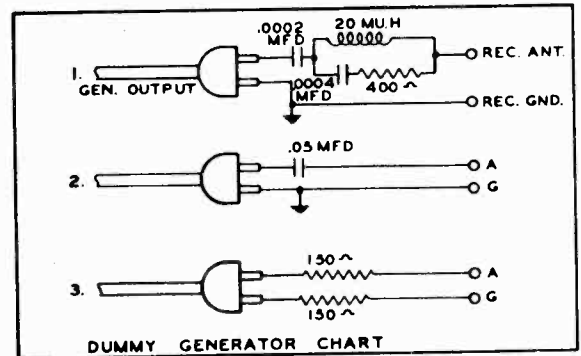
POWER OUTPUT: Max. 4½ watts. U.P.O. 3 watts.

HOWARD RADIO CO

MODELS 472C, 472F
MODELS 472AC, 472AF



TRIMMER LOCATION CHART



DUMMY GENERATOR CHART

ALIGNMENT NOTES

- A. Low voltage AC voltmeter across voice coil.
- B. Repeat operation until no further improvement can be found.

- C. Before adjusting set pointer on heavy gold line below 560 KC. with gang closed.
- D. Check complete dial for sensitivity and calibration.

- E. Signal generator modulation off and turned up to about 100,000 microvolts.
- F. Connect electronic volt meter (equivalent to voltohmmist) at point E on the wiring diagram and turn slug (7) on trimmer location chart to extreme counter clockwise position. Turn clockwise to 1st peak and adjust to maximum.

- G. Turn slug (8) to extreme counter clockwise position. Connect electronic voltmeter to Point F on wiring diagram and turn slug (8) until voltmeter is to zero voltage. Repeat adjustments given in notes F & G until no further improvement can be made.

- H. Connect voltmeter to point E and generator at point C. Adjust (9) (10) (11) (12) then retrim (7). Move voltmeter to post F and recheck zero voltage (retrim if necessary). These adjustments should be made with input signal necessary to produce approximately .7 volts at point E.

- I. Change generator dummy as shown on dummy antenna chart picture 3, and modulation on.
- J. Use meter across voice coil if using RF generator, but use AVC voltage if working with AM generator.

- K. Should 90 MC. signal not fall in at 90 MC. on the dial, adjust F.M. Osc. Coil to correct calibration. It is only necessary to slightly press together or open spacing on one turn to do so. Now adjust slug (15).
- L. Repeat adjustments (13) (14) and then (15) until no further improvement can be made.

- M. Adjust (16) for maximum sensitivity.

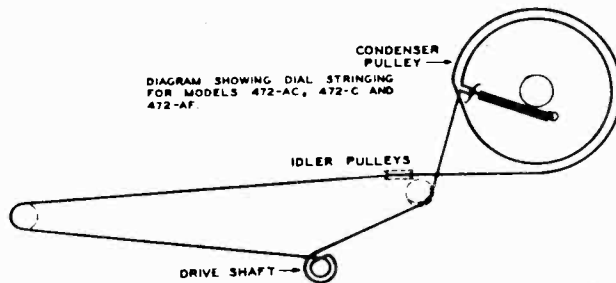


DIAGRAM SHOWING DIAL STRINGING FOR MODELS 472-AC, 472-C AND 472-AF

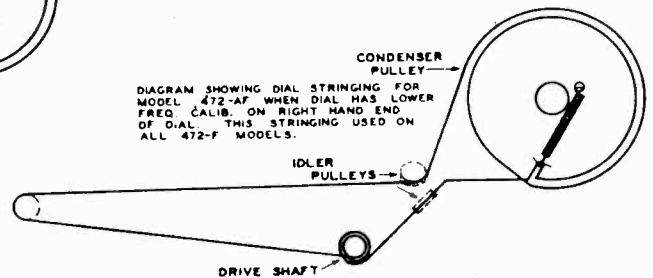


DIAGRAM SHOWING DIAL STRINGING FOR MODEL 472-AF WHEN DIAL HAS LOWER FREQ CALIB. ON RIGHT HAND END OF DIAL. THIS STRINGING USED ON ALL 472-F MODELS.

DIAL STRINGING

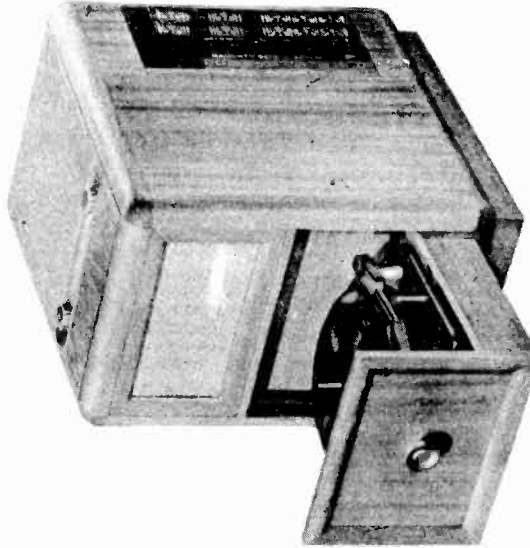
MODELS 472C, 472F
MODELS 472AC, 472AF

HOWARD RADIO CO

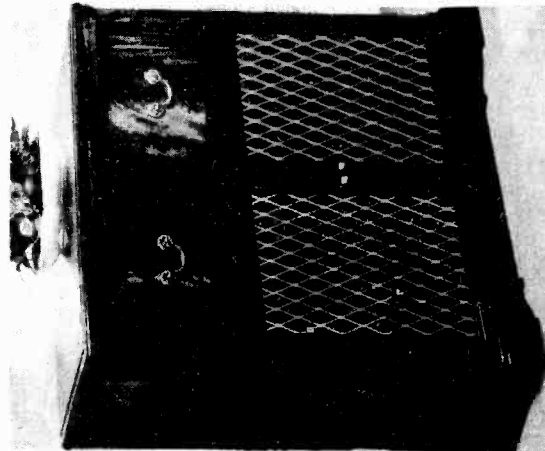
TO REMOVE CHASSIS FROM REGENCY CABINET: Remove both control knobs. Take out the 4 wood screws near the edge of the top panel. Lift off wood panel. Remove 4 machine screws in chassis bracket. With drawer pulled out, remove 2 machine screws found on the bottom of the drawer. Remove back from radio. Pull out plugs from rear of chassis. Chassis is then free to be lifted out.

TO REMOVE CHASSIS FROM CHAIRSIDE CABINET: Take knobs off volume control and tuning control by loosening set screws. Remove the wood screws that are located inside the record storage space at the top rear of cabinet. The entire top panel lifts out by pushing upward (inside the storage space), and then remove panel by lifting to the rear of the cabinet. After the panel is removed it is easy to see the mounting nuts that hold the chassis.

TO REMOVE DRAWER: Pull the drawer out to its full extremity. Place your hands* (one on each side) beneath the drawer about 3 inches from the back and feel along the track until you hit two little metal flaps that are the stops for the drawer. Lift these up with your index fingers and the drawer can then be pulled right out of the cabinet.



MODELS
472C and 472AC



MODELS
472F and 472AF

HOWARD RADIO CO

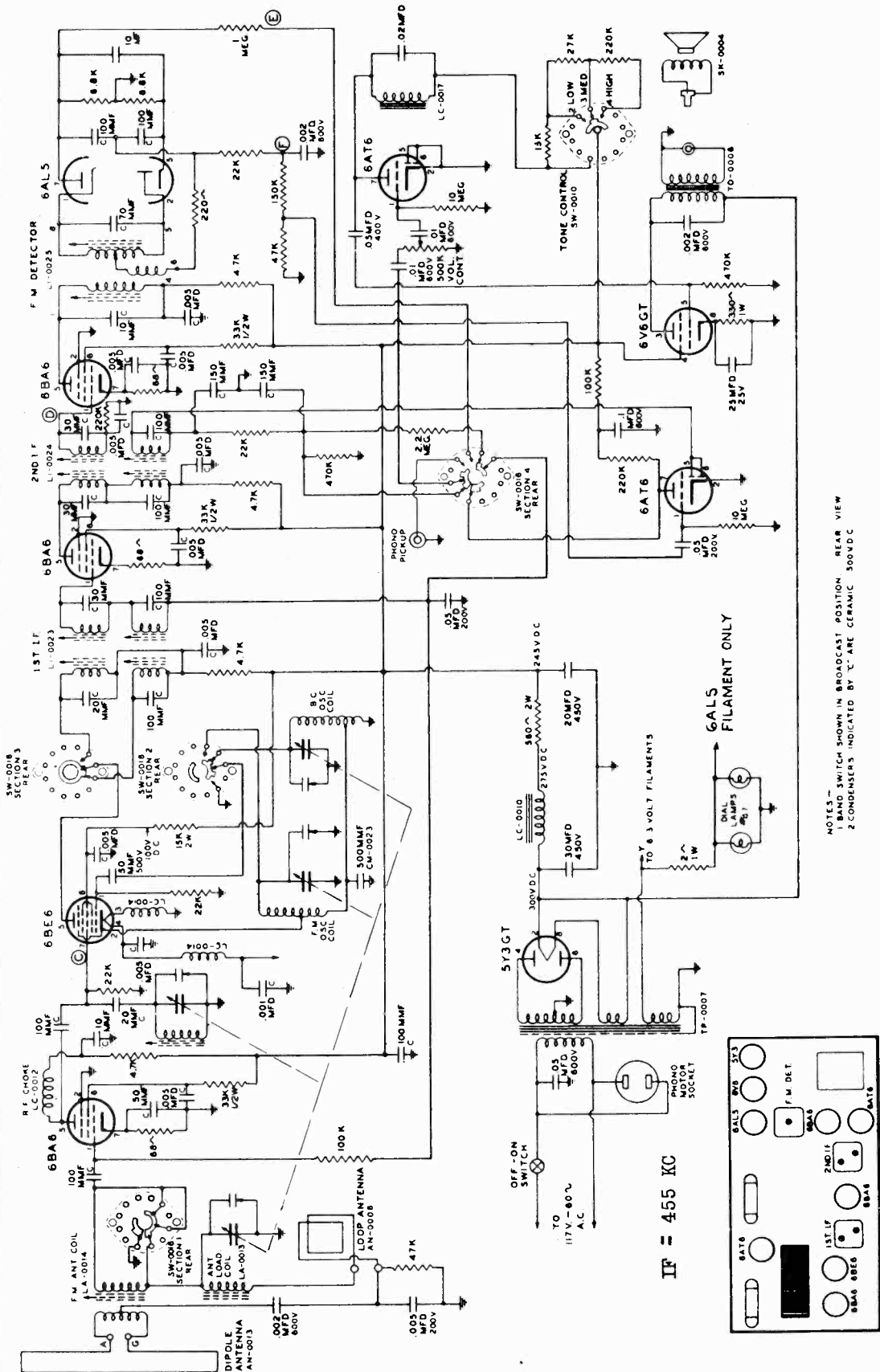
MODELS 472C, 472F
MODELS 472AC, 472AF

PARTS LIST

| | | |
|------------------------------|---|---|
| CONTROL | | |
| VC-0005 | Volume Control with AC Switch or | KNOBS--Continued |
| VC-0006 | Volume Control With AC Switch | KB-0015-1 Knob-tuning & Volume (Mahogany) for C & F |
| | | KB-0015-3 Knob-Tuning & Volume (Blonde) for C |
| CONDENSERS | | |
| AC-0008 | Variable Condenser with Gear & Hub Assy. | KB-0014-1 Knob for Drawer (Mahogany) for C KB-0014-2 Knob for Drawer (Blonde) for C |
| CE-0009 | Capacitor-Electrolytic 30-20 Mfd 450 V., 25 Mfd. 25 V. | HW-0005 Drawer Pull } For F cabinet HW-0006 Knob for Doors } |
| CE-0018 | Capacitor-Electrolytic 8Mfd. 25 V. | |
| CC-0034 | 5000 M.M.F.D. Round Wafer con- denser marked Green-Black-Red | SPEAKER |
| or | | SK-0004 Speaker 9" Elliptical P.M. |
| CC-0024 | 5000 M.M.F.D. | |
| | | TRANSFORMER |
| | | TO-0008 Speaker output Transformer |
| | | LC-0010 Power Choke - 500 Ohm D.C. |
| | | TP-0007 Power Transformer - 60 Cycle 110 V. |
| | | LC-0017 Bass Boost Audio Choke - for 472A only |
| COILS | | |
| AN-0013 | Built in dipole antenna F.M. | |
| AN-0006 | Loop Antenna (Low Impedance) | |
| LI-0023 | 1st I.F. Transformer | |
| LI-0024 | 2nd I.F. Transformer | |
| LI-0025 | Discriminator Transformer | |
| LO-0014 | Oscillator Coil for A.M. | |
| LO-0023 | Oscillator Coil for F.M. | SO-0017 Tube Sockets |
| LA-0013 | Antenna Loading Coil for A.M. | SO-0013 Miniature Tube Sockets |
| LA-0014 | Antenna Loading Coil for F.M. | SO-0010 Phono and Speaker Sockets (female) |
| LR-0007 | R.F. Coil Assy for F.M. | TL-0005 Phono and Speaker Plug (male) |
| LC-0012 | R.F. Choke Coil | TB-0008 Terminal Strip (External Antenna & Ground) |
| LC-0013 | F.M. Antenna Choke | |
| DIAL AND CONTROL ACCESSORIES | | |
| AS-0213 | Tuning Shaft Assy | |
| AS-0217 | Dial Pointer Assy | SW-0016 Phono B'cast and F.M. Switch (4 gang 3 pos) |
| AR-0019 | Dial Light Bracket Assy (right side) | SW-0010 Tone Switch (3 position) |
| AR-0024 | Dial Light Bracket Assy (left side) | |
| SP-0010 | Dial Drive Spring | |
| DC-0001 | Dial Cord 51" long | CABINET |
| DG-0017 | Dial Scale (Low Freq. at right side) | CW-0009-1 Cabinet (Mahogany) CW-0009-2 Cabinet (Blonde) |
| DG-0019 | Dial Scale (Low Freq. at left side) | AA-0008-1 Drawer Sub-assy (Mahogany) AA-0008-2 Drawer Sub-assy (Blonde) |
| LS-0002 | #44 Blue Bead Pilot Lamp | AW-0015 Carriage Assy |
| ES-0004-1 | Metal Escutcheon (Mahogany) | CW-0007 Cabinet - Regency Style |
| ES-0004-2 | Metal Escutcheon (Blonde) | AA-0027 Radio Drawer Sub-Assy (for Regency) |
| ES-0004-3 | Metal Escutcheon (Mahogany) for 472F and 472AF | AA-0026 Drawer-Sub Assy (for Regency) AA-0025 Door Sub-Assy (for Regency) BP-0087 Cabinet back |
| KNOBS | | |
| AR-0042 | Thumb Wheel Assy (Tone Control) | |
| AR-0058 | Thumb Wheel Assy (Phono-B'cast- F.M.) | |
| AR-0025 | Thumb Wheel Assy (Tone Control) for A.F. | CA-0039 Line Cord- 8 Ft and moulded plug CA-0043 Line Cord & Plug 42" long for record changer motor |
| AR-0065 | Thumb Wheel Assy (Phono-B'cast- F.M.) for A.F. | CA-0053 Antenna Jumper - 300 Ohm line |

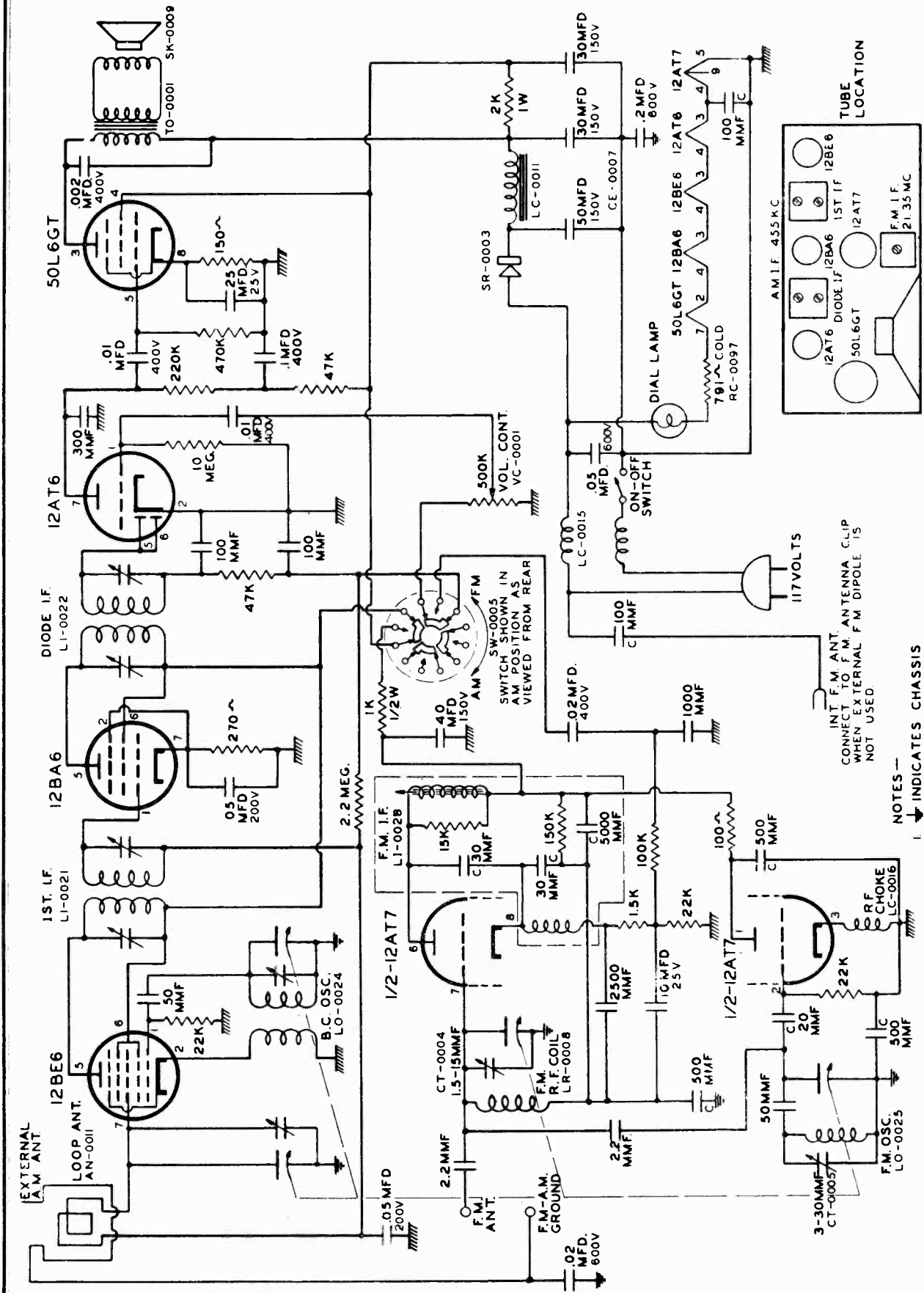
MODELS 472AC, 472AF

HOWARD RADIO CO



NOTES -
 1 BAND SWITCH SHOWN IN BROADCAST POSITION REAR VIEW
 2 CONDENSERS INDICATED BY "C" ARE CERAMIC 500VDC

For alignment procedure and other data see Models 472C, 472F,
 pages 17-4 through 17-7

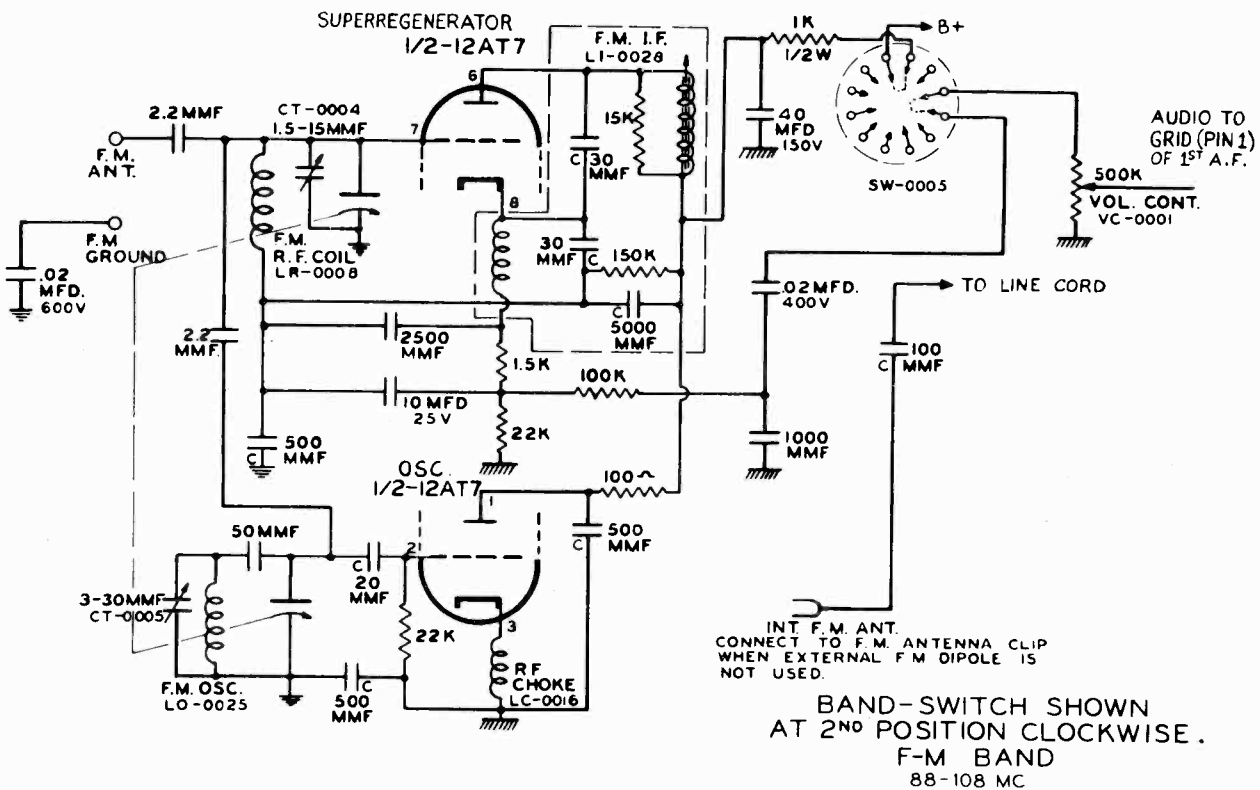
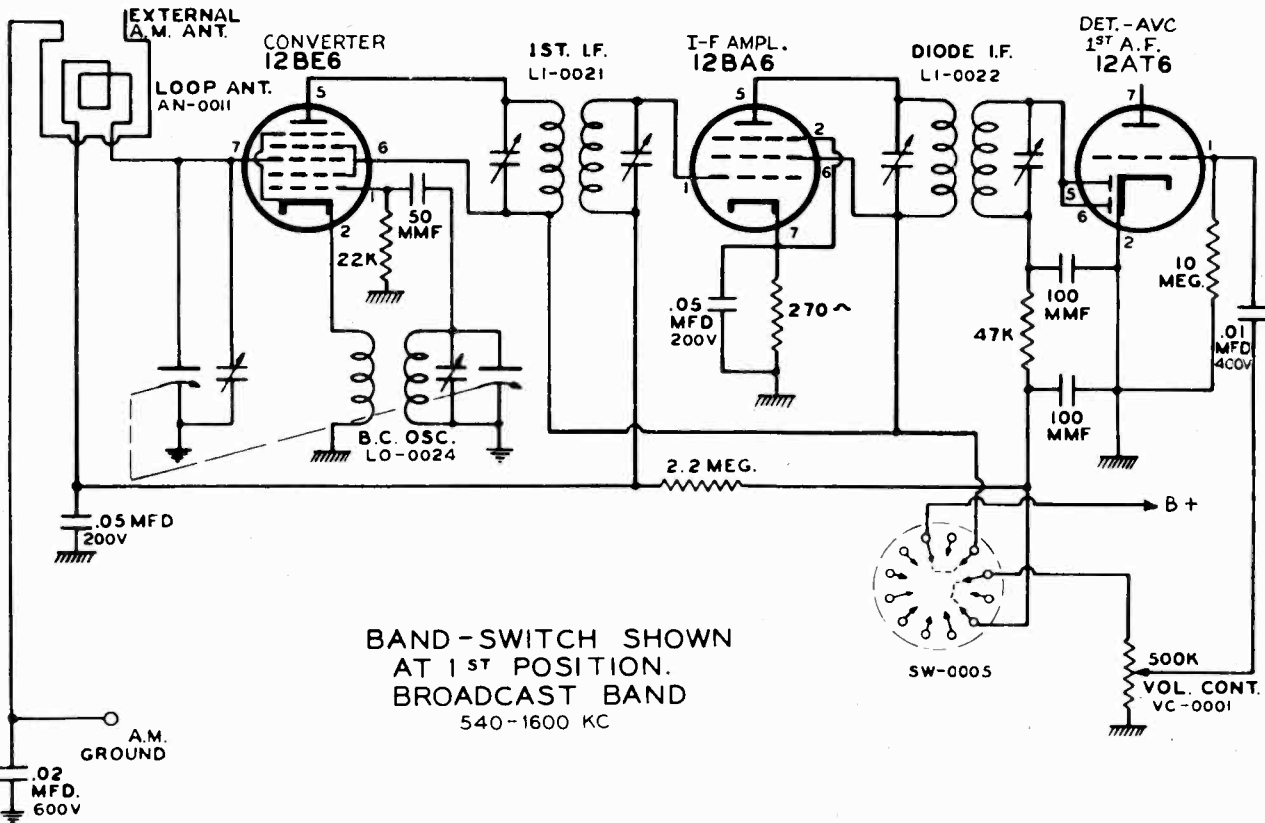


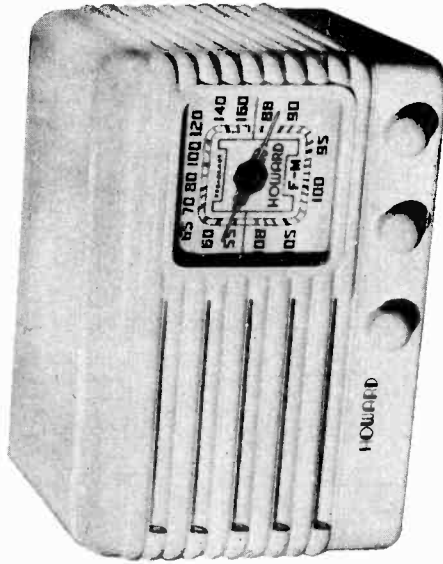
INT. F.M. ANT.
CONNECT TO F.M. ANTENNA CLIP
WHEN EXTERNAL F.M. DIPOLE IS
NOT USED.

- NOTES —
- 1 ↓ INDICATES CHASSIS
 - 2 ▨ INDICATES B —
 - 3 ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE NOTED.
 - 4 ALL CONDENSERS RATED AT 500 VOLTS UNLESS OTHERWISE NOTED.
 - 5 C' INDICATES CERAMIC CONDENSERS.

IF = 455 KC

"clarified schematics"



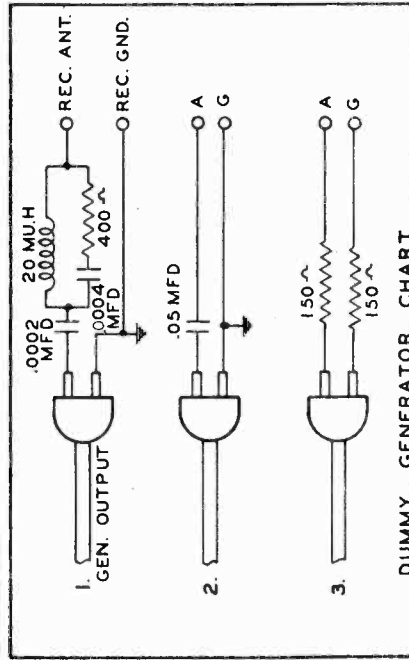
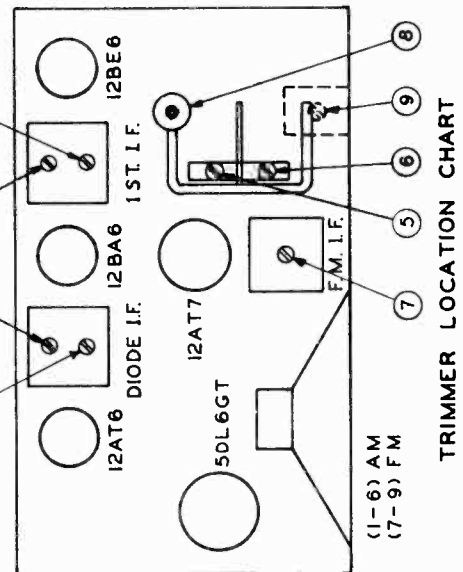


| See Dummy Antenna Chart | Sig. Gen. Connection To | Gen. Freq. | Band Position | Dial Setting | Order of Trimmer Adj. | FUNCTION | See Note |
|-------------------------|-------------------------|------------|---------------|--------------|-----------------------|-------------------------------|----------|
| 2 | Grid of 12BE6 | 455 K.C. | B.C. | Off Station | ① ② ③ ④ | I.F. Peak to Max. Output | |
| 1 | A.M. Ant. Clip | 1400 K.C. | B.C. | 1400 K.C. | ⑤ ⑥ | B.C. Osc. and R.F. | A |
| 2 | F.M. Ant. Clip | 21.35 M.C. | F.M. | Off Station | ⑦ | F.M.-I.F. | B |
| 3 | F.M. Ant. Clip | 105 M.C. | F.M. | 105 M.C. | ⑧ ⑨ | F.M. Osc. Peak to Max. Output | C |

Note A. Set pointer in horizontal position with condenser gang closed.

Note B. Adjust for minimum noise with modulation off.

Note C. Adjust ⑧ to 105 M.C.- Oscillator section. While adjusting ⑨, rock condenser gang slowly back and forth for point of optimum. Check tracking of R.F. at 90 to 100 M.C.



POWER SUPPLY: (Standard Models) 105 to 125 V. AC-DC. 25 to 60 cycle. (Write our Export Sales Manager relative to special voltages). Consumption 30 watts. See label on back of chassis.

ANTENNA SYSTEM: Built in loop on back of cabinet for AM reception. Provision is also made for use of outside antenna on AM distant reception. Built in FM antenna, but provision is also made for exterior FM aerial, either dipole or single wire. (See antenna instructions on rear of cabinet.) If distortion occurs on strong FM local stations, remove antenna from clip marked "FM. ANT" on rear of cabinet and leave disconnected.

TUNING RANGE: FM 88 to 108 M.C.
AM 540 to 1600 K.C.

MODEL 474

HOWARD RADIO CO

PARTS LIST
474-FM

VC-0001 Volume Control & On-off Switch

CONDENSERS
 AC-0009 Tuning Gang with Mounting Assy.
 CE-0016 Capacitor Electrolytic 40 Mfd. 150 volts
 CE-0019 Capacitor Electrolytic 10 Mfd. 150 volts
 CE-0007 Capacitor Electrolytic 50-30-30 Mfd. 150 volts
 CE-0005 Capacitor Electrolytic 25 Mfd. 25 volts

COILS
 AN-0011 Loop Antenna
 LC-0024 Broadcast Oscillator Coil
 LI-0021 1st I.F. Transformer
 LI-0022 2nd I.F. Transformer
 LC-0016 F.M. - R.F. Choke Coil
 LR-0025 F.M. Osc. Coil
 LR-0008 F.M. - R.F. Coil
 LI-0028 F.M. - I.F. Transformer

DIAL AND CONTROL ACCESSORIES
 SM-0074 Dial Drive Shaft
 HD-0002 Dial Pointer Hand
 SL-0004 Dial Light Socket
 LS-0001 Dial Lamp Type #47, Min. Bayonet
 AR-0064 Calibrated Dial Plate
 SP-0010 Dial Cord Spring - 8 Oz. load
 GR-0001 Rubber Grommet
 WG-0001 Dial Window

KNOBBS
 KB-0003 Knob - White
 KB-0003-1 Knob - White Stamped "AM-FM"
 KB-0005 Knob - Brown
 KB-0005-1 Knob - Brown Stamped "AM-FM"

SOCKETS
 SO-0009 Socket - 8 Prong
 SO-0022 Tube Socket - 9 Pin - Low Loss Bakelite
 SO-0013 Tube Socket - 7 Pin

SPEAKER
 SK-0009 Speaker 5" P.M.

TRANSFORMER
 TO-0001 Speaker output Transformer
 LC-0011 Power Choke (150 Ohms D.C.)
 LC-0015 A.C. Input Choke

TUBE COMPLIMENT

TU-12AT6 Tube
 TU-12BA6 Tube
 TU-12BE6 Tube
 TU-12AT7 Tube
 TU-50L6 Tube

SW-0005 SWITCH
 Band Switch

CB-0002 CABINET
 CB-0004 Plastic Cabinet - Ivory
 Plastic Cabinet - Mottled Walnut

CA-0038 LINE CORD
 Line Cord with plastic plug (6 feet)

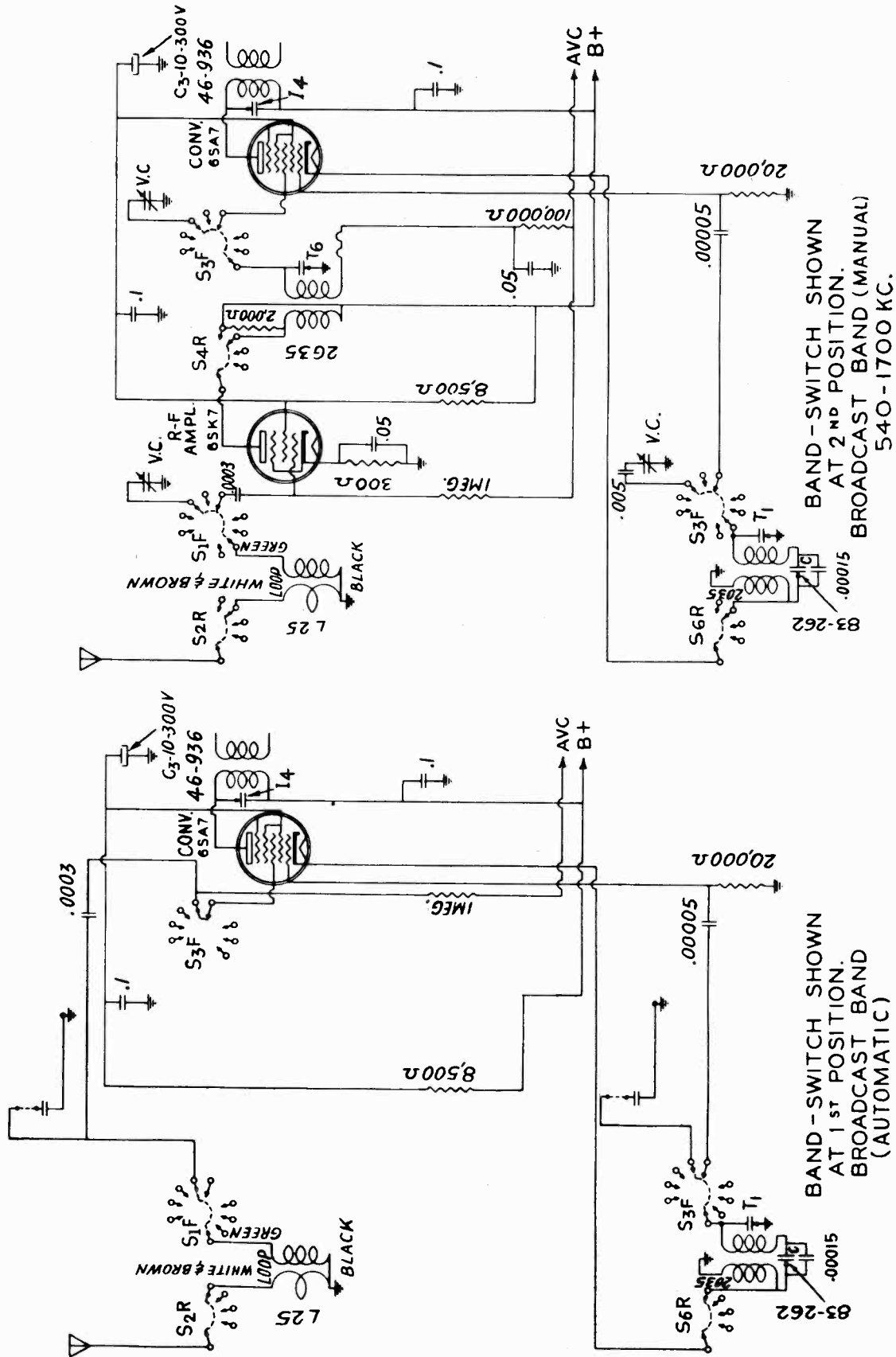
SR-0003 MISCELLANEOUS
 Selenium Rectifier
 PR-0097 Base Clip for Tube Shield
 MP-0324 Gang Cover
 PR-0096 Miniature Tube Shield
 RC-0097 Negative Temp. Coefficient Resistor
 791 Ohms cold - 100 Ohms hot
 (takes surge off pilot light voltage)

SOCKET VOLTAGE READINGS

| Tube | Function | Cath. | Screen Grid | Plate |
|-------|-----------|----------------|-------------|-------|
| 12BE6 | Mixer | 0 | 100 | 98 |
| 12BA6 | I.F. Amp. | 1 | 100 | 98 |
| 12AT7 | FM Tube | Pin 8 14 V. | - | 120 |
| 12AT6 | Det. | 0 | 0 | 65 |
| 50L6 | Output | 6.8 | 100 | 130 |

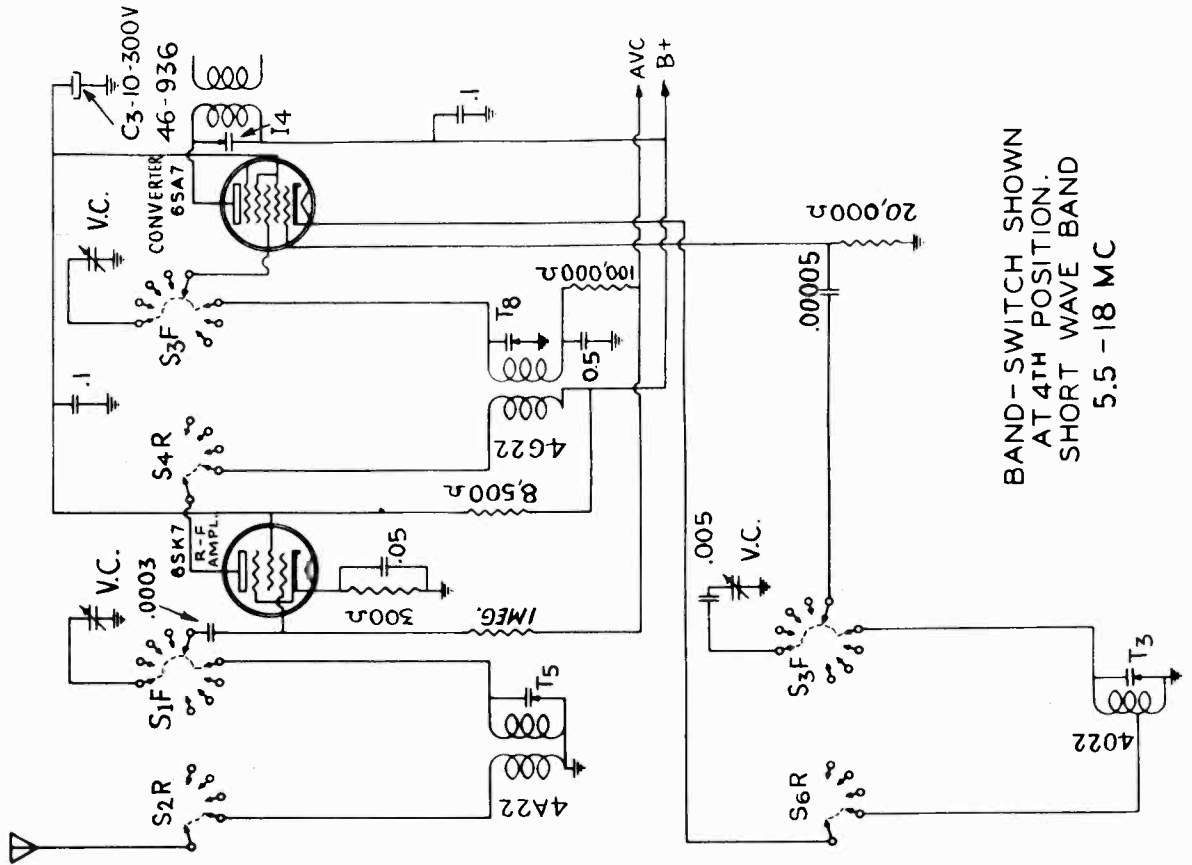
All voltages taken from the buss bar (B-) to the socket contacts, with a 20,000 Ohm per volt D.C. meter and the line voltage fixed at 117 Volts A.C.

"clarified schematics"

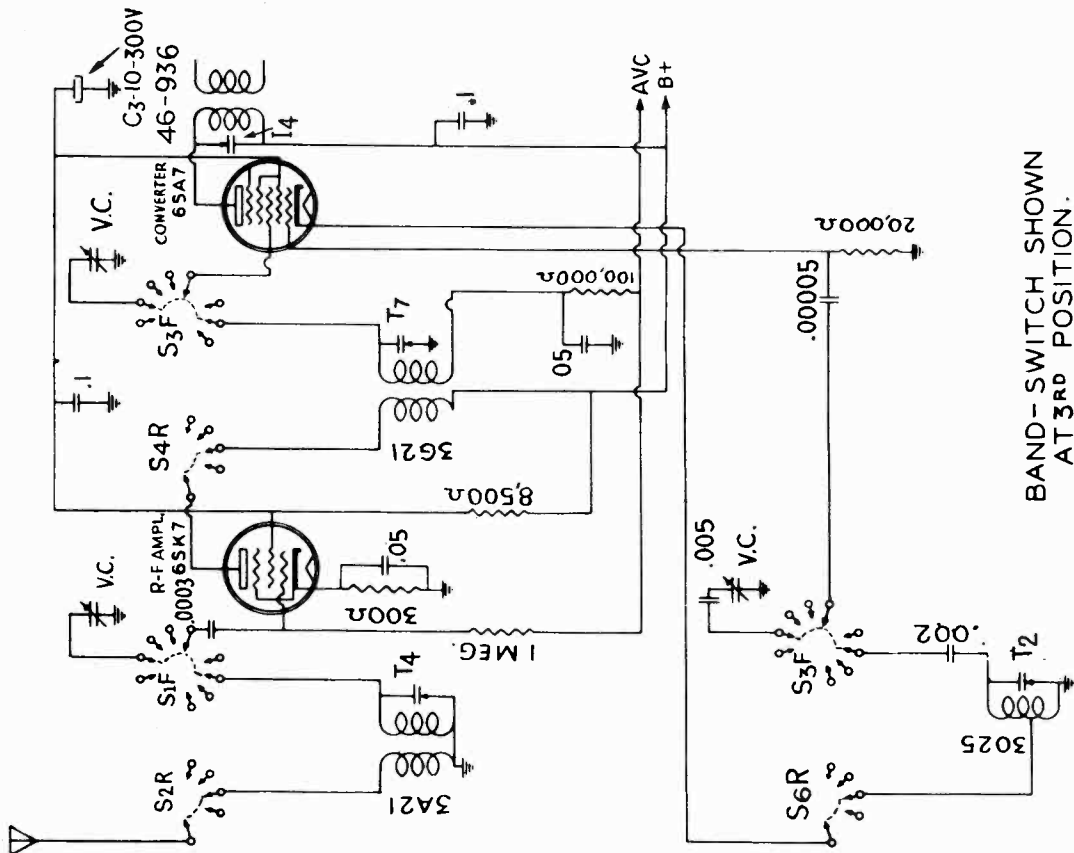


BAND-SWITCH SHOWN
AT 2ND POSITION.
BROADCAST BAND (MANUAL)
540-1700 KC.

BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
(AUTOMATIC)



BAND-SWITCH SHOWN
AT 4TH POSITION.
SHORT WAVE BAND
5.5 - 18 MC



BAND-SWITCH SHOWN
AT 3RD POSITION.
POLICE BAND
1.8 - 5 MC

GENERAL SPECIFICATIONS

12 Tube, 3 Band, R. F. Stage on all bands, Loop for Broadcast band only, Electric Push Button Tuning with muting switch action, Built-in Phono Switch, Bass and Treble Controls, Beam Power Output, Inverse Feed-Back, 6 Ohm Voice Coil. Power Consumption 105 Watts, Alternating Current Only.

SOCKET VOLTAGE READINGS FOR MODEL 718-X

* Socket Terminal Number

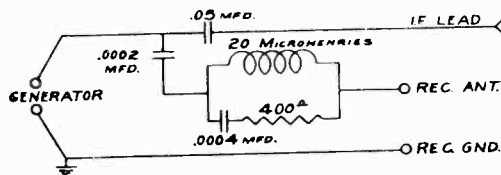
Voltage taken from ground with voltage at 117 Volts AC. Drop across speaker field 105 V. Use at least a 1000 Ohm per Volt Meter. High voltage reading off rectifier 355 V. DC.

| TUBE | FUNCTION | CATH. | SG. | PLATE | | TUBE | FUNCTION | CATH. | SG. | PLATE | | |
|------|------------|-------|-----|-------|---------|-------|-----------|-------|-----|-------|-------|---|
| 6SK7 | R. F. | 1.7 | 5* | 110 | 6 250 8 | 6SF5 | A. F. | | | 115 | 5 | |
| 6SA7 | Converter | 6 | 110 | 4 245 | 3 | 6SF5 | Bass | | | 65 | 5 | |
| 6SK7 | 1st I. F. | 5 | 110 | 6 220 | 8 | 6J5 | Inverter | 8 | 8 | 155 | 3 | |
| 6SK7 | 2nd I. F. | 4 | 5 | 110 | 6 230 | 6V6GT | Output | 16 | 8 | 250 | 4 240 | 3 |
| 6H6 | Det. | | | | | 6V6GT | Output | 16 | 8 | 250 | 4 240 | 3 |
| 6U5 | Tuning eye | | | 250 | | 5Y3G | Rectifier | | | | | |

ALIGNMENT PROCEDURE FOR 718-X SERIES

EQUIPMENT REQUIRED:

1. SIGNAL GENERATOR to accurately cover the alignment frequencies as shown below.
2. OUTPUT METER (0 to 3 V. AC if used in voice coil circuit).
3. DUMMY ANTENNA. Although the values as shown in below table for antenna load may be satisfactory, we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.



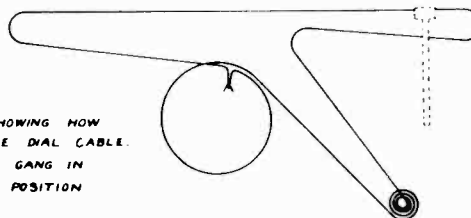
START ALIGNMENT WITH:

Treble and Bass controls turned toward left, Volume Control full ON to right and Band Switch in Broadcast position. After checking for pointer travel to last line above 550, set dial to point where there is no interference with generator signal and proceed with IF alignment.

| DUMMY ANTENNA | SIG. GEN. CONNECTION TO | GEN. FREQ. | BAND SW. POSITION | DIAL SETTING | ORDER OF TRIMMER ADJUSTMENTS | TRIMMER FUNCTION | SEE NOTE |
|------------------|-------------------------|------------|-------------------|--------------|------------------------------|---|----------|
| .05 Mfd. | Grid of 6SA7 | 465 KC | BC | Off Station | See Fig. 1. ① ② ③ ④ ⑤ ⑥ | I.F. peak to Max. Output | 1 |
| 400 Ohm Resistor | Ant. | 1400 KC | BC | 1400 KC | See Fig. 2. ⑦ then ⑧ | BC Osc. - R.F. | 2 |
| " | " | 600 KC | BC | 600 KC | ⑨ Rock Dial | BC Osc. Pad. | 2 |
| " | " | 5 MC | Police Band | 5 MC | ⑩ ⑪ ⑫ | Pol. Band Osc. RF Ant. Check Image at 4.1 | 2 |
| " | " | 16 MC | SW | 16 MC | ⑬ ⑭ ⑮ | Short Wave Osc. - RF - Ant. Check Image at 15.1 | 2 |

NOTE 1: The I.F. adjustments are reached through holes in top of cans on top of chassis.

NOTE 2: Peak for greatest deflection of output meter.



LAYOUT SHOWING HOW TO ASSEMBLE DIAL CABLE. CONDENSER GANG IN MAXIMUM POSITION

FIG. 1

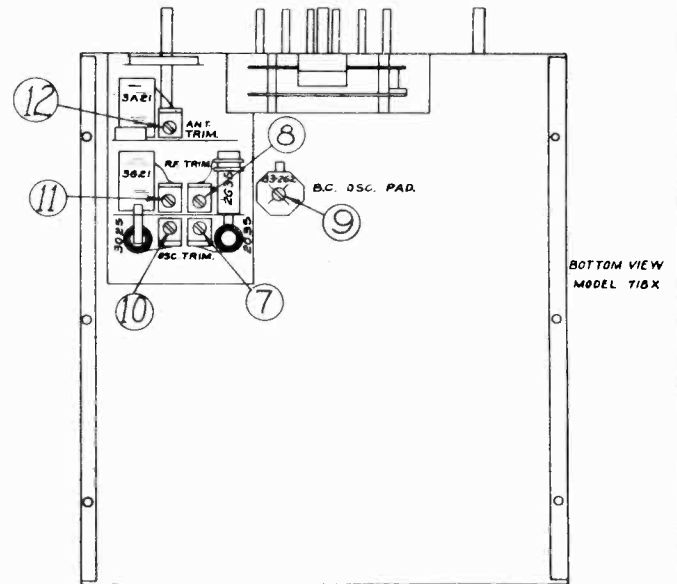
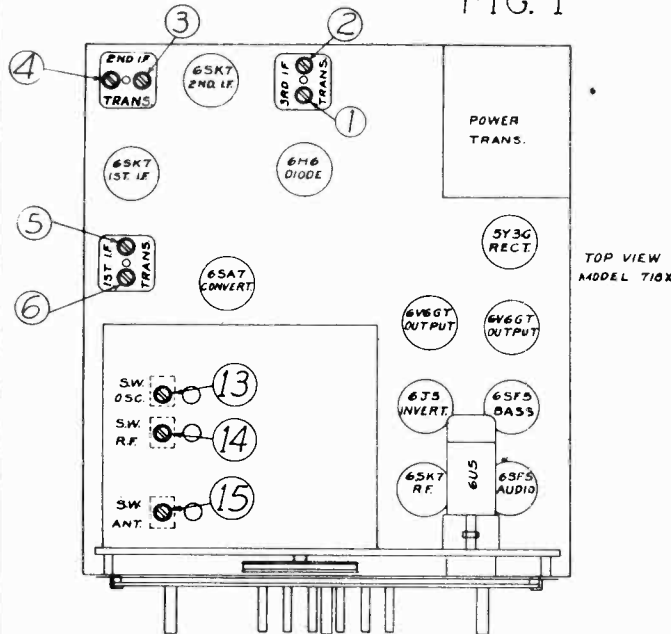


FIG. 2

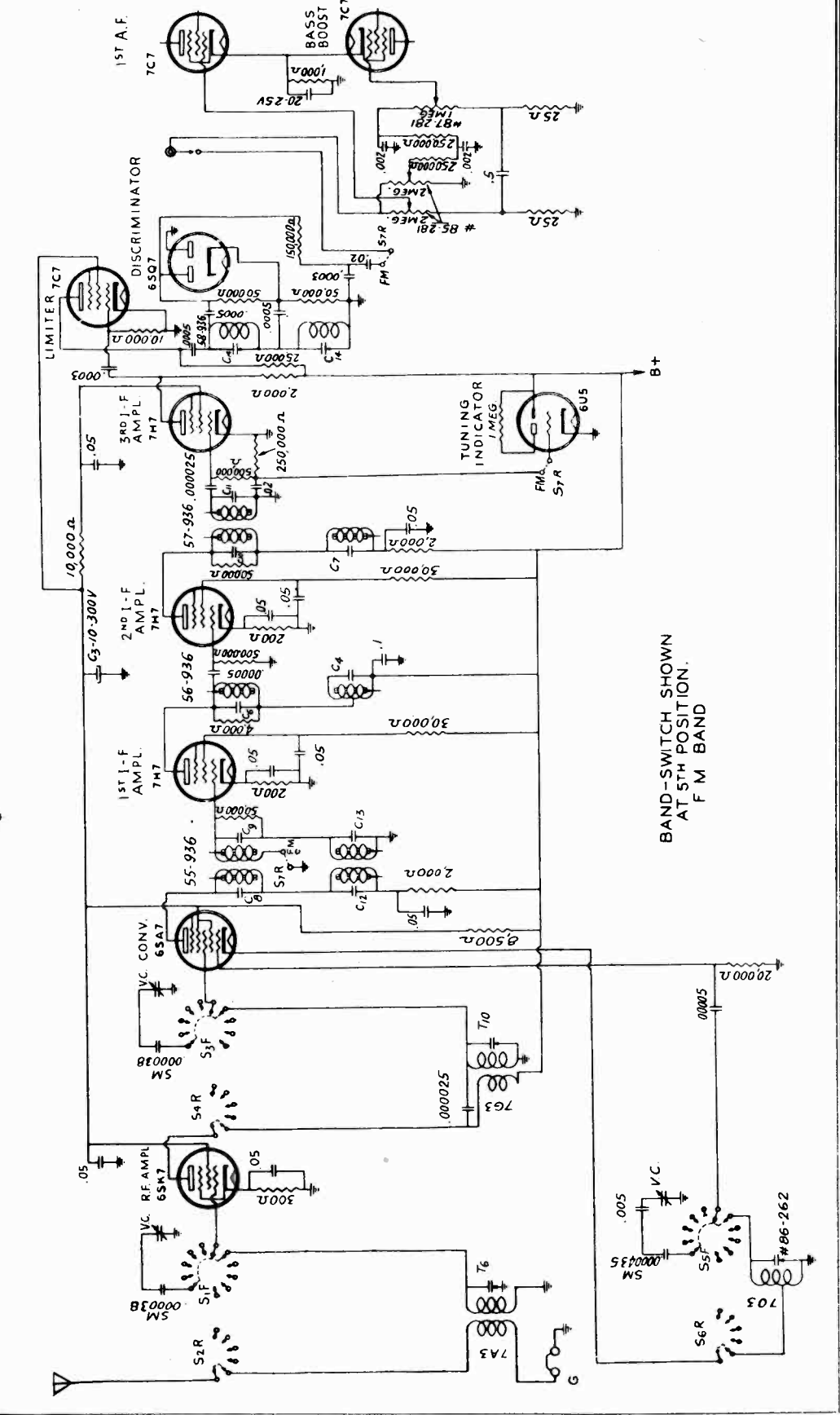
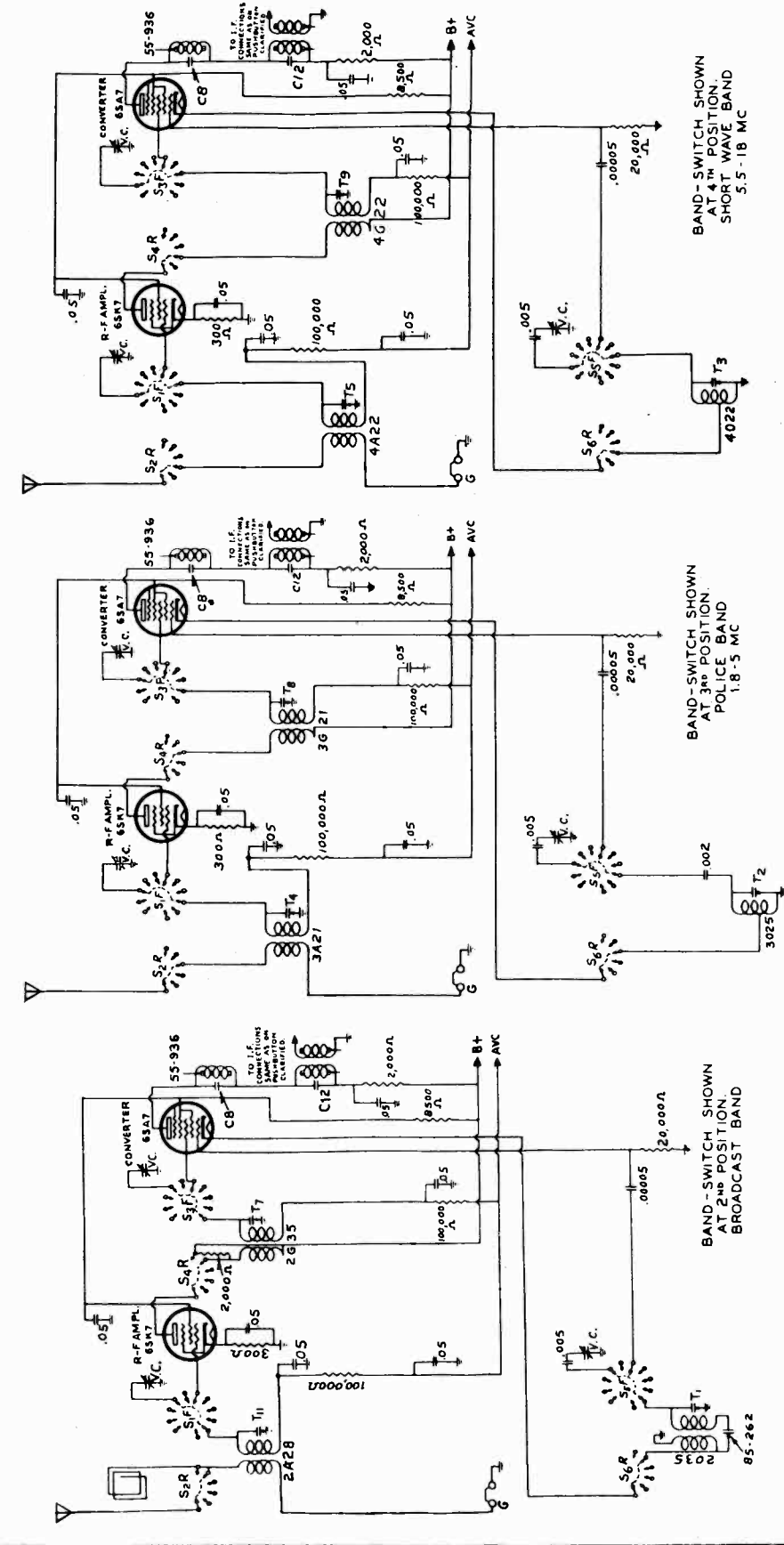
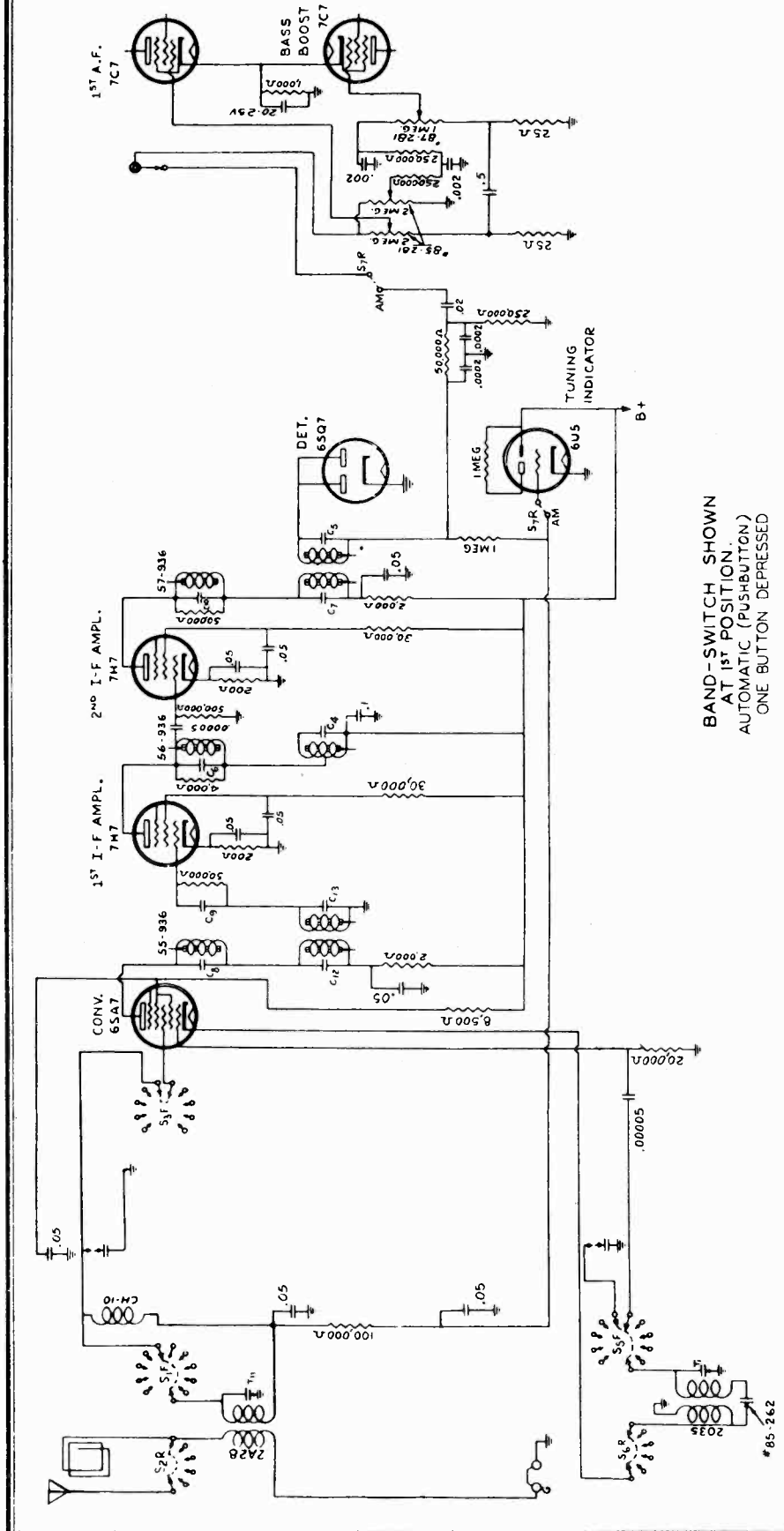
REPLACEMENT PARTS LIST

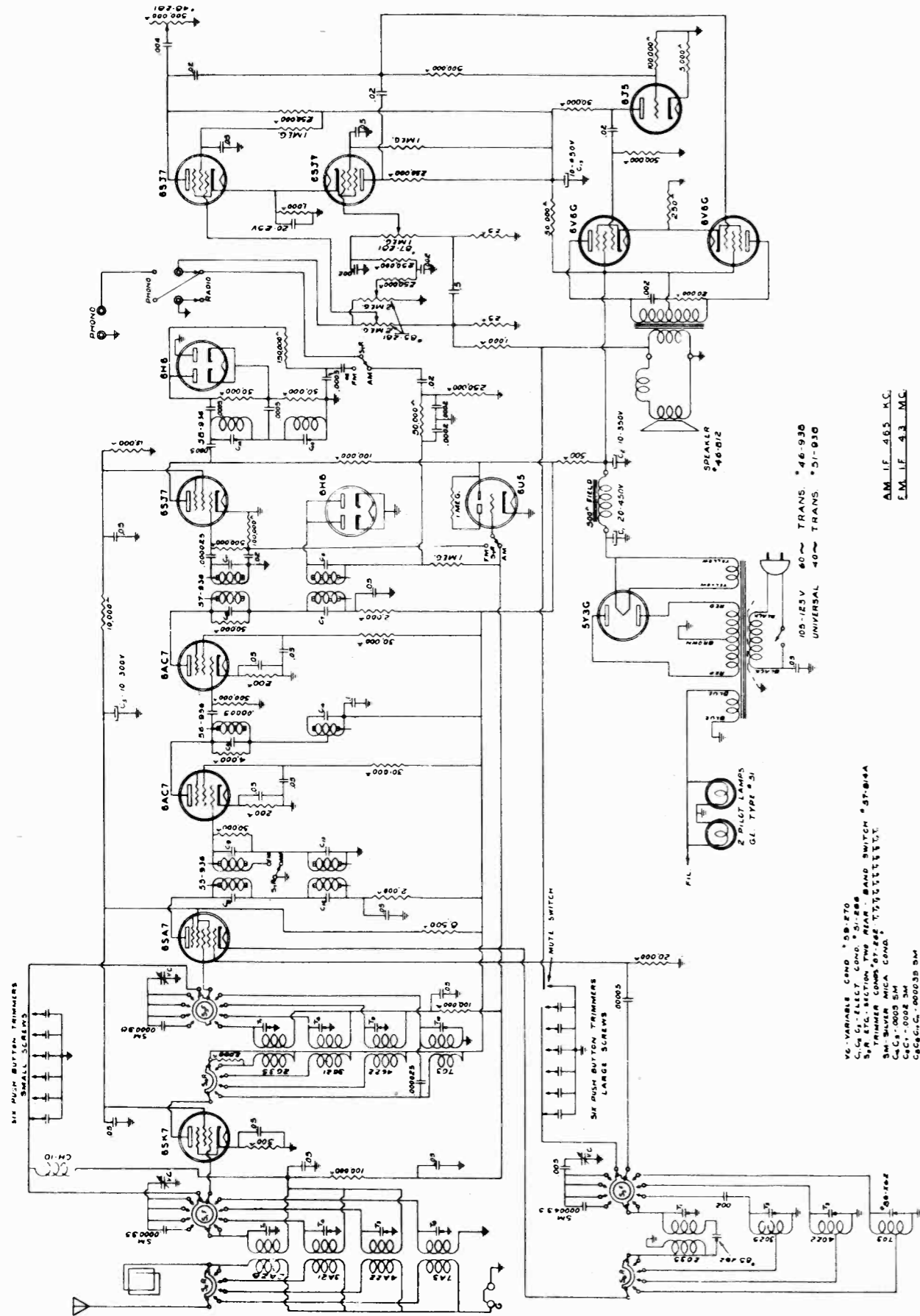
For prompt and accurate service with any correspondence or replacement parts orders pertaining to this model, include the IDENTIFICATION NUMBERS as shown on black and white card accessible at back of cabinet.

The following parts list includes the vital receiver parts only. This list does not include any part pertaining to the cabinet or any type record mechanism. When the IDENTIFICATION NUMBER is specified to us we have the complete record of your model and can furnish complete service information for the particular type cabinet (or record mechanisms with combination models) that you may have.

| Part No. | DESCRIPTION | Part No. | DESCRIPTION |
|---------------------------------|--|---|---|
| CABINETS | | DIAL & CONTROL PARTS - Cont'd. | |
| 51-190 | Chippendale | 11-966 | Push Button Tuning Assembly . . |
| 53-190 | "C" Type | 17-182 | Push Button Plain |
| 54-190 | "A" Type | 5-609 | Pulley with Hub |
| CONTROLS | | 3-609 | String Guide Pulleys |
| 48-281 | Tone | 80-720 | Shaft - Tuning |
| 87-281 | Bass Boost | 43-829 | Spring, Drive Cord Tension . . . |
| 85-281 | Radio-Phono Volume | KNOBS | |
| CONDENSERS | | 19-490 | Wood - 1-1/4 |
| 59-270 | Tuning | 19-490-2 | Wood - 1-1/4 |
| 83-262 | Padding BC | LINE CORDS | |
| 50-262 | Single trimmer | 1-290 | Standard |
| 51-266 | Filter, 20-10-10 mfd. 450,350,300 Volts | MOUNTING HARDWARE | |
| COIL ASSEMBLIES | | 966 | Rubber cushions, chassis mtg |
| L25 | Ant. Loop - Console | 1-703 | Wing Screws ("C" cab. only) . . |
| 2035 | Osc. Coil 1700-540 KC | RECORD CHANGER - AUTOMATIC | |
| 2G35 | R.F. Coil 1700-540 KC | 10-615 | 117 V. 60 Cycle |
| 3A21 | Ant. Coil 5-1.8 MC | SOCKETS, PLUGS, JACKS, CONNECTORS | |
| 3025 | Osc. Coil 5-1.8 MC | 24-768 | Dial Lamp Socket - Bayonet . . . |
| 3G21 | R.F. Coil 5-1.8 MC | 6-772 | Speaker Socket - 4 hole |
| 4A22 | Ant. Coil 18-5.5 MC | 25-771 | Tuning Eye Socket & Cable |
| 4022 | Osc. Coil 18-5.5 MC | 23-771 | Tube Socket-Octal |
| 4Q22 | R.F. Coil 18-5.5 MC | 14-844 | Terminal ANT-GND |
| 46-936 | 1st I.F. Assembly Complete | SPEAKERS | |
| 54-936 | 2nd I.F. Assembly Complete | 45-812 | 12" Console ("C" & "A") |
| 47-936 | Last I.F. Assembly Complete | 1-809 | Twin to 2-809 (Chippendale) . . . |
| DIAL & CONTROL PARTS | | 2-809 | Twin to 1-809 (Chippendale) . . . |
| 207-310A | Calibration - Tuning | SWITCHES | |
| 2-498 | Dial Lamp - Bayonet | 57-914A | Band Switch |
| 22-427 | Dial Window | 26-917 | Radio-Phono |
| 1-288 | Drive String | TRANSFORMERS | |
| 53-352 | Escutcheon with Window | 19-961 | Output - Audio |
| 45-352 | Escutcheon - Push Button Trim . . | 55-938 | 105-120 V. 60 Cy. Stan. |
| 31-448 | Tuning Hand | 70-938 | 117-135-230 V. 40/60 cy |

NOTE When ordering any component part for any speaker, specify part number on speaker including the prefix letter that precedes the part number on certain models.





AM IF 48.5 KC.
FM IF 4.3 MC.

VC VARIABLE COND. *45-270
S.M. T.C. SECTION TWO REAR BAND SWITCH *37-814
TRIMMER COMP. *37-222
S.M. SILVER MICA COND.
C4C1-.0005 SM
C4C2-.0004 500000 DM
C4C3-.001 DM
C4C4-DUAL TRIMMER COND. *71-222
C4C5-ELECT COND. *45-266

* Socket Terminal Number

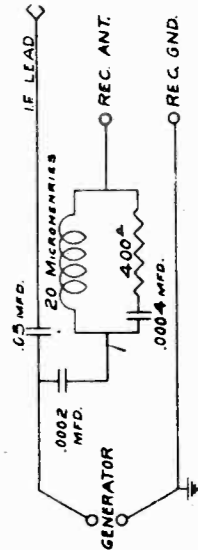
Voltage taken from ground with voltage at 117 Volts AC. Drop across speaker field 65 V.
Use at least a 1000 Ohm per Volt Meter. High voltage reading off rectifier 300 V. DC.

| TUBE | FUNCTION | CATH. | SG. PLATE | TUBE | FUNCTION | CATH. | SG. | PLATE |
|------|-------------|-------|-----------|-------|----------|------------|------|-------------|
| 6SK7 | R.F. | 5 | 100 6 | 230 8 | 6SJ7 | A.F. | 1 5 | 20 6 25 8 |
| 6SA7 | Converter | | 100 4 | 220 3 | 6SJ7 | Bass Boost | 1 5 | 20 6 25 8 |
| 6AC7 | 1st. I.F. | 3 | 155 6 | 225 8 | 6U5 | Tuning Eye | | 230 |
| 6AC7 | 2nd I.F. | 3 | 155 6 | 210 8 | 6J5 | Inverter | 6 8 | 80 3 |
| 6SJ7 | Limiter | | 65 6 | 65 8 | 6V6GT | Output | 14 8 | 235 4 225 3 |
| 6H6 | FM Des-Det. | | | | 6V6GT | Output | 14 8 | 235 4 225 3 |
| 6H6 | AM Det. | | | | 5Y3G | Rectifier | | |

ALIGNMENT PROCEDURE FOR FM718-5-6

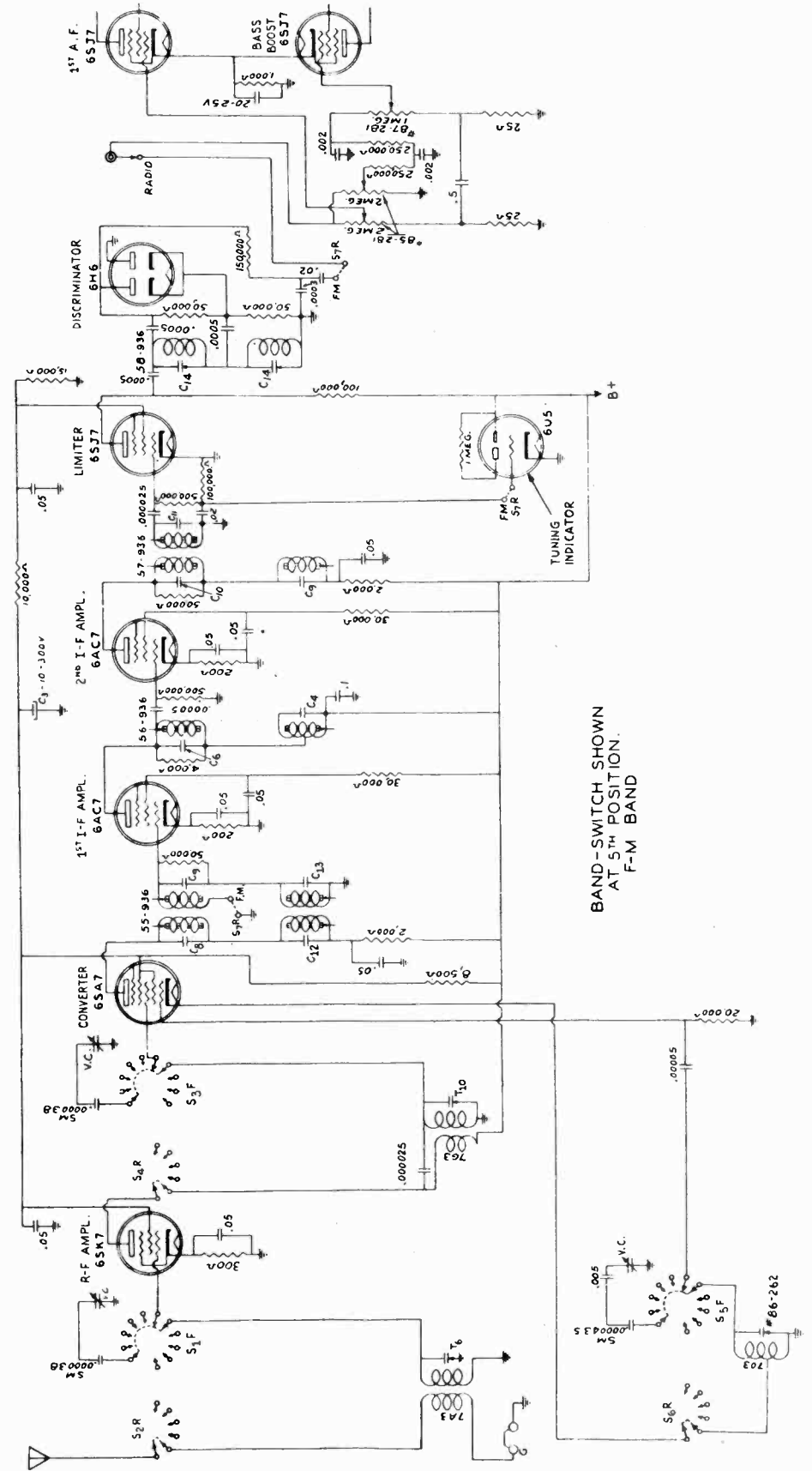
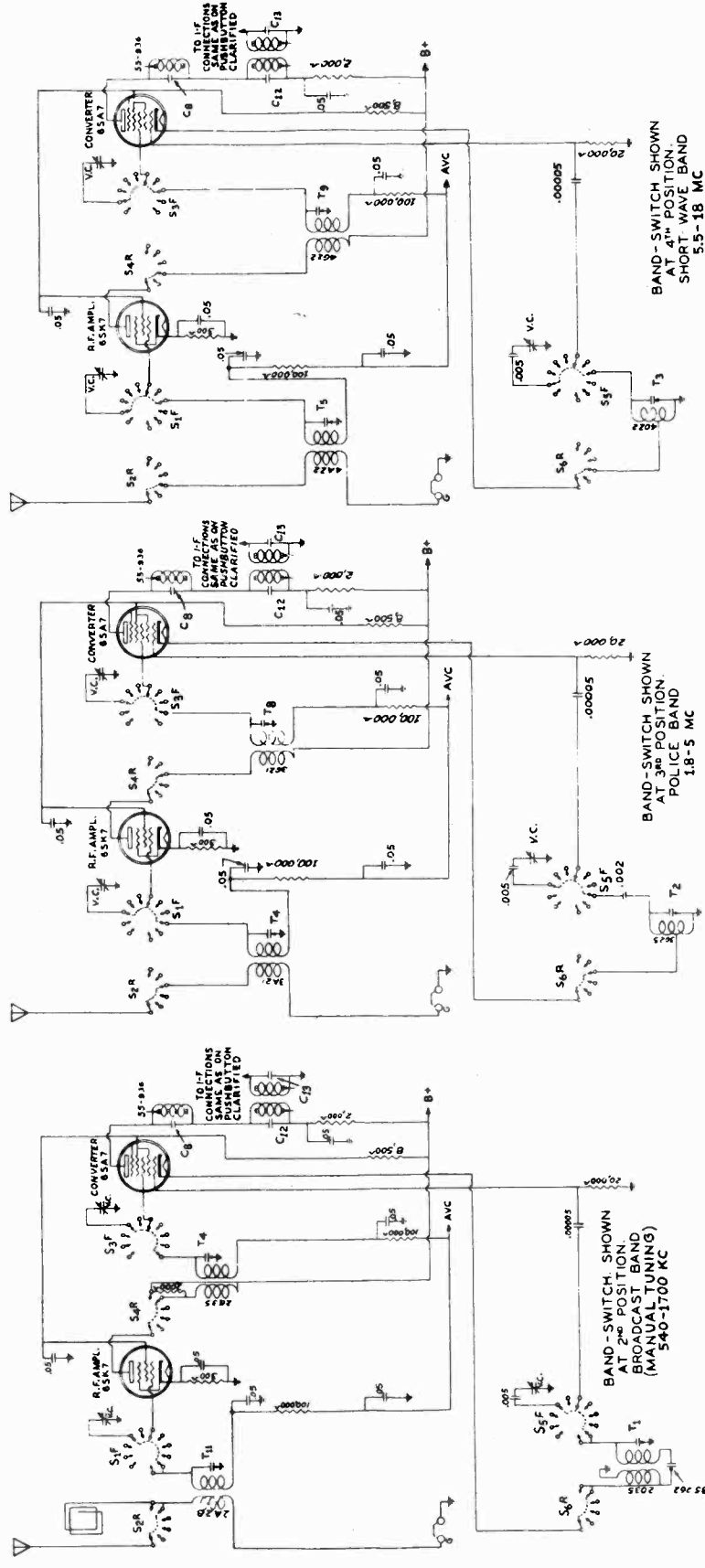
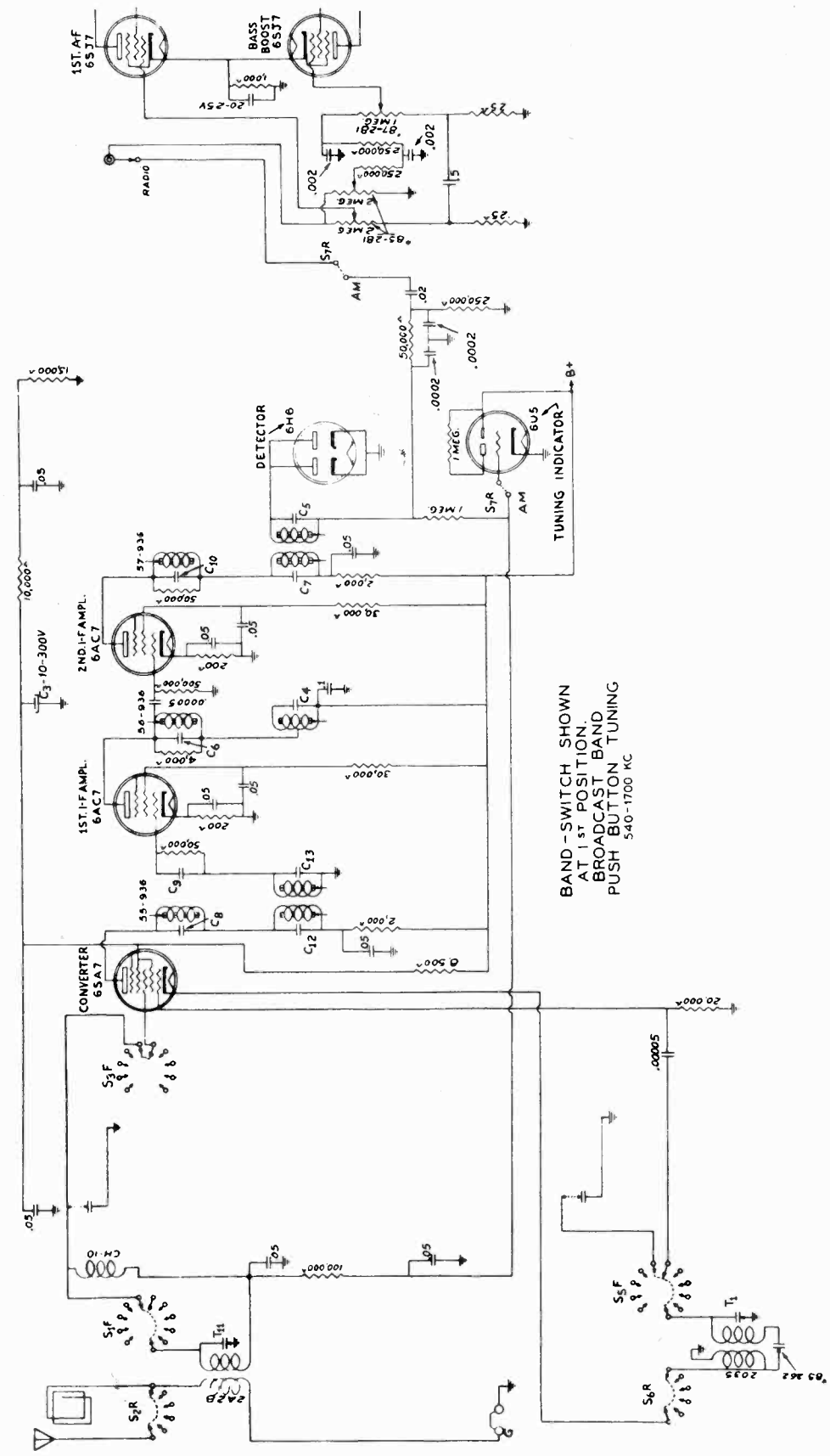
EQUIPMENT REQUIRED:

1. SIGNAL GENERATOR to accurately cover the alignment frequencies as shown below.
2. GALVANOMETER 75 microamperes center "0" (Such as Simpson Type 25) USE SERIES RESISTOR OF 100,000 Ohms in positive lead. Leads from meter to set to be as short as possible.
3. OUTPUT METER (0 to 3 V. AC 1f used in voice coil circuit).
4. DUMMY ANTENNA. Although the values as shown in below table for antenna load may be satisfactory we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.



START ALIGNMENT WITH:

Treble and Bass controls turned toward left, Volume Control full ON to right and Band Switch in Broadcast position. After checking for pointer travel to last line above 550, set dial to point where there is no interference with generator signal and proceed with AM-IF alignment.



| DUMMY ANTENNA | SIG. GEN. CONNECTION TO | GEN. FREQ. | BAND SW. POSITION | DIAL SETTING | ORDER OF TRIMMER ADJUSTMENTS | TRIMMER FUNCTION | SEE NOTE |
|------------------|--------------------------------------|------------------------|-------------------|--------------|---------------------------------------|---|----------|
| .05 Mfd. | Grid of 6SA7 | 465 KC | BC | Off Station | See Fig. 1 ① ② ③ ④ ⑤ | AM I.F. peak to max. output | A |
| " | Grid of 6SA7 - re-move tuned circuit | 4.3 MC Unmod. | FM | " | See Fig. 2 ⑥ ⑦ ⑧ ⑨ ⑩ | FM I.F. See Fig.1 Galvanometer Position | B |
| " | " | 4.4 MC | FM | " | Turn ⑪ down tight - Then adjust ⑫ | FM Detector See Fig. 2 | C |
| " | " | 4.3 MC | FM | " | After ⑫, adjust ⑬ for zero deflection | FM Detector See Fig. 2 | D |
| 400 Ohm Resistor | "A" Ant. post | 1400 KC | BC | 1400 KC | See Fig. 1 ⑬ then ⑭ | BC Osc. and RF | E |
| " | " | 600 KC | BC | 600 KC | ⑮ Rock Dial | BC Osc. Pad. | E |
| " | " | 5 MC | Police | 5 MC | ⑯ ⑰ ⑱ | Osc. - RF - Ant. Check image at 4.1 | E |
| " | " | 16 MC | S.W. | 16 MC | ⑲ ⑳ ㉑ | Osc. - RF - Ant. Check image at 15.1 | E |
| " | " | 48 MC 8th Har. of 6 MC | FM | 48 MC | ㉒ ㉓ ㉔ | FM Osc.- RF - Ant | E |

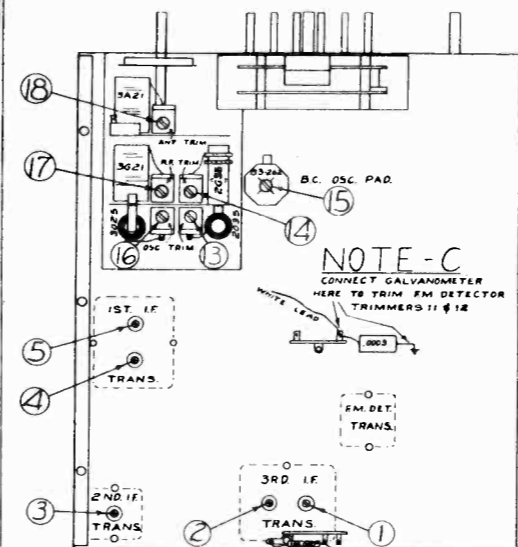
NOTE A: When a re-alignment is made of either the AM I.F. or FM I.F. it should not be necessary to turn the adjustments very far in either direction. The AM I.F. adjustments are reached through holes in the base from underside of chassis. Should the screws be turned too far in, they might fall out of position which would require that the coil be re-assembled. At the other extreme, if the screws are forced too far out, there is danger of breaking the iron cores.

NOTE B: Connect Galvanometer from tap of limiter grid load circuit to ground. See Fig. 1. Adjust for max. current. Normal gain should give deflection (with meter as specified) of 22 with 2,000 to 3,000 microvolt input. Now shift generator frequency each side of 4.3; that is, to 4.2 and 4.4. The drop-in meter deflection should be approximately proportional to change in frequency. If not, recheck alignment.

NOTE C: With Galvanometer connected to FM Detector output (See Fig. 1) and Trimmer 11 turned all the way in temporarily, adjust Trimmer 12 for max. deflection at 4.4 MC. Normal gain should give deflection of 9 with 2,000 to 3,000 microvolts input.

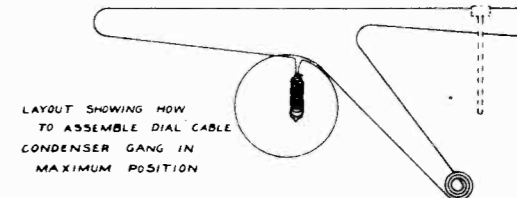
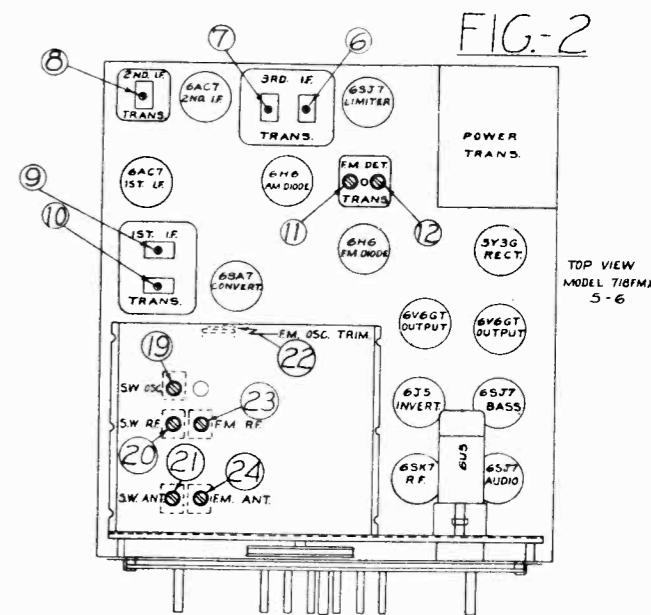
NOTE D: After trimmer 12 is adjusted to 4.4, adjust Trimmer 11 to zero deflection at 4.3. Then shift generator to 4.2 MC. Meter should then show deflection approximately same as at 4.4 at reverse polarity. If the I.F. circuits are ever readjusted, always recheck detector afterwards.

NOTE E: Peak for greatest deflection of output meter.



NOTE-B CONNECT GALVANOMETER HERE TO PEAK TO MAXIMUM SIGNAL FM IF TRIMMERS 6,7,8 & 10

FIG-1



REPLACEMENT PARTS LIST

- NOTICE -

For prompt and accurate service with any correspondence or replacement parts orders pertaining to this model, include the IDENTIFICATION NUMBER as shown on the black and white card accessible at the back of cabinet

The following parts list includes the vital receiver parts only. This list does not include any parts pertaining to the cabinet or any type record mechanism. When the IDENTIFICATION NUMBER is specified to us we have the complete record of your model and can furnish complete service information for the particular type cabinet (or record mechanism with combination models) that you may have.

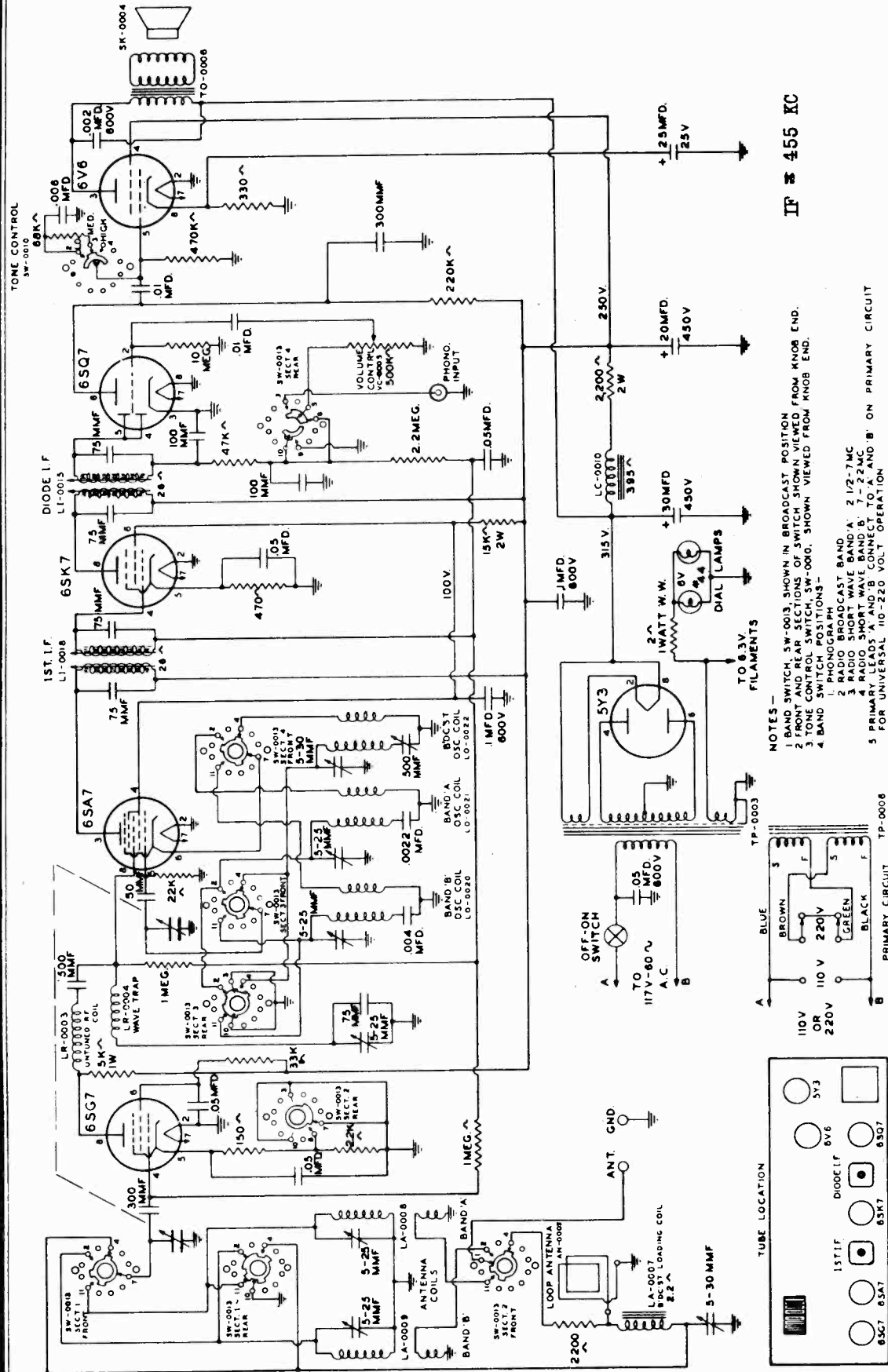
| Part No. | DESCRIPTION | Part No. | DESCRIPTION | Part No. | DESCRIPTION |
|----------|---------------------------------|----------|-----------------------------|----------|-----------------------------------|
| 51-190 | Cabinets | 4022 | COIL ASSEMBLIES--Continued | 10-490 | KNOB |
| 53-190 | Chippendale | 4022 | Osc. Coil 18-5.5 MC | | Wood 1-1/4 |
| 54-190 | "C" type | 7A3 | R.F. Coil 18-5.5 MC | | LINE CORDS |
| | "A" type | 703 | Ant. Coil FM Band | 1-290 | Standard |
| 48-281 | CONTROLS | 703 | Osc. Coil FM Band | | MOUNTING HARDWARE |
| 87-281 | Tone | 703 | R.F. Coil FM Band | 966 | Rubber cushions, chassis mtg. |
| 54-281 | Bass Boost & Sw | 55-936 | 1st Dual AM-IF | 1-703 | Wing Screws ("C" cab. only) |
| 85-281 | Radio-Phono Volume (to 5th run) | 56-936 | 2nd Dual AM-IF | | RECORD CHANGER - AUTOMATIC |
| | Radio-Phono Volume | 57-936 | FM Discriminator AM Det | 10-615 | 117 V. 60 Cycle |
| 59-270 | CONDENSERS | 58-936 | FM Det.-Limiter | | SOCKETS, PLUGS, JACKS, CONNECTORS |
| 83-282 | Tuning | | DIAL & CONTROL PARTS | 24-768 | Dial Lamp Socket |
| 50-262 | Padding BC | 210-310 | Calibration - Tuning | 6-772 | Speaker Socket - 4 hole |
| 86-262 | Single Trimmer | 2-498 | Dial lamp - Bayonet | 25-771 | Tuning eye socket & cable |
| 51-266 | Single Trimmer | 22-427 | Dial Window | 23-771 | Tube Socket - Octal |
| | Filter, 20-10-10-mfd. | 1-288 | Drive String | 31-771 | Socket - Octal shielded |
| | 450, 350, 300 Volts | 53-552 | Escutcheon with Window | 14-844 | Terminal ANT-GND |
| 2A28 | COIL ASSEMBLIES | 45-252 | Escutcheon - P.B. trim | | SPEAKERS |
| CH-10 | Ant. Coil | 31-448 | Tuning Hand | 46-812 | Console 12" |
| 2036 | Ant. Choke | 11-966 | Push Button Tuning Assembly | | SWITCHES |
| 2035 | Osc. Coil 1700-540 KC | 17-186 | Push Button - Plain | 57-914A | Band Switch |
| 2035 | R.F. Coil 1700-540 KC | 5-609 | Pulley with Hub | 26-917 | Radio-Phono |
| 3A21 | Ant. Coil 5-1.8 MC | 3-609 | String Guide Pulleys | | TRANSFORMERS |
| 3025 | Osc. Coil 5-1.8 MC | 80-720 | Shaft - Tuning | 21-961 | output - Audio |
| 3021 | R.F. Coil 5-1.8 MC | 43-829 | Spring Drive Cord Tension | 46-936 | 105-120 V. 60 cy. Stan. |
| 4A22 | Ant. Coil 18-5.5 MC | | | 51-936 | 117-135-230 V.40/60 cy. |

NOTE 1: All 200 Volt paper fixed condensers

NOTE 2: All 400 or 600 Volt paper fixed condensers

NOTE 3: All 1/2 Watt Carbon Resistors

NOTE 4: When ordering any component part for any speaker, specify part number on speaker including the prefix letter that precedes the part number or certain models.

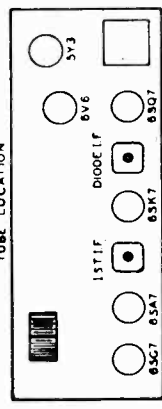


IF = 455 KC

- NOTES—
1. PHONOGRAPH
 2. RADIO BROADCAST BAND: 2 1/2-7 MC
 3. RADIO SHORT WAVE BAND: 2.1-22 MC
 4. BAND SWITCH, SW-000, CONNECT TO 'A' AND 'B' ON PRIMARY CIRCUIT FOR UNIVERSAL 110-220 VOLT OPERATION
 5. PRIMARY CIRCUIT TP-0006

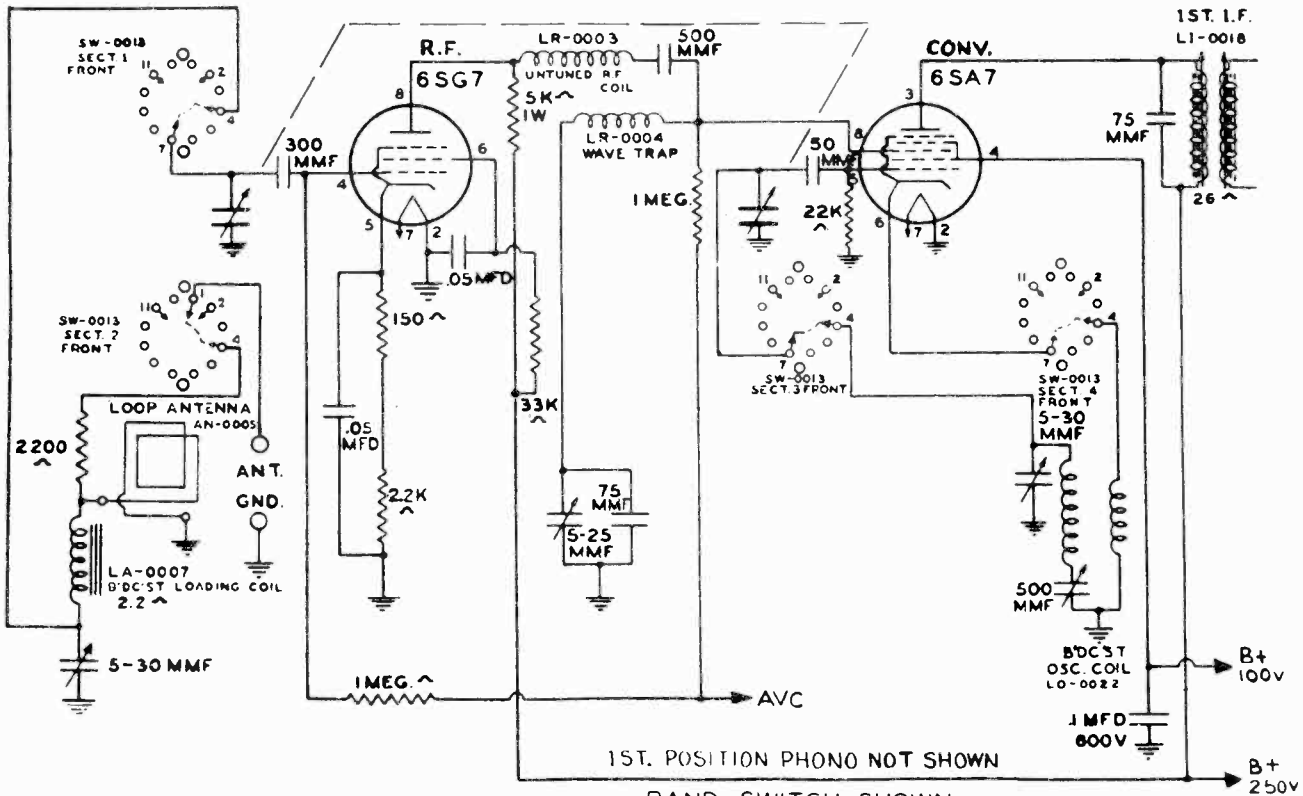
GENERAL SPECIFICATIONS

Six tubes (including rectifier; A.C. Superheterodyne. High gain R.F. stage for greater sensitivity. 2 dual purpose tubes giving 8 tube performance. Wave trap to reduce inane rejection. Low-impedance, "High O" antenna, giving unusual pickup and low noise level. Condenser gang rubber mounted, incorporating 2:1 rear reduction for precision tuning. Speaker is 6 x 9 inch elliptical float mounted Howard P.M., using large alnico No. 5 core capable of 6 watt output. Undistorted power output 3 watts; maximum output 4 1/2 watts.

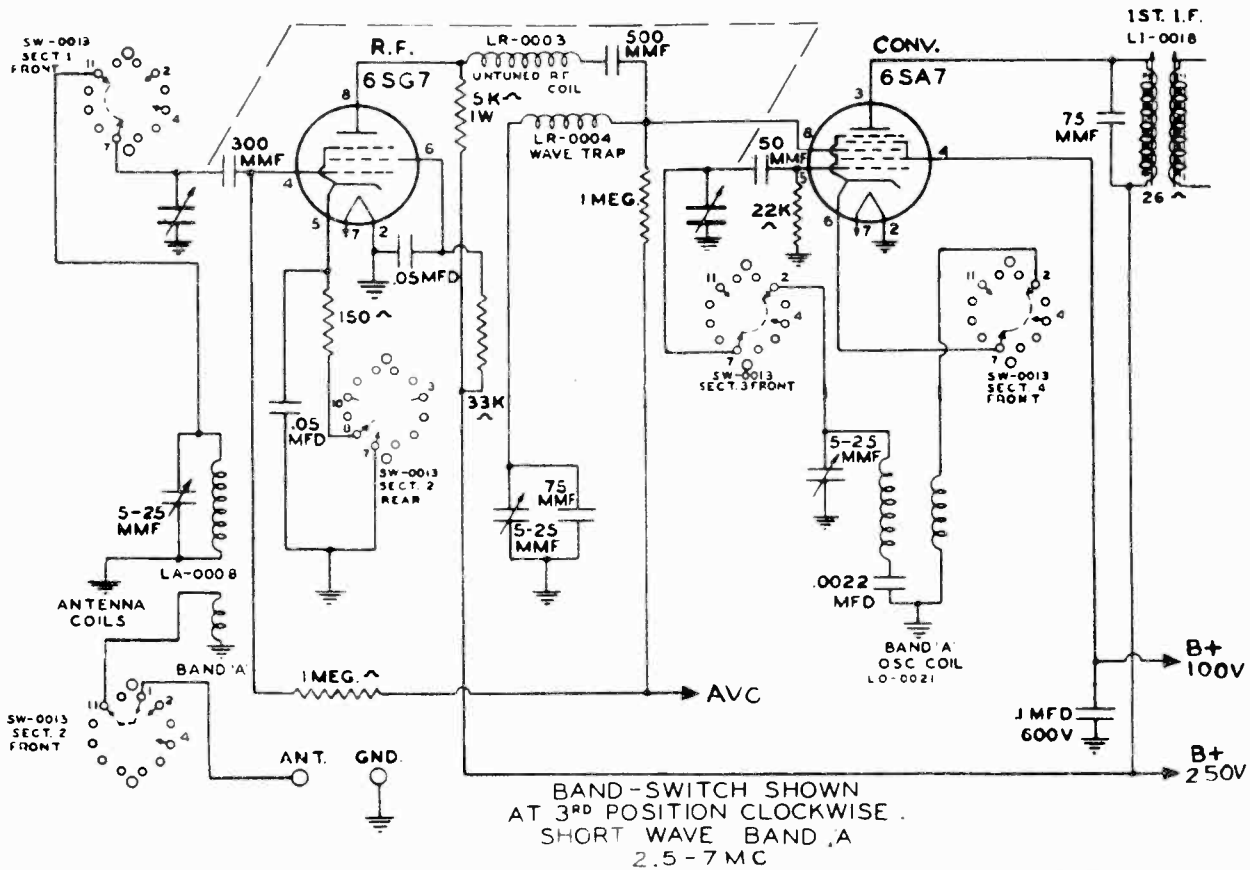


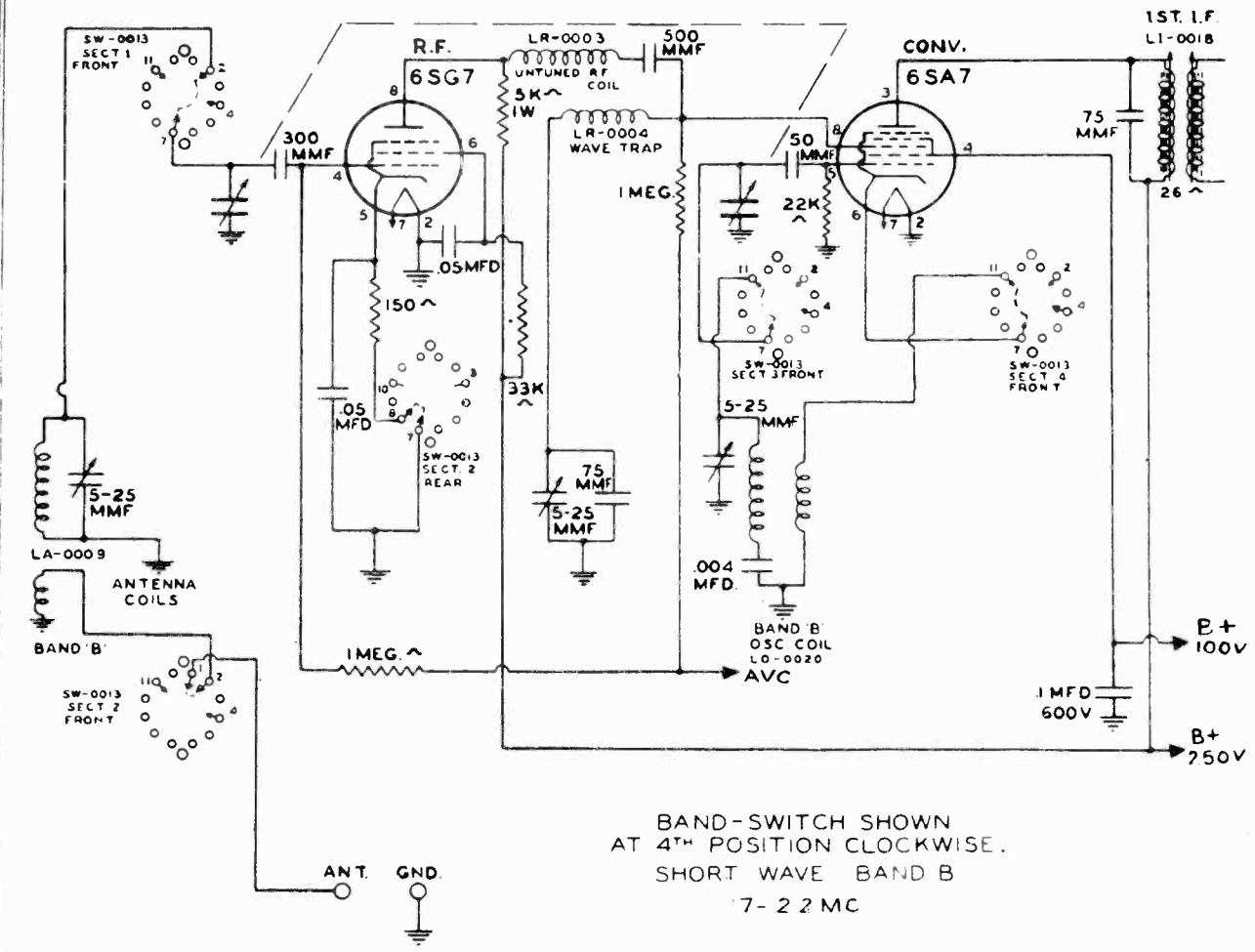
"clarified schematics"

HOWARD RADIO CO



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
BROADCAST BAND





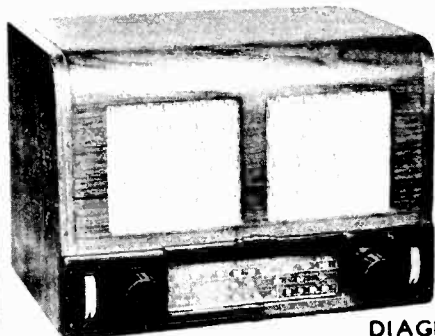
ALIGNMENT CHART

Set controls at indicated positions before following alignment chart.

Loop attached to chassis
 Volume control on full
 Set dial between broadcast stations
 Radio phono control at radio

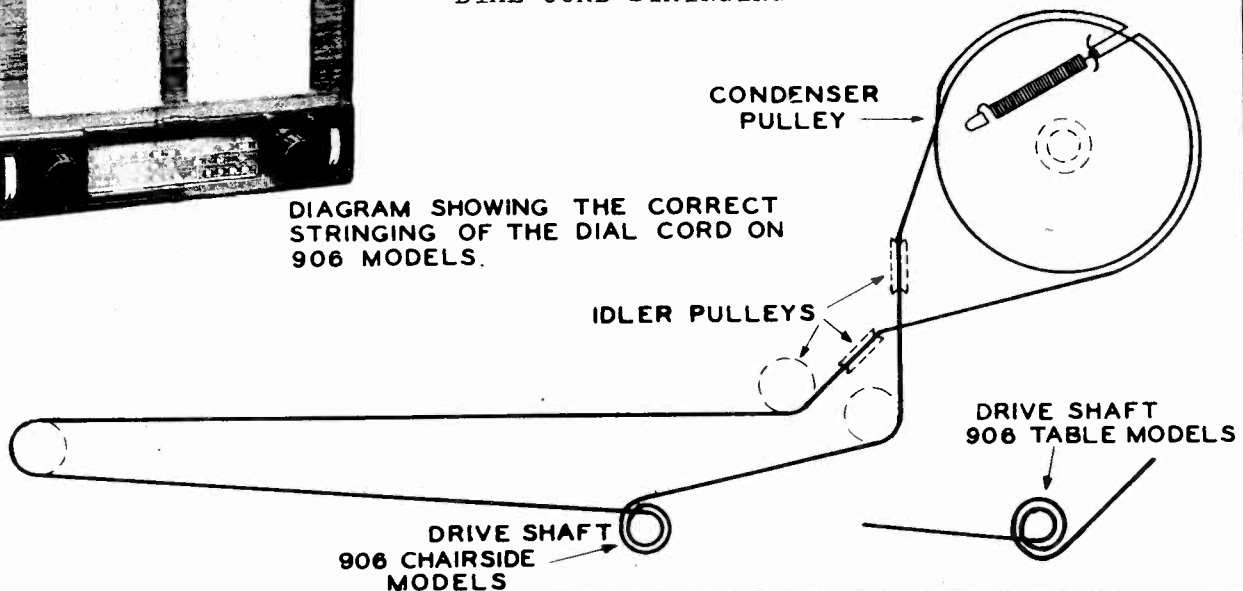
| | DUMMY ANTENNA | SIG. GEN. CONNECTION | GEN. FREQ. | BAND POSITION | DIAL SETTING | ORDER OF TRIMMER ADJUSTMENTS | TRIMMER FUNCTION | SEE NOTE | |
|---|--|----------------------|------------|---------------|--------------|------------------------------|----------------------|----------|---|
| 1 | .05 Mfd. | Grid of 6SA7 | 455 KC | BC | Off Station | ①②③④ | I.F. Peak to Maximum | A | |
| 2 | .05 Mfd. | Ant. | 455 KC | BC | Off Station | ⑤ | Null | B | |
| 3 | 400 Ohm. Line | "A" Ant. Post | 600 KC | BC | 600 KC | ⑦ | Maximum | C | |
| 4 | 400 Ohm. Line | "A" Ant. Post | 1400 KC | BC | 1400 KC | ⑥⑧ | BC Osc. and R.F. | D | |
| 5 | Repeat operations 3 and 4 | | | | | | | | E |
| 6 | 400 Ohm. Line | "A" Ant. Post | 6 MC | A | 6 MC | ⑨⑩ | Maximum | F | |
| 7 | 400 Ohm. Line | "A" Ant. Post | 20 MC | B | 20 MC | ⑪⑫ | Maximum | G | |
| 8 | Accurately set signal generator at one MC and check through both short wave dials, harmonics to be one MC apart. | | | | | | | | |

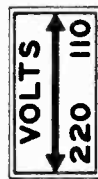
- NOTE A. The I.F. adjustments are iron core slug tuning and it should not be necessary to move them very far in either direction from the factory setting, since they are of a very stable nature.
- NOTE B. Important. Connect the signal generator to the antenna screw on the outside of the radio chassis and keep the metal of the chassis between the generator lead and the wave trap coil. Use your signal generator to the desired turned up powerful position and adjust the wave trap trimmer to null.
- NOTE C. Padding condenser adjustment for calibration at low frequency end of broadcast band.
- NOTE D. Set dial at 1400 KC. Adjust oscillator and R.F. trimmer for maximum sensitivity.
- NOTE E. Check broadcast stations across dial for accuracy.
- NOTE F. True Signal at 6. Image at 5.
- NOTE G. True signal at 20. Image at 19.



DIAL CORD STRINGING

DIAGRAM SHOWING THE CORRECT STRINGING OF THE DIAL CORD ON 906 MODELS.

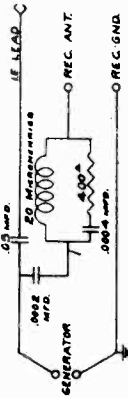




Models equipped with 110-230 volt, 40-60 cycle transformers have a switch and label on the rear of chassis indicating the position for the switch to operate with the proper voltage.

To make change, remove metal cover that holds switch in position by taking off nuts at both ends. If line voltage runs from 100 to 125 volts, push switch towards 110 V. position. If line voltage is from 200 to 240 V., push switch to 220 V. position. After switch has been properly set, replace metal plate and nuts to LOCK it in position.

RECOMMENDED DUMMY ANTENNA. Although the values as shown in above table for antenna load may be satisfactory, we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.



SOCKET VOLTAGE READINGS

Voltage reading taken from ground with voltage at line set at 117 volts A.C. These readings were taken with a vacuum tube voltmeter of the Voltohmyst Junior type.

| TUBE | FUNCTION | CATH. | * SC. | * PLATE | * B | * |
|------|----------------------------|-------|-------|----------|-----|--------|
| 6SQ7 | R.F. | 7.2 | 5 | 200. | 6 | 210. 8 |
| 6SA7 | Converter | | 3 | -10. 86. | 5 | 225. 3 |
| 6SK7 | 1st. I.F. | 3. | 5 | 90. | 6 | 230. 6 |
| 6SQ7 | Det. & 1st. Audio. | | | | | 110. 6 |
| 6V6 | Output. | 13. | 6 | 230. | 4 | 280. 3 |
| 5Y3 | Rectifier | | | | | 290. 8 |

Voltage drop across filter choke 10 volts

* Socket Terminal Number.

PARTS LIST

CONTROLS

- VC-0005 Volume Control with Switch
- VC-0006 Volume Control with Switch

CONDENSERS

- AC-0005 Tuning Gang with Gears and Drive Hub
- CE-0009 Capacitor-Electrolytic 30-20-20 mfd. 450 volts or the following capacitors
- CE-0005 Capacitor - 25 mfd. 25 volts
- CE-0011 Capacitor - 30 mfd. 450 volts
- CE-0012 Capacitor - 20 mfd. 450 volts

COILS

- AN-0005 Loop Antenna
- LA-0007 Loop Load Coil
- LA-0008 Antenna Coil "A" Band
- LA-0009 Antenna Coil "B" Band
- LI-0018 1st IF Transformer in can
- LI-0015 2nd IF Transformer in can
- LO-0021 Oscillator Coil "A" Band
- LO-0020 Oscillator Coil "B" Band
- LR-0004 Wave Trap 455 KC Broadcast
- LR-0003 Untuned RF Coil

KNOBES

- AR-0025 Thumb Wheel Assembly (Tone Control)
- AR-0044 Thumb Wheel Assembly (Radio Phono Broadcast "A"- "B")
- KB-0015-1 Knobs Brown Bakelite

SPEAKER

- SK-0004 Speaker 9" Elliptical PM

TRANSFORMERS

- TO-0006 Speaker Output Transformer
- TP-0003 Power Transformer - 60 cycle 110 volt
- TP-0008 Power Transformer - 40-50-60 Cycle 110-220 volt
- LC-0010 Power Choke (395 ohms D.C.)

TUBE COMPLEMENT

- TU-5Y3 Tube
- TU-6SK7 Tube
- TU-6SA7 Tube
- TU-6SQ7 Tube
- TU-6V6 Tube
- TU-6SQ7 Tube

SOCKETS

- SO-0010 Phono Socket
- SO-0017 Tube Socket
- TB-0007 Terminal Strip, External Antenna

DIAL AND CONTROL ACCESSORIES

- AS-0213 Tuning Shaft Assembly
- AS-0217 Dial Pointer Assembly
- AR-0019 Dial Light Bracket Assembly - Right, Side
- AR-0024 Dial Light Bracket Assembly - Left, Side
- ES-0001 Dial Covering - Plastic Escutcheon for cabinet
- SP-0010 Dial Drive Spring
- DC-0001 Dial Drive Cord 52" long
- ER-0001 Rubber Grommets for Tuning Gang and Speaker Mounting
- DC-0005 Calibrated Lucite Dial
- LS-0002 #44 Blue Bead Pilot Lamp

SWITCHES

- SW-0001 D.P.D.T. Slide Switch 110-220 volt
- SN-0013 Band and Phono Switch (4 position)
- SN-0010 Tone Switch (3 position)

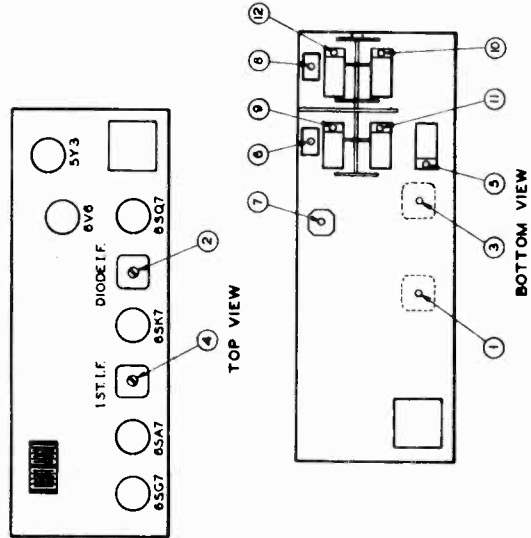
CABINET

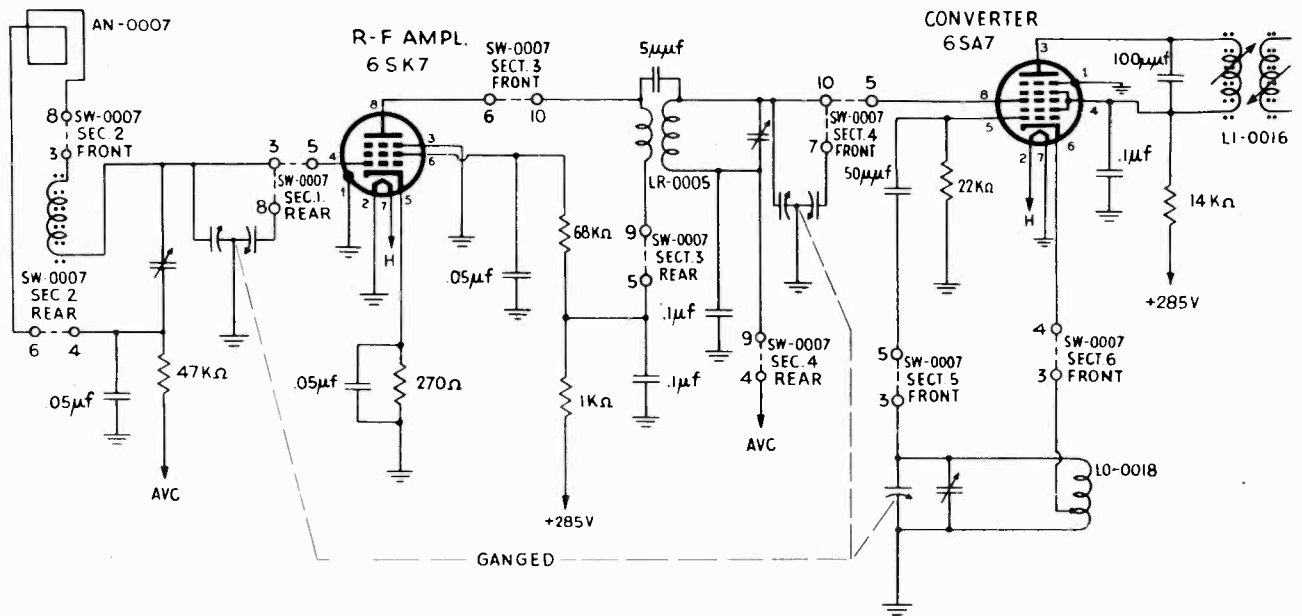
- CW-0008 Cabinet complete with Plastic Dial Covering
- AS-0240 Metal Grill Assembly
- BC-0009 Baffle used with above item

LINE CORD

- CA-0038 Line Cord - 6 ft. and Moulded Plug

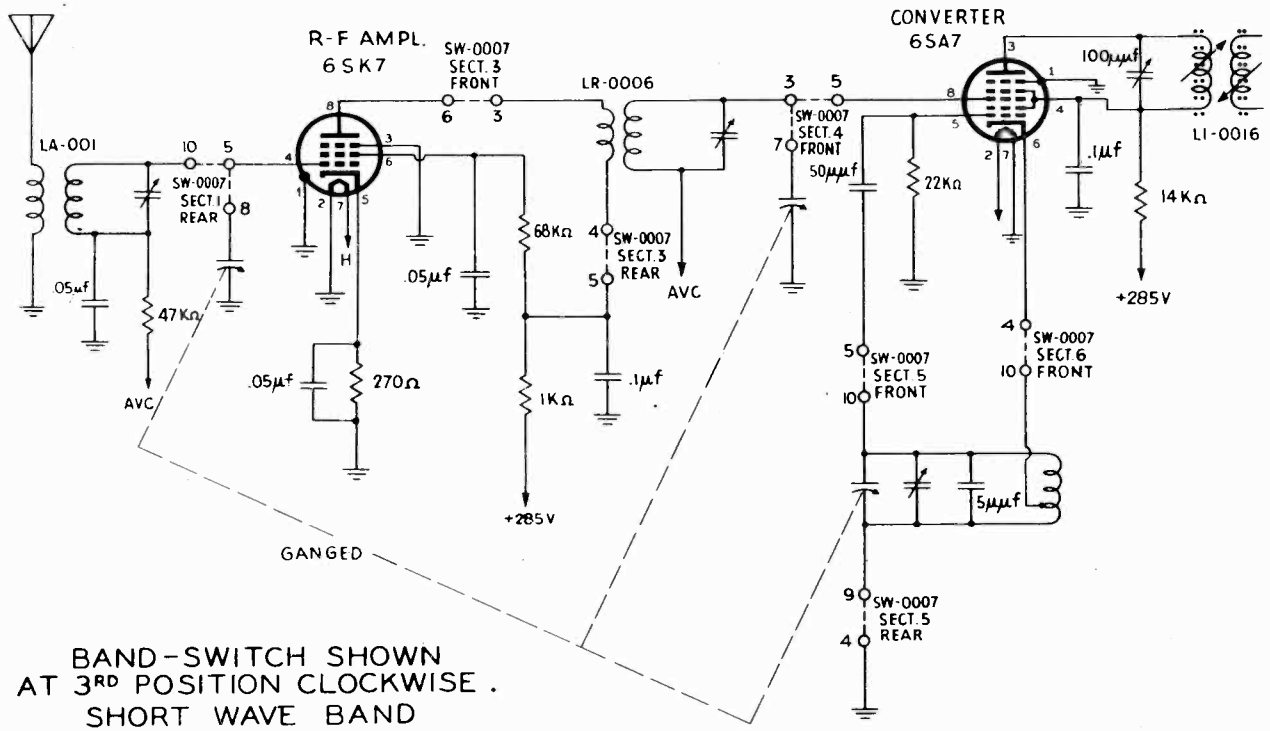
TUBE AND TRIMMER LOCATION CHART





BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE . BROADCAST BAND

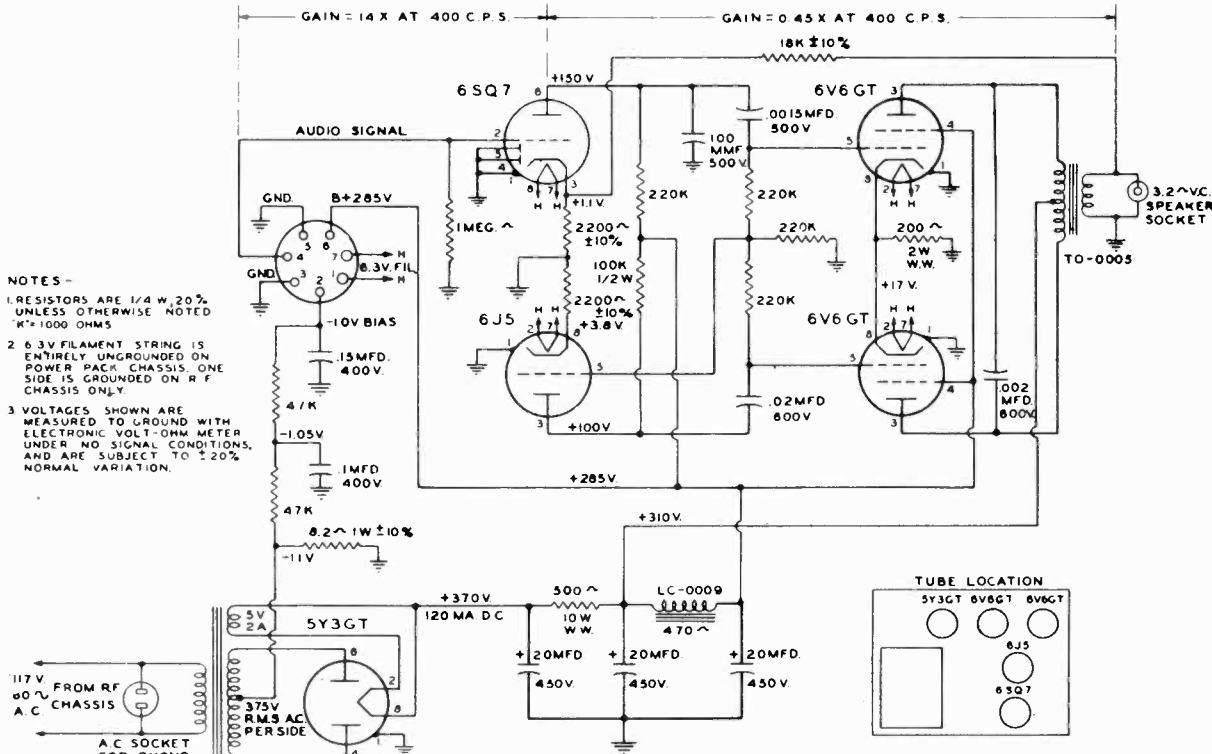
NOTE : 1ST POSITION "PHONO" NOT SHOWN.



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE . SHORT WAVE BAND

HOWARD RADIO CO

MODEL 909-M



- NOTES -
1. RESISTORS ARE 1/4 W. 20% UNLESS OTHERWISE NOTED *K=1000 OHMS
 2. 6.3V FILAMENT STRING IS ENTIRELY UNGROUNDED ON POWER PACK CHASSIS. ONE SIDE IS GROUNDED ON R.F. CHASSIS ONLY.
 3. VOLTAGES SHOWN ARE MEASURED TO GROUND WITH ELECTRONIC VOLT-OHM METER UNDER NO SIGNAL CONDITIONS, AND ARE SUBJECT TO ±20% NORMAL VARIATION.

ALIGNMENT CHART

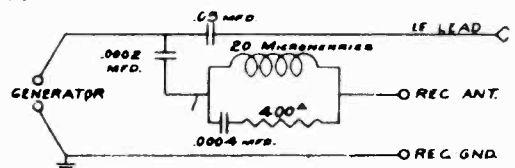
Set controls at indicated positions before following chart.

- Loop attached to chassis.
- Volume control on full.
- Set Dial between broadcast stations at low frequency end of dial.
- Tone Control set at clockwise position (normal).
- Band Switch at broadcast position.
- Adjust all trimmers for maximum sensitivity.

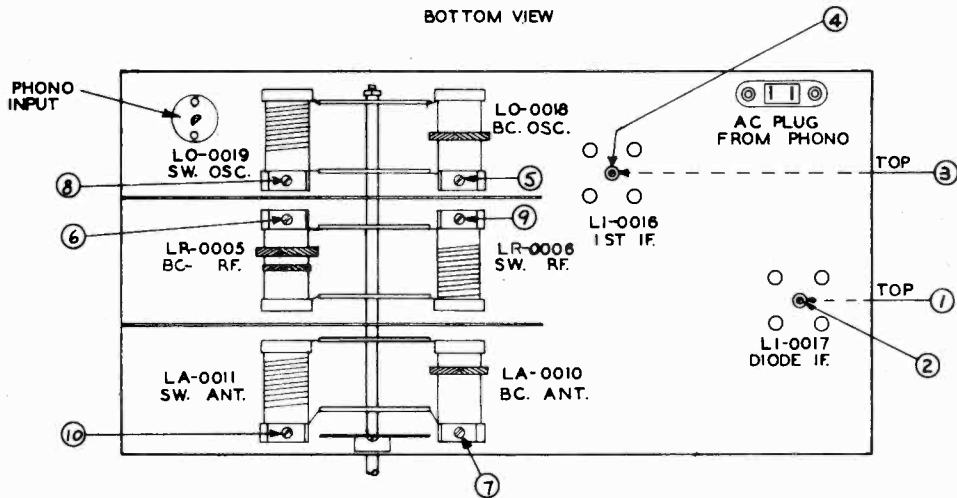
| | DUMMY ANTENNA | SIG. GEN. CONNECTION | GEN. FREQ. | BAND POSITION | DIAL SETTING | ORDER OF TRIMMER ADJUSTMENTS | TRIMMER FUNCTION | SEE NOTE |
|---|--|----------------------|------------|---------------|---------------|------------------------------|------------------|----------|
| 1 | .05 Mfd. | Grid of 6SA7 | 455 KC | BC | Low end of BC | 1,2,3,4 | I.F. | A |
| 2 | .05 Mfd. | Pin #4 6SK7 | 1400 KC | BC | 1400 KC | 5,6 | BC Osc. and R.F. | |
| 3 | Note B | Note B | 1400 KC | BC | 1400 KC | 7 | Loop | B |
| 4 | 400 Ohm. Line | Antenna on loop | 11.9 MC | SW | 11.9 MC | 8,9,10 | SW | C |
| 5 | Accurately set signal generator at one MC and check through short wave dial, harmonics to be one MC apart. | | | | | | | |

- NOTE A. The I.F. adjustments are iron core slug tuning and it should not be necessary to move them very far in either direction from the factory setting, since they are of a very stable nature.
- NOTE B. Inductively couple signal generator to loop by wrapping one or two turns of wire around outside wire of loop and fasten one end to the high side of the signal generator.
- NOTE C. In adjusting trimmer #8, be sure the image of the I.F. is at approximately 11.9 MC.
- CAUTION: Do not knife gang unless absolutely necessary, and then with extreme care.

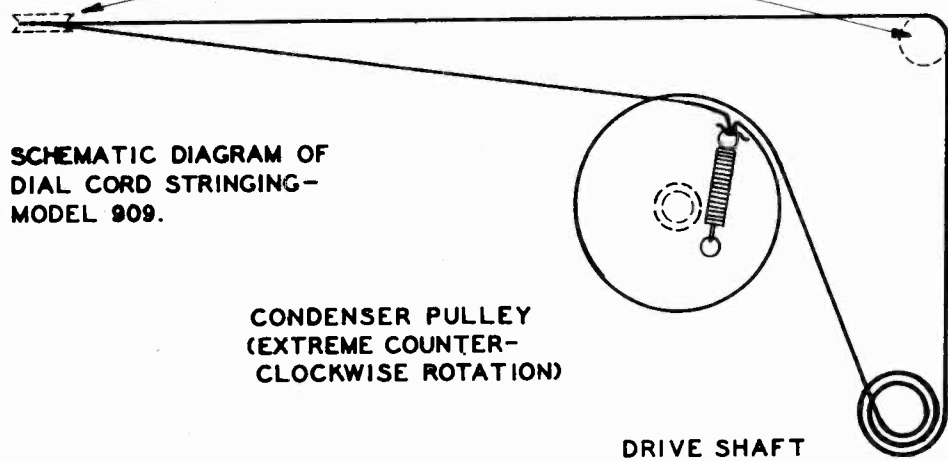
RECOMMENDED DUMMY ANTENNA. Although the values as shown in above table for antenna load may be satisfactory, we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.



TRIMMER LOCATION CHART
BOTTOM VIEW



IDLER PULLEYS



SCHEMATIC DIAGRAM OF
DIAL CORD STRINGING -
MODEL 909.

CONDENSER PULLEY
(EXTREME COUNTER-
CLOCKWISE ROTATION)

DRIVE SHAFT

REPLACEMENT PARTS LIST

| | | | |
|-------------------------------------|--|--------------------------|--|
| CONTROL | | KNOBES | |
| VC-0002 | Volume Control with Switch | KB-0015-3 | Knob - Tuning and Volume |
| CONDENSERS | | KB-0007 | Knob - acousticolor |
| AC-0006 | Tuning Gang with Gears and Drive Hub | KB-0008 | Knob - Selector Switch |
| CE-0006 | Capacitor - Electrolytic 20-20-20 MFD 450 volts | KB-0018 | Knob - 1" Dia. (door) |
| CE-0005 | Capacitor - 25 MFD 25 volts | KB-0016 | Knob - 2" Dia. (drawer) |
| COILS | | TRANSFORMERS | |
| AN-0007 | Loop antenna and Backboard | TO-0005 | Output Transformer |
| LA-0010 | Antenna Coil - Broadcast | LC-0009 | Filter Choke (395 Ohms D.C.) |
| LA-0011 | Antenna Coil - Shortwave | TP-0001-1 | Power Transformer (60 cycle 110 volts) or |
| LO-0018 | Oscillator Coil - Broadcast | TP-0001-2 | Power Transformer (60 cycle 110 volts) or |
| LO-0019 | Oscillator Coil - Shortwave | TP-0004 | Power Transformer (half shell type) (60 cycle 110 volts) |
| LR-0005 | R.F. Coil - Broadcast | 9-TUBE COMPLEMENT | |
| LR-0006 | R.F. Coil - Shortwave | TU-6SA7 | Tube |
| LI-0016 | 1st I.F. Transformer | TU-6SK7 | Tube 2 used |
| LI-0017 | 2nd I.F. Transformer | TU-6SQ7 | Tube 2 used |
| SWITCHES | | TU-6J5 | Tube |
| SW-0007 | Band Switch - 6 Section - 3 position | TU-6V6 | Tube 2 used |
| SW-0006 | Tone Switch - 5 position | TU-5Y3 | Tube |
| DIAL AND CONTROL ACCESSORIES | | SOCKETS | |
| AS-0220 | Tuning Shaft Assembly | SO-0010 | Phono Socket |
| AS-0218 | Pointer and Slide Assembly | SO-0011 | Socket - 7 prong wafer |
| DC-0001 | Dial Cord 54" | SO-0012 | Socket - Power Outlet |
| SP-0010 | Spring - Dial - 40 oz. Load Spring Steel | SO-0007 | Tube Socket, Octal |
| AS-0242 | Dial Light Assembly - Left | LINE CORD | |
| AS-0243 | Dial Light Assembly - Right | CA-0039 | Line Cord with Plastic Plug - 8 ft. |
| DG-0001 | Dial - Broadcast (Lower) | CA-0038 | Line Cord with Plastic Plug - 6 ft. for Changer |
| DG-0002 | Dial - Shortwave (Upper) | CA-0043 | Line Cord with Plastic Plug - 42" (Power Pack Chassis) |
| DG-0003 | Dial - Howard Name | CABINETS | |
| PL-0010 | Antenna Cable Plug - 4 Prong | CW-0006-1 | Cabinet (Mahogany) |
| LS-0002 | Pilot Lamp (Type #44) 6-8 volt .25 Amp. Blue Bead | CW-0006-2 | Cabinet (Blond) |
| LS-0003 | Pilot Lamp (Type #51) 6-8 volt .20 amp. White Bead | AA-0003-1 | Radio Drawer (Mahogany) |
| PR-0070-1 | Metal Escutcheon (Mahogany) | AA-0003-2 | Radio Drawer (Blond) |
| FR-0070-2 | Metal Escutcheon (Blond) | SPEAKER | |
| | | SK-0008 | Speaker 6" x 9" Elliptical P.M. |

Model 626 with Loctal Tubes

SOCKET VOLTAGES

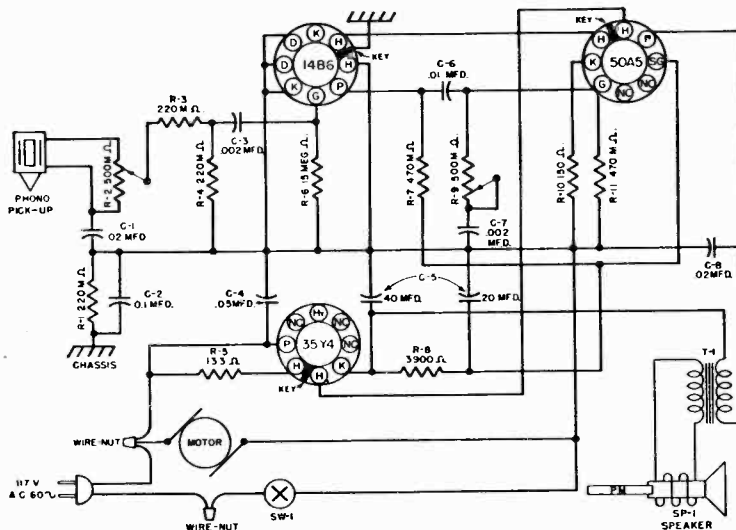
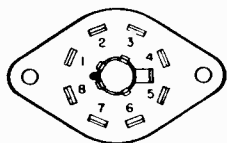
| TUBE | POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------|--------------|-------|--------|-----|-------|----|-----|-----|-------|
| 14B6 | AF Amplifier | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 12 AC |
| 50A5 | Power Output | 54 AC | 118 | 125 | 0 | 40 | 0 | 9.0 | 12 AC |
| 35Y4 | Rectifier | 85 AC | 117 AC | 0 | 85 AC | 0 | 125 | 127 | 54 AC |

NOTE: All DC voltages measured with a 1000 ohm-per-volt meter from B— to socket contact indicated. All voltages are positive DC unless otherwise marked.

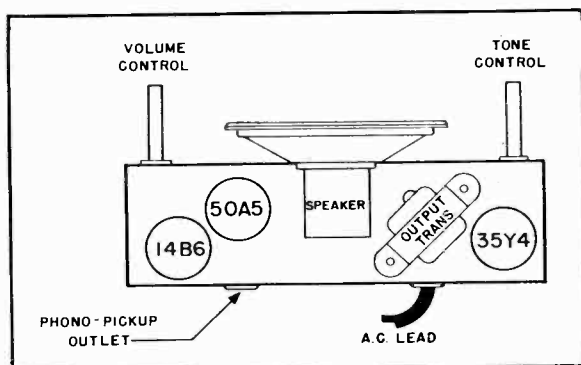
Volume control full on. Zero input.

Tone control in clockwise position.

Line voltage 117 volts AC.



Wiring Diagram Model 626 With Loctal Tubes



Tube Layout

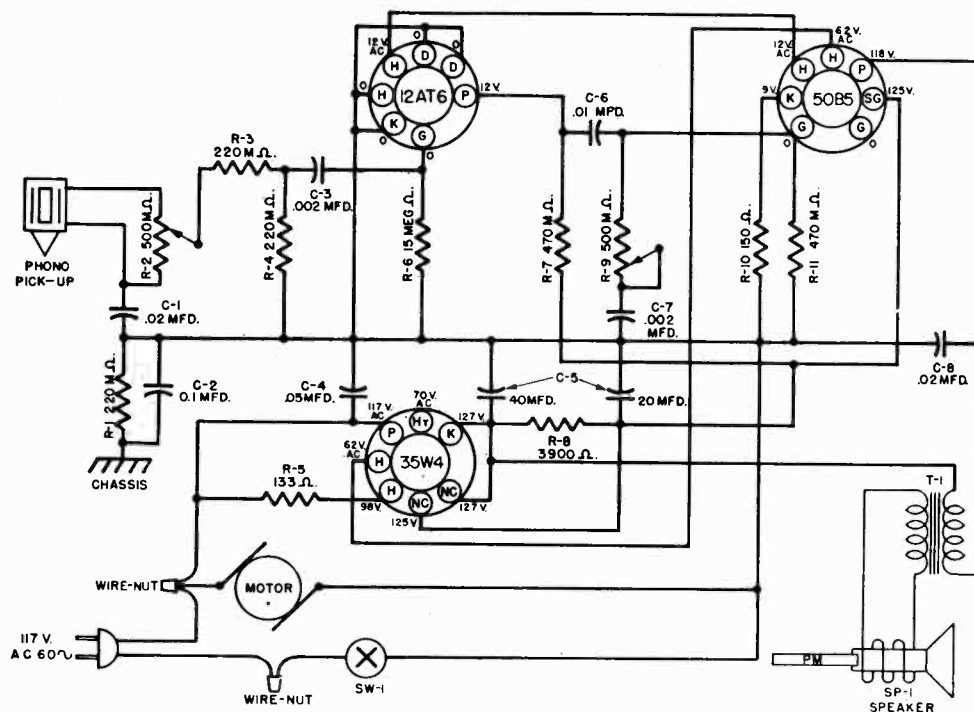
AMPLIFIER WITH LOCTAL TUBES

| Symbol | Part No. | Description |
|-----------|-----------|---|
| C-4 | BC31B503 | Capacitor, .05 mfd., 400 v. |
| C-6 | BD410103 | Capacitor, .01 mfd., 400 v. |
| C-2 | BD410104 | Capacitor, 0.1 mfd., 400 v. |
| C-1, 8 | BD410203 | Capacitor, .02 mfd., 400 v. |
| C-3, 7 | BD610202 | Capacitor, .002 mfd., 600 v. |
| R-8 | BR16C392 | Resistor, 3900 ohm, 1/2 w. |
| R-10 | BR16E151 | Resistor, 150 ohm, 1 w. |
| R-6 | BR17B156 | Resistor, 15 meg., 1/2 w. |
| R-1, 3, 4 | BR17B224 | Resistor, 220M ohm, 1/2 w. |
| R-7, 11 | BR17B474 | Resistor, 470M ohm, 1/2 w. |
| C-5 | A-8948 | Cap., Elec., 40-20 mfd., 150 v. (Metal Container) |
| R-5 | A-9528 | Resistor, 133 ohm, 5 w. |
| C-5 | B-9564-1 | Cap., Elec., 40-20 mfd., 150 v. (Paper Container) |
| | A-51160-1 | Cord, Line |
| | B-51318-6 | Knob |
| T-1 | A-51578-2 | Transformer, Output |
| R-2, 9 | B-54466-1 | Control (Tone and Volume), 500M ohm. |
| SP-1 | B-56029 | Speaker, 4-inch PM |

MODEL 626, with
miniature tubes

INTERNATIONAL DETROLA CORP.

Model 626 with Miniature Tubes

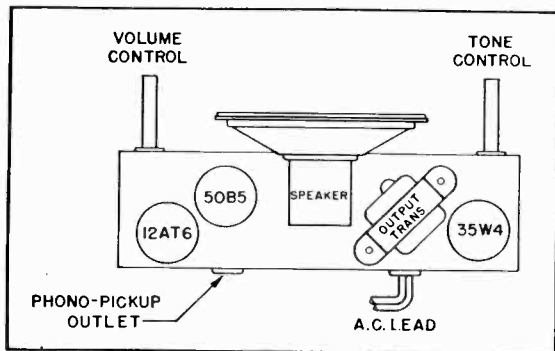


NOTE: All DC voltages measured with a 1000 ohm-per-volt meter from B— to socket contact indicated. All voltages are positive DC unless otherwise marked.
Volume control full on. Zero signal input.
Tone control in clockwise position.
Line voltage 117 volts AC.
Controls shown in clockwise position.
All tube sockets shown from pin end view.

Wiring Diagram Model 626 With Miniature Tubes

AMPLIFIER WITH MINIATURE TUBES

| Symbol | Part No. | Description |
|-----------|-----------|--|
| C-4 | BC31B503 | Capacitor, .05 mfd., 400 v. |
| C-6 | BD410103 | Capacitor, .01 mfd., 400 v. |
| C-2 | BD410104 | Capacitor, .1 mfd., 400 v. |
| C-1, 8 | BD410203 | Capacitor, .02 mfd., 400 v. |
| C-3, 7 | BD610202 | Capacitor, .002 mfd., 600 v. |
| R-10 | BR16E151 | Resistor, 150 ohm, 1 w. |
| R-8 | BR16C392 | Resistor, 3900 ohm, 1/2 w. |
| R-6 | BR17B156 | Resistor, 15 meg., 1/3 w. |
| R-1, 3, 4 | BR17B224 | Resistor, 220M ohm, 1/3 w. |
| R-7, 11 | BR17B474 | Resistor, 470M ohm, 1/3 w. |
| C-5 | A-8948 | Cap., Elec., 40-20 mfd., 150 v. (Metal Container) |
| R-5 | A-9528 | Resistor, 133 ohm, 5 w. |
| C-5 | B-9564-1 | Cap., Elec., 40-20 mfd., 150 v. (Paper Container) |
| T-1 | A-51160-1 | Cord, Line |
| R-2, 9 | B-51578-2 | Transformer, Output Control (Tone and Volume), 500M ohm. |
| SP-1 | B-56029 | Speaker, 4-inch PM |
| | A-56171 | Sheet, Service |

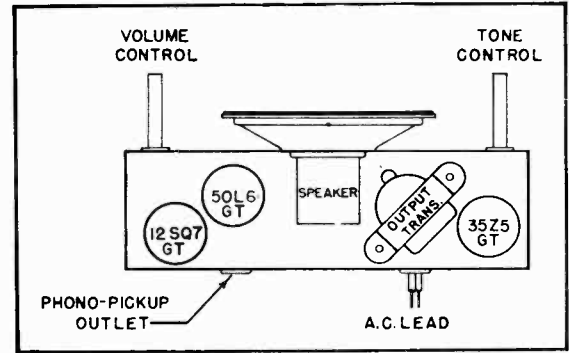


Tube Layout

AMPLIFIER WITH OCTAL TUBES

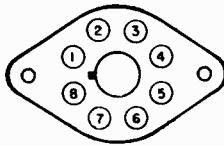
| Symbol | Part No. | Description |
|-----------|-----------|---|
| C-3 | BC31B503 | Capacitor, .05 mfd., 400 v. |
| C-6 | BD410103 | Capacitor, .01 mfd., 400 v. |
| C-2 | BD410104 | Capacitor, .1 mfd., 400 v. |
| C-1, 8 | BD410203 | Capacitor, .02 mfd., 400 v. |
| C-4, 7 | BD610202 | Capacitor, .002 mfd., 600 v. |
| R-7 | BR16C392 | Resistor, 3900 ohm, 1/2 w. |
| R-10 | BR16E151 | Resistor, 150 ohm, 1 w. |
| R-6 | BR17B156 | Resistor, 15 meg., 1/8 w. |
| R-2, 3, 5 | BR17B224 | Resistor, 220M ohm, 1/8 w. |
| R-8, 11 | BR17B474 | Resistor, 470M ohm, 1/8 w. |
| C-5 | A-8948 | Cap., Elec., 40-20 mfd., 150 v. (Metal Container) |
| R-4 | A-9528 | Resistor, 133 ohm, 5 w. |
| C-5 | B-9564-1 | Cap., Elec., 40-20 mfd., 150 v. (Paper Container) |
| | A-51160-1 | Cord, Line |
| | B-51318-6 | Knob |
| T-1 | A-51578-2 | Transformer, Output |
| R-1, 9 | B-54466-1 | Control (Tone and Volume), 500M ohm. |
| SP-1 | B-56029 | Speaker, 4-inch PM |

Model 626 With Octal Tubes

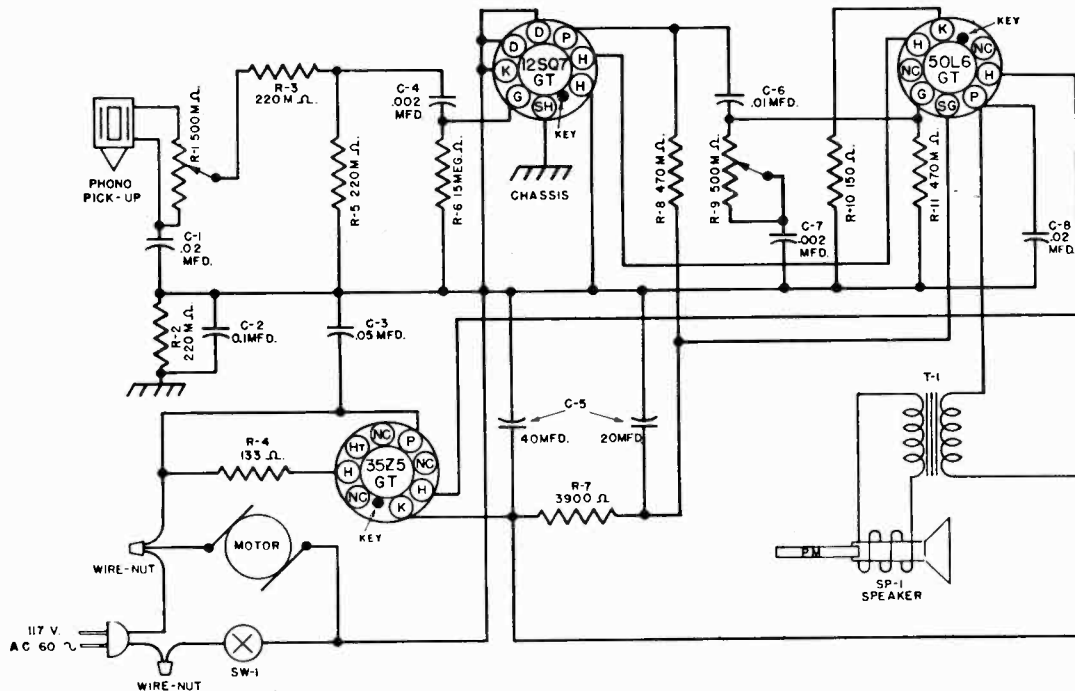


SOCKET VOLTAGES

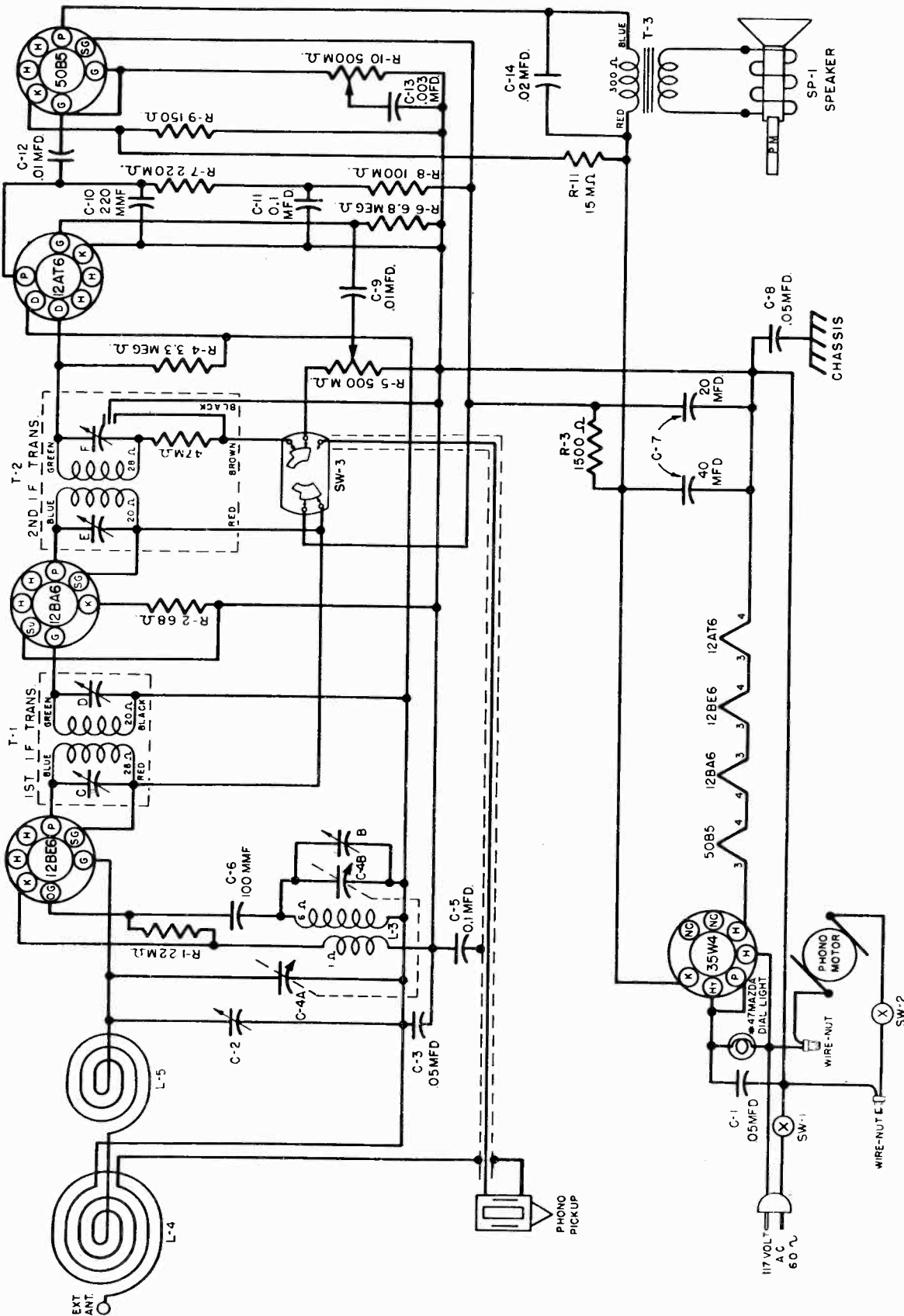
| TUBE | POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|--------------|---|-------|-------|-----|--------|-----|-------|-----|
| 12SQ7GT | AF Amplifier | 0 | 0 | 0 | 0 | 0 | 40 | 12 AC | 0 |
| 50L6GT | Power Output | 0 | 54 AC | 118 | 125 | 0 | 0 | 12 AC | 9.0 |
| 35Z5GT | Rectifier | 0 | 85 AC | 85 AC | 0 | 117 AC | 125 | 54 AC | 127 |



NOTE: All DC voltages measured with a 1000 ohm-per-volt meter from B- to socket contact indicated. All voltages are positive DC unless otherwise marked. Volume control full on. Zero input. Tone control in clockwise position. Line voltage 117 volts AC.



Wiring Diagram Model 626 With Octal Tubes (For Run Number 3 and Up)



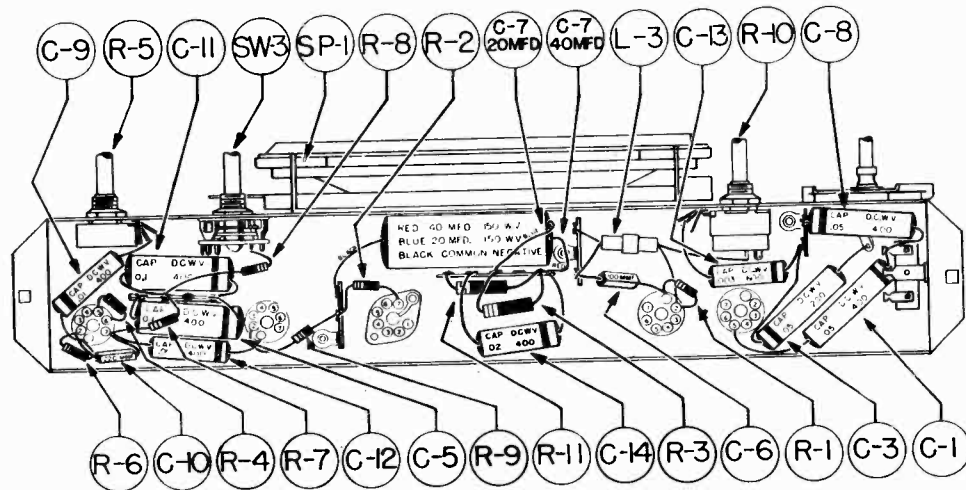
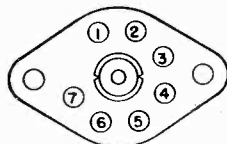
455 KC IF

ALL TUBE SOCKETS SHOWN FROM PIN END VIEW. ALL SWITCHES SHOWN IN COUNTERCLOCKWISE POSITION. SHAFT END VIEW

SOCKET VOLTAGES

| TUBE | POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|---------------------|----|---|-------|--------|--------|--------|-----|
| 12BE6 | Converter | -5 | 0 | 24 AC | 12 AC | 88 | 88 | 0 |
| 12BA6 | I.F. Amplifier | 0 | 0 | 24 AC | 35 AC | 88 | 88 | 0.7 |
| 12AT6 | 2nd DET.—1st AF—AVC | 0 | 0 | 12 AC | 0 | 0 | 0 | 12 |
| 50B5 | Power Output | 0 | 5 | 85 AC | 35 AC | 115 | 88 | 0 |
| 35W4 | Rectifier | 0 | 0 | 85 AC | 117 AC | 112 AC | 112 AC | 122 |

NOTE: All DC voltages measured with a 1000 ohm-per-volt meter from ON-OFF switch (—B) to socket contact indicated. All AC voltages are measured from ON-OFF switch (—B) to socket contact indicated. All voltages are positive DC unless otherwise marked. Volume Control full on. No signal input. Line voltage 117 volts AC.



Parts Layout—Model 7156

SERVICE PARTS LIST

| Symbol | Part No. | Description | Symbol | Part No. | Description |
|-----------|----------|-------------------------------------|-----------|-----------|-------------------------------------|
| C-3 | BD210503 | Capacitor, Paper, .05 mfd., 200 v. | | B-51427-5 | Grommet (large) |
| C-9, C-12 | BD410103 | Capacitor, Paper, .01 mfd., 400 v. | | B-51427-8 | Grommet (small) |
| C-5, C-11 | BD410104 | Capacitor, Paper, 0.1 mfd., 400 v. | SW-3 | B-51576-2 | Switch, Radio-Phono |
| C-14 | BD410203 | Capacitor, Paper, .02 mfd., 400 v. | | A-51787 | Spring, for Dial Cable |
| C-1, C-8 | BD410503 | Capacitor, Paper, .05 mfd., 400 v. | | A-54122 | Button, Plug |
| C-13 | BD610302 | Capacitor, Paper, .003 mfd., 600 v. | R-5 | B-54466-2 | Control, Volume, 500,000 ohm |
| C-6 | BM74A101 | Capacitor, Mica, 100 mmf. | T-2 | B-56718-1 | Transformer Assembly, 2nd IF |
| C-10 | BM74A221 | Capacitor, Mica, 220 mmf. | T-1 | B-56722-1 | Transformer Assembly, 1st IF |
| R-2 | BR16B680 | Resistor, 68 ohm, ½ w. | | B-57262-6 | Cord, AC Phono. |
| R-9 | BR16C151 | Resistor, 150 ohm, ½ w. | R-10 | B-57841-1 | Control, Tone & Switch, 500,000 ohm |
| R-8 | BR17B104 | Resistor, 100,000 ohm, ½ w. | | B-57842 | Coil Assembly, Oscillator |
| R-1 | BR17B223 | Resistor, 22,000 ohm, ½ w. | SP-1 | C-57843 | Speaker, 5x7 PM |
| R-7 | BR17B224 | Resistor, 220,000 ohm, ½ w. | | B-57848-1 | Shaft, Tuning Drive |
| R-4 | BR17B335 | Resistor, 3.3 megohm, ½ w. | | B-57857-1 | Pointer, Dial |
| R-6 | BR17B685 | Resistor, 6.8 megohm, ½ w. | | B-57858-1 | Strip Assembly, Light Diffusing |
| R-3 | BR17E152 | Resistor, 1500 ohm, 1 w. | C-1 | C-57859-1 | Capacitor, Variable |
| R-11 | BR17E153 | Resistor, 15,000 ohm, 1 w. | L-4 & L-5 | D-57870 | Coil Assembly, Loop |
| | A-2163 | Cable, Drive | | C-57872-1 | Knob |
| | A-6158 | Lamp, Pilot, No. 47 Mazda, 6.3 v. | | A-57878 | Clip, Gang Mounting |
| | A-6182-1 | Socket, Dial Light | C-2 | B-57879-1 | Capacitor Assembly, Trimmer |
| C-7 | B-9564-1 | Cap., Electro., 40-20 mfd., 150 v. | | B-58069-1 | Cord, AC Power |
| | A-51163 | Clip, Spring | | | |

TUBE COMPLEMENT

- | | |
|---------------------------------------|--------------------------|
| 1—12BE6 Converter tube | 1—50B5 Power Output tube |
| 1—12BA6 IF Amplifier tube | 1—35W4 Rectifier tube |
| 1—12AT6 Detector—AVC—First Audio tube | |

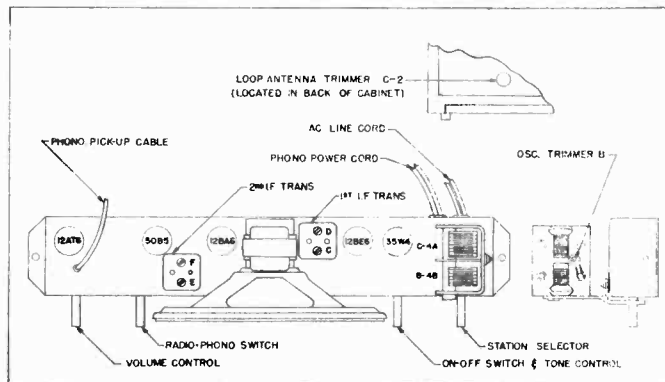
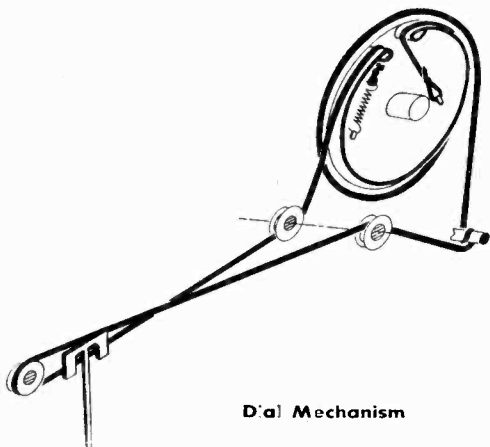
ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. A signal generator which will provide an accurately calibrated signal at the frequencies listed. 2. An output meter. 3. A non-metallic screwdriver. 4. Dummy antenna: — .1 mfd. — RMA loop. | <p>NOTE: Intermediate Frequency and Oscillator adjustments may be made with the loop disconnected provided a resistor of 10,000 to 50,000 ohms is substituted to close the 12BE6 grid circuit. The loop alignment must be done with the loop and chassis mounted in operating position in the cabinet. A single turn loosely coupled to loop may be substituted for RMA loop.</p> |
|---|--|

| GENERATOR | CONNECTION AT RADIO | DUMMY ANTENNA | DIAL | TO TUNE TRIMMERS | REMARKS |
|------------|---------------------|---------------|----------|---------------------|-------------------|
| IF 455 kc. | 12BE6 grid | .1 mfd. | HF end | IF trimmers C D E F | Tune to max. |
| 1620 kc. | 12BE6 grid | RMA loop | HF end | Osc. trimmer B | Set limit of band |
| 1400 kc. | Through loop* | RMA loop | 1400 kc. | Ant. trimmer C-2 | Tune to max. |

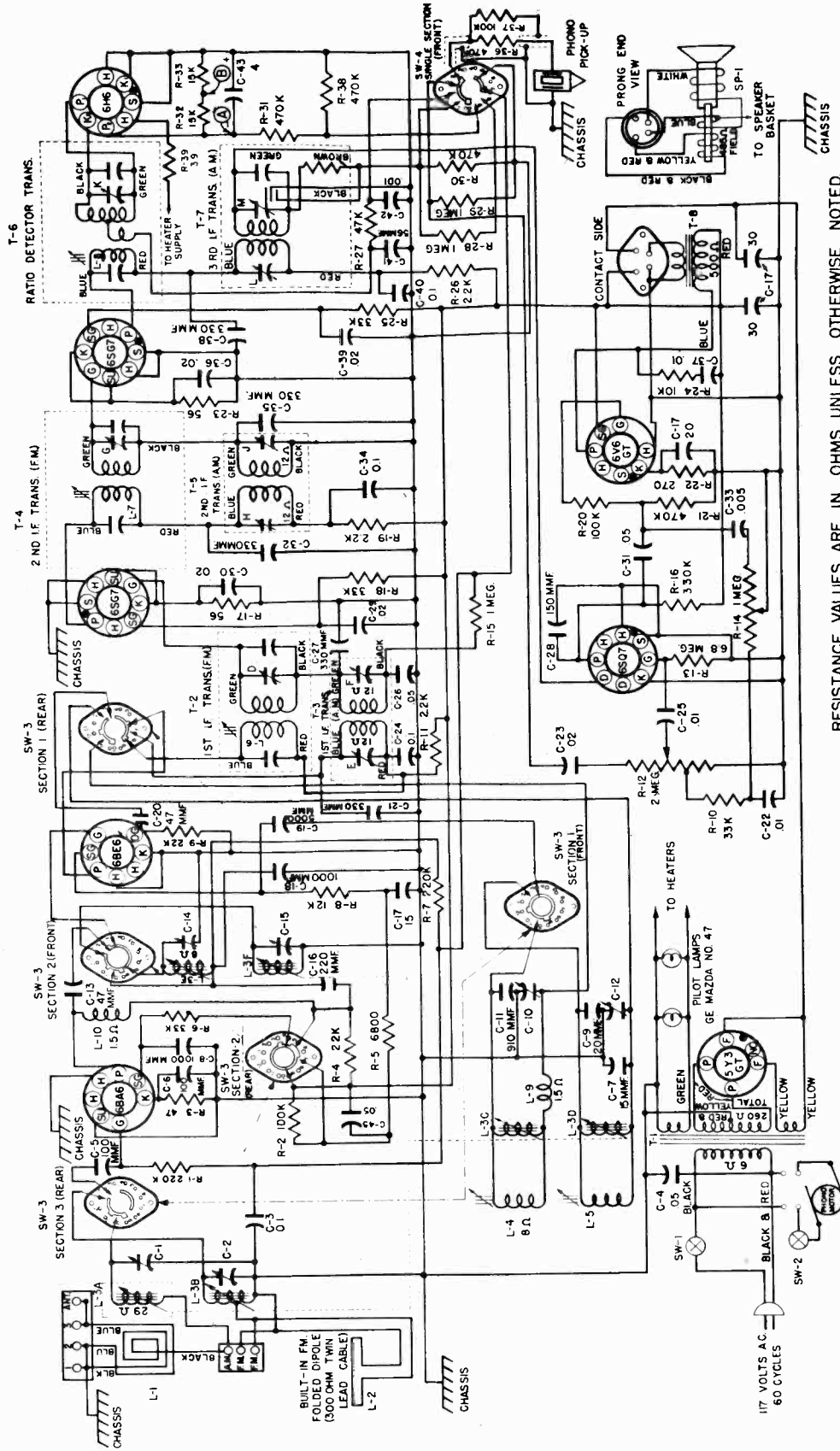
* Loop trimmer accessible through back of cabinet.



V.C. Impedance.....3.2 ohms at 400 cycles

INTERNATIONAL DETROLA CORP.

MODEL 7901



RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE NOTED.
"K" EQUALS 1000 OHMS, "MEG" EQUALS 1000000 OHMS.

CAPACITY VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.

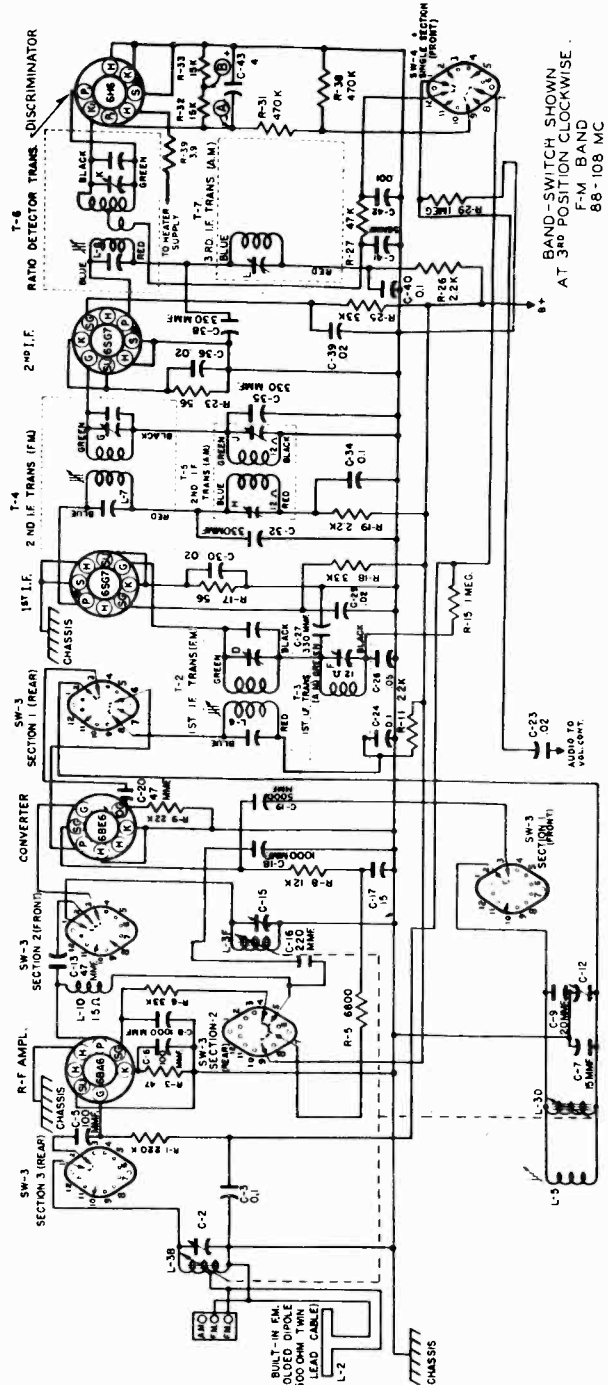
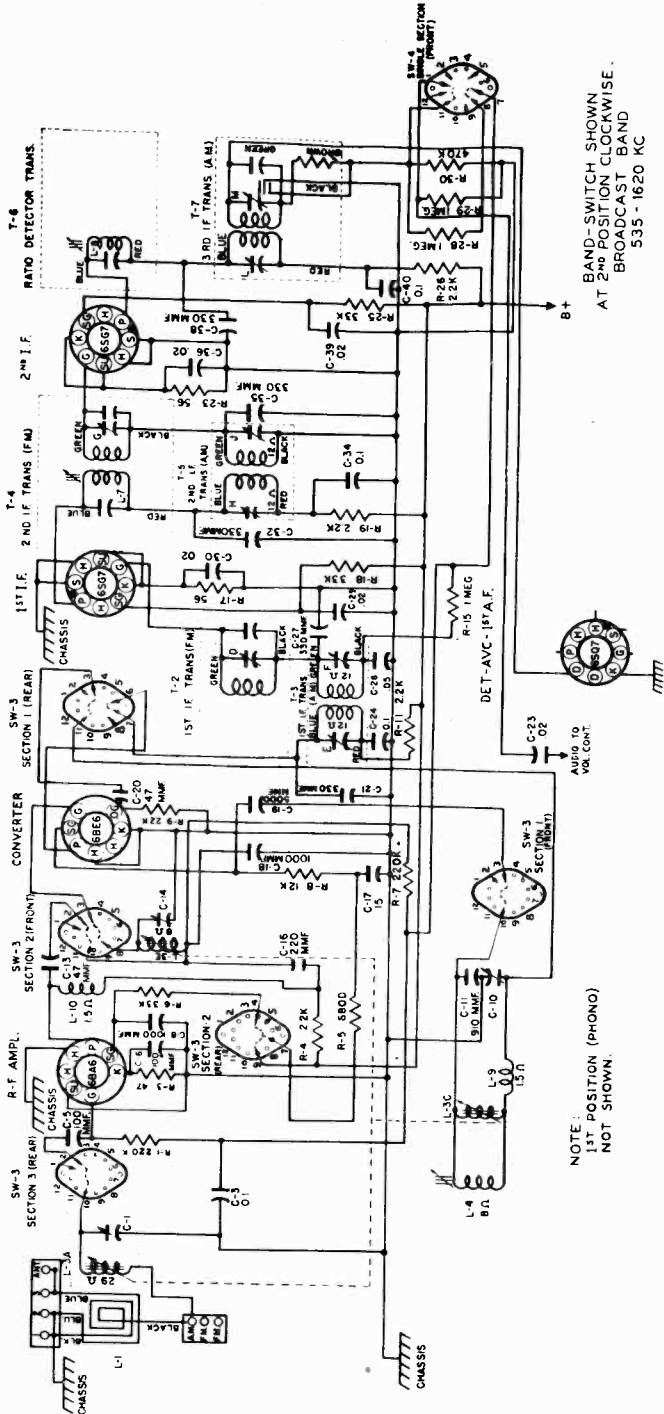
F.M.-107 MC I.F.

ALL TUBE SOCKETS ARE SHOWN FROM PIN END VIEW.
SWITCHES ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION (PHONO POSITION) SHAFT END VIEW

A.M.-455 KC I.F.

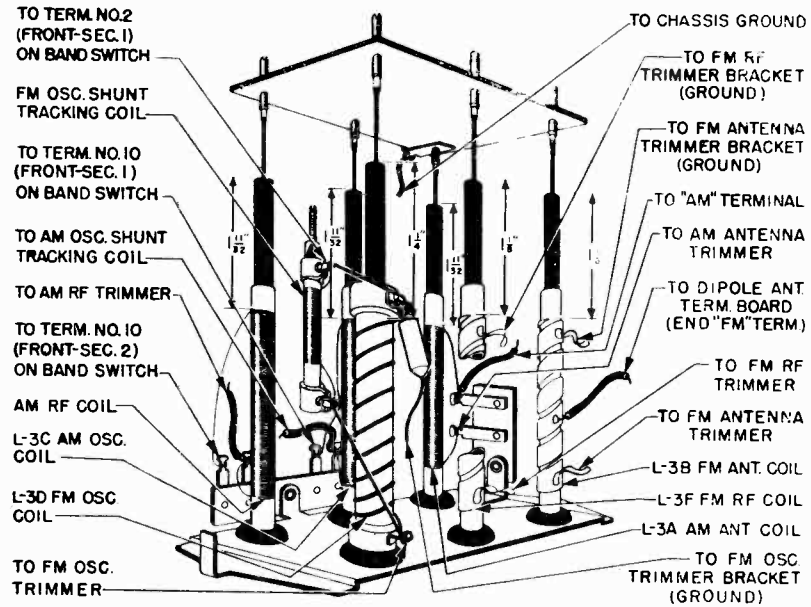
V.C. Impedance..... 3.2 ohms at 400 cycles

"clarified schematics"

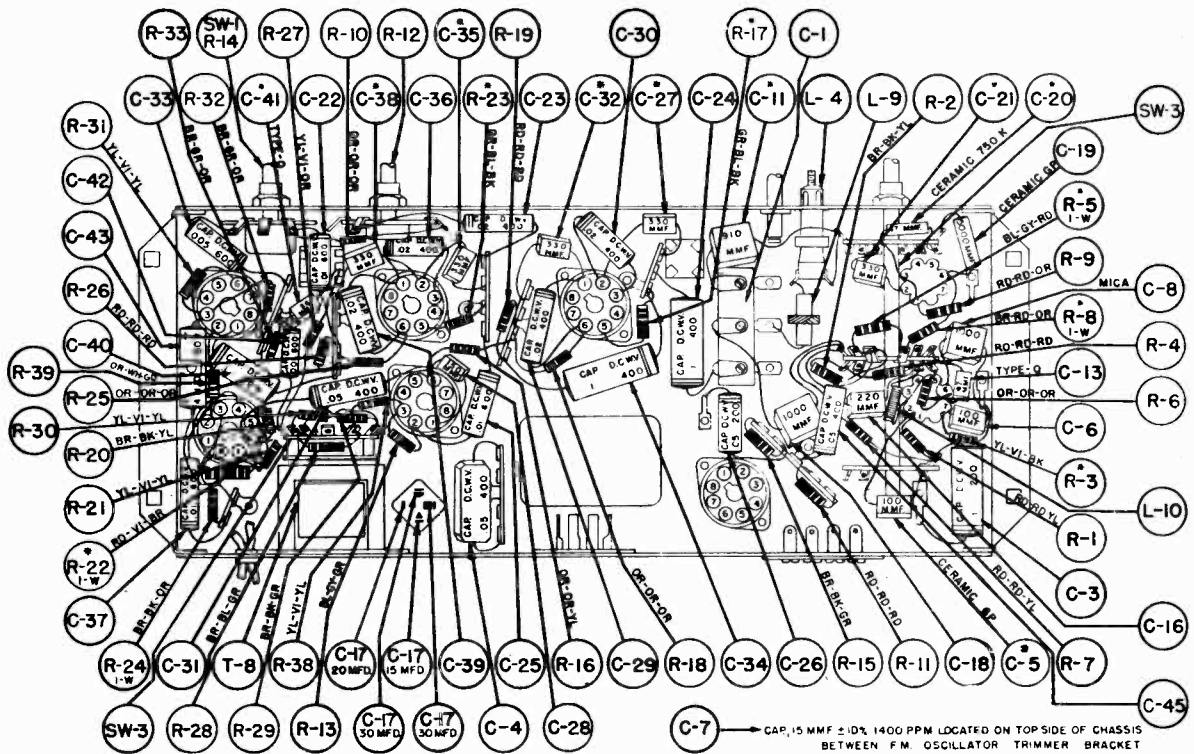


INTERNATIONAL DETROLA CORP.

MODEL 7901



Permaability Tuner Illustration



*10% TOLERANCE

Bottom View - Parts Layout

ALIGNMENT CHART

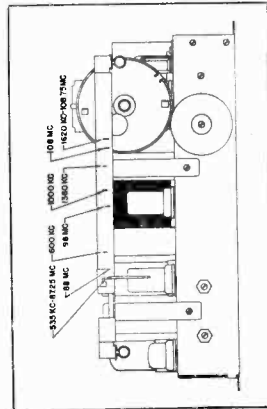
| Step No. | Band Switch Position | Signal Generator | Connection Receiver | Dummy Antenna | Dial Setting | Adjust Trimmer | Remarks |
|----------|----------------------|------------------------|---|-------------------------|--------------|--|---|
| 1 | AM | 455 kc. | 6BE6 Grid Converter Pin No. 7 | 0.1 mfd. | HF end | E, F, H, J, L, M, AM IF Trimmers | Adjust for Maximum Output. |
| 2 | AM | 535 kc. | 6BA6 Grid Pin No. 1 | 0.1 mfd. | LF end | C-10 AM Osc. Trimmer | Adjust for Maximum Output. |
| 3 | AM | 1620 kc. | 6BA6 Grid Pin No. 1 | 0.1 mfd. | HF end | L-4 AM Osc. Shunt Tracking Adjuster (See Note 1). Adjusting Flywheel from Shaft of Tuning Control.) | Adjust for Band Coverage. (See Note 1.) |
| 4 | AM | 535 kc. | 6BA6 Grid Pin No. 1 | 0.1 mfd. | LF end | C-14 AM RF Trimmer | Adjust for Maximum Output. |
| 5 | AM | 1400 kc. | Thru Loop (With Receiver Connected to Set.) | Inductive Loop | 1400 kc. | C-1 AM Antenna Trimmer | Adjust for Maximum Output. |
| 6 | FM | 10.7 mc. (CW Signal) | 6SG7 Driver Grid Pin No. 4 | 0.1 mfd. | HF end | L-8 Ratio Detector Primary | Adjust for Maximum AVC between Points A on Wiring Diagram and C on Electronic Voltmeter. See Notes 2 and 3. |
| 7 | FM | 10.7 mc. (CW Signal) | 6SG7 Driver Pin No. 4 | 0.1 mfd. | HF end | K Ratio Detector Secondary | See Note 2. Adjust for Zero Position (Using Electronic Voltmeter from No. 12 Position on Single Section Switch and Point "B" on Wiring Diagram. |
| 8A | FM | 10.7 mc. (CW Signal) | 6BE6 Converter Grid Pin No. 7 | 0.1 mfd. | HF end | L-6, D, L-7, G FM IF | See Note 2. Adjust for Maximum AVC. |
| 8B | FM | 10.7 mc. (CW Signal) | 6BE6 Converter Grid Pin No. 7 | 0.1 mfd. | HF end | L-6, D, L-7, G FM IF | See Note 3. Adjust for Maximum Output. |
| 9 | FM | 87.25 mc. (FM Signal) | 6BA6 Grid Pin No. 1 | 0.1 mfd. | LF end | C-12 FM Osc. Trimmer | Adjust for Maximum Output. |
| 10 | FM | 108.75 mc. (FM Signal) | 6BA6 Grid Pin No. 1 | 0.1 mfd. | HF end | L-5 FM Osc. Shunt Tracking Adjustment | Adjust for Band Coverage. (See Note 4.) |
| 11 | FM | 87.25 mc. (FM Signal) | 6BA6 Grid Pin No. 1 | 0.1 mfd. | LF end | C-15 FM RF Trimmer | Adjust for Maximum Output. |
| 12 | FM | 87.25 mc. (FM Signal) | Thru 300 ohm Carbon Resistor to End of Antenna Terminal and Center FM Antenna Terminal. | 300 ohm Carbon Resistor | 87.25 mc. | C-2 FM Antenna Trimmer | Adjust for Maximum Output. |

ALIGNMENT PROCEDURE

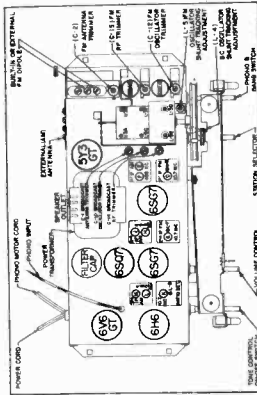
First determine if factory adjustments of the permeability tuner cores have been altered. This may be done by checking core positions against dimensions shown in tuner illustration. Broken wax seals on the core adjustments may also indicate altering. If the slug adjustments have been changed, it will be necessary to first adjust them in accordance with the dimensions given in tuner illustration before proceeding with alignment.

The following equipment is necessary to properly align this receiver:

1. AM signal generator with frequency coverage from 455 kc. to 1700 kc.
2. FM or CW signal generator covering the FM band from 87.25 mc. to 108.75 mc. and the 10.7 mc. frequency for FM IF alignment.
3. Vacuum Tube Voltmeter (VTVM).
4. Output meter—to match 4 ohms, 5 watts maximum.
5. Insulated alignment screwdriver.
6. Dummy antenna—0.1 mfd. capacitor, 300 ohm carbon resistor and inductive loop (fashioned from several turns of wire).



Calibration Points



Trimmer Location

Reference Notes to Alignment Chart

Note 1—If 1620 kc. signal is received lower in frequency than the 1620 kc. dial calibration, turn BC oscillator shunt tracking adjustment (L-4) outward. Retrack at 535 kc. (Step 2). If higher than the 1620 kc. dial calibration, screw adjustment inward and retrack at 535 kc. Repeat until 535 kc. and 1620 kc. signals coincide with their respective dial calibrations.

Note 2—Adjust input voltage to give approximately 5 volts AVC before final adjustment is made. For STEPS 6 and 8A—Voltmeter "common" lead to chassis.

Note 3—If 108.75 mc. signal is received lower in frequency than the 108.75 mc. dial calibration, turn FM oscillator shunt tracking adjustment (L-5) outward. Retrack at 87.25 mc. (STEP 9). If higher than the 108.75 mc. dial calibration, screw adjustment inward and retrack at 87.25 mc. Repeat until 87.25 mc. and 108.75 mc. signals coincide with their respective dial calibrations.

| Symbol | Part No. | Description | Symbol | Part No. | Description |
|------------|-----------|--|------------|------------|---|
| | A-6158 | Lamp, Pilot No. 47..... | | A-51729 | Bushing, Shaft |
| | B-51524-4 | Lead, Shielded | | A-54848 | Bushing, Strain Relief |
| | B-57922 | Link, Band Switch | | A-58341 | Cable, Dial |
| L-3A, 3B, | D-57920 | Permeability Tuner Assy..... | C-33 | BD610502 | Capacitor, .005 mfd., 600 v..... |
| 3C, 3D, | | | C-42 | BD610102 | Capacitor, .001 mfd., 600 v..... |
| 3E, 3F, | | | C-22, 35, | BD610103 | Capacitor, .01 mfd., 600 v..... |
| and L-5 | | | 37 | | |
| | | Perm. Tuner Assembly (on exchange basis only).... | C-23, 29, | BD410203 | Capacitor, .02 mfd., 400 v..... |
| | A-59316-1 | Pointer, Dial | 30, 36, 39 | | |
| R-39 | B-55513-1 | Resistor, 3.9 ohm, 1/2 w..... | C-26 | BD210503 | Capacitor, .05 mfd., 200 v..... |
| R-3 | BR16B470 | Resistor, 47 ohm, 1/2 w..... | C-31, 45 | BD410503 | Capacitor, .05 mfd., 400 v..... |
| R-17, 23 | BR16B560 | Resistor, 56 ohm, 1/2 w..... | C-4 | BC31B503 | Capacitor, .05 mfd., 400 v..... |
| R-22 | BR16E271 | Resistor, 270 ohm, 1 w..... | C-3 | BD210104 | Capacitor, .1 mfd., 200 v..... |
| R-4, 11, | BR17B222 | Resistor, 2,200 ohm, 1/2 w..... | C-24, 34, | BD410104 | Capacitor, .1 mfd. 400 v..... |
| 19, 26 | | | 40 | | |
| R-5 | BR16E682 | Resistor, 6,800 ohm, 1 w..... | C-1 | B-57942-1 | Capacitor Assy., Trimmer (3 sec.) |
| R-24 | BR17E103 | Resistor, 10,000 ohm, 1 w..... | C-19 | B-58802-11 | Capacitor, Ceramic, 5000 mmf., G.P. |
| R-8 | BR16E123 | Resistor, 12,000 ohm, 1 w..... | C-5 | B-58801-18 | Capacitor, Ceramic, 100 mmf., G.P. |
| R-32, 33 | BR17B153 | Resistor, 15,000 ohm, 1/2 w..... | C-20 | B-58800-27 | Capacitor, Ceramic, 47 mmf. (-750 ppm) |
| R-9 | BR17B223 | Resistor, 22,000 ohm, 1/2 w..... | C-7 | B-58803-16 | Capacitor, Ceramic, 15 mmf. (-1400 ppm) |
| R-6, 10, | BR17B333 | Resistor, 33,000 ohm, 1/2 w..... | C-43 | B-55520-1 | Cap., Electro., 4 mfd., 150 v.... |
| 18, 25 | | | C-17 | A-57950 | Cap., Electro., 30-30-75 mfd., 400 v.—20 mfd., 25 v..... |
| R-27 | BR17B473 | Resistor, 47,000 ohm, 1/2 w..... | C-8, 18 | BM74A102 | Capacitor, Mica, 1000 mmf..... |
| R-2, 20 | BR17B104 | Resistor, 100,000 ohm, 1/2 w.... | C-11 | BM64A911 | Capacitor, Mica, 910 mmf..... |
| 37 | | | C-21, 27, | BM55A331 | Capacitor, Mica, 330 mmf..... |
| R-1, 7, | BR17B224 | Resistor, 220,000 ohm, 1/2 w.... | 32, 35, 38 | | |
| R-16 | BR17B334 | Resistor, 330,000 ohm, 1/2 w.... | C-16 | BM74A221 | Capacitor, Mica, 220 mmf..... |
| R-21, 30, | BR17B474 | Resistor, 470,000 ohm, 1/2 w.... | C-28 | BM74A151 | Capacitor, Mica, 150 mmf..... |
| 31, 36, 38 | | | C-6 | BM74A101 | Capacitor, Mica, 100 mmf..... |
| R-15, 28 | | Resistor, 1 megohm, 1/2 w..... | C-41 | B-58902-11 | Capacitor, Mica Mold., Type Q, 56 mmf..... |
| 29 | BR17B105 | | C-13 | B-58900-6 | Capacitor, Mica Mold., Type Q, 47 mmf..... |
| R-13 | BR17B685 | Resistor, 6.8 megohm, 1/2 w.... | C-2 | B-57939-2 | Cap., Trimmer, 10-25 mmf..... |
| | A-51801 | Rivet, Pronged | C-12, 15 | B-57939-1 | Cap., Trimmer, 1.5—14 mmf. |
| | B-55280-1 | Shaft, Drive | | B-55260-1 | Clip, Capacitor Mtg. |
| | B-51469-3 | Socket, Dial Light | | A-57925 | Cup, Spring |
| | A-57996 | Socket, Miniature | L-10 | A-57931 | Coil Assy., R.F. Choke..... |
| | A-54726 | Socket, Octal | L-9 | B-57933 | Coil Assy., Series Track. BC Osc. |
| | A-51403 | Socket, Speaker | L-4 | B-57929 | Coil Assy., Shunt Track. BC Osc. |
| | B-55180-3 | Spacer, Metal | R-14 | B-58219-1 | Control, Pot. and Sw., 1 megohm (T.C.) |
| | A-51787 | Spring, Cable | R-12 | B-58218-1 | Control, Pot., 2 meg. (V.C.).. |
| | A-50147 | Spring, Conical | | B-57262-7 | Cord, AC-Phono..... |
| T-3 | B-57954-1 | Transformer Assembly, 1st IF AM | | B-58069-2 | Cord, Power |
| T-5 | B-57958-1 | Transformer Assembly, 2nd IF AM | | A-57999 | Crank, Switch Lever |
| T-7 | B-57963-1 | Transformer Assembly, 3rd IF AM | | A-59321 | Flywheel, Tuning Shaft |
| T-2 | B-57972-1 | Transformer Assembly, 1st IF FM | | B-57998 | Hub Crank |
| T-4 | B-57976-1 | Transformer Assembly, 2nd IF FM | | | |
| T-6 | B-57994-1 | Transformer Assembly, Ratio Det. | | | |
| T-8 | B-57997-1 | Transformer, Output | | | |
| T-1 | C-57934 | Transformer, Power | | | |