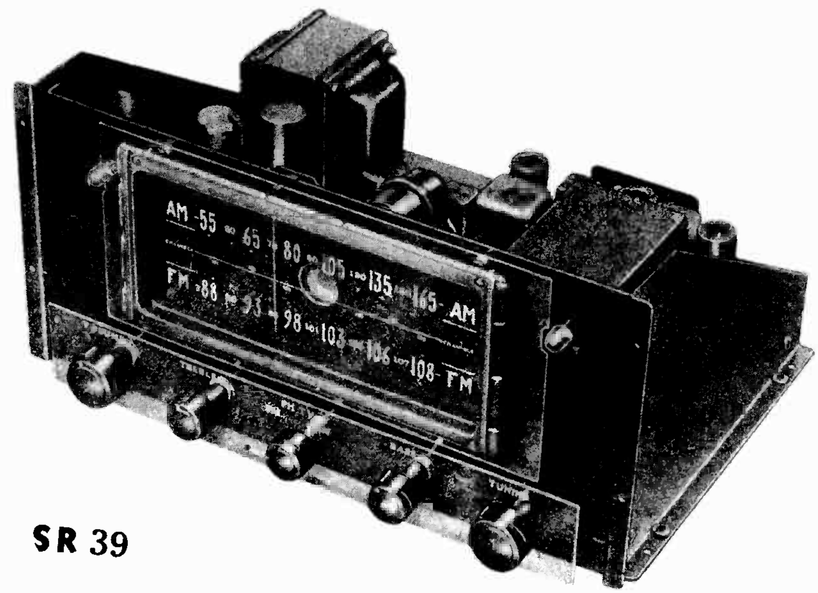
VOLUME XXI

# PERPETUAL TROUBLE SHOOTER'S MANUAL

REG. U.S. PAT. OFF.

JOHN F. RIDER




SR 39

A bandpass pre-stage tuned Radio Frequency section and one stage I.F. at 455 KC terminating in a tuned Infinite Impedence detector for those who insist on the best in a Standard Broadcast Receiver.

A Frequency Modulation Tuner employing a tuned R.F. Pre-stage for added sensitivity, a stable drift-free Triode Oscillator, two stages permiability tuned I.F. at 10.7 for superior F.M. performance and fully balanced static free Ratio Detector with 70% A.M. absorption.

Input jacks for phono pickups, either crystal pickup or properly compensated pre-amp for Variable Reluctance type pickup and a jack for aural television on Selector Control Switch.

A new SR circuit for smooth electro-accoustical control of bass and treble emphasis allowing the controls of the audio amplifier to be pre-set.

Physical dimentions:- 14" wide, 7" high and 10" from escutcheon to back.

F.M. Sensitivity:- 10 microvolts.

Average output:- .4 volts.

Tubes: 3 6BA6; 1 each 6BE6; 6C4; 6AL5; 6SN7GT; 6SA7; 6SK7; 6SF7; 6E5 and 6X5.

Power Consumption:- 68 watts, 110-125 volts, 50-60 cycles.

ANTENNA REQUIREMENTS.
For best non-directional standard AM broadcast results a single wire five to ten feet in length connected to antenna terminal "A" will be sufficient. Additional selectivity to this efficient input circuit would tend to restrict the wide band reception capabilities of the detector.

For best F.M. results a 100 M.C. dipole should be installed well above surrounding obstructions. The twisted 300 ohm line from the dipole should be connected to antenna terminals "D" and "G". ("G" also grounds unit.)
A console type folded dipole is supplied with the tuner and will prove a satisfactory substitute in most cases where an external dipole is impractical.

INPUT JACKS.
All phono or TV audio signals as well as the AM and FM radio are subject to the volume and tone controls of the tuner.

The jack marked "MAG" is the input for a properly compensated pre amplifier when using the variable reluctance cartridge.

XTAL is the phono input for a standard crystal pickup.

The TV jack makes it possible to channel the audio of a television tuner thru the radio's amplifier and speaker.

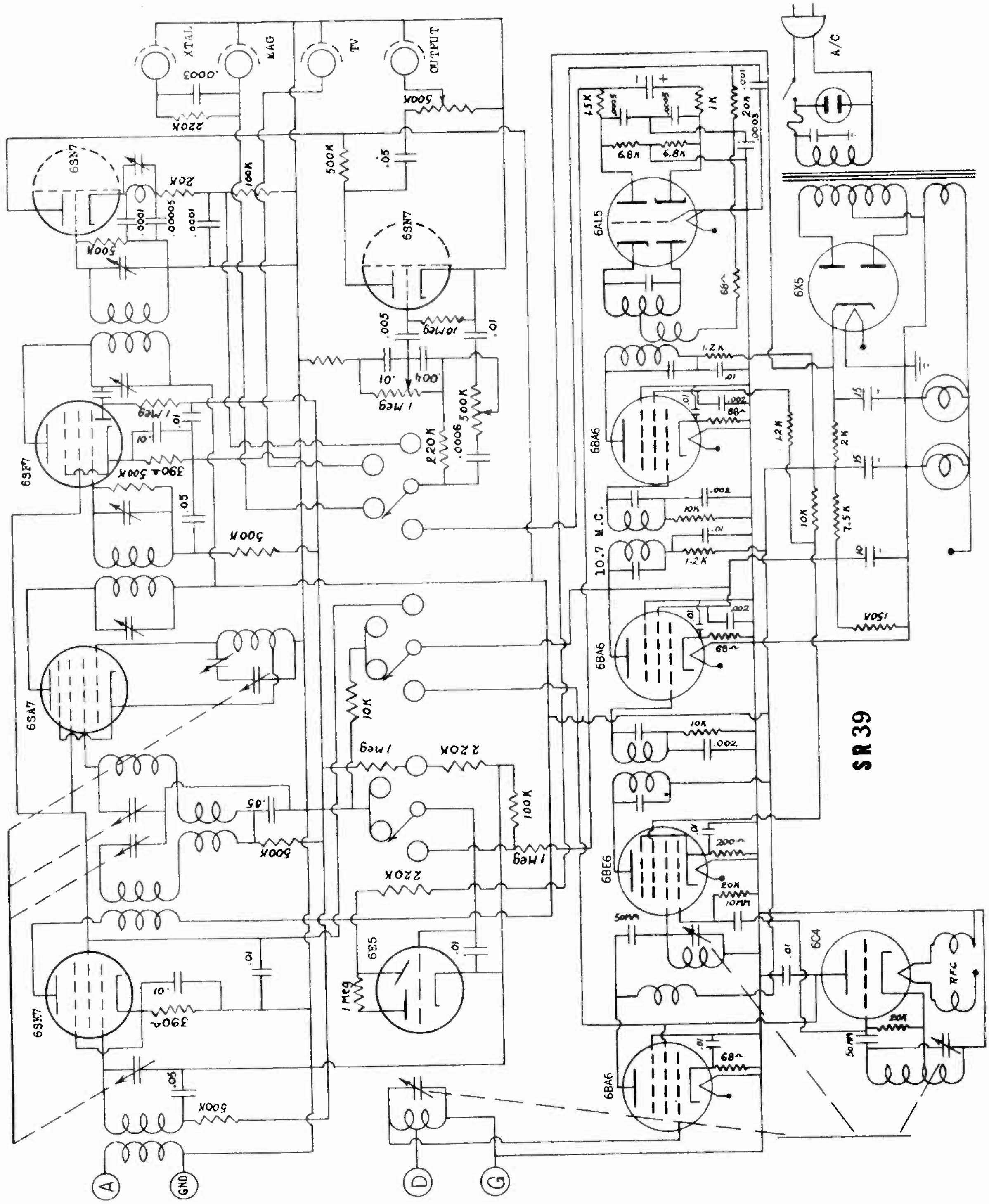
The OUTPUT jack should be connected to the high impedence input control (250,000 to 500,000 ohms) of a quality audio amplifier. Use the prepared shielded lead supplied with the tuner. Choose a speaker capable of wide range reproduction.

A.C.POWER. SR39 is completely powerized for 110-125 volts 50-60 cycles. The power switch (on the Volume Control) also controls the A.C.recepticle on the back of the chassis for convenience in amplifier installation.

CAUTION
VENTILATION IS EXTREMELY IMPORTANT. No multi-tube unit should be housed in an insufficiently ventilated cabinet. Damage to the unit and the cabinet will result.

USE ONLY 1 AMP. FUSE.

MODEL SR39


XTAL
MAG
TV
OUTPUT
A/C
6SN7
6SN7
6SF7
6SA7
6SK7
6E5
6AL5
6BA6
6BA6
6BA6
6BE6
6C4
6X5
10.7 M.C.
RFC
SR 39
A
GND
D
G

## GENERAL FEATURES

The Model 310 is a combination designed for the reception of radio broadcast programs and for the reproduction of phonograph records, television sound or other external sound. The receiver includes the following separate pieces of equipment: (1) chassis, (2) record changer, and (3) high fidelity speaker.

## TECHNICAL DATA

| | |
|---|---|
| Power Input | 105 Watts at 117 Volts, 50-60 cycles. (Phono motor 60 cycles, 25 watts additional.) |
| Tubes | Total 12 including two rectifiers. |
| Circuits | Superheterodyne with RF amplifier stage (three gang tuning condenser) on all bands. Three stage FM-IF amplification (10.7 mc). One stage AM-IF (455 kc). Ratio detector on FM. Drift compensation on RF section. Push-pull output with 6 db inverse feedback. Sound input for phono and for TV or other external sound. |
| Tuning Range | AM - 535 - 1620 kc.<br>FM - 87.5 - 108.5 mc. |
| Output | 10 watts (2-6V6GT tubes in push-pull). Less than 5% distortion at full output. |
| Sensitivity | AM 12 microvolts<br>FM 17 microvolts<br>(Carrier modulated 30% at 400 cycles. Output 500 milliwatts with 10 db signal to noise ratio.) |
| Fidelity | Overall 30 to 20,000 cps plus or minus 1 db. Separate bass and treble control. Phono input equalized for elimination of objectionable scratch level. AM and FM audio equalized to BC standards. |
| Speaker | Hi-fidelity 12 inch PM. 8 ohm voice coil. |

## TUBE REPLACEMENT

The Model 310 has the following tube complement:

| Symbol | Tube | Application | Symbol | Tube | Application |
|---|---|---|---|---|---|
| V1 | 6BA6 | RF Amplifier | V7 | 6AL5 | Ratio Detector, FM |
| V2 | 6BE6 | Conv. & AM Osc. | V8 | 6SQ7 | 1st Audio Amplifier |
| V3 | 6C4 | FM Oscillator | V9 | 6SN7 | 2nd Audio Amplifier |
| V4 | 6BA6 | IF Amp., FM-AM | V10 | 6V6GT | Audio Power Output |
| V5 | 6AU6 | IF Amp., FM & 2nd Detector, AM | V11 | 6V6GT | Audio Power Output |
| V6 | 6AU6 | IF Amp., FM | V12 | 5Y3GT | Rectifier |

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## FUSE REPLACEMENT

A fuse is provided for protection of the receiver against excessive power line voltages, and against failure of any component in the receiver which would cause heavy current drain and fire hazard. This fuse is accessible at the rear panel of the tuner chassis. CAUTION: Always replace the fuse with one of the same rating in the event the fuse is blown. If the fuse continues to blow after replacement trouble is indicated and the equipment should be removed from the cabinet for examination.

## ALIGNMENT PROCEDURE

### Test Equipment

1. Voltohmyst for DC measurements.
2. AM signal generator for 455 KC, 1500 KC, 600 KC, 10.7 MC, 89 MC and 107 MC.
3. AC voltmeter such as the Ballantine voltmeter.
4. An aligning tool is included with each receiver and is taped on the 1st FM-IF transformer can. Additional aligning tools may be had by ordering under part number 94V4707.

In order to reduce instability due to ground currents it is advisable to have a metal sheet covering the test bench and to place all generators and the receivers to be tested on this metal plate.

### Alignment Procedure

The alignment is preferably performed in the following order: See Figure 1 for location of adjustments on chassis.

1. AM-IF
2. AM-RF
3. FM-IF
4. FM-RF

### AM-IF Alignment

A signal generator capable of modulation and accurately set to 455 KC should be attached through a .01 MFD capacitor to the lug on the service selector switch which connects to the middle AM section of the gang condenser. A good ground point for the generator is the rear support bracket of the switch.

The AC voltmeter is placed across the secondary of the audio output transformer, which is loaded with a 8 ohm 10 watt resistor connected in place of the speaker voice coil. In the event this resistor is not available the speaker may be used if the noise can be tolerated. The volume, bass and treble controls must be full on, the service selector switch in the AM position, and the tuning dial in any convenient position that does not interfere with the AM-IF output signal.

Apply sufficient input signal at 455 KC, 30% AM modulated at 400 cycles to give an indication of about 2 volts rms AC on the AC voltmeter across the secondary of the output transformer. With the use of an aligning tool the primary and secondary of the two AM-IF transformers are peaked for a maximum indication on the output voltmeter. As the receiver approaches correct alignment, reduce the input signal level so that the output never exceeds 3-4 volts AC. It is good practice to recheck the peaking of the transformers a second time, especially if the set was badly out of alignment. The normal AM-IF sensitivity is such that when 100 uV are applied with the signal generator, the output voltmeter will read 2 volts minimum.

## AM-RF Alignment

Apply the signal generator to the lug on the service selector switch that supports the loop lead (loop not connected). The AC voltmeter remains attached as for the IF alignment. The operating controls also remain as for the IF adjustment of the receiver. Set the signal generator and receiver dials on 600 KC at 30% modulation with 400 cycles and adjust the AM oscillator core (top adjustment on the 1 1/8" square can toward rear of chassis) for a maximum indication on the output voltmeter. Keep the generator input low enough to prevent the voltmeter from reading above 3-4 volts AC at all times.

The AM converter transformer (top of 1 1/8" square can toward front of chassis) is now adjusted for a maximum output indication on the voltmeter.

The generator and receiver dials are now set at 1500 KC and the oscillator and converter gang condenser trimmers (front holes in the gang cover) are adjusted for a maximum output on AC output voltmeter.

The above procedures are repeated until the 1500 KC and 600 KC points on the generator and the receiver dials coincide without further adjustment of the cores or trimmer condensers.

A sensitivity of 10 uV or less at 400 cycles 30% modulation for a 3 volt AC output and a 10 db or greater signal to noise ratio is normal for this input point.

The loop is then attached to the receiver and the generator is applied to the loop tap which is available on the antenna strip at rear of the receiver. The generator and the receiver dials are set to 1500 K and the antenna trimmer capacitor on the 1st AM section of the gang condenser is adjusted for maximum output on the AC output voltmeter.

A sensitivity of 1 uV at 400 cycles 30% modulation for a 2 volt AC output with a 10 db signal to noise ratio or better at 1500 KC and 600 KC is normal for the receiver at this input point.

## FM-IF Alignment

Place the service selector switch in the FM position. Apply a signal generator unmodulated, and set accurately to 10.7 megacycles, to the grid tap on the FM converter coil. The rear mounting bracket of the service selector switch provides a convenient ground point for the generator.

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A DC voltohmyst voltmeter is connected from ground to the negative side of the 5 MFD electrolytic capacitor (C-37) which is across the two 8200 ohm load resistors (R-30, R-31) of the ratio detector.

Enough signal at 10.7 MC is then applied to the receiver to give an indication on the voltohmyst above the residual voltage already present. Always keep the input level of the signal generator low enough to produce not more than negative 5 volts DC on the voltohmyst.

The following FM-IF transformer cores are then adjusted in the following order for a maximum indication on the DC voltmeter:

1. Primary of ratio detector (bottom of large can).

2. Primary and secondary of 3rd FM-IF transformer.

3. Primary and secondary of 2nd FM-IF transformer.

4. Primary and secondary of 1st FM-IF transformer.

If the receiver was badly mis-aligned it is advisable to repeat the above procedure for better alignment.

The voltohmyst is then connected to the audio output of the ratio detector which is the junction of the 47,000 ohm ½ watt resistor (R-27) and the 1500 MMFD capacitor (C-36) and ground.

By tuning the secondary of the ratio detector (top of large can) it is possible to produce both positive and negative swings of the DC voltmeter from a zero position. The proper tuned position is the zero position of the voltmeter between the positive and negative swings.

In order to check the relative sensitivity of the FM-IF system move the voltohmyst back to the first position from the negative side of the 5 MFD capacitor to ground. A normal sensitivity is indicated when it is necessary to apply between 300 and 700 uV for a negative 5 volts DC on the voltohmyst.

## FM-RF Alignment

Connect a signal generator unmodulated and accurately set on 89 MC to the FM antenna terminals of the receiver through a resistor of 200 ohm to 270 ohm in the hot lead of the generator to match the 300 ohm input of the FM antenna coil. The DC voltmeter is connected as it was for the FM-IF alignment, between the negative side of the 5 MFD capacitor (C-37) and ground.

Set the tuning dial of the radio to 89 MC and adjust the FM oscillator core for a maximum DC output on the voltohmyst. Adjust the input level of the signal generator so as to produce a negative 3 to 5 volts DC on the voltmeter. The correct oscillator core position is when the core is just entering the coil from the bottom of the coil. The 2nd harmonic of the oscillator is used to produce the IF frequency. By compression or expansion of the converter and antenna FM coils it is possible to bring their circuits into alignment with the oscillator at 89 MC.

As the set becomes more accurately aligned it may be necessary to reduce the input of the signal generator to maintain an output below a negative 5 volts DC.

Now reset the signal generator and the receiver dials to 107 MC and adjust the oscillator tubular trimmer and the compression trimmers on the FM converter and antenna sections of the gang condenser for a maximum indication on the output DC voltmeter.

Again reset the generator and receiver dials back to 89 MC and repeat the operations performed formerly at this frequency setting. This realigning at the high and low ends of the FM band is necessary until it is noticed that at both 89 MC and 107 MC the receiver has been aligned to the generator frequency without adjustment of either the core of the oscillator or the oscillator trimmer to bring them into alignment.

The converter and antenna coils have been properly aligned when either compression or expansion of the turns will give no increase in the output DC voltage at 89 MC and the converter and oscillator trimmer condenser adjustment will also give no increase in DC output voltage at 107 MC.

VOLTAGE TABLE

| Tube | Type | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BA6 | 0 | 0 | AC 6.5 | 0 | 115 | 115 | 0 | - |
| V2 | 6BE6 | -7 to -10 | .9 | AC 6.5 | 0 | 125 | 100 | 0 | - |
| V3 | 6C4 | 120 | 0 | AC 5.4 | 0 | 0 | -7 to -10 | 0 | - |
| V4 | 6BA6 | 0 | 0 | AC 6.5 | 0 | 120 | 110 | 1.3 | - |
| V5 | 6AU6 | 0 | 0 | AC 6.5 | 0 | 110 | 110 | 1.2 | - |
| V6 | 6AU6 | 0 | 0 | AC 6.5 | 0 | 110 | 110 | 1.3 | - |
| V7 | 6AL5 | 0 | 0 | AC 6.5 | 0 | .6 | 0 | -.6 | - |
| V8 | 6SQ7 | 0 | -.8 | 0 | 0 | 0 | 20 | AC 6.8 | 0 |
| V9 | 6SN7 | 0 | 75 | 2.8 | 5.2 | 110 | 20 | AC 6.3 | 0 |
| V10 | 6V6G | 0 | 0 | 260 | 270 | 0 | 105 | AC 6.3 | 0 |
| V11 | 6V6G | 0 | 0 | 260 | 270 | 0 | 20 | AC 6.3 | 0 |
| V12 | 5Y3 | 0 | 300 | 0 | AC 320 | 0 | AC 320 | 0 | 300 |

Voltage readings made with Voltohmyst. Line voltage adjusted to 117 V AC. All voltages measured between indicated pin and chassis frame. Unless noted all voltages are DC and positive to frame.

No signal input.
Voltages taken with the service selector switch in the FM position.
Volume control in the counterclockwise position.
Tone controls clockwise.

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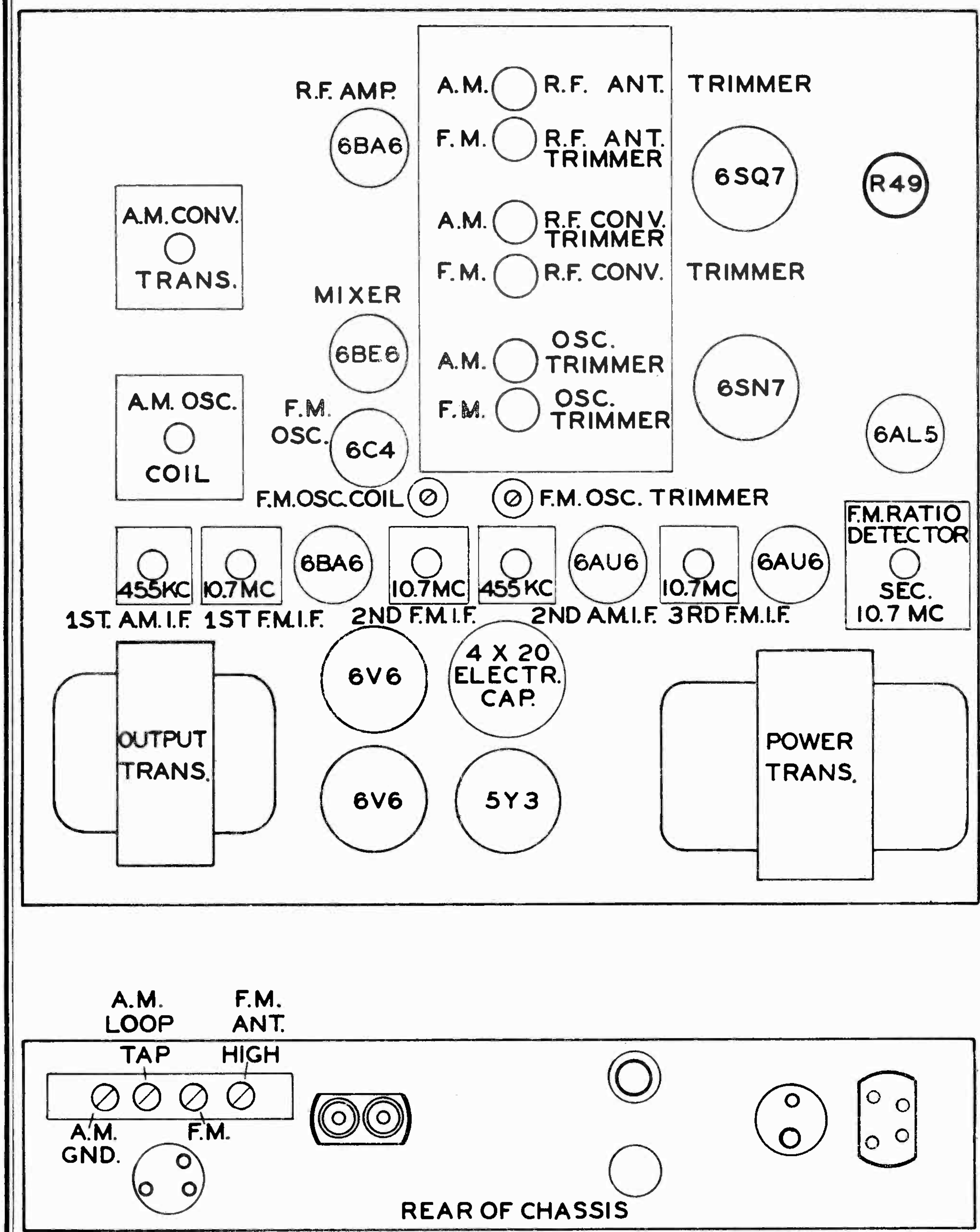


Figure 1    Model 310 Receiver Assembly

## RESISTANCE TABLE

| Tube | Type | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BA6 | 700 K | 0 | 0 | 0 | inf. | inf. | 82 | - |
| V2 | 6BE6 | 22 K | 82 | 0 | 0 | inf. | inf. | 27 | - |
| V3 | 6C4 | inf. | inf. | 3 | 0 | inf. | 47 K | 0 | - |
| V4 | 6BA6 | 200 K | 0 | 0 | 0 | inf. | inf. | 82 | - |
| V5 | 6AU6 | 60 K | 0 | 0 | 0 | inf. | inf. | 220 | - |
| V6 | 6AU6 | 0 | 0 | 0 | 0 | inf. | inf. | 220 | - |
| V7 | 6AL5 | inf. | inf. | 0 | 0 | 10 K | 0 | 10 K | - |
| V8 | 6SQ7 | 0 | 4.7 M | 0 | 0 | 0 | inf. | 0 | 0 |
| V9 | 6SN7 | 17 K | inf. | 2.2 K | 500 K | inf. | 12 K | 0 | 0 |
| V10 | 6V6G | inf. | .2 | inf. | inf. | 220 K | 10 K | 0 | 250 |
| V11 | 6V6G | inf. | 0 | inf. | inf. | 220 K | 10 K | 0 | 250 |
| V12 | 5Y3 | inf. | inf. | inf. | 75 | inf. | 80 | inf. | inf. |

Resistance readings taken with voltohmyst connected between pin indicated and chassis frame. Values given are in ohms except where K indicates times 1000 and M indicates times 1 megohm.

All controls to the counterclockwise or off position. Range switch in FM position.

## Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| (C1<br>(C2<br>(C3 | Main tuning capacitor | Capacitor, variable, 3 gang AM-FM | 15U4569 |
| C4 | Grid coupling | Capacitor,ceramic 1500 MMFD 350 V | 15L3459 |
| C5 | Cathode bypass, RF | Capacitor,ceramic 5000 MMFD Hi-Kap, 500 V | 15L3462 |
| C6 | Cathode bypass, IF | Same as C5 | |
| C7 | Screen bypass, RF | Same as C5 | |
| C8 | Screen bypass, Conv. | Same as C5 | |
| C9 | Screen bypass, IF | Same as C5 | |
| C10 | Screen bypass, IF | Same as C5 | |
| C11 | Heater bypass, RF | Same as C5 | |
| C12 | Heater bypass, IF | Same as C5 | |
| C13 | Heater bypass, IF | Same as C5 | |
| C14 | Heater bypass, IF | Same as C5 | |
| C15 | Heater bypass, ratio detector | Same as C5 | |
| C16 | Grid decoupling, RF | Same as C5 | |
| C17 | Coupling, cathode follower | Capacitor, paper, .05 MFD 600 V, miniature tubular | 15L3467 |
| C18 | Grid decoupling, Conv. | Capacitor, paper, .05 MFD 200 V, miniature tubular | 15S4221 |
| C19 | Cathode bypass, audio | Capacitor, electrolytic, 25 MF 50 V, tubular | 15B638 |
| C20 | RF coupling, FM | Capacitor, silver ceramic, 25 MMFD 10% 500 V NPO | 15D3165 |
| C21 | Grid coupling oscillator | Capacitor, ceramic 51 MMFD 5% 500 V | 15L3458 |
| C22 | Grid coupling, audio | Same as C17 | |
| C23 | Plate bypass, Conv. | Same as C5 | |
| C24 | Drift compensation | Capacitor, compensator, silver ceramic, 4 MMFD plus or minus .25 MMFD Hi-Q, temp coeff., insulated N-750 | 15V4678 |
| C25 | Grid oscillator, FM | Same as C21 | |
| C26 | Plate decoupling oscillator, FM | Same as C4 | |
| C27 | Plate bypass oscillator, FM | Same as C5 | |
| C28 | Plate decoupling, IF | Same as C5 | |
| C29 | Grid capacitor, AM detector | Capacitor,ceramic, 100 MMFD 10% 500 V | 15L3460 |
| (C30<br>(C31 | Grid filter, AM Detector | Capacitor, silver ceramic, 2x100 MMFD 20% 500 V 3 wire leads | 15D2923 |
| C32 | Bypass, AGC | Capacitor, paper, .1 MFD 200 V, miniature tubular | 15S4298 |
| C33 | Diode load | Capacitor, mica, 390 MMFD 10% 500 V | 15B799 |
| C34 | Diode load | Same as C33 | |
| C35 | Ratio detector decoupling | Same as C33 | |

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## Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| C36 | Audio filter, ratio detector | Same as C4 | |
| C37 | Ratio detector | Capacitor, electrolytic, 5 MFD 150 V, tubular | 15V4599 |
| C38 | Screen bypass | Same as C17 | |
| C39 | IF grid bypass | Same as C5 | |
| C40 | Trimmer, FM oscillator | Capacitor, trimmer, .5-5 MMFD | 15V4602 |
| C41 | Coupling, Audio Amp. | Capacitor, paper, .01 MFD 200 V, miniature tubular | 15L3463 |
| C42 | Coupling, Audio Grid | Capacitor, paper, .1 MFD 600 V, miniature tubular | 15L3468 |
| C43 | RF filter, Audio Amp. | Same as C29 | |
| C44 | Bypass, treble control | Same as C41 | |
| C45 | Bypass, treble control | Capacitor, paper, .005 MFD 20% 600 V | 15H2603 |
| C46 | Bypass, bass control | Capacitor, paper, .02 MFD 200 V, tubular miniature | 15U4580 |
| C47 | Bypass, bass control | Same as C45 | |
| C48 | Cathode bypass, audio | Capacitor, electrolytic, 25 MFD 25 V, tubular | 15B795 |
| C49 | Plate coupling, audio | Same as C17 | |
| C50 | Coupling, audio amp. | Same as C46 | |
| (C51 (C52 (C53 (C54 | Filter, high voltage rectifier | Capacitor, electrolytic, 4x20 MFD 450 V | 15L3588 |
| C55 | Plate decoupling, 1st audio | Same as C42 | |
| E1 | Dial light | Lamp, 6-8 V .150 A #47 brown | 49A168 |
| E2 | Dial light | Same as E1 | |
| E3 | Overload protection | Fuse, 3 amp, 3 AG | 37A162 |
| E4 | Main tuning knob | Knob, station selector, 1 7/8" dia., brass | 47V4603 |
| E5 | Control knob | Knob, 1 1/8" dia. black bakelite, push-on type | 47V4604 |
| E6 | Align IF | Aligning tool | 94V4707 |
| J1 | Loop connection to receiver | Receptacle, 3 contact | 67U4716 |
| (J2 ( | Television sound connection | Receptacle, dual,insulated | 67V4657 |
| (J3 | Phono pickup connection | | |
| J4 | Phono motor power | Receptacle, 4 contact | 67B645 |
| J5 | Speaker connection | Receptacle, 2 contact | 67V4673 |

## Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| L1 | AM signal intercept | Loop | 1V4594 |
| L2 | FM antenna tuning | Coil | 20V4625 |
| L3 | Coupling, RF stage | Choke | 17V4668 |
| L4 | Tuning, FM-RF | Coil | 20V4626 |
| L5 | Oscillator, AM | Coil | 20V4621 |
| L6 | Oscillator, FM | Coil | 20V4627 |
| L7 | Filter choke, RF-IF | Choke | 17L3378 |
| L8 | Filter choke, RF-IF | Same as L7 | |
| L9 | Filter choke, RF-IF | Same as L7 | |
| L10 | Heater FM oscillator | Choke | 17V4683 |
| LS1 | Loudspeaker | Speaker 12" PM - 8 ohm voice coil | 85U4709 |
| P1 | Loop to receiver | Plug, 3 contact | 65U4714 |
| R1 | Grid coupling, RF | Resistor, composition, .47 meg 10% ½ watt | 70L3404 |
| R2 | Grid decoupling, RF | Resistor, composition, .1 meg 10% ½ watt | 70L3401 |
| R3 | Cathode bias, RF | Resistor, composition, 82 ohms 5% ½ watt | 70L3391 |
| R4 | Cathode bias, Conv. | Same as R3 | |
| R5 | Cathode bias, IF | Same as R3 | |
| R6 | Cathode bias, IF | Resistor, composition, 220 ohms 10% ½ watt | 70V4783 |
| R7 | Cathode bias, IF | Same as R6 | |
| R8 | Screen decoupling, RF | Resistor, composition, 1000 ohms 10% ½ watt | 70L3393 |
| R9 | Screen decoupling, IF | Same as R8 | |
| R10 | Screen decoupling, Conv. | Resistor, composition, 3300 ohms 10% ½ watt | 70L3394 |
| R11 | Screen decoupling, IF | Same as R10 | |
| R12 | Screen decoupling, IF | Same as R10 | |
| R13 | Grid decoupling, Conv. | Same as R2 | |
| R14 | Oscillator grid, Conv. | Resistor, composition, 22,000 ohms 10% ½ watt | 70L3397 |
| R15 | Plate decoupling, Conv. | Same as R8 | |
| R16 | Oscillator grid, FM | Resistor, composition, 47,000 ohms 10% ½ watt | 70L3399 |
| R17 | Grid loading FM-IF | Same as R14 | |
| R18 | Grid decoupling, FM-IF | Same as R2 | |
| R19 | Grid decoupling, FM-IF | Resistor, composition, .22 meg 10% ½ watt | 70L3403 |
| R20 | Grid decoupling | Same as R14 | |
| R21 | Grid decoupling | Same as R16 | |

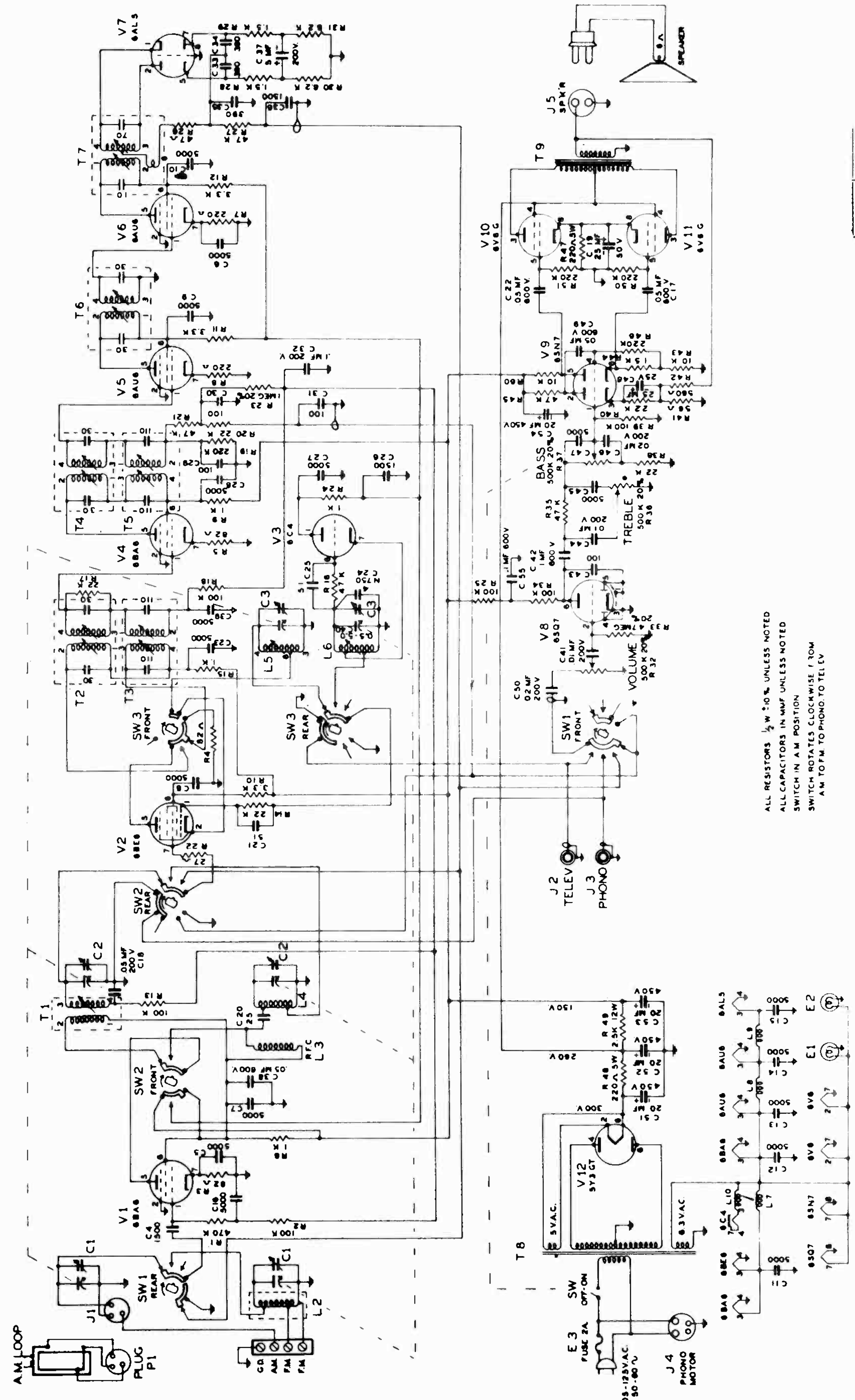
## Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| R22 | Grid | Resistor, composition, 27 ohms 10% ½ watt | 70V4692 |
| R23 | Decoupling, AGC circuit | Resistor, composition, 1 meg 20% ½ watt | 70L3406 |
| R24 | Plate coupling, FM oscillator | Same as R8 | |
| R25 | Plate decoupling, 1st audio | Same as R2 | |
| R26 | Decoupling, ratio detector | Resistor, composition, 47 ohms 10% ½ watt | 70L3429 |
| R27 | De-emphasis, FM detector | Same as R16 | |
| R28 | Diode load, ratio detector | Resistor, composition, 1500 ohms 10% ½ watt | 70L3525 |
| R29 | Diode load, ratio detector | Same as R28 | |
| R30 | Audio load, ratio detector | Resistor, composition, 8200 ohms 10% ½ watt | 70L3523 |
| R31 | Audio load, ratio detector | Same as R30 | |
| R32 | Volume control | Potentiometer, volume, ½ meg | 70V4583 |
| R33 | Grid loading, audio amp. | Resistor, composition, 4.7 meg 20% ½ watt | 70L3530 |
| R34 | Plate load, audio amp. | Same as R2 | |
| R35 | Tone control network | Same as R16 | |
| R36 | Treble control | Potentiometer, treble, ½ meg | 70V4584 |
| R37 | Bass control | Potentiometer, bass off-on, ½ meg | 70V4585 |
| R38 | Bass control network | Same as R14 | |
| R39 | Grid load, audio amp. | Same as R2 | |
| R40 | Cathode bias, audio amp. | Resistor, composition, 2200 ohms 10% ½ watt | 70L3432 |
| R41 | Cathode follower | Resistor, composition, 56 ohms 10% ½ watt | 70V4628 |
| R42 | Cathode follower decoupling | Resistor, composition, 560 ohms 10% ½ watt | 70L3527 |
| R43 | Cathode circuit | Resistor, composition, 10,000 ohms 10% ½ watt | 70L3396 |
| R44 | Cathode bias, Audio Amp. | Same as R28 | |
| R45 | Plate coupling, audio amp. | Same as R16 | |
| R46 | Grid | Same as R19 | |
| R47 | Cathode bias, audio | Resistor, 220 ohms 10% 5 watt, Candohm | 70U4717 |
| R48 | Filter | Same as R47 | |
| R49 | Filter | Resistor, wirewound, 2500 ohms 10% 15 watt | 70U4718 |
| R50 | Grid | Same as R19 | |
| R51 | Grid | Same as R19 | |

## Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| SW1 | AM, FM, Phono, TV switching | Switch, range, 4 position | 89V4630 |
| T1 | Interstage coupling, Conv. | Coil | 20V4620 |
| T2 | Interstage coupling,FM | Coil | 20V4623 |
| T3 | Interstage coupling,AM | Coil | 20V4622 |
| T4 | Interstage coupling,FM | Same as T2 | |
| T5 | Interstage coupling,AM | Same as T3 | |
| T6 | Interstage coupling,FM | Same as T2 | |
| T7 | Ratio detector transformer | Coil | 20V4624 |
| T8 | Power | Transformer | 91U4576 |
| T9 | Output | Transformer | 91U4577 |
| V1 | RF Amplifier | Tube - 6BA6 | 92G2871 |
| V2 | Converter and Oscillator | Tube - 6BE6 | 92V4631 |
| V3 | FM Oscillator | Tube - 6C4 | 92B597 |
| V4 | IF Amplifier, FM-AM | Same as V1 | |
| V5 | IF Amplifier, FM & 2nd Detector, AM | Tube - 6AU6 | 92C2659 |
| V6 | IF Amplifier, FM | Same as V5 | |
| V7 | Ratio detector, FM | Tube - 6AL5 | 92G2870 |
| V8 | 1st Audio Amplifier | Tube - 6SQ7 | 92V4632 |
| V9 | 2nd Audio Amplifier | Tube - 6SN7 | 92A230 |
| V10 | Audio Power Output | Tube - 6V6GT | 92E1061 |
| V11 | Audio Power Output | Same as V10 | |
| V12 | Rectifier | Tube - 5Y3GT | 92G480 |
| X1 | Socket for V1 | Socket, 7 contact, miniature type | 82B663 |
| X2 | Socket for V2 | Socket, 7 contact, miniature, mica filled, top mounting | 82V4636 |
| X3 | Socket for V3 | Same as X2 | |
| X4 | Socket for V4 | Same as X1 | |
| X5 | Socket for V5 | Same as X1 | |
| X6 | Socket for V6 | Same as X1 | |
| X7 | Socket for V7 | Same as X1 | |
| X8 | Socket for V8 | Socket, 8 contact octal, black bakelite type MIP-8 | 82S4412 |
| X9 | Socket for V9 | Same as X8 | |
| X10 | Socket for V10 | Same as X8 | |
| X11 | Socket for V11 | Same as X8 | |
| X12 | Socket for V12 | Same as X8 | |

MODEL 310




ALL RESISTORS ½ W ±10% UNLESS NOTED
ALL CAPACITORS IN MMF UNLESS NOTED
SWITCH IN A.M. POSITION
SWITCH ROTATES CLOCKWISE FROM AM TO FM TO PHONO TO TELEV

| | |
|---|---|
| DATE | 5-25-50 |
| PART NO. | 2U4719A |

Figure 2 Schematic Diagram Model 310 Receiver

## GENERAL FEATURES

The Model 510 is a combination designed for the reception of radio broadcast programs and for the reproduction of phonograph records, television sound or other external sound. The receiver includes the following separate pieces of equipment: (1) radio-phono chassis, (2) power amplifier, (3) record changer, and (4) coaxial high fidelity speaker.

## TECHNICAL DATA

| | |
|---|---|
| Power Input | 140-150 Watts at 117 Volts, 50-60 cycles. (Phono motor 60 cycles, 25 watts additional.) |
| Tubes | Total 14 including two rectifiers. |
| Circuits | Superheterodyne with RF amplifier stage (three gang tuning condenser) on all bands. Three stage FM IF amplification (10.7 mc). One stage AM IF (455 kc). Ratio detector on FM. Drift compensation on RF section. Push-pull output with 6 db inverse feedback. Separate B plus supplies for power amplifier and tuner sections for reduction of temperatures and to prevent damage to components through surges. Sound input for phono and for TV or other external sound. |
| Tuning Range | AM - 535 - 1620 kc.<br>FM - 87.5 - 108.5 mc. |
| Output | 20 watts (2-6L6 tubes in push-pull). Less than 5% distortion at full output. |
| Sensitivity | AM 12 microvolts<br>FM 17 microvolts<br>(Carrier modulated 30% at 400 cycles. Output 500 milliwatts with 10 db signal to noise ratio.) |
| Fidelity | Overall 30 to 20,000 cps plus or minus 1 db. Separate bass and treble control. Phono input equalized for elimination of objectionable scratch level. AM and FM audio equalized to BC standards. |
| Speaker | Hi-fidelity 12 inch coaxial PM. 8 ohm voice coil. |

## TUBE REPLACEMENT

The Model 510 has the following tube complement:

| Symbol | Tube | Application | Symbol | Tube | Application |
|---|---|---|---|---|---|
| V1 | 6BA6 | RF Amplifier | V8 | 6SQ7 | 1st Audio Amplifier |
| V2 | 6BE6 | Conv. & AM Osc. | V9 | 6SN7 | 2nd Audio Amplifier |
| V3 | 6C4 | FM Oscillator | V10 | 6SN7 | 3rd Audio Amplifier |
| V4 | 6BA6 | IF Amp., FM-AM | V11 | 6L6G | Audio Power Output |
| V5 | 6AU6 | IF Amp., FM & 2nd Detector, AM | V12 | 6L6G | Audio Power Output |
| | | | V13 | 5Y3GT | Rectifier |
| V6 | 6AU6 | IF Amp., FM | V14 | 25Z6GT | Rectifier |
| V7 | 6AL5 | Ratio Detector, FM | | | |

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## FUSE REPLACEMENT

A fuse is provided for protection of the receiver against excessive power line voltages, and against failure of any component in the receiver which would cause heavy current drain and fire hazard. This fuse is accessible at the rear panel of the tuner chassis. CAUTION: Always replace the fuse with one of the same rating in the event the fuse is blown. If the fuse continues to blow after replacement trouble is indicated and the equipment should be removed from the cabinet for examination.

## ALIGNMENT PROCEDURE

### Test Equipment

1. Voltohmyst for DC measurements.

2. AM signal generator for 455 KC, 1500 KC, 600 KC, 10.7 MC, 89 MC and 107 MC.

3. AC voltmeter such as the Ballantine voltmeter.

4. An aligning tool is included with each receiver and is taped on the 1st FM-IF transformer can. Additional aligning tools may be had by ordering under part number 94V4707.

In order to reduce instability due to ground currents it is advisable to have a metal sheet covering the test bench and to place all generators and the receivers to be tested on this metal plate.

### Alignment Procedure

The alignment is preferably performed in the following order: See Figure 1 for location of adjustments on chassis.

1. AM-IF

2. AM-RF

3. FM-IF

4. FM-RF

### AM-IF Alignment

A signal generator capable of modulation and accurately set to 455 KC should be attached through a .01 MFD capacitor to the lug on the service selector switch which connects to the middle AM section of the gang condenser. A good ground point for the generator is the rear support bracket of the switch.

The AC voltmeter is placed across the secondary of the audio output transformer, which is loaded with a 8 ohm 10 watt resistor connected in place of the speaker voice coil. In the event this resistor is not available the speaker may be used if the noise can be tolerated. The volume, bass and treble controls must be full on, the service selector switch in the AM position, and the tuning dial in any convenient position that does not interfere with the AM-IF output signal. Apply sufficient input signal at 455 KC, 30% AM modulated at 400 cycles to give an indication of about 2 volts rms AC on the AC voltmeter across the secondary of the output transformer. With the use of an aligning tool the primary and secondary of the two AM-IF transformers are peaked for a maximum indication on the output voltmeter. As the receiver approaches correct alignment, reduce the input signal level so that the output never exceeds 3-4 volts AC. It is good practice to recheck the peaking of the transformers a second time, especially if the set was badly out of alignment. The normal AM-IF sensitivity is such that when 100 uV are applied with the signal generator, the output voltmeter will read 2 volts minimum.

AM-RF Alignment

Apply the signal generator to the lug on the service selector switch that supports the loop lead (loop not connected). The AC voltmeter remains attached as for the IF alignment. The operating controls also remain as for the IF adjustment of the receiver. Set the signal generator and receiver dials on 600 KC at 30% modulation with 400 cycles and adjust the AM oscillator core (top adjustment on the 1 1/8" square can toward rear of chassis) for a maximum indication on the output voltmeter. Keep the generator input low enough to prevent the voltmeter from reading above 3-4 volts AC at all times.

The AM converter transformer (top of 1 1/8" square can toward front of chassis) is now adjusted for a maximum output indication on the voltmeter.

The generator and receiver dials are now set at 1500 KC and the oscillator and converter gang condenser trimmers (front holes in the gang cover) are adjusted for a maximum output on AC output voltmeter.

The above procedures are repeated until the 1500 KC and 600 KC points on the generator and the receiver dials coincide without further adjustment of the cores or trimmer condensers.

A sensitivity of 10 uV or less at 400 cycles 30% modulation for a 3 volt AC output and a 10 db or greater signal to noise ratio is normal for this input point.

The loop is then attached to the receiver and the generator is applied to the loop tap which is available on the antenna strip at rear of the receiver. The generator and the receiver dials are set to 1500 KC and the antenna trimmer capacitor on the 1st AM section of the gang condenser is adjusted for maximum output on the AC output voltmeter.

A sensitivity of 1 uV at 400 cycles 30% modulation for a 2 volt AC output with a 10 db signal to noise ratio or better at 1500 KC and 600 KC is normal for the receiver at this input point.

FM-IF Alignment

Place the service selector switch in the FM position. Apply a signal generator unmodulated, and set accurately to 10.7 megacycles, to the grid tap on the FM converter coil. The rear mounting bracket of the service selector switch provides a convenient ground point for the generator.

A DC voltohmyst voltmeter is connected from ground to the negative side of the 5 MFD electrolytic capacitor (C-37) which is across the two 8200 ohm load resistors (R-30, R-31) of the ratio detector.

Enough signal at 10.7 MC is then applied to the receiver to give an indication on the voltohmyst above the residual voltage already present. Always keep the input level of the signal generator low enough to produce not more than negative 5 volts DC on the voltohmyst.

The following FM-IF transformer cores are then adjusted in the following order for a maximum indication on the DC voltmeter:

1. Primary of ratio detector (bottom of large can).

MODELS 510; 510K, Kenilworth;
510S, Sheffield

2. Primary and secondary of 3rd FM-IF transformer.

3. Primary and secondary of 2nd FM-IF transformer.

4. Primary and secondary of 1st FM-IF transformer.

If the receiver was badly mis-aligned it is advisable to repeat the above procedure for better alignment.

The voltohmyst is then connected to the audio output of the ratio detector which is the junction of the 47,000 ohm ½ watt resistor (R-27) and the 1500 MMFD capacitor (C-36) and ground.

By tuning the secondary of the ratio detector (top of large can) it is possible to produce both positive and negative swings of the DC voltmeter from a zero position. The proper tuned position is the zero position of the voltmeter between the positive and negative swings.

In order to check the relative sensitivity of the FM-IF system move the voltohmyst back to the first position from the negative side of the 5 MFD capacitor to ground. A normal sensitivity is indicated when it is necessary to apply between 300 and 700 uV for a negative 5 volts DC on the voltohmyst.

FM-RF Alignment

Connect a signal generator unmodulated and accurately set on 89 MC to the FM antenna terminals of the receiver through a resistor of 200 ohm to 270 ohm in the hot lead of the generator to match the 300 ohm input of the FM antenna coil. The DC voltmeter is connected as it was for the FM-IF alignment, between the negative side of the 5 MFD capacitor (C-37) and ground.

Set the tuning dial of the radio to 89 MC and adjust the FM oscillator core for a maximum DC output on the voltohmyst. Adjust the input level of the signal generator so as to produce a negative 3 to 5 volts DC on the voltmeter. The correct oscillator core position is when the core is just entering the coil from the bottom of the coil. The 2nd harmonic of the oscillator is used to produce the IF frequency. By compression or expansion of the converter and antenna FM coils it is possible to bring their circuits into alignment with the oscillator at 89 MC.
As the set becomes more accurately aligned it may be necessary to reduce the input of the signal generator to maintain an output below a negative 5 volts DC.

Now reset the signal generator and the receiver dials to 107 MC and adjust the oscillator tubular trimmer and the compression trimmers on the FM converter and antenna sections of the gang condenser for a maximum indication on the output DC voltmeter.

Again reset the generator and receiver dials back to 89 MC and repeat the operations performed formerly at this frequency setting. This realigning at the high and low ends of the FM band is necessary until it is noticed that at both 89 MC and 107 MC the receiver has been aligned to the generator frequency without adjustment of either the core of the oscillator or the oscillator trimmer to bring them into alignment.

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The converter and antenna coils have been properly aligned when either compression or expansion of the turns will give no increase in the output DC voltage at 89 MC and the converter and oscillator trimmer condenser adjustment will also give no increase in DC output voltage at 107 MC.

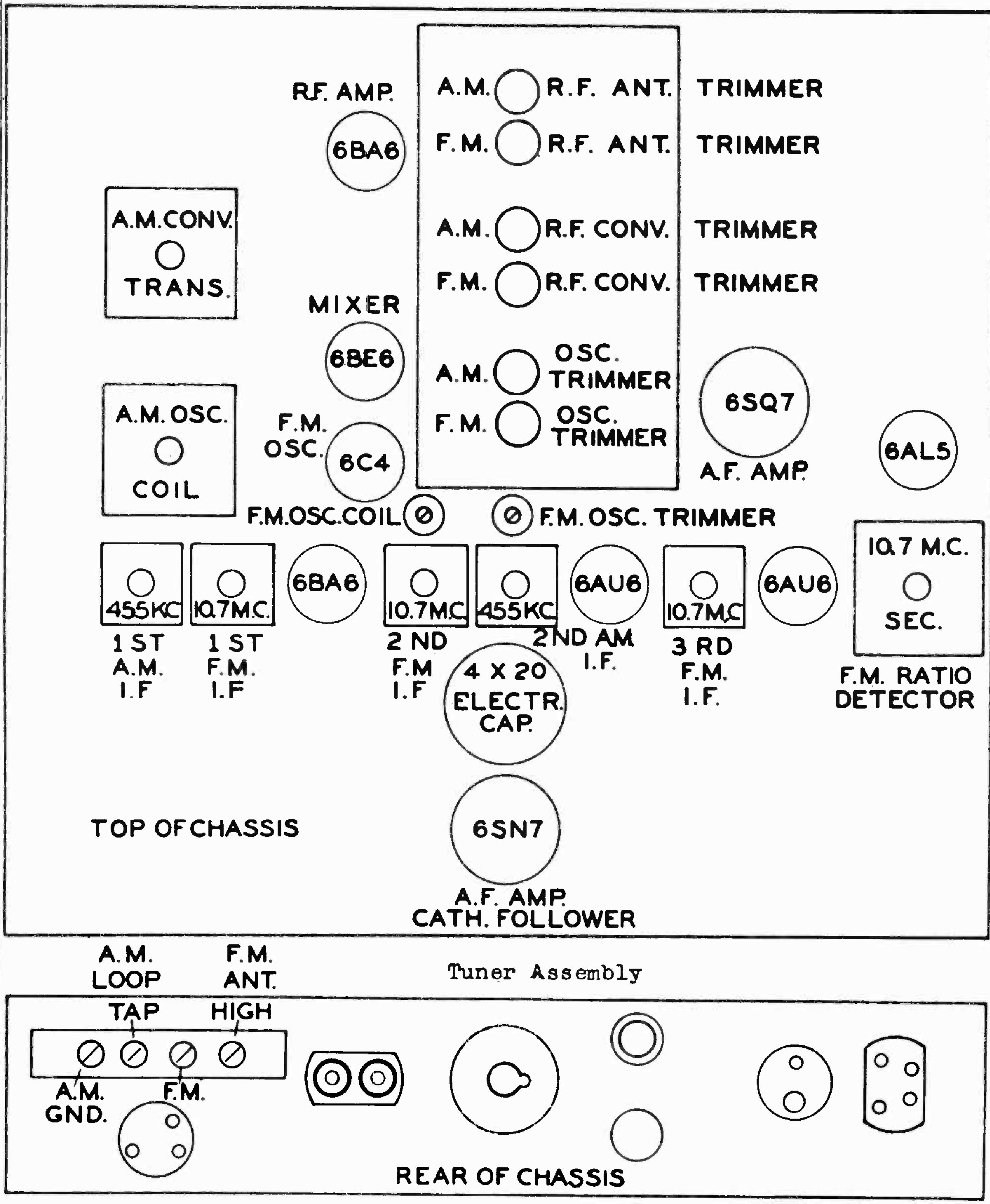


FIG. 1

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VOLTAGE TABLE

| Tube | Type | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BA6 | 0 | 0 | AC 6.5 | 0 | 120 | 120 | 1.5 | - |
| V2 | 6BE6 | -7 to -10 | .9 | AC 6.5 | 0 | 125 | 110 | 0 | - |
| V3 | 6C4 | 130 | 0 | AC 6.5 | 0 | 130 | -7 to -10 | 0 | - |
| V4 | 6BA6 | 0 | 0 | AC 6.5 | 0 | 120 | 120 | 1.5 | - |
| V5 | 6AU6 | 0 | 0 | AC 6.5 | 0 | 110 | 110 | .7 to .9 | - |
| V6 | 6AU6 | 0 | 0 | AC 6.5 | 0 | 110 | 110 | .7 to .9 | - |
| V7 | 6AL5 | 0 | 0 | AC 6.5 | 0 | .6 | 0 | -.6 | - |
| V8 | 6SQ7 | 0 | -.8 | 0 | 0 | 0 | 90 | AC 6.8 | 0 |
| V9 | 6SN7 | 0 | 150 | 6 | 40 | 270 | 55 | AC 6.8 | 0 |
| V10 | 6SN7 | 66 | 210 | 78 | 66 | 210 | 78 | 0 | AC 6.8 |
| V11 | 6L6G | 0 | AC 6.8 | 360 | 275 | 0 | 73 | 0 | 15 |
| V12 | 6L6G | 0 | AC 6.8 | 360 | 275 | 0 | 73 | 0 | 15 |
| V13 | 5Y3 | 0 | 400 | 0 | AC 390 | 0 | AC 390 | 0 | 400 |
| V14 | 25Z6 | 0 | 0 | AC 170 | 200 | AC 170 | 0 | 0 | 200 |

Voltage readings made with Voltohmyst. Line voltage adjusted to 117 V AC. All voltages measured between indicated pin and chassis frame. Unless noted all voltages are DC and positive to frame.

No signal input.
Voltages taken with the service selector switch in the FM position.
Volume control in the counterclockwise position.
Tone controls clockwise.

RESISTANCE TABLE

| Tube | Type | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BA6 | 700 K | 0 | 0 | 0 | inf. | inf. | 82 | - |
| V2 | 6BE6 | 22 K | 82 | 0 | 0 | inf. | inf. | 27 | - |
| V3 | 6C4 | inf. | inf. | 0 | 0 | inf. | 47 K | 0 | - |
| V4 | 6BA6 | 200 K | 0 | 0 | 0 | inf. | inf. | 82 | - |
| V5 | 6AU6 | 60 K | 0 | 0 | 0 | inf. | inf. | 82 | - |
| V6 | 6AU6 | 0 | 0 | 0 | 0 | inf. | inf. | 82 | - |
| V7 | 6AL5 | inf. | inf. | 0 | 0 | 10 K | 0 | 10 K | - |
| V8 | 6SQ7 | 0 | 4.7 M | 0 | 0 | 0 | inf. | 0 | 0 |
| V9 | 6SN7 | 19 K | inf. | 2.2 K | 500 K | inf. | 12 K | 0 | 0 |
| V10 | 6SN7 | 230 K | inf. | 11 K | 230 K | inf. | 11 K | 0 | 0 |
| V11 | 6L6G | inf. | .2 | inf. | inf. | 470 K | 10 K | 0 | 170 |
| V12 | 6L6G | inf. | .2 | inf. | inf. | 470 K | 10 K | 0 | 170 |
| V13 | 5Y3 | inf. | inf. | inf. | 5 | inf. | 5 | inf. | inf. |
| V14 | 25Z6 | inf. | inf. | 2 | inf. | 2 | inf. | inf. | inf. |

Resistance readings taken with voltohmyst connected between pin indicated and chassis frame. Values given are in ohms except where K indicates times 1000 and M indicates times 1 megohm.

All controls to the counterclockwise or off position.
Range switch in FM position.

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Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| (C1<br>(C2<br>(C3 | Main tuning capacitor | Capacitor, variable, 3 gang AM-FM | 15U4569 |
| C4 | Grid coupling | Capacitor, ceramic 1500 MMFD 350 V | 15L3459 |
| C5 | Cathode bypass, RF | Capacitor, ceramic 5000 MMFD Hi-Kap, 500 V | 15L3462 |
| C6 | Cathode bypass, IF | Same as C5 | |
| C7 | Screen bypass, RF | Same as C5 | |
| C8 | Screen bypass, Conv. | Same as C5 | |
| C9 | Screen bypass, IF | Same as C5 | |
| C10 | Screen bypass, IF | Same as C5 | |
| C11 | Heater bypass, RF | Same as C5 | |
| C12 | Heater bypass, IF | Same as C5 | |
| C13 | Heater bypass, IF | Same as C5 | |
| C14 | Heater bypass, IF | Same as C5 | |
| C15 | Heater bypass, ratio detector | Same as C5 | |
| C16 | Grid decoupling, RF | Same as C5 | |
| C17 | Grid decoupling, RF | Capacitor, paper, .05 MFD 200 V, miniature tubular | 15S4221 |
| C18 | Grid decoupling, Conv. | Same as C17 | |
| C19 | AGC bypass, AM | Same as C17 | |
| C20 | RF coupling, FM | Capacitor, silver ceramic, 25 MMFD 10% 500 V NPO | 15D3165 |
| C21 | Grid coupling oscillator | Capacitor, ceramic 51 MMFD 5% 500 V | 15L3458 |
| C22 | Plate bypass, Conv. | Capacitor, paper, .05 MFD 400 V, miniature tubular | 15L3466 |
| C23 | Plate bypass, Conv. | Same as C5 | |
| C24 | Drift compensation | Capacitor, compensator, silver ceramic, 4 MMFD plus or minus .25 MMFD Hi-Q, temp coeff. insulated N-750 | 15V4678 |
| C25 | Grid oscillator, FM | Same as C21 | |
| C26 | Plate decoupling oscillator, FM | Same as C4 | |
| C27 | Plate bypass oscillator, FM | Same as C5 | |
| C28 | Plate decoupling, IF | Same as C22 | |
| C29 | Grid capacitor, AM detector | Capacitor, ceramic, 100 MMFD 10% 500 V | 15L3460 |
| (C30<br>(C31 | Grid filter, AM detector | Capacitor, silver ceramic, 2x100 MMFD 20% 500 V 3 wire leads | 15D2923 |
| C32 | Bypass, AGC | Capacitor, paper, .1 MFD 200 V, miniature tubular | 15S4298 |
| C33 | Diode load | Capacitor, mica, 390 MMFD 10% 500 V | 15B799 |
| C34 | Diode load | Same as C33 | |
| C35 | Ratio detector decoupling | Same as C33 | |

Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| C36 | Audio filter, ratio detector | Same as C4 | |
| C37 | Ratio detector | Capacitor, electrolytic, 5 MFD 150 V, tubular | 15V4599 |
| (C38<br>(C39<br>(C40 | Filter, low frequency | Capacitor, electrolytic, 10/10/10/40, 450 V | 15L3539 |
| C41 | Coupling, Audio Amp. | Capacitor, paper, .01 MFD 200 V, miniature tubular | 15L3563 |
| C42 | Coupling, Audio Grid | Capacitor, paper, .1 MFD 400 V, miniature tubular | 15V4685 |
| C43 | RF filter, Audio Amp. | Same as C29 | |
| C44 | Bypass, treble control | Same as C41 | |
| C45 | Bypass, treble control | Capacitor, paper, .005 MFD 20% 600 V | 15H2603 |
| C46 | Bypass, bass control | Same as C40 | |
| C47 | Bypass, bass control | Same as C45 | |
| C48 | Cathode bypass, audio | Capacitor, electrolytic, 25 MFD 25 V, tubular | 15B795 |
| C49 | Plate coupling, audio | Capacitor, paper, .05 MFD 600 V, miniature tubular | 15L3467 |
| C50 | Coupling, Audio Amp. | Capacitor, paper, .02 MFD 200 V, tubular miniature | 15U4580 |
| C51 | Coupling, cathode follower | Same as C22 | |
| C60 | Trimmer, FM oscillator | Capacitor, trimmer, .5-5 MMFD | 15V4602 |
| C61 | IF grid bypass | Same as C5 | |
| C62 | Screen bypass | Same as C22 | |
| (C52<br>(C53 | Filter, low voltage rectifier | Capacitor, electrolytic, 2 x 60 MFD 200 V | 15L3438 |
| (C54<br>(C55<br>(C56 | Filter, high voltage rectifier | Capacitor, electrolytic, 4x20 MFD 450 V | 15L3588 |
| C57 | Grid coupling, power amplifier | Same as C49 | |
| C58 | Grid coupling, power amplifier | Same as C49 | |
| C59 | Cathode bypass, power amplifier | Capacitor, electrolytic, 25 MF 50 V, tubular | 15B638 |
| E1 | Dial light | Lamp, 6-8 V .150 A #47 brown | 49A169 |
| E2 | Dial light | Same as E1 | |
| E3 | Overload protection | Fuse, 3 amp, 3 AG | 37A162 |
| E4 | Main tuning knob | Knob, station selector, 1 7/8" dia., brass | 47V4603 |

MODELS 510; 510K, Kenilworth; 510S, Sheffield

Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| E5 | Control knob | Knob, 1 1/8" dia. black bakelite, push-on type | 47V4604 |
| E6 | Align IF | Aligning tool | 94V4707 |
| J1 | Loop connection to receiver | Receptacle, 3 contact | 67L3560 |
| (J2 | Television sound connection | Receptacle, dual, insulated | 67V4657 |
| (J3 | Phono pickup connection | | |
| J4 | Power cable connection | Receptacle, 12 contact | 82S4305 |
| J5 | Phono motor power | Receptacle, 4 contact | 67B645 |
| J6 | Speaker connection | Receptacle, 2 contact | 67V4673 |
| L1 | AM signal intercept | Loop | 1V4594 |
| L2 | FM antenna tuning | Coil | 20V4625 |
| L3 | Coupling, RF stage | Choke | 17V4668 |
| L4 | Tuning, FM-RF | Coil | 20V4626 |
| L5 | Oscillator, AM | Coil | 20V4621 |
| L6 | Oscillator, FM | Coil | 20V4627 |
| L7 | Filter choke, RF-IF | Choke | 17L3378 |
| L8 | Filter choke, RF-IF | Same as L7 | |
| L9 | Filter choke, RF-IF | Same as L7 | |
| L10 | Filter choke, hum | Choke | 17L3312 |
| LS1 | Loudspeaker | Speaker, 12" coaxial, Jensen K210, 8 ohm voice coil | 85V4593 |
| P1 | Loop to receiver | Plug, 3 contact | 65L3559 |
| P2 | Amplifier to tuner | Plug, 12 contact | 65S4301 |
| R1 | Grid coupling, RF | Resistor, composition, .47 meg 10% ½ watt | 70L3404 |
| R2 | Grid decoupling, RF | Resistor, composition, .1 meg 10% ½ watt | 70L3401 |
| R3 | Cathode bias, RF | Resistor, composition, 82 ohms 5% ½ watt | 70L3391 |
| R4 | Cathode bias, Conv. | Same as R3 | |
| R5 | Cathode bias, IF | Same as R3 | |
| R6 | Cathode bias, IF | Same as R3 | |
| R7 | Cathode bias, IF | Same as R3 | |

Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| R8 | Screen decoupling, RF | Resistor, composition, 1000 ohms 10% ½ watt | 70L3393 |
| R9 | Screen decoupling, IF | Same as R8 | |
| R10 | Screen decoupling, Conv. | Resistor, composition, 3300 ohms 10% ½ watt | 70L3394 |
| R11 | Screen decoupling, IF | Same as R10 | |
| R12 | Screen decoupling, IF | Same as R10 | |
| R13 | Grid decoupling, Conv. | Same as R2 | |
| R14 | Oscillator grid, Conv. | Resistor, composition, 22,000 ohms 10% ½ watt | 70L3397 |
| R15 | Plate decoupling, Conv. | Same as R8 | |
| R16 | Oscillator grid, FM | Resistor, composition, 47,000 ohms 10% ½ watt | 70L3399 |
| R17 | Grid loading, FM-IF | Same as R14 | |
| R18 | Grid decoupling, FM-IF | Same as R2 | |
| R19 | Grid decoupling, FM-IF | Resistor, composition, .22 meg 10% ½ watt | 70L3403 |
| R20 | Grid decoupling | Same as R14 | |
| R21 | Grid decoupling | Same as R16 | |
| R22 | Grid loading, FM-IF | Same as R14 | |
| R23 | Decoupling, AGC circuit | Resistor, composition, 1 meg 20% ½ watt | 70L3406 |
| R24 | Plate coupling, FM oscillator | Same as R8 | |
| R25 | Grid loading, FM-IF | Same as R14 | |
| R26 | Decoupling, ratio detector | Resistor, composition, 47 ohms 10% ½ watt | 70L3429 |
| R27 | De-emphasis, FM detector | Same as R16 | |
| R28 | Diode load, ratio detector | Resistor, composition, 1500 ohms 10% ½ watt | 70L3525 |
| R29 | Diode load, ratio detector | Same as R28 | |
| R30 | Audio load, ratio detector | Resistor, composition, 8200 ohms 10% ½ watt | 70L3523 |
| R31 | Audio load, ratio detector | Same as R30 | |
| R32 | Volume control | Potentiometer, volume, ½ meg | 70V4583 |
| R33 | Grid loading, audio amp. | Resistor, composition, 4.7 meg 20% ½ watt | 70L3530 |
| R34 | Plate load, audio amp. | Same as R2. | |
| R35 | Tone control network | Same as R16 | |
| R36 | Treble control | Potentiometer, treble, 1/2 meg | 70V4584 |
| R37 | Bass control | Potentiometer, bass off-on, 1/2 meg | 70V4585 |
| R38 | Bass control network | Same as R14 | |
| R39 | Grid load, audio amp. | Same as R2 | |
| R40 | Cathode bias, audio amp. | Resistor, composition, 2200 ohms 10% ½ watt | 70L3432 |

MODELS 510; 510K, Kenilworth; 510S, Sheffield

Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| R41 | Cathode follower | Resistor, composition, 56 ohms 10% ½ watt | 70V4628 |
| R42 | Cathode follower decoupling | Resistor, composition, 560 ohms 10% ½ watt | 70L3527 |
| R43 | Cathode circuit | Resistor, composition, 10,000 ohms 10% ½ watt | 70L3396 |
| R44 | Cathode bias, Audio Amp. | Resistor, composition, 1800 ohms 10% ½ watt | 70V4700 |
| R45 | Plate coupling, Audio Amp. | Same as R16 | |
| R46 | Plate decoupling, Audio Amp. | Same as R8 | |
| R47 | Power filter | Resistor, 750 ohms 10% 5 watt, Candohm | 70V4662 |
| R58 | Grid resistor | Resistor, composition, 27 ohms 10% ½ watt | 70V4692 |
| R59 | Grid loading | Same as R1 | |
| R48 | Filter | Resistor, 375 ohms 10% 5 watt, Candohm | 70V4589 |
| R49 | Filter | Resistor, composition, 3900 ohms 10% 2 watt | 70V4693 |
| R50 | Cathode coupling | Resistor, composition, 10,000 ohms 10% 1 watt | 70L3427 |
| R51 | Cathode bias | Resistor, composition, 680 ohms 10% ½ watt | 70V4691 |
| R52 | Grid | Same as R19 | |
| R53 | Plate coupling | Same as R50 | |
| R54 | Grid | Same as R1 | |
| R55 | Grid | Same as R1 | |
| R56 | Cathode bias | Resistor, 167 ohms 10% 5 watt, Candohm | 70V4588 |
| R57 | Used on two tap transformer only | Resistor, wirewound, 10 ohms 10 watt 10% | 70E2630 |
| SW1 | AM, FM, Phono, TV switching | Switch, range, 4 position | 89V4630 |
| T1 | Interstage coupling, Conv. | Coil | 20V4620 |
| T2 | Interstage coupling, FM | Coil | 20V4623 |
| T3 | Interstage coupling, AM | Coil | 20V4622 |
| T4 | Interstage coupling, FM | Same as T2 | |
| T5 | Interstage coupling, AM | Same as T3 | |

Parts List By Symbol Designation

| Symbol Desig. | Function | Description | Part No. |
|---|---|---|---|
| T6 | Interstage coupling, FM | Same as T2 | |
| T7 | Ratio detector transformer | Coil | 20V4624 |
| T8 | Power | Transformer | 91V4666 |
| T9 | Output | Transformer | 91V4667 |
| V1 | RF amplifier | Tube - 6BA6 | 92G2871 |
| V2 | Converter and Oscillator, AM | Tube - 6BE6 | 92V4631 |
| V3 | FM oscillator | Tube - 6C4 | 92B597 |
| V4 | IF amplifier, FM-AM | Same as V1 | |
| V5 | IF amplifier, FM-AM Detector | Tube - 6AU6 | 92C2659 |
| V6 | IF amplifier, FM | Same as V5 | |
| V7 | Ratio detector | Tube - 6AL5 | 92G2870 |
| V8 | Audio amplifier | Tube - 6SQ7 | 92V4632 |
| V9 | Audio amplifier and cathode follower | Tube - 6SN7 | 92A230 |
| V10 | Driver for power stage | Same as V9 | |
| V11 | Audio power amplifier | Tube - 6L6G | 92A233 |
| V12 | Audio power amplifier | Same as V11 | |
| V13 | High voltage rectifier | Tube - 5Y3 | 92B480 |
| V14 | Low voltage rectifier | Tube - 25Z6GT | 92E1419 |
| X1 | Socket for V1 | Socket, 7 contact, miniature type | 82B663 |
| X2 | Socket for V2 | Socket, 7 contact, miniature, mica filled, top mounting | 82V4636 |
| X3 | Socket for V3 | Same as X2 | |
| X4 | Socket for V4 | Same as X1 | |
| X5 | Socket for V5 | Same as X1 | |
| X6 | Socket for V6 | Same as X1 | |
| X7 | Socket for V7 | Same as X1 | |
| X8 | Socket for V8 | Socket, 8 contact octal, black bakelite type MIP-8 | 82S4412 |
| X9 | Socket for V9 | Same as X8 | |
| X10 | Socket for V10 | Socket, 8 contact octal, bakelite | 82E1322 |
| X11 | Socket for V11 | Same as X10 | |
| X12 | Socket for V12 | Same as X10 | |
| X13 | Socket for V13 | Same as X10 | |
| X14 | Socket for V14 | Same as X10 | |

MODELS 510; 510K,
Kenilworth; 510S,
Sheffield

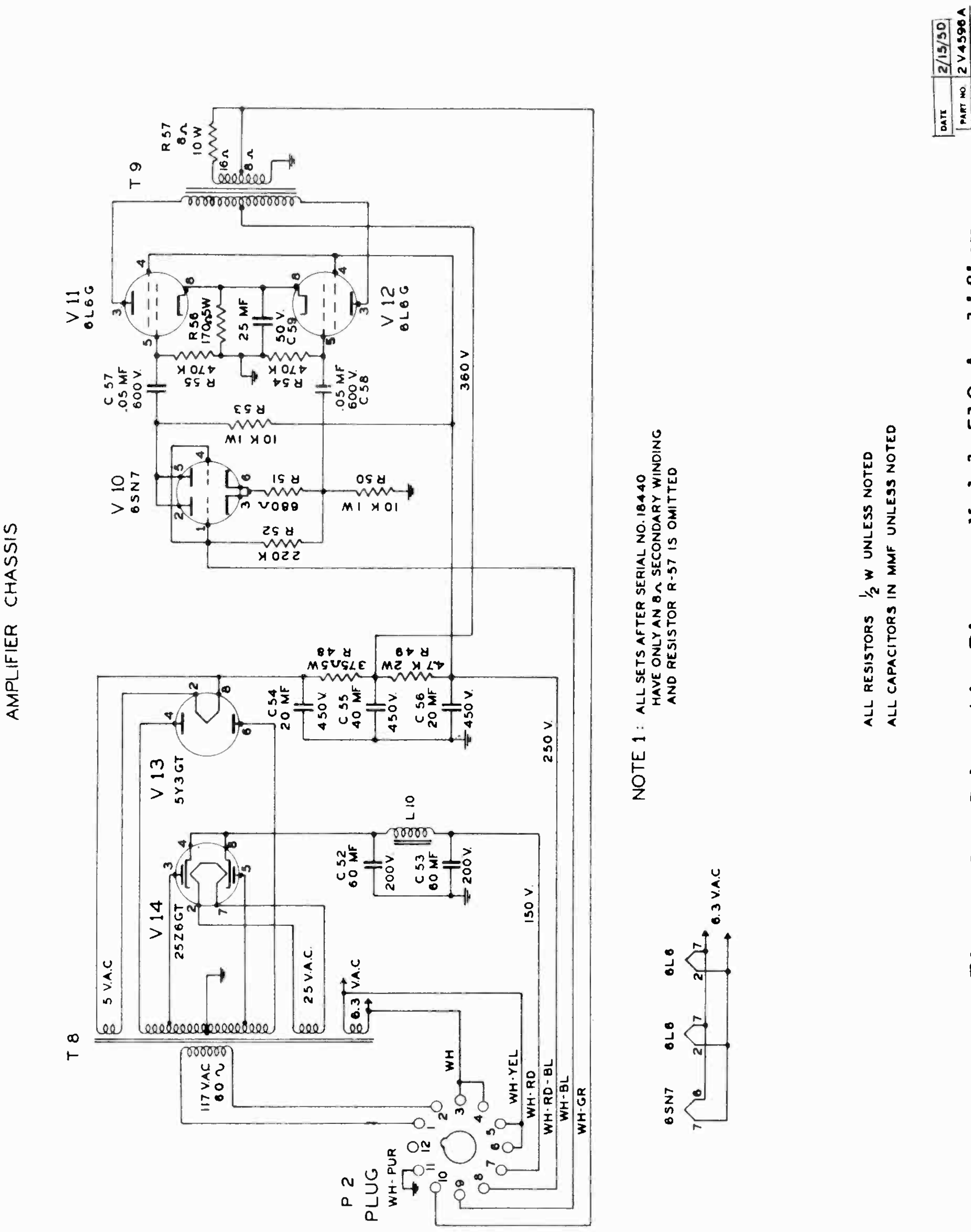
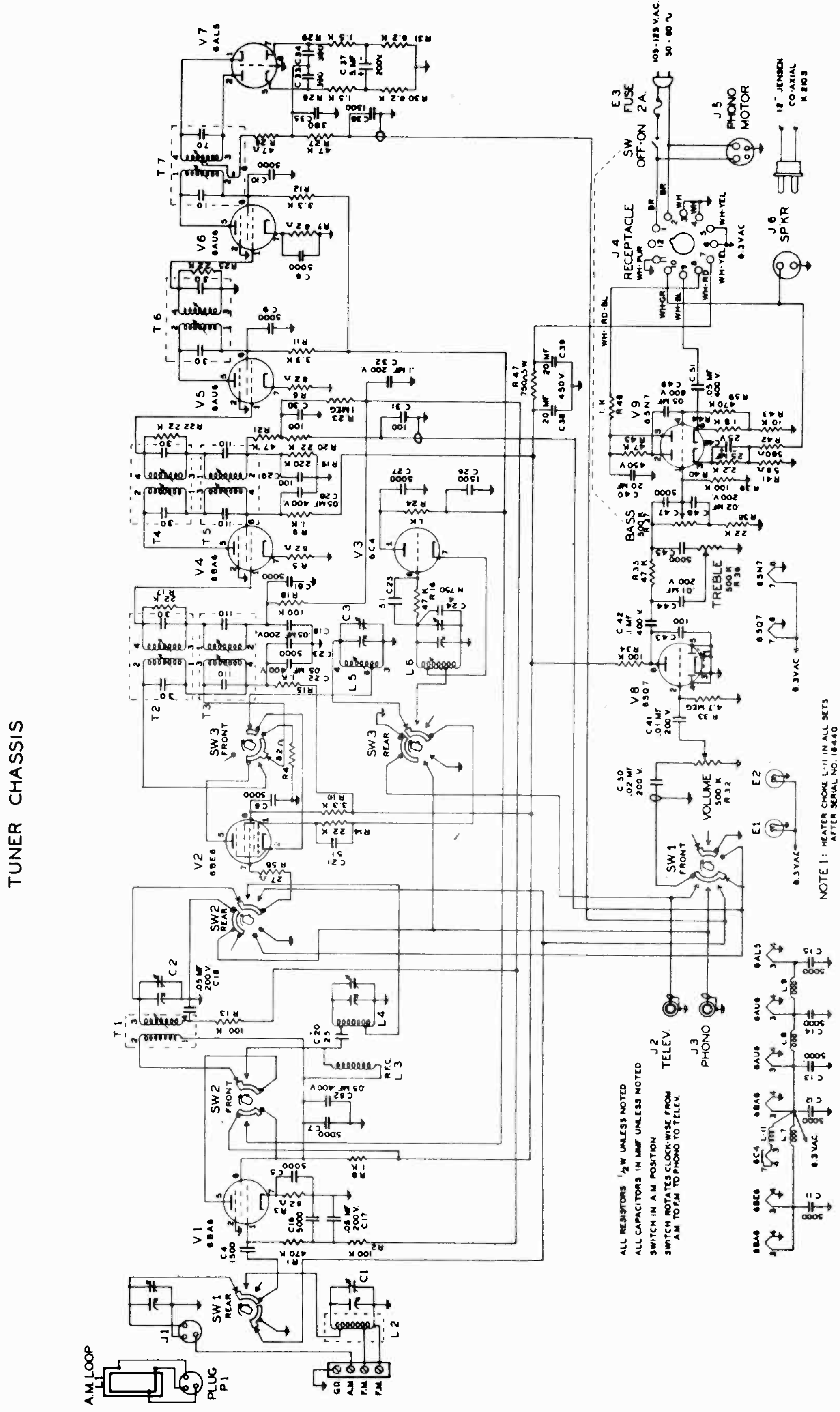



Figure 2 Schematic Diagram Model 510 Amplifier

MODELS 510; 510K, Kenilworth; 510S, Sheffield




| | |
|---|---|
| DATE | 2/15/50 |
| PART NO. | 2V4595A |

Figure 3 Schematic Diagram Model 510 Tuner

## ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection ---------- Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts (Standard Output) ---------- 1.26 volts
Dummy antenna to be in series with signal generator output ---------- See chart below
Connection of generator ground lead ---------- Floating ground
Generator modulation ---------- 30% 400 cycles
Position of Volume Control ---------- Fully clockwise

| Position of Variable | Generator Frequency | Dummy Antenna | Generator Output Connection | Trimmers Adjusted | Trimmer Function | Approximate Sensitivity |
|---|---|---|---|---|---|---|
| Open | 455 Kc | .05 uf | 12SA7 Grid (Stator of C-1) | A1 A2 | IF | 4000 uv. |
| 1400 Kc | 1400 Kc | | Antenna Lug with hank removed | ** A3 | Oscillator | 500 uv. |

** Since the antenna section of the variable has no trimmer, the rotor of the variable should be rocked back and forth on both sides of 1400 Kc while adjusting the oscillator trimmer for maximum output. This is to obtain the combination of rotor and trimmer setting to give perfect tracking of the two sections of the variable condenser and consequently give maximum output. Check sensitivity at 600 Kc. If weak, adjust antenna section plates for maximum output at 600 Kc. Tracking of the condenser at points other than 1400 Kc is accomplished by bending the outside plates on the variable condenser rotor, which are cut for this purpose. When bending plates to track the condenser at any given frequency, keep in mind the fact that this will effect the tracking at all frequencies below that point. A tuning wand is very helpful in checking the tracking of this condenser, to indicate whether more or less capacity is needed.
The alignment procedure should be repeated stage by stage in the original order for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

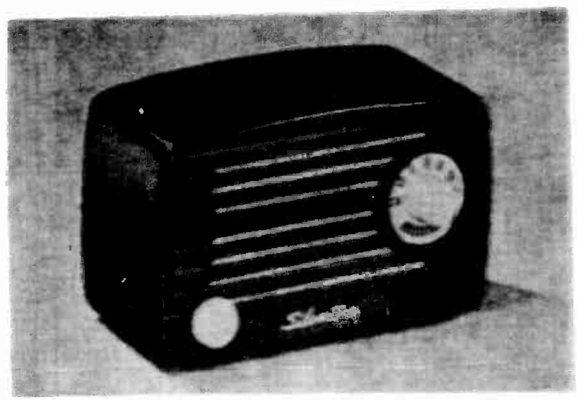
## SPECIFICATIONS

Power Output
Undistorted . . . . . . . . . 8 watt
Maximum . . . . . . . . . . 2 watt
Speaker Voice Coil Impedance 3.2 ohms

Power Supply
105-125 Volts 30 Watts
Frequency Range
Broadcast . . . . . . . . . 540 - 1600 Kc

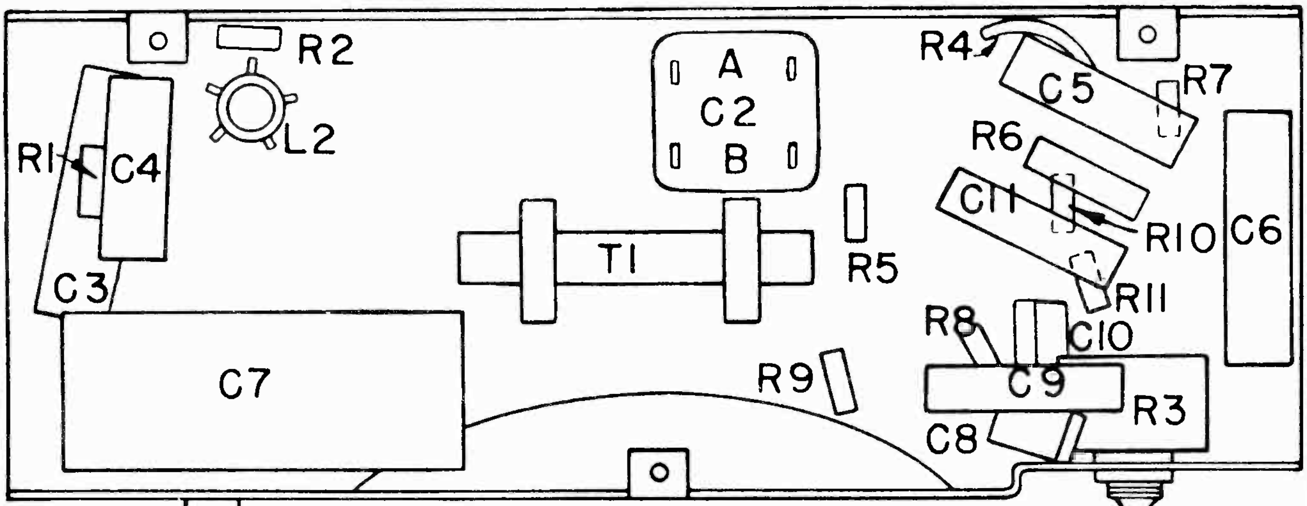
## REPAIR PART LIST

| Schematic Location | Part No. | Description |
|---|---|---|
| | N22934-1 | Cabinet, Brown, (Cat. No. 1) |
| | N22934-2 | Cabinet, Ivory, (Cat. No. 2) |
| | N22990-1 | Cloth, Grille, White, (Cat. No. 1) |
| | N22990-2 | Cloth, Grille, Maroon, (Cat. No. 2) |
| L1 | N22864 | Coil, Antenna |
| L2 | N22865 | Coil, Oscillator |
| C1A, C1B | N22919 | Condenser, Variable, 2 Gang |
| C2A, C2B | N21042 | Condenser, Trimmers, I.F. Trans. |
| C3, C6 | | Condenser, .05 mfd., 400 volt |
| C4 | | Condenser, .05 mfd., 200 volt |
| C5 | | Condenser, .01 mfd., 400 volt |
| C7 | N22876 | Condenser, Electrolytic, 40-20 uf., 150 volt 20 uf., 25 volt |
| C8, C10 | | Condenser, .0001 mfd., 500 volt, mica |
| C9, C11 | | Condenser, .002 mfd., 600 volt |
| P | N20257-1 | Cord, Power with Plug |
| | N22974-1 | Knob, Volume, Ivory, (Cat. No. 1) |
| | N22975-1 | Knob, Tuning, Ivory, (Cat. No. 1) |
| | N22974-2 | Knob, Volume, Maroon, (Cat. No. 2) |

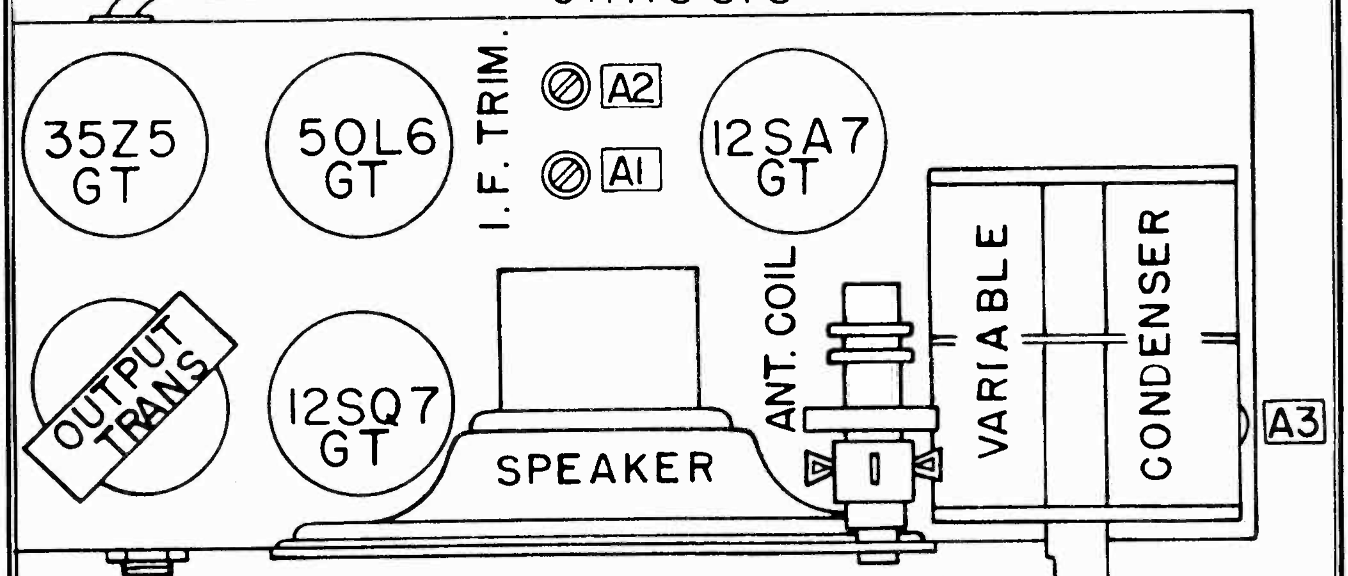


MODELS 1, 2,
Ch. 132.878

| Schematic Location | Part No. | Description |
|---|---|---|
| | N22975-2 | Knob, Tuning, Maroon, (Cat. No. 2) |
| | N22978 | Leaflet, Instruction |
| R1 | | Resistor, 330,000 ohms, 1/4 watt |
| R2 | | Resistor, 22,000 ohms, 1/4 watt |
| R3 | N21630 | Resistor, 2 Megohm, Volume Control & Switch |
| R4 | N19177 | Resistor, 47 ohm, 1 watt wire wound |
| R5 | | Resistor, 120 ohm, 1/4 watt |
| R6 | | Resistor, 2200 ohm, 1 watt |
| R7 | | Resistor, 15 ohm, 1/4 watt |
| R8 | | Resistor, 4.7 megohm, 1/4 watt |
| R9 | | Resistor, 15 megohm, 1/4 watt |
| R10 | | Resistor, 470,000 ohm, 1/4 watt |
| R11 | | Resistor, 1 megohm, 1/4 watt |
| SPK | N22875 | Speaker, 4" P.M. |
| T1 | N22863 | Transformer, I.F. |
| T2 | N22878 | Transformer, Output |
| | N18136 | Wire, Antenna |

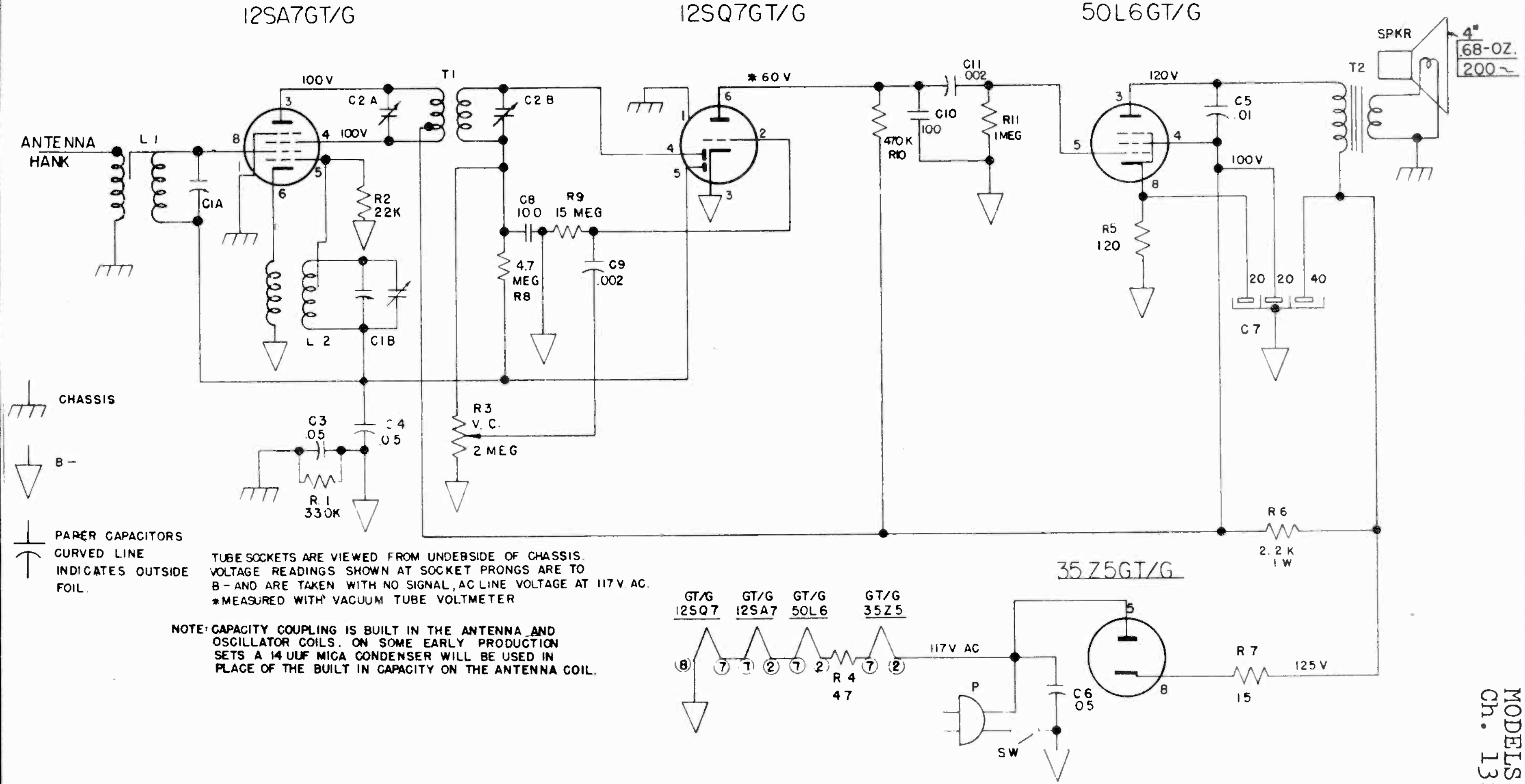



LOCATION OF PARTS UNDER CHASSIS




TUBE LAYOUT OUTLINE

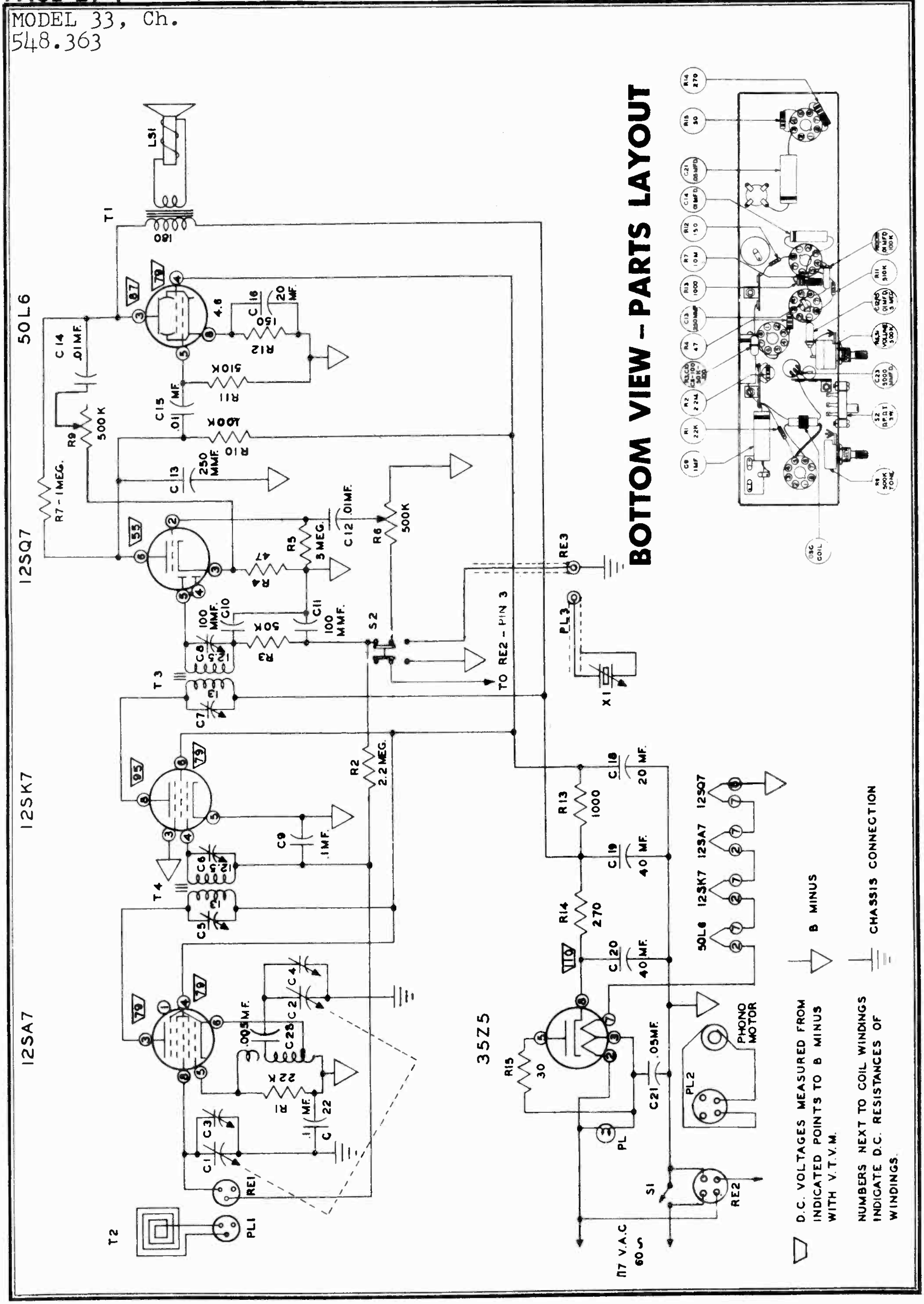
# SCHEMATIC CIRCUT DIAGRAM




TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO B - AND ARE TAKEN WITH NO SIGNAL, AC LINE VOLTAGE AT 117 V AC.
✱MEASURED WITH VACUUM TUBE VOLTMETER

NOTE: CAPACITY COUPLING IS BUILT IN THE ANTENNA AND OSCILLATOR COILS. ON SOME EARLY PRODUCTION SETS A 14 UUF MICA CONDENSER WILL BE USED IN PLACE OF THE BUILT IN CAPACITY ON THE ANTENNA COIL.

MODEL 33, Ch.
548.363



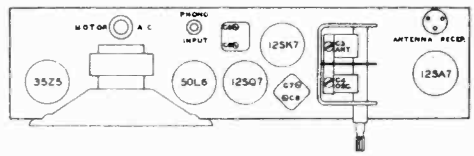
MODEL 33,
Ch. 548.363

POWER SUPPLY . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 117 V. A.C. 45 WATTS

## PARTS LIST

| SCHEMATIC LOCATION | PART NO. | DESCRIPTION |
|---|---|---|
| R1 | 517 | Resistor 22,000 Ohm. 1/2 Watt |
| R2 | 615 | Resistor 2.2 Meg Ohm. 1/2 Watt |
| R4 | 520 | Resistor 47 Ohm. 1/2 Watt |
| R6 | 401 | Control, Volume, 500,000 Ohm. with Switch |
| R7 | 516 | Resistor, 1 Meg Ohm. 1/2 Watt |
| R9 | 408 | Control, Tone, 500,000 Ohm. |
| R11 | 502 | Resistor 510,000 Ohm. 1/2 Watt |
| R12 | 505 | Resistor 150 Ohm. 1/2 Watt |
| R13 | 607 | Resistor 1000 Ohm. 1 Watt |
| R14 | 622 | Resistor 270 Ohm. 1 Watt |
| R15 | 534 | Resistor 30 Ohm. 1/2 Watt |
| C1, C2, C3, C4 | 1004A | Tuning Gang and Trimmer Assembly |
| C5, C6, C7, C8 | | Trimmer Condensors in I. F. Cans |
| C9, C22 | 804 | Capacitor .1 Mfd. 200 V. |
| C13 | 817 | Capacitor 250 Mmfd. Ceramic |
| C14 | 802 | Capacitor .01 Mfd. 400 V. |
| C16, C18 | 1010 | Capacitor Filter 40, 40, 20 Mfd. 150 Volts |
| C19, C20 | | 20 Mfd. 25 Volts |
| C21 | 803A | Capacitor .05 Mfd. 400 V. |
| C23 | 906 | Capacitor 5000 Mmfd. Ceramic |
| R3, C10 | 811 | Capristor 100 Mmfd. 50,000 Ohm. |
| C11 | | 100 Mmfd. Dual Shunt |
| R5, C12 | 813 | Capristor .01 Mfd. 5 Meg Ohm. Common Terminal |
| R10, C15 | 814A | Capristor .01 Mfd. 100,000 Ohm. |
| T2 | 1512A | Loop Antenna |
| T3, T4 | 1402 | Transformers I. F. #118 |
| S2 | 1892A | Switch, Radio-Phono |
| PL1 | 307A | Plug, Loop Antenna |
| PL2 | 307C | Plug, Motor A. C. |
| PL3 | 305 | Plug, Pick up |
| RE1 | 106A | Receptacle, Loop Antenna |
| RE2 | 107A | Receptacle, A. C. |
| RE3 | 104 | Receptacle, Pick up |
| X1 | 2530 | Pick up, Ceramic Cartridge and Plastic Arm |
| LS1, T1 | 2607 | Speaker, 5" P.M. with 2500 Ohm. Output Transformer |
| | 2108A | Portable Carrying Case |
| | 2411A | Knob, Volume |
| | 2411B | Knob, Tuning |
| | 2411C | Knob, Tone |
| | 1736A | Dial Pointer |
| | 2307 | Dial Bezel |
| | 1722B | Dial |

## TUBE LAYOUT




## ALIGNMENT PROCEDURE

The following equipment is required for aligning: A signal generator which will provide an accurately calibrated signal at the indicated test frequencies; an output indicating meter; a non-metallic screwdriver.

Radiation Loop: 2-turn loop, 6 inches in diameter.

Conditions for Alignment:

Tone - Treble

Volume - Maximum

Selector Switch - "Radio" position

Test loop coupled loosely to receiver by spacing - receiver loop in same position as it will be with chassis in cabinet.

| SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | REMARKS | ADJUST FOR MAXIMUM OUTPUT |
|---|---|---|---|---|---|
| LOOP | 455 KC | Low End of Band | Across Voice Coil | Short out osc. tuning gang section C-2; compress C-3 | C-8, C-7, C-6, C-5 |
| LOOP | 1620 KC | High End of Band | " | Remove short across C-2 | C-4 |
| LOOP | 1400 KC | Point of Maximum Output | " | Set pointer to 140 on dial | C-3 |
| LOOP | 600 KC | Point of Maximum Output | " | Knife C-1 plates for maximum output | |
| LOOP | 1400 KC | 1400 | " | Recheck alignment. | C-3 if necessary |

MODELS 51, 53,
Ch. 132.887

## Specifications

Power Supply
105-120 volts 60 cycle AC, 65 watts
Frequency Range
Broadcast - 1600 - 540 Kc

Power Output
Undistorted .8 watt
Maximum 1.5 watt
Speaker Voice Coil Impedance 3.2 ohms

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| L1 | N23159 | Antenna Loop Assembly |
| | N22953 | Bracket, Antenna Loop Mtg. |
| | N23207 | Bracket, Var. Con. Mtg. |
| | N23427 | Bracket, Dial Scale Mtg. |
| | N19361 | Clip, Hairpin |
| L2 | N23163 | Coil, R.F. |
| L3 | *N23751 | Coil, Oscillator |
| C1A,C1B,C1C | *N23743 | Condenser, Variable, 3 Gang |
| C2,C5,C13 | | Condenser, .05 mfd., 400 volt |
| C3 | | Condenser, .05 mfd., 200 volt |
| C4 | | Condenser, .00005 mfd., 500 volt, mica |
| C6,C8 | | Condenser, .0002 mfd., 350 volt, Ceramic |
| C7,C9 | | Condenser, .01 mfd., 400 volt |
| C11 | | Condenser, .02 mfd., 400 volt |
| C12A,C12B | N22111 | Condenser, Electrolytic, 50-50 mfd., 150 volt |
| | N19132 | Cord, Dial Drive |
| P | N20138-15 | Cord, Power with Plug |
| | N23484 | Cover, Rear Cabinet |
| | N23573 | Cover, Record Changer, Bottom |
| | N23402 | Escutcheon, Dial with Crystal |
| | N23450-1C | Knob, On-Off-Volume |
| | N23450-1B | Knob, Radio-Phono |
| | N23450-1A | Knob, Tuning |

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | | Lamp, Dial, Mazda, No. 47 |
| | N23534 | Leaflet, Instruction |
| | N22956-1 | Pointer, Dial |
| R1,R9 | | Resistor, 330,000 ohms, ¼ watt |
| R2 | | Resistor, 1000 ohms, ¼ watt |
| R3 | | Resistor, 22,000 ohms, ¼ watt |
| R4 | | Resistor, 6.8 megohm, ¼ watt |
| R5 | | Resistor, 1 megohm, ¼ watt |
| R6 | | Resistor, 15 ohm, ¼ watt |
| R7 | N22963 | Resistor, Volume Control & Switch, 500,000 ohms |
| R8 | | Resistor, 3.3 megohm, ¼ watt |
| R10 | | Resistor, 470,000 ohms, ¼ watt |
| R11,R13 | | Resistor, 150 ohm, ¼ watt |
| R12 | | Resistor, 1200 ohms, 2 watt |
| | N23430 | Scale, Dial |
| | N22957 | Shaft, Tuning |
| | N23537-1 | Socket, Dial-lite with leads |
| | N19551 | Socket, Phono Motor |
| | N19552 | Socket, Phono input |
| SPKR | N23406 | Speaker, 6" P.M. |
| | N19133 | Spring, Dial Cord |
| T1 | N23161 | Transformer, 1st I.F. |
| T2 | N23162 | Transformer, 2nd I.F. |
| T3 | N23407 | Transformer, Output |
| | N22763 | Weight, Cabinet |

*On some of the first sets manufactured variable condenser N23155 (with a single spaced oscillator section) and oscillator coil N23160 were used. If either the oscillator coil or the variable condenser is replaced with the part listed here, the other part should also be replaced for correct tracking. N23155 and N23160 should be used together, and N23743 and N23751 should be used together.

## TECHNICAL INFORMATION

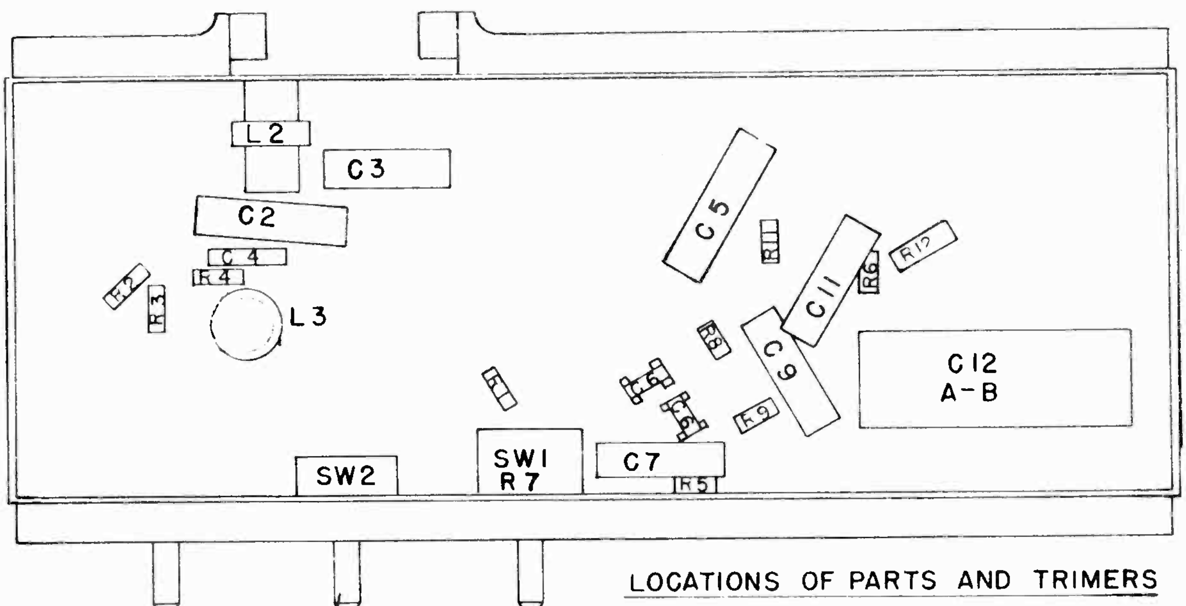
Tuning range 540 Kc. to 1600 Kc. Intermediate frequency - 455 Kc. I-f and r-f measurements made at .5 watt output - approximately 1.26 volts on a rectifier type voltmeter connected across the voice coil.

Approximate inputs for a .5 watt output: I-f 200 uv. R-f with standard loop: at 600 Kc. 500 uv/m; at 1000 Kc. 400 uv/m; at 1400 Kc. 400 uv/m. R-f at external antenna connection: at 600 Kc. 250 uv; at 1000 Kc. 200 uv; at 1400 Kc. 200 uv.

## ALIGNMENT DATA

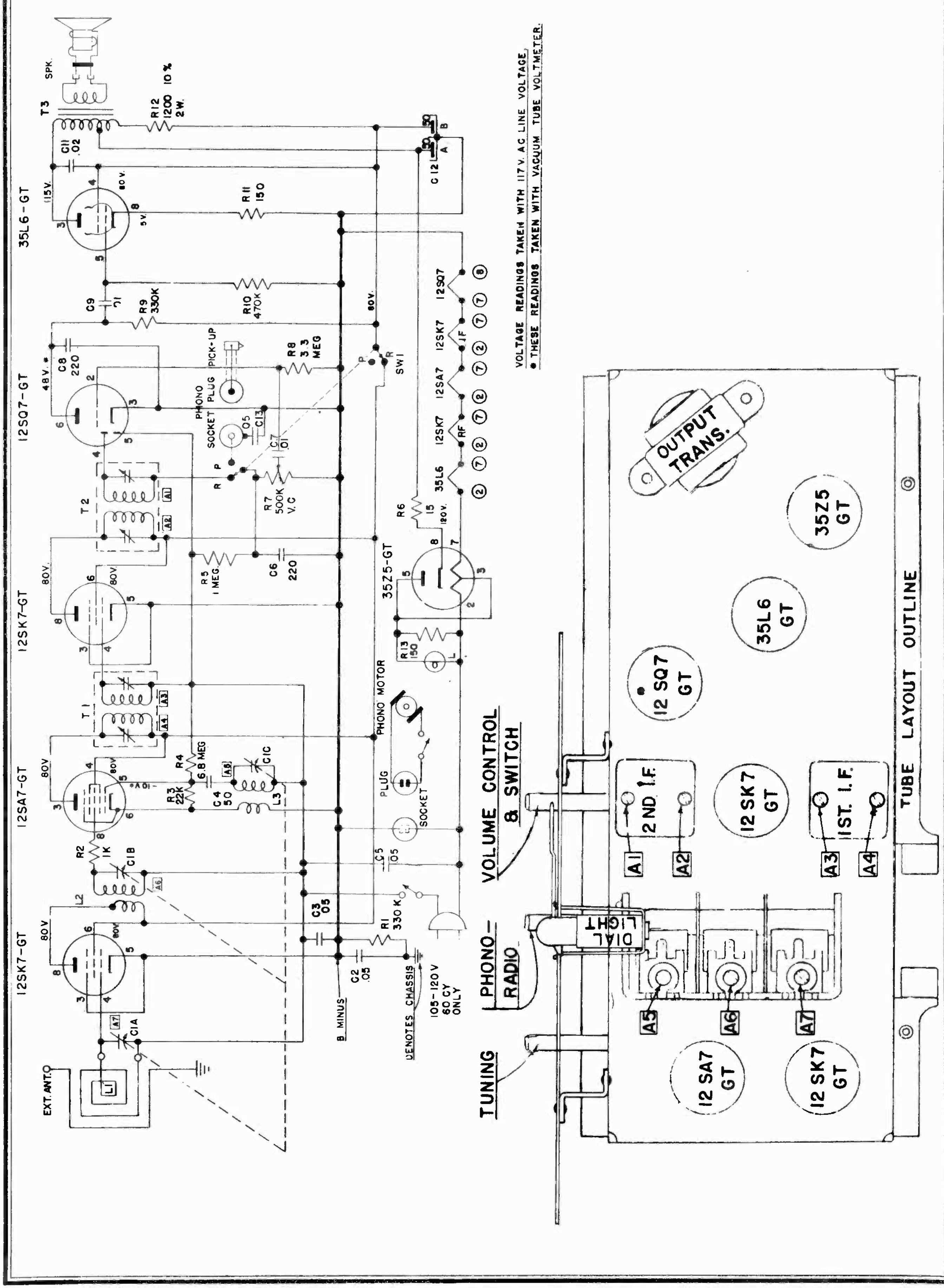
With variable condenser closed, set the pointer horizontally to the left.

| Position of Variable | Generator Frequency | Dummy Ant. | Generator Connection (High) | Generator Connection (Low) | Adjust Trimmers (in order shown) | Trimmer Function |
|---|---|---|---|---|---|---|
| Open | 455 Kc | .05 mfd. | Mixer Grid | Float.Gnd. | A1,A2,A3,A4 | I.F. |
| 1400 Kc | 1400 Kc | 50 mmfd. | Ext.Ant.Conn. | Float.Gnd. | A5,A6,A7 | Osc.R.F.Ant. |
| 600 Kc | 600 Kc | 50 mmfd. | Ext.Ant.Conn. | Float.Gnd. | Check Point | |




LOCATIONS OF PARTS AND TRIMERS UNDER CHASSIS

MODELS 51, 53,
Ch. 132.887



MODELS 54, 56,
Ch. 132.888

## Specifications

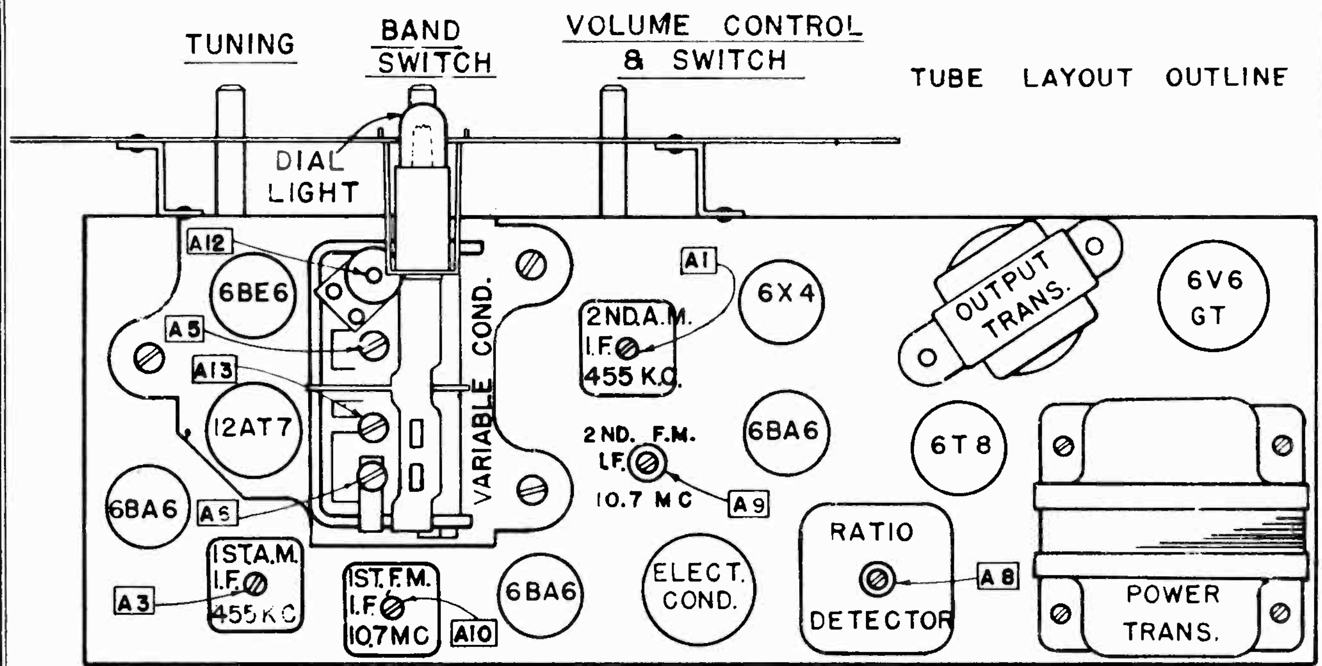
Power Supply
105-120 volt 60 cycle AC, 65 watts
Frequency Range
Broadcast - 1600 - 540 Kc
FM - 108 - 88 Mc
Power Output
Undistorted 1.5
Maximum 2.5

Speaker Voice Coil Impedance 3.2

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| L3 | N22586 | Antenna Loop Ass'y. |
| L1 | N22648-1 | Choke, High Frequency, 1.5 uh |
| L2 | N21445-1 | Choke, High Frequency, 7.5 uh |
| L7 | N22597-1 | Choke, High Frequency, 3 uh |
| L8 | N21673 | Choke, R.F., Iron core, 14 uh |
| L4 | N22593 | Coil, R.F., FM |
| L5 | N22594 | Coil, Oscillator, FM |
| L6 | N22587-1 | Coil, Oscillator, AM |
| C1,C2,C3,C4 | N22962 | Condenser, Variable |
| C4A | N22724 | Condenser, Osc. Temp. Cor. 5-25 uuf |
| C5,C14 | | Condenser, Ceramic, 47 uuf, 350 v. |
| C6,C18,C19, C21,C23,C25 | | Condenser, Disc, 5K uuf, 350 v. |
| C7,C20,C24 | | Condenser, Disc, 10 K uuf,350 v. |
| C8,C26,C28, C30,C31 | | Condenser, Ceramic, 100 uuf, 350 v. |
| C9,C12,C13, C16,C17 | | Condenser, Ceramic, 1K uuf, 350 v. |
| C10 | | Condenser, Ceramic, 1.5 uuf, 350 v. Gimmick |
| C11 | | Condenser, Ceramic, 50 uuf, 500 v. N750 |
| C15,C34 | | Condenser, P.T., .01 uf, 400 v. |
| C22 | | Condenser, Ceramic, 15 uuf, 350 v. |
| C27 | | Condenser, P.T., .003 uf, 600 v. |
| C29 | N22659 | Condenser, Electrolytic, 4 uf, 25 v. |
| C32,C35A,C35B | | Condenser, Ceramic, 220 uuf, 350 v. |
| C35C | N22806 | Condenser, Electrolytic, 40-20-20 uf, 250 v. |
| C36,C38 | | Condenser, P.T., .02 uf, 400 v. |
| C37 | N22602 | Condenser, Electrolytic, 10 uf, 25 v. |
| C39 | | Condenser, Molded, .01 uf, 400 v. |
| C40 | | Condenser, P.T., .05 uf, 200 v. |
| R24,SW-2 | N22963 | Control, Volume & Switch, 500K ohms |
| | N19132 | Cord, Dial Drive |
| P | N20138-14 | Cord, Power with Plug |
| | N23484 | Cover, Rear Cabinet |
| | N23402 | Escutcheon, Dial with Crystal |
| | N23450-1C | Knob, On-Off Volume |
| | N23450-1D | Knob, AM-FM-Phono |
| | N23450-1A | Knob, Tuning |

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | | Lamp, Dial, Mazda No. 47 |
| | N23524 | Leaflet, Instruction |
| | N22956-1 | Pointer, Dial |
| R1,R11,R15 | | Resistor, 68 ohms, 1/4 watt |
| R2 | | Resistor, 27K ohms, 1 watt |
| R3 | | Resistor, 47 ohms, 1/4 watt |
| R4,R6 | | Resistor, 22K ohms, 1/4 watt |
| R5 | | Resistor, 2200 ohms, 1/4 watt |
| R7,R8,R13, R17,R30 | | Resistor, 1K ohms, 1/4 watt |
| R9 | | Resistor, 8.2K ohms, 1 watt |
| R10,R20 | | Resistor, 1 megohm, 1/4 watt |
| R12 | | Resistor, 10K ohms, 1 watt |
| R14,R22 | | Resistor, 100K ohms, 1/4 watt |
| R16 | | Resistor, 3.3K ohms, 1 watt |
| R18 | | Resistor, 180 ohms, 1/4 watt |
| R19 | | Resistor, 39K ohms, 1/4 watt |
| R21 | | Resistor, 220K ohms, 1/4 watt |
| R23 | | Resistor, 15K ohms, 1/4 watt |
| R25 | | Resistor, 10 megohms, 1/4 watt |
| R26 | | Resistor, 330K ohms, 1/4 watt |
| R27A,R27B | N22624 | Resistor, 2 x 500 ohms, 5 watts |
| R28 | | Resistor, 470 K ohms, 1/4 watt |
| R29 | | Resistor, 270 ohms, 1 watt |
| | N23429 | Scale, Dial |
| | N22957 | Shaft, Tuning |
| | N23537-1 | Socket, Dial-Lite with Leads |
| | N19551 | Socket, AC Phono Motor |
| | N19552 | Socket, Phono Input |
| Spk. | N23406 | Speaker, 6" P.M. |
| | N19133 | Spring, Dial Cord |
| PS.-2 | N22334-1 | Suppressor Ass'y. Parasitic-AM |
| PS.-1 | N22335-1 | Suppressor Ass'y. Parasitic-FM |
| SW-1 | N23485 | Switch, Band, FM-AM-Phono |
| T2,T4 | N22352-1 | Transformer, I.F., AM, 445 Kc. |
| T1 | N22590 | Transformer, 1st I.F., FM, 10.7 Mc. |
| T3 | N22967 | Transformer, 2nd I.F., FM, 10.7 Mc. |
| T6 | N23669 | Transformer, Output |
| T7 | N22959 | Transformer, Power |
| T5 | N22592 | Transformer, Ratio Detector |
| | N22763 | Weight, Cabinet |

TUBE LAYOUT OUTLINE




## TECHNICAL INFORMATION

**AM** Tuning range—540 Kc. to 1600 Kc. Immediate Frequency—455 Kc. I.F. and R.F. measurements made at 500 milliwatts output—approximately 1.27 volts on a receiver type voltmeter connected across speaker voice coil. Approximate input for 500 MW output: I.F. 300 uv; R.F. with standard loop: at 00 Kc. 1200 uv/m; at 1000 Kc. uv/m; at 1400 Kc. 800 uv/m.

**FM** Tuning range—88 megacycles to 108 megacycles. Intermediate frequency 10.7 megacycles. I.F. and R.F. measurements made at 500 milliwatts output—approximately 1.27 volts on a recitfier type voltmeter connected across speaker voice coil. Approximate input for 500 MW output: I.F. 300 uv; R.F. "Absolute Measurements": 91 megacycles 125 uv; 105 megacycles, 100 uv.

## ALIGNMENT PROCEDURE

Output meter connection——Across speaker voice coil.
Output meter reading to indicate 500 MW——1.27 volts.
Generator Modulation——30%, 400 cycles
Position of volume control——Fully clockwise.
Set dial pointer——Horizontal, variable condenser closed.
Set band switch——To left for AM alignment, center for FM alignment

MODELS 54, 56,
Ch. 132.888

# FM ALIGNMENT

Detector and I.F. alignment using Signal Generator and Oscilloscope.

1. Connect FM Generator, High side, to grid (pin 1) of 6BA6 2nd I.F. tube through .005 mfd. dummy.
2. Set generator frequency to 10.7 Mc. modulated either 60 cycles or 400 cycles, 250 Kc sweep (125 Kc. deviation).
3. Connect vertical input of scope across volume control of receiver (grounded terminal to chassis, ungrounded terminal to high side of control).
4. Set scope switch for internal synchronization and set horizontal oscillator to 2X frequency of modulating voltage of generator. (120 or 800 cycles)
5. Turn variable condenser fully open, and band switch to right (FM).
6. Adjust frequency vernier of horizontal oscillator on scope until the pattern becomes stationary.
7. Adjust ratio detector primary slug No. A7 for maximum vertical sweep of the scope pattern.
8. Adjust ratio detector secondary slug No. A8 to center the cross over point of the pattern. Pattern should look like Fig. 1 with the same amount of curve on both ends, and the cross over point in the center.
9. Connect generator, high side, to center antenna screw terminal on rear of chassis.
10. Adjust I.F. slugs A9, A10 and A11 for the greatest vertical sweep of the pattern, consistent with linearity. If the I.F. slugs are adjusted for maximum sweep of the pattern, the pattern may become non-linear. Therefore, adjustment should be made for the greatest sweep which can be obtained and still have all four ends of the "X" pattern similar in size and shape.
11. Check the alignment of the I.F. and detector circuits by varying the signal generator frequency above and below the center frequency of 10.7 Mc. If the receiver is perfectly aligned, two smaller "X" patterns of similar size and shape will result, one on either side of the center frequency. See Figure 2.

X PATTERN
CENTER FREQUENCY

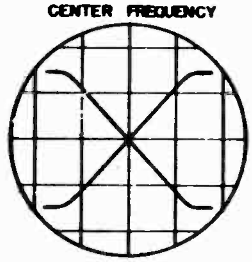


FIG. 1

SMALL X PATTERN
ABOVE AND BELOW
CENTER FREQUENCY

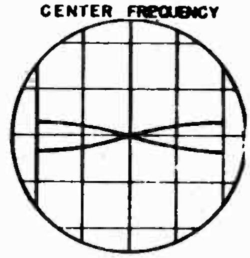
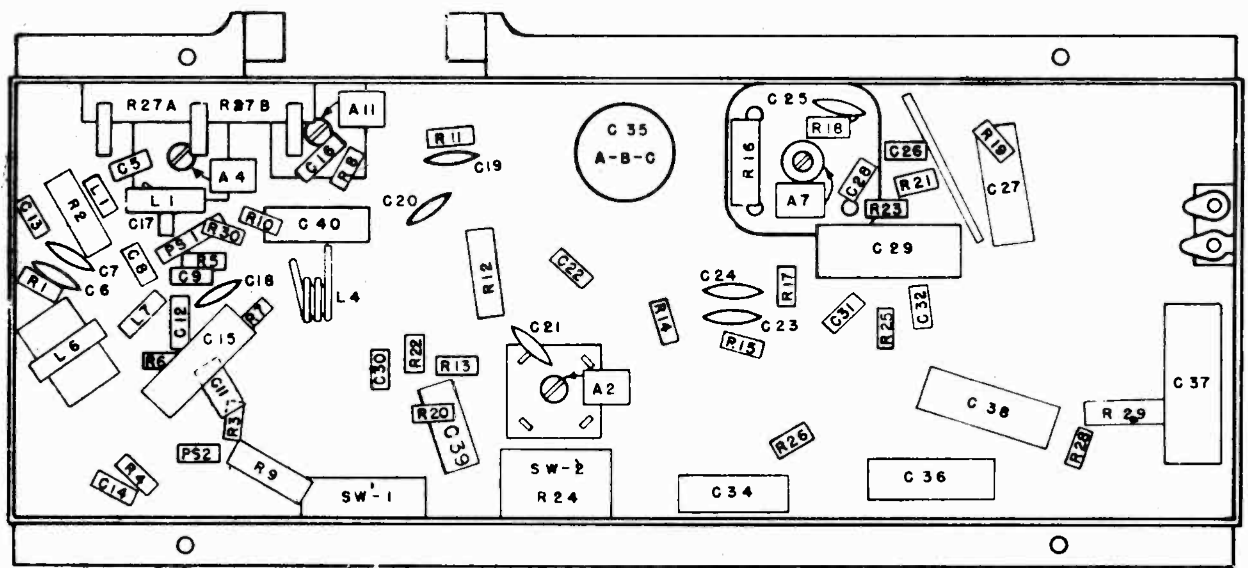


FIG. 2

| Position of Variable | Generator Frequency | Dummy Ant. | RF Generator Connection High Side | Generator Connection Ground Lead | Adjust Trimmers In Order Shown | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully open | 108.5 Mc. | *300 ohm | Ant. (FM) Terminal | Ground (G) Terminal | A12 | Oscillator |
| Fully Closed | 87.5 Mc. | *300 ohm | Ant. (FM) Terminal | Ground (G) Terminal | Check Point | Oscillator |
| 105 Mc. | 105 Mc. | *300 ohm | Ant. (FM) Terminal | Ground (G) Terminal | A13 | R.F. |
| 91 Mc. | 91 Mc. | *300 ohm | Ant. (FM) Terminal | Ground (G) Terminal | Check Point | R.F. |

For R.F. alignment use FM generator signal modulated with 400 cycles 45 Kc. sweep (22.5 Kc.) deviation).
*The 300 ohm dummy should be made up to two 150 ohm resistors, one placed in each lead at the receiver antenna terminals.




LOCATIONS OF PARTS AND TRIMERS
UNDER CHASSIS

MODELS 54, 56,
Ch. 132.888

## AM ALIGNMENT

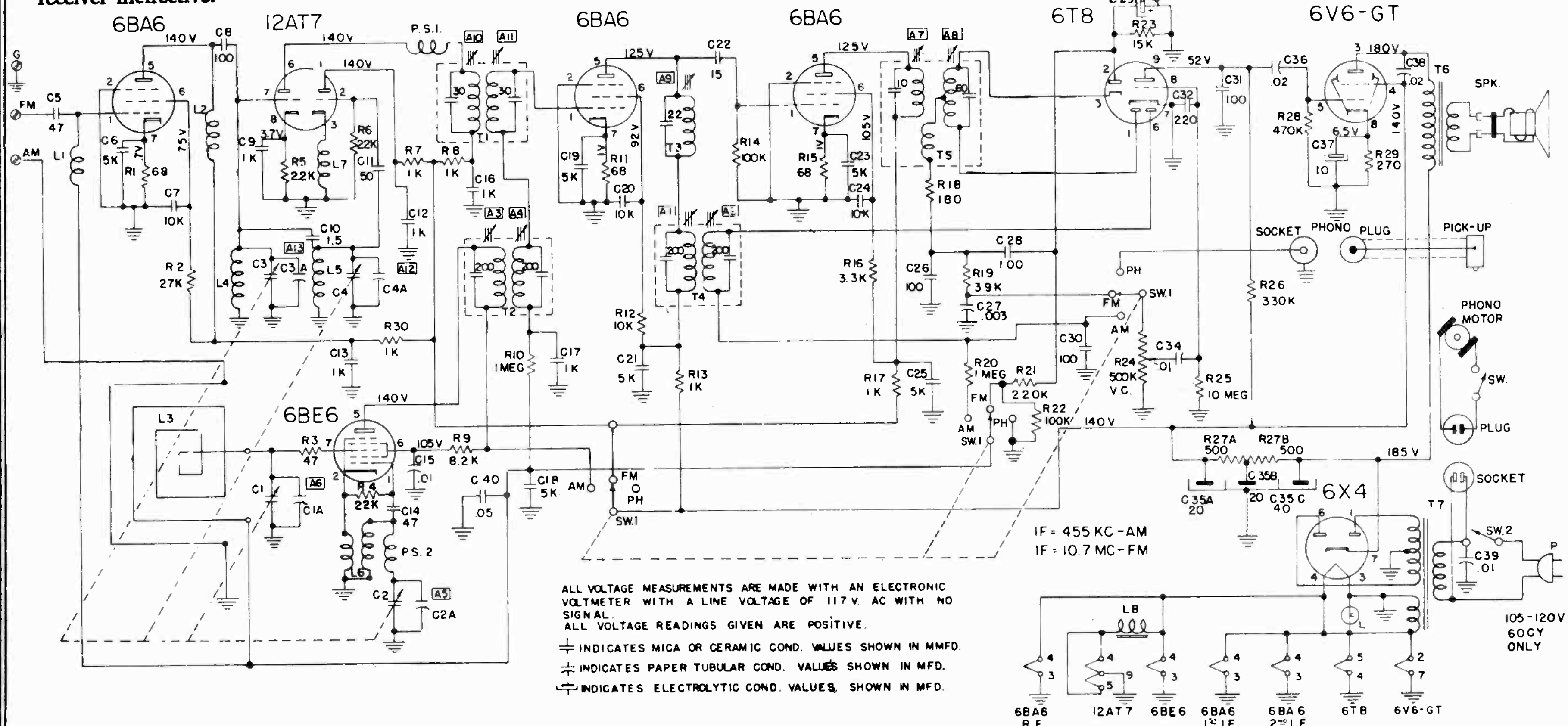
| Position of Variable | Generator Frequency | Dummy Ant. | Generator Connection (high) | Generator Connection Ground Lead | Adjust Trimmers In Order Shown For Max. Output | Trimmer Function |
|---|---|---|---|---|---|---|
| Open | 455 Kc | .05 mfd. | Mixer Grid | Chassis | A1, A2, A3, A4, A5 | I. F. |
| Open | 1650 Kc | | *Test Loop | Test Loop | A6 | Oscillator |
| 1400 Kc | 1400 Kc | | *Test Loop | Test Loop | A6 | Antenna |
| **600 Kc | 600 Kc | | *Test Loop | Test Loop | Check Point | Antenna |

* Connect generator lead to Standard Hazeltine Test Loop, Model 1150, placed two feet from the set loop, or three turns of wire about six inches in diameter, placed about one foot from the set loop. Or the generator can be connected with the high side lead to the AM antenna screw terminal and the ground lead to the chassis.

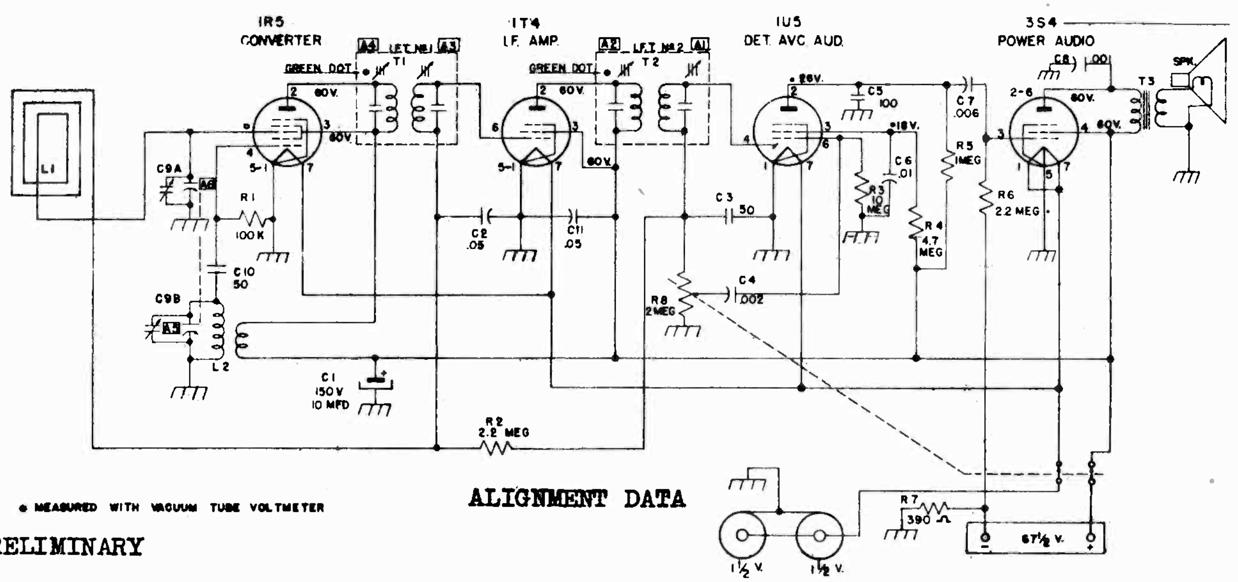
**With a generator signal of 600 Kc, tune the set to the point where maximum output is obtained, which should be approximately 600 Kc on the dial. Adjust antenna section plates of variable for maximum output.

The alignment procedure should be repeated in the original order for greatest accuracy

Always keep the output from the signal generator at its lowest possible value to make the A. V. C. action of the receiver ineffective.



MODEL 210,
Ch. 132.880



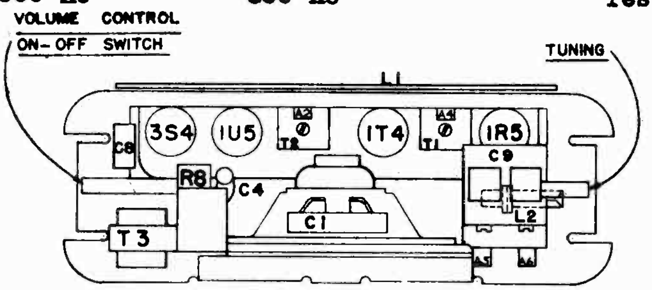

• MEASURED WITH VACUUM TUBE VOLTMETER

## ALIGNMENT DATA

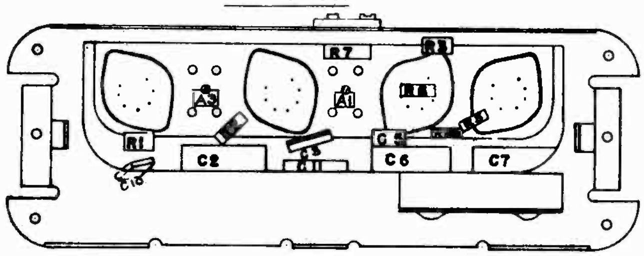
PRELIMINARY

Output meter reading to indicate .05 watt across voice coil . . . . . . . . . 0.4 V
Generator ground lead connected . . . . . . . . . . . . . . . . . . . . to metal chassis
Generator modulation . . . . . . . . . . . . . . . . . . . . . . . . . 30%, 400 cycles
Position of Volume control . . . . . . . . . . . . . . . . . . . . . . . . fully on

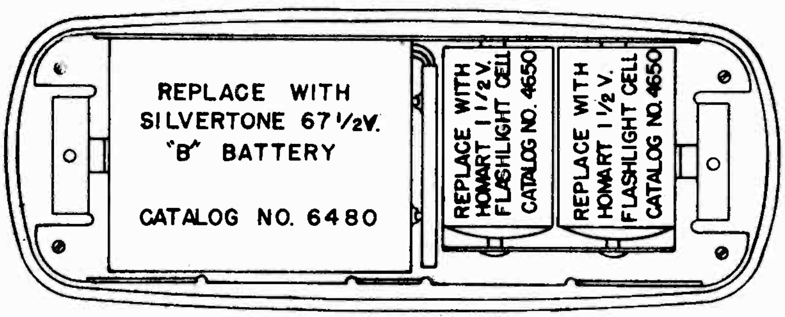
| Position of Variable | Generator Frequency | Dummy Antenna | Generator Connections | Adjust Trimmers (In order shown) | Trimmer Function |
|---|---|---|---|---|---|
| Open | 455 KC | .05 MFD | Mixer Grid | A1, A2, A3, A4 | I.F. |
| Open | 1650 KC | | Test Loop | A5 | Osc. |
| 1400 KC | 1400 KC | | Test Loop | A6 | Ant. |
| 600 KC | 600 KC | | Test Loop | Check Point | |




TUBE LAYOUT




LOCATIONS OF PARTS UNDER CHASSIS




## Specifications

Power Supply - 1½ V. A Battery
67½ V. B Battery

Frequency Range
Broadcast - 540 - 1600 KC
FM

Power Output
Undistorted 65 mw
Maximum 150 mw

Speaker Voice Coil Impedance 3.2 ohms

| Schematic Location | Part No. | Description |
|---|---|---|
| C7 | | Condenser, .006 mfd., 600 volt |
| C8 | | Condenser, .001 mfd., 600 volt |
| C9A,B | N22966 | Condenser, Variable |
| | N23137 | Insulator, Battery Clip |
| | N23181 | Knob, Tuning |
| | N23182 | Knob, On-Off-Volume |
| | N23187 | Leaflet, Instruction |
| R1 | | Resistor, 100,000 ohms, 1/4 watt |
| R2,R6 | | Resistor, 2.2 megohm, 1/4 watt |
| R3 | | Resistor, 10 megohm, 1/4 watt |
| R4 | | Resistor, 4.7 megohm, 1/2 watt |
| R5 | | Resistor, 1 megohm, 1/4 watt |
| R7 | | Resistor, 390 ohm, 1/2 watt |
| R8 | N23138 | Resistor, Volume Control & Switch 2 megohm |
| SPK | N22972 | Speaker, 4" P.M. |
| T1,T2 | N21797-1 | Transformer, I.F. |
| T3 | N23140 | Transformer, Output |
| L1 | N23141 | Antenna Loop Assembly |
| | N23675 | Cabinet Assembly |
| | N23179 | Cabinet, Green Plastic |
| | N23170-1 | Cloth, Grille |
| | N23260 | Handle, Green Plastic |
| | N21842-1 | Cable, "B" Battery & Terminal Strip |
| | N23136 | Clip, "A" Battery |
| | N23139 | Coil, Oscillator Assy. |
| C1 | N21811 | Condenser, Electrolytic, 10 mfd., 150 volt |
| C2,C11 | | Condenser, .05 mfd., 200 volt |
| C3,C10 | | Condenser, .00005 mfd., 500 volt, mica |
| C4 | | Condenser, .002 mfd., 600 volt |
| C5 | | Condenser, .0001 mfd., 500 volt, mica |
| C6 | | Condenser, .01 mfd., 200 volt |

MODEL 220,
Ch. 528.173

## SPECIFICATIONS

**Power Supply:** ................................117 Volts, DC or 50-60 Cycles AC, 11 Watts or Catalog No. 6407 Battery Pack.

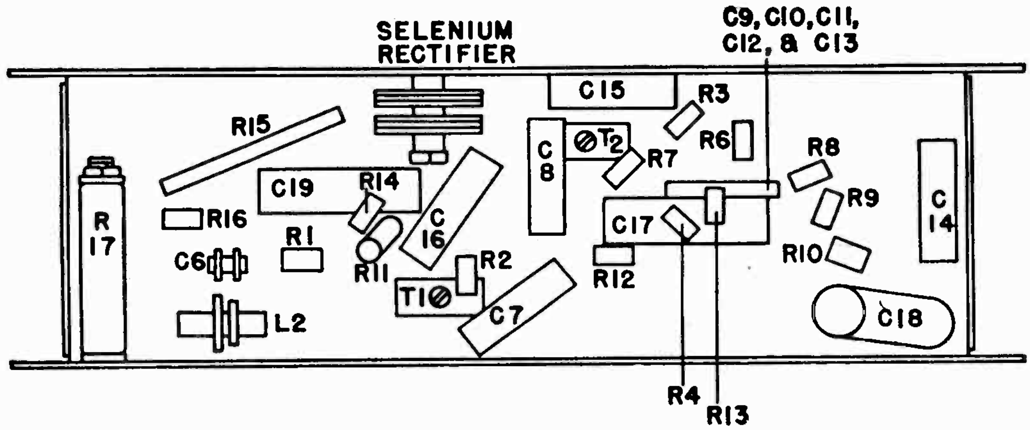
**Power Output:**
Undistorted ........................0.15 Watt
Maximum ........................0.30 Watt

**Frequency Range:**
Broadcast ........................540-1625 KC

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| | | **CHASSIS PARTS** |
| | T72-50 | Bushing, pointer drive |
| | T72-51 | Bushing, tuning shaft |
| | T84-437 | Cable assembly, battery |
| C1, C2 | T19-210 | Capacitor, variable (2 gang) |
| C3, C4, C5 | T18-296 | Capacitor, electrolytic |
| C6 | T15-229 | Capacitor, 47 mmfd., ceramic |
| C7, C14 | T16-153 | Capacitor, .005 mfd., 600 v. |
| C8, C15 | T16-152 | Capacitor, .05 mfd. 200 v. |
| C9, C10, C11, C12, C13 | T17-103 | Capacitor, ceramic unit |
| C16 | T16-156 | Capacitor, .01 mfd. 400 v. |
| C17 | T16-157 | Capacitor, .1 mfd. 200 v. |
| C18, C19 | T16-197 | Capaictor, .05 mfd. 400 v. |
| | T83-421 | Clip, I.F. transformer mounting |
| L2 | T10-554 | Coil, oscillator |
| R5, S1 | T24-188 | Control, volume and switch |
| | T23-162 | Cord, power, AC/DC |
| | T21-158 | Cover, bottom |
| | T47-108 | Grammet, variable condenser |
| | T76-13 | Insulator, electrolytic |
| L1 | T82-67 | Loop, antenna |
| | T58-80 | Pointer |
| | T31-160 | Plate, dial backing |
| | T83-642 | Rectifier, selenium |
| R1 | T60-727 | Resistor, 100,000 ohm, ½ w. |
| R2, R6 | T60-728 | Resistor, 10 meg., ½ w. |
| R3, R8 | T60-726 | Resistor, 2.2 meg., ½ w. |
| R4 | T60-730 | Resistor, 47,000 ohm, ½ w. |
| R7 | T60-669 | Resistor, 4.7 meg., ½ w. |
| R9 | T60-770 | Resistor, 470 ohm, ½ w. 10% |
| R10 | T60-708 | Resistor, 680 ohm, ½ w. 10% |
| R11 | T60-760 | Resistor, 10,000 ohm, ½ w. 10% |
| R12 | T60-753 | Resistor, 220 ohm, ½ w. 10% |
| R13 | T60-668 | Resistor, 1 meg., ½ w. |
| R14 | T60-756 | Resistor, 1200 ohm, ½ w., 10% |
| R15 | T60-725 | Resistor, 160 ohm, 3 w. 5% |
| R16 | T60-675 | Resistor, 1000 ohm, ½ w. |
| R17 | T60-757 | Resistor, 2000 ohm, 10 w. 5% |
| | T83-661 | Retainer, tube shield |
| | T75-81 | Shaft, pointer drive |
| | T75-82 | Shaft, condenser drive |
| | T71-42 | Shield, tube |
| | T68-39 | Socket, miniature wafer |
| | T77-151 | Spacer, variable condenser |
| | T70-103 | Spring, pointer drive |
| | T70-135 | Spring, condenser drive |
| | T79-381 | Speaker, 4" x 6" P.M. |
| S2 | T69-186 | Switch, Batt./AC/DC |
| T1, T2 | T10-508 | Transformer, I.F. |
| T3 | T80-245 | Transformer, output |
| | T86-51 | Washer, "C", pointer shaft |
| | T86-112 | Washer, "C", tuning shaft |
| | T86-136 | Washer, compression, tuning shaft |

### CABINET PARTS

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| | T42-467 | Cabinet (front case only, less escutcheon and hardware) |
| | T22-155 | Clip (cabinet) |
| | T64-9 | Clip (back cover) |
| | T42-467 | Cover, back (less hardware) |
| | T53-3 | Cover, handle |
| | T49-4 | End caps, handle |
| | T40-160 | Escutcheon |
| | T52-308 | Knob |
| | T97-112 | Screw, self-tapping |
| | T70-163 | Spring, hinge |
| | T53-2 | Strap, handle |




LOCATION OF PARTS UNDER CHASSIS

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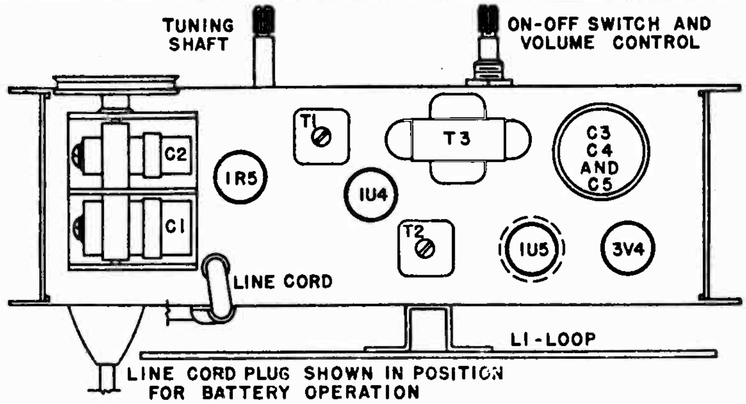
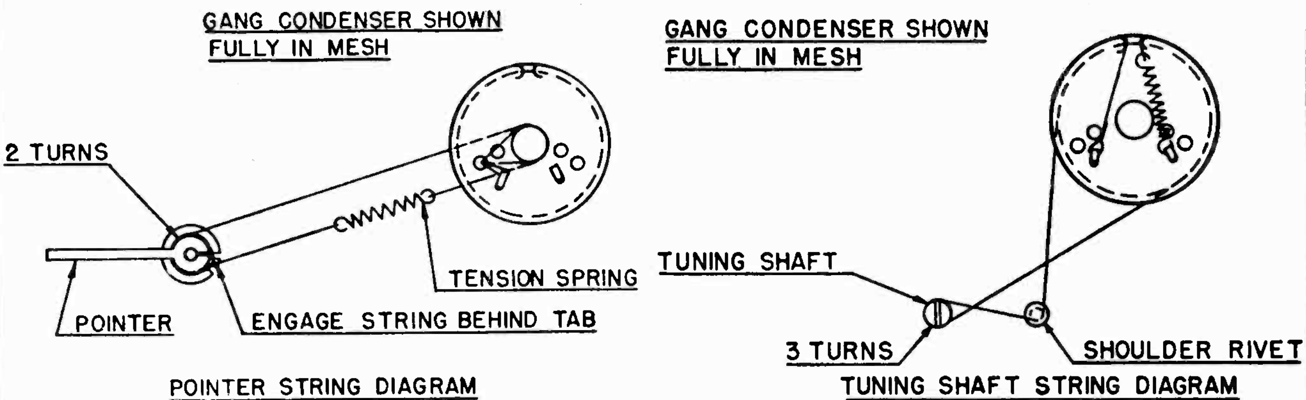



LOCATION OF PARTS ON TOP OF CHASSIS




STRING AND POINTER HOOKUP

## ALIGNMENT PROCEDURE

Output meter reading to indicate 0.05 watt across voice coil .................................. 0.4 v.
Generator ground lead connected.................................To B- through 0.1 mfd. capacitor
Generator modulation ............................................................30%, 400 cycles
Position of volume control.....................................................................Fully on
Position of pointer with tuner fully closed........................Pointer should be horizontal, pointing to left (9 o'clock).

| Position of Tuner | Generator Freq. | Dummy Antenna | Generator Connection | Adjustments (in order shown) | Function | Max. Microvolts Input to produce .05 w. output |
|---|---|---|---|---|---|---|
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1U4 I-F Amp. | T2 (top and bottom) | I.F. | 5000 |
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1R5 Conv. | T1 (top and bottom) | I.F. | 250 |
| Min. Cap. | 1625 kc | 0.1 mfd. | Stator ant. tuner | C2 | Osc. | |
| 1400 kc | 1400 kc | | Hazeltine Test Loop | C1 | Loop | 100 |

**ALIGNMENT NOTES:**

1. It is recommended that this set be connected to an isolation transformer when aligning on AC.
2. The alignment must be done in the order given above.
3. While making the above adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

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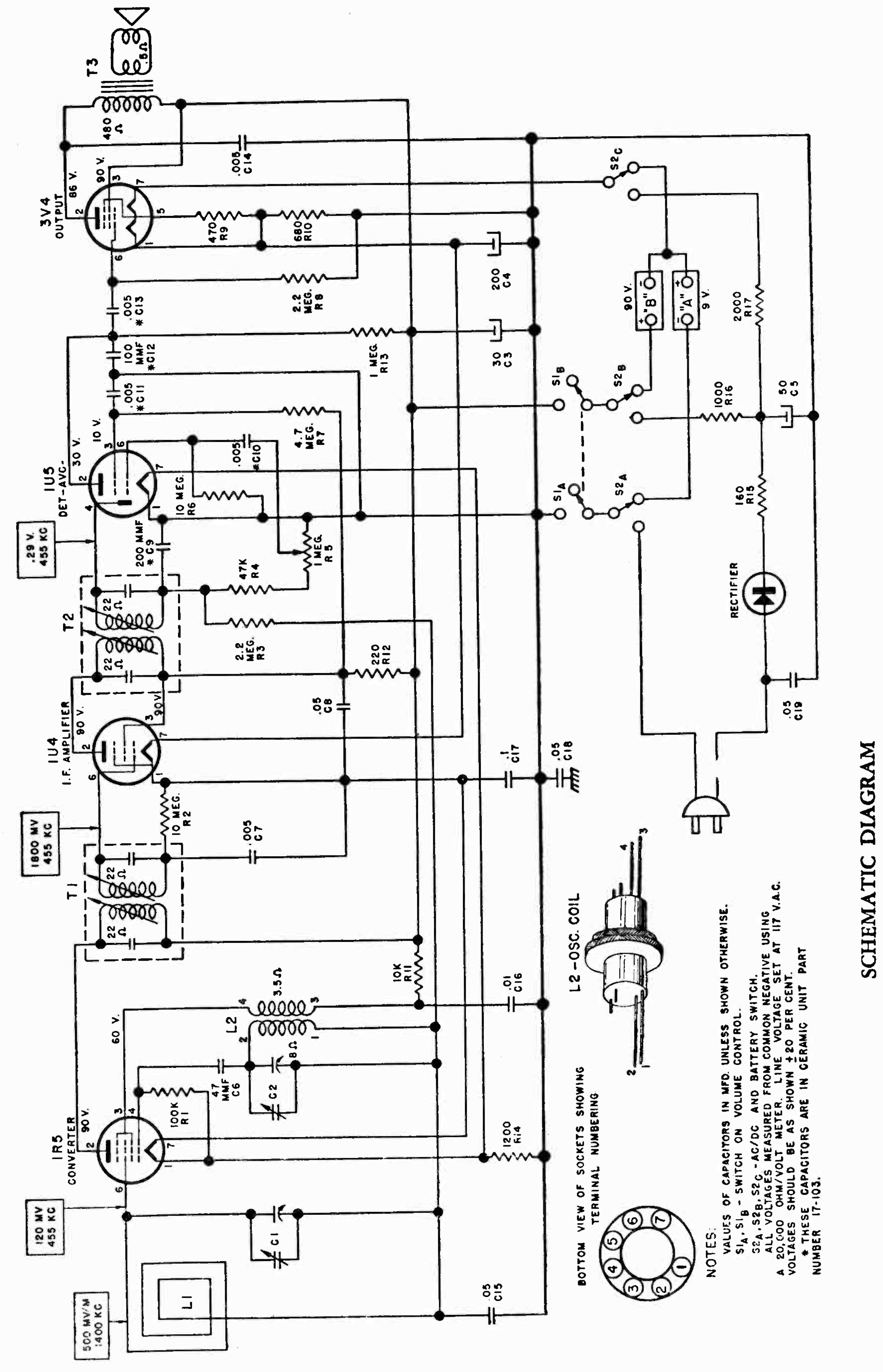


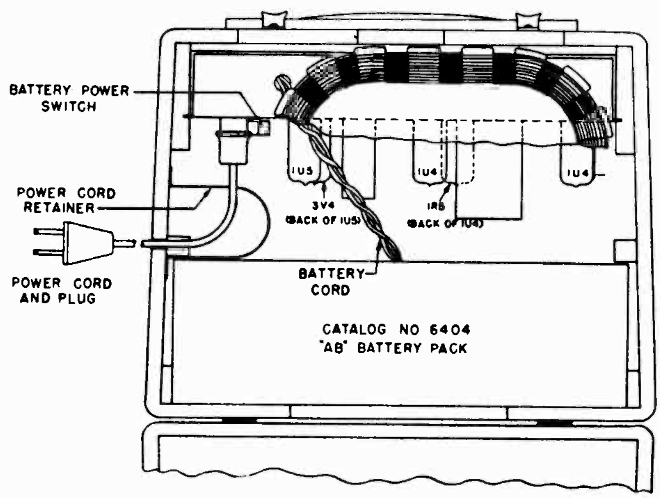
# PARTS LIST

## CHASSIS

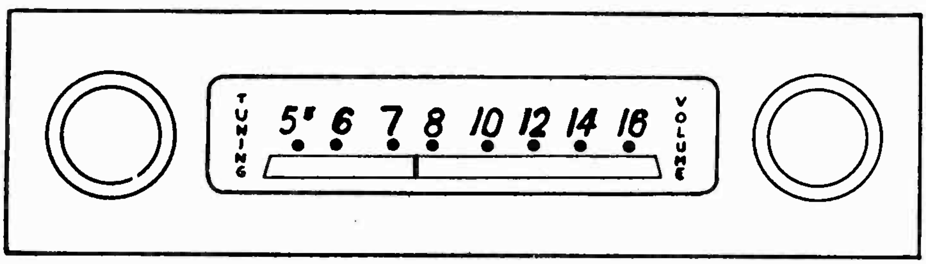
| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | T84-391 | Cable, assembly, battery |
| | T83-421 | Clip, I.F. transformer mounting |
| C1, C2, C3 | T18-296 | Capacitor, electrolytic |
| C4, C5, C6 | T19-208 | Capacitor, variable (3 gang) |
| C8, C11 | T16-153 | Capacitor, .005 mfd. 600 v. |
| C9, C10, C20, C21, C22 | T17-103 | Capacitor, ceramic unit |
| C12, C17 | T16-152 | Capacitor, .05 mfd. 200 v. |
| C13 | T15-186 | Capacitor, 10 mmfd. mica |
| C14 | T16-150 | Capacitor, .02 mfd. 400 v. |
| C15, C16 | T16-157 | Capacitor, .1 mfd. 200 v. |
| C18, C19 | T16-179 | Capacitor, .05 mfd. 400 v. |
| L3 | T10-553 | Coil, oscillator |
| R11, S1 | T24-186 | Control, volume, with switch |
| | T84-77 | Cord, power, AC/DC |
| | T51-105 | Cord, pointer travel, 29" |
| | T47-108 | Grommet, variable condenser |
| | T76-13 | Insulator, electrolytic |
| | T52-196 | Knob, AC/DC/Battery switch |
| L1 | T82-66 | Loop, antenna |
| | T45-121 | Plug, AC/DC |
| | T58-78 | Pointer |
| | T39-265 | Pulley, dial cord |
| | T83-642 | Rectifier, selenium |
| R1 | T60-744 | Resistor, 22,000 ohm, ½ w. 10% |
| R2, R17 | T60-669 | Resistor, 4.7 meg., ½ w. |
| R3, R5 | T60-728 | Resistor, 10 meg., ½ w. |
| R4 | T60-730 | Resistor, 47,000 ohm, ½ w. |
| R6 | T60-704 | Resistor, 330 ohm, ½ w. 10% |
| R7 | T60-727 | Resistor, 100,000 ohm, ½ w. |
| R8 | T60-676 | Resistor, 30,000 ohm, ½ w. |
| R9 | T60-770 | Resistor, 470 ohm, ½ w. 10% |
| R10, R19 | T60-726 | Resistor, 2.2 meg., ½ w. |
| R12, R15 | T60-729 | Resistor, 1500 ohm, ½ w. 10% |
| R13 | T60-708 | Resistor, 680 ohm, ½ w. 10% |
| R14 | T60-796 | Resistor, 110 ohm, 3 w. 10% |
| R16 | T60-757 | Resistor, 2000 ohm, 10 w. 5% |
| R18 | T60-668 | Resistor, 1 meg., ½ w. |
| | T75-69 | Shaft, tuning |
| | T68-39 | Socket, miniature, wafer |
| | T79-380 | Speaker, 5" P.M. |
| | T70-122 | Spring, dial cord |
| S2 | T69-173 | Switch, AC/DC/Battery |
| T1, T2 | T10-508 | Transformer, 1st and 2nd I.F. |
| T3 | T80-228 | Transformer, output |
| L2 | T10-535 | Transformer, R.F. |
| | T86-51 | Washer, "C", tuning shaft |
| | T86-80 | Washer, compression, tuning shaft |

## CABINET

| PART NUMBER | DESCRIPTION |
|---|---|
| T44-12 | Baffle |
| T42-466 | Cabinet |
| T67-549 | Dial scale |
| T40-158 | Escutcheon |
| T98-14 | Grille cloth |
| T52-306 | Knob |




# OPERATION



MODEL 225,
Ch. 528.171

# ALIGNMENT PROCEDURE

Output meter reading to indicate 0.05 watt across voice coil .................................... 0.4 v.

Generator ground lead connected.................................. To B- through 0.1 mfd. capacitor

Generator modulation ............................................................ 30%, 400 cycles

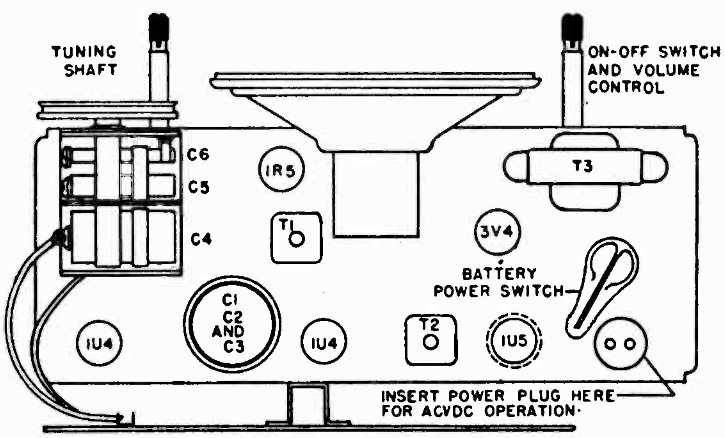
Position of volume control.......................................................... Fully on

Position of pointer with tuner fully closed........................ Center of pointer lined up with extreme right dot on dial backing plate. (Chassis right side up.)

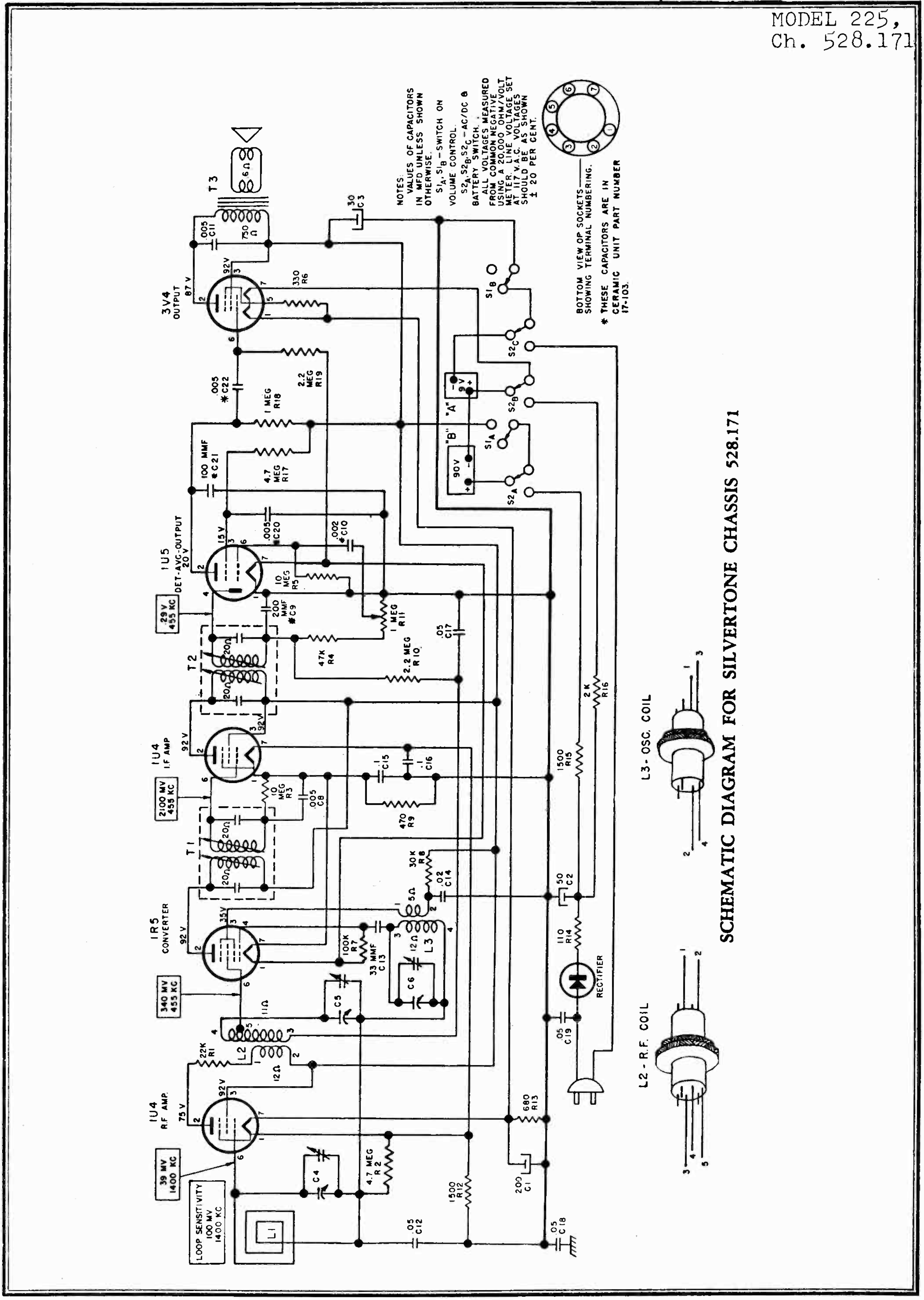
| Position of Tuner | Generator Freq. | Dummy Antenna | Generator Connection | Adjustments (in order shown) | Function | Max. Microvolts Input to produce .05 w. output |
|---|---|---|---|---|---|---|
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1U4 I-F Amp. | T2 (top and bottom) | I.F. | 5000 |
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1R5 Conv. | T1 (top and bottom) | I.F. | 250 |
| Min. Cap. | 1610 kc | 0.1 mfd. | Stator ant. tuner | C6 | Osc. | |
| 1400 kc | 1400 kc | 0.1 mfd. | Stator ant. tuner | C5 | R.F. | 30 |
| 1400 kc | 1400 kc | | Hazeltine Test Loop | C4 | Loop | 100 |

**ALIGNMENT NOTES:**

1. It is recommended that this set be connected to an isolation transformer when aligning on AC.
2. The alignment must be done in the order given above.
3. While making the above adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.



MODEL 225,
Ch. 528.171




SCHEMATIC DIAGRAM FOR SILVERTONE CHASSIS 528.171

MODEL 225,
Ch. 528.171-1

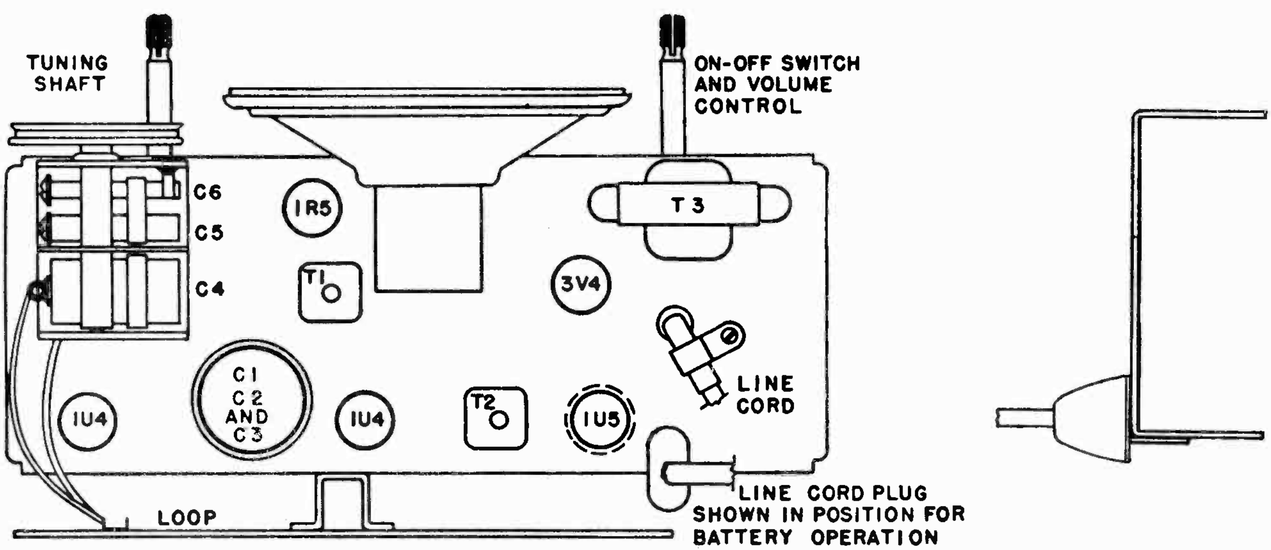
# ALIGNMENT PROCEDURE

Output meter reading to indicate 0.05 watt across voice coil ........ 0.4 v.
Generator ground lead connected ........ To B- through 0.1 mfd. capacitor
Generator modulation ........ 30%, 400 cycles
Position of volume control ........ Fully on
Position of pointer with tuner fully closed ........ Center of pointer lined up with extreme right dot on dial backing plate. (Chassis right side up.)

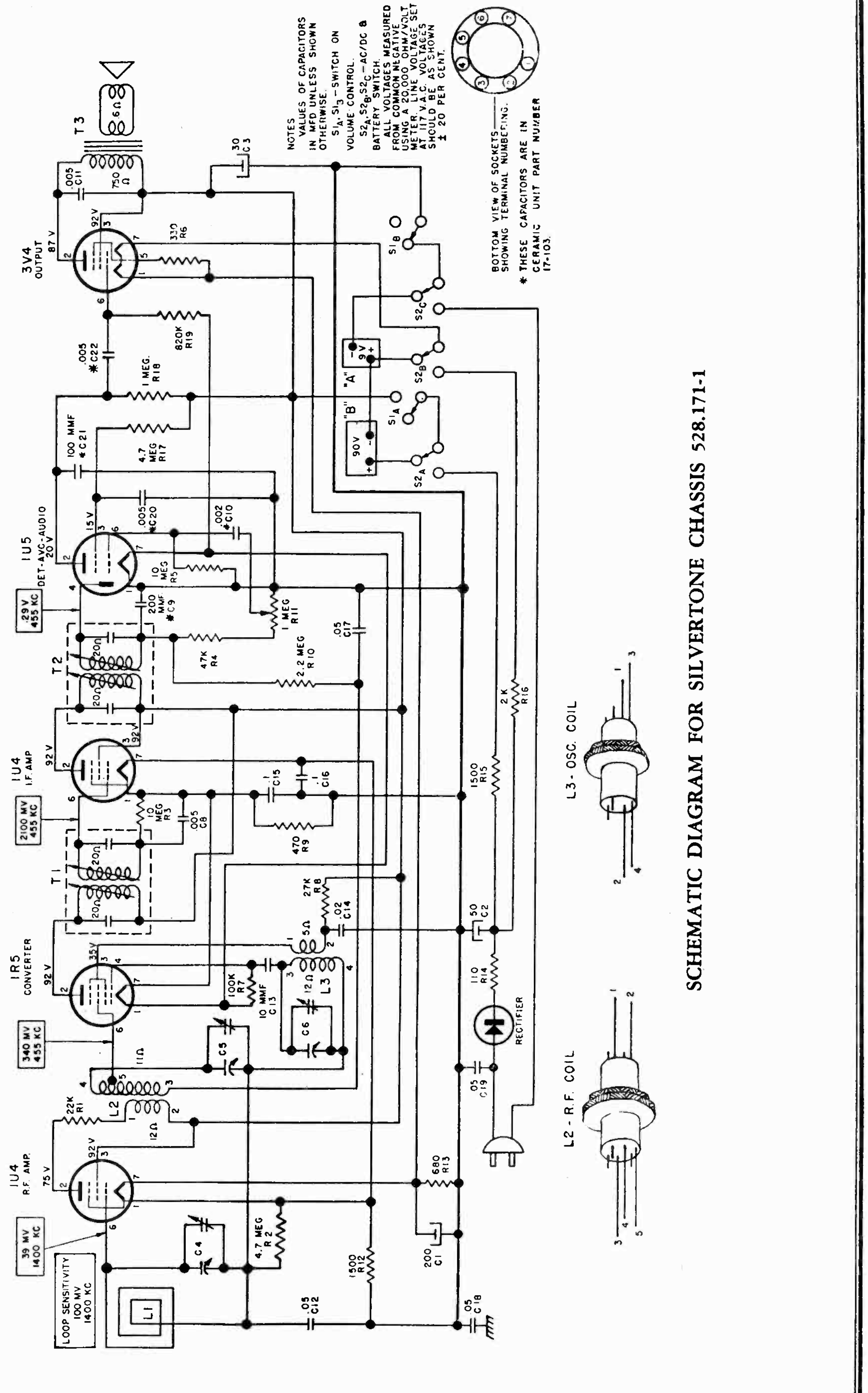
| Position of Tuner | Generator Freq. | Dummy Antenna | Generator Connection | Adjustments (in order shown) | Function | Max. Microvolts Input to produce .05 w. output |
|---|---|---|---|---|---|---|
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1U4 I-F Amp. | T2 (top and bottom) | I.F. | 5000 |
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1R5 Conv. | T1 (top and bottom) | I.F. | 250 |
| Min. Cap. | 1625 kc | 0.1 mfd. | Stator ant. tuner | C6 | Osc. | |
| 1400 kc | 1400 kc | 0.1 mfd. | Stator ant. tuner | C5 | R.F. | 30 |
| 1400 kc | 1400 kc | | Hazeltine Test Loop | C4 | Loop | 100 |

**ALIGNMENT NOTES:**

1. It is recommended that this set be connected to an isolation transformer when aligning on AC.
2. The alignment must be done in the order given above.
3. While making the above adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.



MODEL 225,
Ch. 528.171-1



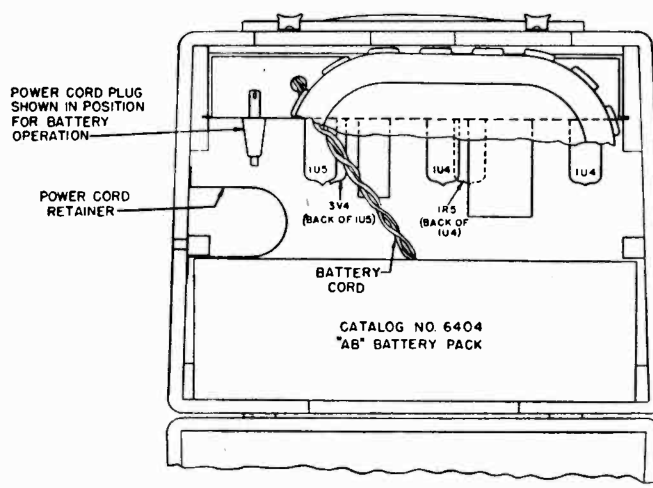

SCHEMATIC DIAGRAM FOR SILVERTONE CHASSIS 528.171-1

MODEL 225,
Ch. 528.171-1

# PARTS LIST

## CHASSIS

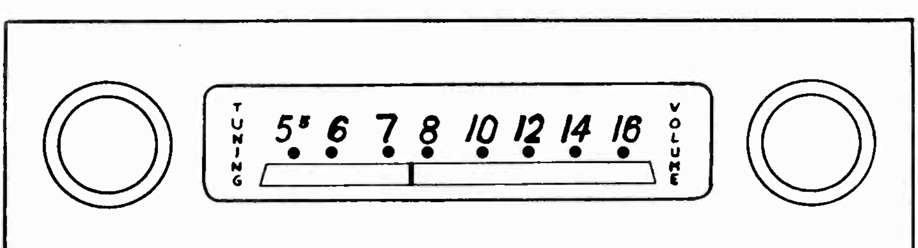
| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | T84-391 | Cable, assembly, battery |
| | T83-421 | Clip, I.F. transformer mounting |
| C1, C2, C3 | T18-296 | Capacitor, electrolytic |
| C4, C5, C6 | T19-208 | Capacitor, variable (3 gang) |
| C8, C11 | T16-153 | Capacitor, .005 mfd. 600 v. |
| C9, C10, C20, C21, C22 | T17-103 | Capacitor, ceramic unit |
| C12, C17 | T16-152 | Capacitor, .05 mfd. 200 v. |
| C13 | T15-186 | Capacitor, 10 mmfd. mica |
| C14 | T16-150 | Capacitor, .02 mfd. 400 v. |
| C15, C16 | T16-157 | Capacitor, .1 mfd. 200 v. |
| C18, C19 | T16-179 | Capacitor, .05 mfd. 400 v. |
| L3 | T10-553 | Coil, oscillator |
| R11, S1 | T24-186 | Control, volume, with switch |
| | T23-151 | Cord, power, AC/DC |
| | T51-105 | Cord, pointer travel, 29" |
| | T47-108 | Grommet, variable condenser |
| | T76-13 | Insulator, electrolytic |
| L1 | T82-66 | Loop, antenna |
| | T58-78 | Pointer |
| | T39-265 | Pulley, dial cord |
| | T83-642 | Rectifier, selenium |
| R1 | T60-744 | Resistor, 22,000 ohm, ½ w. 10% |
| R2, R17 | T60-669 | Resistor, 4.7 meg., ½ w. |
| R3, R5 | T60-728 | Resistor, 10 meg., ½ w. |
| R4 | T60-730 | Resistor, 47,000 ohm, ½ w. |
| R6 | T60-704 | Resistor, 330 ohm, ½ w. 10% |
| R7 | T60-727 | Resistor, 100,000 ohm, ½ w. |
| R8 | T60-745 | Resistor, 27,000 ohm, ½ w. |
| R9 | T60-770 | Resistor, 470 ohm, ½ w. 10% |
| R10 | T60-726 | Resistor, 2.2 meg., ½ w. |
| R12, R15 | T60-729 | Resistor, 1500 ohm, ½ w. 10% |
| R13 | T60-708 | Resistor, 680 ohm, ½ w. 10% |
| R14 | T60-796 | Resistor, 110 ohm, 3 w. 10% |
| R16 | T60-757 | Resistor, 2000 ohm, 10 w. 5% |
| R18 | T60-668 | Resistor, 1 meg., ½ w. |
| R19 | T60-799 | Resistor, 820,000 ohm, ½ w. |
| | T75-69 | Shaft, tuning |
| | T68-39 | Socket, miniature, wafer |
| | T79-380 | Speaker, 5" P.M. |
| | T70-122 | Spring, dial cord |
| S2 | T69-186 | Switch, AC/DC/Battery |
| T1, T2 | T10-508 | Transformer, 1st and 2nd I.F. |
| T3 | T80-228 | Transformer, output |
| L2 | T10-535 | Transformer, R.F. |
| | T86-51 | Washer, "C", tuning shaft |
| | T86-80 | Washer, compression, tuning shaft |




## CABINET

| PART NUMBER | DESCRIPTION |
|---|---|
| T44-12 | Baffle |
| T42-466 | Cabinet |
| T67-549 | Dial scale |
| T40-158 | Escutcheon |
| T98-14 | Grille cloth |
| T52-306 | Knob |

# OPERATION



MODEL 6293,
Ch. 528.6293

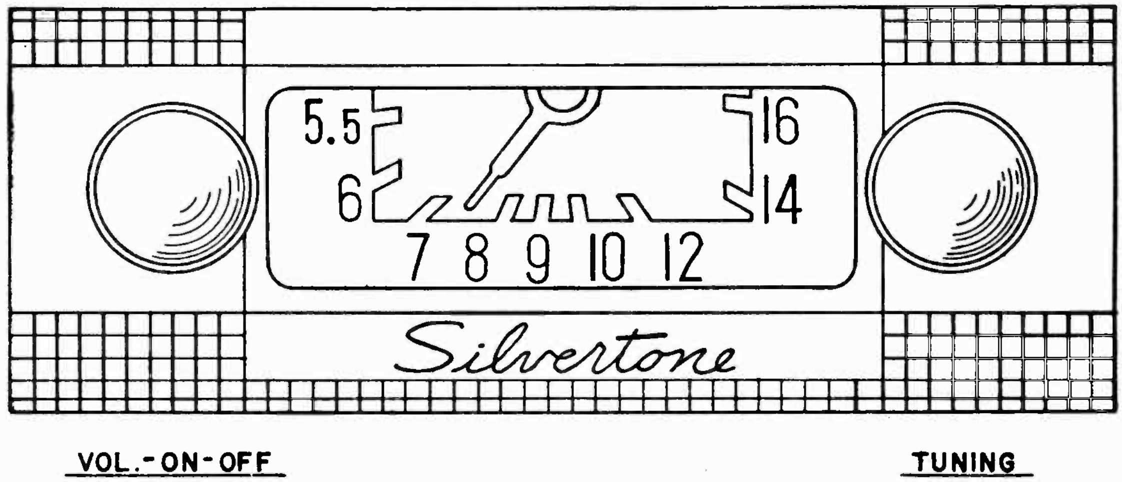



*Fig. 1. Front View*

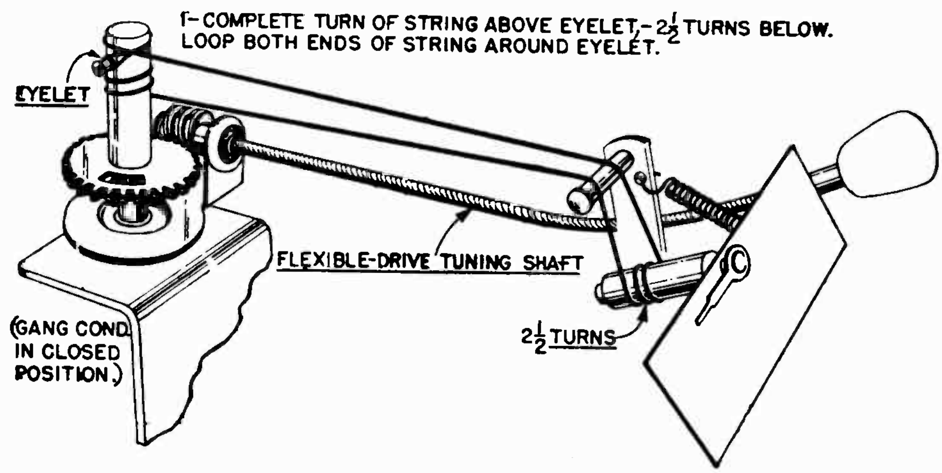
## DESCRIPTION

Your new automobile receiver is a 5-tube (plus rectifier) superheterodyne, designed to operate from the 6 volt storage battery in your car. It is a universal type of receiver for mounting underneath the dash panel. It has a self-contained PM speaker, and covers the frequency range 540 to 1600 K.C. Two simple controls are provided for operating the receiver. (see fig. 1).

Special care has been taken in the design of this receiver to insure the finest in sensitivity and selectivity, there-by insuring good reception of even distant or weak stations. The unit is simple to install, the antenna input circuit adjustable to permit the use of any two or three section whip or "fish pole" antenna.

## OPERATION

To turn the receiver on, rotate the volume control and switch knob (left hand knob) to the right about half its range. After allowing about 30 seconds for the tubes to warm up, the desired station may be tuned by rotating the tuning control (right hand knob) to the desired frequency. The dial scale is calibrated in kilocycles minus the final two zeros. After the station has been properly tuned, the volume may be adjusted by means of the volume control knob. To increase the volume, turn the control to the right; to decrease the volume, turn it to the left. Turning this control to the left as far as it will go, turns the radio off.




DIAL POINTER DRIVE & STRINGING DIAGRAM

*Fig. 2.*

MODEL 6293,
Ch. 528.6293

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, ammeter condenser and generator condenser. By referring to Figures 1, 3 and 9, and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 5/8″ holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided, and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed by bending to the correct angles, as illustrated in Figure 3, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8″ drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4″ bolt, lock washer and nut furnished with the receiver.

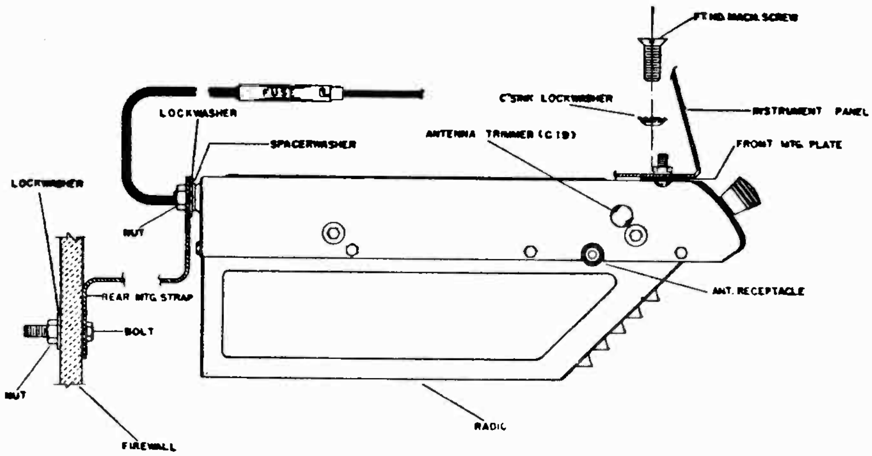



*Fig. 3. Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the antenna receptacle provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1400 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 3) and adjust the trimmer for maximum volume by turning the screw to the left or right with a small screw driver.

# ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S-84-192, and the Suppression and Misc. Parts Kit, part No. S84-232, as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-147.

## S84-192 MOUNTING PARTS KIT

- 1 1/4″ Bolt
- 2 1/4″ Lock Washers
- 2 1/4″ Hexagon Nuts
- 2 10-32 x 5/8″ Screws
- 2 10-32 x 3/8″ Screws
- 2 External Tooth Lock Washers
- 2 Internal Tooth Lock Washers
- 2 10-32 Hexagon Nuts
- 1 Washer-Spacer

## S84-232 SUPPRESSION KIT & MISC. PARTS

- 1 S84-233 "A" lead assem.
- 1 A43-10 Fuse
- 1 A81-13 Sleeve (for fuse)
- 1 S84-193 Suppression Kit consisting of:
  - 2 .5 MFD Condensers
  - 1 Distributor Suppressor
  - 20″ Wire Braid

# ELIMINATING MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise.

## GENERATOR CONDENSER

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.

## AMMETER CONDENSER

A .5 MFD bypass condenser is furnished for attaching to the ammeter. This should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby. In most cases the use of this condenser, the distributor suppressor, and the generator condenser, will eliminate all objectionable ignition interference.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION LEADS

In many cases 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## BONDING OF FIRE WALL RODS AND TUBES

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

MODEL 6293,
Ch. 528.6293

## ELECTRICAL SPECIFICATIONS

Power Supply............................6.3 volts DC
Current ..............................6.2 amp. average
Frequency Range.....................540 to 1600 KC
I. F. Frequency............................455 KC
Speaker.................................4" P. M.
Power Output...................1.75 watts, undistorted
3 watts, maximum
Sensitivity..........1 microvolt average for 1 watt output
Selectivity...40 KC broad at 1000 times signal, at 1000 KC

The tube compliment of this receiver is as follows:

1—6SK7GT—R. F. Amplifier.

1—6SA7GT—Converter.

1—6SK7GT—I.F. Amplifier.

1—6SQ7—Detector—AVC—1st audio.

1—6V6GT—Power output.

1—6X5GT—Rectifier.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the schematic diagram (Fig. 7).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

**CAUTION:** Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.

BOTTOM VIEW OF CHASSIS

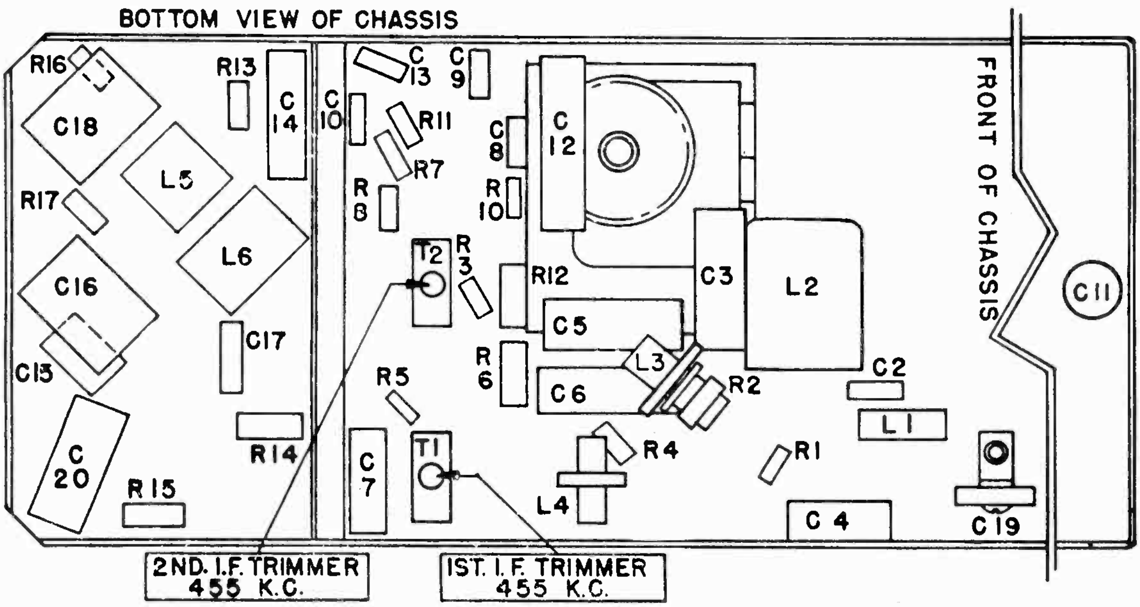



*Fig. 4. Bottom View*

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (0.04 volt for 0.05 watt output.)

Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| Dial Setting | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1C | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C1B | Maximum | R.F. |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C19 | Maximum | Antenna |

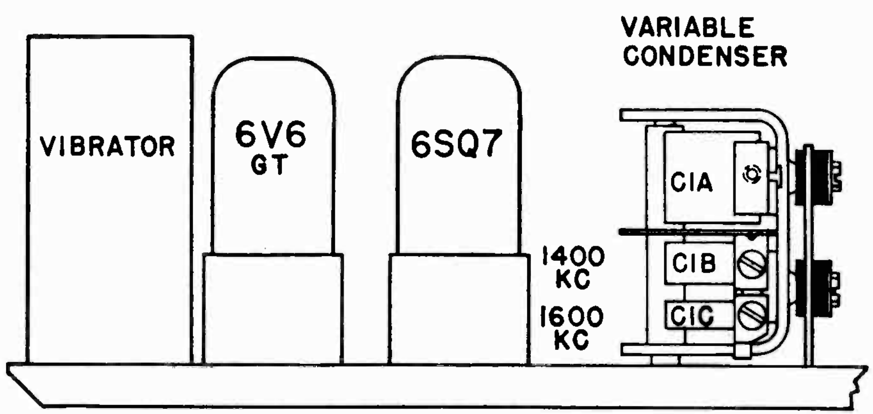



Fig. 5. Trimmer Locations

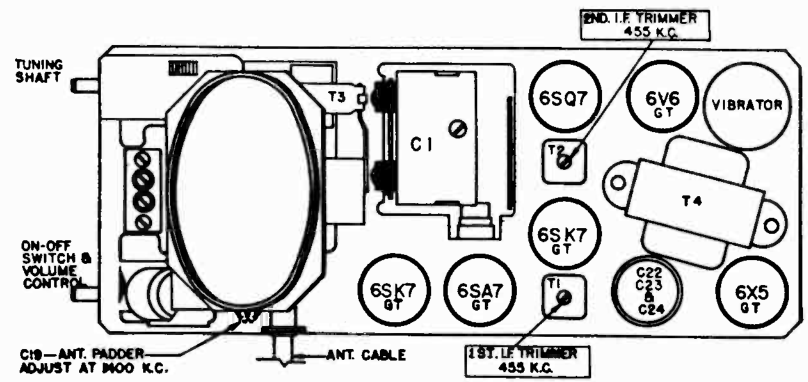



Fig. 6. Tube and Trimmer Locations

MODEL 6293,
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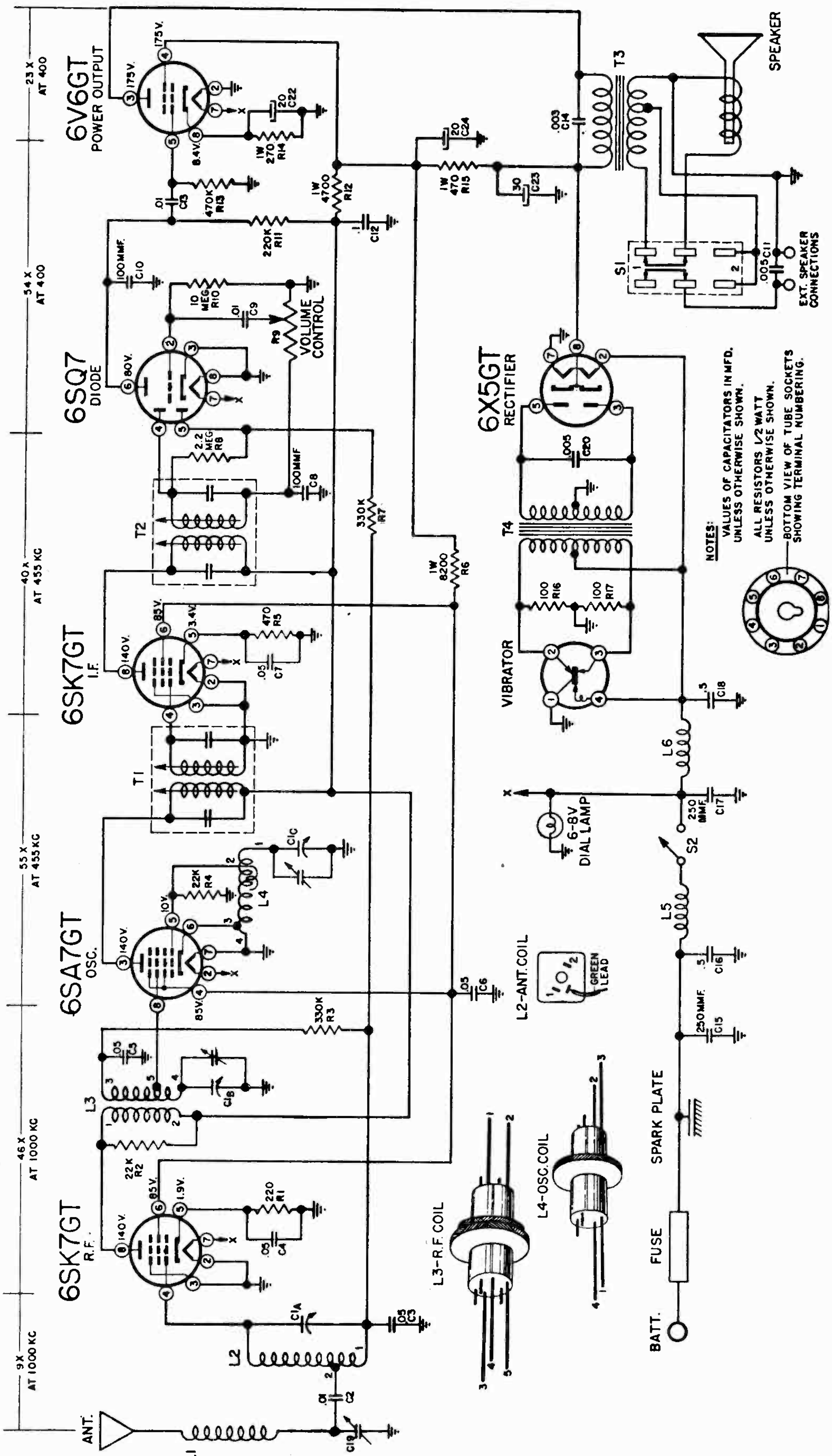


*Fig. 7. Schematic Diagram*

# INSTRUCTIONS FOR INSTALLATION OF REAR SEAT SPEAKER

Your Silvertone Auto Radio, Chassis Number 528.6293 includes a special feature which makes it simple and easy to install an additional speaker in the rear of the car. A speaker with the proper voice coil impedance (3.2 ohms) for such an installation is available at the Sears store where you bought your Silvertone Auto Radio.

The terminal strip in the illustration below is accessible through an opening in the case. The two wire leads from the rear seat speaker should be connected to these terminals. This completes the electrical installation of the speaker. The switch at the right is for operation of the rear seat speaker. In position 1, only the speaker in the case is connected; in position 2, both speakers are connected.

IMPORTANT: When there is no rear seat speaker installation, ALWAYS keep the switch in position 1.

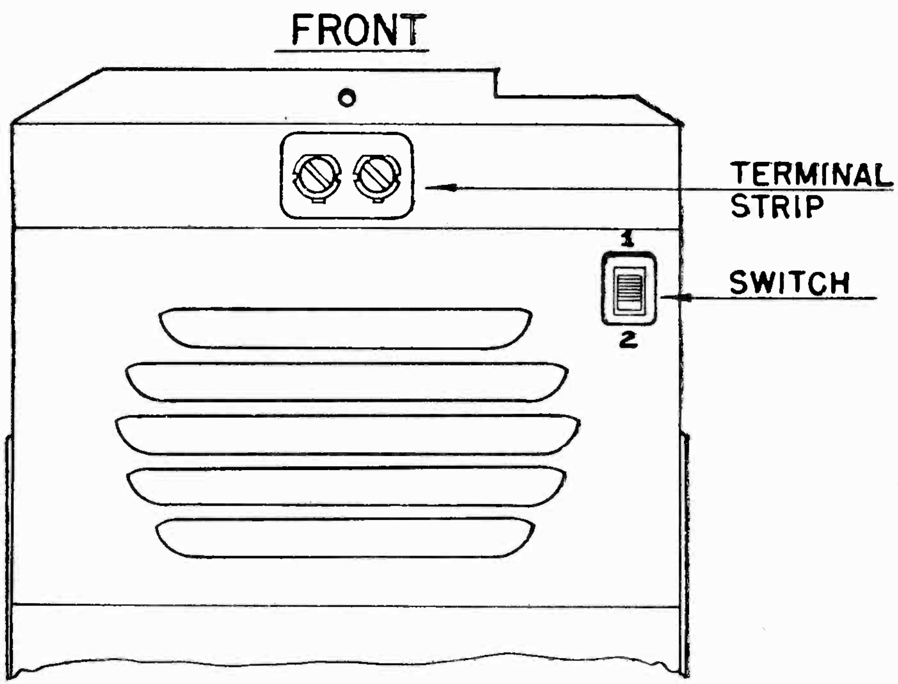


*Fig. 8. Bottom View of Case*

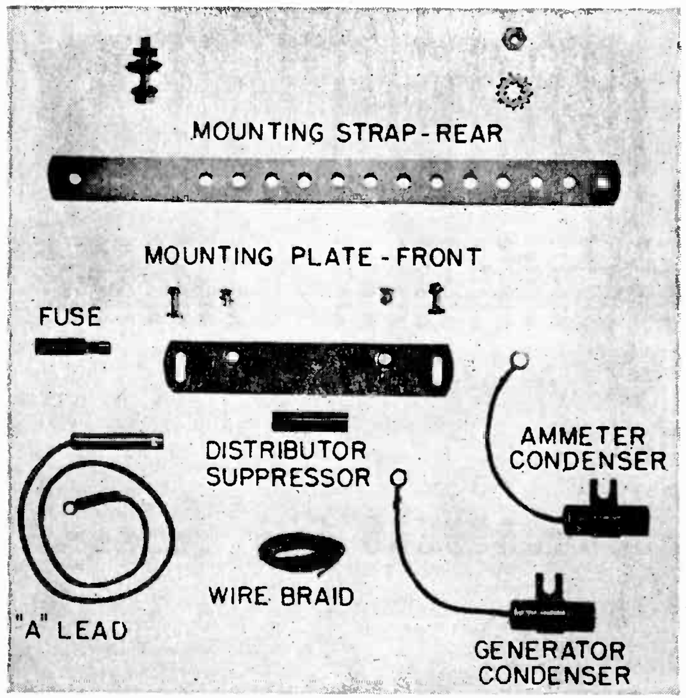


*Fig. 9. Mounting Parts*

MODEL 6293,
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# REPAIR PARTS LIST

| Schematic Location | Part No. | Description |
|---|---|---|
| C1A, C1B, C1C | B19-203 | Capacitor—variable, worm drive |
| C2, C9, C13 | A16-201 | Capacitor—.01 mfd.—600 v. |
| C3, C5, C6 | A16-189 | Capacitor—.05 mfd.—400 v. |
| C4, C7 | A16-197 | Capacitor—.05 mfd.—200 v. |
| C8, C10 | A15-196 | Capacitor—mica—100 mmfd. |
| C11 | A16-177 | Capacitor—ceramic—.005 mfd. |
| C12 | A16-187 | Capacitor—.1 mfd.—400 v. |
| C14 | A16-200 | Capacitor—.003 mfd.—600 v. |
| C15, C17 | A15-176 | Capacitor—mica—250 mmfd. |
| C16 | A16-184 | Capacitor—.5 mfd.—100 v. |
| C18 | A16-202 | Capacitor—.5 mfd.—100 v. |
| C19 | A20-145 | Capacitor—ceramic—antenna trimmer |
| C20 | A16-185 | Capacitor—.005 mfd.—1600 v. |
| | A18-289 | Capacitor—electrolytic |
| C22 | | 20 mfd.—25 v. |
| C23 | | 30 mfd.—350 v. |
| C24 | | 20 mfd.—350 v. |
| | A83-421 | Clip—I.F. transformer mounting |
| L1 | A10-527 | Coil—Antenna loading |
| L2 | B10-525 | Coil—Antenna |
| L3 | B10-528 | Coil—R. F. |
| L4 | B10-526 | Coil—Oscillator |
| L5 | A33-229 | Coil—"A" line choke |
| L6 | A33-234 | Coil—Vibrator hash choke |
| R9, S2 | A24-177 | Control—ON-OFF and VOLUME |
| | A51-105 | Cord—Pointer travel, 17" |
| | B67-541 | Dial—Station |
| | A47-112 | Grommet—Speaker and variable capacitor mounting |
| | A47-114 | Grommet—Fibre—Flexible shaft bearing |
| | S84-233 | Kit—"A" lead assembly |
| | S84-192 | Kit—Mounting parts |
| | S84-193 | Kit—Suppression, assembly |
| | A52-293 | Knob—Volume and tuning |
| | A89-10 | Lamp—Dial—G. E. No. 422 |
| | A31-147 | Plate—Mounting, front |
| | A58-76 | Pointer—Dial |
| | A87-38 | Receptacle—Antenna cable |
| R1 | A60-753 | Resistor—220 ohm—½ w. |
| R2, R4 | A60-744 | Resistor—22,000 ohm—½ w. |
| R3, R7 | A60-661 | Resistor—330,000 ohm—½ w. |
| R5 | A60-722 | Resistor—470 ohm—½ w. |
| R6 | A60-766 | Resistor—8200 ohm—1 w. |
| R8 | A60-726 | Resistor—2.2 megohm—½ w. |
| R10 | A60-728 | Resistor—10 megohm—½ w. |
| R11 | A60-667 | Resistor—220,000 ohm—½ w. |
| R12 | A60-765 | Resistor—4700 ohm—1 w. |
| R13 | A60-731 | Resistor—470,000 ohm—½ w. |
| R14 | A60-754 | Resistor—270 ohm—1 w. |
| R15 | A60-694 | Resistor—470 ohm—½ w. |
| R16, R17 | A60-752 | Resistor—100 ohm—½ w. |
| | B75-72 | Shaft—Tuning drive—flexible |
| | B79-373 | Speaker—4" P.M. |
| | B31-134 | Strap—Mounting, rear |
| S1 | A69-185 | Switch—Rear seat speaker |
| T1 | A10-521 | Transformer—I.F. No. 1 |
| T2 | A10-529 | Transformer—I.F. No. 2 |
| T3 | B80-249 | Transformer—Output (part of speaker) |
| T4 | B80-243 | Transformer—Power |
| | A34-105 | Vibrator—Mallory No. 659 |

IMPORTANT: All tubular condensers must be high temperature (85°C.) wax type.

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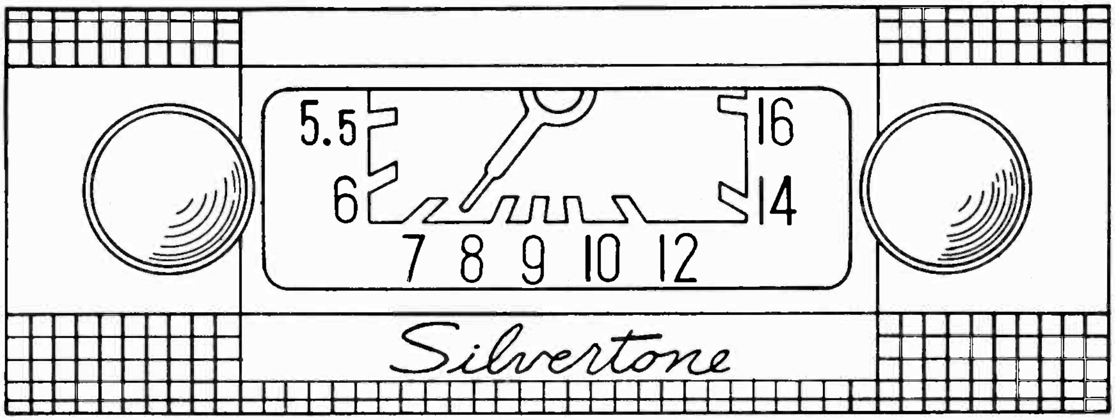


VOL.-ON-OFF

TUNING

*Fig. 1 Front View*

## DESCRIPTION

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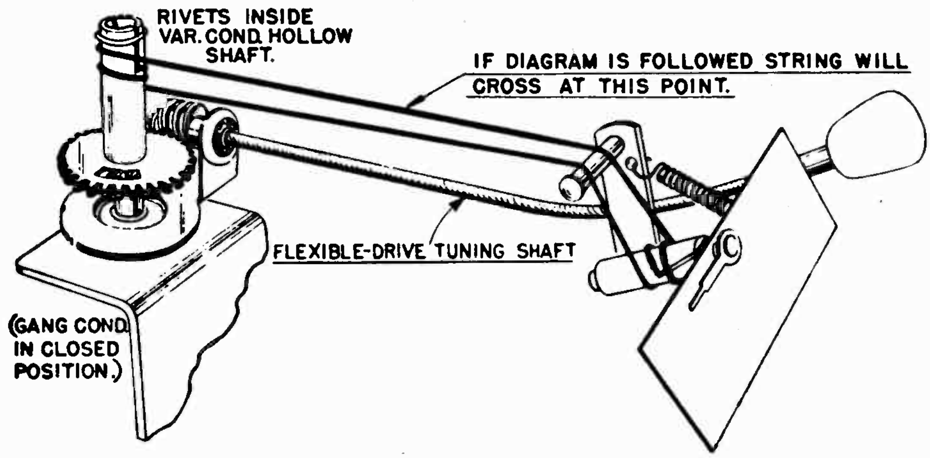
## OPERATION

To turn the receiver on, rotate the volume control and switch knob (left hand knob) to the right about half its range. After allowing about 30 seconds for the tubes to warm up, the desired station may be tuned by rotating the tuning control (right hand knob) to the desired frequency. The dial scale is calibrated in kilocycles minus the final two zeros. After the station has been properly tuned, the volume may be adjusted by means of the volume control knob. To increase the volume, turn the control to the right; to decrease the volume, turn it to the left. Turning this control to the left as far as it will go, turns the radio off.




DIAL POINTER DRIVE & STRINGING DIAGRAM

*Fig. 2*

MODEL 6293,
Ch. 528.6293-2

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, ammeter condenser and generator condenser. By referring to Figures 1 and 2, and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 7/32″ holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided, and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed by bending to the correct angles, as illustrated in Figure 3, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8″ drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4″ bolt, lock washer and nut furnished with the receiver.

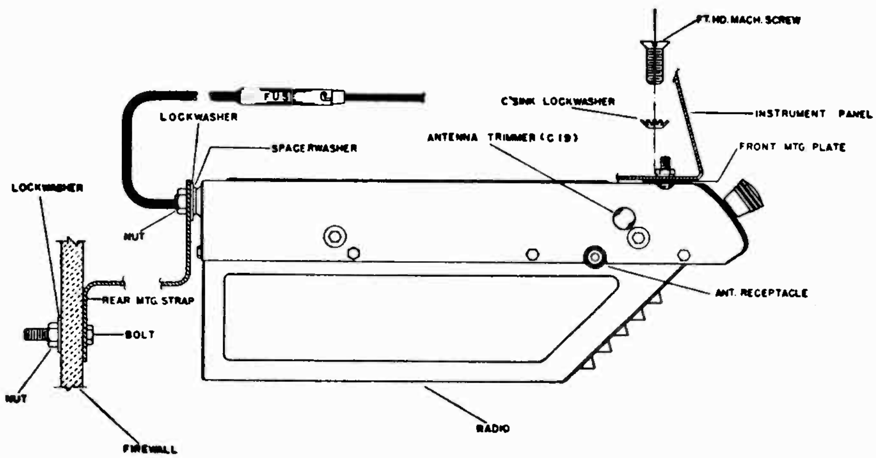



*Fig. 2 Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the socket provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1100 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 2) and adjust the trimmer for maximum volume. A small screw driver will be needed for this purpose.

# ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S84-192, and the Suppression and Misc. Parts Kit, part No. S84-232 as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-147.

## S84-192 MOUNTING PARTS KIT

- 1 1/4″ Bolt
- 2 1/4″ Lock Washers
- 2 1/4″ Hexagon Nuts
- 2 10-32 x 5/8″ Screws
- 2 10-32 x 3/8″ Screws
- 2 External Tooth Lock Washers
- 2 Internal Tooth Lock Washers
- 2 10-32 Hexagon Nuts
- 1 Washer-Spacer

## S84-232 SUPPRESSION KIT & MISC. PARTS

- 1 S84-233 "A" lead assem.
- 1 A43-10 Fuse
- 1 A81-13 Sleeve (for fuse)
- 1 S84-193 Suppression Kit consisting of:
  - 2 .5 MFD Condensers
  - 1 Distributor Suppressor
  - 20″ Wire Braid

# ELIMINATING MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise. (The following steps may not be necessary in all cases. Install your radio and operate it before making changes.)

## GENERATOR CONDENSER

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.

## AMMETER CONDENSER

A .5 MFD bypass condenser is furnished for attaching to the ammeter. This should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby. In most cases the use of this condenser, the distributor suppressor, and the generator condenser, will eliminate all objectionable ignition interference.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION WIRES

In many cases the low tension battery leads, etc., are grouped together with the high tension wires. These wires 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## BONDING OF FIRE WALL RODS AND TUBES

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

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## ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| Power Supply | 6.3 volts DC |
| Current | 6.2 amp. average |
| Frequency Range | 540 to 1600 KC |
| I. F. Frequency | 455 KC |
| Speaker | 4" P. M. |
| Power Output | 1.75 watts, undistorted<br>3 watts, maximum |
| Sensitivity | 3 microvolt average for 1 watt output |
| Selectivity | 40 KC broad at 1000 times signal, at 1000 KC |

This receiver contains the following:

1—6SK7GT—R. F. Amplifier.

1—6SA7GT—Converter.

1—6SK7GT—I.F. Amplifier.

1—6SQ7—Detector—AVC—1st audio.

1—6V6GT—Power output.

A 6X5GT Rectifier is used.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes and the rectifier in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage diagram (Fig. 7).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

**CAUTION:** Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.

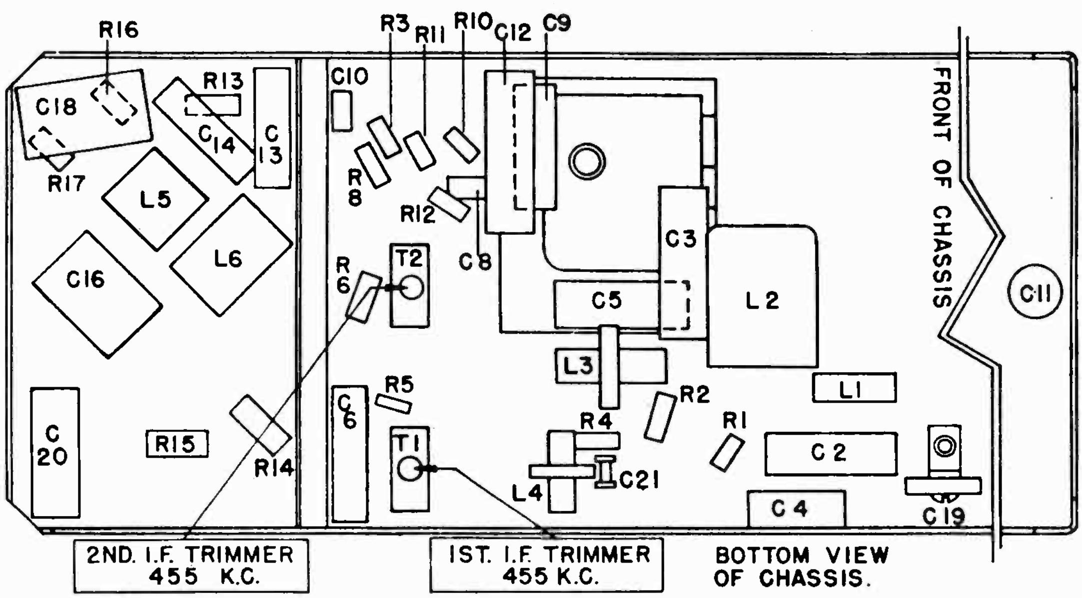


*Fig. 4. Bottom View*

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

- Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.
- Non-metallic screwdriver.
- Output meter. (1.8 volt for 1 watt output.)
- Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| *Dial Setting* | *Generator Frequency* | *Dummy Ant.* | *Generator Connections* | *Trimmer Reference* | *Trimmer Adjustment* | *Trimmer Function* |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1C | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C1B | Maximum | R.F. |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C19 | Maximum | Antenna |

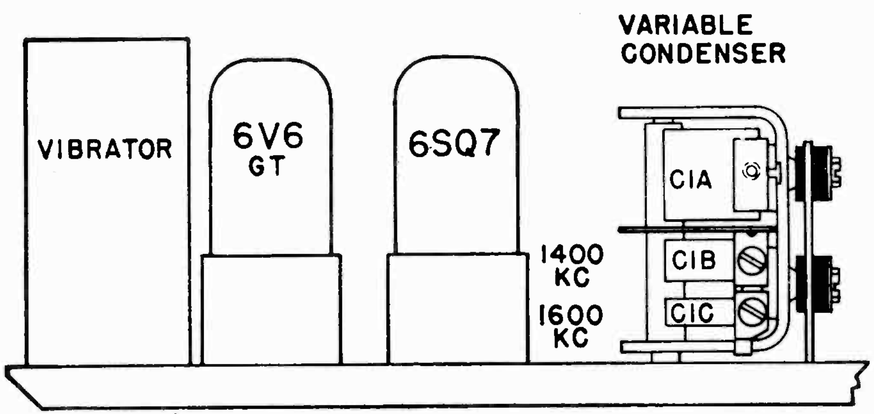


*Fig. 5. Trimmer Locations*

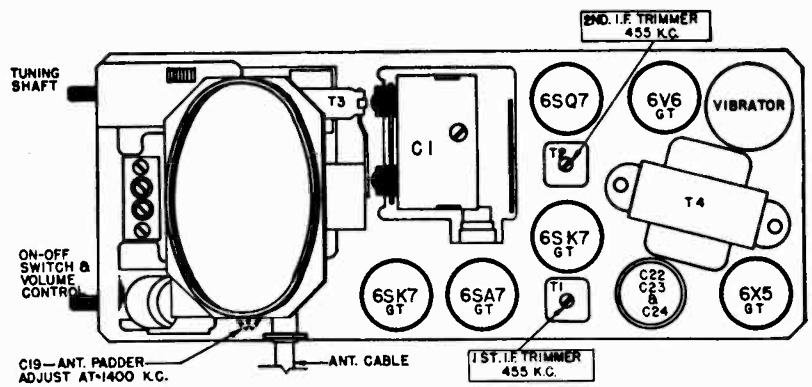


*Fig. 6. Tube, Rectifier and Trimmer Locations*

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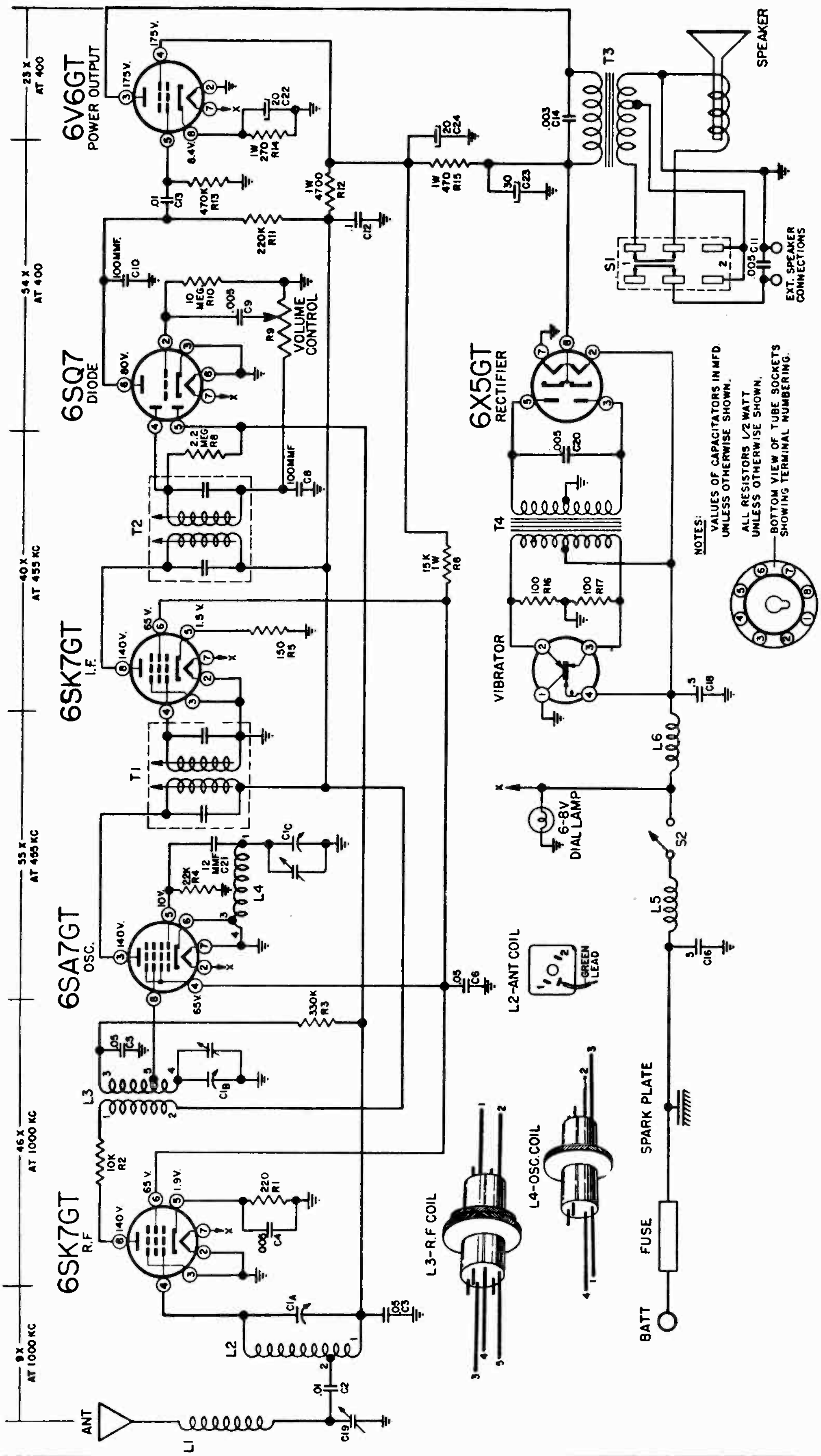


Fig. 7. Schematic Diagram

# INSTRUCTIONS FOR INSTALLATION OF REAR SEAT SPEAKER

Your Silvertone Auto Radio, Chassis No. 528.6293-2 includes a special feature which makes it simple and easy to install an additional speaker in the rear of the car. A speaker with the proper voice coil impedance (3.2 ohms) for such an installation is available at the Sears store where you bought your Silvertone Auto Radio.

The terminal strip in the illustration below is accessible through an opening in the case. The two wire leads from the rear seat speaker should be connected to these terminals. This completes the electrical installation of the speaker. The switch at the right is for operation of the rear seat speaker. In position 1, only the speaker in the case is connected; in position 2, both speakers are connected.

IMPORTANT: When there is no rear seat speaker installation, ALWAYS keep the switch in position 1.

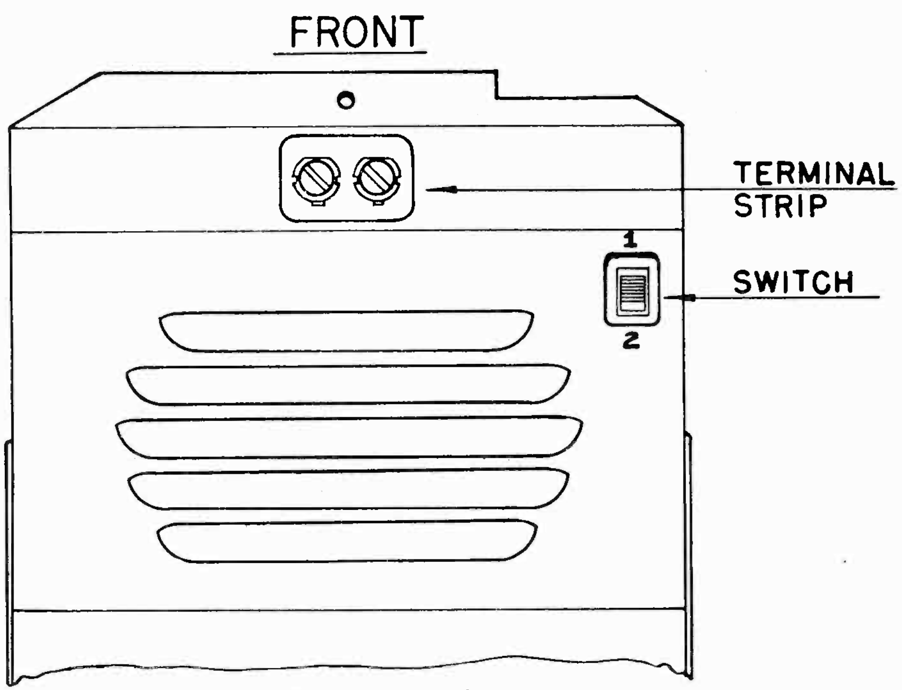


*Fig. 8. Bottom View of Case*

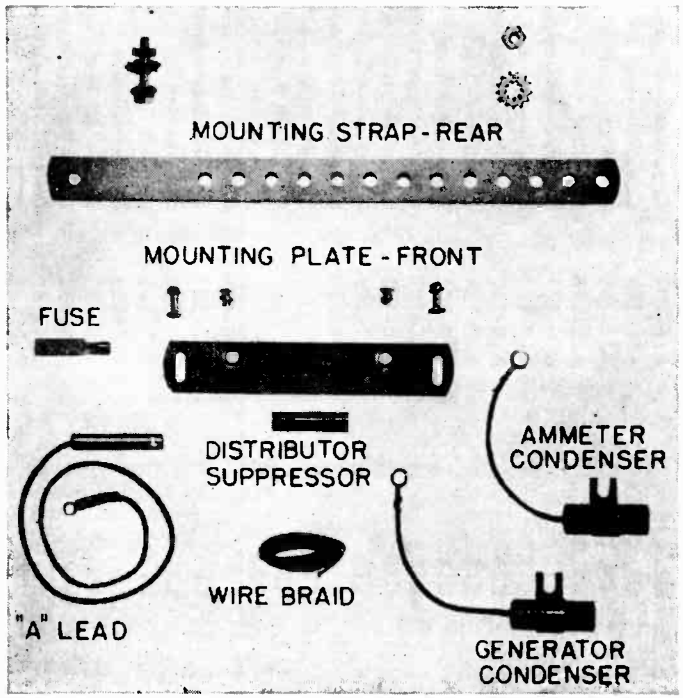


*Fig. 9. Mounting Parts*

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# REPAIR PARTS LIST

| Schematic Location | Part No. | Description |
|---|---|---|
| C1A, C1B, C1C | B19-205 | Capacitor—variable—worm drive |
| C2, C13 | A16-201 | Capacitor—.01 mfd.—600 v. |
| C3, C5, C6 | A16-189 | Capacitor—.05 mfd.—400 v. |
| C4, C9 | A16-190 | Capacitor—.005mfd.—600 v. |
| C8, C10 | A15-196 | Capacitor—mica—100 mmfd. |
| C11 | A16-177 | Capacitor—ceramic—.005 mfd. |
| C12 | A16-187 | Capacitor—.1 mfd.—400 v. |
| C14 | A16-200 | Capacitor—.003 mfd.—600 v. |
| C16 | A16-184 | Capacitor—.5 mfd.—100 v. |
| C18 | A16-202 | Capacitor—.5 mfd.—100 v. |
| C19 | A20-145 | Capacitor—ceramic—antenna trimmer |
| C20 | A16-185 | Capacitor—.005 mfd.—1600 v. |
| C21 | A15-205 | Capacitor—ceramic—12 MMFD. (temp. comp.) |
| | A18-289 | Capacitor—electrolytic |
| C22 | | 20 mfd.—25 v. |
| C23 | | 30 mfd.—350 v. |
| C24 | | 20 mfd.—350 v. |
| | A83-421 | Clip—I.F. transformer mounting |
| L1 | A10-527 | Coil—Antenna loading |
| L2 | B10-525 | Coil—Antenna |
| L3 | B10-535 | Coil—R. F. |
| L4 | B10-536 | Coil—Oscillator |
| L5 | A33-229 | Coil—"A" line choke |
| L6 | A33-234 | Coil—Vibrator hash choke |
| R9, S2 | A24-182 | Control—ON-OFF and VOLUME, 500,000 ohm |
| | A51-105 | Cord—Pointer travel, 17" |
| | B67-541 | Dial—Station |
| | A47-112 | Grommet—Speaker and variable capacitor mounting |
| | A47-114 | Grommet—Fibre—Flexible shaft bearing |
| | S84-233 | Kit—"A" lead assembly |
| | S84-192 | Kit—Mounting parts |
| | S84-193 | Kit—Suppression, assembly |
| | A52-294 | Knob—Volume and tuning |
| | A89-10 | Lamp—Dial—G.E. No. 422 |
| | A31-147 | Plate—Mounting, front |
| | A58-76 | Pointer—Dial |
| | A87-38 | Receptacle—Antenna cable |
| R1 | A60-753 | Resistor—220 ohm—½ watt |
| R2 | A60-760 | Resistor—10,000 ohm— ½ watt |
| R3 | A60-661 | Resistor—330,000 ohm—½ watt |
| R4 | A60-744 | Resistor—22,000 ohm—½ watt |
| R5 | A60-767 | Resistor—150 ohm—½ watt |
| R6 | A60-716 | Resistor—15,000 ohm—1 watt |
| R8 | A60-726 | Resistor—2.2 megohm—½ watt |
| R10 | A60-728 | Resistor—10 megohm—½ watt |
| R11 | A60-667 | Resistor—220,000 ohm—½ watt |
| R12 | A60-765 | Resistor—4700 ohm—1 watt |
| R13 | A60-731 | Resistor—470,000 ohm—½ watt |
| R14 | A60-754 | Resistor—270 ohm—1 watt |
| R15 | A60-694 | Resistor—470 ohm—1 watt |
| R16, R17 | A60-752 | Resistor—100 ohm—½ watt |
| | A75-74 | Shaft—Pointer |
| | B75-73 | Shaft—Tuning drive—flexible |
| | B79-373 | Speaker—4" P.M. |
| | B31-134 | Strap—Mounting, rear |
| S1 | A69-185 | Switch—Rear seat speaker |
| T1 | A10-521 | Transformer—I.F. No. 1 |
| T2 | A10-529 | Transformer—I.F. No. 2 |
| T3 | B80-249 | Transformer—Output (part of speaker) |
| T4 | B80-243 | Transformer—Power |
| | A34-105 | Vibrator—Mallory No. 659 |

**IMPORTANT:** All tubular condensers must be high temperature (85°C.) wax type.

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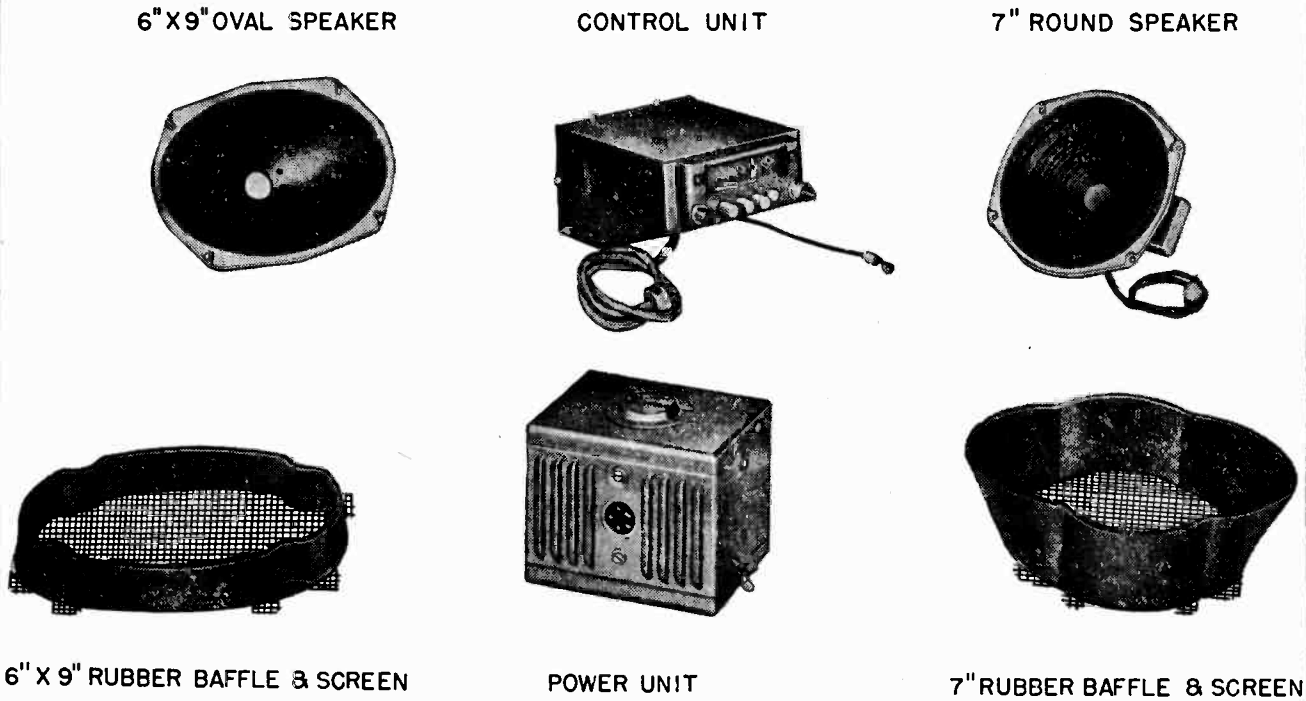


*Fig. 1. Parts in Master Package*

Only one of the speakers illustrated is supplied with each radio; the type of speaker you receive will be determined by the make of car for which the radio is ordered.

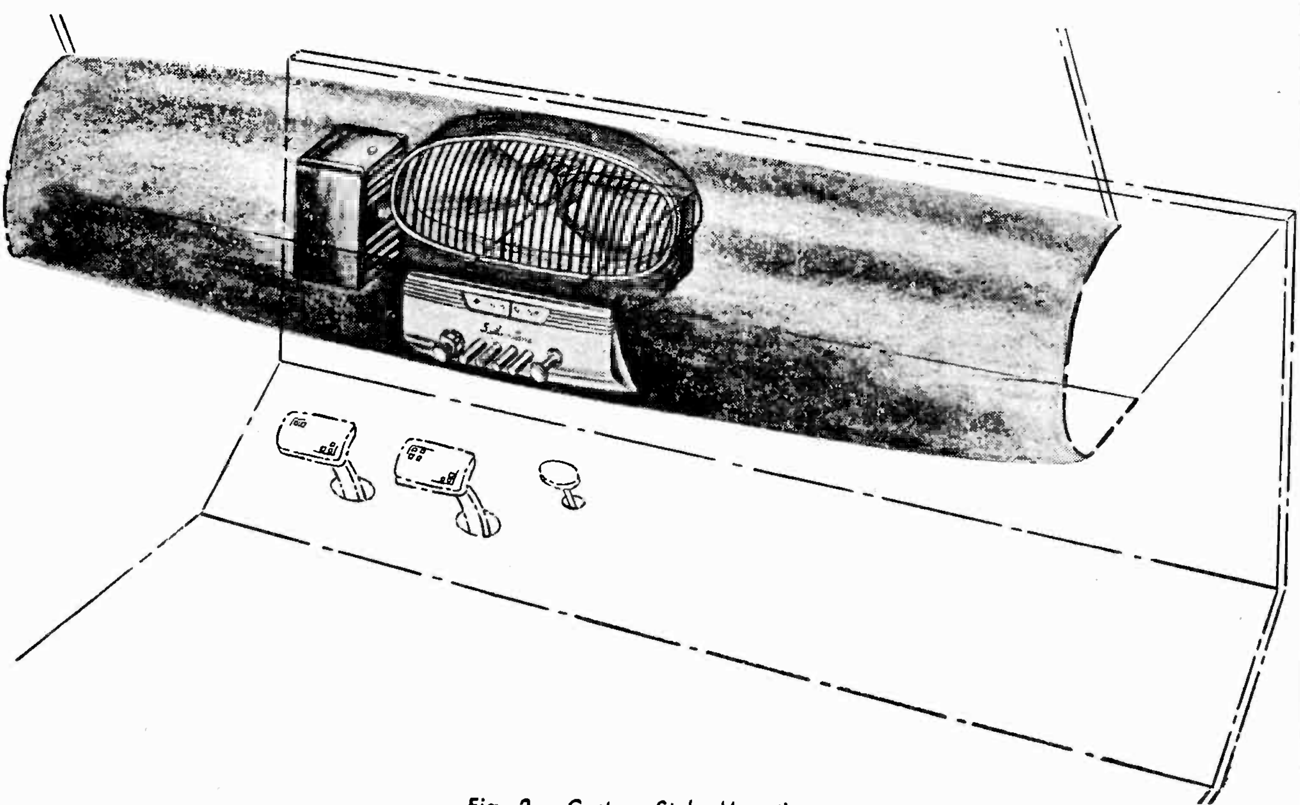

*Fig. 2. Custom Style Mounting*

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# DESCRIPTION

Your SILVERTONE radio is a newly designed DE LUXE PUSHBUTTON TUNING AUTOMOBILE RECEIVER of advance superheterodyne circuit design, for operation on the six volt storage battery in your car. It covers the frequency range from 540 KC to 1600 KC. In addition to PUSHBUTTON TUNING it features BASS-COMPENSATED VOLUME CONTROL supplemented by a MANUAL TONE CONTROL. It consists of three principal parts—the Control Unit, the Power Unit and the Speaker (See Fig. 1)—and is supplied with mounting parts to accommodate either custom installation in the instrument panel or underdash mounting. (See Figs. 2 and 3.)

Special care has been taken in the design of this receiver to insure the finest in sensitivity and selectivity, thereby insuring good reception of even distant or very weak stations. It is simple to install. The antenna input circuit is adjustable to permit the use of any two, three or four section telescopic, whip or "fishpole" type antenna.

Each complete radio, with accessories, is made up in two separate packages, one carton containing the Escutcheon Kit and speaker mounting hardware, the other carton containing the Control Unit, the Power Unit and either a 7" round speaker or a 6"x9" oval speaker, depending on the make and and model of the car for which the radio was ordered. This second carton will be stamped with the letter "A" to indicate that it contains a 7" round speaker, or the letter "B" to indicate the 6"x9" oval speaker.

Control Unit Escutcheon Kits (instrument panel matching or universal) are supplied as a separate item, thus permitting you to transfer the radio from one car to another with only the small expense of replacing the Escutcheon Kit and speaker if you desire to match the instrument panel of your new or different car. Instrument panel matching Escutcheon Kits for most popular late model cars are available at your nearest Sears retail store or Mail Order House. If your Silvertone radio is equipped with a universal underdash tuning panel it may be transferred as is to a different car without changing the Escutcheon Kit. However, if you wish to change from an underdash mounting to a custom style instrument panel mounting, this can be accomplished by discarding the universal Escutcheon Kit and replacing it with an instrument panel matching Escutcheon Kit and 6"x9" oval speaker, if necessary), as outlined above.

# INSTALLATION

## THE SPEAKER

The speakers (7" round or 6"x9" oval) are supplied with sponge rubber baffles for mounting on flat or curved instrument panels. The rubber baffle for the 7" round speaker has flared sides so that it will cover an oval opening in the car's speaker grill as well as a round opening.

Speaker mounting hardware is supplied with each Escutcheon Kit for mounting the speaker in your car. This includes a "U-shaped" bracket for mounting the round speaker in cars on which it is not possible to mount the speaker on existing bolts.

SPECIFIC INSTRUCTIONS PERTAINING TO THE MOUNTING OF THE SPEAKER AND CONTROL UNIT IN THE CAR FOR WHICH YOU ORDERED YOUR RADIO ARE CONTAINED IN THE LEAFLET PACKED IN THE ESCUTCHEON KIT.

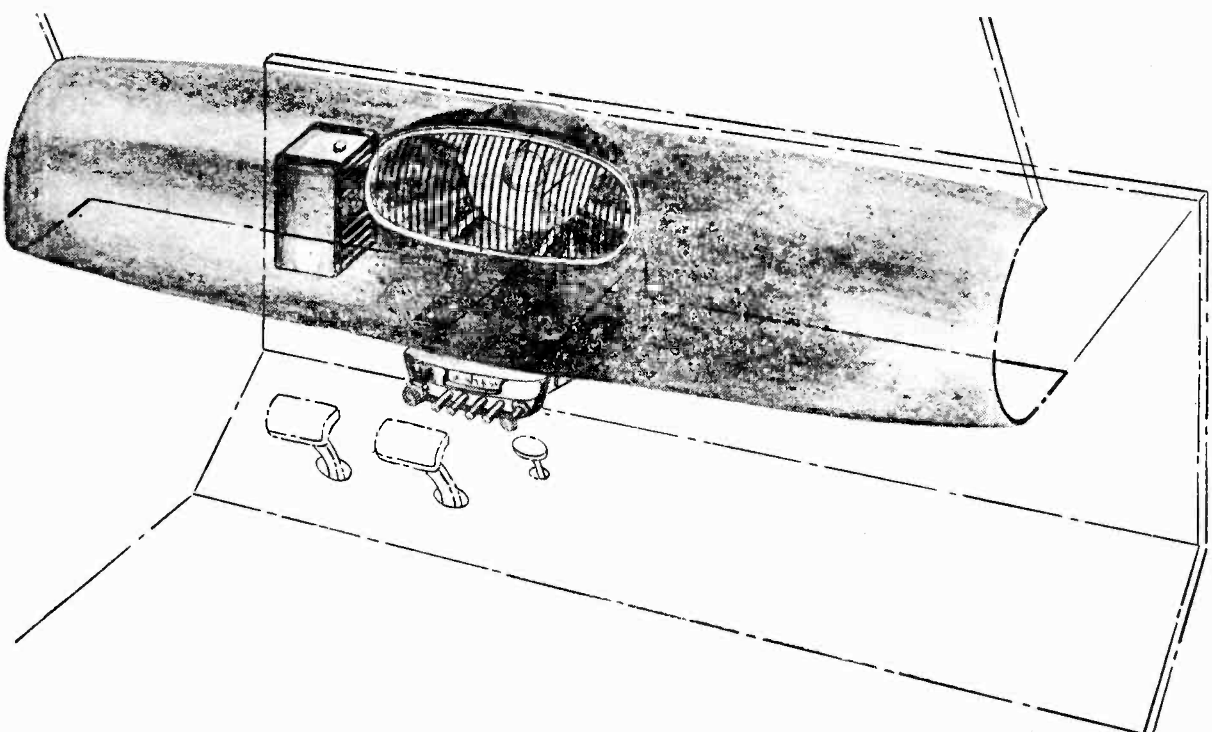

*Fig. 3. Underdash Mounting*

## MOUNTING THE POWER UNIT

The power unit mounts on the firewall (see Fig. 3). Determine a suitable position for mounting it by holding the case in your hands against the firewall. When a suitable position has been determined, then check the underhood side of the wall, to make sure there is no obstruction to prevent drilling a hole and inserting the mounting bolt. Having located a suitable position that will permit drilling, mark and drill a 5/16" hole. Insert the 1/4 inch diameter by 3 inch long, carriage type mounting bolt into the hole from the underdash side and attach the lockwasher and nut on the underhood side, but do not tighten. Now holding the case in a vertical position (with wingnut on the bottom), bring the case up to the bolt and slide the channel in the mounting plate down over the head of the bolt. The lockwasher and nut on the underhood side should then be tightened down securely.

If, because of limited space, you find it necessary to mount the power unit in a horizontal or angle position, this type of mounting is entirely satisfactory and has no ill effect on the operation of the radio.

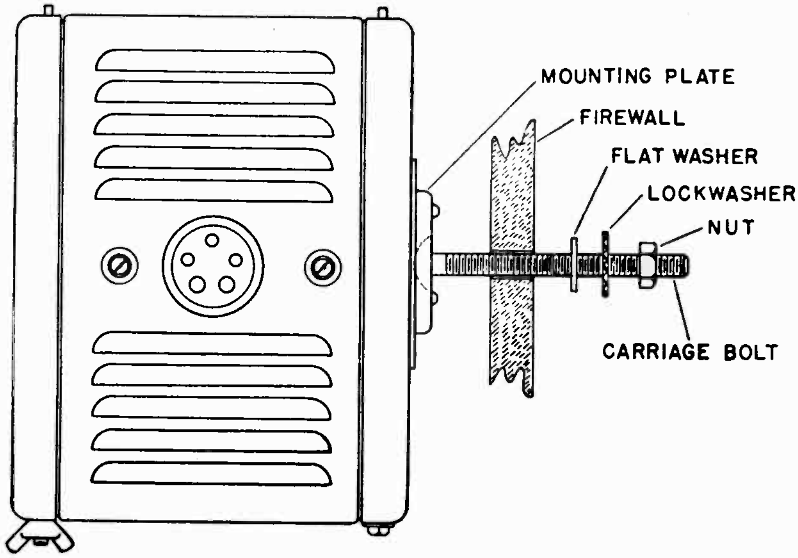


*Fig. 3. Power Unit Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the plug into the antenna receptacle on the side of the control unit (see Fig. 4). Plug the speaker and power cables into the sockets provided on the sides of the Power Unit. Connect the "A" lead to the battery side of the ammeter behind the instrument panel. The fuse should then be inserted into the holder in the "A' lead. These connections are illustrated in Fig. 4.

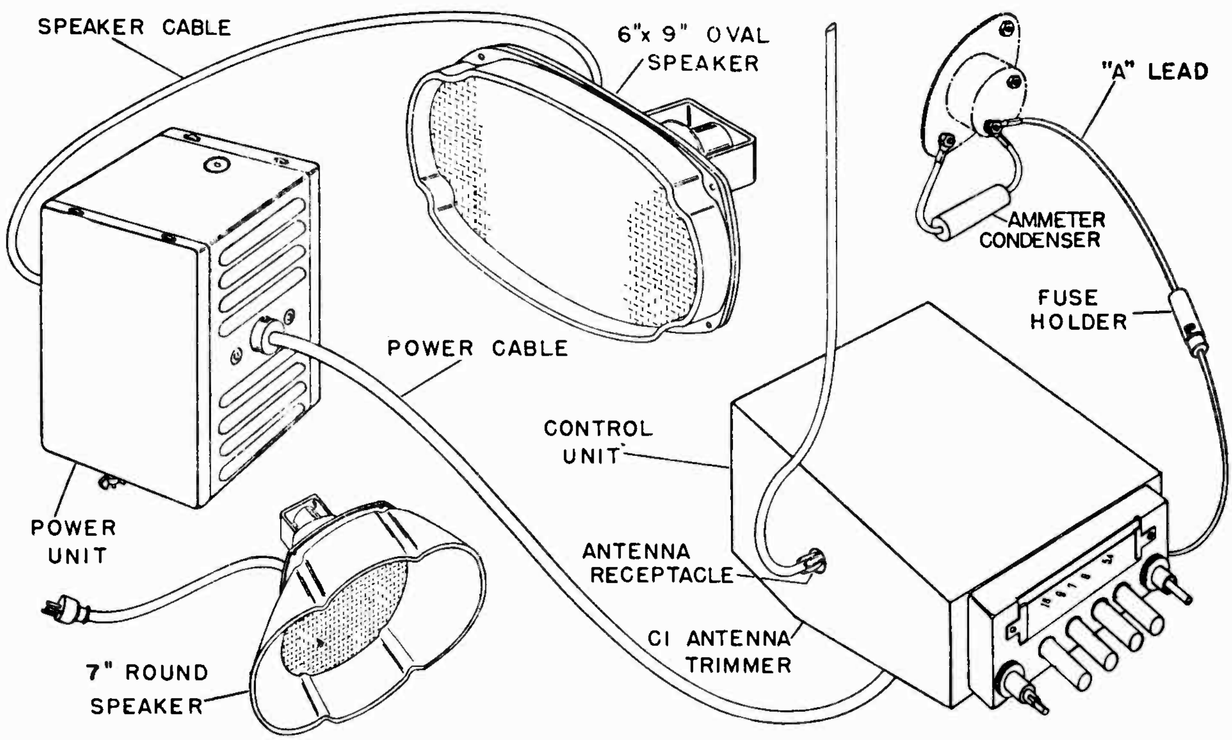


*Fig. 4. Connecting the Radio*

## CONTROLS

There are six operating controls on the front of the Control Unit, (see Fig. 5). The two outside knobs are dual purpose controls, the other four are PUSHBUTTON STATION SELECTORS. The left-hand control consists of two knobs mounted on concentric shafts; the front knob (round) is the ON-OFF-SWITCH and VOLUME CONTROL; the rear knob (with four points) is the MANUAL TONE CONTROL. The knob on the right is the MANUAL TUNING CONTROL and it also serves as a fifth PUSHBUTTON STATION SELECTOR. The use of these controls is explained below.

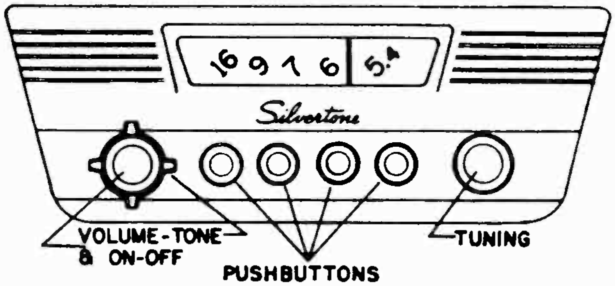


*Fig. 5. Control Unit Panel*

## THE ON-OFF-SWITCH AND VOLUME CONTROL

When the outer left knob is turned all the way to the left the receiver is switched off and there is no drain from the car's battery. Rotating the knob part of a turn toward the right switches the receiver on and illuminates the dial. Further rotation of the knob increases the volume. After a station has been tuned in properly the volume control knob should be adjusted to give the desired volume.

## MANUAL TUNING

Use the right-hand knob to tune in stations manually. To select a station, push in the knob and tune the radio by turning the knob until the desired station is heard. The dial pointer will indicate the frequency to which you are tuned.

The dial is marked in Kilocycles minus the final two zeroes. Always tune carefully for the clearest sound and minimum background noise.

## PUSHBUTTON TUNING

Adjusting the pushbutton station selectors is simple and quick. No tools are required and a button may be set up for a new station in a few seconds. Each button can be tuned to any station in the broadcast band; thus you can arrange the tuning in any order to suit your convenience.

Before making the following adjustments, turn the radio on and let it warm up for 15 minutes.

Choose the PUSHBUTTON STATION SELECTOR you wish to adjust, and push the button all the way in; it will lock in this position. Now tune in the station to which you wish to pre-tune by turning the button to right or left until the desired station is heard. The dial pointer will indicate the frequency to which you are tuned, but to insure the accuracy of the setting, keep the volume control turned low and adjust the button for sharpest tuning. This will be indicated when the sound is clearest and noise at a minimum. The button is now properly adjusted and should not be turned again until it is desired to set it for a different station.

Follow the above procedure to adjust the remaining PUSHBUTTON STATION SELECTORS.

As was mentioned under the heading *CONTROLS*, the MANUAL TUNING CONTROL has been designed to serve as a fifth PUSHBUTTON STATION SELECTOR. If you wish to use this control as a PUSHBUTTON STATION SELEC-

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## S84--382 SUPPRESSION KIT AND MISCELLANEOUS PARTS

| | |
|---|---|
| 1 S84-233—"A" lead assembly | 20" wire braid |
| 1 A43-10—Fuse | 1 bolt—1/4" diameter by 3" long |
| 1 A81-13—Sleeve (for fuse) | 1 lockwasher |
| 2 A16-183—.5 MFD condensers | 1 flat washer |
| 1 A96-4—Distributor Suppressor | 1 nut |

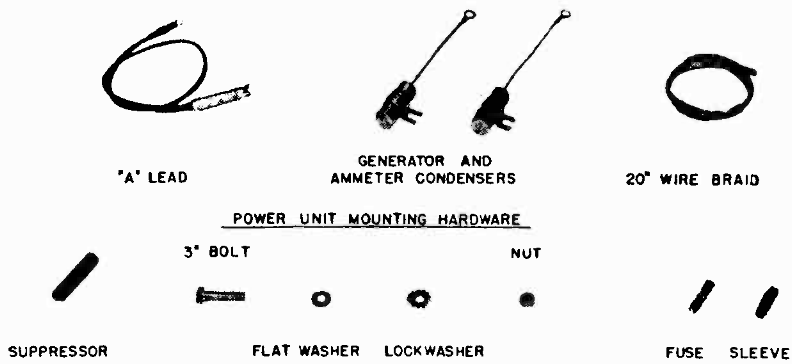


*Fig. 6. Suppression Kit and Miscellaneous Parts*

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TOR, simply follow the procedure given above for adjusting the other PUSHBUTTON STATION SELECTORS. However, remember that if you use this control for MANUAL TUNING at any time, it will have to be re-set to the desired station if you wish to use it again as a PUSHBUTTON STATION SELECTOR.

## THE TONE CONTROL

The inner left knob (with four points) is the TONE CONTROL, which permits you to select the most pleasing tonal range. When it is turned all the way to the right (clockwise) the tone is treble or brilliant. This position is best for the most distinct reproduction, especially of speech. Turning the knob to the left (counterclockwise) makes the tone more mellow. This is often desirable for certain types of music and is also useful to lessen the effects of static and electrical noise. Turn the knob to the position that gives the tone most pleasing to you.

## MATCHING THE ANTENNA

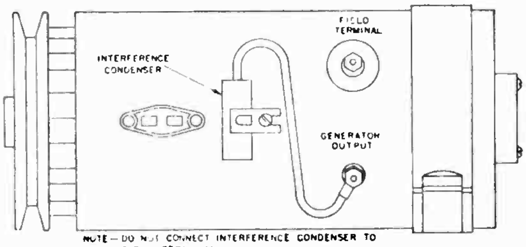
An adjusting screw for matching the receiver to the particular antenna used is accessible through a hole in the bottom side of the Control Unit. (See Fig. 4.) Set the dial pointer between 1400 KC and 1500 KC, where no station is heard with the volume control fully on. Then use a small screw driver to turn the adjusting screw to the point giving the most hiss or noise. The set is now ready for operation.

# ELIMINATING MOTOR NOISE

Every precaution was taken in the design of this radio to eliminate motor noise interference. However, in the remote instance that it may be found desirable to take further steps, the following notes are added for your guidance.

IMPORTANT: Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all mounting points. A good electrical contact at these points will aid materially in eliminating motor noise.

## GENERATOR CONDENSER




NOTE — DO NOT CONNECT INTERFERENCE CONDENSER TO FIELD TERMINAL.

Fig. 7

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.

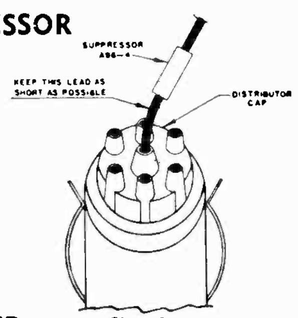



Fig. 8

## AMMETER CONDENSER

A .5 MFD bypass condenser is furnished for attaching to the ammeter. This should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby. In most case the use of this condenser, the distributor suppressor, and the generator condenser, will eliminate all objectionable ignition interference.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION LEADS

In many cases 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## BONDING OF STEERING COLUMN TO BODY

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

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## ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| Power Supply | 6.3 volts DC |
| Current | 6.5 amp. average |
| Frequency Range | 540 to 1600 KC |
| I. F. Frequency | 262 KC |
| Speaker | 7" round or 6"x9" oval |
| Power Output | 3 watts, undistorted<br>5.5 watts, maximum |
| Sensitivity | 3 microvolt average for 1 watt output |
| Selectivity | 40 KC broad at 1000 times signal, at 1000 KC |

The set contains the following:

1—6BA6—R. F. Amplifier.
1—6BE6—Converter.
1—6BA6—I. F. Amplifier.
1—6AT6—Detector—AVC—1st audio.
1—6V6GT—Power output.

1—6X5GT—Rectifier.

## SERVICE NOTES

Voltages taken from the different points of the circuit to chassis are measured with the volume and tone controls in maximum position, all tubes and the rectifier in their sockets, no signal applied, and with a voltmeter having a resistance of 20,000 ohm per volt. These voltages are clearly shown on the schematic diagram (Figs. 11 and 12). All voltages should be measured with an input voltage of 6.3 volts DC.

The tubes and rectifier are accessible for servicing without removing the chassis. Loosen the wing-nut on the cover of the power supply case and lift off the cover. On the RF Tuning Unit, loosen the wing nuts on the two stud bolts protruding from the side of the case at the top, rear, and remove the plate over the tubes. CAUTION: Be sure to replace the tubes and the rectifier in the proper sockets. Refer to Tube and Rectifier Location Pictorials, Fig. 10 and 14.

WARNING: The dash pot (brass cylinder on the mechanical tuner) should never be oiled. If it is ever necessary to make adjustments on the mechanical tuner, the dash pot may be cleaned with ordinary cleaning solvents.

## ALIGNING INSTRUCTIONS

Never attempt any adjustments on this receiver unless it becomes necessary to replace the coils or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, the rectifier, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE." After re-alignment has been completed repeat the procedure as a final check.

## INSTRUCTIONS FOR REMOVING THE CHASSIS FROM THE CASE

RF TUNING UNIT: Remove the knobs and nuts from the two control shafts. Take out the six self-tapping screws around the back edge of the case and remove the back cover. Remove the plate over the tubes (see service notes). Loosen the screw securing the cable clamp, slip the cable out from under the clamp and out of the notch. Remove the lead from the plug-in terminal on the spark plate attached to the inside top of case. Slide the "A" lead out of the notch. Now tilt the front of the case up so that the chassis can slide out. Grasp the chassis at the rear with the fingers against the chassis plate and with the thumb hooked over the IF transformer. Pull the chassis straight back, being careful that the pointer bracket does not get caught against the spark plate components. Handle the chassis carefully and set down gently so that the mechanical tuning parts may not be damaged or the settings of the coil cores upset by jarring.

POWER SUPPLY: Loosen the wing-nut and lift the top cover off. Remove the 6-32x½ screw securing the high voltage cable socket to the case. Remove the four screws (one on each side) near the bottom outside of the case. Now take the case in one hand and grasp the output transformer with the other hand and lift the chassis straight up.

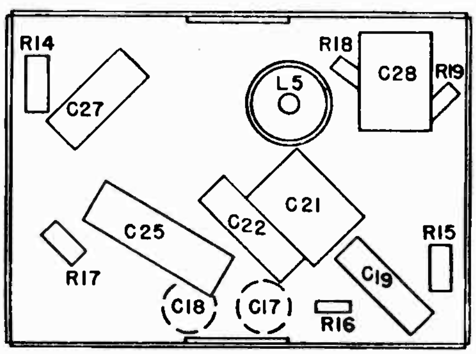
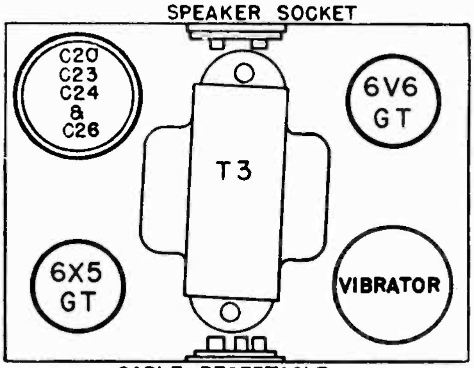



*Fig. 9. Power Unit—Bottom View*

SPEAKER SOCKET




CABLE RECEPTACLE

*Fig. 10. Power Unit—Top View*

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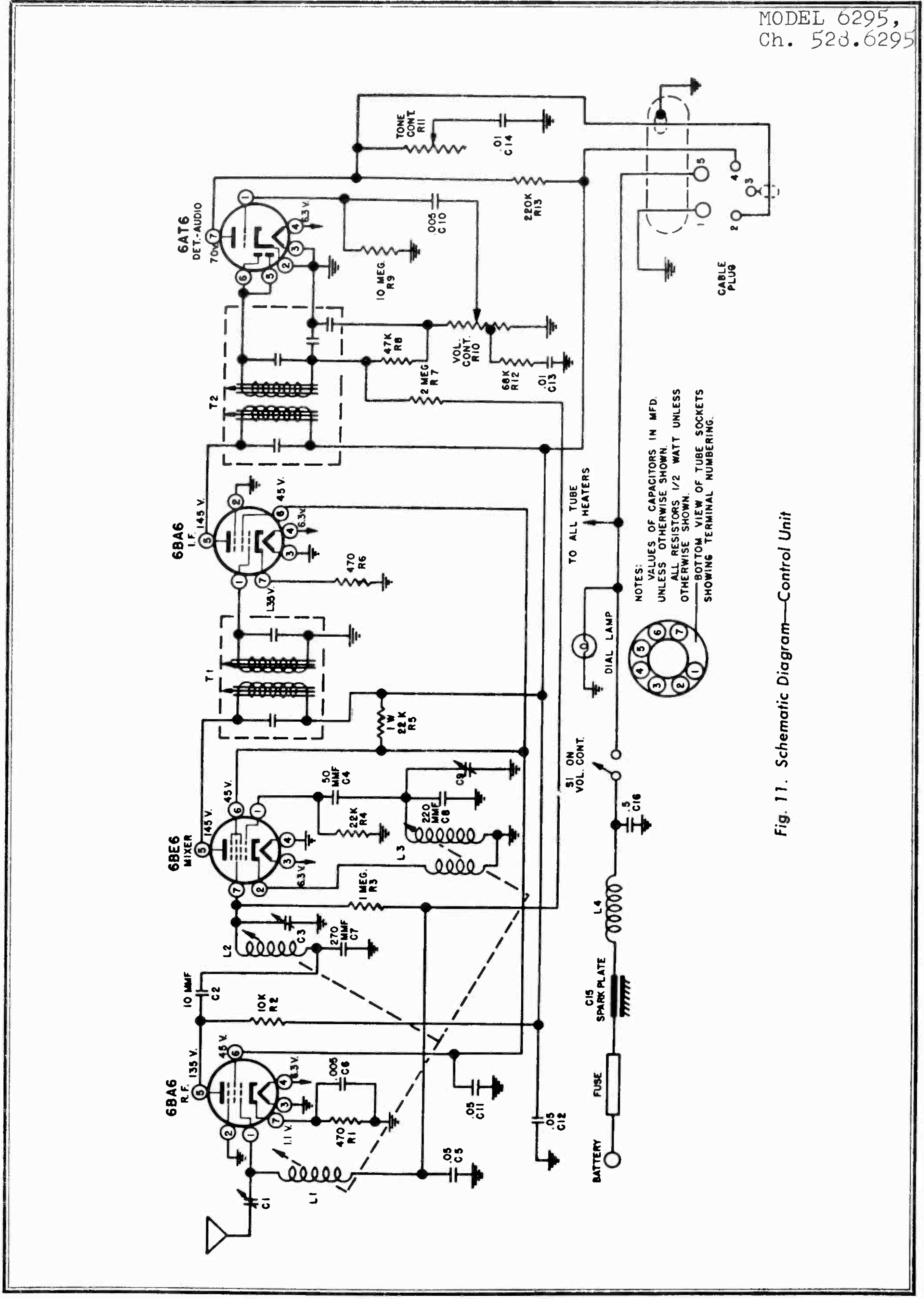


*Fig. 11. Schematic Diagram—Control Unit*

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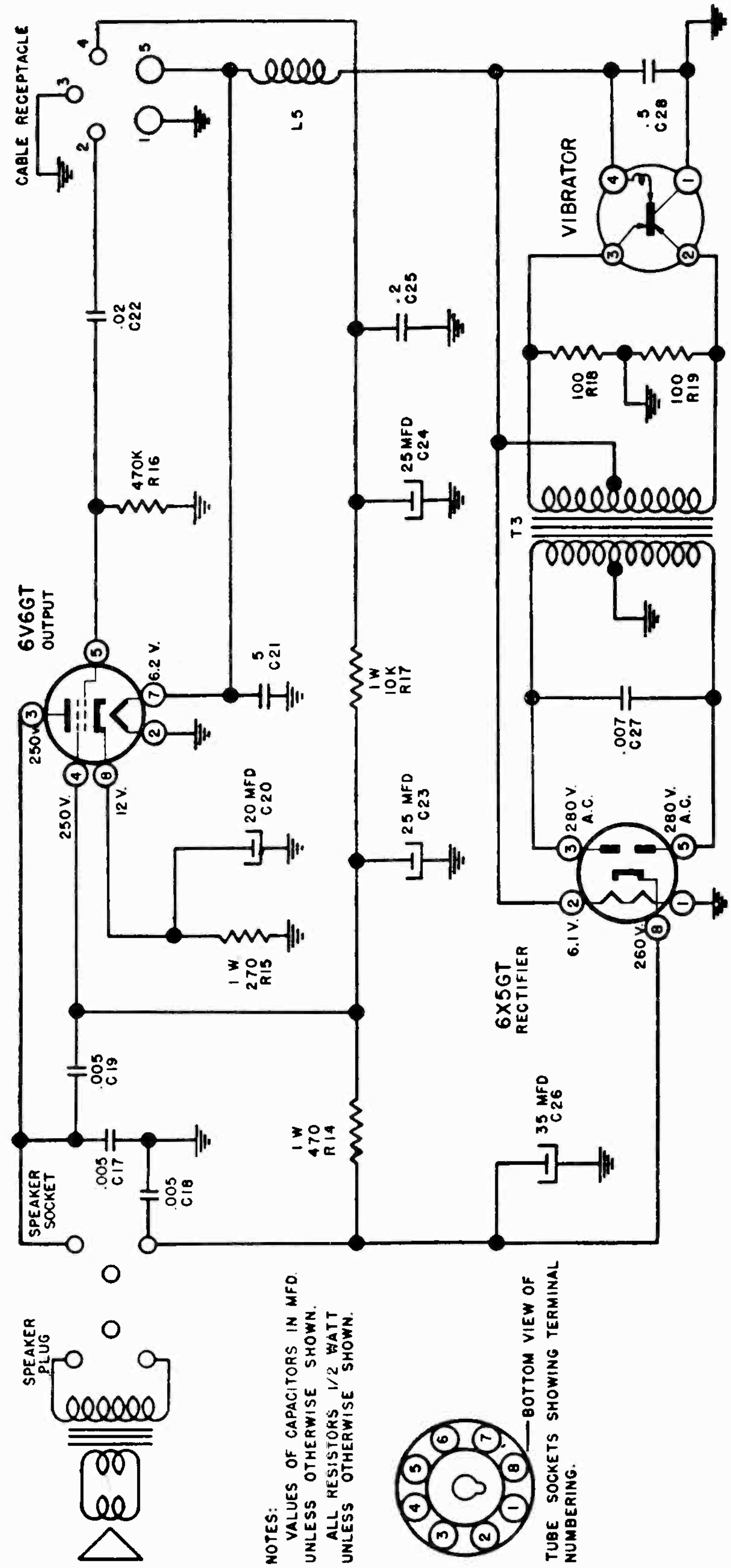


*Fig. 12. Schematic Diagram—Power Unit*

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD., 30 MMFD.

For alignment points refer to Figures 13 and 14.

| Slug Position | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Out | 262 KC | .1 MFD. | 6BE6 Grid | T2 | Maximum | Output I.F. |
| Fully Out | 262 KC | .1 MFD. | 6BE6 Grid | T1 | Maximum | Input I.F. |
| Fully Out | 1610 KC | * | Ant. lead | C9 | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | * | Ant. lead | C3 | Maximum | R.F. |
| Tune in signal from generator | 1400 KC | * | Ant. lead | C1 | Maximum | Antenna |

*30 MMFD across input terminals and 75 MMFD in series with "hot" side of signal generator leads.

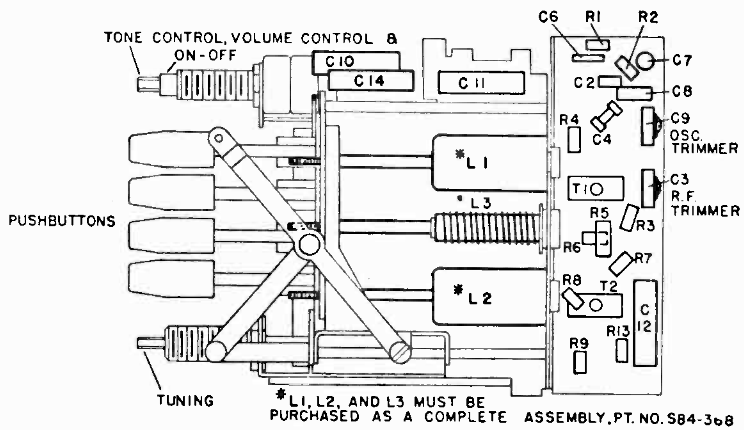


Fig. 13. Control Unit—Bottom View

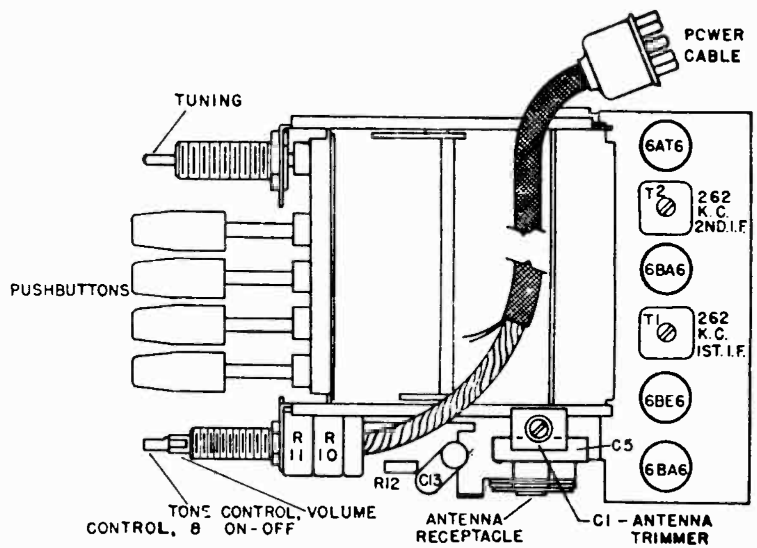


Fig. 14. Control Unit—Top View

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| Schematic Location | Part No. | Description |
|---|---|---|
| C1 | A20-148 | Capacitor—antenna trimmer |
| C2 | A15-197 | Capacitor—ceramic—10 mmfd. |
| C3, C9 | A20-147 | Capacitor—dual trimmer—R.F. and Oscillator |
| C4 | A15-194 | Capacitor—ceramic—50 mmfd. |
| C5 | A16-197 | Capacitor—.05 mfd.—200 v. |
| C6, C17, C18 | A16-177 | Capacitor—ceramic—.005 mfd. |
| C7 | A15-215 | Capacitor—ceramic—270 mmfd. |
| C8 | A15-218 | Capacitor—silver mica—220 mmfd. |
| C10, C19 | A16-190 | Capacitor—.005 mfd.—600 v. |
| C11, C12 | A16-189 | Capacitor—.05 mfd.—400 v. |
| C13, C14 | A16-192 | Capacitor—.01 mfd.—400 v. |
| C15 | | Capacitor—spark plate |
| C16, C21, C28 | A16-184 | Capacitor—.5 mfd.—100 v. |
| | A18-294 | Capacitor—electrolytic |
| C20 | | 20 mfd.—25 v. |
| C23, C24 | | 25 mfd.—350 v. |
| C26 | | 35 mfd.—400 v. |
| C22 | A16-206 | Capacitor—.02 mfd.—600 v. |
| C25 | A16-188 | Capacitor—.2 mfd.—400 v. |
| C27 | A16-207 | Capacitor—.007 mfd.—1600 v.—oil filled |
| | B23-157 | Cable—power |
| L1, L2, L3 | S84-368 | Coil—assembly—including carriage and slugs, etc. |
| L4 | A33-229 | Coil—"A" line choke |
| L5 | A33-228 | Coil—vibrator hash choke |
| | A83-421 | Clip—I.F. transformer mounting |
| R10, R11, S1 | A24-183 | Control—dual—ON-OFF-VOLUME and TONE |
| | B67-547 | Dial scale |
| | A43-10 | Fuse—15 amp.—3AG |
| | A47-115 | Grommet—rubber—power cable |
| | S84-233 | Kit—"A" lead assembly |
| | B52-296 | Knob—Tuning |
| | B52-297 | Knob—Volume |
| | B52-298 | Knob—Tone |
| | A89-7 | Lamp—pilot—No. 47 Bayonet |
| R1, R6 | A60-770 | Resistor—470 ohm—½ watt |
| R2 | A60-760 | Resistor—10K ohm—½ watt |
| R3 | A60-668 | Resistor—1 megohm—½ watt |
| R4 | A60-744 | Resistor—22K ohm—½ watt |
| R5 | A60-773 | Resistor—22K ohm—1 watt |
| R7 | A60-726 | Resistor—2.2 megohm—½ watt |
| R8 | A60-730 | Resistor—47K ohm—½ watt |
| R9 | A60-728 | Resistor—10 megohm—½ watt |
| R12 | A60-775 | Resistor—68K ohm—½ watt |
| R13 | A60-672 | Resistor—220K ohm—½ watt |
| R14 | A60-694 | Resistor—470 ohm—1 watt |
| R15 | A60-754 | Resistor—270 ohm—1 watt |
| R16 | A60-731 | Resistor—470K ohm—½ watt |
| R17 | A60-698 | Resistor—10K ohm—1 watt |
| R18, R19 | A60-752 | Resistor—100 ohm—½ watt |
| | A83-646 | Retainer—dial scale—left |
| | A83-647 | Retainer—dial scale—right |
| | C79-375 | *Speaker—7" round |
| | C79-376 | *Speaker—6"x9" oval |
| | S84-383 | Transformer—output—with cable and plug |
| T1 | A10-537 | Transformer—I.F. No. 1 |
| T2 | A10-540 | Transformer—I.F. No. 2 |
| T3 | C80-250 | Transformer—power |
| | A34-105 | Vibrator—Mallory No. 659 |

*When ordering a replacement speaker, order the same type, 7" round or 6"x9" oval, as the old one that was installed in your car.

## Mechanical Tuner Parts

| | |
|---|---|
| A56-141 | Pusher nut—manual tuning |
| A56-142 | Pusher nut—pushbutton tuning |
| A75-75 | Pusher rod—manual tuning |
| S84-355 | Pushbutton and rod assembly |

**IMPORTANT: All tubular condensers must be high temperature (85°C.) wax type.**

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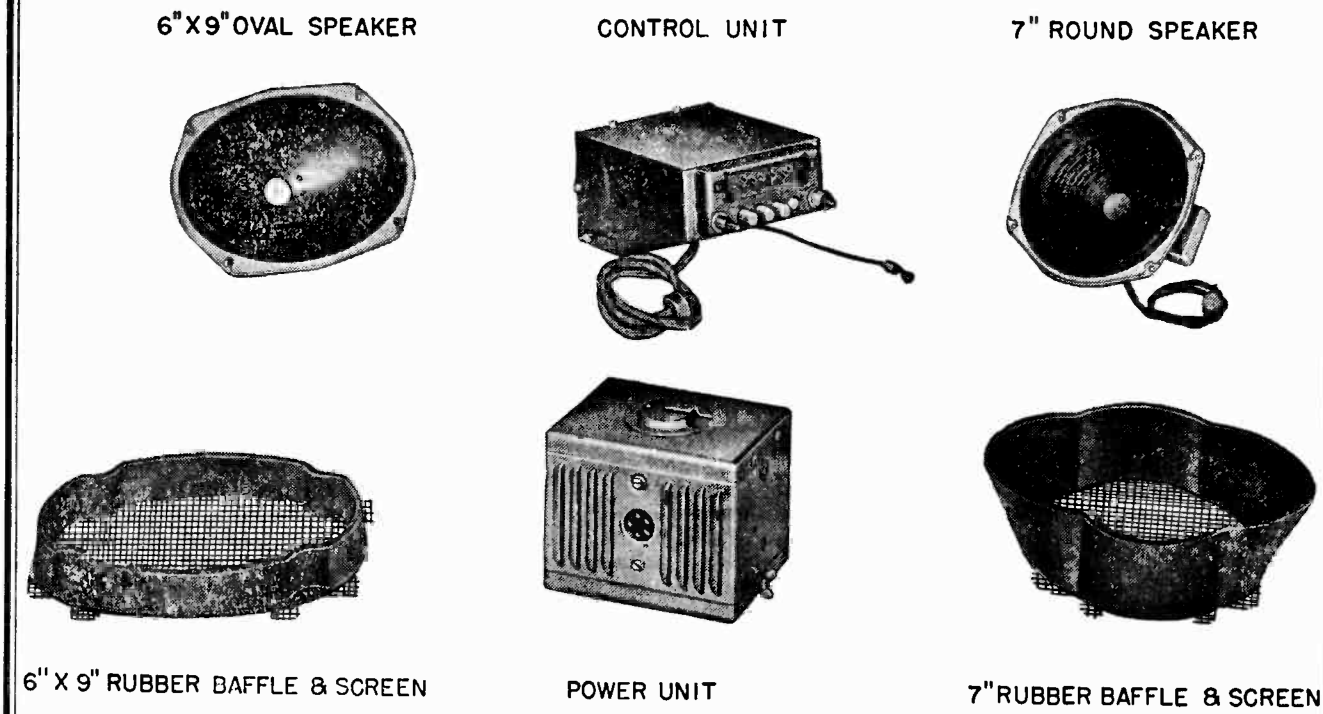


*Fig. 1. Parts in Master Package*

Only one of the speakers illustrated is supplied with each radio; the type of speaker you receive will be determined by the make of car for which the radio is ordered.

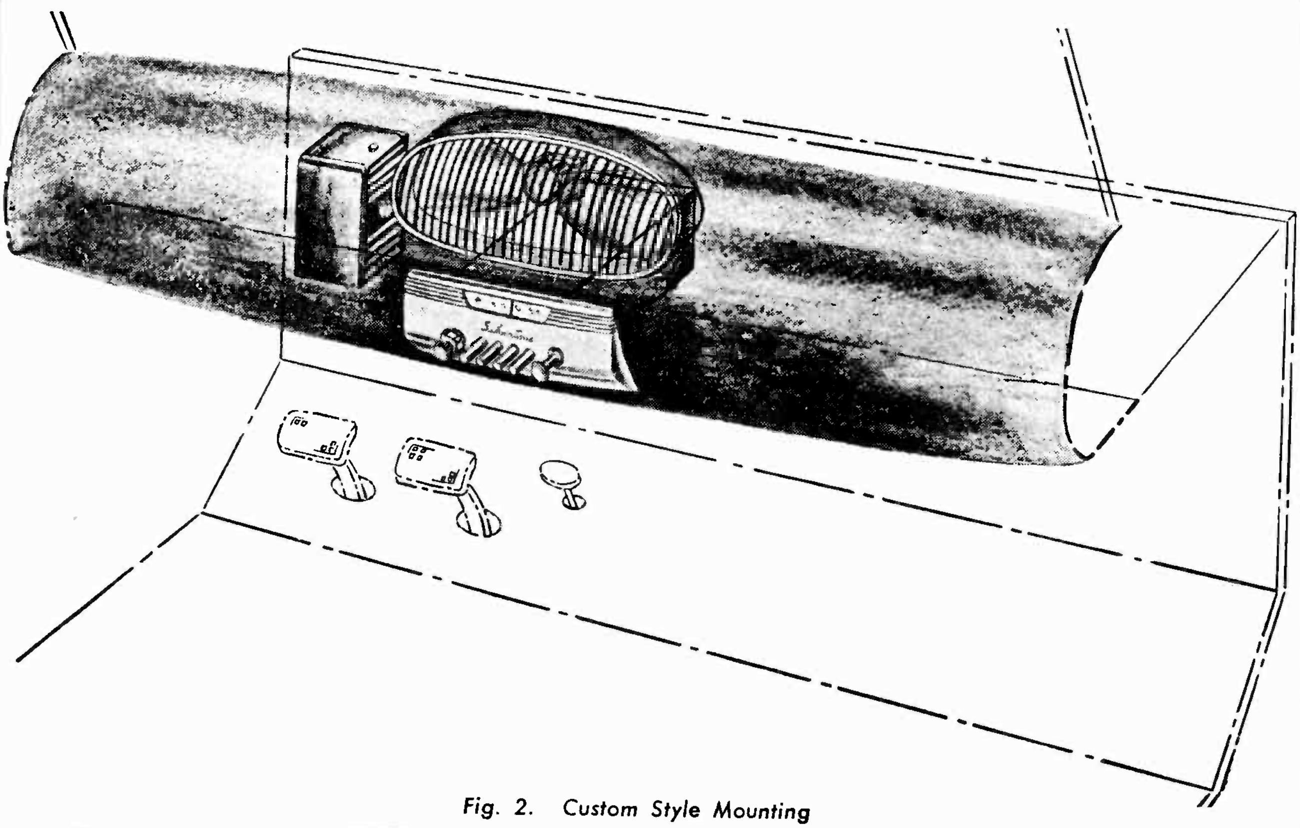

*Fig. 2. Custom Style Mounting*

MODEL 6295-1,
Ch. 528.6295-1

# DESCRIPTION

Your SILVERTONE radio is a newly designed DE LUXE PUSHBUTTON TUNING AUTOMOBILE RECEIVER of advance superheterodyne circuit design, for operation on the six volt storage battery in your car. It covers the frequency range from 540 KC to 1600 KC. In addition to PUSHBUTTON TUNING it features BASS-COMPENSATED VOLUME CONTROL supplemented by a MANUAL TONE CONTROL. It consists of three principal parts—the Control Unit, the Power Unit and the Speaker (See Fig. 1)—and is supplied with mounting parts to accommodate either custom installation in the instrument panel or underdash mounting. (See Figs. 2 and 3.)

Special care has been taken in the design of this receiver to insure the finest in sensitivity and selectivity, thereby insuring good reception of even distant or very weak stations. It is simple to install. The antenna input circuit is adjustable to permit the use of any two, three or four section telescopic, whip or "fishpole" type antenna.

Each complete radio, with accessories, is made up in two separate packages, one carton containing the Escutcheon Kit and speaker mounting hardware, the other carton containing the Control Unit, the Power Unit and either a 7" round speaker or a 6"x9" oval speaker, depending on the make and and model of the car for which the radio was ordered. This second carton will be stamped with the letter "A" to indicate that it contains a 7" round speaker, or the letter "B" to indicate the 6"x9" oval speaker.

Control Unit Escutcheon Kits (instrument panel matching or universal) are supplied as a separate item, thus permitting you to transfer the radio from one car to another with only the small expense of replacing the Escutcheon Kit and speaker if you desire to match the instrument panel of your new or different car. Instrument panel matching Escutcheon Kits for most popular late model cars are available at your nearest Sears retail store or Mail Order House. If your Silvertone radio is equipped with a universal underdash tuning panel it may be transferred as is to a different car without changing the Escutcheon Kit. However, if you wish to change from an underdash mounting to a custom style instrument panel mounting, this can be accomplished by discarding the universal Escutcheon Kit and replacing it with an instrument panel matching Escutcheon Kit ( and 6"x9" oval speaker, if necessary), as outlined above.

# INSTALLATION

## THE SPEAKER

The speakers (7" round or 6"x9" oval) are supplied with sponge rubber baffles for mounting on flat or curved instrument panels. The rubber baffle for the 7" round speaker has flared sides so that it will cover an oval opening in the car's speaker grill as well as a round opening.

Speaker mounting hardware is supplied with each Escutcheon Kit for mounting the speaker in your car. This includes a "U-shaped" bracket for mounting the round speaker in cars on which it is not possible to mount the speaker on existing bolts.

SPECIFIC INSTRUCTIONS PERTAINING TO THE MOUNTING OF THE SPEAKER AND CONTROL UNIT IN THE CAR FOR WHICH YOU ORDERED YOUR RADIO ARE CONTAINED IN THE LEAFLET PACKED IN THE ESCUTCHEON KIT.

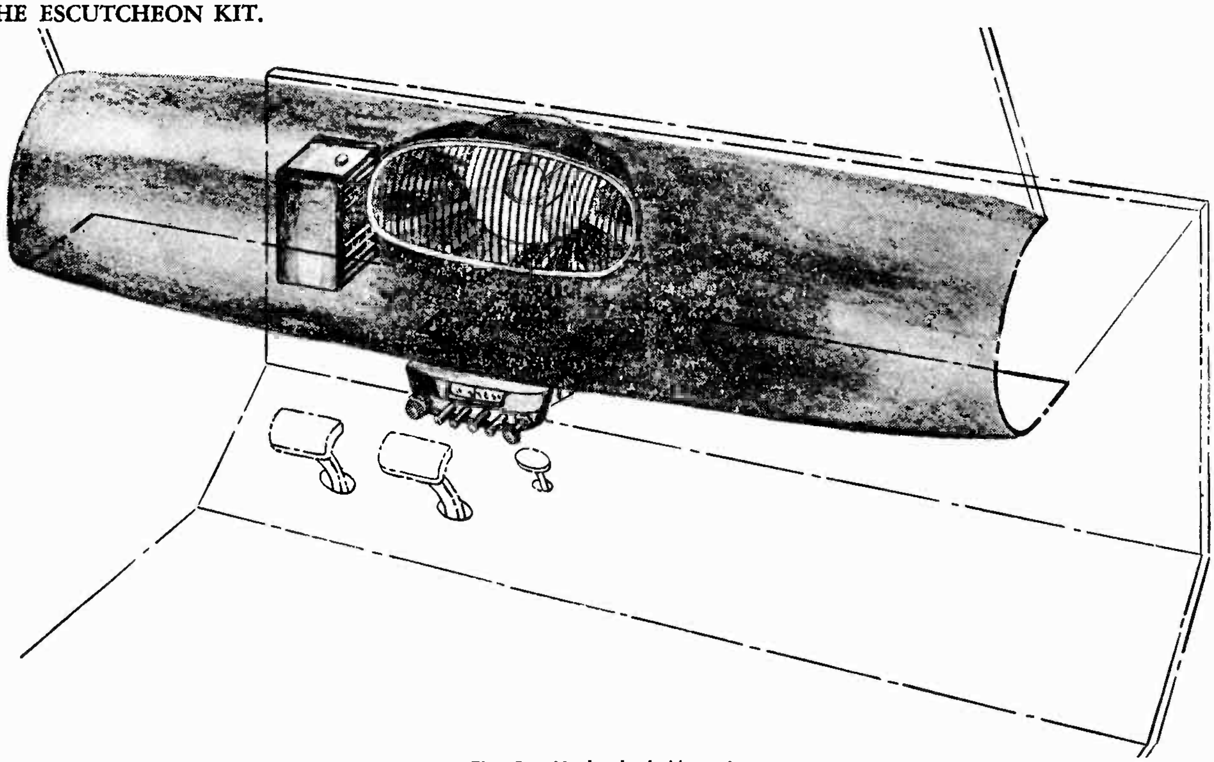

*Fig. 3. Underdash Mounting*

## MOUNTING THE POWER UNIT

The power unit mounts on the firewall (see Fig. 3). Determine a suitable position for mounting it by holding the case in your hands against the firewall. When a suitable position has been determined, then check the underhood side of the wall, to make sure there is no obstruction to prevent drilling a hole and inserting the mounting bolt. Having located a suitable position that will permit drilling, mark and drill a 5/16" hole. Insert the 1/4 inch diameter by 3 inch long, carriage type mounting bolt into the hole from the underdash side and attach the lockwasher and nut on the underhood side, but do not tighten. Now holding the case in a vertical position (with wingnut on the bottom), bring the case up to the bolt and slide the channel in the mounting plate down over the head of the bolt. The lockwasher and nut on the underhood side should then be tightened down securely.

If, because of limited space, you find it necessary to mount the power unit in a horizontal or angle position, this type of mounting is entirely satisfactory and has no ill effect on the operation of the radio.

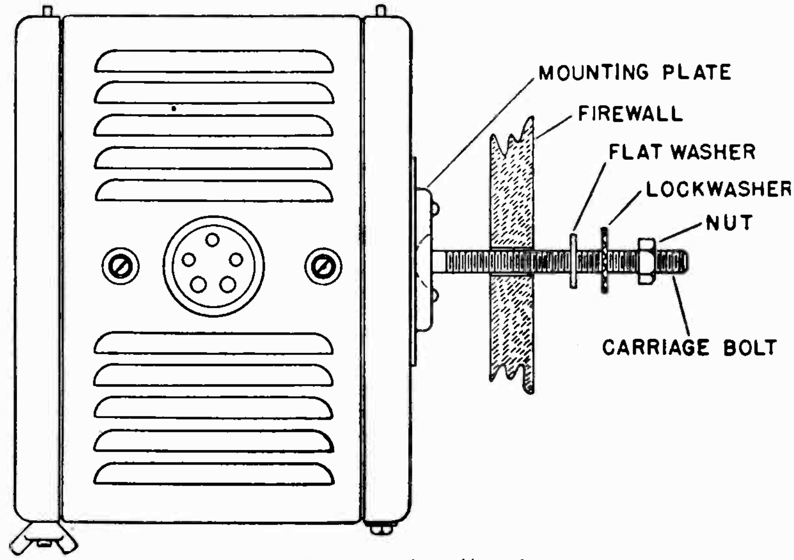


*Fig. 3. Power Unit Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the plug into the antenna receptacle on the side of the control unit (see Fig. 4). Plug the speaker and power cables into the sockets provided on the sides of the Power Unit. Connect the "A" lead to the battery side of the ammeter behind the instrument panel. The fuse should then be inserted into the holder in the "A' lead. These connections are illustrated in Fig. 4.

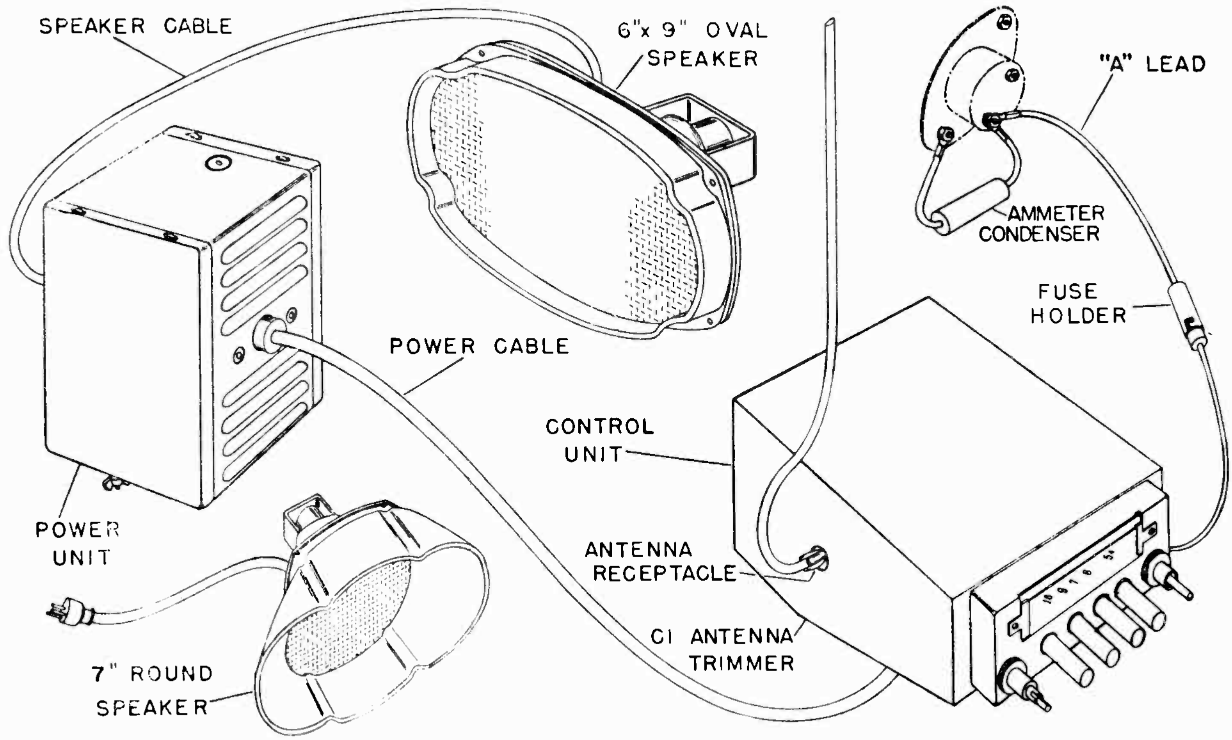


*Fig. 4. Connecting the Radio*

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## CONTROLS

There are six operating controls on the front of the Control Unit, (see Fig. 5). The two outside knobs are dual purpose controls, the other four are PUSHBUTTON STATION SELECTORS. The left-hand control consists of two knobs mounted on concentric shafts; the front knob (round) is the ON-OFF-SWITCH and VOLUME CONTROL; the rear knob (with four points) is the MANUAL TONE CONTROL. The knob on the right is the MANUAL TUNING CONTROL and it also serves as a fifth PUSHBUTTON STATION SELECTOR. The use of these controls is explained below.

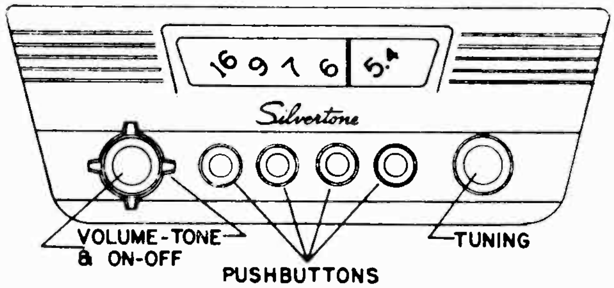



*Fig. 5. Control Unit Panel*

## THE ON-OFF-SWITCH AND VOLUME CONTROL

When the outer left knob is turned all the way to the left the receiver is switched off and there is no drain from the car's battery. Rotating the knob part of a turn toward the right switches the receiver on and illuminates the dial. Further rotation of the knob increases the volume. After a station has been tuned in properly the volume control knob should be adjusted to give the desired volume.

## MANUAL TUNING

Use the right-hand knob to tune in stations manually. To select a station, push in the knob and tune the radio by turning the knob until the desired station is heard. The dial pointer will indicate the frequency to which you are tuned.

The dial is marked in Kilocycles minus the final two zeroes. Always tune carefully for the clearest sound and minimum background noise.

## PUSHBUTTON TUNING

Adjusting the pushbutton station selectors is simple and quick. No tools are required and a button may be set up for a new station in a few seconds. Each button can be tuned to any station in the broadcast band; thus you can arrange the tuning in any order to suit your convenience.

Before making the following adjustments, turn the radio on and let it warm up for 15 minutes.

Choose the PUSHBUTTON STATION SELECTOR you wish to adjust, and push the button all the way in; it will lock in this position. Now tune in the station to which you wish to pre-tune by turning the button to right or left until the desired station is heard. The dial pointer will indicate the frequency to which you are tuned, but to insure the accuracy of the setting, keep the volume control turned low and adjust the button for sharpest tuning. This will be indicated when the sound is clearest and noise at a minimum. The button is now properly adjusted and should not be turned again until it is desired to set it for a different station.

Follow the above procedure to adjust the remaining PUSHBUTTON STATION SELECTORS.

As was mentioned under the heading *CONTROLS,* the MANUAL TUNING CONTROL has been designed to serve as a fifth PUSHBUTTON STATION SELECTOR. If you wish to use this control as a PUSHBUTTON STATION SELECTOR, simply follow the procedure given above for adjusting the other PUSHBUTTON STATION SELECTORS. However, remember that if you use this control for MANUAL TUNING at any time, it will have to be re-set to the desired station if you wish to use it again as a PUSHBUTTON STATION SELECTOR.

## S84--382 SUPPRESSION KIT AND MISCELLANEOUS PARTS

| | |
|---|---|
| 1 S84-233—"A" lead assembly | 20" wire braid |
| 1 A43-10—Fuse | 1 bolt—1/4" diameter by 3" long |
| 1 A81-13—Sleeve (for fuse) | 1 lockwasher |
| 2 A16-183—.5 MFD condensers | 1 flat washer |
| 1 A96-4—Distributor Suppressor | 1 nut |

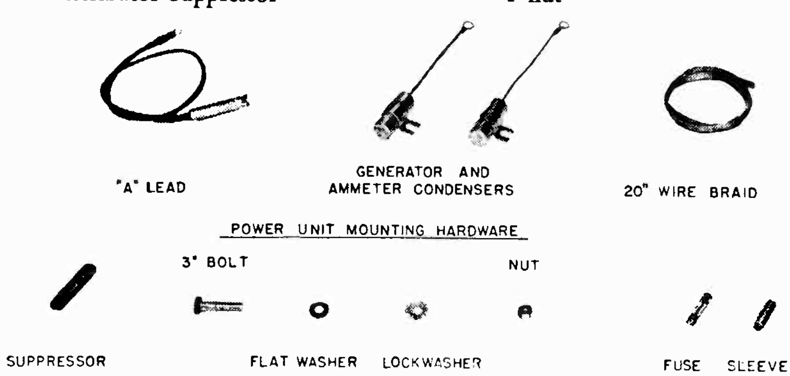



*Fig. 6. Suppression Kit and Miscellaneous Parts*

## THE TONE CONTROL

The inner left knob (with four points) is the TONE CONTROL, which permits you to select the most pleasing tonal range. When it is turned all the way to the right (clockwise) the tone is treble or brilliant. This position is best for the most distinct reproduction, especially of speech. Turning the knob to the left (counterclockwise) makes the tone more mellow. This is often desirable for certain types of music and is also useful to lessen the effects of static and electrical noise. Turn the knob to the position that gives the tone most pleasing to you.

## MATCHING THE ANTENNA

An adjusting screw for matching the receiver to the particular antenna used is accessible through a hole in the bottom side of the Control Unit. (See Fig. 4.) Set the dial pointer between 1400 KC and 1500 KC, where no station is heard with the volume control fully on. Then use a small screw driver to turn the adjusting screw to the point giving the most hiss or noise. The set is now ready for operation.

# ELIMINATING MOTOR NOISE

Every precaution was taken in the design of this radio to eliminate motor noise interference. However, in the remote instance that it may be found desirable to take further steps, the following notes are added for your guidance.

IMPORTANT: Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all mounting points. A good electrical contact at these points will aid materially in eliminating motor noise.

## GENERATOR CONDENSER

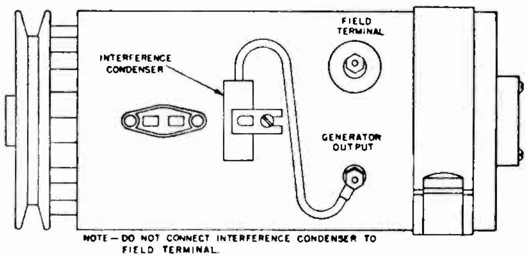



*Fig. 7*

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.

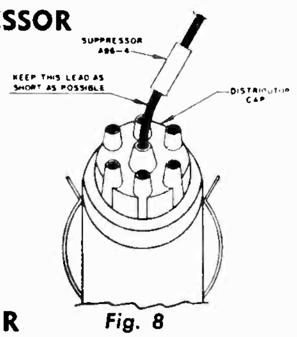



*Fig. 8*

## AMMETER CONDENSER

A .5 MFD bypass condenser is furnished for attaching to the ammeter. This should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby. In most case the use of this condenser, the distributor suppressor, and the generator condenser, will eliminate all objectionable ignition interference.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION LEADS

In many cases 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.

## GROUNDING THE POWER CABLE

In some cases motor noise is reduced by grounding the power cable to the power unit case. See Fig. 4. Loosen one of the two screws located on either side of the power cable socket on the power unit. Cut a six inch length off the wire braid supplied in the Suppression Kit. Fasten one end under the screw and tighten down the screw again. Wrap the remainder of the braid around the cable and solder or tape it securely in place.

## 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## BONDING OF STEERING COLUMN TO BODY

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

MODEL 6295-1,
Ch. 528.6295-1

## ELECTRICAL SPECIFICATIONS

Power Supply . . . . . . 6.3 volts DC
Current . . . . . . 6.5 amp. average
Frequency Range . . . . . . 540 to 1600 KC
I. F. Frequency . . . . . . 262 KC
Speaker . . . . . . 7" round or 6"x9" oval
Power Output . . . . . . 2.5 watts, undistorted
5 watts, maximum
Sensitivity . . . . . . 3 microvolt average for 1 watt output
Selectivity . . . 40 KC broad at 1000 times signal, at 1000 KC

The set contains the following:
1—6BA6—R. F. Amplifier.
1—6BE6—Converter.
1—6BA6—I. F. Amplifier.
1—6AT6—Detector—AVC—1st audio.
1—6V6GT—Power output.

1—6X5GT—Rectifier.

## SERVICE NOTES

Voltages taken from the different points of the circuit to chassis are measured with the volume and tone controls in maximum position, all tubes and the rectifier in their sockets, no signal applied, and with a voltmeter having a resistance of 20,000 ohm per volt. These voltages are clearly shown on the schematic diagram (Figs. 11 and 12). All voltages should be measured with an input voltage of 6.3 volts DC.

The tubes and rectifier are accessible for servicing without removing the chassis. Loosen the wing-nut on the cover of the power supply case and lift off the cover. On the RF Tuning Unit, loosen the wing nuts on the two stud bolts protruding from the side of the case at the top, rear, and remove the plate over the tubes. CAUTION: Be sure to replace the tubes and the rectifier in the proper sockets. Refer to Tube and Rectifier Location Pictorials, Fig. 10 and 14.

WARNING: The dash pot (brass cylinder on the mechanical tuner) should never be oiled. If it is ever necessary to make adjustments on the mechanical tuner, the dash pot may be cleaned with ordinary cleaning solvents.

## ALIGNING INSTRUCTIONS

Never attempt any adjustments on this receiver unless it becomes necessary to replace the coils or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, the rectifier, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE." After re-alignment has been completed repeat the procedure as a final check.

## INSTRUCTIONS FOR REMOVING THE CHASSIS FROM THE CASE

RF TUNING UNIT: Remove the knobs and nuts from the two control shafts. Take out the six self-tapping screws around the back edge of the case and remove the back cover. Remove the plate over the tubes (see service notes). Loosen the screw securing the cable clamp, slip the cable out from under the clamp and out of the notch. Remove the lead from the plug-in terminal on the spark plate attached to the inside top of case. Slide the "A" lead out of the notch. Now tilt the front of the case up so that the chassis can slide out. Grasp the chassis at the rear with the fingers against the chassis plate and with the thumb hooked over the IF transformer. Pull the chassis straight back, being careful that the pointer bracket does not get caught against the spark plate components. Handle the chassis carefully and set down gently so that the mechanical tuning parts may not be damaged or the settings of the coil cores upset by jarring.

POWER SUPPLY: Loosen the wing-nut and lift the top cover off. Remove the 6-32x½ screw securing the high voltage cable socket to the case. Remove the four screws (one on each side) near the bottom outside of the case. Now take the case in one hand and grasp the output transformer with the other hand and lift the chassis straight up.

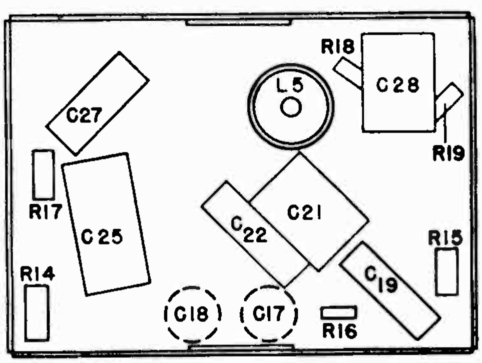
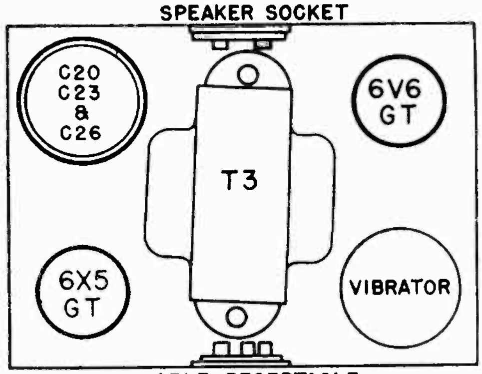


*Fig. 9. Power Unit—Bottom View*

SPEAKER SOCKET


CABLE RECEPTACLE
*Fig. 10. Power Unit—Top View*

MODEL 6295-1,
Ch. 528.6295-1

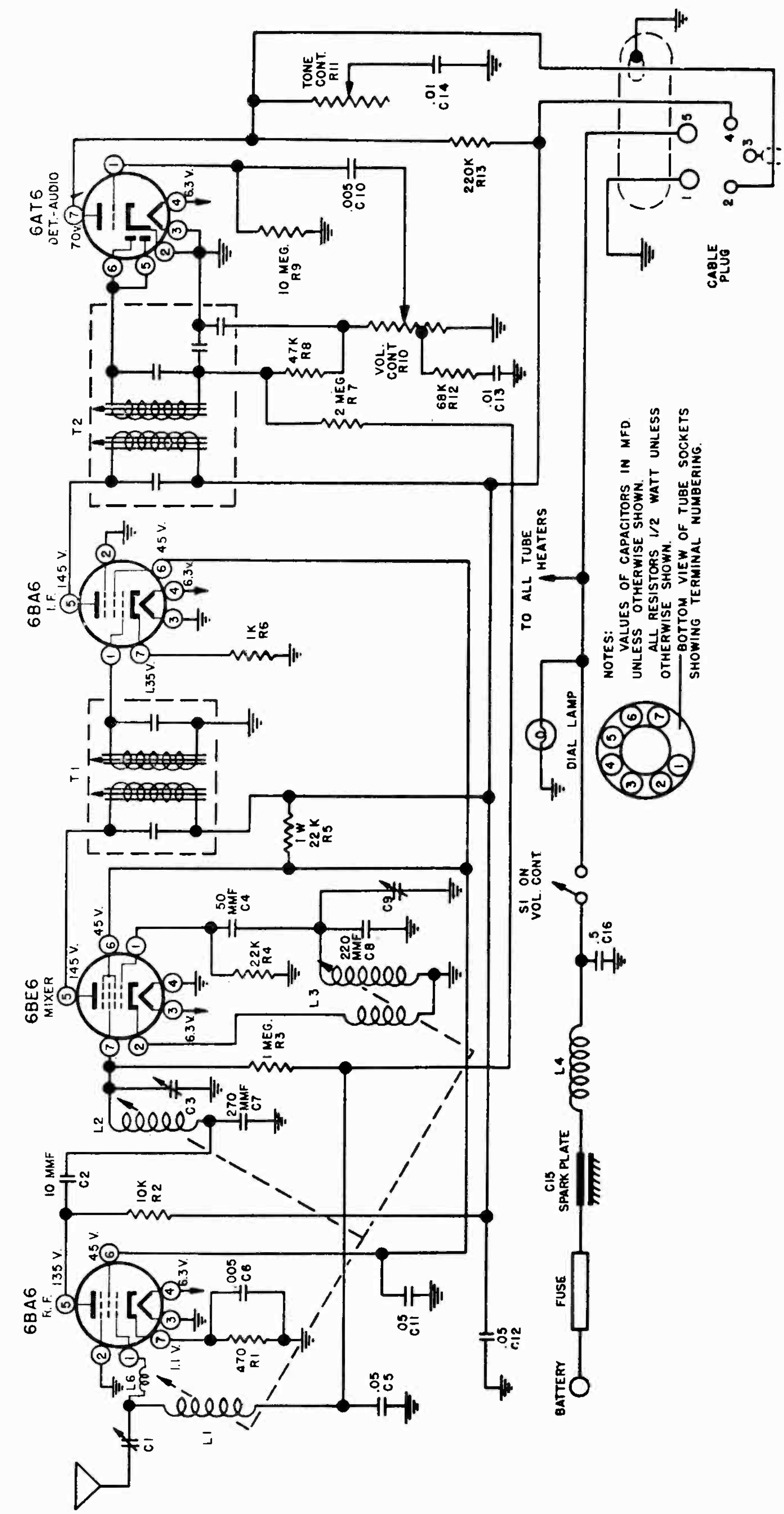



*Fig. 11. Schematic Diagram—Control Unit*

MODEL 6295-1,
Ch. 528.6295-1

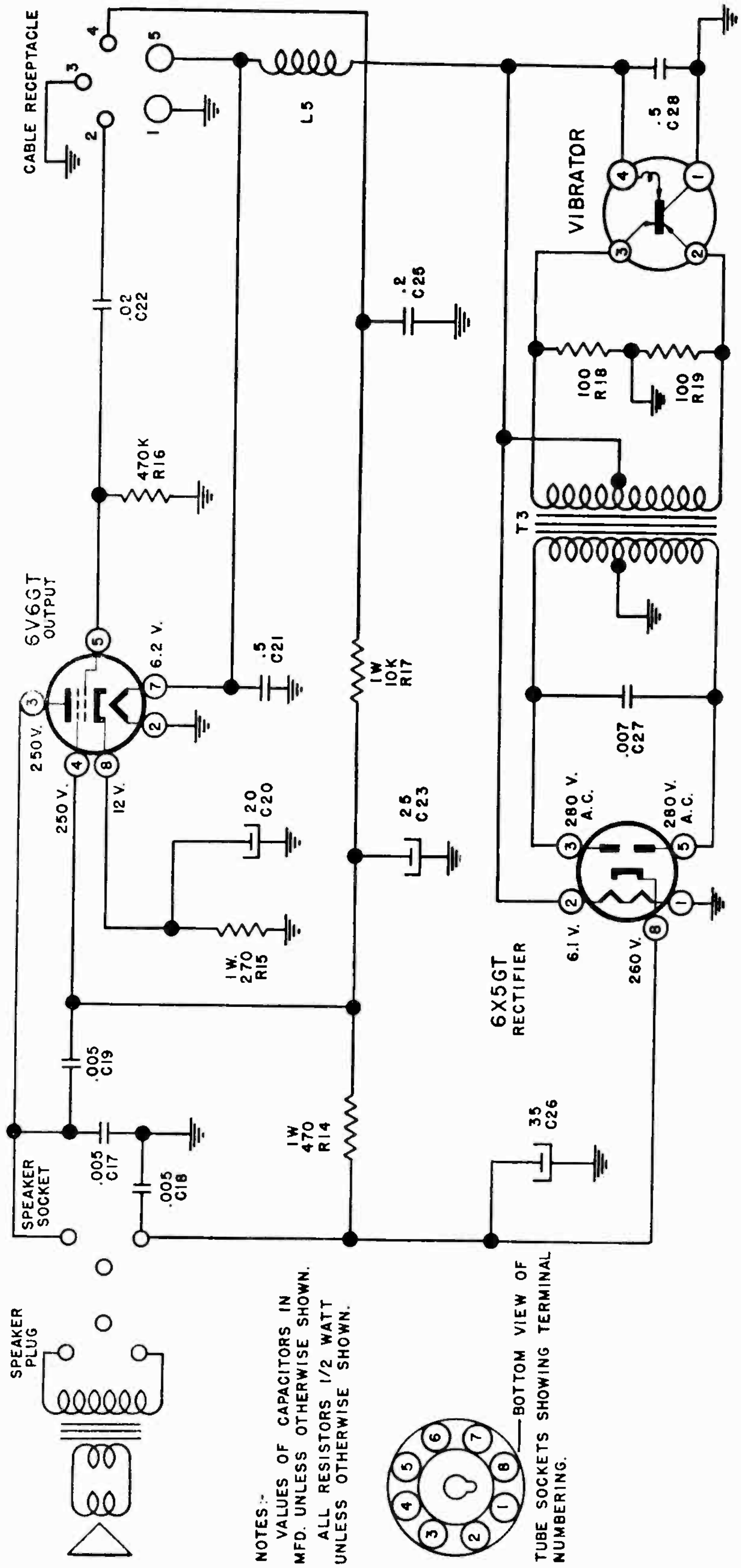



*Fig. 12. Schematic Diagram—Power Unit*

NOTES:-
VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE SHOWN.
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SHOWN.

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD., 30 MMFD.

For alignment points refer to Figures 13 and 14.

| Slug Position | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Out | 262 KC | .1 MFD. | 6BE6 Grid | T2 | Maximum | Output I.F. |
| Fully Out | 262 KC | .1 MFD. | 6BE6 Grid | T1 | Maximum | Input I.F. |
| Fully Out | 1610 KC | * | Ant. lead | C9 | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | * | Ant. lead | C3 | Maximum | R.F. |
| Tune in signal from generator | 1400 KC | * | Ant. lead | C1 | Maximum | Antenna |

*30 MMFD across input terminals and 75 MMFD in series with "hot" side of signal generator leads.

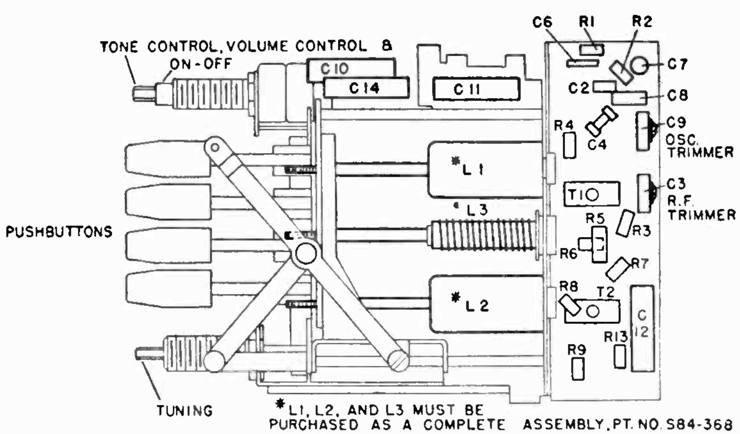



Fig. 13. Control Unit—Bottom View

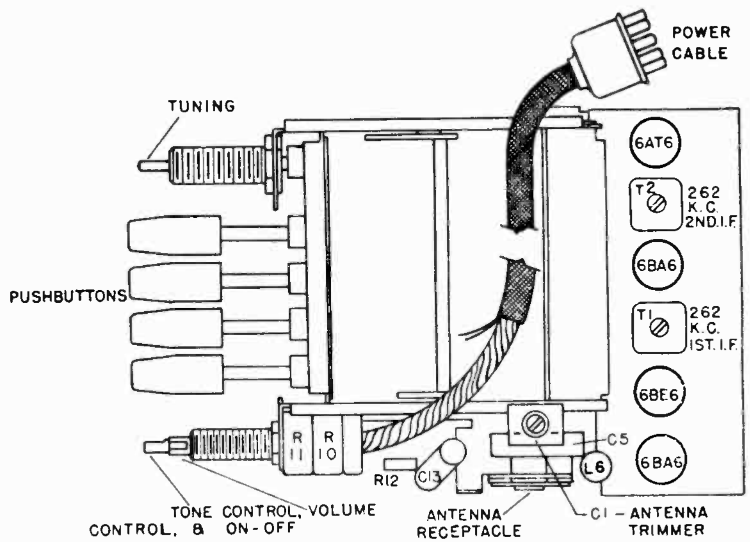



Fig. 14. Control Unit—Top View

MODEL 6295-1,
Ch. 528.6295-1

# PARTS LIST

| Schematic Location | Part No. | Description |
|---|---|---|
| C1 | A20-148 | Capacitor—antenna trimmer |
| C2 | A15-197 | Capacitor—ceramic—10 mmfd. |
| C3, C9 | A20-147 | Capacitor—dual trimmer—R.F. and Oscillator |
| C4 | A15-194 | Capacitor—ceramic—50 mmfd. |
| C5 | A16-197 | Capacitor—.05 mfd.—200 v. |
| C6, C17, C18 | A16-177 | Capacitor—ceramic—.005 mfd. |
| C7 | A15-215 | Capacitor—ceramic—270 mmfd. |
| C8 | A15-218 | Capacitor—silver mica—220 mmfd. |
| C10, C19 | A16-190 | Capacitor—.005 mfd.—600 v. |
| C11, C12 | A16-189 | Capacitor—.05 mfd.—400 v. |
| C13, C14 | A16-192 | Capacitor—.01 mfd.—400 v. |
| C15 | | Capacitor—spark plate |
| C16, C21, C28 | A16-184 | Capacitor—.5 mfd.—100 v. |
| | A18-300 | Capacitor—electrolytic |
| C20 | | 20 mfd.—25 v. |
| C23 | | 25 mfd.—350 v. |
| C26 | | 35 mfd.—400 v. |
| C22 | A16-206 | Capacitor—.02 mfd.—600 v. |
| C25 | A16-188 | Capacitor—.2 mfd.—400 v. |
| C27 | A16-207 | Capacitor—.007 mfd.—1600 v.—oil filled |
| | B23-157 | Cable—power |
| L1, L2, L3 | S84-368 | Coil—assembly—including carriage and slugs, etc. |
| L4 | A33-229 | Coil—"A" line choke |
| L5 | A33-228 | Coil—vibrator hash choke |
| L6 | A10-527 | Coil—antenna loading |
| | A83-421 | Clip—I.F. transformer mounting |
| R10, R11, S1 | A24-183 | Control—dual—ON-OFF-VOLUME and TONE |
| | A43-10 | Fuse—15 amp.—3AG |
| | A47-115 | Grommet—rubber—power cable |
| | S84-233 | Kit—"A" lead assembly |
| | B52-296 | Knob—Tuning |
| | B52-297 | Knob—Volume |
| | B52-298 | Knob—Tone |
| | A89-7 | Lamp—pilot—No. 47 Bayonet |
| R1 | A60-770 | Resistor—470 ohm—½ watt |
| R2 | A60-760 | Resistor—10K ohm—½ watt |
| R3 | A60-668 | Resistor—1 megohm—½ watt |
| R4 | A60-744 | Resistor—22K ohm—½ watt |
| R5 | A60-773 | Resistor—22K ohm—1 watt |
| R6 | A60-675 | Resistor—1000 ohm—½ watt |
| R7 | A60-726 | Resistor—2.2 megohm—½ watt |
| R8 | A60-730 | Resistor—47K ohm—½ watt |
| R9 | A60-728 | Resistor—10 megohm—½ watt |
| R12 | A60-775 | Resistor—68K ohm—½ watt |
| R13 | A60-672 | Resistor—220K ohm—½ watt |
| R14 | A60-694 | Resistor—470 ohm—1 watt |
| R15 | A60-754 | Resistor—270 ohm—1 watt |
| R16 | A60-731 | Resistor—470K ohm—½ watt |
| R17 | A60-698 | Resistor—10K ohm—1 watt |
| R18, R19 | A60-752 | Resistor—100 ohm—½ watt |
| | A83-646 | Retainer—dial scale—left |
| | A83-647 | Retainer—dial scale—right |
| | C79-387 | *Speaker—7" round |
| | C79-386 | *Speaker—6"x9" oval |
| | S84-383 | Transformer—output—with cable and plug |
| T1 | A10-537 | Transformer—I.F. No. 1 |
| T2 | A10-540 | Transformer—I.F. No. 2 |
| T3 | C80-258 | Transformer—power |
| | A34-105 | Vibrator—Mallory No. 659 |

## Mechanical Tuner Parts

| | |
|---|---|
| A56-141 | Pusher nut—manual tuning |
| A56-142 | Pusher nut—pushbutton tuning |
| A75-75 | Pusher rod—manual tuning |
| S84-355 | Pushbutton and rod assembly |

**IMPORTANT:** All tubular condensers must be high temperature (85°C.) wax type.

*When ordering a replacement speaker, order the same type, 7" round or 6"x9" oval, as the old one that was installed in your car.

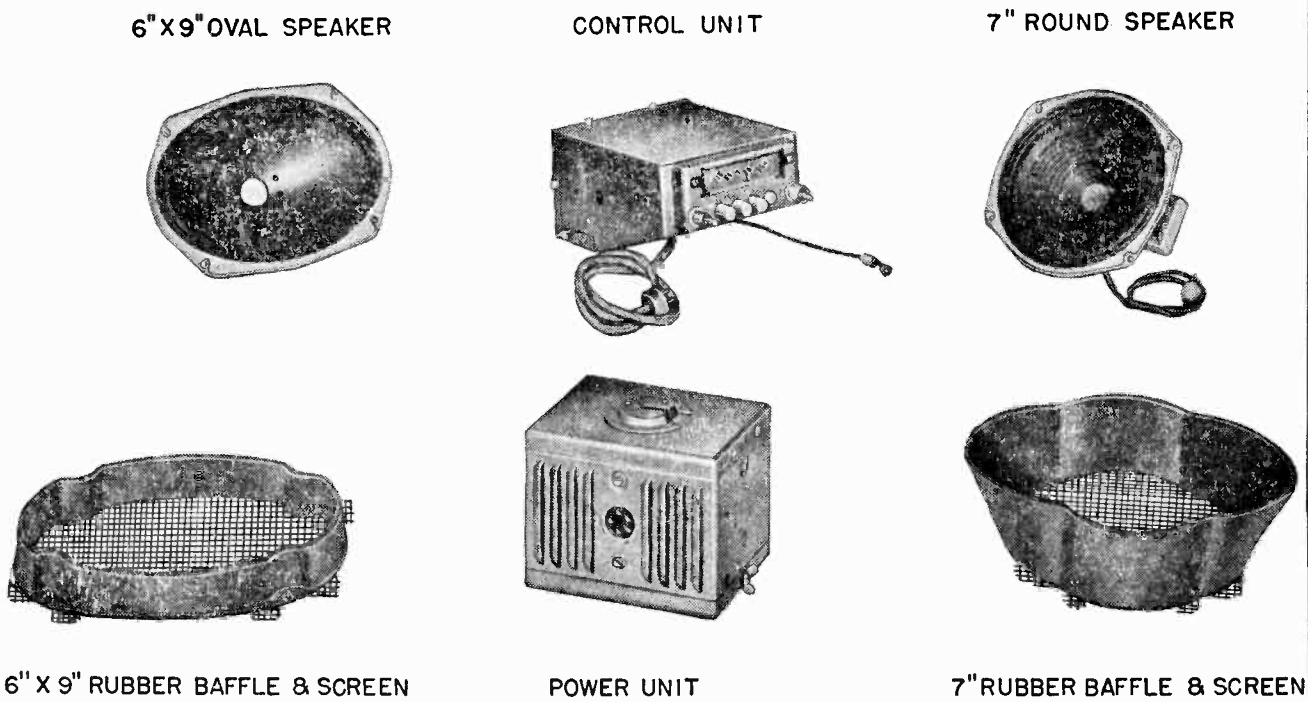



*Fig. 1. Parts in Master Package*

Only one of the speakers illustrated is supplied with each radio; the type of speaker you receive will be determined by the make of car for which the radio is ordered.

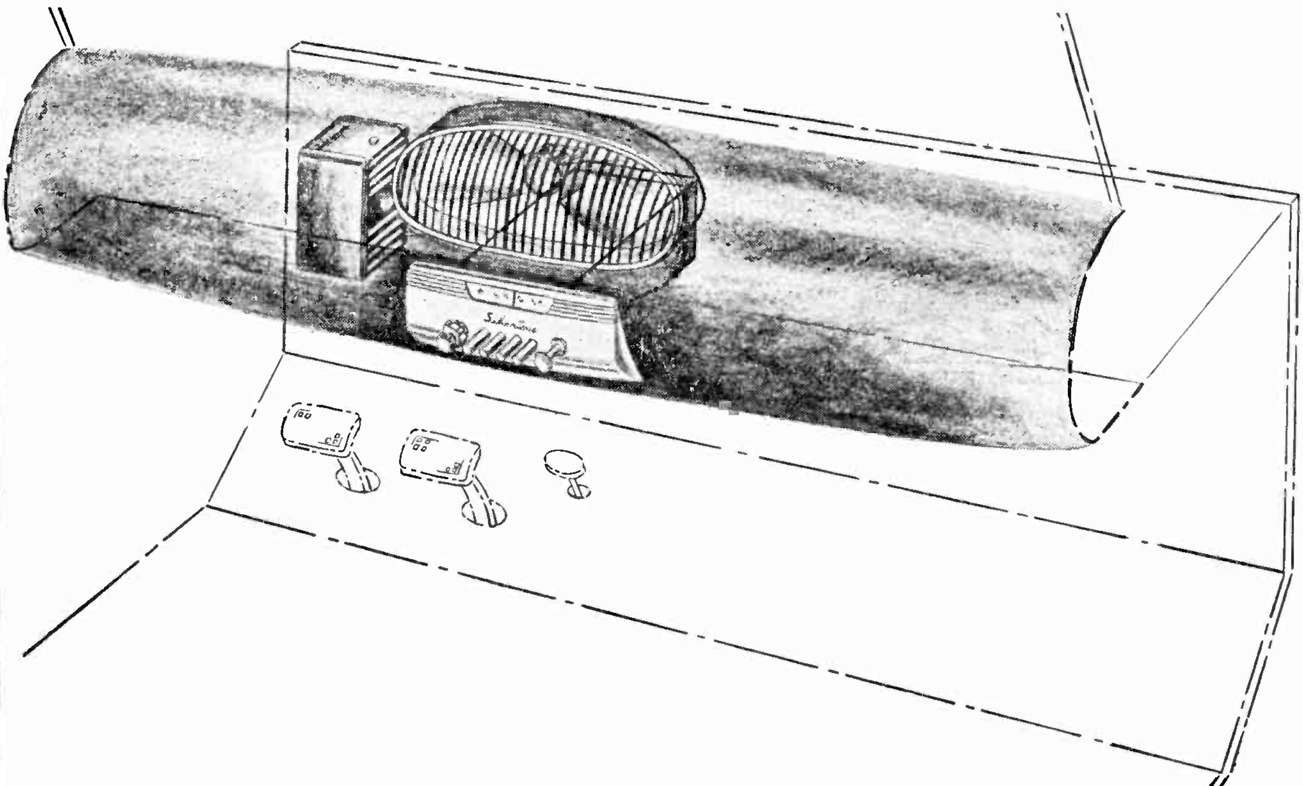


*Fig. 2. Custom Style Mounting*

MODEL 6295-2,
Ch. 528.6295-2

# DESCRIPTION

Your SILVERTONE radio is a newly designed DE LUXE PUSHBUTTON TUNING AUTOMOBILE RECEIVER of advance superheterodyne circuit design, for operation on the six volt storage battery in your car. It covers the frequency range from 540 KC to 1600 KC. In addition to PUSHBUTTON TUNING it features BASS-COMPENSATED VOLUME CONTROL supplemented by a MANUAL TONE CONTROL. It consists of three principal parts—the Control Unit, the Power Unit and the Speaker (See Fig. 1)—and is supplied with mounting parts to accommodate either custom installation in the instrument panel or underdash mounting. (See Figs. 2 and 3.)

Special care has been taken in the design of this receiver to insure the finest in sensitivity and selectivity, thereby insuring good reception of even distant or very weak stations. It is simple to install. The antenna input circuit is adjustable to permit the use of any two, three or four section telescopic, whip or "fishpole" type antenna.

Each complete radio, with accessories, is made up in two separate packages, one carton containing the Escutcheon Kit and speaker mounting hardware, the other carton containing the Control Unit, the Power Unit and either a 7" round speaker or a 6"x9" oval speaker, depending on the make and and model of the car for which the radio was ordered. This second carton will be stamped with the letter "A" to indicate that it contains a 7" round speaker, or the letter "B" to indicate the 6"x9" oval speaker.

Control Unit Escutcheon Kits (instrument panel matching or universal) are supplied as a separate item, thus permitting you to transfer the radio from one car to another with only the small expense of replacing the Escutcheon Kit and speaker if you desire to match the instrument panel of your new or different car. Instrument panel matching Escutcheon Kits for most popular late model cars are available at your nearest Sears retail store or Mail Order House. If your Silvertone radio is equipped with a universal underdash tuning panel it may be transferred as is to a different car without changing the Escutcheon Kit. However, if you wish to change from an underdash mounting to a custom style instrument panel mounting, this can be accomplished by discarding the universal Escutcheon Kit and replacing it with an instrument panel matching Escutcheon Kit ( and 6"x9" oval speaker, if necessary), as outlined above.

# INSTALLATION

## THE SPEAKER

The speakers (7" round or 6"x9" oval) are supplied with sponge rubber baffles for mounting on flat or curved instrument panels. The rubber baffle for the 7" round speaker has flared sides so that it will cover an oval opening in the car's speaker grill as well as a round opening.

Speaker mounting hardware is supplied with each Escutcheon Kit for mounting the speaker in your car. This includes a "U-shaped" bracket for mounting the round speaker in cars on which it is not possible to mount the speaker on existing bolts.

SPECIFIC INSTRUCTIONS PERTAINING TO THE MOUNTING OF THE SPEAKER AND CONTROL UNIT IN THE CAR FOR WHICH YOU ORDERED YOUR RADIO ARE CONTAINED IN THE LEAFLET PACKED IN THE ESCUTCHEON KIT.

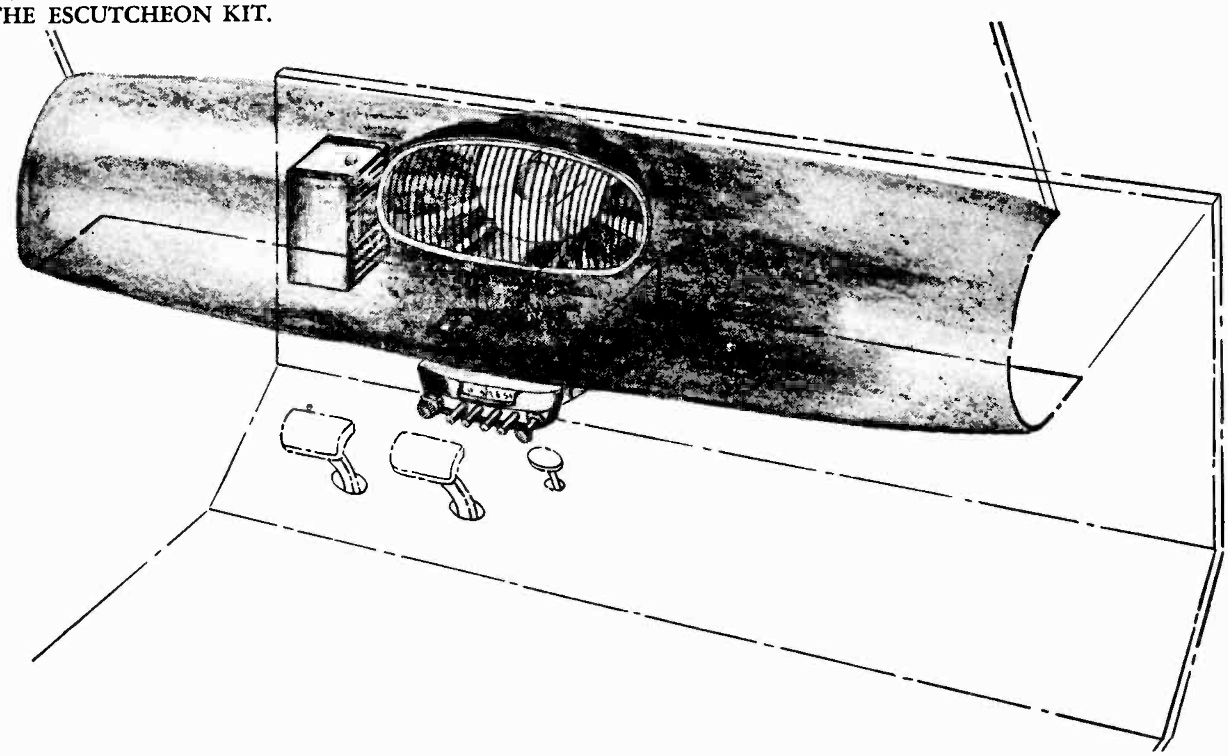


*Fig. 3. Underdash Mounting*

MODEL 6295-2,
Ch. 528.6295-2

## MOUNTING THE POWER UNIT

The power unit mounts on the firewall (see Fig. 3). Determine a suitable position for mounting it by holding the case in your hands against the firewall. When a suitable position has been determined, then check the underhood side of the wall, to make sure there is no obstruction to prevent drilling a hole and inserting the mounting bolt. Having located a suitable position that will permit drilling, mark and drill a 5/16" hole. Insert the 1/4 inch diameter by 3 inch long, carriage type mounting bolt into the hole from the underdash side and attach the lockwasher and nut on the underhood side, but do not tighten. Now holding the case in a vertical position (with wingnut on the bottom), bring the case up to the bolt and slide the channel in the mounting plate down over the head of the bolt. The lockwasher and nut on the underhood side should then be tightened down securely.

If, because of limited space, you find it necessary to mount the power unit in a horizontal or angle position, this type of mounting is entirely satisfactory and has no ill effect on the operation of the radio.

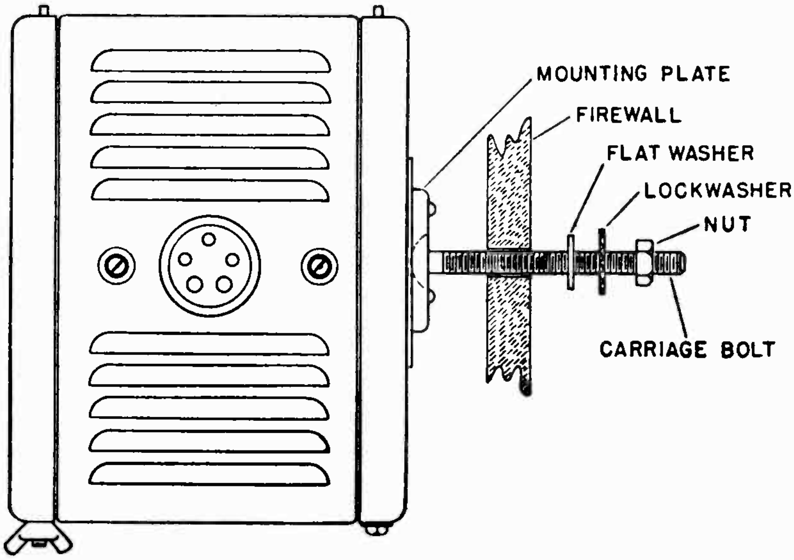



*Fig. 3. Power Unit Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the plug into the antenna receptacle on the side of the control unit (see Fig. 4). Plug the speaker and power cables into the sockets provided on the sides of the Power Unit. **IMPORTANT: LOOSEN SCREW "A" (SEE FIG. 4) ON POWER UNIT CASE. WRAP THE PIGTAIL OF BRAID ON THE POWER SUPPLY CABLE AROUND THE SCREW AND TIGHTEN DOWN THE SCREW AGAIN. BE SURE THAT THE PIGTAIL IS SECURELY HELD BY THE SCREW.** Connect the "A" lead to the battery side of the ammeter behind the instrument panel. The fuse should then be inserted into the holder in the "A" lead. These connections are illustrated in Fig. 4.

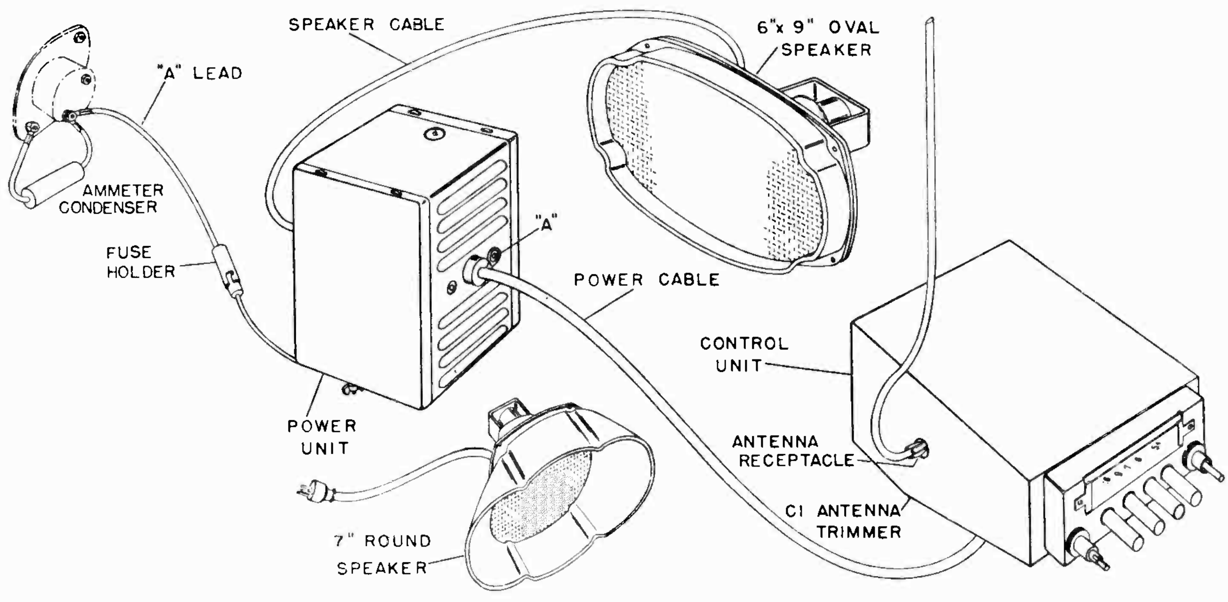



*Fig. 4. Connecting the Radio*

MODEL 6295-2,
Ch. 528.6295-2

## CONTROLS

There are six operating controls on the front of the Control Unit, (see Fig. 5). The two outside knobs are dual purpose controls, the other four are PUSHBUTTON STATION SELECTORS. The left-hand control consists of two knobs mounted on concentric shafts; the front knob (round) is the ON-OFF-SWITCH and VOLUME CONTROL; the rear knob (with four points) is the MANUAL TONE CONTROL. The knob on the right is the MANUAL TUNING CONTROL and it also serves as a fifth PUSHBUTTON STATION SELECTOR. The use of these controls is explained below.

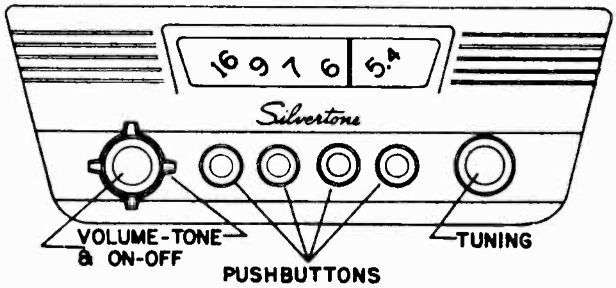



*Fig. 5. Control Unit Panel*

## THE ON-OFF-SWITCH AND VOLUME CONTROL

When the outer left knob is turned all the way to the left the receiver is switched off and there is no drain from the car's battery. Rotating the knob part of a turn toward the right switches the receiver on and illuminates the dial. Further rotation of the knob increases the volume. After a station has been tuned in properly the volume control knob should be adjusted to give the desired volume.

## MANUAL TUNING

Use the right-hand knob to tune in stations manually. To select a station, push in the knob and tune the radio by turning the knob until the desired station is heard. The dial pointer will indicate the frequency to which you are tuned.

The dial is marked in Kilocycles minus the final two zeroes. Always tune carefully for the clearest sound and minimum background noise.

## PUSHBUTTON TUNING

Adjusting the pushbutton station selectors is simple and quick. No tools are required and a button may be set up for a new station in a few seconds. Each button can be tuned to any station in the broadcast band; thus you can arrange the tuning in any order to suit your convenience.

Before making the following adjustments, turn the radio on and let it warm up for 15 minutes.

Choose the PUSHBUTTON STATION SELECTOR you wish to adjust, and push the button all the way in; it will lock in this position. Now tune in the station to which you wish to pre-tune by turning the button to right or left until the desired station is heard. The dial pointer will indicate the frequency to which you are tuned, but to insure the accuracy of the setting, keep the volume control turned low and adjust the button for sharpest tuning. This will be indicated when the sound is clearest and noise at a minimum. The button is now properly adjusted and should not be turned again until it is desired to set it for a different station.

Follow the above procedure to adjust the remaining PUSHBUTTON STATION SELECTORS.

As was mentioned under the heading *CONTROLS*, the MANUAL TUNING CONTROL has been designed to serve as a fifth PUSHBUTTON STATION SELECTOR. If you wish to use this control as a PUSHBUTTON STATION SELECTOR, simply follow the procedure given above for adjusting the other PUSHBUTTON STATION SELECTORS. However, remember that if you use this control for MANUAL TUNING at any time, it will have to be re-set to the desired station if you wish to use it again as a PUSHBUTTON STATION SELECTOR.

## S84--382 SUPPRESSION KIT AND MISCELLANEOUS PARTS

| | |
|---|---|
| 1 S84-233—"A" lead assembly | 20" wire braid |
| 1 A43-10—Fuse | 1 bolt—¼" diameter by 3" long |
| 1 A81-13—Sleeve (for fuse) | 1 lockwasher |
| 2 A16-183—.5 MFD condensers | 1 flat washer |
| 1 A96-4—Distributor Suppressor | 1 nut |

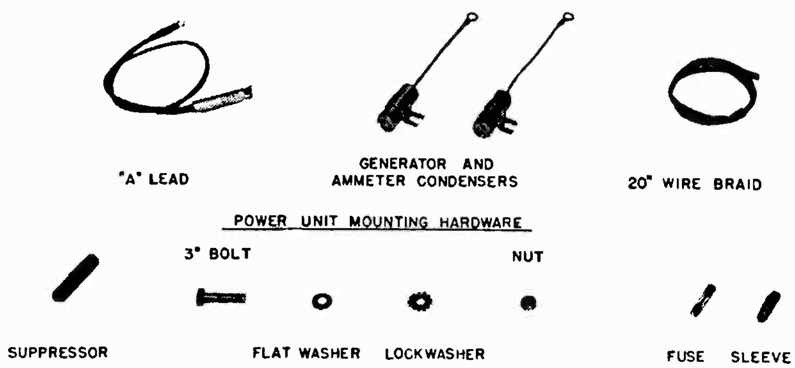



*Fig. 6. Suppression Kit and Miscellaneous Parts*

## THE TONE CONTROL

The inner left knob (with four points) is the TONE CONTROL, which permits you to select the most pleasing tonal range. When it is turned all the way to the right (clockwise) the tone is treble or brilliant. This position is best for the most distinct reproduction, especially of speech. Turning the knob to the left (counterclockwise) makes the tone more mellow. This is often desirable for certain types of music and is also useful to lessen the effects of static and electrical noise. Turn the knob to the position that gives the tone most pleasing to you.

## MATCHING THE ANTENNA

An adjusting screw for matching the receiver to the particular antenna used is accessible through a hole in the bottom side of the Control Unit. (See Fig. 4.) Set the dial pointer between 1400 KC and 1500 KC, where no station is heard with the volume control fully on. Then use a small screw driver to turn the adjusting screw to the point giving the most hiss or noise. The set is now ready for operation.

# ELIMINATING MOTOR NOISE

Every precaution was taken in the design of this radio to eliminate motor noise interference. However, in the remote instance that it may be found desirable to take further steps, the following notes are added for your guidance. It may not be necessary to use all of the following suggestions to correct a noise condition in any one car. We recommend using these helpful hints in the manner of a process of elimination, using only those methods that correct your condition.

IMPORTANT: Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all mounting points. A good electrical contact at these points will aid materially in eliminating motor noise.

## GENERATOR CONDENSER

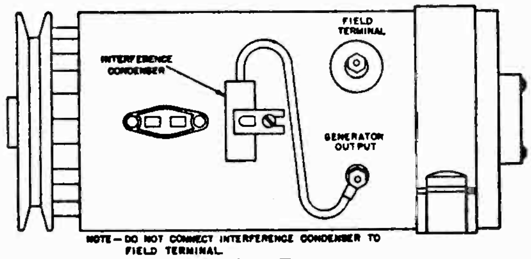



*Fig. 7*

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.

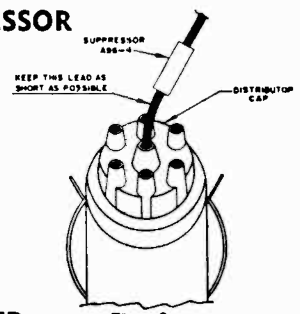



*Fig. 8*

## AMMETER CONDENSER

A .5 MFD bypass condenser is furnished for attaching to the ammeter. This should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby. In most cases the use of this condenser, the distributor suppressor, and the generator condenser, will eliminate all objectionable ignition interference.

## VOLTAGE REGULATOR

It is normal to connect a .5 mfd condenser from the battery terminal on the voltage regulator to ground; however, in a number of cars the voltage regulator is mounted on rubber grommets. In such instances, the condenser should be grounded directly to the case of the regulator, rather than to some other ground point. Do not use a larger condenser than .5 mfd or else it will affect the timing of the regulator rendering it less useful.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION LEADS

Considerable ignition interference is experienced from leads in cables that run along the inside of the fire wall near the auto radio. For example, the battery lead to the low voltage side of the ignition coil on a 1950 Model Oldsmobile '88' runs through the fire wall and along the inside past the auto radio to a point beyond the steering column. This lead has heavy radiation. It can be disconnected at the ignition coil and pulled through the fire wall and pushed back through the fire wall at a point to the left of the steering column and run along the outside to its original point of connection on the ignition coil. Such types of leads should be watched for in all installations. They should be rerouted, if possible, or shielded with braid material. It is advisable in extreme cases to bond all leads by wrapping braid around them, and grounding the braid at the closest point. In wrapping a braid around a lead, do not remove the insulation from the leads as this is a radiation type of shield. Keep all ground leads as short as possible, or they will pick up interference.

Bunch up any excess length of the shielded power cable, wrap it with braid and ground it to the closest ground point.

## 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

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## Bonding of Ungrounded Engine and Body Parts

The best rule is to keep the ignition interference underneath the hood as much as possible. This is best accomplished by using filters and suppressors on all points that would produce radiation as well as effectively bonding the hood, motor block, and any engine and body parts that are isolated from each other. It would be advisable to check all bolt-on fenders on which antennas are mounted, in that these fenders frequently are not sufficiently well grounded to the rest of the car. Use bonding braid wherever necessary to ground such fenders. Use wide bonding braid and keep all such braid as short as possible. Bonding all cables and tubes that go through the fire wall is necessary in some cases.

## ELECTRICAL SPECIFICATIONS

Power Supply............................6.3 volts DC
Current............................6.5 amp. average
Frequency Range....................540 to 1600 KC
I. F. Frequency..............................262 KC
Speaker........................7" round or 6"x9" oval
Power Output...................2.5 watts, undistorted
5 watts, maximum
Sensitivity.........3 microvolt average for 1 watt output
Selectivity...40 KC broad at 1000 times signal, at 1000 KC

The set contains the following:

1—6BA6—R. F. Amplifier.
1—6BE6—Converter.
1—6BA6—I. F. Amplifier.
1—6AT6—Detector—AVC—1st audio.
1—6V6GT—Power output.

1—6X5GT—Rectifier.

## SERVICE NOTES

Voltages taken from the different points of the circuit to chassis are measured with the volume and tone controls in maximum position, all tubes and the rectifier in their sockets, no signal applied, and with a voltmeter having a resistance of 20,000 ohm per volt. These voltages are clearly shown on the schematic diagram (Figs. 11 and 12). All voltages should be measured with an input voltage of 6.3 volts DC.

The tubes and rectifier are accessible for servicing without removing the chassis. Loosen the wing-nut on the cover of the power supply case and lift off the cover. On the RF Tuning Unit, loosen the wing nuts on the two stud bolts protruding from the side of the case at the top, rear, and remove the plate over the tubes. CAUTION: Be sure to replace the tubes and the rectifier in the proper sockets. Refer to Tube and Rectifier Location Pictorials, Fig. 10 and 14.

WARNING: The dash pot (brass cylinder on the mechanical tuner) should never be oiled. If it is ever necessary to make adjustments on the mechanical tuner, the dash pot may be cleaned with ordinary cleaning solvents.

## ALIGNING INSTRUCTIONS

Never attempt any adjustments on this receiver unless it becomes necessary to replace the coils or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, the rectifier, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE." After realignment has been completed repeat the procedure as a final check.

## INSTRUCTIONS FOR REMOVING THE CHASSIS FROM THE CASE

RF TUNING UNIT: Remove the knobs and nuts from the two control shafts. Take out the six self-tapping screws around the back edge of the case and remove the back cover. Remove the plate over the tubes (see service notes). Loosen the screw securing the cable clamp, slip the cable out from under the clamp and out of the notch. Remove the lead from the plug-in terminal on the spark plate attached to the inside top of case. Slide the "A" lead out of the notch. Now tilt the front of the case up so that the chassis can slide out. Grasp the chassis at the rear with the fingers against the chassis plate and with the thumb hooked over the IF transformer. Pull the chassis straight back, being careful that the pointer bracket does not get caught against the spark plate components. Handle the chassis carefully and set down gently so that the mechanical tuning parts may not be damaged or the settings of the coil cores upset by jarring.

POWER SUPPLY: Loosen the wing-nut and lift the top cover off. Remove the 6-32x½ screw securing the high voltage cable socket to the case. Remove the four screws (one on each side) near the bottom outside of the case. Now take the case in one hand and grasp the output transformer with the other hand and lift the chassis straight up.

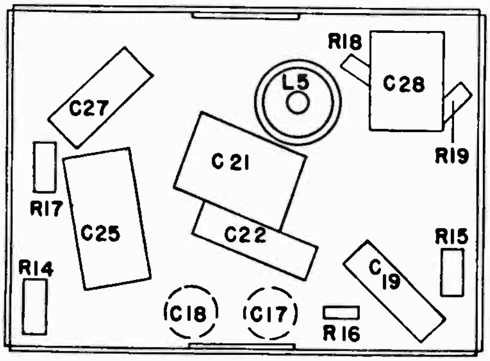


*Fig. 9. Power Unit—Bottom View*

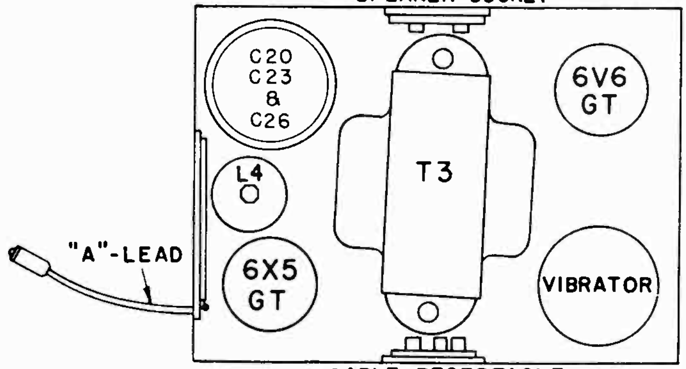


*Fig. 10. Power Unit—Top View*

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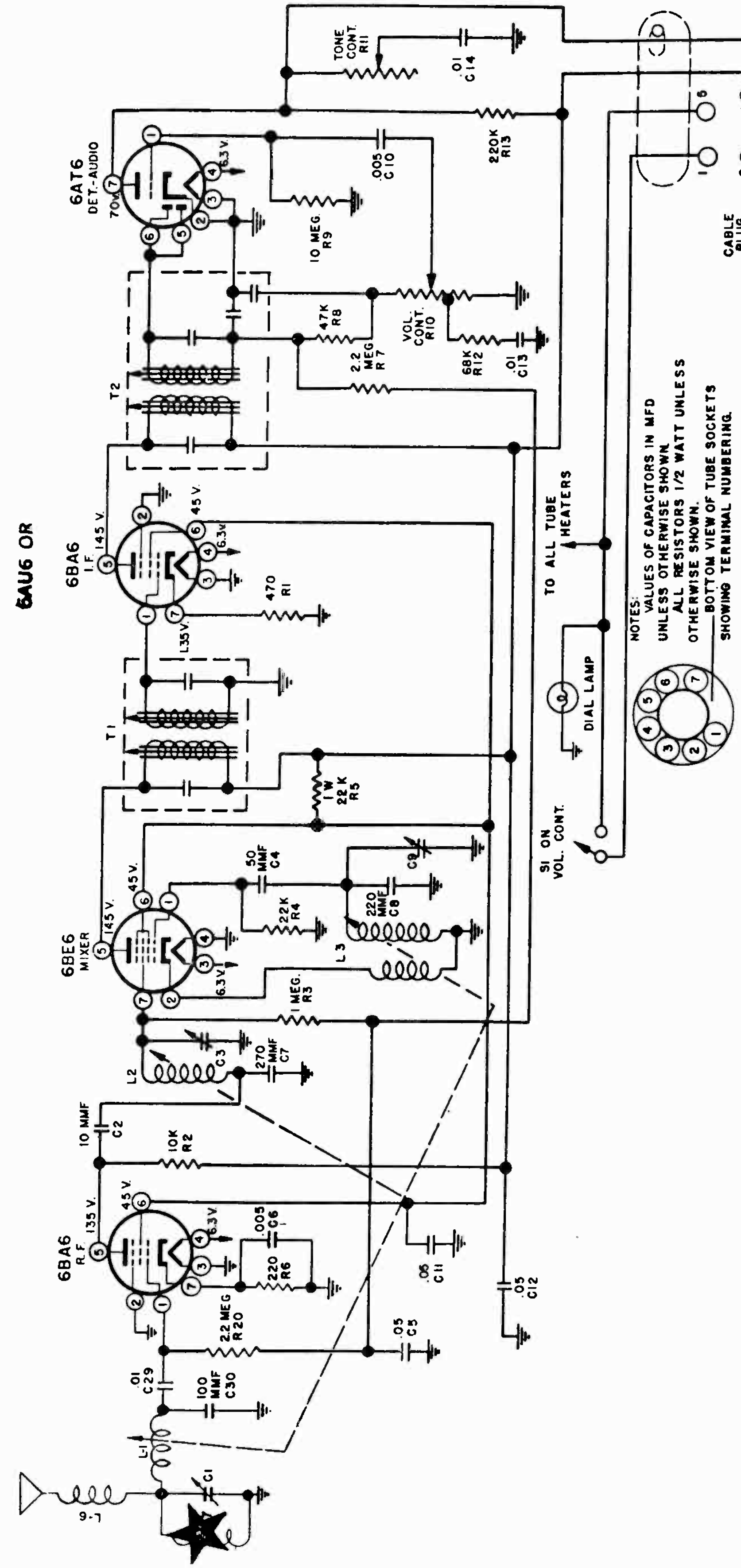


*Fig. 11. Schematic Diagram—Control Unit*

★ A60-775 Res. 68K—½ W.

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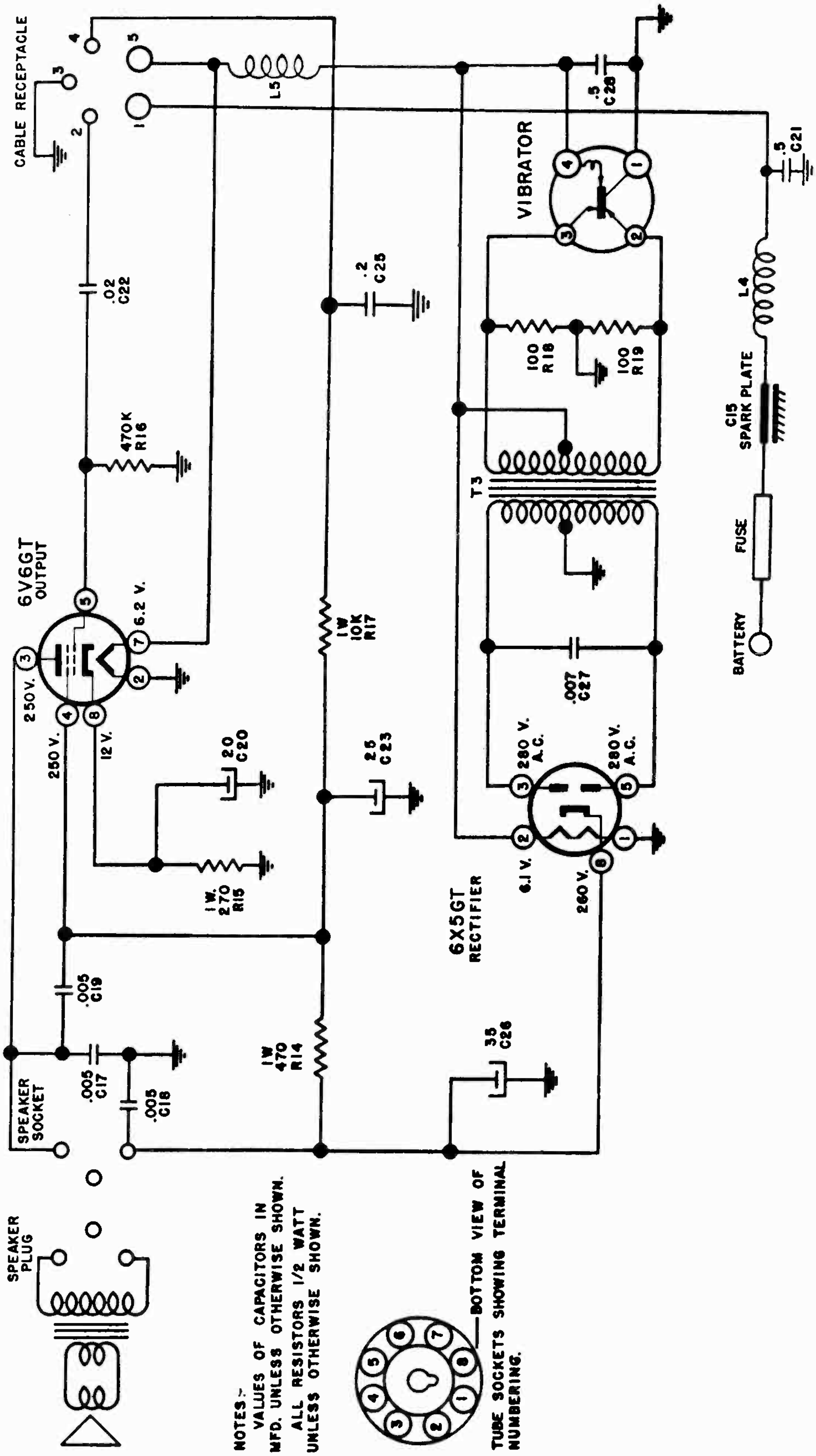


NOTES:-
VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE SHOWN.
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SHOWN.

BOTTOM VIEW OF TUBE SOCKETS SHOWING TERMINAL NUMBERING.

*Fig. 12. Schematic Diagram—Power Unit*

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD., 30 MMFD.

For alignment points refer to Figures 13 and 14.

| *Slug Position* | *Generator Frequency* | *Dummy Ant.* | *Generator Connections* | *Trimmer Reference* | *Trimmer Adjustment* | *Trimmer Function* |
|---|---|---|---|---|---|---|
| Fully Out | 262 KC | .1 MFD. | 6BE6 Grid | T2 | Maximum | Output I.F. |
| Fully Out | 262 KC | .1 MFD. | 6BE6 Grid | T1 | Maximum | Input I.F. |
| Fully Out | 1610 KC | * | Ant. lead | C9 | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | * | Ant. lead | C3 | Maximum | R.F. |
| Tune in signal from generator | 1400 KC | * | Ant. lead | C1 | Maximum | Antenna |

*30 MMFD across input terminals and 75 MMFD in series with "hot" side of signal generator leads.

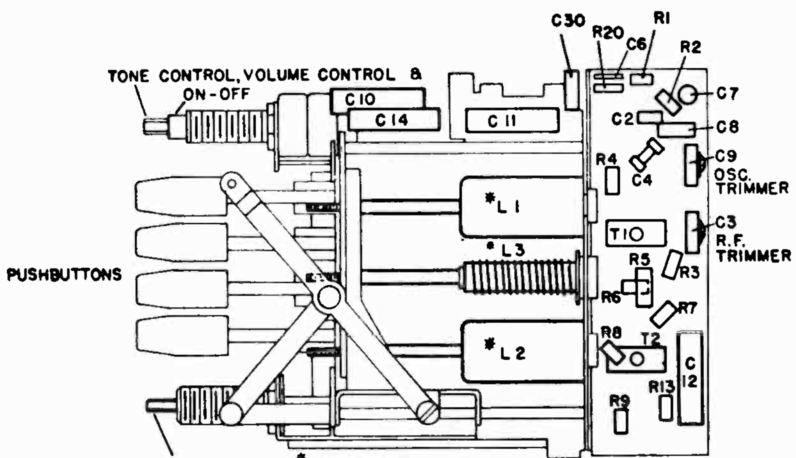


Fig. 13. Control Unit—Bottom View

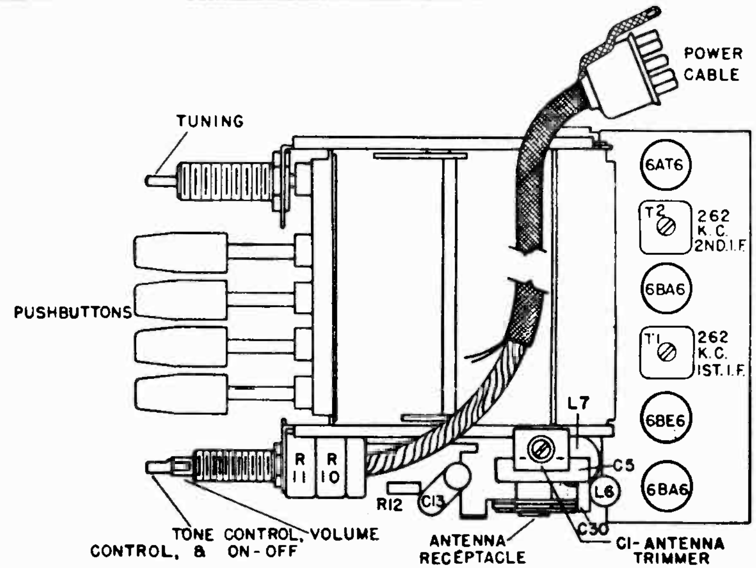


Fig. 14. Control Unit—Top View

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# PARTS LIST

| Schematic Location | Part No. | Description |
|---|---|---|
| C1 | A20-148 | Capocitor—antenna trimmer |
| C2 | A15-197 | Capacitor—ceramic—10 mmfd. |
| C3, C9 | A20-147 | Capacitor—dual trimmer—R.F. and Oscillator |
| C4 | A15-194 | Capacitor—ceramic—50 mmfd. |
| C5 | A16-197 | Capacitor—.05 mfd.—200 v. |
| C6, C17, C18 | A16-177 | Capocitor—ceramic—.005 mfd. |
| C7 | A15-215 | Capacitor—ceramic—270 mmfd. |
| C8 | A15-218 | Capacitor—silver mica—220 mmfd. |
| C10, C19 | A16-190 | Capacitor—.005 mfd.—600 v. |
| C11, C12 | A16-189 | Capacitor—.05 mfd.—400 v. |
| C13, C14 | A16-192 | Capacitor—.01 mfd.—400 v. |
| C15 | | Capacitor—spark plate |
| C21, C28 | A16-184 | Capacitor—.5 mfd.—100 v. |
| | A18-300 | Capacitor—electrolytic |
| C20 | | 20 mfd.—25 v. |
| C23 | | 25 mfd.—350 v. |
| C26 | | 35 mfd.—400 v. |
| C22 | A16-206 | Capacitor—.02 mfd.—600 v. |
| C25 | A16-188 | Capacitor—.2 mfd.—400 v. |
| C27 | A16-207 | Capacitor—.007 mfd.—1600 v.—oil filled |
| C29 | A15-211 | Capacitor—ceramic—.01 mfd. |
| C30 | A15-188 | Capacitor—mica—100 mmfd. |
| | B23-157 | Cable—power |
| L1, L2, L3 | S84-470 | Coil—assembly—including carriage and slugs, etc. |
| L4 | A33-234 | Coil—"A" line choke |
| L5 | A33-228 | Coil—vibrator hash choke |
| L6 | A10-527 | Coil—antenna loading |
| L7 | [redacted] | A60-775 Res.—68K—½ watt |
| | A83-421 | Clip—I.F. transformer mounting |
| R10, R11, S1 | A24-183 | Control—dual—ON-OFF-VOLUME and TONE |
| | B67-547 | Dial scale |
| | A43-10 | Fuse—15 amp.—3AG |
| | A47-115 | Grommet—rubber—power cable |
| | S84-233 | Kit—"A" lead assembly |
| | B52-296 | Knob—Tuning |
| | B52-297 | Knob—Volume |
| | B52-298 | Knob—Tone |
| | A89-7 | Lamp—pilot—No. 47 Bayonet |
| R1 | A60-770 | Resistor—470 ohm—½ watt |
| R2 | A60-760 | Resistor—10K ohm—½ watt |
| R3 | A60-668 | Resistor—1 megohm—½ watt |
| R4 | A60-744 | Resistor—22K ohm—½ watt |
| R5 | A60-773 | Resistor—22K ohm—1 watt |
| R6 | A60-753 | Resistor—220 ohm—½ watt |
| R7, R20 | A60-726 | Resistor—2.2 megohm—½ watt |
| R8 | A60-730 | Resistor—47K ohm—½ watt |
| R9 | A60-728 | Resistor—10 megohm—½ watt |
| R12 | A60-775 | Resistor—68K ohm—½ watt |
| R13 | A60-672 | Resistor—220K ohm—½ watt |
| R14 | A60-694 | Resistor—470 ohm—1 watt |
| R15 | A60-754 | Resistor—270 ohm—1 watt |
| R16 | A60-731 | Resistor—470K ohm—½ watt |
| R17 | A60-698 | Resistor—10K ohm—1 watt |
| R18, R19 | A60-752 | Resistor—100 ohm—½ watt |
| | A83-646 | Retainer—dial scale—left |
| | A83-647 | Retainer—dial scale—right |
| | C79-387 | *Speaker—7" round |
| | C79-386 | *Speaker—6"x9" oval |
| | S84-383 | Transformer—output—with cable and plug |
| T1 | A10-537 | Transformer—I.F. No. 1 |
| T2 | A10-540 | Transformer—I.F. No. 2 |
| T3 | C80-258 | Transformer—power |
| | A34-105 | Vibrator—Mallory No. 659 |

## Mechanical Tuner Parts

| | |
|---|---|
| A56-141 | Pusher nut—manual tuning |
| A56-152 | Pusher nut—pushbutton tuning |
| A75-75 | Pusher rod—manual tuning |
| S84-355 | Pushbutton and rod assembly |

**IMPORTANT: All tubular condensers must be high temperature (85°C.) wax type.**

*When ordering a replacement speaker, order the same type, 7" round or 6"x9" oval, as the old one that was installed in your car.

MODEL 6297-1,
Ch. 528.6297-1

## DESCRIPTION

Your new automobile receiver is a 5-tube (plus rectifier) superheterodyne, designed to operate from the 6 volt storage battery in your car. It is a universal type of receiver for mounting underneath the dash panel. It has a self-contained PM speaker, and covers the frequency range 540 to 1600 K.C. Two simple controls are provided for operating the receiver. (see fig. 1).

Special care has been taken in the design of this receiver to insure the finest in sensitivity and selectivity, there-by insuring good reception of even distant or weak stations. The unit is simple to install, the antenna input circuit adjustable to permit the use of any two or three section whip or "fish pole" antenna.

## OPERATION

To turn the receiver on, rotate the volume control and switch knob (left hand knob) to the right about half its range. After allowing about 30 seconds for the tubes to warm up, the desired station may be tuned by rotating the tuning control (right hand knob) to the desired frequency. The dial scale is calibrated in kilocycles minus the final two zeros. After the station has been properly tuned, the volume may be adjusted by means of the volume control knob. To increase the volume, turn the control to the right; to decrease the volume, turn it to the left. Turning this control to the left as far as it will go, turns the radio off.

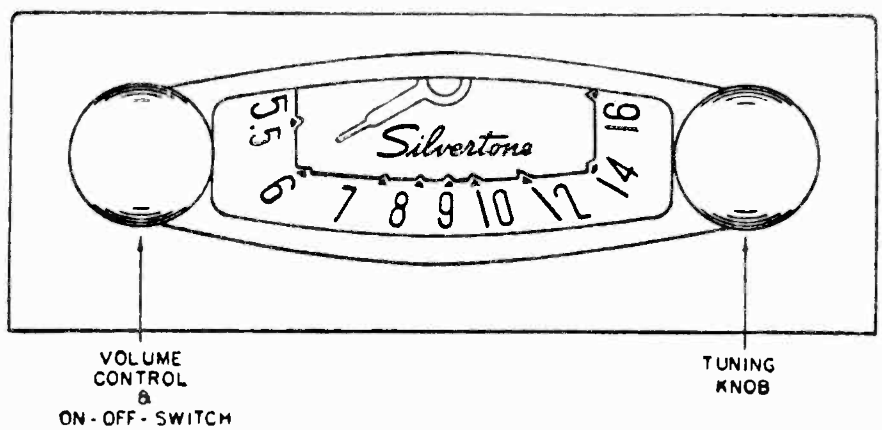


Fig. 1 Front View

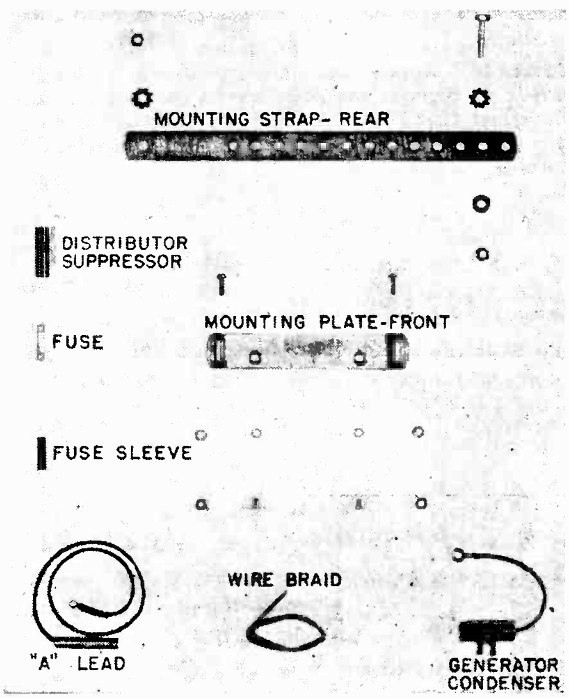


Fig 2

## DIAL POINTER ADJUSTMENT

If it should become necessary to readjust the dial pointer for correct calibration, this may be easily done without removing the radio from the car by proceeding as follows:

A. Turn tuning knob to the right (clockwise) as far as it will go.

B. Remove snap button located on the right side of the case (viewed from the front), in the extreme upper front corner.

C. Insert screwdriver through hole in case and move dial pointer directly over white dot at high end of dial (1600KC).

D. Tune receiver to station of known frequency in the center of the dial and readjust pointer for more accurate indication, if necessary.

E Replace snap button into hole in case.

CAUTION: Be careful not to scratch or damage dial scale or dial pointer when making this adjustment

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Ch. 528.6297-1

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, and generator condenser. By referring to Figures 2 and 3, and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 7/32″ holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided. and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed by bending to the correct angles, as illustrated in Figure 3, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8″ drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4″ bolt, lock washer and nut furnished with the receiver.

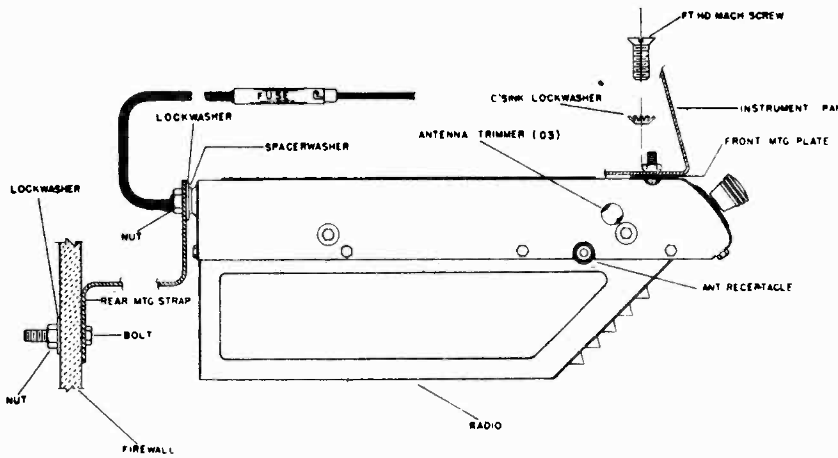



*Fig.3 Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the socket provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1100 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 3) and adjust the trimmer for maximum volume. A small screw driver will be needed for this purpose.

# ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S84-192, and the Suppression and Misc. Parts Kit, part No. S84-407, as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-138.

## S84-192 MOUNTING PARTS KIT

| | | | |
|---|---|---|---|
| 1 | 1/4″ Bolt | 2 | External Tooth Lock Washers |
| 2 | 1/4″ Lock Washers | 2 | Internal Tooth Lock Washers |
| 2 | 1/4″ Hexagon Nuts | 2 | 10-32 Hexagon Nuts |
| 2 | 10-32 x 5/8″ Screws | 1 | Washer-Spacer |
| 2 | 10-32 x 3/8″ Screws | | |

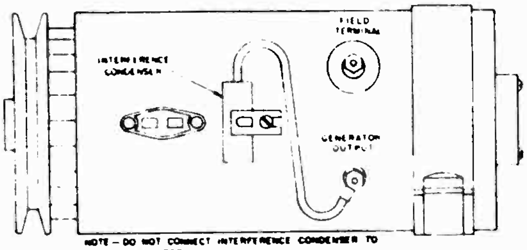
## S84-407 SUPPRESSION KIT & MISC. PARTS

| | | |
|---|---|---|
| 1 | S84-233 "A" lead assem. | 1 S84-322 Suppression Kit consisting of: |
| 1 | A43-10 Fuse | 1 .5 MFD Condenser |
| 2 | A52-300 Control Knobs | 1 Distributor Suppressor |
| 1 | A81-13 Sleeve (for fuse) | 20″ Wire Braid |

# ELIMINATING MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise.

## GENERATOR CONDENSER

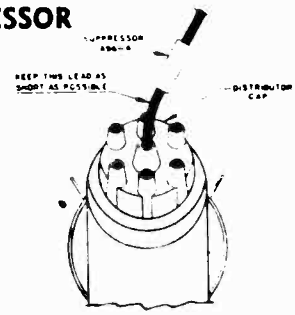



NOTE — DO NOT CONNECT INTERFERENCE CONDENSER TO FIELD TERMINAL

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.




## NOTE

In most cases the use of the generator condenser and the distributor suppressor will eliminate all objectionable ignition interference. However, if further reduction of noise is found to be desirable, it is suggested that a .5 MFD. condenser, (similar to the one used on the generator), be connected from either side of the ammeter to a good ground.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION LEADS

In many cases the low tension battery leads, etc., are grouped together with the high tension wires. These wires 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## BONDING OF STEERING COLUMN TO BODY

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

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Ch. 528.6297-1

# SERVICE DATA

## ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| Power Supply | 6.3 volts DC |
| Current | 6.2 amp. average |
| Frequency Range | 540 to 1600 KC |
| I. F. Frequency | 455 KC |
| Speaker | 4" P. M. |
| Power Output | 1.2 watts, undistorted<br>2.5 watts, maximum |
| Sensitivity | 10 microvolt average for 1 watt output |
| Selectivity | 50 KC broad at 1000 times signal, at 1000 KC |

This receiver contains the following:

1—6SK7GT—R. F. Amplifier.

1—6SA7GT—Converter.

1—6SK7GT—I.F. Amplifier.

1—6SQ7—Detector—AVC—1st audio.

1—6V6GT—Power output.

A 6X5GT Rectifier is used.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes and the rectifier in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage diagram (Fig. 4).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, rectifier, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

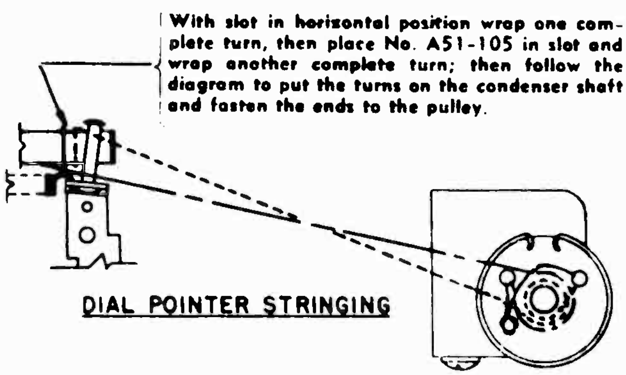
## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes, rectifier and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

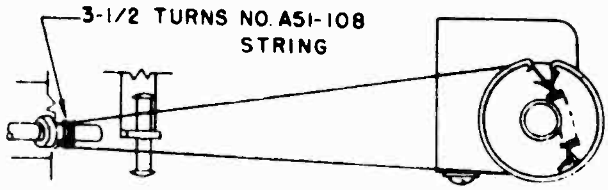
**CAUTION**: Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.




DIAL POINTER STRINGING




DIAL DRIVE STRINGING

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| Dial Setting | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1B | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD | Ant. lead | C1A | Maximum | Antenna |

NOTE: The antenna trimmer condenser, C3, (see Fig. 3) should be adjusted after the radio is installed in the car. Tune the receiver to a weak station at about 1100 KC and adjust this trimmer for maximum volume.

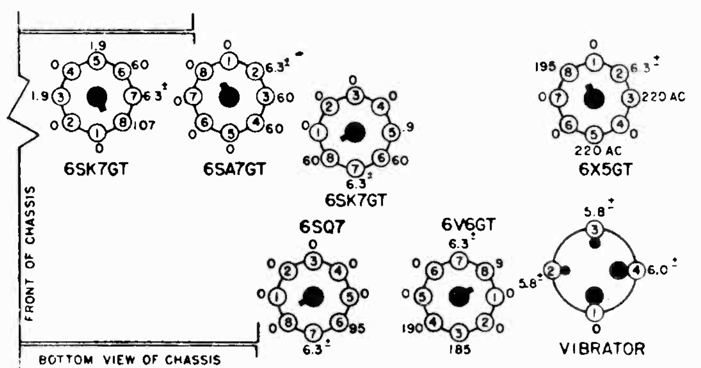



Fig.4. Socket Voltages

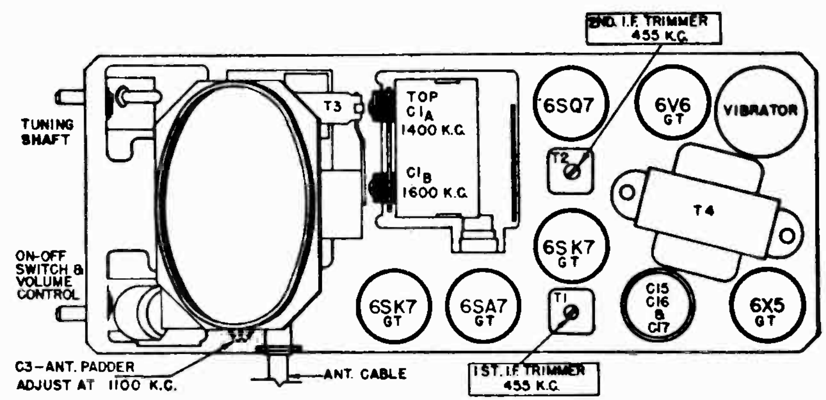



Fig. 5. Tube, Rectifier and Trimmer Locations

MODEL 6297-1,
Ch. 528.6297-1

# PARTS LIST

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| | | **CONDENSERS** |
| C1A, C1B | B19-201 | Variable condenser |
| C2, C14 | A16-192 | .01 MFD 400 volt condenser |
| C3 | A20-145 | Trimmer condenser |
| C4 | A16-189 | .05 MFD 400 volt condenser |
| C5 | A15-196 | 100 MMFD ceramic condenser |
| C7 | A15-204 | 50 MMFD ceramic condenser |
| C8 | A15-205 | 12 MMFD ceramic condenser, temp. comp. |
| C9 | A16-187 | .1 MFD 400 volt condenser |
| C10 | A15-176 | 250 MMFD mica condenser |
| C11 | A16-190 | .005 MFD 600 volt condenser |
| C12 | A16-195 | .001 MFD ceramic condenser |
| C13 | A16-193 | .05 MFD 600 volt condenser |
| C15<br>C16<br>C17 | A18-289 | 20 MFD 25 volt electrolytic condenser<br>20 MFD 350 volt electrolytic condenser<br>30 MFD 350 volt electrolytic condenser |
| C19, C20 | A16-184 | .5 MFD 100 volt condenser |
| C21 | A16-185 | .005 MFD 1600 volt oil filled condenser |
| | | **RESISTORS** |
| R1, R3 | A60-659 | 22K ohm ½ watt 20% resistor |
| R2 | A60-685 | 47K ohm ½ watt 20% resistor |
| R4 | A60-769 | 7.5K ohm 2 watt 10% resistor |
| R5 | A60-726 | 2.2 megohm ½ watt 20% resistor |
| R6 | A24-177 | Volume control, 500,000 ohm, with switch |
| R7 | A60-728 | 10 megohm ½ watt 20% resistor |
| R8, R15 | A60-758 | 560 ohm ½ watt 10% resistor |
| R9 | A60-667 | 220K ohm ½ watt 20% resistor |
| R10 | A60-731 | 470K ohm ½ watt 20% resistor |
| R11 | A60-771 | 270 ohm ½ watt 10% resistor |
| R12 | A60-770 | 470 ohm ½ watt 10% resistor |
| R13, R14 | A60-752 | 100 ohm ½ watt 10% resistor |
| | | **COILS AND TRANSFORMERS** |
| L1 | A10-527 | Antenna Loading Coil |
| L2 | B10-511 | Antenna Coil |
| L4 | A10-512 | Oscillator Coil |
| L5 | A33-229 | Choke, "A" Line |
| L6 | A33-228 | Choke, vibrator hash |
| T1 | A10-508 | 1st I.F. Transformer |
| T2 | A10-509 | 2nd I.F. Transformer |
| T3 | B80-242 | Output Transformer (Part of Speaker, not furnished separately) |
| T4 | B80-243 | Power transformer |
| | | **DIAL PARTS** |
| | A11-303 | Bracket, Dial Scale |
| | B11-328 | Bracket, String Guide |
| | A72-29 | Bushing, Tuning Shaft Bearing |
| | A70-130 | Clip, Spring, for Tuning Shaft |
| | A58-55 | Dial Pointer |
| | B67-545 | Dial Scale |
| | A28-101 | Gasket for Speaker |
| | A52-300 | Knob |
| | A11-329 | Link, String Guide |
| | A89-10 | Pilot Light, No. 47 Bayonet |
| | A65-37 | Rivet, Shoulder, for Dial Pointer Stringing |
| | A65-42 | Rivet, Shoulder, for String Guide Brkt. and Link |
| | A65-12 | Rivet, Shoulder, for Dial Drive Stringing |
| | A75-70 | Shaft, tuning |
| | A75-74 | Shaft, for Dial Pointer |
| | A70-132 | Spring, for Pilot Light Socket |
| | A70-135 | Spring, Dial Drive String Tension |
| | A70-142 | Spring, Pointer Drive String Tension |
| | A51-105 | String, Pointer Travel, 17" |
| | A51-108 | String, Condenser Drive, 19" |

MODEL 6297-1,
Ch. 528.6297-1

## MISCELLANEOUS

| | |
|---|---|
| S84-233 | "A" lead assembly |
| A83-421 | Clip, I.F. Transformer Mounting |
| A83-517 | Clip, Oscillator Coil Mounting |
| A43-10 | Fuse, 15 Amp. |
| A47-112 | Grommet, rubber, (Spkr. & Gang mounting) |
| B31-134 | Mounting strap, rear |
| A31-138 | Mounting Plate, Front |
| S84-192 | Mounting parts kit |
| A87-38 | Receptacle, Antenna Cable |
| B79-379 | Speaker, 4" P.M. (includes Output Transformer) |
| S84-322 | Suppression Kit Assembly |
| A34-105 | Vibrator |
| A83-519 | Wiper, grounding, for case covers |

Note: Tubular condensers must be high temperature (85°C) wax type.

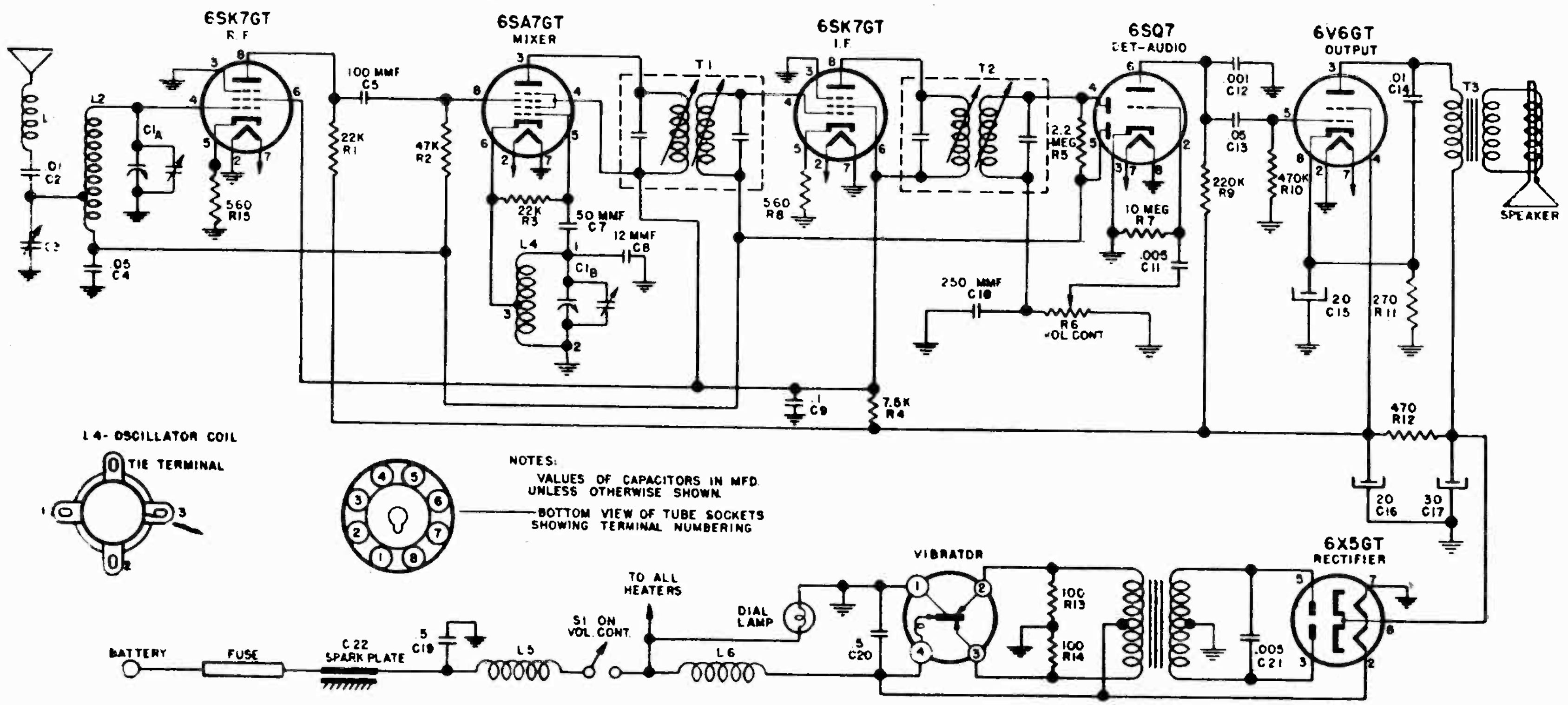



Fig 6. Schematic Diagram

MODEL 6297-2,
Ch. 528.6297-2

## DESCRIPTION

Your new automobile receiver is a 5-tube (plus rectifier) superheterodyne, designed to operate from the 6 volt storage battery in your car. It is a universal type of receiver for mounting underneath the dash panel. It has a self-contained PM speaker, and covers the frequency range 540 to 1600 K.C. Two simple controls are provided for operating the receiver. (see fig. 1).

Special care has been taken in the design of this receiver to insure the finest in sensitivity and selectivity, there-by insuring good reception of even distant or weak stations. The unit is simple to install, the antenna input circuit adjustable to permit the use of any two or three section whip or "fish pole" antenna.

## OPERATION

To turn the receiver on, rotate the volume control and switch knob (left hand knob) to the right about half its range. After allowing about 30 seconds for the tubes to warm up, the desired station may be tuned by rotating the tuning control (right hand knob) to the desired frequency. The dial scale is calibrated in kilocycles minus the final two zeros. After the station has been properly tuned, the volume may be adjusted by means of the volume control knob. To increase the volume, turn the control to the right; to decrease the volume, turn it to the left. Turning this control to the left as far as it will go, turns the radio off.

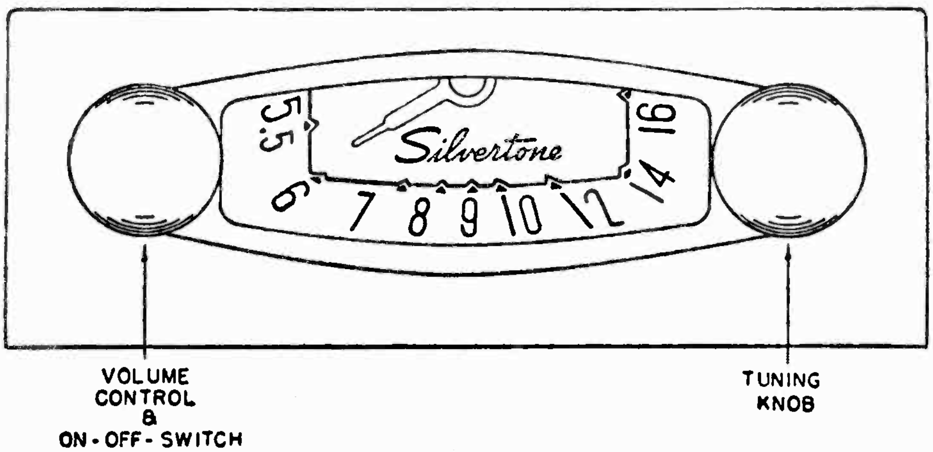



*Fig. 1 Front View*

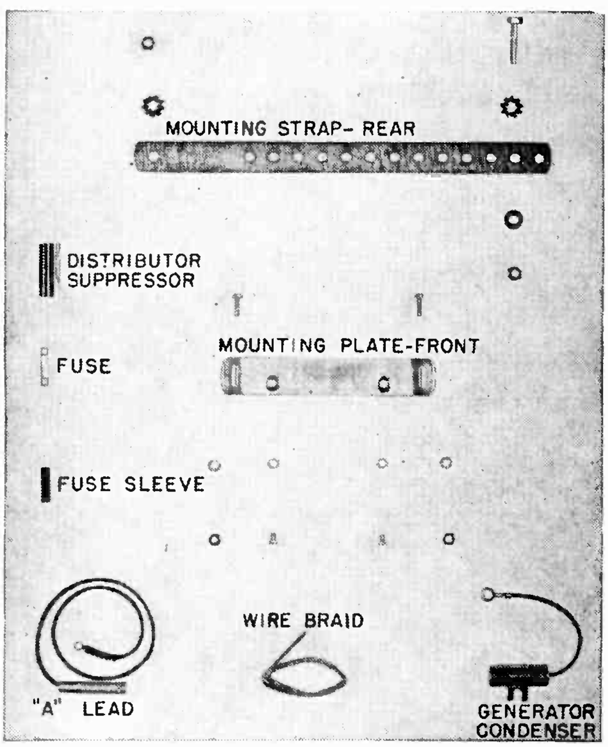



*Fig. 2*

## DIAL POINTER ADJUSTMENT

If it should become necessary to readjust the dial pointer for correct calibration, this may be easily done without removing the radio from the car by proceeding as follows:

A. Turn tuning knob to the right (clockwise) as far as it will go.

B. Remove snap button located on the right side of the case (viewed from the front), in the extreme upper front corner.

C. Insert screwdriver through hole in case and move dial pointer directly over white dot at high end of dial (1600KC).

D. Tune receiver to station of known frequency in the center of the dial and readjust pointer for more accurate indication, if necessary.

E. Replace snap button into hole in case.

CAUTION: Be careful not to scratch or damage dial scale or dial pointer when making this adjustment.

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, and generator condenser. By referring to Figures 2 and 3, and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 7/32″ holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided, and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed by bending to the correct angles, as illustrated in Figure 3, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8″ drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4″ bolt, lock washer and nut furnished with the receiver.

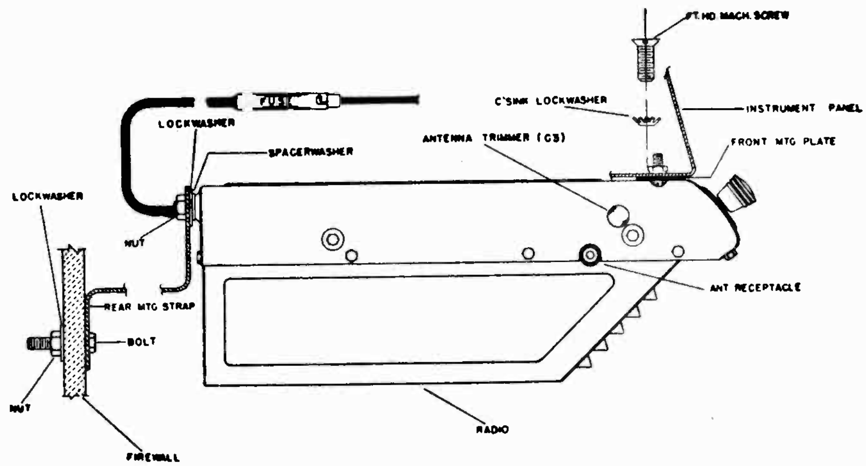



*Fig.3. Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the socket provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1100 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 3) and adjust the trimmer for maximum volume. A small screw driver will be needed for this purpose.

# ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S84-192, and the Suppression and Misc. Parts Kit, part No. S84-407, as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-138.

## S84-192 MOUNTING PARTS KIT

| | | | |
|---|---|---|---|
| 1 | 1/4″ Bolt | 2 | External Tooth Lock Washers |
| 2 | 1/4″ Lock Washers | 2 | Internal Tooth Lock Washers |
| 2 | 1/4″ Hexagon Nuts | 2 | 10-32 Hexagon Nuts |
| 2 | 10-32 x 5/8″ Screws | 1 | Washer-Spacer |
| 2 | 10-32 x 3/8″ Screws | | |

## S84-407 SUPPRESSION KIT & MISC. PARTS

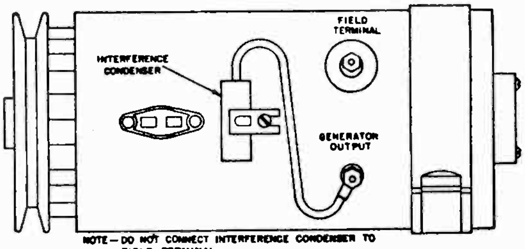
| | | |
|---|---|---|
| 1 | S84-233 "A" lead assem. | 1 S84-322 Suppression Kit consisting of: |
| 1 | A43-10 Fuse | 1—.5 MFD Condenser |
| 2 | A52-300 Control Knobs | 1 Distributor Suppressor |
| 1 | A81-13 Sleeve (for fuse) | 20″ Wire Braid |

MODEL 6297-2,
Ch. 528.6297-2

# ELIMINATING MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise.

## GENERATOR CONDENSER

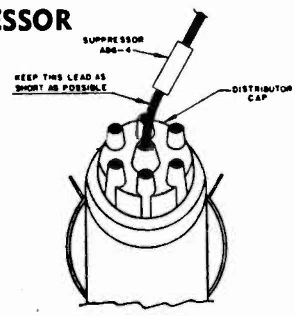



NOTE—DO NOT CONNECT INTERFERENCE CONDENSER TO FIELD TERMINAL.

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Remove from distributor cap the high tension lead from coil to distributor. Cut the lead two inches from the end, and screw the distributor resistor on to the coil lead, then screw the short length into the resistor and plug the cable into the distributor cap.




## NOTE

In most cases the use of the generator condenser and the distributor suppressor will eliminate all objectionable ignition interference. However, if further reduction of noise is found to be desirable, it is suggested that a .5 MFD. condenser, (similar to the one used on the generator), be connected from either side of the ammeter to a good ground.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to try another by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

## HIGH AND LOW TENSION LEADS

In many cases the low tension battery leads, etc., are grouped together with the high tension wires. These wires 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 instruinstrument 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.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## BONDING OF STEERING COLUMN TO BODY

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

MODEL 6297-2,
Ch. 528.6297-2

# ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| Power Supply | 6.3 volts DC |
| Current | 6.2 amp. average |
| Frequency Range | 540 to 1600 KC |
| I. F. Frequency | 455 KC |
| Speaker | 4" P. M. |
| Power Output | 1.2 watts, undistorted<br>2.5 watts, maximum |
| Sensitivity | 10 microvolt average for 1 watt output |
| Selectivity | 50 KC broad at 1000 times signal, at 1000 KC |

**This receiver contains the following:**

1—6SK7GT—R. F. Amplifier.

1—6SA7GT—Converter.

1—6SK7GT—I.F. Amplifier.

1—6SQ7—Detector—AVC—1st audio

1—6V6GT—Power output.

A 6X5GT Rectifier is used.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes and the rectifier in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage diagram (Fig. 4).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, rectifier, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

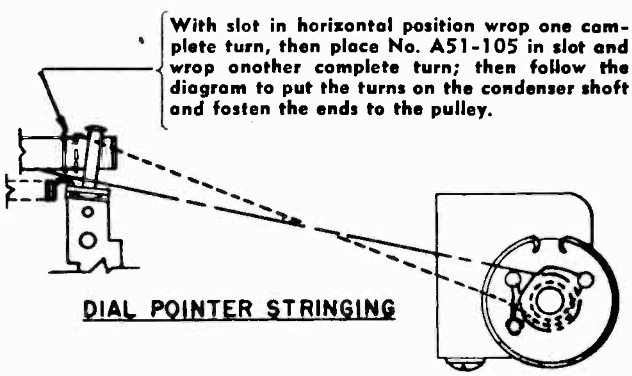
## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes, rectifier and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

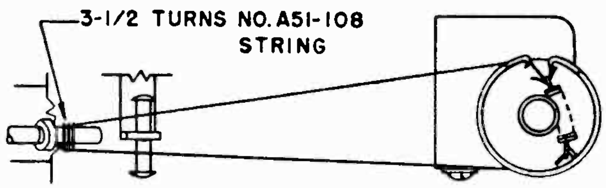
**CAUTION:** Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.




DIAL POINTER STRINGING




DIAL DRIVE STRINGING

MODEL 6297-2,
Ch. 528.6297-2

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| Dial Setting | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1B | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C1A | Maximum | Antenna |

NOTE: The antenna trimmer condenser, C3, (see Fig. 3) should be adjusted after the radio is installed in the car. Tune the receiver to a weak station at about 1100 KC and adjust this trimmer for maximum volume.

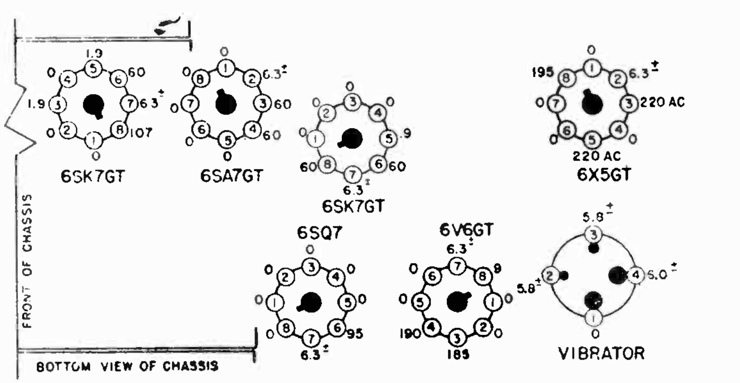



Fig.4. Socket Voltages

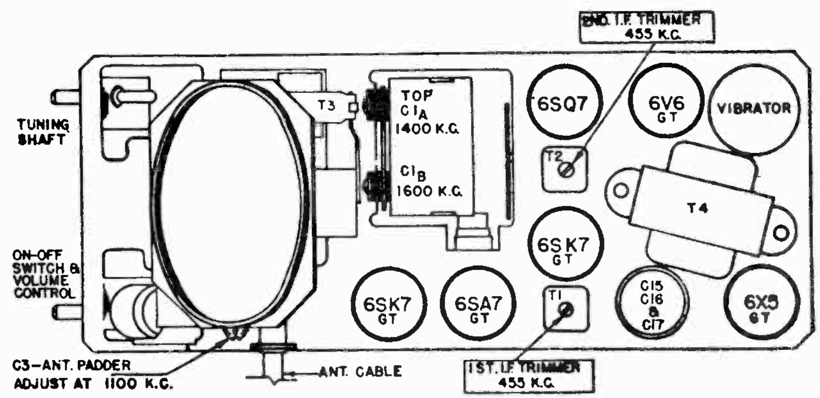



Fig. 5. Tube, Rectifier and Trimmer Locations

MODEL 6297-2,
Ch. 528.6297-2

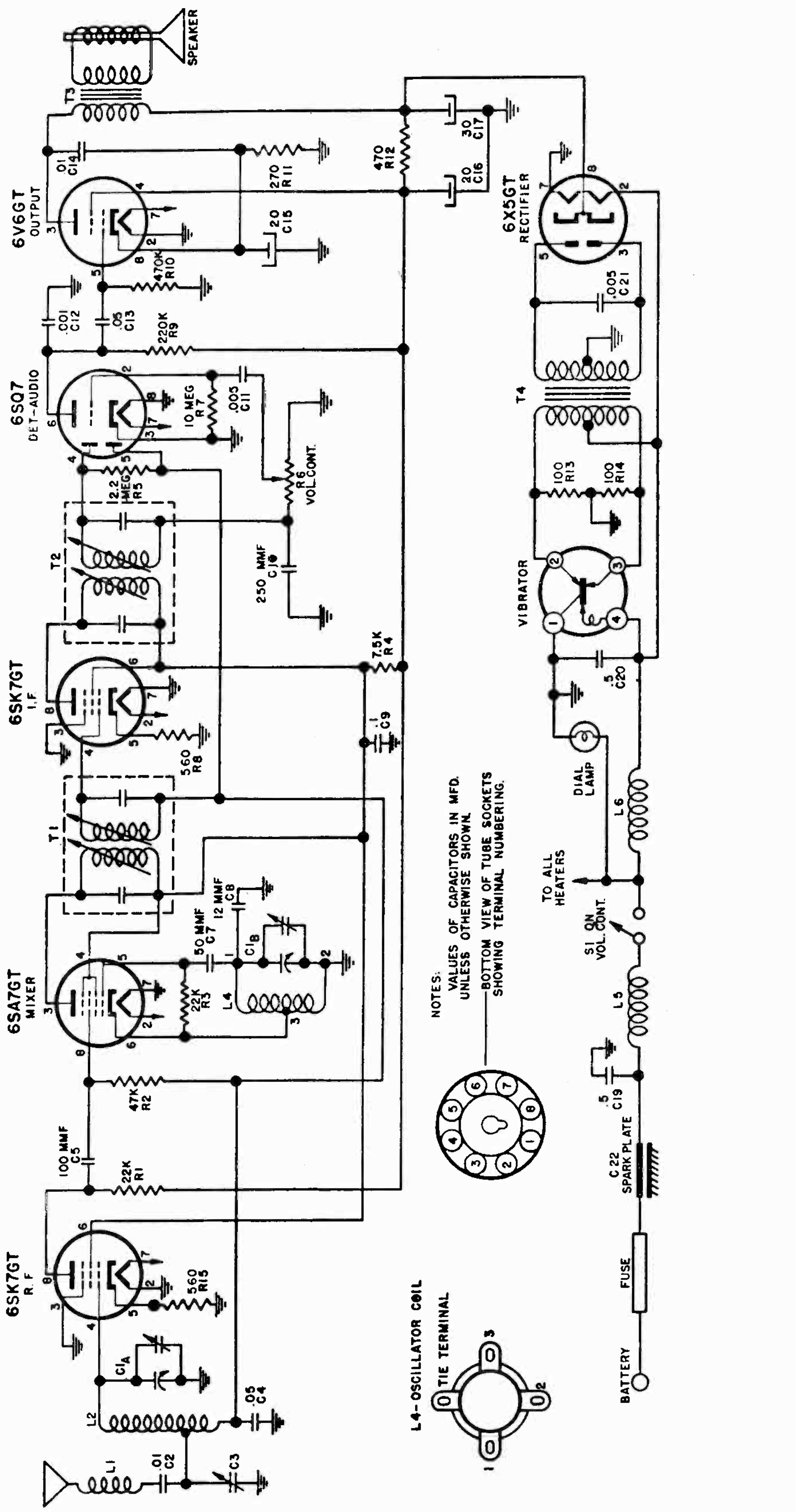



*Fig 6. Schematic Diagram*

MODEL 6297-2,
Ch. 528.6297-2

## CONDENSERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| C1A, C1B | B19-201 | Variable condenser |
| C2, C14 | A16-192 | .01 MFD 400 volt condenser |
| C3 | A20-145 | Trimmer condenser |
| C4 | A16-189 | .05 MFD 400 volt condenser |
| C5 | A15-196 | 100 MMFD ceramic condenser |
| C7 | A15-204 | 50 MMFD ceramic condenser |
| C8 | A15-205 | 12 MMFD ceramic condenser, temp. comp. |
| C9 | A16-187 | .1 MFD 400 volt condenser |
| C10 | A15-176 | 250 MMFD mica condenser |
| C11 | A16-190 | .005 MFD 600 volt condenser |
| C12 | A16-195 | .001 MFD ceramic condenser |
| C13 | A16-193 | .05 MFD 600 volt condenser |
| C15, C16, C17 | A18-289 | 20 MFD 25 volt electrolytic condenser<br>20 MFD 350 volt electrolytic condenser<br>30 MFD 350 volt electrolytic condenser |
| C19, C20 | A16-184 | .5 MFD 100 volt condenser |
| C21 | A16-185 | .005 MFD 1600 volt oil filled condenser |

## RESISTORS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| R1, R3 | A60-659 | 22K ohm ½ watt 20% resistor |
| R2 | A60-685 | 47K ohm ½ watt 20% resistor |
| R4 | A60-769 | 7.5K ohm 2 watt 10% resistor |
| R5 | A60-726 | 2.2 megohm ½ watt 20% resistor |
| R6 | A24-182 | Volume control, 500,000 ohm, with switch |
| R7 | A60-728 | 10 megohm ½ watt 20% resistor |
| R8, R15 | A60-758 | 560 ohm ½ watt 10% resistor |
| R9 | A60-667 | 220K ohm ½ watt 20% resistor |
| R10 | A60-731 | 470K ohm ½ watt 20% resistor |
| R11, | A60-771 | 270 ohm ½ watt 10% resistor |
| R12 | A60-770 | 470 ohm ½ watt 10% resistor |
| R13, R14 | A60-752 | 100 ohm ½ watt 10% resistor |

## COILS AND TRANSFORMERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| L1 | A10-527 | Antenna Loading Coil |
| L2 | B10-511 | Antenna Coil |
| L4 | A10-512 | Oscillator Coil |
| L5 | A33-229 | Choke, "A" Line |
| L6 | A33-228 | Choke, vibrator hash |
| T1 | A10-508 | 1st I.F. Transformer |
| T2 | A10-509 | 2nd I.F. Transformer |
| T3 | B80-242 | Output Transformer (Part of Speaker, not furnished separately) |
| T4 | B80-243 | Power transformer |

## DIAL PARTS

| Part No. | Description |
|---|---|
| A11-303 | Bracket, Dial Scale |
| B11-328 | Bracket, String Guide |
| A72-36 | Bushing, Tuning Shaft Bearing |
| A70-130 | Clip, Spring, for Tuning Shaft |
| A58-55 | Dial Pointer |
| B67-545 | Dial Scale |
| A28-101 | Gasket for Speaker |
| A52-316 | Knob |
| A11-329 | Link, String Guide |
| A89-10 | Pilot Light, No. 47 Bayonet |
| A65-37 | Rivet, Shoulder, for Dial Pointer Stringing |
| A65-42 | Rivet, Shoulder, for String Guide Brkt. and Link |
| A65-12 | Rivet, Shoulder, for Dial Drive Stringing |
| A75-83 | Shaft, tuning |
| A75-74 | Shaft, for Dial Pointer |
| A70-132 | Spring, for Pilot Light Socket |
| A70-135 | Spring, Dial Drive String Tension |
| A70-142 | Spring, Pointer Drive String Tension |
| A51-105 | String, Pointer Travel, 17" |
| A51-108 | String, Condenser Drive, 19" |

Note: Tubular condensers must be high temperature (85°C) wax type.

## MISCELLANEOUS

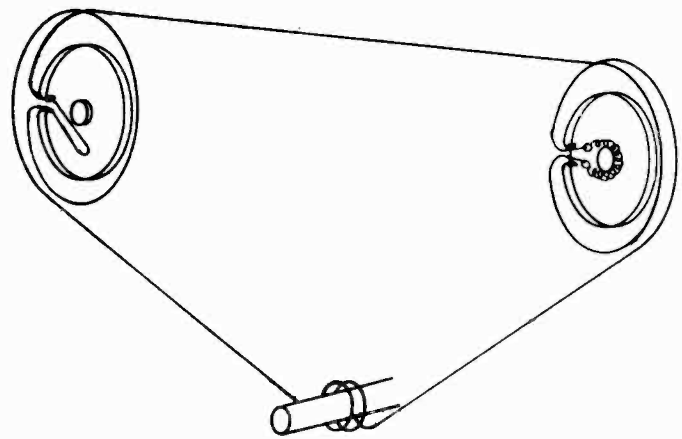
| Part No. | Description |
|---|---|
| S84-233 | "A" lead assembly |
| A83-421 | Clip, I.F. Transformer Mounting |
| A83-517 | Clip, Oscillator Coil Mounting |
| A43-10 | Fuse, 15 Amp. |
| A47-112 | Grommet, rubber, (Spkr. & Gang mounting) |
| B31-134 | Mounting strap, rear |
| B31-138 | Mounting Plate, Front |
| S84-192 | Mounting parts kit |
| A87-38 | Receptacle, Antenna Cable |
| B79-379 | Speaker, 4" P.M. (includes Output Transformer) |
| S84-322 | Suppression Kit Assembly |
| A34-105 | Vibrator |
| A83-519 | Wiper, grounding, for case covers |

MODELS 41, 41A, 9082, Ch. 135.245

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | F-7621 | Arm, Assembly (including pickup arm, pivot spring and arm lift bearing pin assembly) |
| | F-7622 | Cartridge—Crystal (Less Needle)—Shure Bros. P92B |
| | F-298 | Cabinet (including Lid, Hinges and Lid Support) Lid—Cabinet (For F-298 Cabinet) |
| | F-7679 | Capacitor—Variable Assembly) |
| C19, C20 | F-5051 | Capacitor—Electrolytic—40 MFD. 150 V. 40 MFD. 150 V. |
| C5, C11 | F-6015 | Capacitor—Ceramic 100 MMFD. 500 V. 20% |
| C12 | F-7549 | Capacitor—Ceramic 100 MMFD. 500 V. 10% |
| C15 | F-6488 | Capacitor—Ceramic 250 MMFD. 500 V. 20% |
| C13 | F-4894 | Capacitor—Paper .005 MFD. 600 V. |
| C16 | F-1344 | Capacitor—Paper .01 MFD. 400 V. |
| C18 | F-1376 | Capacitor—Paper .02 MFD. 400 V. |
| C6, C7, C14 | F-1345 | Capacitor—Paper .05 MFD. 200 V. |
| C21 | F-1346 | Capacitor—Paper .05 MFD. 400 V. |
| C10 | F-4957 | Capacitor—Paper .09 MFD. 200 V. |
| C17 | F-1623 | Capacitor—Paper .1 MFD. 400 V. |
| | F-6149 | Coil—Antenna |
| | F-7139 | Coil—Oscillator |
| R5 | F-5757 | Control—On-Off & Volume |
| R12 | F-6157 | Control—Tone |
| | F-1090 | Cord—Line |
| | F-6738 | Knob—Plastic—Volume Control |
| | F-6740 | Knob—Plastic—Tone Control |
| | F-6742 | Knob—Plastic—Radio-Phono |
| | F-6744 | Knob—Station Tuning |
| | F-7683 | Leaflet—Instruction |
| | F-7623 | Motor—Phono—60 Cycle (Less Turntable) |
| | F-7707 | Needle—Phono |
| | F-7673 | Panel Assembly—Cabinet Front |
| R14 | F-4022 | Resistor—33 Ohm—½ W.—20% |
| R10 | F-4067 | Resistor—180 Ohm—½ W.—10% |
| R1 | F-4025 | Resistor—22,000 Ohm—½ W.—20% |
| R4 | F-4063 | Resistor—47,000 Ohm—½ W.—20% |
| R9 | F-4064 | Resistor—33,000 Ohm—½ W.—20% |
| R2, R8 | F-4026 | Resistor—220,000 Ohm—½ W.—20% |
| R11 | F-4027 | Resistor—470,000 Ohm—½ W.—20% |
| R3, R6 | F-1262 | Resistor—1 Megohm—½ W.—20% |
| R7 | F-4028 | Resistor—6.8 Megohm—½ W.—20% |
| R13 | F-5358 | Resistor—1,000 Ohm—1 W.—10% |
| | F-4978 | Shield—I.F. Transformer |
| | F-7515 | Socket—Tube—8 Prong—Octal |
| | F-6148 | Speaker—5" P.M. Dynamic |
| | F-6156 | Switch—Radio-Phono |
| T1 | F-7676 | Transformer—I.F. #1 |
| T2 | F-7677 | Transformer—I.F. #2 |
| T3 | F-4875 | Transformer—Output |

NOTE: In some receivers the following components—R8, R11, C15 and C16 are replaced by the assembly listed below:

F-6477 Audio Coupling Plate



DIAL DRIVE STRINGING DIAGRAM

## RADIO SPECIFICATIONS

**Power Supply:**
All models available . . . . . . . . . . . . . . . . . . . . . . . . . . 117 Volts AC 60 Cycles

**Frequency Range:**
Broadcast . . . . . . . . . . . 535-1620 KC

**Power Output:**
Undistorted . . . . . . . . . . . . 1.0 Watt
Maximum . . . . . . . . . . . . . 1.8 Watts

## DISASSEMBLY INSTRUCTIONS

The following steps must be taken in removing the chassis from the cabinet:

1. Remove wood enclosure panel in record changer compartment.
2. Remove two speednuts located in rear of front panel. These speednuts retain the pins used to fasten the top of Dial Crystal to front panel.
3. Remove two pins and lift out crystal.
4. Remove dial pointer, knobs, motor & pickup plugs and antenna connections.
5. Remove five screws used to mount chassis board to underside of cabinet.
6. Remove chassis and mounting board.

MODELS 41, 41A,
9082, Ch. 135.245

| POSITION OF TUNER | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMER ADJUSTMENTS (IN ORDER) SHOWN | TRIMMER FUNCTION |
|---|---|---|---|---|---|
| Closed | 455 KC | .1 mfd. | 12SA7GT Transl.Grid | T2, C9, & C8 | I.F. |
| Open | 1620 KC | .0002 mfd. | Loop | C4 | Oscillator |
| 1400 KC | 1400 KC | .0002 mfd. | Loop | C2 | Transl. |

## IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

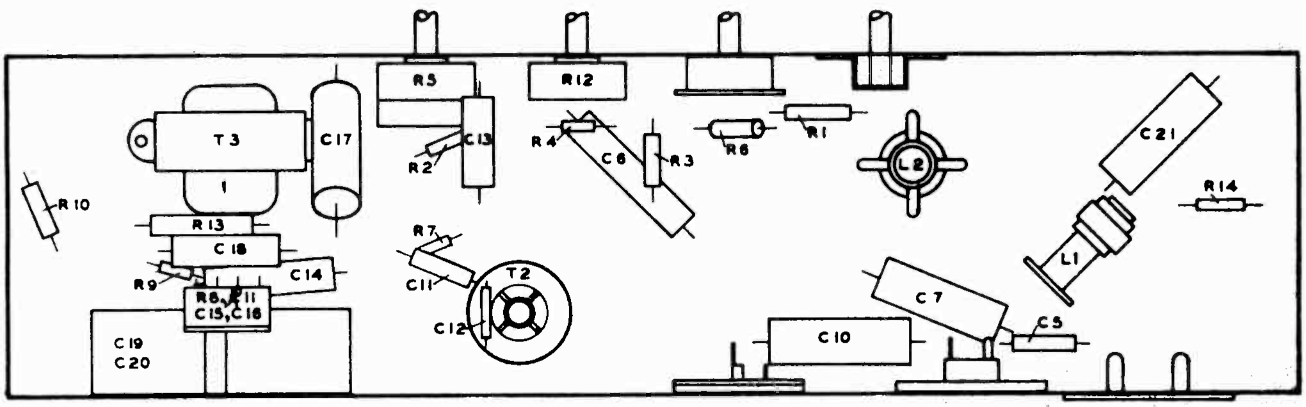
The entire Alignment Procedure should be repeated step by step in the original order for greatest accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

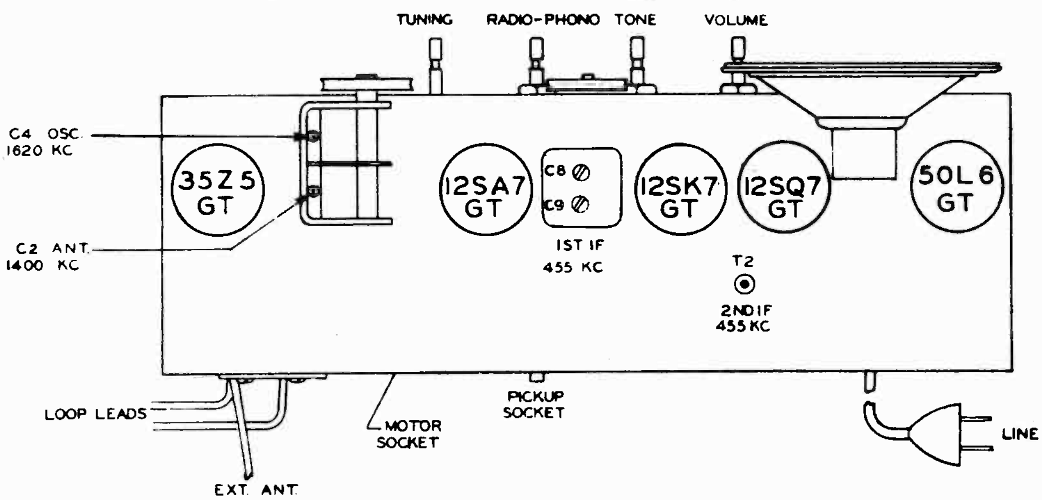
## ALIGNMENT PROCEDURE

**PRELIMINARY:**

Output Meter Connection. . . . . . . . . . . . . . . . . . . . . . . . . . . . Across loud speaker voice coil
Generator ground lead connection. . . . . . . . . . . . . . . . . . . . . . . . Floating Ground
Dummy Antenna Value to be in series with generator output. . . . . . . . . . . . . See chart below
Connection of Generator Output lead . . . . . . . . . . . . . . . . . . . . . . . See chart below
Generator Modulation . . . . . . . . . . . . . . . . . . . . . . . . . . . . 30%, 400 Cycles
Position of Volume Control . . . . . . . . . . . . . . . . . . . . . . . . . . . . Fully on

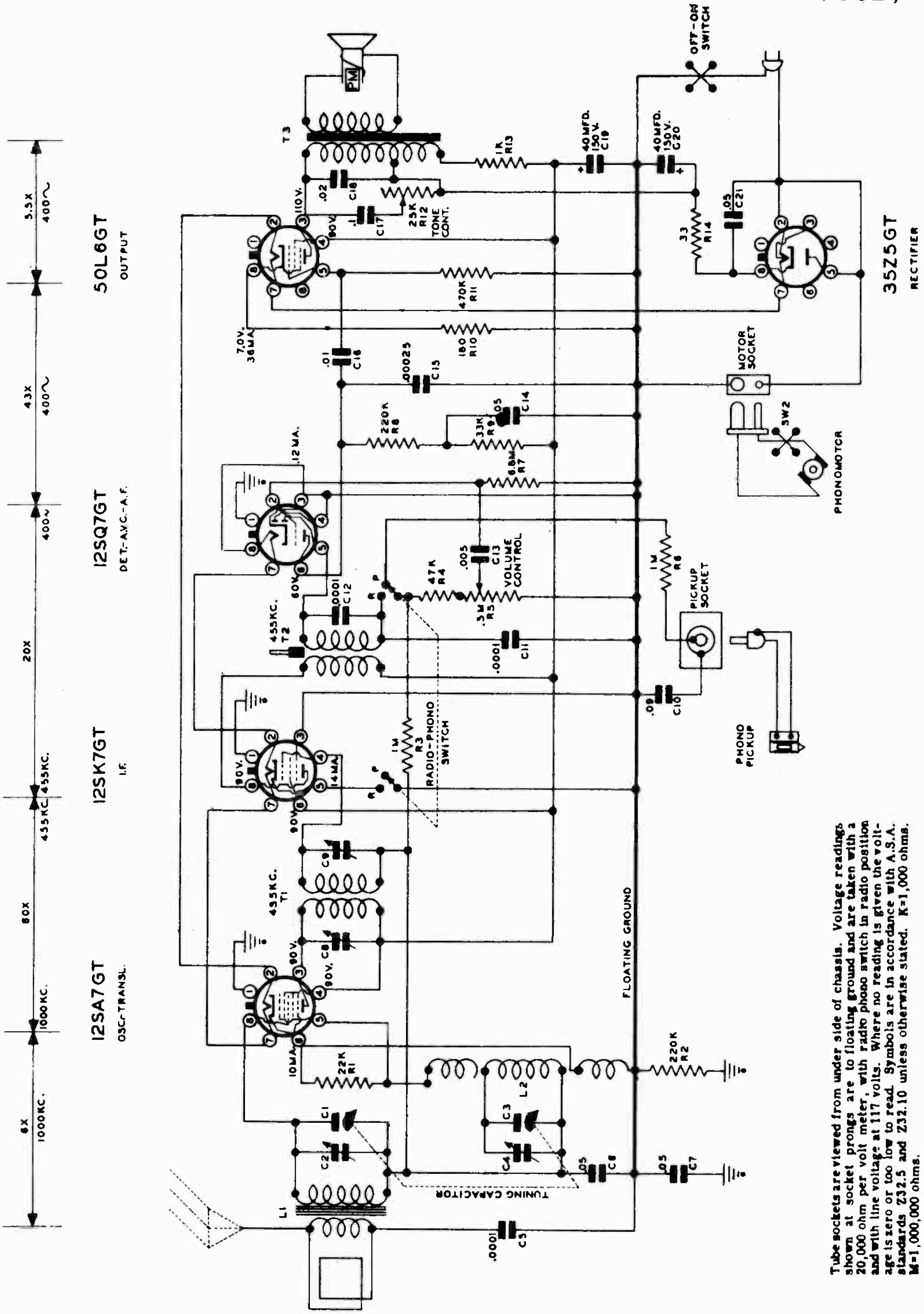


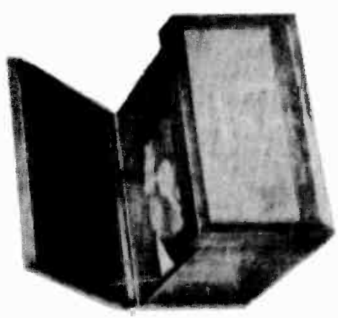

LOCATION OF PARTS UNDER CHASSIS




LOCATION OF PARTS ON TOP OF CHASSIS

MODELS 41, 41A, 9082, Ch. 135.245



MODEL 9083,
Ch. 100.154

## ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter reading to indicate 0.05 Watt across voice coil. . . . . . . . . . . 0.4 Volt

Generator ground lead connection. . . . . . . . . . . . . . . . . . . . . . Receiver chassis

Generator modulation. . . . . . . . . . . . . . . . . . . . . . . . . . .30%, 400 cycles

Position of volume control. . . . . . . . . . . . . . . . . . . . . . . . . Fully on

Position of tone control. . . . . . . . . . . . . . . . . . . . . . . . . Radio-Speech

Position of pointer with tuner fully closed . . . . . . . . . Horizontal position at low end of dial, parallel to bottom edge of dial scale. Repositioning of pointer may be accomplished by holding tuning control shaft steady and turning pointer to correct position.

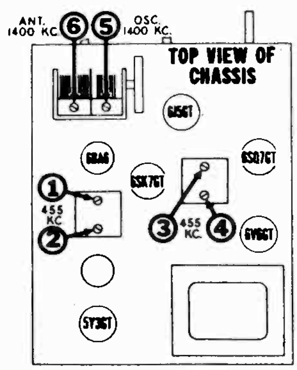
| POSITION OF TUNER | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMER ADJUSTMENTS (IN ORDER SHOWN) | TRIMMER FUNCTION | SENSITIVITY (FOR .05 WATT OUTPUT) |
|---|---|---|---|---|---|---|
| Closed | 455 Kc. | 0.1 mfd. | Trimmer #6 | 1, 2, 3 & 4 | I.F. | 46 mv |
| 1400 Kc. | 1400 Kc. | 200 mmfd. | Ext. Ant. Clip | 5 | Osc. | |
| 1400 Kc. | 1400 Kc. | 200 mmfd. | Ext. Ant. Clip | 6 | Ant. | 100 mv/m |

IMPORTANT ALIGNMENT NOTES:

The alignment must be done in the order given.

The entire alignment procedure should be repeated step by step in the original order for greatest accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

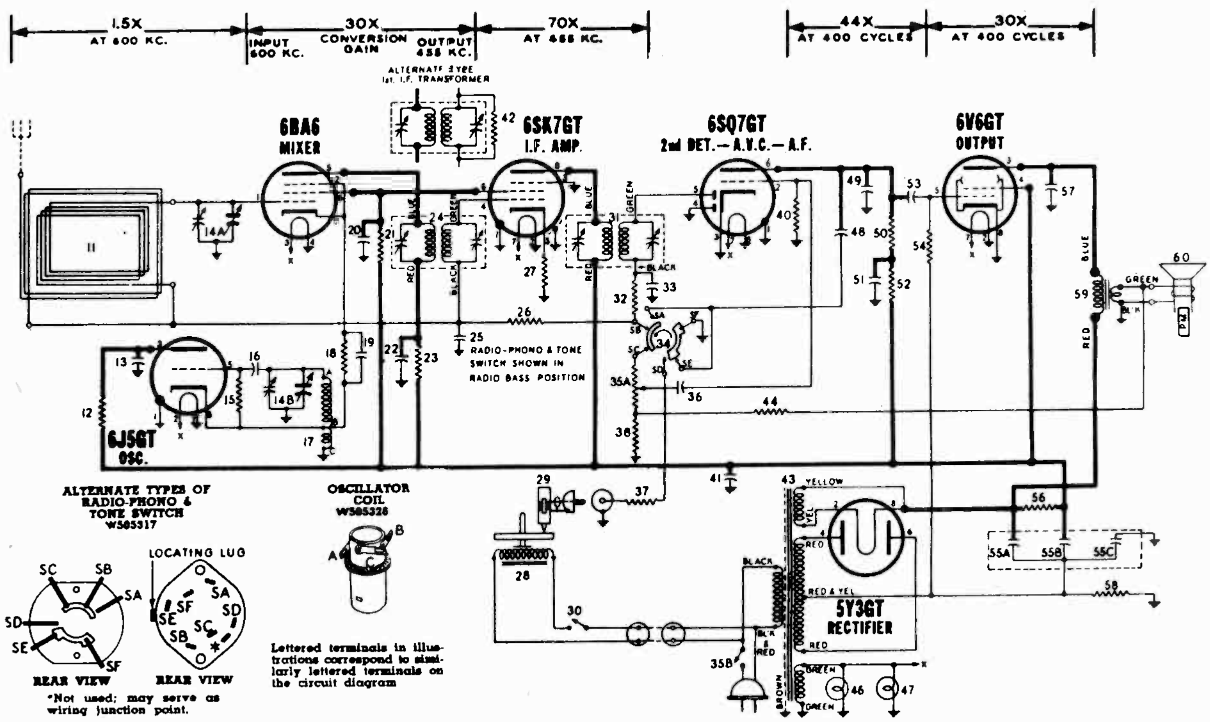



## AUDIO OSCILLATION

The audio system of this receiver utilizes a two stage type of inverse feed-back arrangement and should it ever be necessary to replace the speaker or output transformer it is important to maintain a definite phase relationship in the feed-back circuit. If the connections to the output transformer are reversed or if the feed-back connection is made to the wrong side of the output transformer secondary, the system will become regenerative instead of degenerative. Under those conditions audio oscillation may result. If that occurs, oscillation may be prevented by reversing the connections to the speaker.

MODEL 9083,
Ch. 100.154

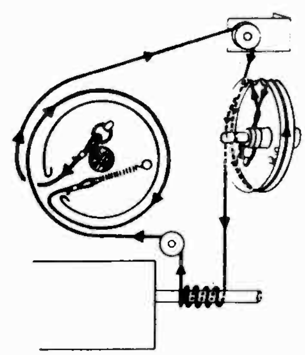
## SCHEMATIC DIAGRAM




## DIAL POINTER DRIVE CORD ARRANGEMENT (Side View)

To string dial cord, set gang condenser to fully open position and use the following parts:

W 114955 Clip on end of cord
W 117057 Cord (3 feet)
W 119087 Ring for dial cord
W 505161 Tension spring

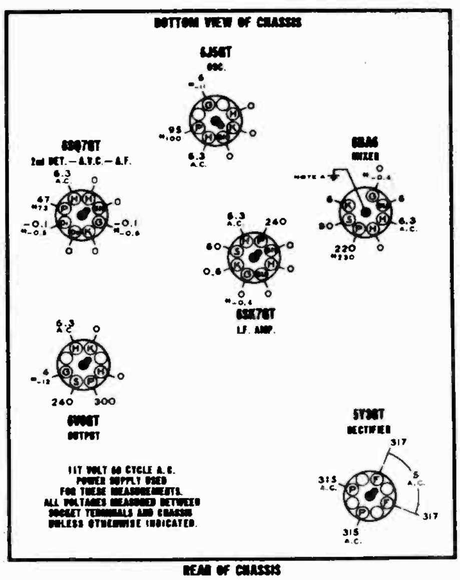


To replace and properly position pointer see step 1 in "Alignment Procedure"

## SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 Ohms per volt except where indicated by (*). The (*) symbol designated a vacuum tube voltmeter measurement.

DIAL TUNED TO 540 KC.
VOLUME ON FULL WITH NO SIGNAL
RADIO-PHONO & TONE SWITCH IN
"RADIO-BASS" POSITION




NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

MODEL 9083,
Ch. 100.154

## SPECIFICATIONS

Power Supply
All models available . . . .117 volts AC, 60 cycle — Radio 60 watts, Phono 30 watts

Frequency Range
Broadcast . . . 540-1600 Kc.

Power Output
Undistorted . . 3.0 watts
Maximum . . . . 5.0 watts

## REPAIR PARTS LIST

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | | **CONDENSERS** |
| 13 | W502151 | Condenser—.01 Mfd. 400 volt |
| 14-A,B | W505315 | Condenser—variable gang (with drum) |
| 16 | W502931 | Condenser—ceramic 100 Mmfd. 500 volt. |
| 19 | W502153 | Condenser—.05 Mfd. 200 volt |
| 20 | W502157 | Condenser—.05 Mfd. 400 volt |
| 22 | W502152 | Condenser—.02 Mfd. 400 volt |
| 25 | W502153 | Condenser—.05 Mfd. 200 volt |
| 33 | W502931 | Condenser—ceramic 100 Mmfd. 500 volt. |
| 36 | W502156 | Condenser—.004 Mfd. 400 volt |
| 41 | W502157 | Condenser—.05 Mfd. 400 volt |
| 48 | W512006 | Condenser—.005 Mfd. 600 volt |
| 49 | W502271 | Condenser—mica 260 Mmfd. 500 volt |
| 51 | W502410 | Condenser—.1 Mfd. 400 volt |
| 53 | W502152 | Condenser—.02 Mfd. 400 volt |
| 55-A,B,C. | W502207 | Condenser—electrolytic<br>A—20 Mfd. 400 volt<br>B—10 Mfd. 400 volt<br>C—20 Mfd. 25 volt. |
| 57 | W502156 | Condenser—.004 Mfd. 400 volt |
| | | **RESISTORS** |
| 12 | W502466 | Resistor—carbon 33,000 Ohms ± 10% 1w. |
| 15 | W502131 | Resistor—carbon 47,000 Ohms 1/4 watt. |
| 18 | W502128 | Resistor—carbon 2200 Ohms 1/4 watt |
| 21 | W502288 | Resistor—carbon 47,000 Ohms 1 watt |
| 23 | W502459 | Resistor—carbon 6800 Ohms 1/4 watt |
| 26 | W502269 | Resistor—carbon 3.3 Meg. 1/4 watt |
| 27 | W502264 | Resistor—carbon 47 Ohms ± 10% 1/4 w. |
| 32 | W502131 | Resistor—carbon 47,000 Ohms 1/4 watt. |
| 35-A,B | W505318 | Volume control 1 Meg. (with switch) |
| 37 | W510185 | Resistor—carbon 470,000 Ohms 1/2 watt |
| 38 | W510122 | Resistor—carbon 150 Ohms 1/2 watt |
| 40 | W502468 | Resistor—carbon 4.7 Meg. 1/4 watt |
| 42 | W510191 | Resistor—carbon 1 Meg. 1/2 watt |
| 44 | W510146 | Resistor—carbon 150 Ohms 1/2 watt |
| 50 | W502133 | Resistor—carbon 220,000 Ohms 1/4 watt |
| 52 | W502133 | Resistor—carbon 220,000 Ohms 1/4 watt |
| 54 | W502134 | Resistor—carbon 470,000 Ohms 1/4 watt |
| 56 | W504771 | Resistor—carbon 3300 Ohms 2 watt |
| 58 | W502293 | Resistor—wire wound 200 Ohms ± 10% 2 w |

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | | **COILS AND TRANSFORMERS** |
| 11 | W508361 | Loop antenna |
| 17 | W505326 | Coil—oscillator |
| 24 | W502657 | Transformer—1st I.F. |
| 31 | W502658 | Transformer—2nd I.F. |
| 43 | W502174 | Transformer—power |
| 59 | W505305 | Transformer—output |
| | | **OTHER ELECTRICAL PARTS** |
| 28 | W508120 | Motor—for record changer; 115 volt 60 cycle |
| 29 | W508432 | Crystal Cartridge |
| 30 | W505269 | Switch—"ON-OFF" for record changer |
| 34 | W505317 | Switch—radio-phono |
| 46, 47 | W110629 | Lamp—dial (Mazda #44) 6.3 volt 0.25 Amp. |
| 60 | W506657 | Speaker—P.M. Dynamic (6 inch) |
| | | **MISCELLANEOUS PARTS** |
| | W116467 | Base for mtg. electrolytic condenser |
| | W505165 | "C" Washer—for tuning shaft |
| | KX508371 | Cabinet |
| | W112745 | Clip—coil mounting |
| | W114955 | Clip—retainer on end of dial cord |
| | W160326 | Clip—retains dial scale |
| | W117057 | Cord—dial drive (3 ft. required) per foot |
| | W508363 | Dial scale (foil) |
| | W508350 | Escutcheon and dial window assy |
| | W505464 | Hinge for lid per pair |
| | W505344 | Knob—tuning (clear plastic) |
| | W505345 | Knob—"Volume" (clear plastic) |
| | W505346 | Knob—"Radio-Phono" (clear plastic) |
| | W508372 | Lid (less hardware) |
| | W505463 | Lid support |
| | W508433 | Needle—phonograph; for standard records |
| | W508434 | Needle—phonograph; for "Fine Groove" and "Microgroove" records |
| | W500966 | Plug for phono. pick-up cable |
| | W501031 | Plug for phono. motor cable |
| | W505686 | Pointer |
| | W508266 | Record changer |
| | W119087 | Ring for dial cord |
| | W505944 | Rubber pad for mtg. chassis |
| | W79993 | Screw—#8 x 1 1/4"; for mtg. chassis |
| | W152054 | Shaft and drum for pointer |
| | W505313 | Shaft—tuning |
| | W117716 | Shield—tube |
| | W505459 | Socket—dial lamp |
| | W504397 | Socket—miniature |
| | W116690 | Socket—octal base |
| | W160392 | Socket—octal (rectifier) |
| | W160039 | Socket—phono. plug |
| | W505307 | Socket and phono. motor cable |
| | W505161 | Spring—tension |
| | W111456 | Washer—spring washer for tuning shaft |

## SPECIFICATIONS

Power Supply: ....................................

Power Output:
Undistorted ..............................0.15 Watt
Maximum ..............................0.30 Watt

117 Volts, DC or 50-60 Cycles AC, 11 Watts or Catalog No. 6404 Battery Pack.

Frequency Range:
Broadcast ..............................540-1610 KC

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| | | **CHASSIS PARTS** |
| | T84-391 | Cable, assembly, battery |
| | T83-421 | Clip, I.F. transformer mounting |
| C1, C2, C3 | T18-296 | Capacitor, electrolytic |
| C4, C5, C6 | T19-207 | Capacitor, variable (3 gang) |
| C7 | T20-149 | Capacitor, trimmer |
| C8, C10 | | |
| C11 | T16-153 | Capacitor, .005 mfd. 600 v. |
| C9 | T15-188 | Capacitor, 100 mmfd. mica |
| C12, C17 | T16-152 | Capacitor, .05 mfd. 200 v. |
| C13 | T15-186 | Capacitor, 10 mmfd. mica |
| C14 | T16-150 | Capacitor, .02 mfd. 400 v. |
| C15, C16 | T16-157 | Capacitor, .1 mfd. 200 v. |
| C18, C19 | T16-179 | Capacitor, .05 mfd. 400 v. |
| C20, C21, C22 | T17-100 | Couplate, ceramic unit |
| L3 | T10-553 | Coil, oscillator |
| R11, S1 | T24-185 | Control, volume |
| | T84-77 | Cord, power, AC/DC |
| | T51-105 | Cord, pointer travel, 28" |
| | T21-152 | Cover, plate, bottom |
| | T47-108 | Grommet, variable condenser |
| | T76-13 | Insulator, electrolytic |
| | T52-196 | Knob, AC/DC/battery switch |
| L1 | T82-65 | Loop, antenna |
| | T45-121 | Plug, AC/DC |
| | T58-77 | Pointer |
| | T39-265 | Pulley, dial cord |
| | T83-642 | Rectifier, selenium |

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| S2 | T69-173 | Switch, AC/DC/battery |
| T1, T2 | T10-475 | Transformer, 1st and 2nd I.F. |
| T3 | T80-228 | Transformer, output |
| L2 | T10-535 | Transformer, RF |
| | T86-51 | Washer, "C", tuning shaft |
| | T86-80 | Washer, compression, tuning shaft |
| | | **CABINET PARTS** |
| | T44-10 | Baffle |
| | T22-159 | Button, plug (trimmer hole) |
| | T42-463 | Cabinet |
| | T67-549 | Dial scale |
| | T40-152 | Escutcheon |
| | T52-203 | Grille cloth |
| | T31-157 | Knob |
| | T76-17 | Plate, loop cover |
| | T97-70 | Terminal strip, loop |
| | T97-132 | Screw, #6-3/8, statuary bronze |
| | T98-12 | Screw, #6-1/4, statuary bronze |

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| R1 | T60-744 | Resistor, 22,000 ohms, 1/2 w. 10% |
| R2 | T60-669 | Resistor, 4.7 meg. 1/2 w. |
| R3, R5 | T60-728 | Resistor, 10 meg. 1/2 w. |
| R4 | T60-730 | Resistor, 47,000 ohms, 1/2 w. |
| R6 | T60-704 | Resistor, 330 ohms, 1/2 w. 10% |
| R7 | T60-727 | Resistor, 100,000 ohms, 1/2 w. |
| R8 | T60-676 | Resistor, 30,000 ohms, 1/2 w. |
| R9 | T60-770 | Resistor, 470 ohms, 1/2 w. 10% |
| R10 | T60-726 | Resistor, 2.2 meg. 1/2 w. |
| R12, R15 | T60-729 | Resistor, 1500 ohms, 1/2 w. 10% |
| R13 | T60-708 | Resistor, 680 ohms, 1/2 w. 10% |
| R14 | T60-796 | Resistor, 110 ohms, 3 w. 10% |
| R16 | T60-757 | Resistor, 2000 ohms, 10 w. 5% |
| R17, R18, R19 | T17-100 | Couplate, ceramic unit |
| | T75-79 | Shaft, tuning |
| | T68-39 | Socket miniature, wafer |
| | T79-378 | Speaker, 5" P.M. |
| | T70-122 | Spring, dial cord |

## ALIGNMENT PROCEDURE

Output meter reading to indicate 0.05 watt across voice coil .................................. 0.4 v.

Generator ground lead connected ..............................To B- through 0.1 mfd. capacitor

Generator modulation ..............................................................30%, 400 cycles

Position of volume control ...........................................................Fully on

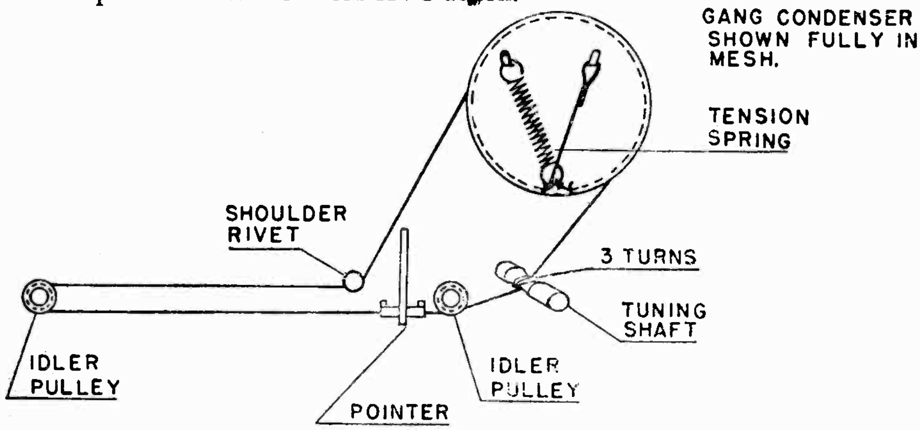
Position of pointer with tuner fully closed ..........................Center of pointer lined up with extreme left dot on dial backing plate. (Chassis right side up.)

MODEL 9280,
Ch. 528.168

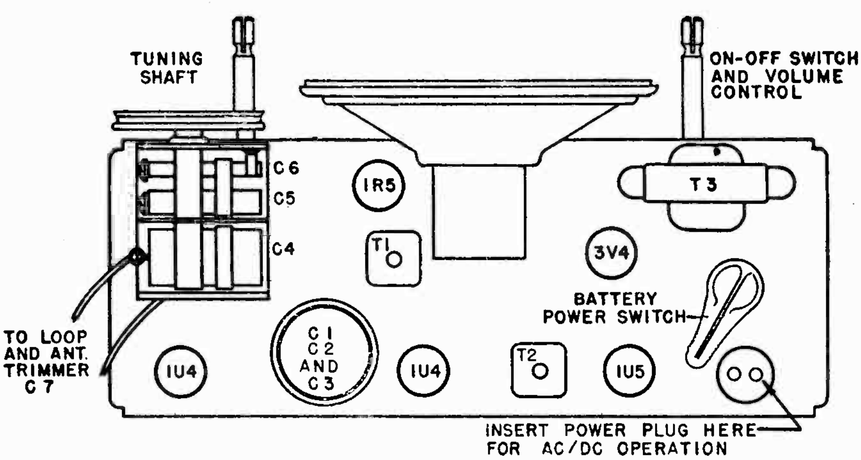
| Position of Tuner | Generator Freq. | Dummy Antenna | Generator Connection | Adjustments (in order shown) | Function | Max. Microvolts Input to produce .05 w. output |
|---|---|---|---|---|---|---|
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1U4 I-F Amp. | T2 (top and bottom) | I.F. | 5000 |
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1R5 Conv. | T1 (top and bottom) | I.F. | 250 |
| Min. Cap. | 1610 kc | 0.1 mfd. | Stator ant. tuner | C6 | Osc. | |
| 1400 kc | 1400 kc | 0.1 mfd. | Stator ant. tuner | C5 | R.F. | 30 |
| 1400 kc | 1400 kc | | Hazeltine Test Loop | C7 | Loop | 100 |

**ALIGNMENT NOTES:**

1. It is recommended that this set be connected to an isolation transformer when aligning on AC.
2. The alignment must be done in the order given above.
3. While making the above adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

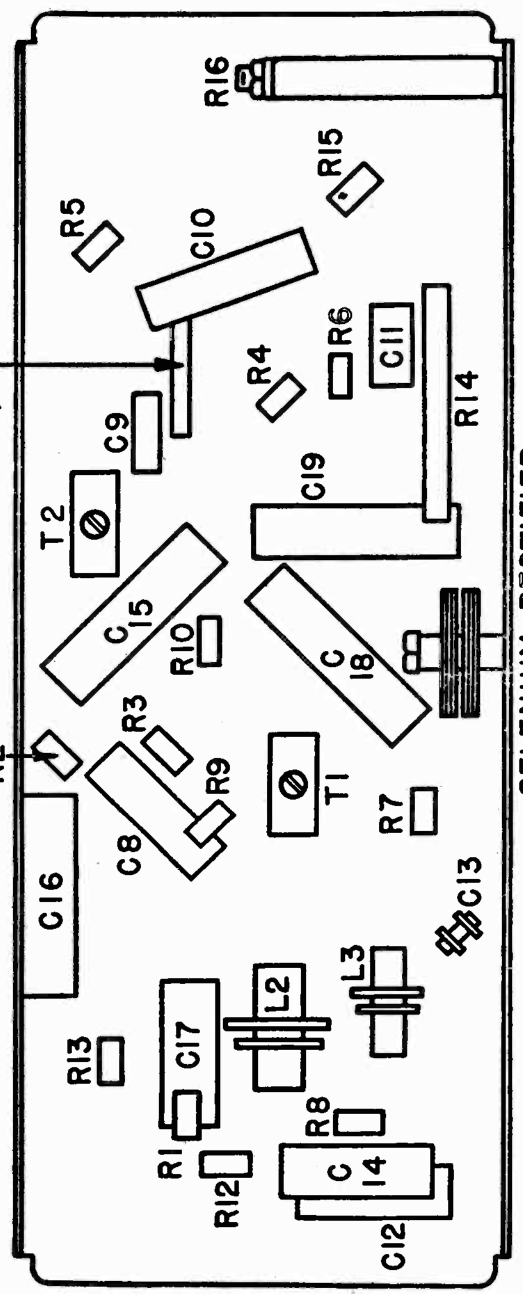



STRING AND POINTER HOOKUP

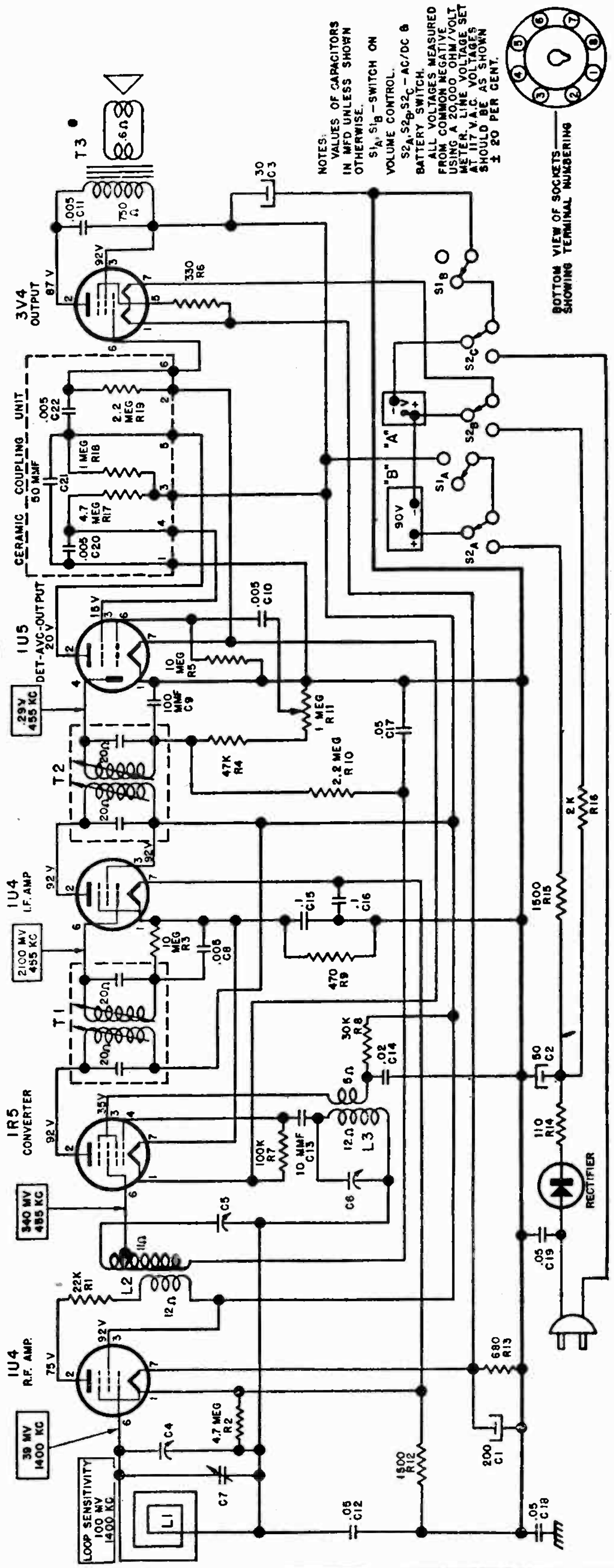



LOCATION OF PARTS ON TOP OF CHASSIS

MODEL 9280,
Ch. 528.168




LOCATION OF PARTS UNDER CHASSIS




SCHEMATIC DIAGRAM FOR SILVERTONE CHASSIS 528.168

MODEL 215,
Ch. 528.174

## SPECIFICATIONS

Power Supply: ....................................

Power Output:
Undistorted ............................0.15 Watt
Maximum ............................0.30 Watt

117 Volts, DC or 50-60 Cycles AC, 11 Watts or Catalog No. 6480 "B" Battery and two Flashlight Cells

Frequency Range:
Broadcast ............................540-1625 KC

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| | | **CHASSIS PARTS** |
| C1, C2 | T19-209 | Capacitor, variable (2 gang) |
| C3, C4, C5 | T18-297 | Capacitor, electrolytic |
| C6 | T15-205 | Capacitor, 50 mmfd. ceramic |
| C7, C14 | T16-153 | Capacitor, .005 mfd. 600 v. |
| C8, C16, C17 | T16-150 | Capacitor, .02 mfd. 400 v. |
| C9, C10, C11, C12, C13 | T17-103 | Capacitor, ceramic unit |
| C15 | T16-152 | Capacitor, .05 mfd. 200 v. |
| C18 | T16-179 | Capacitor, .05 mfd. 400 v. |
| | T11-187 | Clamp, power cord |
| | T83-421 | Clip, I.F. transformer mounting |
| L2 | T10-554 | Coil, oscillator |

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| | T76-69 | Connector, "B" battery |
| R4, S1 | T24-187 | Control, volume and switch |
| | T23-162 | Cord, power, AC/DC |
| | T21-159 | Cover, bottom |
| | T47-108 | Grommet, variable condenser |
| | T37-126 | Insulator, volume control |
| | T37-127 | Insulator, selenium rectifier |
| L1 | T82-68 | Loop, antenna |
| | T83-642 | Rectifier, selenium |
| R1 | A60-727 | Resistor, 100,000 ohm, ½ w. |
| R2, R5 | A60-728 | Resistor, 10 megohm, ½ w. |
| R3 | A50-730 | Resistor, 47,000 ohm, ½ w. |
| R6 | A60-669 | Resistor, 4.7 megohm, ½ w. |
| R7, R8 | A60-726 | Resistor, 2.2 megohm, ½ w. |
| R9 | A60-690 | Resistor, 27 ohm, ½ w. 10% |
| R10 | A60-753 | Resistor, 220 ohm, ½ w. 10% |

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| R11, R12 | T60-668 | Resistor, 1 megohm, ½ w. |
| R13 | T60-708 | Resistor, 680 ohm, ½ w. 10% |
| R14 | T60-709 | Resistor, 820 ohm, ½ w. 10% |
| R15 | T60-770 | Resistor, 470 ohm, ½ w. 10% |
| R16 | T60-729 | Resistor, 1500 ohm, ½ w. 10% |
| R17 | T60-725 | Resistor, 160 ohm, 3 w. 5% |
| R18 | T60-757 | Resistor, 2000 ohm, 10 w. 5% |
| R19 | T60-711 | Resistor, 2700 ohm, ½ w. 10% |
| R20 | T60-771 | Resistor, 270 ohm, ½ w. 10% |
| | T71-43 | Shield, volume control |
| | T68-39 | Socket, miniature wafer |
| | T77-151 | Spacer, variable condenser |
| | T79-382 | Speaker, 3½" P.M. |
| | T70-165 | Spring |

| Schematic Location | Part Number | DESCRIPTION |
|---|---|---|
| T1, T2 | T10-508 | Transformer, 1st and 2nd I.F. |
| T3 | T80-256 | Transformer, output |
| | | **CABINET PARTS** |
| | T42-468 | Cabinet—front —back cover |
| | T22-155 | Clip, back cover |
| | T35-8 | Clip, "A" battery retainer |
| | T83-431 | Handle |
| | T70-164 | Hinge, spring clip |
| | T52-307 | Knob |
| | T67-544 | Overlay, dial scale |
| | T67-555 | Overlay, volume |

## ALIGNMENT PROCEDURE

Output meter reading to indicate 0.05 watt across voice coil .................................. 0.4 v.

Generator ground lead connected ..................................To B- through 0.1 mfd. capacitor

Generator modulation ..................................................................30%, 400 cycles

Position of volume control..................................................................Fully on

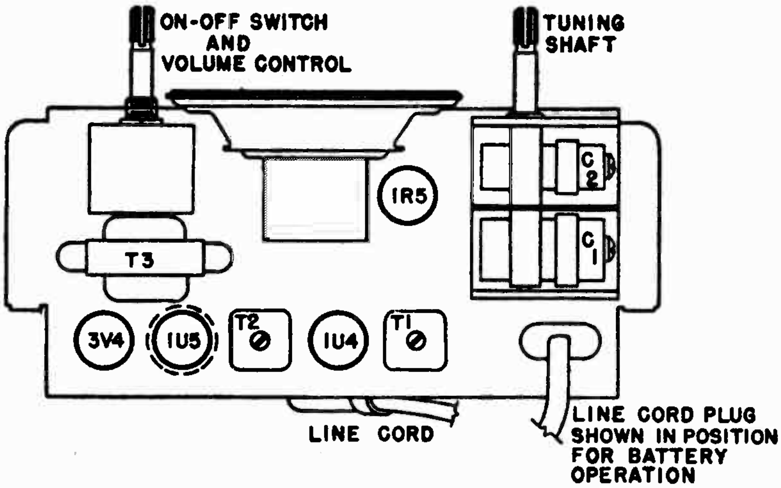
Position of pointer with tuner fully closed..........................Pointer should be horizontal, pointing to left (9 o'clock).

MODEL 215,
Ch. 528.174

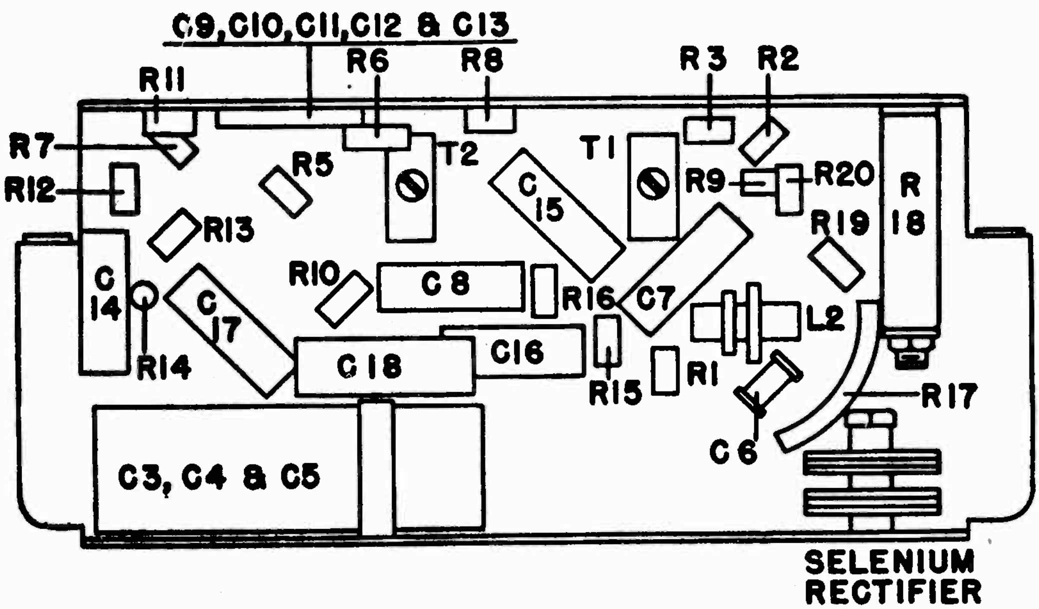
| Position of Tuner | Generator Freq. | Dummy Antenna | Generator Connection | Adjustments (in order shown) | Function | Max. Microvolts Input to produce .05 w. output |
|---|---|---|---|---|---|---|
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1U4 I-F Amp. | T2 (top and bottom) | I.F. | 5000 |
| Min. Cap. | 455 kc | 0.1 mfd. | Pin #6 of 1R5 Conv. | T1 (top and bottom) | I.F. | 250 |
| Min. Cap. | 1625 kc | 0.1 mfd. | Stator ant. tuner | C2 | Osc. | |
| 1400 kc | 1400 kc | | Hazeltine Test Loop | C1 | Loop | 100 |

**ALIGNMENT NOTES:**

1. It is recommended that this set be connected to an isolation transformer when aligning on AC.
2. The alignment must be done in the order given above.
3. While making the above adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

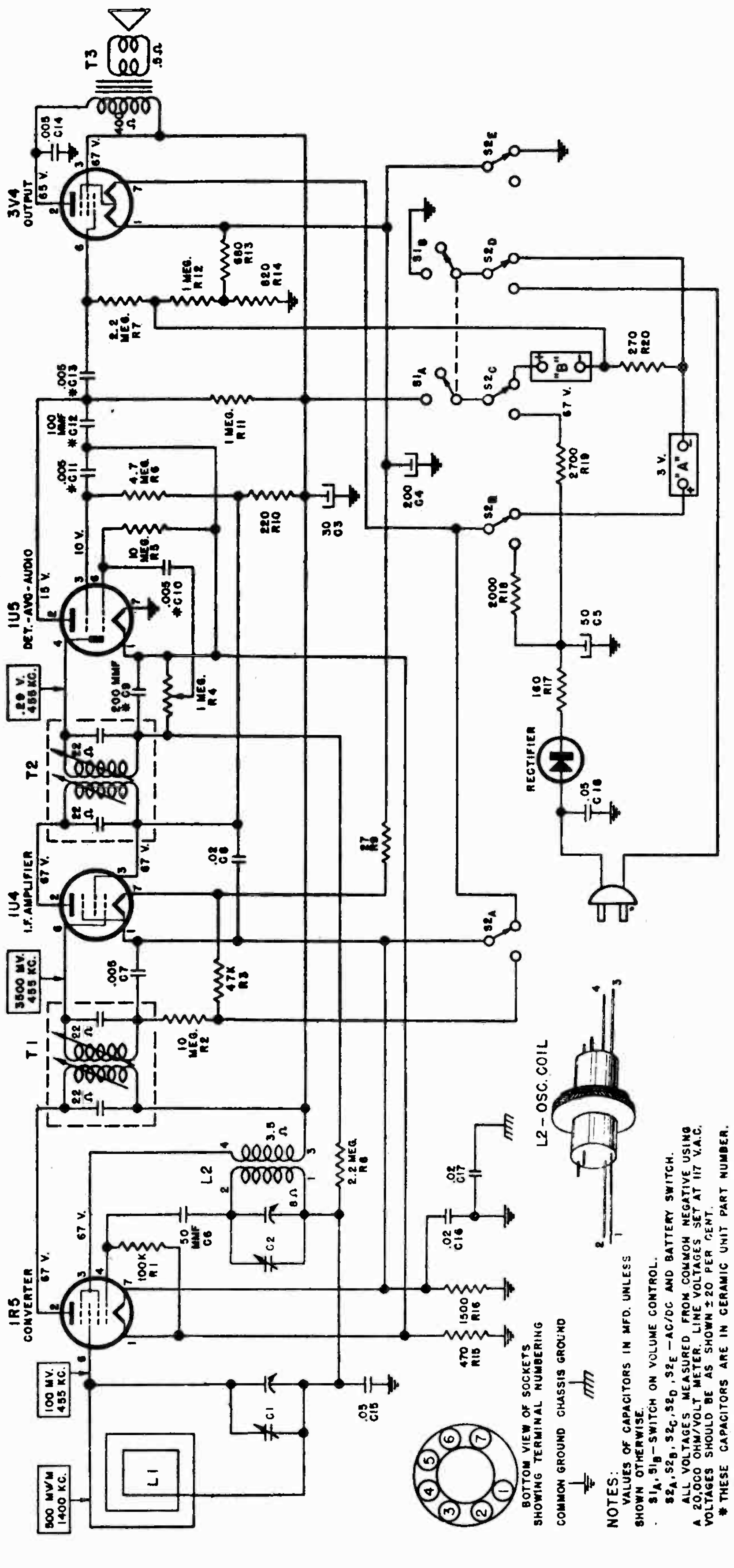



LOCATION OF PARTS ON TOP OF CHASSIS



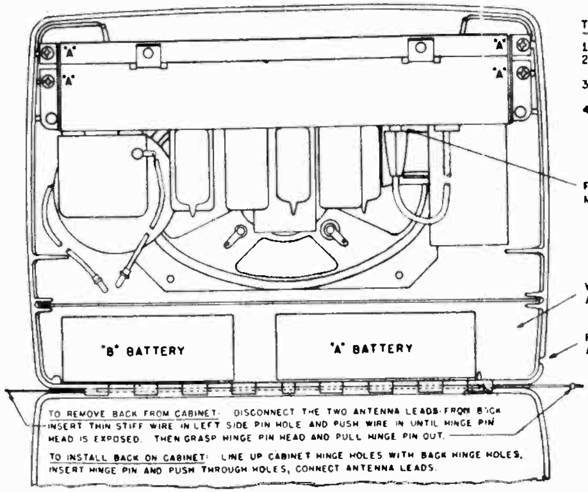

LOCATION OF PARTS UNDER CHASSIS

MODEL 215,
Ch. 528.174




SCHEMATIC DIAGRAM FOR SILVERTONE CHASSIS 528.174

MODELS 1U-312-PG, 1U-312-PW, 312-PG, 312-PW




## POWER SUPPLY

**THIS RADIO CAN BE OPERATED ON EITHER:**

110 to 120 VOLTS DIRECT CURRENT

OR

110 to 120 VOLTS, 50 to 60 CYCLE, ALTERNATING CURRENT

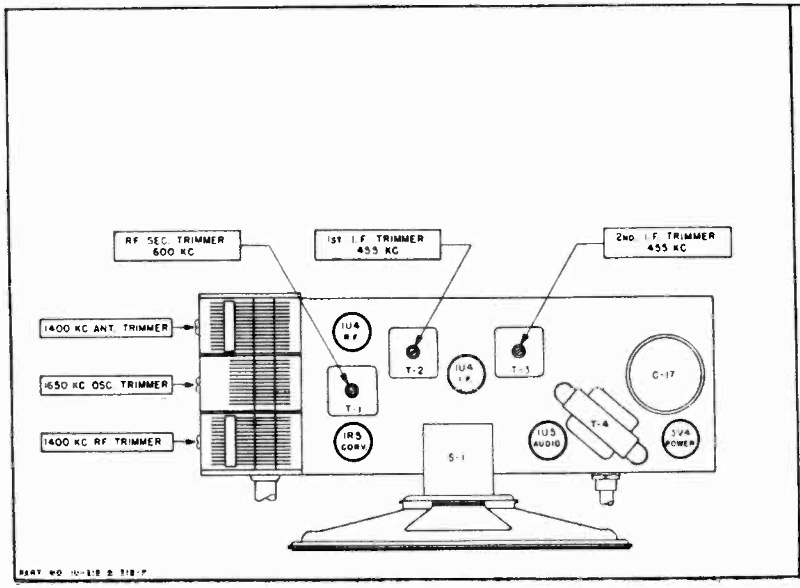
OR

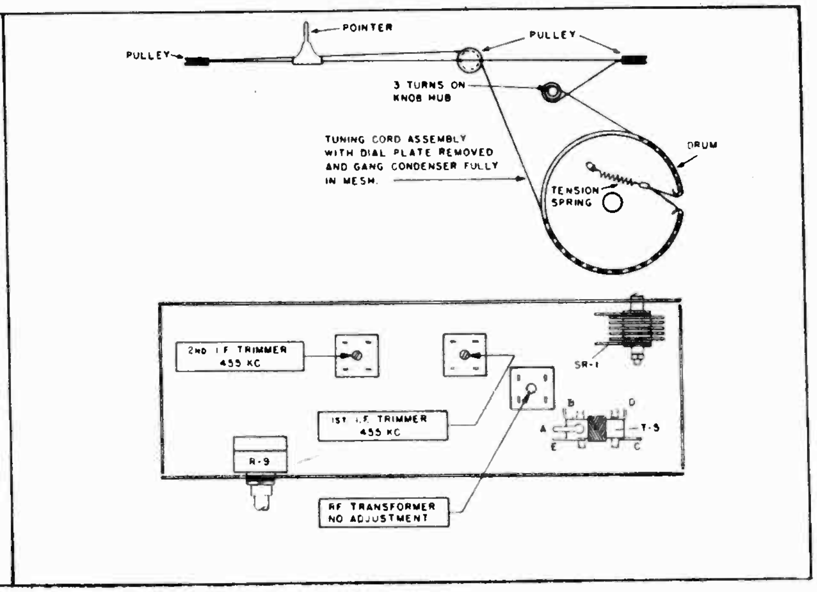
BATTERIES—WITH ONE 4½ VOLT "A" and ONE 90 VOLT "B"

## GROUND

When an external aerial is attached to the radio be sure that a good ground is connected to the outer clip marked "GND" located inside of the cabinet back.

WARNING:—Do not attach a ground direct to the radio chassis—any external ground connection to any metal part of the chassis will cause a short and possible damage.



MODELS 1U-312-PG, 1U-312-PW, 312-PG, 312-PW

## ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure, read tabulations from left to right. Make the adjustment marked (1) first, (2) next, (3) third.

IF RADIO HAS METAL PLATE ON BOTTOM OF CHASSIS BE SURE TO HAVE PLATE MOUNTED ON CHASSIS WHEN ALIGNING SET IN STEPS 2, 3 AND 4.

Before starting alignment:

(A) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the first mark at the low frequency end of the dial scale. If dial indicator does not point exactly to this mark, move pointer to correct position.

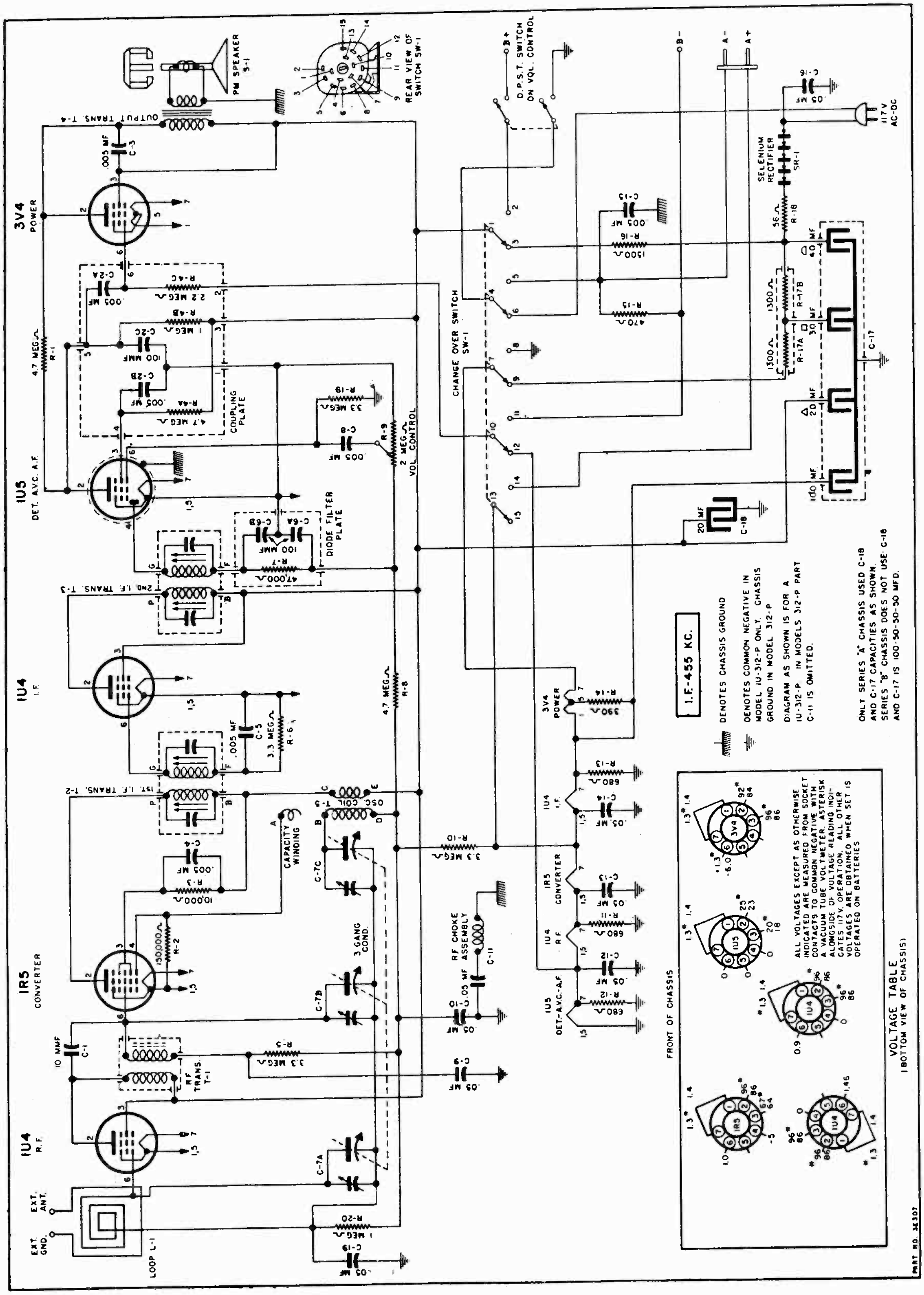
(B) Use an accurately calibrated test oscillator with some type of output measuring device.

(C) WHEN ADJUSTING THE 1650 KC OSCILLATOR TRIMMER, remove chassis from cabinet and disconnect the loop connection wires from the loop terminal strip. Attach a 1 megohm resistor across these connections and feed output of test oscillator across the 1 megohm resistor.

(D) THE 1400 KC LOOP ANTENNA TRIMMER should be adjusted only after all other adjustments have been made and with the set mounted in the cabinet. When aligning the 1400 KC Antenna Trimmer, couple test oscillator to receiver loop by: (1) make loop consisting of five to ten turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio loop. Open cabinet back just enough to insert a screw driver to adjust the antenna trimmer. BE SURE THAT NEITHER LOOP MOVES WHILE ALIGNING.

| Steps | Set receiver dial to: | TEST OSCILLATOR | | | Refer to parts layout diagram for location of trimmers mentioned below: |
|---|---|---|---|---|---|
| | | Adjust test oscillator frequency to: | Use dummy antenna in series with output of test oscillator consisting of: | Attach output of test oscillator to | |
| 1 | Any point where no interfering signal is received | Exactly 455 K. C. | 0.2 Mfd. Condenser | High side to grid of 1R5 tube. Low side to chassis (common negative in Model 1U312) through a .02 Mfd. blocking condenser. | Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output. |
| 2 | Rotate gang condenser to minimum capacity | Exactly 1650 K. C. | See paragraph (C) above | See paragraph (C) above | Adjust 1650 K. C. oscillator trimmer for maximum output. |
| 3 | Approximately 1400 K. C. | Approx. 1400 K. C. | See paragraph (D) above | See paragraph (D) above | Adjust 1400 K. C. antenna trimmer for maximum output. |
| 4 | Approximately 600 K. C. | Approx. 600 K. C. | See paragraph (D) above | See paragraph (D) above | While rocking gang adjust 600 K. C. R.F. trimmer for maximum output. |

MODELS 1U-312-PG, 1U-312-PW, 312-PG, 312-PW



MODELS 1U-312-PG, 1U-312-PW, 312-PG, 312-PW

# PARTS LIST

| Illus. No. | Part No. | Part Name and Description |
|---|---|---|
| C-1 | 23E2027-5 | Capacitor, Fixed Ceramic, 10 MMF 350 V. |
| C-2A, C-2B, C-2C | Part of 23E2023-2 Ceramic Coupling Plate (See Misc. Parts) | |
| C-3 | 23E2025 | Capacitor, Fixed Ceramic, .005 MFD 350 V. (Disc) |
| C-4 | 23E2025 | Capacitor, Fixed Ceramic, .005 MFD 350 V. (Disc) |
| C-5 | 23E2025 | Capacitor, Fixed Ceramic, .005 MFD 350 V. (Disc) |
| C-6A, C-6B | Part of 23E2022-2 Diode Filter Plate (See Misc. Parts) | |
| C-7A, C-7B, C-7C | 24E54 | Capacitor, 3 Gang, Tuning |
| C-8 | 23E2025 | Capacitor, Fixed Ceramic, .005 MFD 350 V (Disc) |
| C-9 | 23E416 | Capacitor, Tubular .05 MFD 400 V. |
| C-10 | 23E416 | Capacitor, Tubular .05 MFD 400 V. |
| C-11 | 20E611 | Capacitor, R. F. Choke & Capacitor Assembly (in Model 1U312P only) |
| C-12 | 23E416 | Capacitor, Tubular, .05 MFD 400 V. |
| C-13 | 23E416 | Capacitor, Tubular, .05 MFD 400 V. |
| C-14 | 23E416 | Capacitor, Tubular, .05 MFD 400 V. |
| C-15 | 23E2025 | Capacitor, Fixed Ceramic, .005 MFD 350 V. (Disc) |
| C-16 | 23E416 | Capacitor, Tubular, .05 MFD 400 V. |
| C-17 | 25E48 | Capacitor, Dry Electrolytic, 40-30-20 MFD 150 V., 100 MFD 25 V. (Used in "Series A" only) |
| C-17 | 25E53 | Capacitor, Dry Electroyltic 50-50-50 MFD 150 V., 100 MFD 25 V. (Used, starting with "Series B") |
| C-17 | 25E56 | Capacitor, Dry Electrolytic, 50-50-50 MFD 150 V., 100 MFD 25 V. (in Model 1U312P only) |
| C-18 | 25E55 | Capacitor, Dry Electrolytic, 20 MFD 150 V. (used in Series "A" only) |
| C-19 | 23E416 | Capacitor, Tubular .05 MFD 400 V. |
| R-1 | 27E475 | Resistor, Carbon, 4.7 Megohm 1/3 W. |
| R-2 | 27E154 | Resistor, Carbon, 150,000 Ohm 1/3 W. |
| R-3 | 27E103 | Resistor, Carbon, 10,000 Ohm 1/3 W. |
| R-4A, R-4B, R-4C | Part of 23E2023-2 Ceramic Coupling Plate (See Misc. Parts) | |
| R-5 | 27E335 | Resistor, Carbon, 3.3 Megohm 1/3 W. |
| R-6 | 27E335 | Resistor, Carbon, 3.3 Megohm 1/3 W. |
| R-7 | Part of 23E2022-2 Diode Filter Plate (See Misc. Parts) | |
| R-8 | 27E475 | Resistor, Carbon, 4.7 Megohm 1/3 W. |
| R-9 | 28E63 | Resistor, Volume Control, 2 Megohm |
| R-10 | 27E335 | Resistor, Carbon, 3.3 Megohm 1/3 W. |
| R-11 | 27E681 | Resistor, Carbon, 680 Ohm 1/3 W. |
| R-12 | 27E681 | Resistor, Carbon, 680 Ohm 1/3 W. |
| R-13 | 27E681 | Resistor, Carbon, 680 Ohm 1/3 W. |
| R-14 | 27E391 | Resistor, Carbon, 390 Ohm 1/3 W. |
| R-15 | 27E471 | Resistor, Carbon, 470 Ohm 1/3 W. |
| R-16 | 27E152-3 | Resistor, Carbon, 1500 Ohm 1 W. |
| R-17A, R-17B | 27E1000-6 | Resistor, Wirewound, Dual, 1300 Ohm 6.5 W. |
| R-18 | 27E560-3 | Resistor, Carbon, 56 Ohm 1 W. |
| R-19 | 27E335 | Resistor, Carbon, 3.3 Megohm 1/3 W. |
| R-20 | 27E105 | Resistor, Carbon, 1 Megohm 1/3 W. |
| L-1 | 64E31 | Antenna, Loop |
| T-1 | 20E565 | Coil, R. F. Transformer |
| T-2 | 20E463 | Coil, 1st I. F. Transformer |
| T-3 | 20E463 | Coil, 2nd I. F. Transformer |
| T-4 | 22E50 | Transformer, Output |
| T-5 | 20E566 | Coil, Oscillator |
| S-1 | 1E42 | Speaker, 4" x 6" P. M. |
| SW-1 | 29E20 | Switch, Change-Over, AC-DC-BATT. |
| SR-1 | 57E4 | Rectifier, Selenium |

**IMPORTANT:** When ordering complete cabinet, or cabinet parts, **BE SURE TO MENTION REQUIRED COLOR** in addition to proper part number.

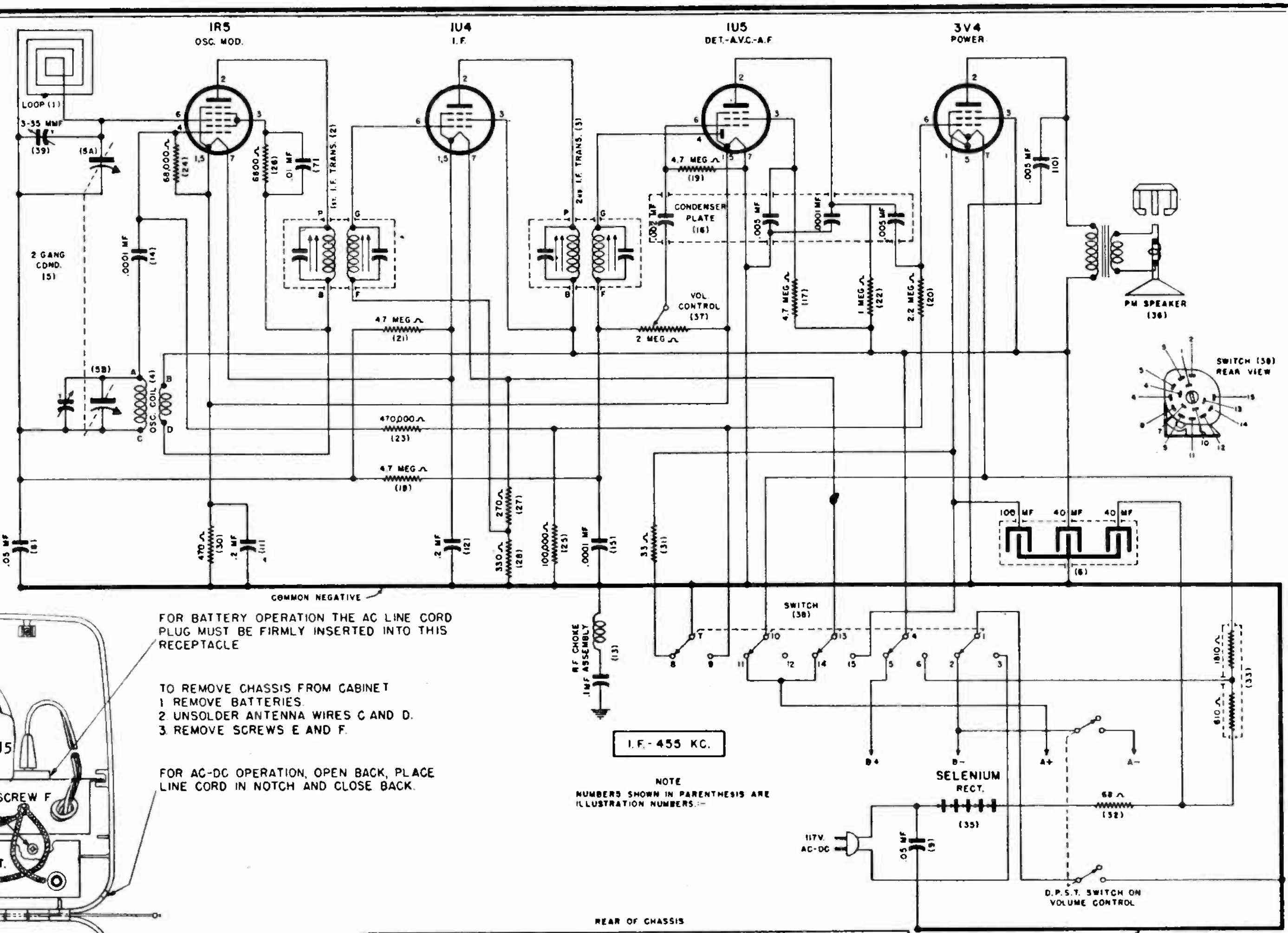
# MISCELLANEOUS PARTS

| Part No. | Part Name and Description |
|---|---|
| 20E570 | Complete Brown Cabinet Assembly, with Handle, Baffle, Grille, Screen, Dial Scale, Loop and Cabinet Back |
| 20E570-2 | Complete Green Cabinet Assembly, with Handle, Baffle, Grille, Screen, Dial Scale, Loop and Cabinet Back |
| 20E571 | Cabinet Assembly, less Back and Loop, but with Handle, Baffle, Grille, Screen and Dial Scale, Brown |
| 20E571-2 | Cabinet Assembly, less Back and Loop, but with Handle, Baffle, Grille, Screen and Dial Scale, Green |
| 7E230 | Cabinet Assembly, with Handle only—less Back, Loop, Baffle, Grille, Screen and Dial Scale, Brown |
| 7E230-2 | Cabinet Assembly, with Handle only—less Back, Loop, Baffle, Grille, Screen and Dial Scale, Green |
| 7E233 | Cabinet Back, Less Loop, with 47E13 Hinge Pin, Brown |
| 7E233-2 | Cabinet Back, Less Loop, with 47E13 Hinge Pin, Green |
| 20E253-26 | Dial Drive Cord |
| 65E2 | Dial Cord Tension Spring |
| 35E28 | Dial Pointer |
| 36E61 | Dial Scale, Calibrated, Polystyrene Scale |
| 5E62 | Dial Backplate, Metal, Background for Dial Scale |
| 20E249-3 | B— Battery Connector Assembly |
| 20E249-4 | B+ Battery Connector Assembly |
| 20E340-2 | "A" Battery Cable With Plug |
| 55E52-2 | Handle Bracket, for Mounting Handle |
| 52E31-7 | Handle Cover, Plastic, Brown |
| 52E31-8 | Handle Cover, Plastic, Green |
| 55E39-2 | Handle Strap, Clock Spring Steel |
| 47E13 | Hinge Pin, for Cabinet Back |
| 37E64 | Tuning Knob, less Hub, for Brown Cabinet |
| 37E64-2 | Tuning Knob, less Hub, for Green Cabinet |
| 37E66 | Off-On-Vol. Knob, for Brown Cabinet |
| 37E66-2 | Off-On-Vol. Knob, for Green Cabinet |
| 37E65 | Knob Hub, for 37E64 Tuning Knob |
| 37E65-2 | Knob Hub, for 37E64-2 Tuning Knob |
| 41E13 | Line Cord and Plug |
| 17E3-2 | "A" Battery Plug |
| 84E6 | Stud, Shaft for Tuning Knob |
| 23E2022-2 | Diode Filter Plate, Capacitor and Resistor Assembly |
| 23E2023-2 | Ceramic Coupling Plate, Capacitor and Resistor Assembly |

# MOUNTING HARDWARE

| Part No. | Part Name and Description |
|---|---|
| 13E103-20 | Clip, Holds Back to Cabinet |
| 82E39-F10 | Screw, No. 6-20 x ½ holds Chassis in Cabinet |
| 10E43 | Stud, Trimount, for mounting Speaker Baffle and Screen to Cabinet |

MODELS 1U-335-PG, 1U-335-PI, 1U-335-PM, 1U-335-PW, 335-PG, 335-PI, 335-PM, 335-PW

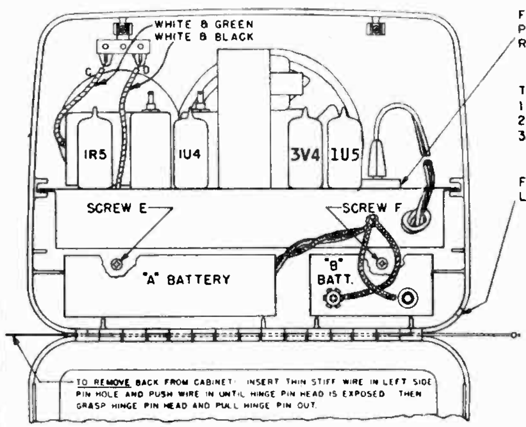



NOTE
NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

FOR BATTERY OPERATION THE AC LINE CORD PLUG MUST BE FIRMLY INSERTED INTO THIS RECEPTACLE

TO REMOVE CHASSIS FROM CABINET
1 REMOVE BATTERIES.
2 UNSOLDER ANTENNA WIRES C AND D.
3 REMOVE SCREWS E AND F.

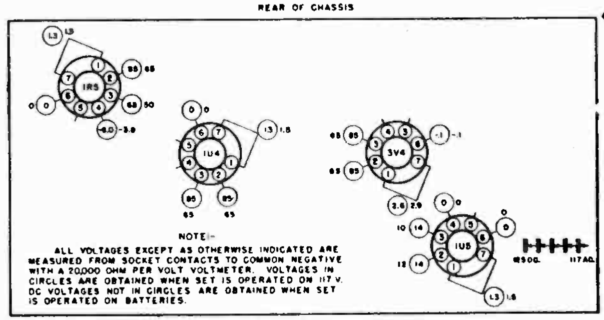
FOR AC-DC OPERATION, OPEN BACK, PLACE LINE CORD IN NOTCH AND CLOSE BACK.




TO REMOVE BACK FROM CABINET: INSERT THIN STIFF WIRE IN LEFT SIDE PIN HOLE AND PUSH WIRE IN UNTIL HINGE PIN HEAD IS EXPOSED. THEN GRASP HINGE PIN HEAD AND PULL HINGE PIN OUT.

TO INSTALL BACK ON CABINET: LINE UP CABINET HINGE HOLES WITH BACK HINGE HOLES, INSERT HINGE PIN AND PUSH THROUGH HOLES.

REAR OF CHASSIS



NOTE:-
ALL VOLTAGES EXCEPT AS OTHERWISE INDICATED ARE MEASURED FROM SOCKET CONTACTS TO COMMON NEGATIVE WITH A 20,000 OHM PER VOLT VOLTMETER. VOLTAGES IN CIRCLES ARE OBTAINED WHEN SET IS OPERATED ON 117 V. DC VOLTAGES NOT IN CIRCLES ARE OBTAINED WHEN SET IS OPERATED ON BATTERIES.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS).

## POWER SUPPLY

**THIS RADIO CAN BE OPERATED ON EITHER:**

110 to 120 VOLTS DIRECT CURRENT
OR
110 to 120 VOLTS, 50 to 60 CYCLE, ALTERNATING CURRENT
OR
BATTERIES—WITH ONE 4½ VOLT "A" and ONE 67½ VOLT "B"

MODELS 1U-335-PG, 1U-335-PI, 1U-335-PM, 1U-335-PW, 335-PG, 335-PI, 335-PM, 335-PW

# ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure, read tabulations from left to right. Make the adjustment marked (1) first, (2) next, (3) third.
IF RADIO HAS METAL PLATE ON BOTTOM OF CHASSIS BE SURE TO HAVE PLATE MOUNTED ON CHASSIS WHEN ALIGNING SET.

Before starting alignment:

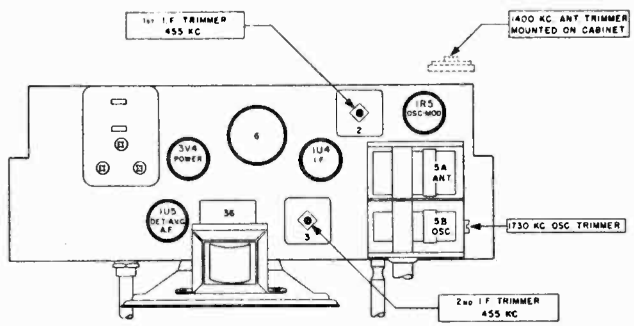
(A) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the outside edge of the first 5 in the 55 calibration number at the low frequency end of the dial scale. If dial indicator does not point exactly to the outside edge, move pointer to correct position.

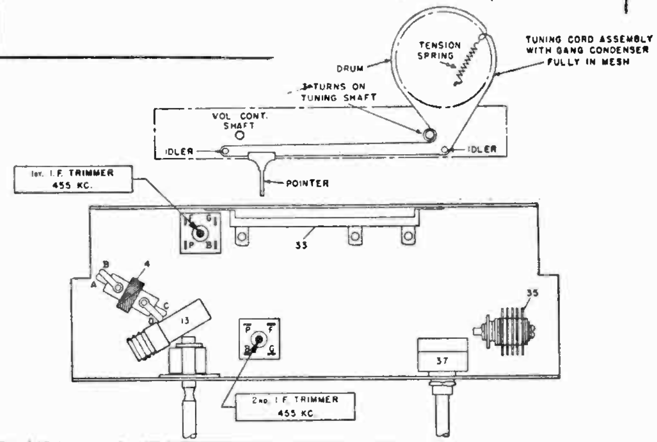
(B) Use an accurately calibrated test oscillator with some type of output measuring device.

(C) WHEN ADJUSTING THE 1730 KC OSCILLATOR TRIMMER, remove chassis from cabinet and disconnect the loop connection wires from the loop terminal strip. Attach a 1 megohm resistor across these connections and feed output of test oscillator across the 1 megohm resistor.

(D) THE 1400 KC LOOP ANTENNA TRIMMER should be adjusted only after all other adjustments have been made and with the set mounted in the cabinet. When aligning the 1400 KC Antenna Trimmer, couple test oscillator to receiver loop by: (1) make loop consisting of five to ten turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio loop. BE SURE THAT NEITHER LOOP MOVES WHILE ALIGNING.

| Steps | Set receiver dial to: | TEST OSCILLATOR | | | Refer to parts layout diagram for location of trimmers mentioned below: |
|---|---|---|---|---|---|
| | | Adjust test oscillator frequency to: | Use dummy antenna in series with output of test oscillator consisting of: | Attach output of test oscillator to | |
| 1 | Any point where no interfering signal is received | Exactly 455 K. C. | 0.2 Mfd. Condenser | High side to grid of 1R5 tube. Low side to chassis (common negative in Model 1U-335) through a .02 Mfd. blocking condenser. | Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output. |
| 2 | Rotate gang condenser to minimum capacity | Exactly 1730 K. C. | See paragraph (C) above | See paragraph (C) above | Adjust 1730 K. C. oscillator trimmer for maximum output. |
| 3 | Approximately 1400 K. C. | Approx. 1100 K. C. | See paragraph (D) above | See paragraph (D) above | Adjust 1100 K. C. antenna trimmer for maximum output. |



MODELS 1U-335-PG, 1U-335-PI, 1U-335-PM, 1U-335-PW, 335-PG, 335-PI, 335-PM, 335-PW

# PARTS LIST

| Illus. No. | Part No. | Part Name | Description |
|---|---|---|---|
| 1 | 64E32 | Antenna | Loop |
| 2 | 20E463 | Coil | 1st I.F. Transformer |
| 3 | 20E463 | Coil | 2nd I.F. Transformer |
| 4 | 20E338 | Coil | Oscillator |
| 5 | 24E40 | Condenser | Tuning, Two Gang |
| *6 | 25E28 | Condenser | Dry Electrolytic 40-40 Mfd. 150 V. & 100 Mfd. 10 V. |
| OR | | | |
| *6 | 25E29 | Condenser | Dry Electrolytic, 40-40 Mfd. 150 V. & 100 Mfd. 10 V. (1U-335P Only) |
| 7 | 23E211 | Condenser | Tubular, .01 Mfd. 200 V. |
| 8 | 23E216 | Condenser | Tubular, .05 Mfd. 200 V. |
| 9 | 23E416 | Condenser | Tubular, .05 Mfd. 400 V. |
| 10 | 23E408 | Condenser | Tubular, .005 Mfd. 400 V. |
| 11 | 23E220 | Condenser | Tubular, .2 Mfd. 200 V. |
| 12 | 23E220 | Condenser | Tubular, .2 Mfd. 200 V. |
| 13 | 20E407 | Choke | R. F. (1U-335P Only) |
| 14 | 23E24 | Condenser | Ceramic, .0001 Mfd. |
| 15 | 23E24 | Condenser | Ceramic, .0001 Mfd. |
| 16 | 23E2024 | Condenser | Ceramic Condenser Plate |
| 17 | 27E475 | Resistor | Carbon, 4.7 Megohm, 1/3 W. |
| 18 | 27E475 | Resistor | Carbon, 4.7 Megohm, 1/3 W. |
| 19 | 27E475 | Resistor | Carbon, 4.7 Megohm, 1/3 W. |
| 20 | 27E225 | Resistor | Carbon, 2.2 Megohm, 1/3 W. |
| 21 | 27E475 | Resistor | Carbon, 4.7 Megohm, 1/3 W. |
| 22 | 27E105 | Resistor | Carbon, 1 Megohm, 1/3 W. |
| 23 | 27E474 | Resistor | Carbon, 470,000 Ohm, 1/3 W. |
| 24 | 27E683 | Resistor | Carbon, 68,000 Ohm, 1/3 W. |
| 25 | 27E104 | Resistor | Carbon, 100,000 Ohm, 1/3 W. |
| 26 | 27E682 | Resistor | Carbon, 6,800 Ohm, 1/3 W. |
| 27 | 27E271 | Resistor | Carbon, 270 Ohm, 1/3 W. |
| 28 | 27E331 | Resistor | Carbon, 330 Ohm, 1/3 W. |
| 30 | 27E471 | Resistor | Carbon, 470 Ohm, 1/3 W. |
| 31 | 27E330-2 | Resistor | Carbon, 33 Ohm, 1/2 W. |
| 32 | 27E680-3 | Resistor | Carbon, 68 Ohm, 1 W. |
| 33 | 27E1005 | Resistor | Wire Wound, 1810 and 610 Ohms, 8 W. |
| *35 | 57E1-4 | Rectifier | Selenium |
| | OR | | |
| *35 | 57E1-5 | Rectifier | Selenium |
| 36 | 1E29 | Speaker | 4" P.M. |
| *37 | 28E30 | Volume Control | With D.P.S.T. Switch, 2 Megohm |
| 38 | 29E20 | Switch | Spring Return Type |
| 39 | 24E33 | Condenser | Trimmer 3-35 MMF. Working Range |

**IMPORTANT:** When ordering complete cabinet, or cabinet parts, **BE SURE TO MENTION REQUIRED COLOR** in addition to proper part number.

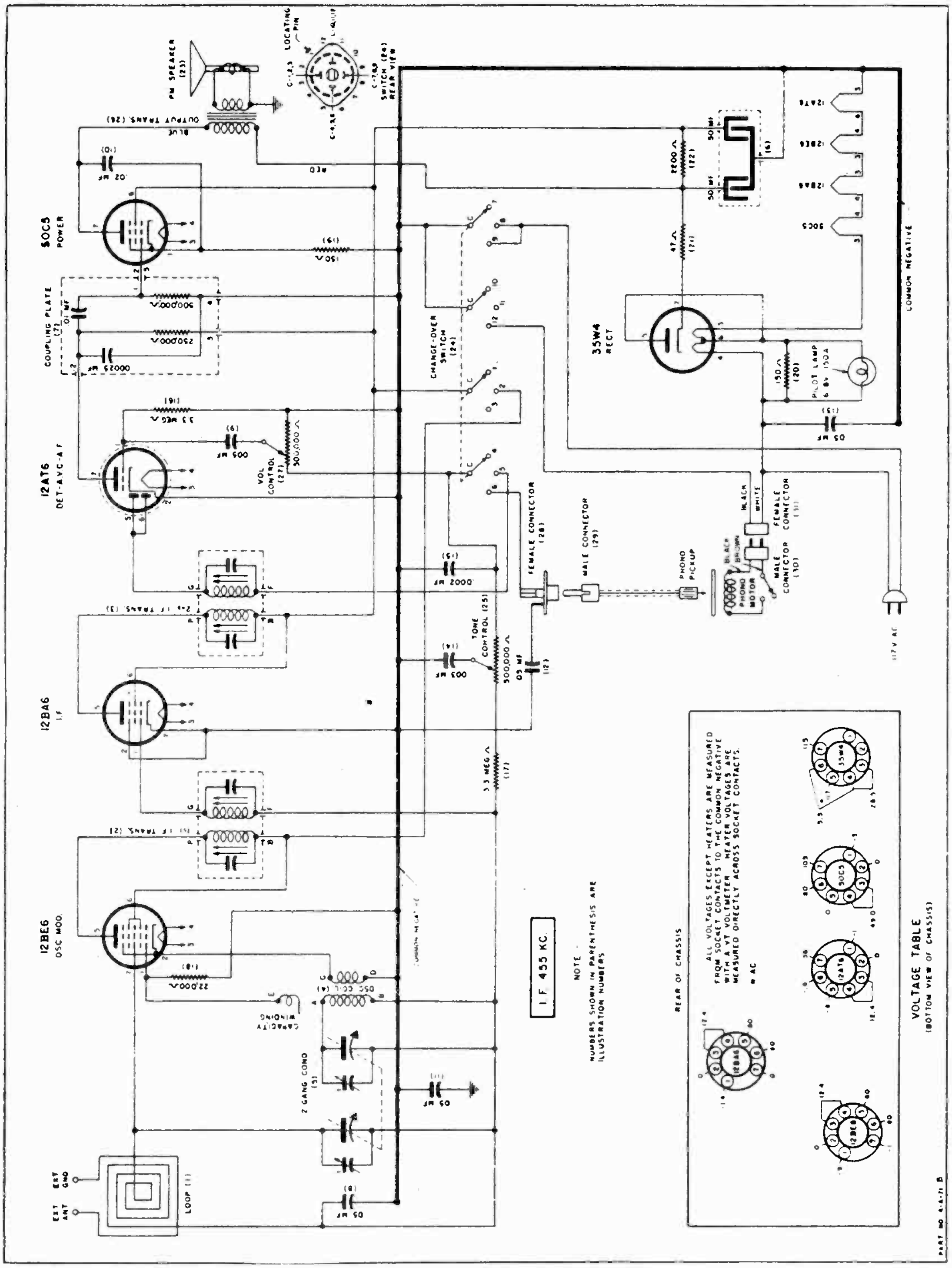
# MISCELLANEOUS PARTS

| Part No. | Part Name | Description |
|---|---|---|
| 20E577 | Cabinet | Complete Cabinet Assembly with Handle, Baffle, Loop and Cabinet Back, Red |
| 20E577-2 | Cabinet | Complete Cabinet Assembly with Handle, Baffle, Loop and Cabinet Back, Brown |
| 20E577-3 | Cabinet | Complete Cabinet Assembly with Handle, Baffle, Loop and Cabinet Back, White |
| 20E577-4 | Cabinet | Complete Cabinet Assembly with Handle, Baffle, Loop and Cabinet Back, Green |
| 20E578 | Cabt., less back | Cabinet Assembly, less Back, but with Handle, Baffle and Loop, Red |
| 20E578-2 | Cabt., less back | Cabinet Assembly, less Back, but with Handle, Baffle and Loop, Brown |
| 20E578-3 | Cabt., less back | Cabinet Assembly, less Back, but with Handle, Baffle and Loop, White |
| 20E578-7 | Cabt., less back | Cabinet Assembly, less Back, but with Handle, Baffle and Loop, Green |
| 7E236 | Cabinet Back | Back for cabinet with 47E13-2, Hinge Pin, Red |
| 7E236-2 | Cabinet Back | Back for cabinet with 47E13-2, Hinge Pin, Brown |
| 7E236-3 | Cabinet Back | Back for cabinet with 47E13-2, Hinge Pin, White |
| 7E236-5 | Cabinet Back | Back for cabinet with 47E13-2, Hinge Pin, Green |
| 20E253-19 | Dial Cord | Dial Drive Cord |
| 65E2 | Dial Spring | Dial Cord Tension Spring |
| 20E348 | Dial Shaft | Drive Shaft Assembly |
| 5E32-2 | Backplate | Dial Backplate |
| 35E8-13 | Dial Pointer | Dial Indicator |
| 20E249 | Batt. Connector | B— Battery Connector Assembly |
| 20E249-2 | Batt. Connector | B+ Battery Connector Assembly |
| 20E340 | "A" Batt. Cable | "A" Battery Cable with Plug |
| 55E52 | Handle Bracket | Bracket for Mounting Handle |
| 52E31-9 | Handle Cover | Plastic Cover, Red |
| 52E31-10 | Handle Cover | Plastic Cover, Brown |
| 52E31-11 | Handle Cover | Plastic Cover, White |
| 52E31-12 | Handle Cover | Plastic Cover, Green |
| 55E39 | Handle Strap | Clock Spring Steel |
| 47E13-2 | Hinge | Hinge Pin for Cabinet Back |
| 37E17-15 | Knob | Red |
| 37E17-16 | Knob | Brown |
| 37E17-17 | Knob | White |
| 37E17-18 | Knob | Green |
| 41E14 | Line Cord | Line Cord and Plug |
| 17E3-2 | Plug | "A" Battery Plug |
| 20E579 | Speaker Baffle | Baffle Assembly with Grille Cloth |

# MOUNTING HARDWARE

| Part No. | Part Name | Description |
|---|---|---|
| 13E103-9 | Clip | Holds Back to Cabinet |
| 82E37-F10 | Screw | 6-20x3/8—Holds 13E103-9 Clip to Cabt. |
| 82E36-F10 | Screw | 6-20x5/16—For Mounting Chassis |
| 13E103-17 | Speednut | For Mounting Speaker Baffle to Cabt. |

MODELS 1U-339-K,
339-K



# ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third.

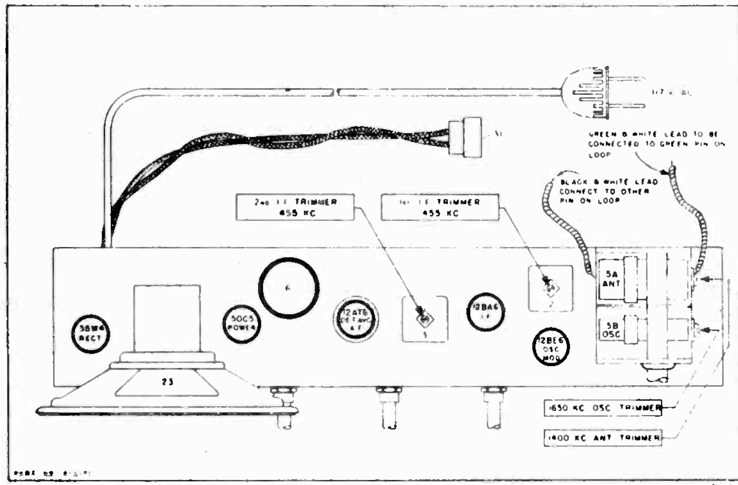
Before starting alignment:

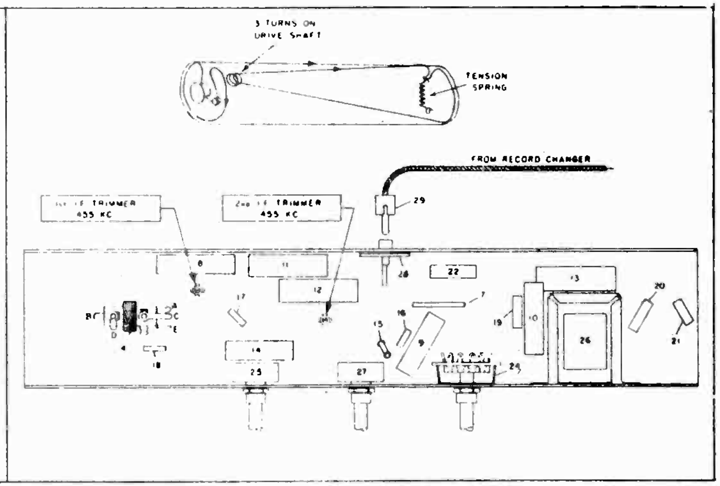
(A) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move to correct position by holding dial needle shank at the point where it attaches to its drum while turning the drum on the gang condenser.

(B) Use an accurately calibrated test oscillator with some type of output measuring device.

(C) THE LOOP MAY BE LEFT IN THE CABINET and the chassis with its mounting board pulled out of the cabinet just far enough for adjustment of the trimmers, or the loop and chassis may be removed from the cabinet and the loop placed in the same position and plane it will be in when both are mounted in cabinet—approximately 1" space between receiver loop and chassis. Couple test oscillator to receiver loop by: (1) make loop consisting of 5 to 10 turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio loop. BE SURE THAT NEITHER LOOP MOVES WHILE ALIGNING.

| Steps | Set receiver dial to: | TEST OSCILLATOR | | | Refer to parts layout diagram for location of trimmers mentioned below: |
|---|---|---|---|---|---|
| | | Adjust test oscillator frequency to: | Use dummy antenna in series with output of test oscillator consisting of: | Attach output of test oscillator to: | |
| 1 | Any point where no interfering signal is received | 455 K. C. | .02 MFD. See Paragraph (C) Above | High side to rear stator plates of tuning condenser. Low side to chassis (common negative in 1U339K) through a .02 Mfd. blocking condenser. | Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I.F. trimmers for maximum output. |
| 2 | Exactly 1650 K. C. | Exactly 1650 K. C. | See Paragraph (C) Above | See Paragraph (C) Above | Adjust 1650 K. C. oscillator trimmer for maximum output. |
| 3 | Approx. 1400 K. C. | Approx. 1400 K. C. | See Paragraph (C) Above | See Paragraph (C) Above | Adjust 1400 K. C. antenna trimmer for maximum output. |



TO REMOVE TUBES OR REPLACE PILOT LIGHT it is necessary to remove chassis from cabinet. To do this:

A. Take knobs off control shafts.

B. Rest cabinet on its side.

C. Unscrew the four copper colored screws that are used to hold mounting board (on which chassis rests) to the cabinet.

D. Gently pull mounting board and chassis from cabinet.

DO NOT REMOVE THE TWO SCREWS USED TO HOLD THE CHASSIS TO THE MOUNTING BOARD.

## RADIO PARTS LIST

| Illus. No. | Part No. | Part Name | Description |
|---|---|---|---|
| 1 | 64E21 | Antenna | Loop |
| 2 | 20E402 | Coil | 1st I. F. Transformer |
| 3 | 20E402 | Coil | 2nd I. F. Transformer |
| 4 | 20E397 | Coil | Oscillator |
| 5 | 24E47 | Condenser | 2 Gang, Tuning |
| *6 | **25E1** | **Condenser** | **Dry Elect. 50-50 MFD. 150 V.** |
| | **OR** | | |
| *6 | **25E16** | **Condenser** | **Dry Elect. 50-50 MFD. 150 V. (in Model 1U339 only)** |
| 7 | 23E2023 | Condenser | Ceramic Coupling Plate |
| 8 | 23E216 | Condenser | Paper .05 MF. 200 V. |
| 9 | 23E208 | Condenser | Paper .005 MF. 200 V. |
| 10 | 23E413 | Condenser | Paper .02 MF. 400 V. |
| 11 | 23E416 | Condenser | Paper .05 MF. 400 V. (in Model 1U339 only) |
| 12 | 23E416 | Condenser | Paper .05 MF. 400 V. |
| 13 | 23E416 | Condenser | Paper .05 MF. 400 V. |
| 14 | 23E406 | Condenser | Paper .003 MF. 400 V. |
| 15 | 23E41 | Condenser | Mica, .0002 MF. |
| | OR | | |
| 15 | 23E2027-3 | Condenser | Ceramic, .0002 MF. |
| 16 | 27E335 | Resistor | Carbon, 3.3 MEG OHM 1/3 W. |
| 17 | 27E335 | Resistor | Carbon, 3.3 MEG OHM 1/3 W. |
| 18 | 27E223 | Resistor | Carbon, 22,000 OHM 1/3 W. |
| 19 | 27E151 | Resistor | Carbon, 150 OHM 1/3 W. |
| 20 | 27E151 | Resistor | Carbon, 150 OHM 1/3 W. |
| 21 | 27E470-2 | Resistor | Carbon, 47 OHM 1/2 W. |
| 22 | 27E222-3 | Resistor | Carbon, 2200 OHM 1 W. |
| 23 | 1E33 | Speaker | 5" PM |
| 24 | 29E23 | Switch | "Off-Radio-Phono" |
| *25 | **28E41** | **Tone Control** | **500,000 Ohm** |
| 26 | 22E8-2 | Transformer | Output |
| *27 | **28E46** | **Vol. Control** | **500,000 Ohm** |
| 28 | 17E21-5 | Connector | Female, for Pickup |
| 29 | 17E21-7 | Plug | Male Phono Plug for Pickup |
| 30 | 17E21-2 | Plug | Male, Attached to Phono Motor |
| 31 | 20E184-1 | Socket | Female, 2 Contact, for Phono Motor |

*Fast Moving Items.

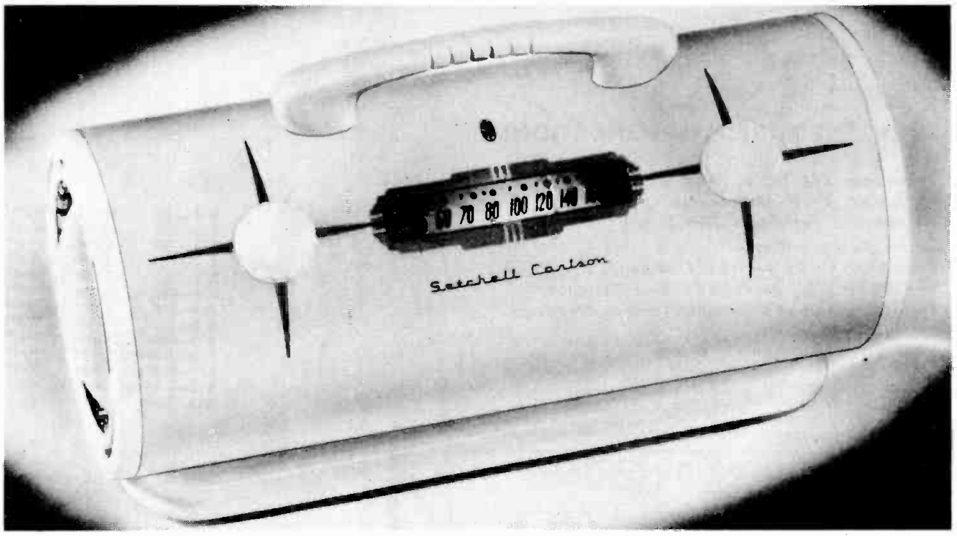
## MISCELLANEOUS PARTS

| Part No. | Part Name | Description |
|---|---|---|
| 7E246 | Cabinet | Cabinet only, less Frontplate Bezel Assembly |
| 20E428-2 | Cabt. Frontplate | Bezel, Frontplate with calibrated crystal |
| 7E171-3 | Cabinet Bottom | Cardboard Cabinet Bottom (in Model 1U339 only) |
| 7E171-4 | Cabinet Bottom | Cardboard Cabinet Bottom |
| 41E8 | Cord | 8 Ft. Rubber Line Cord |
| 30E116-3 | Dial Plate Assembly | Dial Back Plate Assembly |
| 20E253-21 | Dial Cord | Dial Drive Cord |
| 36E64 | Dial Scale | Calibrated Scale |
| 20E394 | Dial Shaft & Pulley | Drive Shaft & Pulley Assembly with Mounting Bracket |
| 68E16 | Dial Shaft | Drive Shaft only with 12E124 "C" Washer |
| 35E25-4 | Dial Pointer | Dial Indicator with Set Screw |
| 65E2 | Dial Spring | Tension Spring for Drive Cord |
| 37E56 | Knob | |
| 37E56-2 | Knob | With Dot, for "Off-Radio-Phono" Switch |
| 17E34 | Pilot Lamp Socket | Pilot Lamp Socket Assembly |
| 40E1 | Pilot Lamp | 6-8 Volt, .150 Amp. Type 47 |

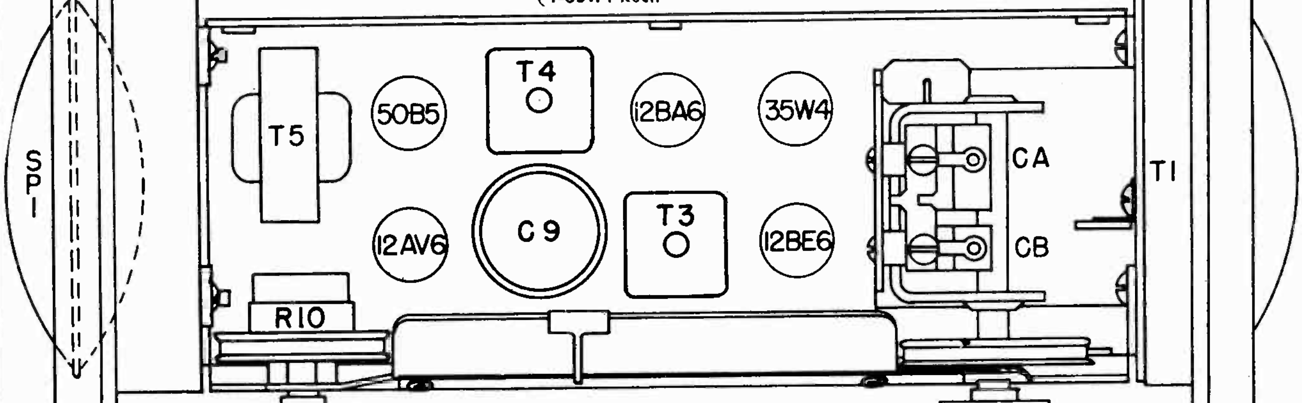
## MOUNTING HARDWARE

| Part No. | Part Name | Description |
|---|---|---|
| P-122 | Lid Stop | Cabinet Lid Stop |
| 13E103-1 | Speed Nut | For Mounting Front Plate Bezel to Cabt. |
| 82E1111-F10 | Screw | 6x3/8 Hx Hd—no slot—for holding Chassis to Mounting Board |
| 71E162 | Screw | 3-48x3/16" for Dial Pointer |
| 86E227-F43 | Screw | 6x7/8 Rd Hd Copper Colored Iron Wood Screw for attaching Chassis Mtg. Board to Cabt. |
| 86E183-F49 | Screw | 4x3/8 Rd Hd Iron Wood Screw for Mtg. Cardboard to Cabinet Bottom |
| 12E124 | Washer | "C" Washer for Dial Drive Shaft |

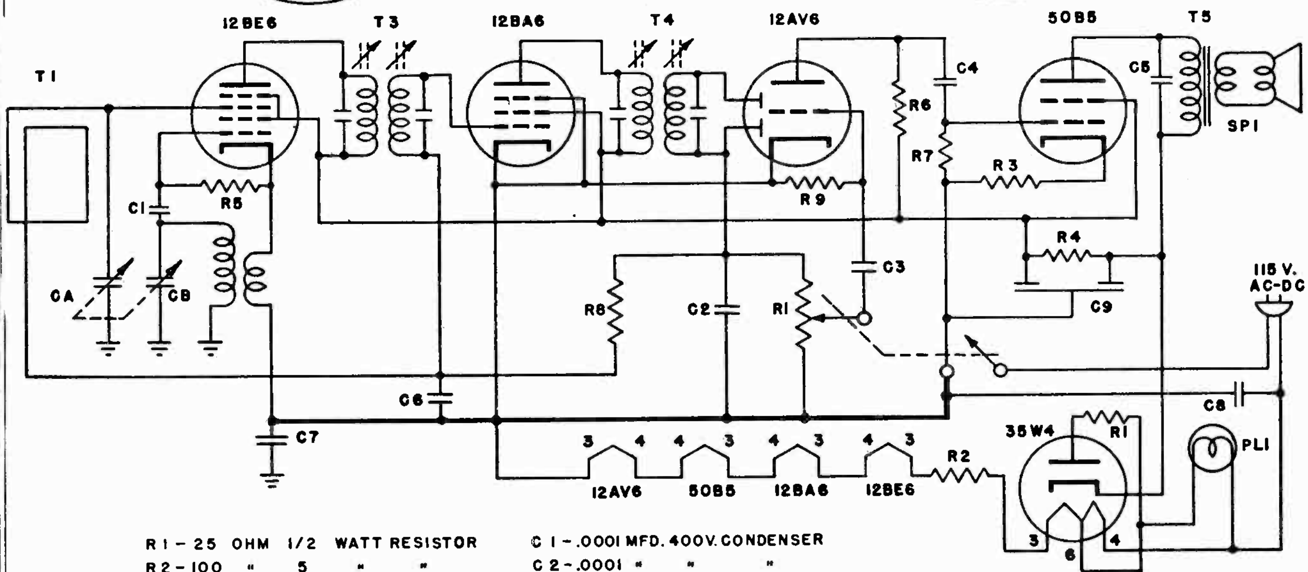
MODEL 570




- Band Coverage: 1750 KC to 535 KC.
- Operates on 115 Volts—A. C. or D. C.
- Four tubes plus rectifier { 1-12BE6 Det. Osc., 1-12BA6 I. F. Amp., 1-12AV6 2nd Det. 1st Audio, 1-50B5 Output, 1-35W4 Rect.




TOP VIEW CHASSIS LAYOUT



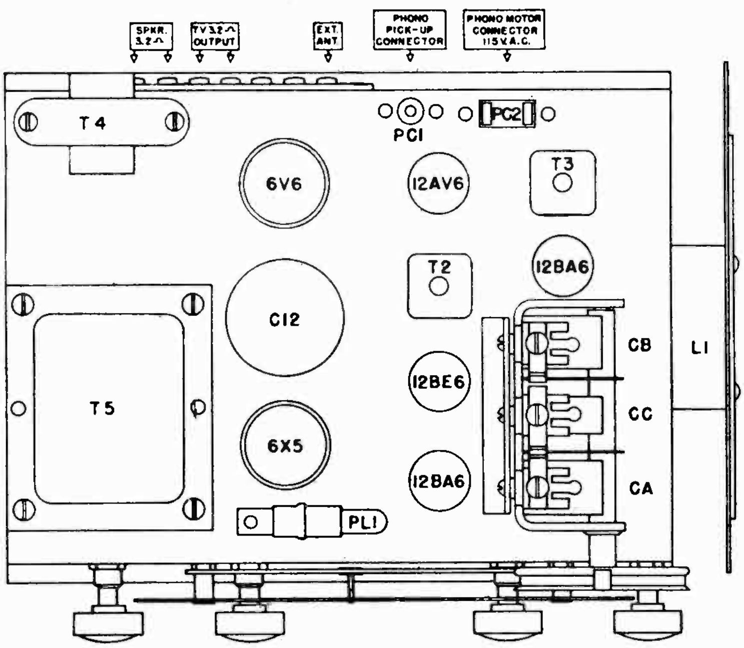

| | | |
|---|---|---|
| R1 - 25 OHM 1/2 WATT RESISTOR | C1 - .0001 MFD. 400V. CONDENSER | |
| R2 - 100 " 5 " " | C2 - .0001 " " " | |
| R3 - 180 " 1/2 " " | C3 - .01 " " " | |
| R4 - 1500 " " " " | C4 - .01 " " " | T1 - LOOP ANTENNA |
| R5 - 25M " " " " | C5 - .01 " " " | T2 - OSC. COIL |
| R6 - 500M " " " " | C6 - .05 " 200V. " | T3 - 455 KC. I.F. |
| R7 - 500M " " " " | C7 - .1 " 400V. " | T4 - 455 KC. I.F. |
| R8 - 5MEG. " " " " | C8 - .1 " " " | T5 - O. P. TRANSFORMER |
| R9 - 5MEG. " " " " | C9 - 50+50 " 150V. " | PL1 - NO. 44 PILOT LAMP |
| R10 - 500M " POT. WITH SWITCH | CA-B - GANG CONDENSER | SP1 - PILLOW SPEAKER |

MODELS 580,
5803, Ch. 58A

## MODEL 580, 5803 SPECIFICATIONS

- Band coverage: 540 KC to 1900 KC.
- Ten-inch Alnico V - P. M. console speaker.
- 3.2-ohm speaker terminals (for T. V.)
- Five tubes, plus rectifier—
  1—12BA6 R. F., 1—12BE6 Mixer,
  1—12BA6 I. F., 1—12AV6 2nd Detector,
  1st Audio, 1—6V6 Output, 1—6x5 Rectifier.
- Wattage load: 45 watts.
- Undistorted power output: 2 watts.

| | | | |
|---|---|---|---|
| R 1—400 | Ohm | 1 Watt | Resistor |
| R 2—500 | Ohm | 2 Watt | Resistor |
| R 3— 3K | Ohm | 1/2 Watt | Resistor |
| R 4—10K | Ohm | 1 Watt | Resistor |
| R 5—25K | Ohm | 1/2 Watt | Resistor |
| R 6—39K | Ohm | 1 Watt | Resistor |
| R 7—50K | Ohm | 1/2 Watt | Resistor |
| R 8—500K | Ohm | 1/2 Watt | Resistor |
| R 9—500K | Ohm | 1/2 Watt | Resistor |
| R10—2 Meg. | Ohm | 1/2 Watt | Resistor |
| R11—5 Meg. | Ohm | 1/2 Watt | Resistor |
| R12—5 Meg. | Ohm | 1/2 Watt | Resistor |
| R13—500K | Potentiometer | | |



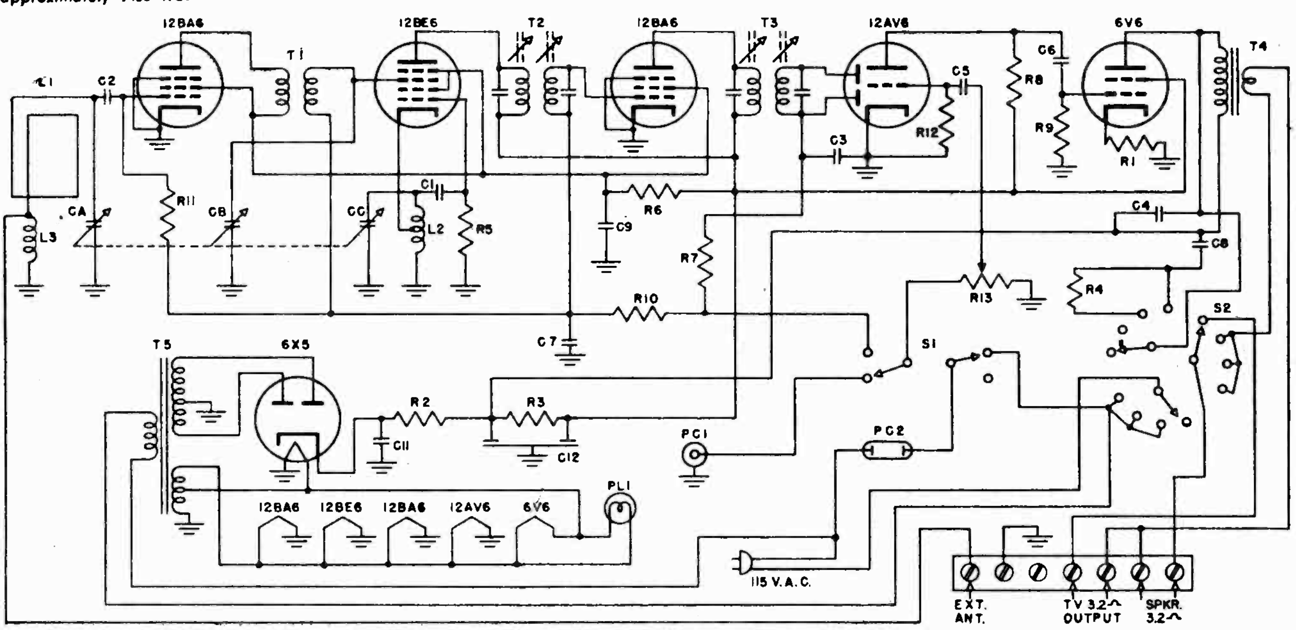

| | | | |
|---|---|---|---|
| C 1—100 | Mmfd. | 400 V. | Condenser |
| C 2—250 | Mmfd. | 400 V. | Condenser |
| C 3—250 | Mmfd. | 400 V. | Condenser |
| C 4— .0025 | Mfd. | 400 V. | Condenser |
| C 5— .01 | Mfd. | 400 V. | Condenser |
| C 6— .01 | Mfd. | 400 V. | Condenser |
| C 7— .05 | Mfd. | 200 V. | Condenser |
| C 8— .05 | Mfd. | 400 V. | Condenser |
| C 9— .1 | Mfd. | 400 V. | Condenser |
| C10— .1 | Mfd. | 400 V. | Condenser |
| C11— 20 | Mfd. | 450 V. | Condenser |
| C12—20+20 | Mfd. | 475 V. | Condenser |
| CA, B and C Gang Condenser | | | |

oop Antenna
L1 —Oscillator Coil
L3 —Antenna Coupling Coil
T1 —R. F. Transformer
T2 —455 KC I. F. Transformer
T3 —455 KC I. F. Transformer
T4 —Audio Output Transformer
T5 —Power Transformer
PL1—No. 47 Pilot Lamp
S1 —2-Pole 2-Pos. Switch
S2 —3-Pole 4-Pos. Switch
PC1—Phono Pickup Connector
PC2—Phono Motor Connector 115 V. AC

### ALIGNMENT

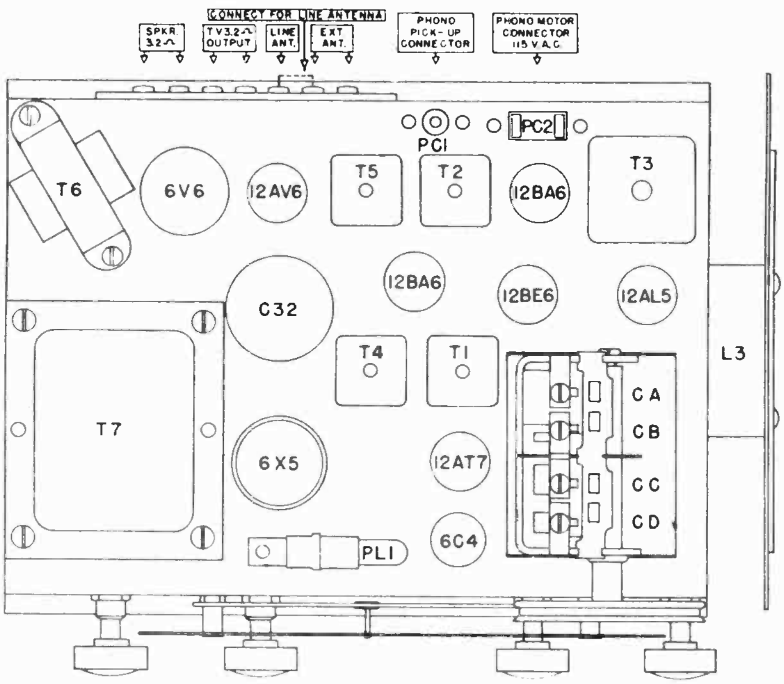
Connect signal generator to mixer grid No. 12BE6 through an .01 condenser and align I.F.'s T2 and T3 to 455 KC. Use output meter across output transformer or vacuum tube volt meter for highest AVC voltage across condenser C7.

Align oscillator trimmer (CC) to dial calibration at approximately 1400 KC. Adjust antenna and RF section (CA and CB) for best sensitivity at approximately 1400 KC. Low frequency end alignment can be made by bending condenser plates.




SCHEMATIC DIAGRAM

MODELS 5110,
51103, Ch. 511A


## MODEL 51103 5110 SPECIFICATIONS

- A. M. band coverage: 535 KC to 1800 KC.
- F. M. band coverage: 110 MC to 87 MC.
- Ten-inch Alnico V - P. M. console speaker.
- 3.2-ohm speaker terminals (for T. V.)
- Wattage load: A. M.—40 watts
  F. M.—50 watts
- Undistorted power output: 2 watts.
- Eight tubes, plus rectifier—
  6C4, 12AT7, 12BA6, 12BE6, 12BA6, 6V6, 12AL5, 12AV6, 6X5 Rectifier.

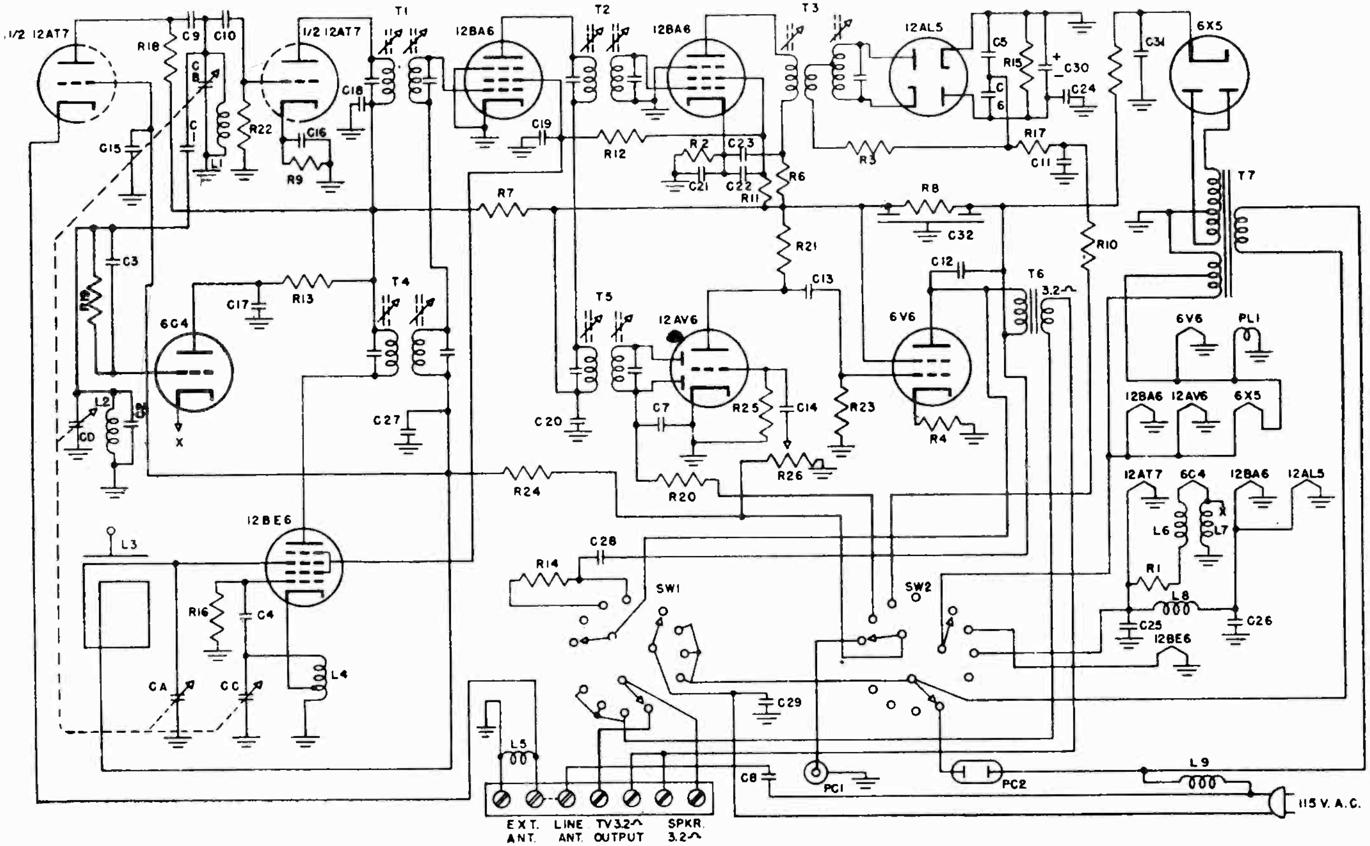
### F. M. ALIGNMENT

Align I.F.'s, T1, T2, primary T3 to 10.7 KC by connecting unmodulated signal generator to grid of 12AT7 through .01 condenser. Use vacuum tube volt meter to read highest AVC voltage across C30 condenser. Adjust secondary T3 (ratio detector coil, top slug) for minimum hiss level (off station).
Adjust oscillator trimmer to correspond with dial calibration at 100 mc and RF trimmer for maximum sensitivity.

### A. M. ALIGNMENT

Connect signal generator to mixer grid (12BE6) through .01 condenser and align I.F.'s T4 and T5 to 455 KC. Use output meter across output transformer or vacuum tube volt meter for highest AVC voltage across condenser C27. Align oscillator trimmer to dial calibration at approximately 1400 KC and antenna trimmer for best sensitivity.

MODELS 5110, 51103, Ch. 511A




## SCHEMATIC DIAGRAM

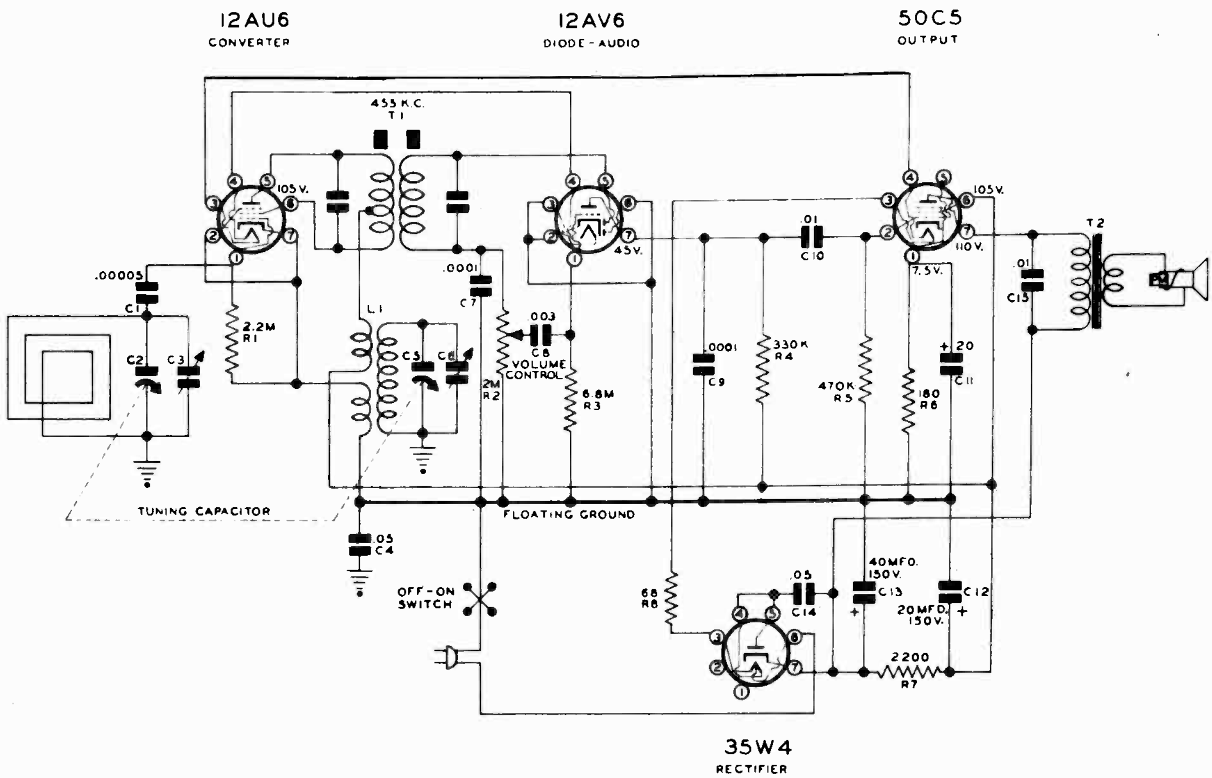
| | | | | |
|---|---|---|---|---|
| R1 | 42 Ohm | 2 Watt | Resistor | |
| R2 | 68 Ohm | 1/2 Watt | Resistor | |
| R3 | 68 Ohm | 1/2 Watt | Resistor | |
| R4 | 400 Ohm | 1 Watt | Resistor | |
| R5 | 500 Ohm | 5 Watt | Resistor | |
| R6 | 500 Ohm | 1/2 Watt | Resistor | |
| R7 | 500 Ohm | 1/2 Watt | Resistor | |
| R8 | 2000 Ohm | 10 Watt | Resistor | |
| R9 | 2500 Ohm | 1/2 Watt | Resistor | |
| R10 | 5000 Ohm | 1/2 Watt | Resistor | |
| R11 | 10K Ohm | 1 Watt | Resistor | |
| R12 | 10K Ohm | 1 Watt | Resistor | |
| R13 | 10K Ohm | 1 Watt | Resistor | |
| R14 | 10K Ohm | 1 Watt | Resistor | |
| R15 | 15K Ohm | 1/2 Watt | Resistor | |
| R16 | 25K Ohm | 1/2 Watt | Resistor | |
| R17 | 25K Ohm | 1/2 Watt | Resistor | |
| R18 | 50K Ohm | 1/2 Watt | Resistor | |
| R19 | 50K Ohm | 1/2 Watt | Resistor | |
| R20 | 50K Ohm | 1/2 Watt | Resistor | |
| R21 | 200K Ohm | 1/2 Watt | Resistor | |
| R22 | 500K Ohm | 1/2 Watt | Resistor | |
| R23 | 500K Ohm | 1/2 Watt | Resistor | |
| R24 | 5 Meg. Ohm | 1/2 Watt | Resistor | |
| R25 | 15 Meg. Ohm | 1/2 Watt | Resistor | |
| R26 | 500K Ohm | Potentiometer | | |

L1—FM RF Coil
L2—FM Oscillator Coil
L3—AM Loop Antenna
L4—AM Oscillator Coil
L5—FM Antenna Choke
L6—Filament Choke
L7—Filament Choke
L8—Filament Choke
L9—FM Line Antenna Choke

T1—10.7 Meg. I. F. Transformer
T2—10.7 Meg. I. F. Transformer
T3—10.7 Meg. Ratio Detector
T4—455 Meg. I. F. Transformer
T5—455 Meg. I. F. Transformer
T6—Audio O. P. Transformer
T7—Power Transformer

SW1—3-Pole 4-Pos. Off-On Tone Switch
SW2—3-Pole 4-Pos. AM—FM Phono Switch
PC1—Phono Pickup Connector
PC2—Phono Motor Connector 115 V. AC
PL1—No. 47 Pilot Light

| | | | | |
|---|---|---|---|---|
| C1 | 1.5 | Mmfd. | 400 V. | Condenser |
| C2 | 14 | Mmfd. | 400 V. | N220 |
| C3 | 100 | Mmfd. | 400 V. | Tubular Ceramic |
| C4 | 100 | Mmfd. | 400 V. | Tubular Ceramic |
| C5 | 100 | Mmfd. | 400 V. | Tubular Ceramic |
| C6 | 100 | Mmfd. | 400 V. | Tubular Ceramic |
| C7 | 100 | Mmfd. | 400 V. | Tubular Ceramic |
| C8 | 100 | Mmfd. | 400 V. | Tubular Ceramic |
| C9 | 250 | Mmfd. | 400 V. | Tubular Ceramic |
| C10 | 250 | Mmfd. | 400 V. | Tubular Ceramic |
| C11 | .0015 | Mfd. | 400 V. | Mica Condenser |
| C12 | .0025 | Mfd. | 400 V. | Paper Condenser |
| C13 | .01 | Mfd. | 400 V. | Paper Condenser |
| C14 | .01 | Mfd. | 400 V. | Paper Condenser |
| C15 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C16 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C17 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C18 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C19 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C20 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C21 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C22 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C23 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C24 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C25 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C26 | .01 | Mfd. | 400 V. | Disc Ceramic |
| C27 | .05 | Mfd. | 200 V. | Paper Condenser |
| C28 | .05 | Mfd. | 400 V. | Paper Condenser |
| C29 | .1 | Mfd. | 400 V. | Paper Condenser |
| C30 | 4 | Mfd. | 50 V. | Electro. Condenser |
| C31 | 20 | Mfd. | 450 V. | Electro. Condenser |
| C32 | 20+20 | Mfd. | 475 V. | Electro. Condenser |
| CA, B, C, D | Gang Condenser AM-FM | | | |




## ALIGNMENT PROCEDURE

| Step No. | Position of Gang | Signal Generator Frequency | Generator Connection | Dummy Antenna | Adjust-ment | Type of Adjustment |
|---|---|---|---|---|---|---|
| 1. | Open | 455 KC. | Rear Gang Terminal | .1 Mfd. | Slugs Top and Bottom in can. | Adjust for Maximum Output |
| 2. | Open | 1620 KC. | Dummy Antenna | 2 Turns of Hookup Wire 6" in Dia. (Place Approx. a Foot from and in Same Plane as Loop) | Front Gang Trimmer | Adjust for Maximum Output |
| 3. | 1400 KC | 1400 KC | | | Rear Gang Trimmer | Adjust for Maximum Output |
| 4. | 600 KC | 600 KC | | | — | Check Gang Align-ment |

| Sche-matic Location | Sonora Part No. | DESCRIPTION |
|---|---|---|
| C1 | N-6385 | Condenser, Ceramic 50 MMFD. 500V. |
| C4 | N-1345 | Condenser, Paper .05 MFD. 200V. |
| C7, C9 | N-6015 | Condenser, Ceramic 100 MMFD. 500V. |
| C8 | N-2063 | Condenser, Paper .003 MFD. 600V. |
| C10, C15 | N-1344 | Condenser, Paper .01 MFD. 400V. |
| C11, C12, C13 | N-7153 | Electrolytic { 20 MFD. 15V. / 20 MFD. 150V. / 40 MFD. 150V. } |
| C14 | N-1346 | Condenser, Paper .05 MFD. 400V. |
| R1 | N-4277 | Resistor 2.2 Megohm ½W 20% |
| | | Volume Control—2.0 Megohm |

| Sche-matic Location | Sonora Part No. | DESCRIPTION |
|---|---|---|
| R2 | N-7142 | Resistor 6.8 Megohm ½W 20% |
| R3 | N-4028 | Resistor 330,000 Ohm ½W 20% |
| R4 | N-4423 | Resistor 470,000 Ohm ½W 20% |
| R5 | N-4027 | Resistor 180 Ohm ½W 10% |
| R6 | N-4067 | Resistor 2,200 Ohm ½W 10% |
| R7 | N-4896 | Resistor 68 Ohm 2.0W 10% |
| R8 | N-6014 | Transformer, I.F. |
| T1 | N-7694 | Oscillator Coil |
| L1 | N-7725 | Loop Antenna Coil |
| | N-7670 | Variable Capacitor |
| | N-7141 | Speaker, 4" PM with Output |
| | N-7824 | Transformer |

N-7839

MODEL 306

**POWER SUPPLY** - 110 to 120 Volt, 60 Cycle Only.

**GROUND** - No ground connection should be used.

**TUBES** - 5 Tubes (inc. rectifier) are used. See label on bottom of cabinet.

**TUNING RANGE** - 535 to 1620 Kilocycles

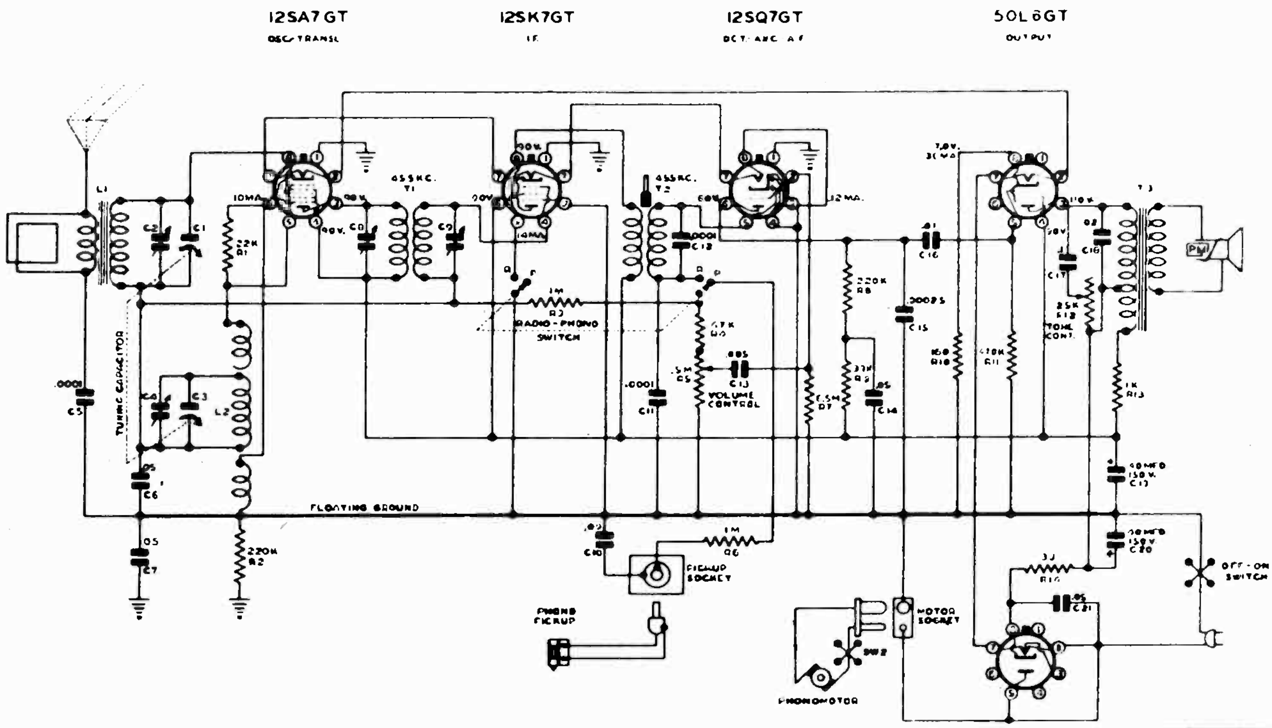
**AERIAL SYSTEM** - Built-in "Loop" aerial. Provision is made at the rear of cabinet for connecting an external antenna if required.

## ALIGNMENT PROCEDURE

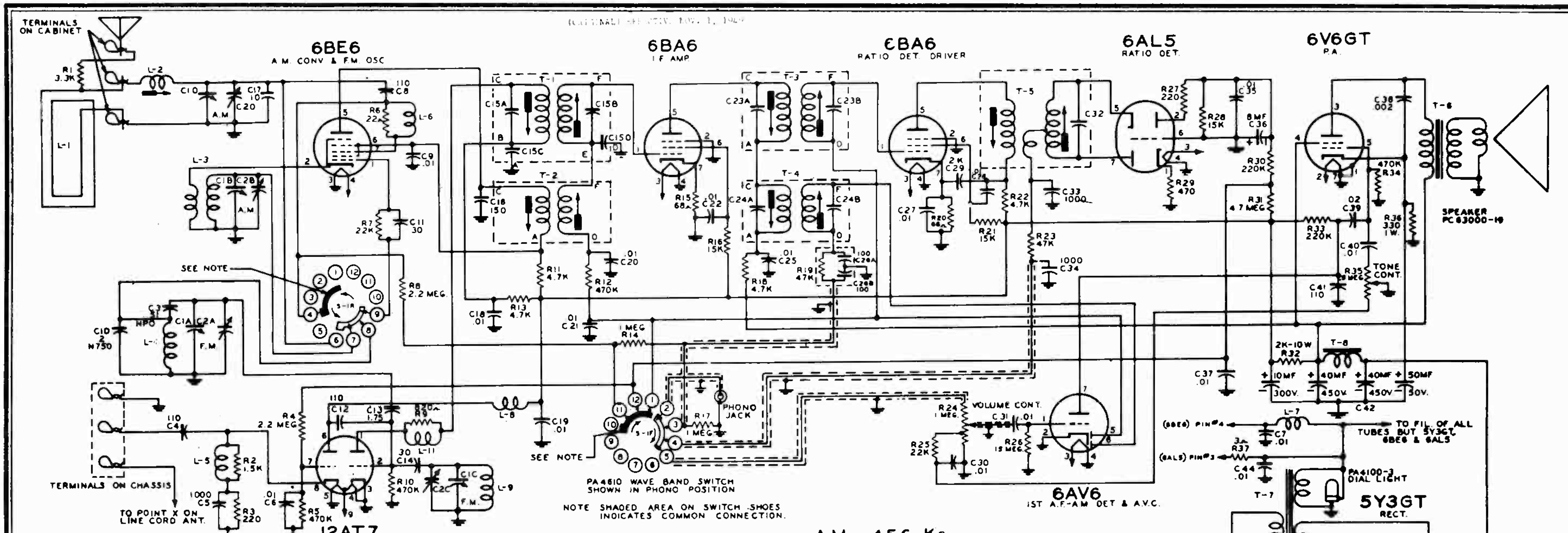
| STEP NO. | POSITION OF GANG | SIGNAL GENERATOR FREQUENCY | GENERATOR CONNECTION | DUMMY ANTENNA | TYPE OF ADJUSTMENT | ADJUSTMENT |
|---|---|---|---|---|---|---|
| 1. | OPEN | 455 KC. | REAR GANG TERMINAL | .1 MFD. | T2, C9 & C8 | ADJUST FOR MAXIMUM OUTPUT |
| 2. | OPEN | 1620 KC. | LOOP | .0002 MFD. | FRONT GANG TRIMMER | ADJUST FOR MAXIMUM OUTPUT |
| 3. | 1400 KC. | 1400 KC. | LOOP | .0002 MFD. | REAR GANG TRIMMER | ADJUST FOR MAXIMUM OUTPUT |
| 4. | 600 KC | 600 KC. | LOOP | .0002 MFD. | | CHECK GANG ALIGNMENT |

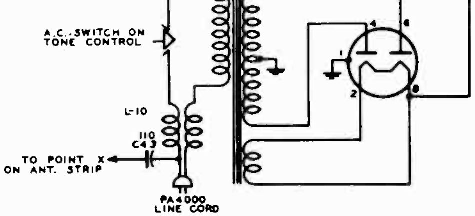
| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| C19, C20 | N-5051 | Capacitor - Electrolytic - 40 MFD. 150 V. 40 MFD. 150 V. |
| C5, C11 | N-6015 | Capacitor - Ceramic 100 MMFD. 500V. 20% |
| C12 | N-7549 | Capacitor - Ceramic 100 MMFD. 500V. 10% |
| C15 | N-6488 | Capacitor - Ceramic 250 MMFD. 500V. 20% |
| C13 | N-4894 | Capacitor - Paper .005 MFD. 600V. |
| C16 | N-1344 | Capacitor - Paper .01 MFD. 400V. |
| C18 | N-1376 | Capacitor - Paper .02 MFD. 400V. |
| C6, C7, C14 | N-1345 | Capacitor - Paper .05 MFD. 200V. |
| C21 | N-1346 | Capacitor - Paper .05 MFD. 400V. |
| C10 | N-4957 | Capacitor - Paper .09 MFD. 200V. |
| C17 | N-1623 | Capacitor - Paper .1 MFD. 400V. |
| R5 | N-5757 | Control - On-Off & Volume |
| R12 | N-6157 | Control - Tone |
| R14 | N-4022 | Resistor - 33 Ohm - 1/2W. 20% |
| R10 | N-4067 | Resistor - 180 Ohm - 1/2W. 10% |
| R1 | N-4025 | Resistor - 22,000 Ohm - 1/2W. 20% |
| R9 | N-4064 | Resistor - 33,000 Ohm - 1/2W. 20% |
| R4 | N-4063 | Resistor - 47,000 Ohm - 1/2W. 20% |
| R2, R8 | N-4026 | Resistor - 220,000 Ohm - 1/2W. 20% |
| R11 | N-4027 | Resistor - 470,000 Ohm - 1/2W. 20% |
| R3, R6 | N-1262 | Resistor - 1.0 Megohm - 1/2W. 20% |
| R7 | N-4028 | Resistor - 6.8 Megohm - 1/2W. 20% |
| R13 | N-5358 | Resistor - 1,000 Ohm - 1.0W. 10% |
| T1 | N-7676 | Transformer - I.F. #1 |
| T2 | N-7677 | Transformer - I.F. #2 |
| T3 | N-4875 | Transformer - Output |
| | N-6149 | Coil - Antenna |
| | N-7139 | Coil - Oscillator |

RECORD CHANGER: Gen. Instr. Model 700F, See pages RCD.CH.19-1,2 through RCD.CH.19-9.



MODEL 141A, Ch. 8L10



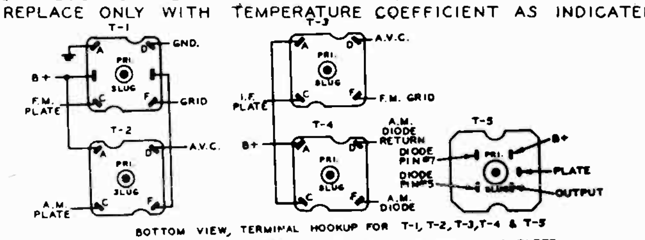

INTERMEDIATE FREQUENCY A.M. 456 Kc. F.M. 10.7 Mc

| | | |
|---|---|---|
| C1A, C1C | F.M. GANG CONDENSER | PC65002-1 |
| C1B, C1D | A.M. " " | PC65002-1 |
| C2C | TRIMMER ON F.M. GANG | PC65002-1 |
| C2B, C2D | " " A.M. " | PC65002-1 |
| C2A | F.M. OSC. TRIMMER | PA4366 |
| C3 | 51 MMF. CERAMIC (NPO) | ** CC30A-510K |
| C4 | 110 " | CC30H-111A |
| C5 | 1000 MMF. CERAMIC DISC. | HK35G-102 |
| C6 | .01 MFD. " " | PA4334-2 |
| C7 | .01 MFD. " | PA4334-2 |
| C8 | 110 MMF. CERAMIC | CC30H-111A |
| C9 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C10 | 2 MMF. CERAMIC (N750) | ** CC30H-020K |
| C11 | 30 MMF. CERAMIC | CC30H-300K |
| C12 | 110 MMF. CERAMIC | CC30H-111A |
| C13 | 1.75 MMF. BIFILAR WIRE CAPACITOR | PA4344 |
| C14 | 30 MMF. CERAMIC | CC30H-300K |
| C15A, C | (F.M. PRI.) C15B, D (F.M. SEC.) I.F. CAPACITORS | * |
| C16 | 150 MMF. CERAMIC | CC30G-151F |
| C18 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C19 | .01 MFD. 400 V. TUBULAR | PC40HL-103 |
| C20 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C21 | .01 MFD. " " | PA4334-2 |
| C22 | .01 MFD. " " | PA4334-2 |
| C23A | (F.M. PRI.) C23B (F.M. SEC.) I.F. CAPACITORS | * |
| C24A | (A.M. PRI.) C24B (A.M. SEC.) " " | * |
| C25 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C26A, B | 100 MMF. C & R UNIT | PA4329-1 |
| C27 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C28 | .01 MFD. " " | PA4334-2 |
| C29 | .002 MFD. " " | HK35E-202 |
| C30 | .01 MFD. " " | PA4334-2 |
| C31 | .01 MFD. " " | PA4334-2 |
| C32 | 33 MMF. MICA CAPACITOR RATIO DET. | * |
| C33 | 1000 MMF. CERAMIC | HK35G-102 |
| C34 | 1000 MMF. " | HK35G-102 |
| C35 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C36 | 8 MFD. 50V. ELECTROLYTIC | PA4303-7 |
| C37 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C38 | .002 MFD. 1000 V. TUBULAR | PC40GN-202 |
| C39 | .02 MFD. 400 V. " | PC40HL-203 |
| C40 | .01 MFD. 400 V. " | PC40HL-103 |
| C41 | 110 MMF. CERAMIC | CC30H-111A |

| | | | | |
|---|---|---|---|---|
| C42 | 10-40-40-50 MFD. ELECTROLYTIC | | | PA4307-4 |
| C43 | 110 MMF. CERAMIC | | | CC30H-111A |
| C44 | .01 MFD. CERAMIC DISC. | | | PA4334-2 |
| R1 | 3.3 K OHMS | | 1/2 W. | BR12S-332 |
| R2 | 1.5 K " | (IN L-5) | 2 W | DR12S-152 |
| R3 | 220 " | | 1/2 W. | BR12S-221 |
| R4 | 2.2 MEG " | | " " | BR12S-225 |
| R5 | 470K " | | " " | BR12S-474 |
| R6 | 22 " | (IN L-6) | " " | BR12S-220 |
| R7 | 22K " | | " " | BR12S-223 |
| R8 | 2.2 MEG " | | " " | BR12S-225 |
| R9 | 820 " | (IN L-11) | " " | BR12S-821 |
| R10 | 470K " | | " " | BR12S-474 |
| R11 | 4.7K " | | " " | BR12S-472 |
| R12 | 470K " | | " " | BR12S-474 |
| R13 | 4.7K " | | " " | BR12S-472 |
| R14 | 1 MEG " | | " " | BR12S-105 |
| R15 | 68 " | | " " | BR12S-680 |
| R16 | 15K " | | " " | BR12S-153 |
| R17 | 1 MEG " | | " " | BR12S-105 |
| R18 | 4.7K " | | " " | BR12S-472 |
| R19 | 47K " | C & R UNIT | " " | PA4329-1 |
| R20 | 68 " | | " " | BR12S-680 |
| R21 | 15K " | | " " | BR12S-153 |
| R22 | 4.7K " | | " " | BR12S-472 |
| R23 | 47K " | | " " | BR12S-473 |
| R24 | 1 MEG " | VOLUME CONTROL | | PA4408-2 |
| R25 | 22K " | | 1/2 W. | BR12S-223 |
| R26 | 15 MEG " | | " " | BR12S-156 |
| R27 | 220 " | | " " | BR12S-221 |
| R28 | 15K " | | " " | BR12S-153 |
| R29 | 470 " | | " " | BR12S-471 |
| R30 | 220K " | | " " | BR12S-224 |
| R31 | 4.7 MEG " | | " " | BR12S-475 |
| R32 | 2K " | WIRE WOUND | 10 W. | PA4200-10 |
| R33 | 220K " | | 1/2 W. | BR12S-224 |
| R34 | 470K " | | " " | BR12S-474 |
| R35 | 5 MEG " | TONE CONTROL | | PA4400-10 |
| R36 | 330 " | | 1 W. | CR12S-331 |
| R37 | 3 " | WIRE WOUND | 1/2 W. | PA4207-1 |
| L1 | LOOP ANTENNA | | | PA5250-4 |
| L2 | LOOP LOADING COIL | | | AA6616-1 |
| L3 | B.C. OSC. COIL | | | AA6665-3 |
| L4 | F.M. OSC. COIL | | | PA5200-7 |

| | | |
|---|---|---|
| L5 | 100 MC. CHOKE COIL (1500Ω FORM) | AA6798-3 |
| L6 | " " " (22Ω " ) | AA6798-5 |
| L7 | CHOKE COIL (FILAMENT) | AA6798-6 |
| L8 | CHOKE COIL | AA6769-2 |
| L9 | F.M.-R.F. COIL | PA5200-6 |
| L10 | LINE CORD ANT. CHOKE | AA6664-1 |
| L11 | CHOKE COIL | AA6798-7 |
| T1 | NO. 1 F.M.-I.F. TRANS. | AA6667-1 |
| T2 | NO. 1 A.M.-I.F. TRANS. | AA6668-5 |
| T3 | NO. 2 F.M.-I.F. TRANS. | AA6667-3 |
| T4 | NO. 2 A.M.-I.F. TRANS. | AA6668-1 |
| T5 | RATIO DETECTOR | AA6684-1 |
| T6 | OUTPUT TRANS. | AB44061-2 |
| T7 | POWER TRANS. | AB44013-1 |
| T8 | FILTER CHOKE | AB47004-1 |

** REPLACE ONLY WITH TEMPERATURE COEFFICIENT AS INDICATED.

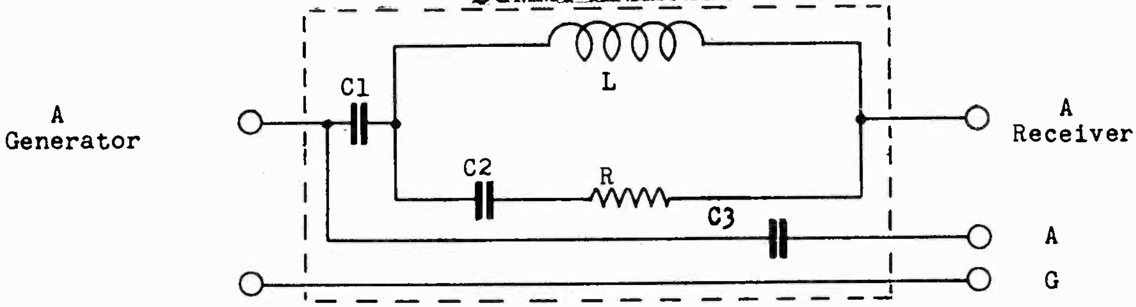



BOTTOM VIEW, TERMINAL HOOKUP FOR T-1, T-2, T-3, T-4 & T-5

* SPECIAL SERVICE NOTE THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.

MODELS 141A, Ch. 8L10; 4970, 4971, 4972, Ch. 8S10

## DUMMY ANTENNA



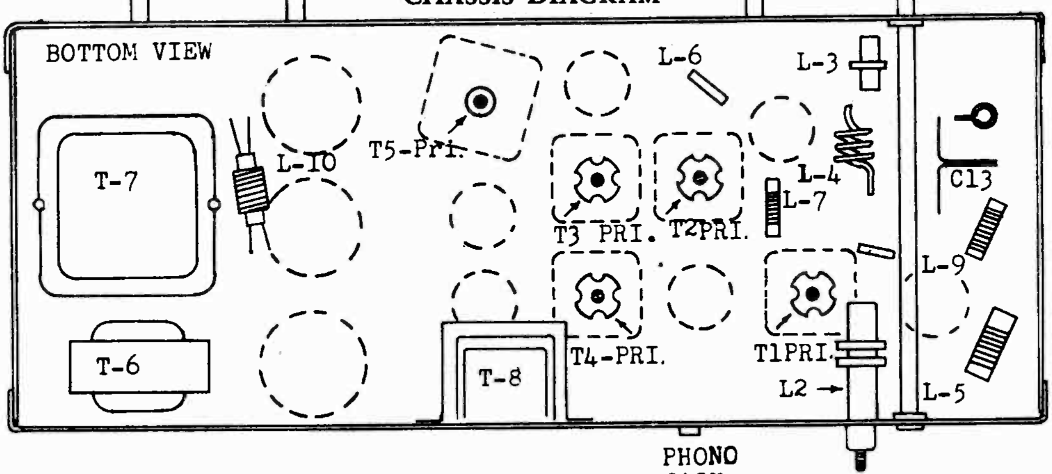

C1 - 200 mmf. Condenser 400 V.D.C.
C2 - 400 mmf. Condenser 400 V.D.C.
C3 - .02 mmf. Condenser 400 V.D.C.
R - 100 ohms Resistor 1/4 Watt
L - Choke Coil

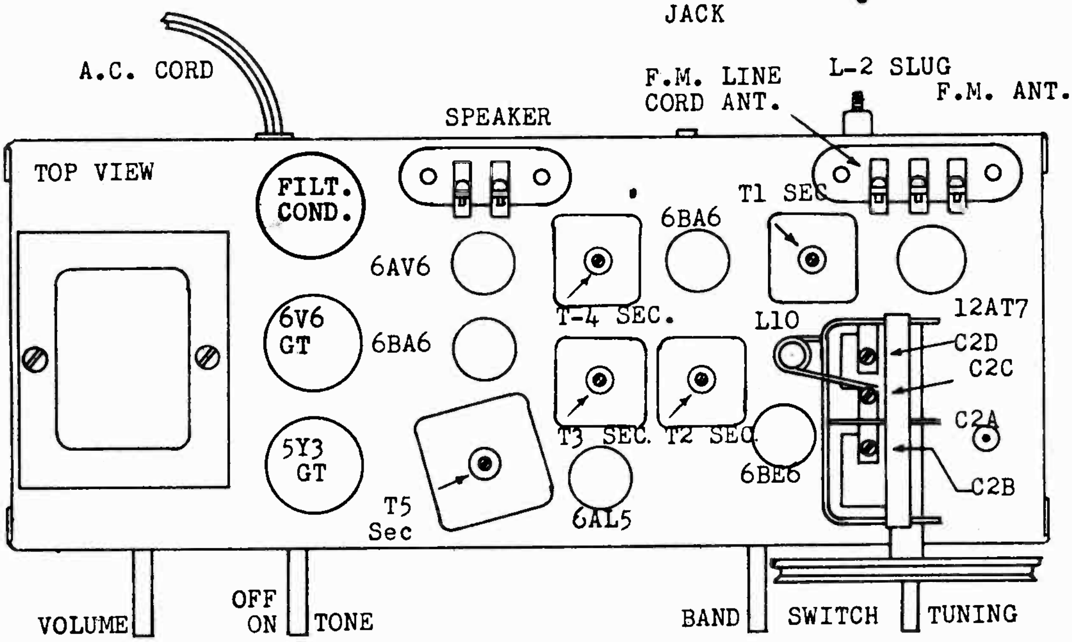
----Case Shield
Choke Coil Specification
Tubing - 3/8" diameter Bakelite
Wire - No. 38 Enameled
Turns - 59 Closely Wound (Impregnated)

NOTE: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

## CHASSIS TYPE 8L10

**MODEL** 141A
**CHASSIS DIAGRAM**



MODELS 141A, Ch. 8L10; 4970, 4971, 4972, Ch. 8S10

## STEP BY STEP ALIGNMENT PROCEDURE

| OPERATION | ALIGNMENT OF | GENERATOR CONNECTED TO | DUMMY ANT. | GENERATOR FREQUENCY | BAND SWITCH SETTING | TUNING COND SETTING | TRIMMER OR SLUG | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Set dial pointer even with left-hand stop line with condenser gang closed. | | | | | | | |
| 2. | Connect output meter across speaker terminals. | | | | | | | |
| 3. | A.M.-I.F. | Pin #7 of 6BE6 Conv. Tube | .02 MFD. Cond. | 456 KC. | A.M. | Open | T4 Sec. Slug | Max. Reading |
| | | | | | | | T4 Pri. Slug | Max. Reading |
| | | | | | | | T2 Sec. Slug | Max. Reading |
| | | | | | | | T2 Pri. Slug | Max. Reading |
| 4. | Repeat operation #3. | | | | | | | |
| 5. | A.M.-R.F. | A.M. Ant. | * | 1500 KC. | A.M. | 1500 KC. | C2B Osc. Tri. | Peak Accurately |
| 6. | A.M.-R.F. | On Cabinet | * | 1500 KC. | A.M. | 1500 KC. | C2D Ant. Tri. | Peak Accurately |
| 7. | A.M.-R.F. | On Cabinet | * | 600 KC. | A.M. | 600 KC. | L-2 Slug | Max. Reading |
| 8. | Repeat operations #5, #6 and #7. | | | | | | | |
| 9. | Check Calibrations at 600,1000 and 1500 KC. | | | | | | | |
| 10. | SPECIAL NOTE: For complete F.M.-I.F. Visual Alignment instructions please refer to pages 7, 8,9,10,11 and 12 of this bulletin. | | | | | | | |
| 11. | F.M.-I.F. Alignment using an A.M. Generator and Output Meter. | | | | | | | |
| 12. | T5 F.M. Ratio Det. | Pin #1 of 2nd 6BA6 Tube | .02 MFD. Cond. | 10.7 MC. | F.M. | Open | T5 Sec. Slug | Max. Reading |
| | | | | | | | T5 Pri. Slug | Max. Reading |
| 13. | NOTE: Operations 11, 13, 14, 15, 18 and 19 must be made with generator output as low as possible, consitent with usable output meter reading. | | | | | | | |
| 14. | T3 2nd. F.M.-I.F. | Pin #1 1st 6BA6 Tube | .02 MFD. COND. | 10.7 MC. | F.M. | Open | T3 Sec. Slug | Max. Reading |
| | | | | | | | T3 Pri. Slug | Max. Reading |
| 15. | T1 1st F.M.-I.F. | Pin #8 on 12AT7 Mixer Tube | .02 MFD. Cond. | 10.7 MC. | F.M. | Open | T1 Sec. Slug | Max. Reading |
| | | | | | | | T1 Pri. Slug | Max. Reading |
| 16. | Adjust secondary slug on T5 ratio detector transformer to minimum deflection or dip on output meter. Under certain conditions it is possible to adjust T5 sec. slug to minimum noise with the receiver tuned to a weak station. This operation is very critical and the receiver must be tuned to the center response only. | | | | | | | |
| 17. | F.M.-R.F. alignment using an A.M. generator with frequencies of 88 to 108 MC. and a vacuum tube voltmeter, or D.C. voltmeter. (20,000 Ohms per volt.) | | | | | | | |
| 18. | Place meter across C36 elect. condenser. (Meter reading approximately 1 volt.) | | | | | | | |
| 19. | F.M.-R.F. | F.M. Ant. | Match Gen. To 300 Ohm | 106 MC. | F.M. | 106 MC. | C2A Osc. Tri. | Max. Reading |
| | | | | | | | C2C Ant. Tri. | Peak Accurately |
| 20. | Check Calibration at 88 MC. | | | | | | | |

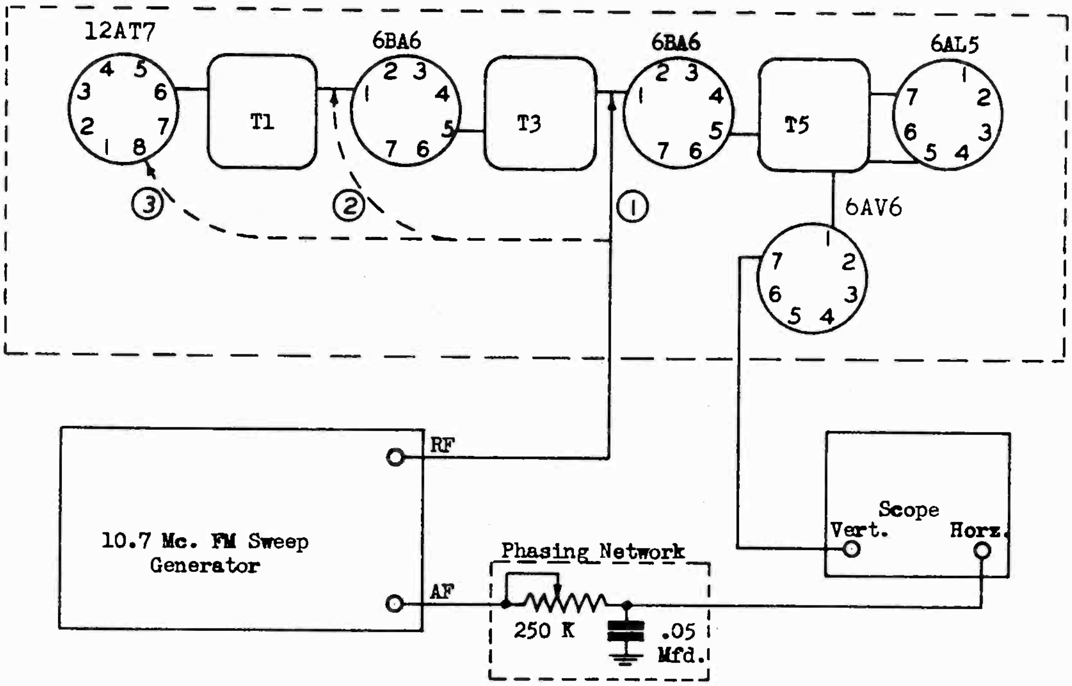
MODELS 141A, Ch. 8L10;
4970, 4971, 4972, Ch. 8S10

# VISUAL I. F.-F. M. ALIGNMENT DATA

WARNING: Do not proceed with any of the following alignment instructions unless it is certain that the AM-IF is in accurate alignment. If not, align the AM-IF system according to the step by step alignment procedure.

1. DESCRIPTION OF CIRCUIT USED:

A 6AL5 is employed as a ratio detector. This tube is preceeded by a 6BA6 ratio detector driver and a stage of amplification at 10.7 Mc. also utilizing a 6BA6 tube. The 2nd section of the 12AT7 tube is used as the FM mixer. All IF coupling uses individual slug tuned transformers.



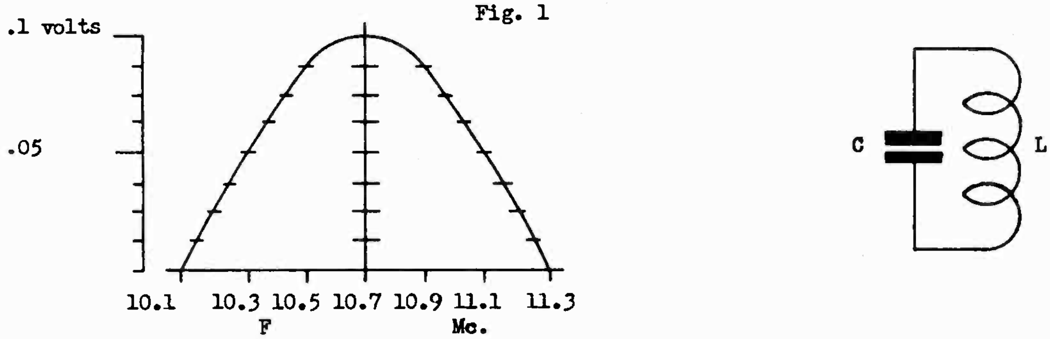

| Gen. & Scope Position | Adjust |
|---|---|
| 1 | T-5 |
| 2 | T-3 |
| 3 | T-1 |

2. THEORY OF VISUAL ALIGNMENT.

One of the characteristics of a tuned circuit is the fact that when it is excited or driven by a generator such as a vacuum tube or another tuned circuit, the voltage developed across it will vary with slight changes in frequency. This voltage will be greatest when the frequency is equal to the resonant frequency of the circuit and will be less if the frequency is higher or lower than the resonant frequency.

Thus if we were to shift the frequency from high to low or low to high across the resonant frequency and make a record of the voltage across the tuned circuit, we could plot the voltage against frequency and obtain a curve which might look like Fig. 1.

Fig. 1



MODELS 141A, Ch. 8L10;
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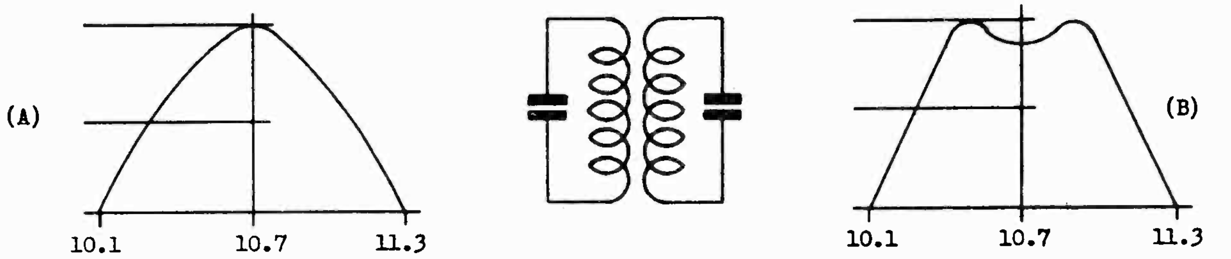
# VISUAL I. F.-F. M. ALIGNMENT DATA

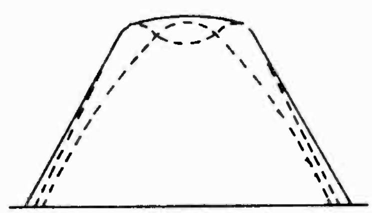
This is the selectivity curve or response curve for the circuit under discussion. This type of circuit may be aligned or adjusted to resonance by simply changing either L or C until maximum voltage is obtained at the resonant frequency. Now if another circuit tuned to the same resonant frequency is coupled to the simple case above, a number of things can happen. First current flowing in one circuit will induce current in the second circuit, the magnitude of this current depending on the degree or amount of coupling between the two circuits. This coupling may be in the form of mutual inductance, mutual capacitance or any impedance common to the two circuits. Now if we repeat the proceedure outlined for obtaining the response curve of a single tuned circuit using the voltage developed across the secondary of the coupled circuit while driving the primary, we may get either of two types of curves depending on the magnitude of the coupling, (a) in Fig. 2 is a typical curve for two circuits coupled below critical coupling and (b) is a representation of the curve for an over coupled circuit.

Fig. 2



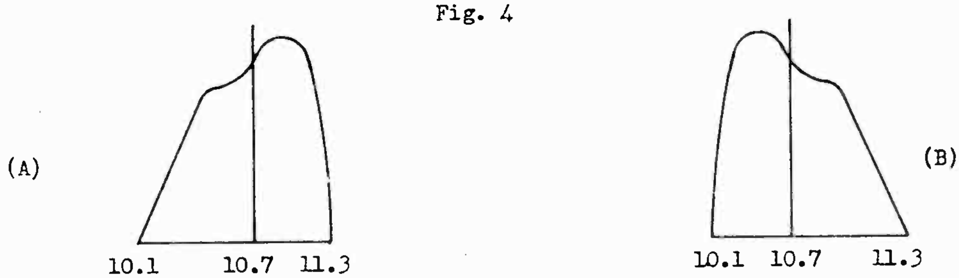

Overcoupled circuits producing a response curve like (b) Fig. 2 are often employed where it is important that the response curve remain approximately flat over a narrow band of frequencies near the resonant frequency. They are also frequently combined with single peaked circuits to produce a response curve like Fig. 3.

Fig. 3



The dotted lines indicate the curves of the individual circuits and the solid curve shows the overall response of the two or more pairs of coupled circuits. Circuits like the above or approaching them in form are desirable in an FM receiver where the pass band should be of the order of 200 Kc. Now from the above it is evident that simple peaking both sides of a circuit coupled below critical for maximum voltage will provide optimum alignment but if this proceedure is followed with an over-coupled circuit it is almost a certainty that the two circuits will not be tuned to the resonant frequency but will instead be aligned so that either one or the other is accentuated. The response curve will then look like Fig. 4 (a) or (b).

Fig. 4

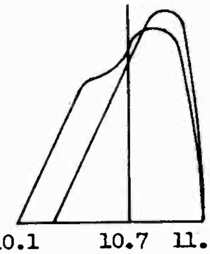


MODELS 141A, Ch. 8L10;
4970, 4971, 4972, Ch. 8S10

# VISUAL I. F.-F. M. ALIGNMENT DATA

Now if this overcoupled circuit is combined with a single peaked circuit (where the coupling is below critical), the misalignment becomes worse, something like Fig. 5.

Fig. 5




From the above it appears that to properly align a receiver using overcoupled IF transformers it will be necessary to take a response curve of each stage and align the circuit so that the two peaks are symmetrical, that is, approximately equal in amplitude and displaced equally from the center frequency. To do this with a CW or AM signal would be laborious and time consuming whereas the use of visual equipment makes it nearly as simple as adjusting a simple single peaked amplifier.

Visual alignment test equipment performs the operation of plotting the response curve almost exactly as described above except that instead of manually changing the generator frequency, recording the voltage and then plotting the results, these operations are performed automatically and simultaneously by a combination of electronic circuits. The operation is briefly as follows.

In the signal generator a low AC voltage is applied to a reactance tube modulator which shifts the oscillator frequency from low to high or from high to low at a rate determined by the frequency of the AC voltage and by an amount determined by the AC voltage. The frequency at any instant is dependant on the AC voltage present at that instant of time. An oscilloscope is provided which may be considered a voltmeter used to read the voltage across the tuned circuit, provided a detector is used to convert the RF to a low audio frequency. This voltage is then applied to the vertical plates and results in a vertical displacement of the spot on the screen. Some of the voltage used to shift the oscillator frequency is also applied to the horizontal plates of the oscilloscope providing a means of displacing the spot horizontally. It is now evident that since for any given AC voltage only one frequency may be obtained and since that AC voltage will result in an exact amount of spot deflection on the scope we can read the voltage across the circuit under examination by noticing the position of the spot at this exact instant.

Now if we consider the frequency as shifting from low to high 60 times per second and remember that the spot is moving across the screen of the scope 60 times per second at exact synchronisation with the change in frequency it is only necessary to apply the voltage from our circuit to the vertical plates to obtain a replica of the response curve on the face of the cathode ray tube. This curve will be repeated 60 times per second if our sweep frequency is 60 cycles. Adjustments to the circuit may now be made and the effect on the response curve noted instantaneously.

Although it is possible to observe the selectivity curves as shown in Fig. 1, 2, and 3 on the scope by the use of an auxiliary special detector coupled to the plate of the last IF tube, it is much more convenient to observe the effects of IF alignment upon the shape of the ratio detector output trace. When this is done the auxiliary detector is not necessary and a direct connection of the scope into the receiver circuits will provide all the necessary connections.

If the overall selectivity curve is not "flat-topped" (solid line in Fig. 3) the ratio detector curve cannot be linear (straight) throughout the center section, symmetrical and have sufficient band width (Fig. 6).

Under these conditions it would not be possible to receive a signal without distortion and higher than normal noise, the degree of distortion and abnormal noise dependent upon the extent to which the center of the ratio detector trace departs from a straight line and the extent to which the entire trace departs from true symmetry.

After a pattern similar to Fig. 6 is obtained with connection #1 shown in the block diagram, the generator lead may be moved ahead through the IF system one tube at a time and the intervening transformer aligned for maximum output but at all times a curve very similar to Fig. 6 must be maintained.

3. EQUIPMENT REQUIRED.

(a) A sweep signal generator with a center frequency of 10.7 Mc. and a total sweep width of at least 400 Kc. Examination of the block diagram will reveal a variable resistor-capacitor circuit inserted in the lead between the FM sweep generator and the horizontal amplifier of the oscilloscope. This control should be adjusted so that the dual trace observed on the oscilloscope will blend into a single trace and thereby eliminate any confusion due to the two traces.

(b) An Oscilloscope with either a 3" or 5" tube equipped with both vertical and horizontal amplifiers.

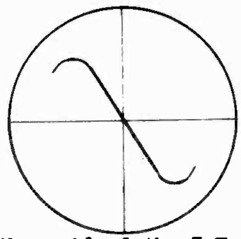
MODELS 141A, Ch. 8L10;
4970, 4971, 4972, Ch. 8S10

# VISUAL I. F.-F. M. ALIGNMENT DATA

4. **ALIGNMENT OF THE 10.7 I.F.**
Turn the wave band switch to F.M. and the generator to 10.7 Mc. Connect the F.M. signal generator output lead to the grid of the ratio detector driver tube and the scope to the 1st audio plate. Now proceed to align the ratio detector transformer for maximum linearity and output, being careful to maintain as symmetrical a trace as possible. Note that the adjustment of the secondary circuit, controls to a large extent, the linearity and symmetry of the pattern, and adjustment of the primary will influence the gain of the circuit. Fig. 6 represents a linear detector curve properly aligned.

It is important that the generator sweep a sufficiently wide band of frequencies so that the curves on both ends of the straight portion can be seen. Maximum linearity of alignment will result when these curves are symmetrically shaped and as previously stated this will result in minimum distortion and noise.

Fig. 6



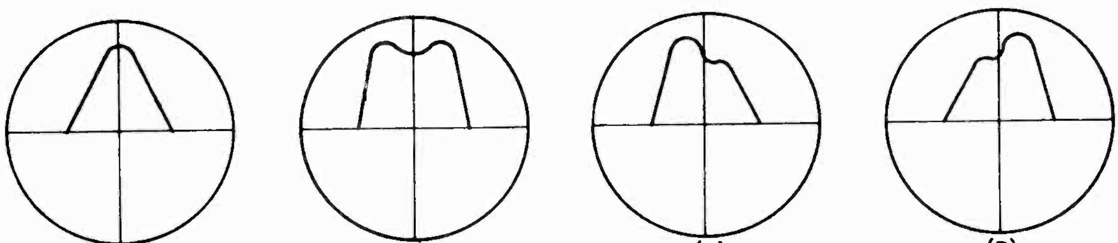
Connect the generator output lead to the grid of the I.F. amplifier. Align primary and secondary of the I.F. transformer being careful to maintain the same basic ratio detector trace as just described.

Observe that by alternately adjusting the primary and secondary, the vertical amplitude can be increased without the response curve becoming distorted. At all times it is important to reduce the signal generator output to maintain the scope picture on the screen. This will avoid overload and possible misalignment therefrom.

Move the generator lead to the grid of the converter tube and align No. 1 I.F. transformer following the same proceedure as above.

Fig. 7, (A), (B), (C), and (D) represent typical selectivity curves of an overall I.F. Amplifier.
Fig. 7, (AA), (BB), (CC), and (DD) represent the corresponding ratio detector curves.

Fig. 7

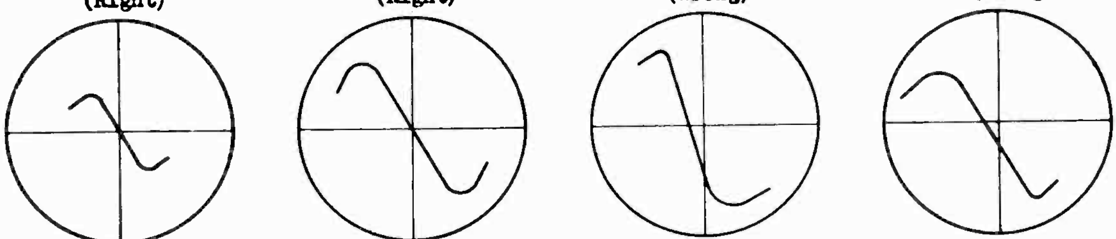


(A) Not Overcoupled Properly Aligned (Right)

(B) Overcoupled Properly Aligned (Right)

(C) Overcoupled Improperly Aligned (Wrong)

(D) Overcoupled Improperly Aligned (Wrong)



(AA) Narrow Bandpass

(BB) Proper Alignment

(CC) Overcoupled

(DD) IF Transformer Improperly Aligned

Should the trace appear unsatisfactory, a very slight readjustment of the detector secondary alignment may be made at this time as the need for any but a slight correction is an indication of incorrect alignment in one of the other stages. This is permissible only if the degree of correction necessary is slight. If this is not the case the entire alignment procedure should be repeated.

MODELS 141A, Ch. 8L10;
4970, 4971, 4972, Ch. 8S10

WHEN ORDERING PARTS ALWAYS SPECIFY PART NUMBER AND MODEL FOR WHICH PART IS INTENDED.

**COILS**

| DESCRIPTION | | PART NUMBER |
|---|---|---|
| L-1 | Loop Ant. Assembly | PA5250-4 |
| L-2 | Loop Loading Coil | AA6616-1 |
| L-3 | A.M. Osc. Coil | AA6665-3 |
| L-4 | F.M. Osc. Coil | PA5200-7 |
| L-5 | 100 Mc. Choke Coil | AA6798-3 |
| L-6 | Choke Coil | AA6798-5 |
| L-7 | Choke Coil | AA6798-6 |
| L-8 | Choke Coil | AA6769-2 |
| L-9 | F.M.-R.F. Coil | PA5200-6 |
| L-10 | Line Cord Ant. Choke | AA6664-1 |
| L-11 | Choke Coil | AA6798-7 |

**CONDENSERS & MISCELLANEOUS**

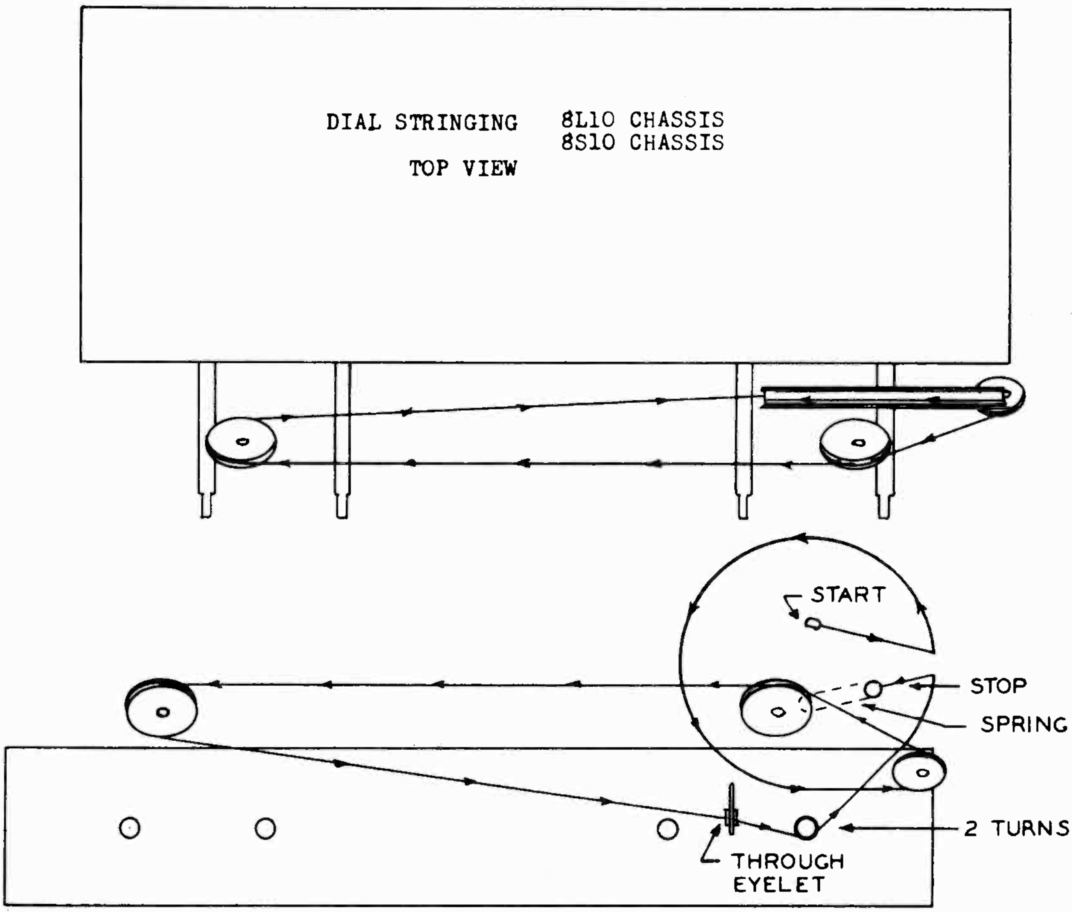
| | |
|---|---|
| Condenser - 2 Gang Variable | PC65002-1 |
| Condenser - (C42) 10-40-40-50 Mfd. Electrolytic | PA4307-4 |
| Condenser - (C36) 8 Mfd. 50 Volt Electro. | PA4303-7 |
| C & R Unit - (C26A & B with R19) | PA4329-1 |
| Control - (R24) 1 Megohm Volume | PA4408-2 |
| Control - (R35) .5 Megohm Tone & A.C. Switch | PA4400-10 |
| Control - Panel | PC63071 |
| Dial Chart | PB30013 |
| Dial Light Bulb | PA4100-3 |
| Knobs - (4-Black) | PA5625-1 |
| Switch - Wave Band | PA4610 |
| *Speaker - (6" x 9" Oval) | PC63000-19 |

**TRANSFORMERS**

| | | |
|---|---|---|
| T1 | Transformer - No. 1 F.M. - I.F. Assembly | AA6667-1 |
| T2 | Transformer - No. 1 A.M. - I.F. Assembly | AA6668-5 |
| T3 | Transformer - No. 2 F.M. - I.F. Assembly | AA6667-3 |
| T4 | Transformer - No. 2 A.M. - I.F. Assembly | AA6668-1 |
| T5 | Transformer - Ratio Detector Assembly | AA6684-1 |
| T6 | Transformer - Output | AB44061-2 |
| T7 | Transformer - Power | AB44013-1 |
| T8 | Choke - Filter | AB47004-1 |

* Complete speakers may be returned to factory Service Department for repair or replacement.

## DIAL STRINGING



MODELS 141A, Ch. 8L10;
4970, 4971, 4972, Ch. 8S10

## VOLTAGE CHART

.Line Voltage: 117 Volts AC

Postion of volume control: Full with set tuned to quiet channel. Position of Band Switch A.M.

| TUBE | FUNCTION | Voltage of Sockets Prongs to Ground See Prong Nos. on Schematic. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 | No. 9 |
| 6BE6 | A.M. Conv. & F.M. Osc. | -2.5 | 0 | 0 | 6.3* | 100 | 100 | ** | | |
| 12AT7 | F.M. - R.F. & Mixer | 115 | -.6 | 0 | 0 | 0 | 145 | -1 | 1.6 | 6.3 |
| 6BA6 | I.F. Amp. | -.1 | 0 | 6.3* | 0 | 190 | 100 | 1.0 | | |
| 6BA6 | Ratio Det. Driver | -.5 | 0 | 6.3* | 0 | 110 | 100 | .85 | | |
| 6AL5 | Ratio Det. | 0 | -.25 | 5.6* | 0 | 0 | 0 | 0 | | |
| 6AV6 | 1st A.F.-A.M. Det. & A.V.C. | -.1 | 0 | 6.3* | 0 | -.1 | -.1 | 75 | | |
| 6V6GT | Power Amplifier | 0 | 0 | 220 | 230 | 0 | 145 | 6.3* | 12 | |
| 5Y3GT | Rectifier | 0 | 270 | | 260* | | 260* | | 270 | |

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Alsways use meter scale which will give greatest deflection within scale limits. All D.C. measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.

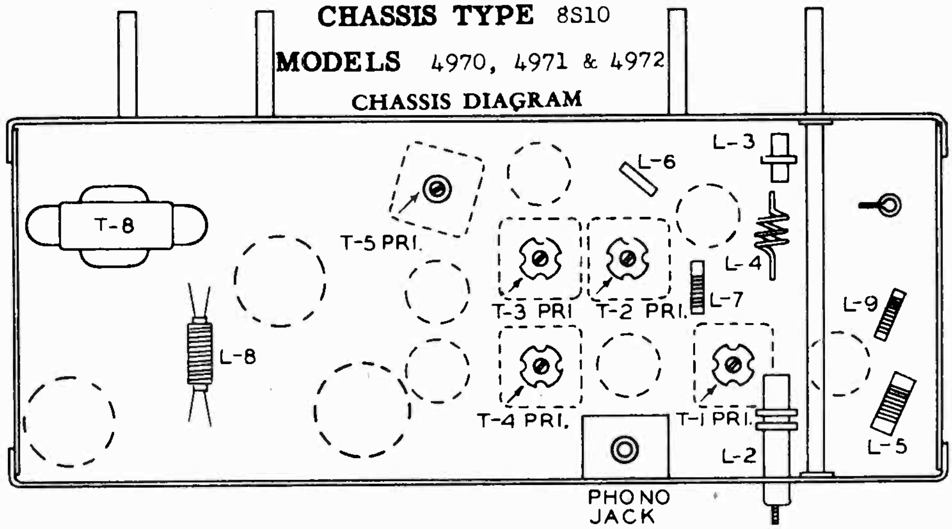
* AC Volts.

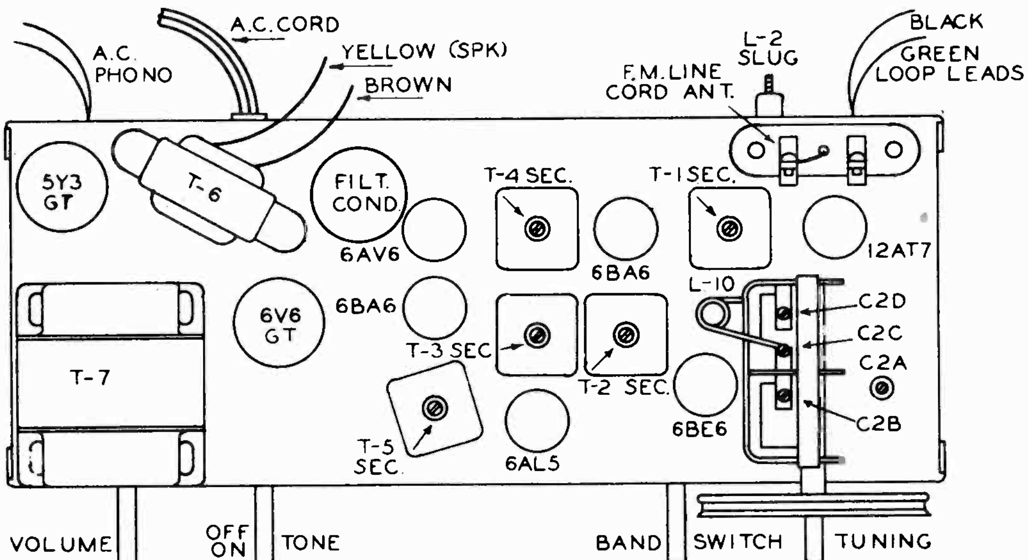
** Cannot be measured with 20,000 ohms per volt voltmeter.

**CHASSIS TYPE** 8S10

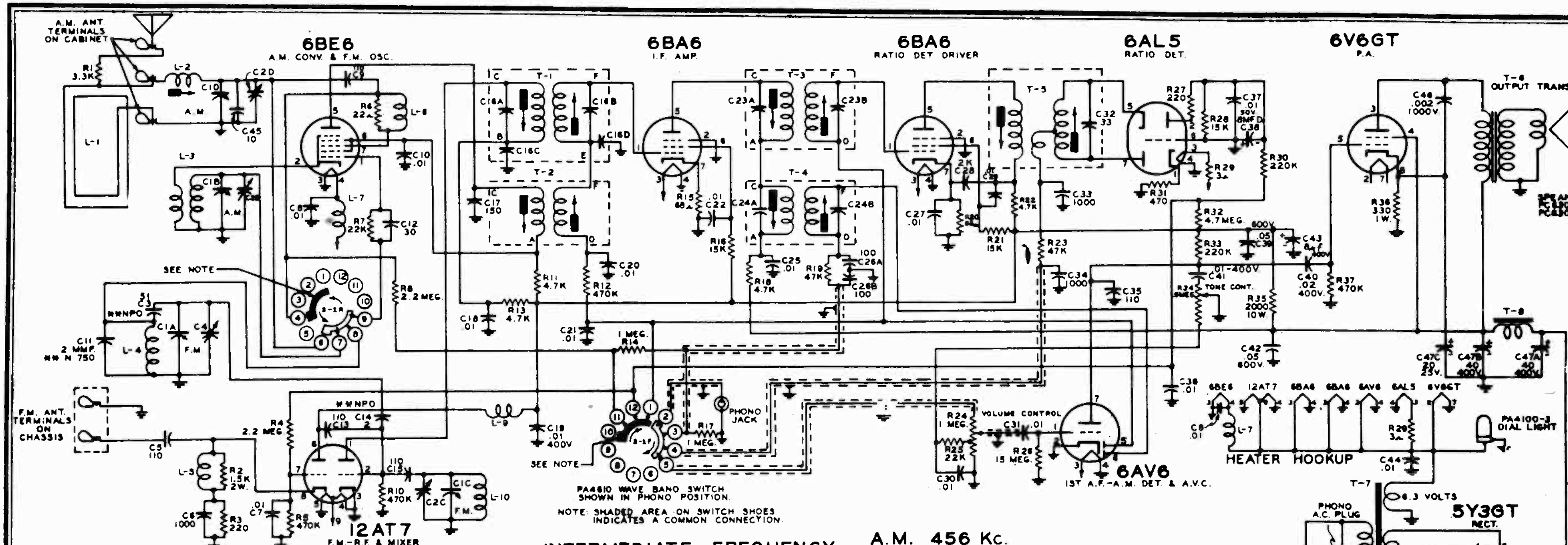
**MODELS** 4970, 4971 & 4972

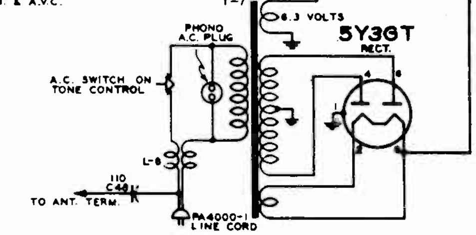
**CHASSIS DIAGRAM**



# MODELS 4970, 4971, 4972, Ch. 8S10

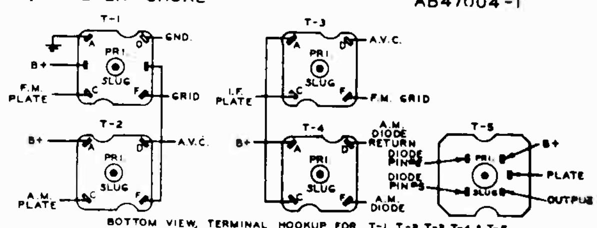



(ORIGINAL) EFFECTIVE NOV. 1, 1949

INTERMEDIATE FREQUENCY A.M. 456 Kc. F.M. 10.7 Mc.

| | | |
|---|---|---|
| C1A,C1C | F.M. GANG CONDENSER | PC65002-1 |
| C1B,C1D | A.M. GANG CONDENSER | PC65002-1 |
| C2C | F.M. TRIMMER ON GANG | PC65002-1 |
| C2B,C2D | A.M. TRIMMER ON GANG | PC65002-1 |
| C3 | 51 MMF. CERAMIC | CC30A-510K |
| C4 | F.M. OSC. TRIMMER | PA4366 |
| C5 | 110 MMF. CERAMIC | CC30H-111A |
| C6 | 1000 " " DISC. | HK35G-102 |
| C7 | .01 MFD. " DISC. | PA4334-2 |
| C8 | .01 " " " | PA4334-2 |
| C9 | 110 MMF. " | CC30H-111A |
| C10 | .01 MFD. " " | PA4334-2 |
| C11 | 2 MMF. " | ** CC30H-020K |
| C12 | 30 " " | CC30H-300K |
| C13 | 110 " " | CC30H-111A |
| C14 | 2 " " | ** CC30A-020K |
| C15 | 110 " " | CC30H-111A |
| C16A,C (F.M. PRI.) C16B,D (F.M. SEC.) | I.F. CAPACITORS | * |
| C17 | 150 MMF. CERAMIC | CC30G-151F |
| C18 | .01 MFD. " DISC. | PA4334-2 |
| C19 | .01 " 400V. PAPER | PC40HL-103 |
| C20 | .01 " CERAMIC DISC. | PA4334-2 |
| C21 | .01 " " " | PA4334-2 |
| C22 | .01 " " " | PA4334-2 |
| C23A (F.M. PRI.) C23B (F.M. SEC.) | I.F. CAPACITORS | * |
| C24A (A.M. PRI.) C24B (A.M. SEC.) | " " | * |
| C25 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C26A,B | 100 MMF. C & R UNIT | PA4329-1 |
| C27 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C28 | 2000 MMF. " " | HK35E-202 |
| C29 | .01 MFD. " " | PA4334-2 |
| C30 | .01 " " " | PA4334-2 |
| C31 | .01 " " " | PA4334-2 |
| C32 | 33 MMF. MICA | * |
| C33 | 1000 MMF. CERAMIC | HK35G-102 |
| C34 | 1000 " " | HK35G-102 |
| C35 | 110 " " | CC30H-111A |
| C36 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C37 | .01 " " " | PA4334-2 |
| C38 | 8 MFD. 50V. ELECTROLYTIC | PA4303-7 |
| C39 | .05 MFD. 600V. PAPER | PC40HM-503 |
| C40 | .02 " 400V. " | PC40HL-203 |
| C41 | .01 " 400V. " | PC40HL-103 |
| C42 | .05 " 600V. " | PC40HM-503 |
| C43 | 8 MFD. 400V. ELECTROLYTIC | PA4303-4 |
| C44 | .01 MFD. CERAMIC DISC. | PA4334-2 |
| C45 | 10 MMF. MICA | MC60F-100 |
| C46 | .002 MFD. 1000V. | PC40GN-202 |
| C47 | 40-40-20 MFD. ELECTROLYTIC | PA4307-3 |
| C48 | 110 MMF. CERAMIC | CC30H-111A |
| R1 | 3.3K OHMS ½ W. | BR12S-332 |
| R2 | 1.5K " (IN L-5) 2 W. | DR12S-152 |
| R3 | 220 " ½ W. | BR12S-221 |
| R4 | 2.2 MEG. " " " | BR12S-225 |
| R5 | 470K " " " | BR12S-474 |
| R6 | 22 " (IN L-6) " " | BR12S-220 |
| R7 | 22K " " " | BR12S-223 |
| R8 | 2.2 MEG. " " " | BR12S-225 |
| R10 | 470K " " " | BR12S-474 |
| R11 | 4.7K " " " | BR12S-472 |
| R12 | 470K " " " | BR12S-474 |
| R13 | 4.7K " " " | BR12S-472 |
| R14 | 1 MEG. " " " | BR12S-105 |
| R15 | 68 " " " | BR12S-680 |
| R16 | 15K " " " | BR12S-153 |
| R17 | 1 MEG. " " " | BR12S-105 |
| R18 | 4.7K " " " | BR12S-472 |
| R19 | 47K " C & R UNIT " " | PA4329-1 |
| R20 | 68 " " " | BR12S-680 |
| R21 | 15K " " " | BR12S-153 |
| R22 | 4.7K " " " | BR12S-472 |
| R23 | 47K " " " | BR12S-473 |
| R24 | 1 MEG. " VOLUME CONTROL | PA4408-2 |
| R25 | 22K " ½ W. | BR12S-223 |
| R26 | 15 MEG. " " " | BR12S-156 |
| R27 | 220 " " " | BR12S-221 |
| R28 | 15K " " " | BR12S-153 |
| R29 | 3 " WIRE WOUND ½ W. | PA4207-1 |
| R30 | 220K " ½ W. | BR12S-224 |
| R31 | 470 " " " | BR12S-471 |
| R32 | 4.7 MEG. " " " | BR12S-475 |
| R33 | 220K " " " | BR12S-224 |
| R34 | .5 MEG. " TONE CONTROL | PA4400-10 |
| R35 | 2000 " 10 W. | PA4200-10 |
| R36 | 330 " WIRE WOUND 1 W. | CR12S-331 |
| R37 | 470K " WIRE WOUND ½ W. | BR12S-474 |
| L1 | LOOP ANTENNA | AC67008-6 |
| L2 | LOOP LOADING COIL | AA6618-1 |
| L3 | B.C. OSC. COIL | AA6665-3 |
| L4 | F.M. OSC. COIL | PA5200-7 |
| L5 | 100MC. CHOKE COIL (1500Ω FORM) | AA6798-3 |
| L6 | " " " (22Ω FORM) | AA6798-5 |
| L7 | CHOKE COIL (FILAMENT) | AA6798-6 |
| L8 | LINE CORD ANTENNA CHOKE | AA6664-1 |
| L9 | CHOKE COIL | AA6769-2 |
| L10 | F.M.-R.F. COIL | PA5200-6 |
| T1 | NO. 1 F.M.-I.F. TRANS. ASSEM. | AA6667-1 |
| T2 | NO. 1 A.M.-I.F. TRANS. ASSEM. | AA6668-5 |
| T3 | NO. 2 F.M.-I.F. TRANS. ASSEM. | AA6667-3 |
| T4 | NO. 2 A.M.-I.F. TRANS. ASSEM. | AA6668-1 |
| T5 | RATIO DETECTOR ASSEM. | AA6684-1 |
| T6 | OUTPUT TRANS. | AB44061-3 |
| T7 | POWER TRANS. | AB44016-1 |
| T8 | FILTER CHOKE | AB47004-1 |




BOTTOM VIEW, TERMINAL HOOKUP FOR T-1, T-2, T-3, T-4 & T-5

* SPECIAL SERVICE NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.

** REPLACE ONLY WITH TEMPERATURE COEFFICIENT AS INDICATED.

MODELS 141X, 142X, 1040X, 1041X, Ch. 8M10

MODEL 141X 142X

MODEL 1040X 1041X

VOLTAGE CHART

Line Voltage: 117 Volts AC

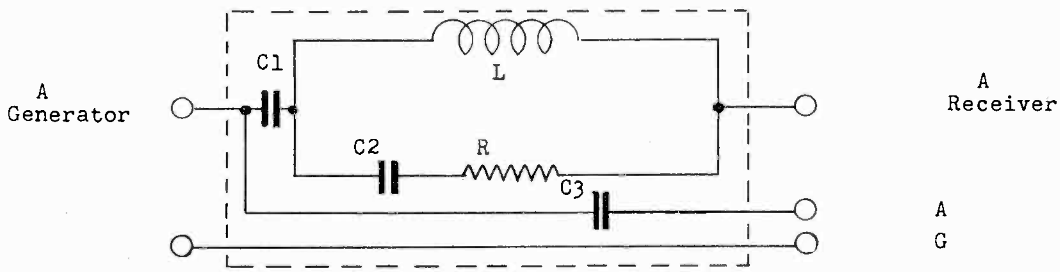
Position of volume control: Full with set tuned to quiet channel. Position of band switch A.M.

| TUBE | FUNCTION | Voltage of Sockets Prongs to Ground See Prong Nos.on Schematic. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No. 2 | No. 3 | No. 4 | No. 5 | No.6 | No.7 | No. 8 | No. 9 |
| 6BE6 | A.M. Conv. & F.M. Osc. | -2.5 | 0 | 0 | 6.3* | 90 | 80 | ** | | |
| 12AT7 X | F.M. -R.F. & Mixer | 135 | -.6 | 0 | 0 | 0 | 150 | -1 | 1.2 | 6.3* |
| 6BA6 | I. F. Amp. | -.1 | 0 | 6.3* | 0 | 235 | 100 | 1.0 | | |
| 6BA6 X | Ratio Det. Driver | -.5 | 0 | 6.3* | 0 | 95 | 90 | 1.2 | | |
| 6AL5 | Ratio Det. | 0 | -.25 | 5.6* | 0 | 0 | 0 | 0 | | |
| 6AV6 | 1st A.F.-A.M. Det.& A.V.C. | -.1 | 0 | 6.3* | 0 | -.1 | -.1 | 95 | | |
| 6V6GT | Power Amplifier | 0 | 0 | 250 | 260 | 0 | 240 | 6.3* | 14 | |
| 5Y3GT | Rectifier | 0 | 270 | | 260* | | 260* | | 270 | |

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greater deflection within scale limits. All D. C. measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.

* AC Volts
** Cannot be measured with 20,000 ohms per volt voltmeter.
X Band switch on F.M.

## DUMMY ANTENNA




C1 - 200 mmf. Condenser 400 V.D. C.
C2 - 400 mmf. Condenser 400 V.D.C.
C3 - .02 mmf. Condenser 400 V.D.C.
R - 100 ohms Resistor 1/4 Watt
L - Choke Coil

----Case Shield
Choke Coil Specification
Tubing - 3/8" diameter Bakelite
Wire- No. 38 Enameled
Turns- 59 Closely Wound (Impregnated)

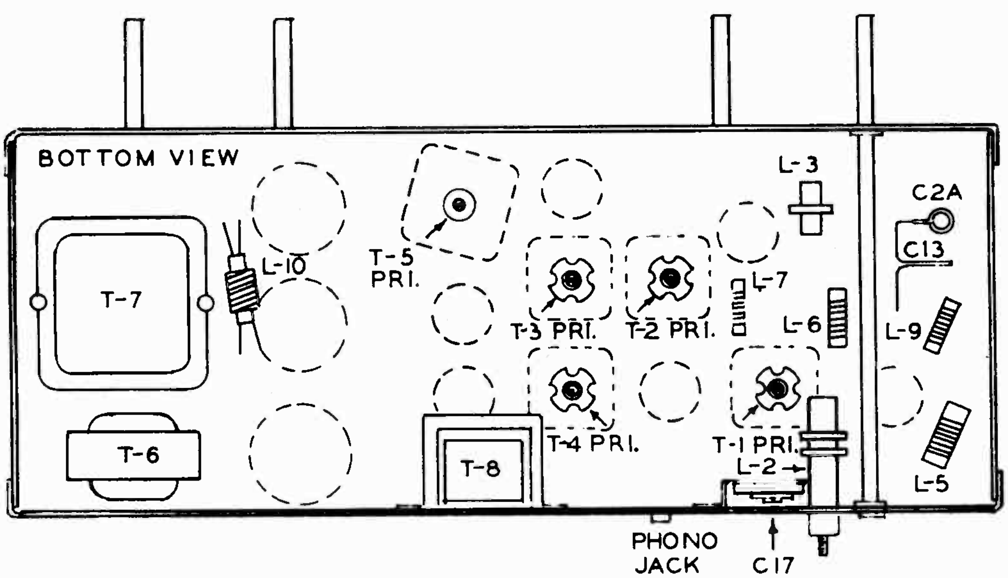
NOTE: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

MODELS 141X, 142X,
1040X, 1041X, Ch. 8M10

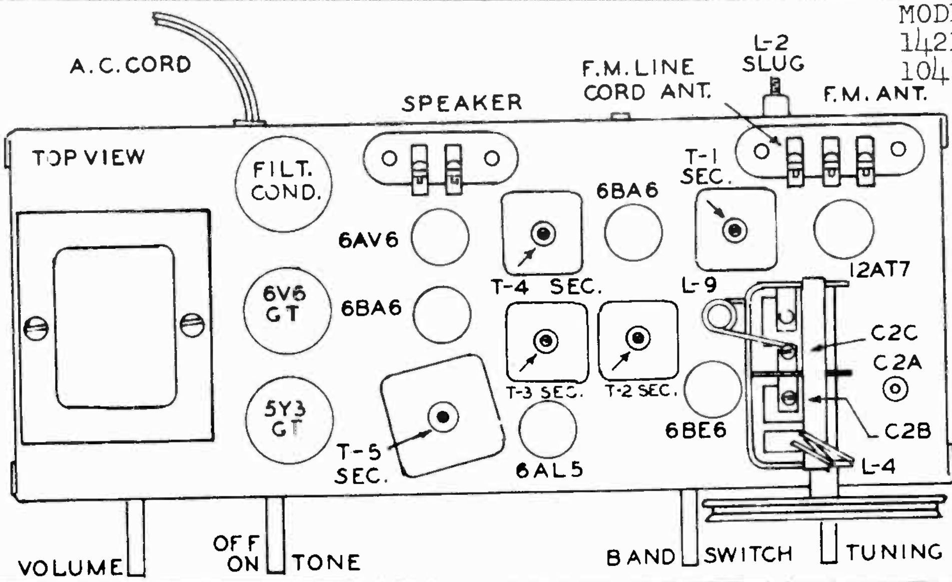
| OPER-ATION | ALIGNMENT OF | GENERATOR CONNECTED TO | DUMMY ANT. | GENERATOR FREQUENCY | BAND SWITCH SETTING | TUNING COND SETTING | TRIMMER OR SLUG | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Set Dial pointer even with left-hand stop line with condenser gang closed. | | | | | | | |
| 2. | Connect output meter across speaker terminals. | | | | | | | |
| 3. | A.M.-I.F. | Pin #7 of 6BE6 Conv. Tube | .02 MFD Cond. | 456 KC. | A.M. | Open | T4 Sec. Slug | Max. Reading |
| | | | | | | | T4 Pri. Slug | Max. Reading |
| | | | | | | | T2 Sec.Slug | Max. Reading |
| | | | | | | | T2 Pri. Slug | Max. Reading |
| 4. | Repeat operation #3. | | | | | | | |
| 5. | A.M.-R.F. | A.M. Ant. On Cabinet | * | 1500 KC. | A.M. | 1500 KC. | C2B Osc. Tri. | Peak Accurately |
| 6. | A.M.-R.F. | On Cabinet | * | 1500 KC. | A.M. | 1500 KC. | C17 Ant.Tri. | Peak Accurately |
| 7. | A.M.-R.F. | On Cabinet | * | 600 KC. | A.M. | 600 KC. | L-2 Slug | Max.Reading |
| 8. | Repeat operations #5,#6 and #7. | | | | | | | |
| 9. | Check Calibrations at 600,1000 and 1500 KC. | | | | | | | |
| 10. | SPECIAL NOTE: For complete F.M.- I.F. Visual Alignment instructions please refer to pages 9.10.11.12.13 and 14 of Bulletin 11, Manual 6. | | | | | | | |
| 11. | F.M.-I.F. Alignment using an A.M. Generator and Output Meter. | | | | | | | |
| 12. | T5 F.M. Ratio Det. | Pin #1 of 2nd 6BA6 Tube | .02 MFD. Cond. | 10.7 MC. | F.M. | Open | T5 Sec. Slug | Max.Reading |
| | | | | | | | T5 Pri. Slug | Max.Reading |
| 13. | NOTE: Operations 11,12,14,15,18 and 19 must be made with generator output as low as possible, consistent with usable output meter reading. | | | | | | | |
| 14. | T3 2nd. F.M.-I.F. | Pin #1 1st 6BA6 Tube | .02 MFD. COND. | 10.7 MC. | F.M. | Open | T3 Sec. Slug | Max.Reading |
| | | | | | | | T3 Pri. Slug | Max.Reading |
| 15. | T1 1st F.M.-I.F. | Pin #8 on 12AT7 Mixer Tube | .02 MFD. COND. | 10.7 MC. | F.M. | Open | T1 Sec. Slug | Max.Reading |
| | | | | | | | T1 Pri. Slug | Max.Reading |
| 16. | Adjust secondary slug on T5 ratio detector transformer to minimum deflection or dip on output meter. Under certain conditions it is possible to adjust T5 sec.slug to minimum noise with the receiver tuned to a weak station. This operation is very critical and the receiver must be tuned to the center response only. | | | | | | | |
| 17. | F.M-R.F. alignment using an A.M. Generator with frequencies of 88 to 108 MC.and a vacuum tube voltmeter or D. C. voltmeter. (20.000 Ohms per volt). | | | | | | | |
| 18. | Place meter across C36 elect. condenser. (Meter reading approximately 1 volt) | | | | | | | |
| 19. | F.M.-R.F. | F.M. Ant. | Match Gen. To 300 Ohms | 106 MC | F.M. | 106 MC. | C2A Osc. Tri. | Max.Reading |
| | | | | | | | C2C Ant. Tri. | Peak Accurately |
| 20. | Check Calibration at 88 MC. | | | | | | | |

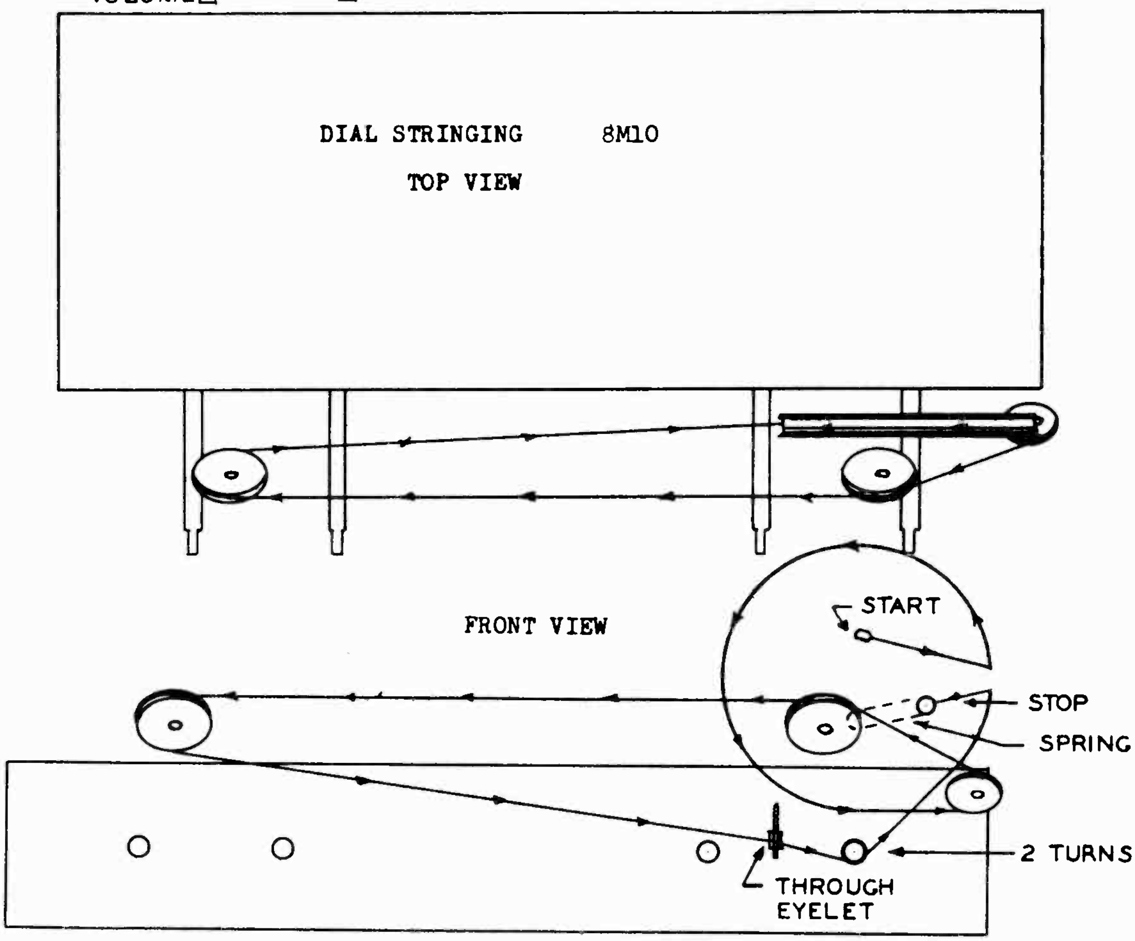
*Use standard dummy antenna as described

## CHASSIS DIAGRAM



MODELS 141X, 142X, 1040X, 1041X, Ch. 8M10

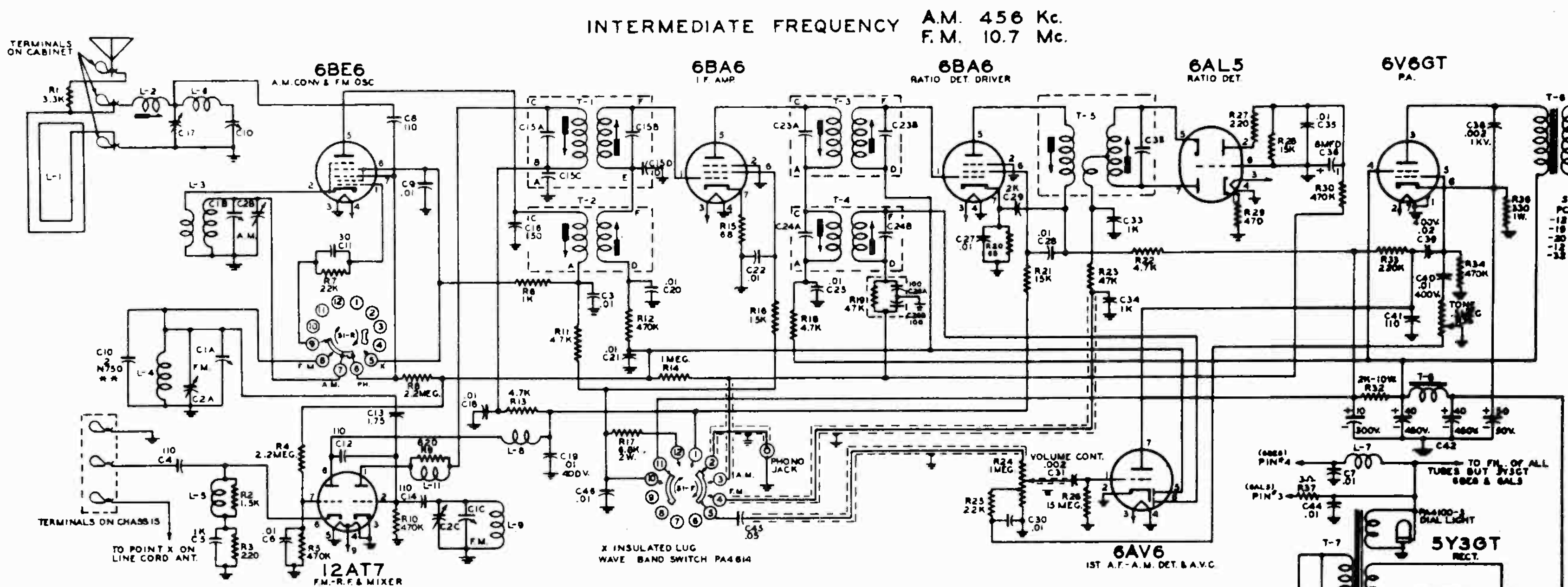


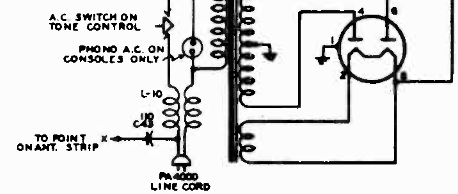




| | |
|---|---|
| Wave Band Switch | PA4614 |
| *Speaker (Model 1085,1086) | PC3000-12 |
| *Speaker (Models 141X, 142X) | PC63000-19 |
| *Speaker (Models 1040X, 1041X) | PC63000-20 |
| Escutcheon-(Black) (142X,1041X, 1086) | PB40150 |
| Escutcheon-(Maroon)(141X,1040X, 1085) | PB40150-1 |
| Panel(Black)(142X,1041X, 1086) | PC63071 |
| Panel(Maroon)(141X,1040X,1085) | PC63071-1 |
| Knob(142X,1041X,1086) | PA5625-1 |
| Knob(141X,1040X,1085) | PA5654 |
| Washer-Paper (4 Each Model) | PA709-1 |

# MODELS 141X, 142X, 1040X, 1041X, Ch. 8M10

INTERMEDIATE FREQUENCY A.M. 456 Kc. F.M. 10.7 Mc.

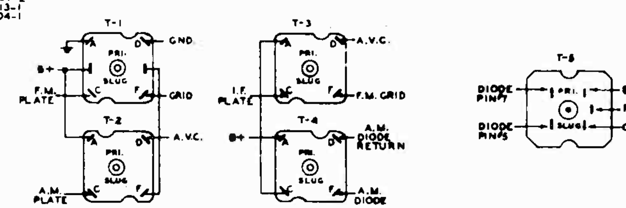



| DESCRIPTION | PART NO. |
|---|---|
| C1A, C1C F.M. GANG CONDENSER | PC65002-2 |
| C1B, C1D A.M. .. .. | PC65002-2 |
| C2C TRIMMER ON F.M. GANG | PC65002-2 |
| C2B .. .. A.M. .. | PC65002-2 |
| C2A F.M. OSC. TRIMMER | PA4388 |
| C3 .01 MFD. CERAMIC DISC | PA4334-2 |
| C4 110 .. .. | CC30H-111A |
| C5 1000 MMF. CERAMIC DISC | HK35G-102 |
| C6 .01 MFD. .. .. | PA4334-2 |
| C7 .01 .. .. .. | PA4334-2 |
| C8 110 MMF. CERAMIC | CC30H-111A |
| C9 .01 MFD. CERAMIC DISC | PA4334-2 |
| C10 2 MMF .. N750 | ** CC30H-D20K |
| C11 30 .. .. | CC30H-300K |
| C12 110 .. .. | CC30H-111A |
| C13 1.75 .. BIFILAR WIRE CAPACITOR | PA4344-1 |
| C14 110 .. CERAMIC | CC30H-111A |
| C15A, C (F.M. PRI.) C15B, D (F.M. SEC.) I.F. CAPACITORS | * |
| C16 150 MMF. CERAMIC | CC30G-151F |
| C17 3-35 .. A.M.-R.F. TRIMMER | PA4388-1 |
| C18 .01 MFD. CERAMIC DISC | PA4334-2 |
| C19 .01 .. 400V. TUBULAR | PC40HL-103 |
| C20 .01 .. CERAMIC DISC | PA4334-2 |
| C21 .01 .. .. .. | PA4334-2 |
| C22 .01 .. .. .. | PA4334-2 |
| C23A (F.M. PRI.) C23B (F.M. SEC.) I.F. CAPACITORS | * |
| C24A (A.M. PRI.) C24B (A.M. SEC.) .. .. | * |
| C25 .01 MFD. CERAMIC DISC | PA4334-2 |
| C26A, B 100 MMF. C&R UNIT | PA4329-1 |
| C27 .01 MFD. CERAMIC DISC | PA4334-2 |
| C28 .01 .. .. .. | PA4334-2 |
| C29 .002 .. .. | HK35E-202 |
| C30 .01 .. .. .. | PA4334-2 |
| C31 .002 .. .. | HK35E-202 |
| C32 33 MMF. MICA CAPACITOR RATIO DET. | ** |
| C33 1K .. CERAMIC | HK35G-102 |
| C34 1K .. .. | HK35G-102 |
| C35 .01 MFD. .. DISC | PA4334-2 |
| C36 8 .. 50V. ELECT. | PA4303-7 |
| C38 .002 .. 1000V. TUBULAR | PC40GN-202 |
| C39 .02 .. 400V. .. | PC40HL-203 |
| C40 .01 .. 400V. .. | PC40HL-103 |
| C41 110 MMF. CERAMIC | CC30H-111A |
| C42 10-40-40-50 MFD. ELECT. | PA4307-4 |
| C43 110 MMF. CERAMIC | CC30H-111A |
| C44 .01 MFD. .. DISC | PA4334-2 |
| C45 .05 .. 200V. TUBULAR | PC40GK-503 |
| C46 .01 .. CERAMIC DISC | PA4334-2 |

| DESCRIPTION | PART NO. |
|---|---|
| R1 3.3K OHMS ½ W. | BR125-332 |
| R2 15K .. (IN L-5) 2 .. | PA4203-4 |
| R3 220 .. ½ .. | BR125-221 |
| R4 2.2 MEG. .. .. .. | BR125-225 |
| R5 470K .. .. .. | BR125-474 |
| R6 1K .. .. .. | BR125-102 |
| R7 22K .. .. .. | BR125-223 |
| R8 2.2 MEG. .. .. .. | BR125-225 |
| R9 620 .. (IN L-11) .. .. | PA4203-5 |
| R10 470K .. .. .. | BR125-474 |
| R11 4.7K .. .. .. | BR125-472 |
| R12 470K .. .. .. | BR125-474 |
| R13 4.7K .. .. .. | BR125-472 |
| R14 1 MEG. .. .. .. | BR125-105 |
| R15 68 .. .. .. | BR125-680 |
| R16 15K .. .. .. | BR125-153 |
| R17 6.8K .. 2 .. | DR125-682 |
| R18 4.7K .. ½ .. | BR125-472 |
| R19 47K .. C&R UNIT .. .. | PA4329-1 |
| R20 68 .. .. .. | BR125-680 |
| R21 15K .. .. .. | BR125-153 |
| R22 4.7K .. .. .. | BR125-472 |
| R23 47K .. .. .. | BR125-473 |
| R24 1 MEG .. VOLUME CONTROL | PA4408-2 |
| R25 22K .. ½ W | BR125-223 |
| R26 15 MEG. .. .. .. | BR125-156 |
| R27 220 .. .. .. | BR125-221 |
| R28 15K .. .. .. | BR125-153 |
| R29 470 .. .. .. | BR125-471 |
| R30 470K .. .. .. | BR125-474 |
| R32 2K .. WIRE WOUND 10 .. | PA4200-10 |
| R33 220K .. ½ .. | BR125-224 |
| R34 470K .. .. .. | BR125-474 |
| R35 .5 MEG. .. TONE CONTROL | PA4400-10 |
| R36 330 .. 1 W | CR125-331 |
| R37 3 .. WIRE WOUND ½ W | PA4207-1 |

| DESCRIPTION | PART NO. |
|---|---|
| L-1 LOOP ANT. | PA5250-5 OR 6 |
| L-2 LOOP LOADING COIL | AA6618-2 |
| L-3 B.C. OSC. COIL | AA6665-3 |
| L-4 F.M. OSC. COIL | PA5200-8 |
| L-5 100MC. CHOKE COIL (1500Ω FORM) | AA6798-3 |
| L-6 CHOKE COIL | AA6769-2 |
| L-7 CHOKE COIL | AA6798-6 |
| L-8 CHOKE COIL | AA6769-2 |
| L-9 F.M. R.F. COIL | PA5200-9 |
| L-10 LINE CORD ANT. CHOKE | AA6664-1 |
| L-11 CHOKE COIL | AA6798-7 |
| T-1 NO. 1 I.F. F.M. TRANS. | AA6667-1 |
| T-2 NO. 1 I.F. A.M. .. | AA6668-5 |
| T-3 NO. 2 I.F. F.M. .. | AA6667-3 |
| T-4 NO. 2 I.F. A.M. .. | AA6668-1 |
| T-5 RATIO DETECTOR | AA6684-1 |
| T-6 OUTPUT TRANS. | AB44081-2 |
| T-7 POWER TRANS. | AB44013-1 |
| T-8 FILTER CHOKE | AB47004-1 |




BOTTOM VIEW, TERMINAL HOOKUP FOR T-1, T-2, T-3, T-4 & T-5

* SPECIAL NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.

** REPLACE ONLY WITH TEMPERATURE COEFFICIENT AS INDICATED.

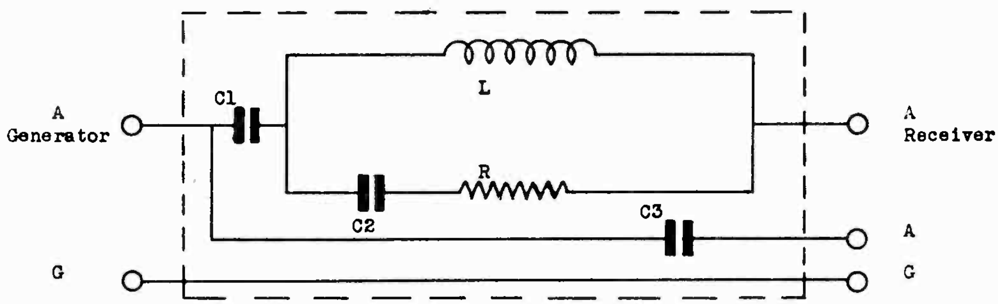
## VOLTAGE CHART

Line Voltage: 117 Volts AC — Position of Volume Control: Full with set tuned to quiet channel. Position of Band Switch: B.C.

| TUBE | FUNCTION | Voltage of Socket Prongs to B- See Prong Nos. on Schematic. No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 | G.Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| 35L6 | P.A. | 0 | 80* | 82 | 90 | 0.25 | 117* | 117* | 11 | |
| 35L6 | P.A. | 0 | 80* | 82 | 90 | 0.25 | 5.6 | 48* | 11 | |
| 12 SQ 7 | 1st Audio,Det. & A.V.C. | 0 | -0.6 | 0 | -0.5 | 0 | 61 | 12* | 0 | |
| 12 BA 6 | I.F. AMP. | 0 | 0 | 48* | 36* | 90 | 90 | 0.8 | - | |
| 12 BA 6 | R.F. AMP. | 0 | 0 | 24* | 36* | 75 | 90 | 2.3 | - | |
| 12 BE 6 | CONV. & OSC. | -3.8 | 0 | 24* | 12* | 90 | 90 | 0 | - | |

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% ≠ or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
* AC Volts.
** Cannot be measured with 20,000 ohms per volt voltmeter.

## DUMMY ANTENNA




C1 - 200 mmf. Condenser 400 V.D.C.
C2 - 400 mmf. Condenser 400 V.D.C.
C3 - .02 mmf. Condenser 400 V.D.C.
R - 100 Ohms Resistor 1/4 Watt
L - Choke Coil

----Case Shield
Choke Coil Specification
Tubing - 3/8" Diameter Bakelite
Wire - No. 38 Enameled
Turns - 59 closely wound (Impregnated)

NOTE: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

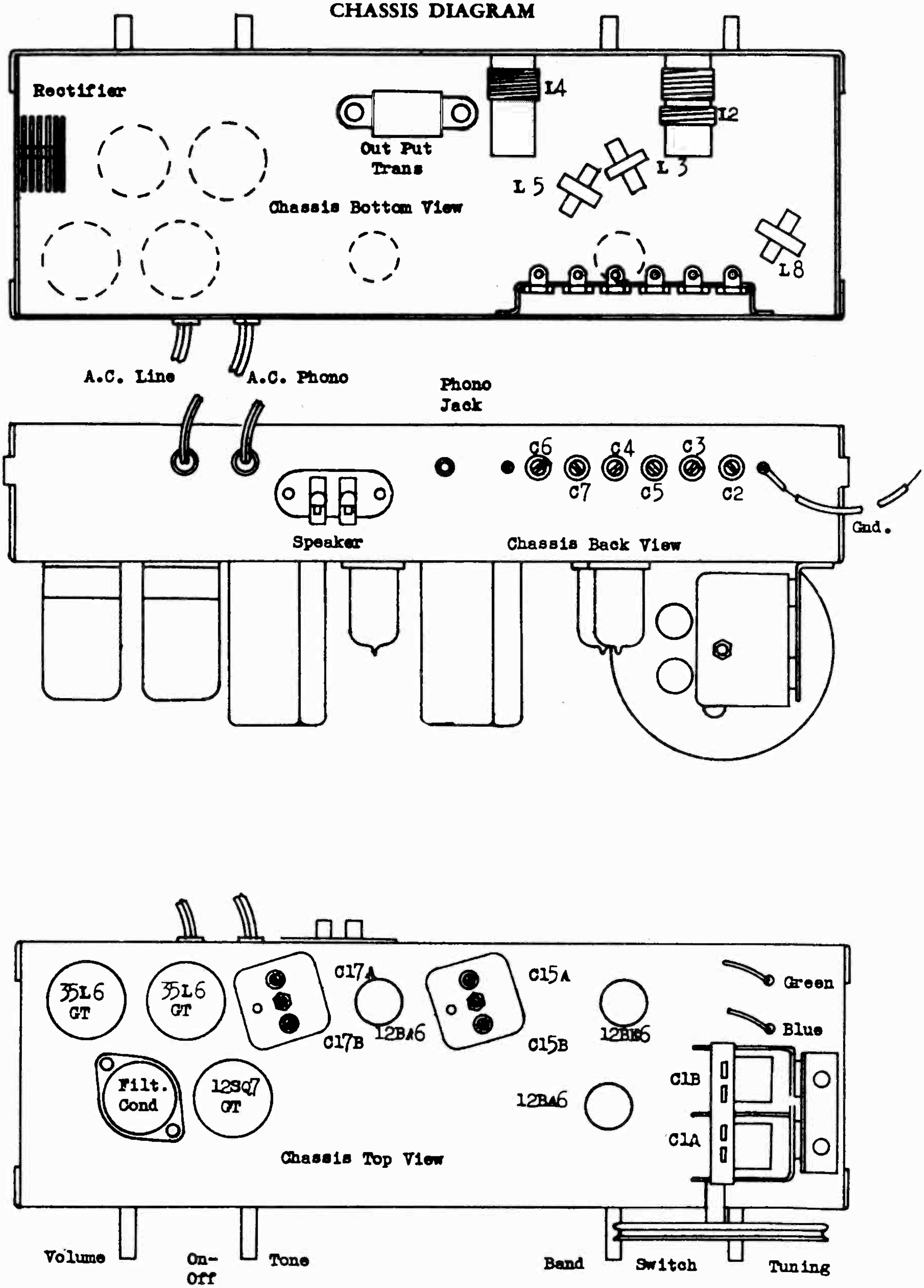
## STEP BY STEP ALIGNMENT PROCEDURE

| OPER-ATION | ALIGNMENT OF | GENERATOR CONNECTED TO | DUMMY ANTENNA | GENERATOR FREQUENCY | BAND SWITCH SETTING | TUNING CONDENSER SETTING | TRIMMERS | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | Set dial pointer even with left-hand stop line with gang closed. | | | | | | | |
| 2 | I.F. | Pin #7 on 12BE6 conv. | .02 MFD Cond. | 456 KC. | B.C. | Open | C17A & C17B | Peak Accurately |
| 3 | | | | | | | C15A & C15B | Peak Accurately |
| 4 | I.F. Rej. | Antenna | .02 MFD | 456 KC. | B.C. | Closed | C7 Trim | Adj. to Min. |
| 5 | B.C. Band | Antenna | * | 1500 KC. | B.C. | 1500 KC | C5 OSC. Trim | Peak Accurately |
| | | | | | | | C2 ANT. Trim | Peak Accurately |
| 6 | | | | 600 KC. | B.C. | 600 KC | C4 OSC. Pad. | ** |
| 7 | Repeat Operations 5 and 6 | | | | | | | |
| 8 | Check Calibration at 600KC., 1000KC. and 1500KC. | | | | | | | |
| 9 | S.W. Band | Antenna | * | 18 MC. | S.W. | 18 MC. | C6 OSC. Trim | Peak Accurately |
| 10 | | | | | | | C3 ANT. Trim | ** |
| 11 | Repeat Operations 9 & 10 | | | | | | | |
| 12 | Check Operations at 18MC., 9MC. and 6 MC. | | | | | | | |
| 13 | Check Operations 1 to 10 inclusive. | | | | | | | |

NOTES: * Use dummy Antenna as shown below. (STD.)
** Rock dial while adjusting for maximum output.

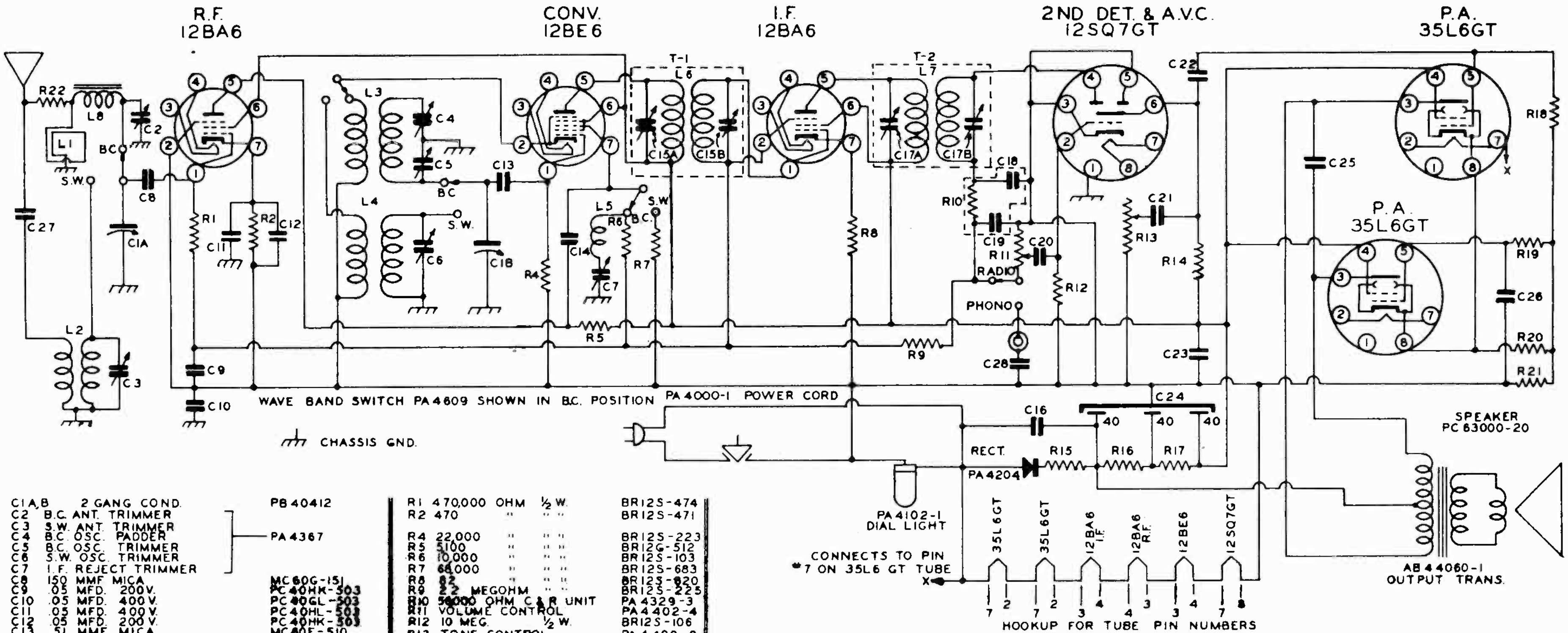
MODELS 1051,
1052, Ch. 6B9

## CHASSIS DIAGRAM



(ORIGINAL) SEPT. 10, 1948

# SCHEMATIC DIAGRAM
## SPARTON SUPERHETERODYNE MODEL 6B9
## INTERMEDIATE FREQUENCY 456 KC.
BOTTOM VIEW OF ALL SOCKET CONNECTIONS




| | | |
|---|---|---|
| C1A,B | 2 GANG COND. | PB 40412 |
| C2 | B.C. ANT. TRIMMER | PA 4367 |
| C3 | S.W. ANT. TRIMMER | PA 4367 |
| C4 | B.C. OSC. PADDER | PA 4367 |
| C5 | B.C. OSC. TRIMMER | PA 4367 |
| C6 | S.W. OSC. TRIMMER | PA 4367 |
| C7 | I.F. REJECT TRIMMER | PA 4367 |
| C8 | 150 MMF MICA | MC 60G-151 |
| C9 | .05 MFD. 200 V. | PC 40HK-503 |
| C10 | .05 MFD. 400 V. | PC 40GL-503 |
| C11 | .05 MFD. 400 V. | PC 40HL-503 |
| C12 | .05 MFD. 200 V. | PC 40HK-503 |
| C13 | 51 MMF. MICA | MC 60F-510 |
| C14 | 100 MMF. MICA. | MC 60G-101 |
| C15 A,B | NO. 1 I.F. TRIMMER | |
| C16 | .05 MFD. 400 V. | PC 40HL-503 |
| C17 A,B | NO. 2 I.F. TRIMMER | |
| C18 | 100 MMF } C & R UNIT | PA 4329-3 |
| C19 | 100 MMF } C & R UNIT | PA 4329-3 |
| C20 | .01 MFD. 200 V. | PC 40HK-103 |
| C21 | .005 MFD. 400 V. | PC 40GL-502 |
| C22 | .01 MFD. 200 V. | PC 40HK-103 |
| C23 | .1 MFD. 200 V. | PC 40HK-104 |
| C24 | 40-40-40 ELECTROLYTIC | PA 4300-9 |
| C25 | .006 MFD. 1000 V. | PC 40GN-602 |
| C26 | .01 MFD. 200 V. | PC 40HK-103 |
| C27 | 82 MMF. MICA | MC 60F-820 |
| C28 | .05 MFD. 400 V. | PC 40GL-503 |

| | | | | |
|---|---|---|---|---|
| R1 | 470,000 | OHM | ½ W. | BR12S-474 |
| R2 | 470 | " | " " | BR12S-471 |
| R4 | 22,000 | " | " " | BR12S-223 |
| R5 | 5100 | " | " " | BR12G-512 |
| R6 | 10,000 | " | " " | BR12S-103 |
| R7 | 68,000 | " | " " | BR12S-683 |
| R8 | 82 | " | " " | BR12S-820 |
| R9 | 2.2 | MEGOHM | " " | BR12S-225 |
| R10 | 56000 | OHM C & R UNIT | | PA 4329-3 |
| R11 | VOLUME CONTROL | | | PA 4402-4 |
| R12 | 10 MEG. | | ½ W. | BR12S-106 |
| R13 | TONE CONTROL | | | PA 4400-9 |
| R14 | 270,000 | OHM | ½ W. | BR12S-274 |
| R15 | 27 | " | 2 W. | DR12S-270 |
| R16 | 120 | " | 1 W. | CR12S-121 |
| R17 | 1200 | " | 1 W. | CR12S-122 |
| R18 | 1 MEG. | " | ½ W. | BR12S-105 |
| R19 | 1 " | " | " " | BR12G-105 |
| R20 | 100 | " | 1 W. | CR12S-101 |
| R21 | 100 | " | 1 W. | CR12S-101 |
| R22 | 2700 | " | ½ W. | BR12S-272 |

| | | |
|---|---|---|
| L1 | LOOP ANT. | PB41927-1 |
| L2 | S.W. ANT. COIL | AA6758-8 |
| L3 | B.C. OSC. COIL | AA6797-3 |
| L4 | S.W. OSC. COIL | AA6753-7 |
| L5 | I.F. REJECT COIL | AA6787-1 |
| L6 | NO. 1 I.F. COIL | AA6800-1 |
| L7 | NO. 2 I.F. COIL | AA6800-2 |
| L8 | ANT. CHOKE COIL | AA6686-4 |

| | | |
|---|---|---|
| T1 | NO. 1 I.F. TRANSFORMER ASSEM. | AB43502-24 |
| T2 | NO. 2 I.F. TRANSFORMER ASSEM. | AB43502-25 |

SPECIAL SERVICE NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.

## DESCRIPTION

Your new automobile receiver is a 5-tube (plus rectifier) superheterodyne, designed to operate from the 6 volt storage battery in your car. It is a universal type of receiver for mounting underneath the dash panel. It has a self-contained PM speaker, and covers the frequency range 540 to 1600 K.C. Two simple controls are provided for operating the receiver. (See Fig. 1)

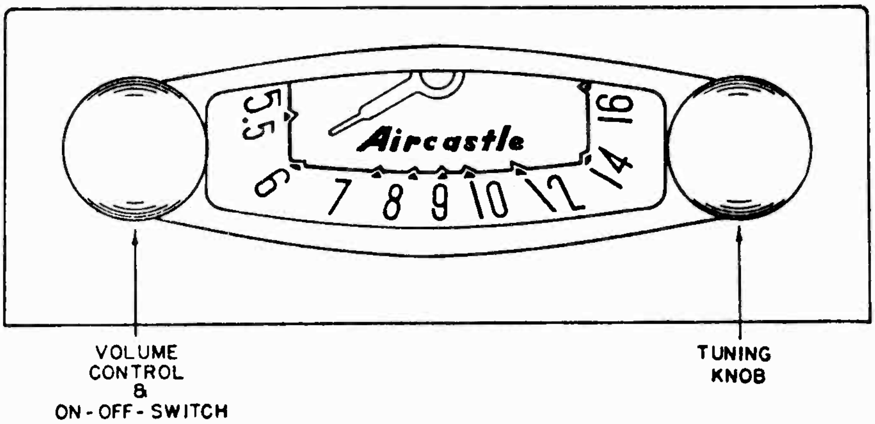



Fig. 1 Front View

## SUGGESTIONS FOR ELIMINATING POSSIBLE MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise. (The following steps may not be necessary in all cases. Install your radio and operate it before making changes.)

### GENERATOR CONDENSER

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

### DISTRIBUTOR SUPPRESSOR

Detach the high tension wire where it goes into the top of the distributor cap and cut two inches off the end. Screw the piece you cut off into one end of the distributor suppressor and then screw the other end of the suppressor on the long wire which leads to the coil. Insert the wire back into the distributor cap.

### 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 .5 MFD condenser. It must be installed from the battery side of the ignition coil to the closest ground on the ment panel.

Short wires 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 wire from the coil to the distributor.

they run from the engine compartment up to the instrument panel. These wires should be placed in a flexible wire shield and the shield grounded to frame or motor. 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 wires.

### BONDING OF FIRE WALL

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

### WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

MODEL 602-17C144

## HIGH AND LOW TENSION WIRES

In many cases the low tension battery leads, etc., are grouped together with the high tension wires. These wires 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

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to connect a .5 MFD by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, and generator condenser. By referring to Figure 2 and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 7/32" holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided, and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed to the correct angles, as illustrated in Figure 2, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8" drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4" bolt, lock washer and nut furnished with the receiver.

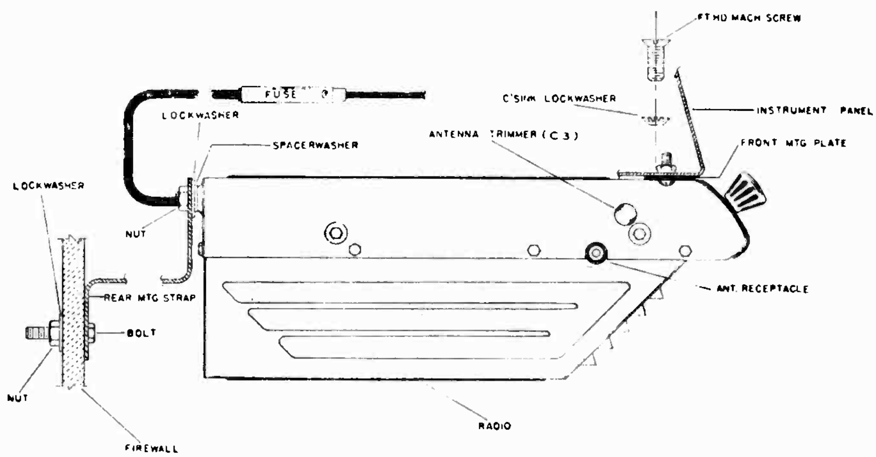



*Fig. 2 Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the socket provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## S84-413 SUPPRESSION KIT & MISC. PARTS ASSEMBLY

| | |
|---|---|
| 1—S84-233 | "A" lead assembly |
| 1—A43-10 | Fuse |
| 2—A52-295 | Control knobs |
| 1—A81-13 | Sleeve (for fuse) |
| 1—S84-193 | Suppression Kit consisting of: |
| | 1—.5 MFD Condenser |
| | 1—Distributor Suppressor |
| | 20"—Wire Braid |

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1100 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 3) and adjust the trimmer for maximum volume. A small screw driver will be needed for this purpose.

## S84-192 MOUNTING PARTS KIT

| | | | |
|---|---|---|---|
| 1 | 1/4" Bolt | 2 | External Tooth Lock Washers |
| 2 | 1/4" Lock Washers | 2 | Internal Tooth Lock Washers |
| 2 | 1/4" Hexagon Nuts | | |
| 2 | 10-32 x 5/8" Screws | 2 | 10-32 Hexagon Nuts |
| 2 | 10-32 x 3/8" Screws | 1 | Washer-Spacer |

## ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S84-192, and the Suppression & Misc. Parts Kit, part No. S84-413, as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-158.

NOTE: For shipping, the two control knobs have been removed from the tuning and volume control shafts. To install the knobs, line up the flat side of the knob spring (inside knob), with the flat side of the control shaft and push the knob forward until it stops.

# ELECTRICAL SPECIFICATIONS

Power Supply .......... 6.3 volts DC
Current .......... 6.2 amp. average
Frequency Range .......... 540 to 1600 KC
I. F. Frequency .......... 455 KC
Speaker .......... 4" P. M.
Power Output .......... 1.2 watts, undistorted
2.5 watts, maximum
Sensitivity .......... 10 microvolt average for 1 watt output
Selectivity ... 50 KC broad at 1000 times signal, at 1000 KC

This receiver contains the following:

1—6SK7GT—R. F. Amplifier.

1—6SA7GT—Converter.

1—6SK7GT—I.F. Amplifier.

1—6SQ7—Detector—AVC—1st audio.

1—6V6GT—Power output.

A 6X5GT Rectifier is used.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage chart, (Fig. 4).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

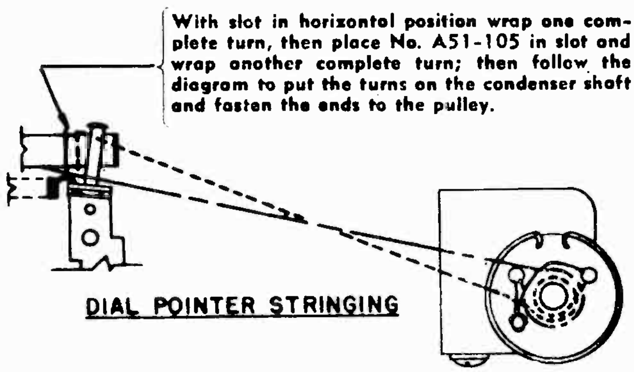
## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

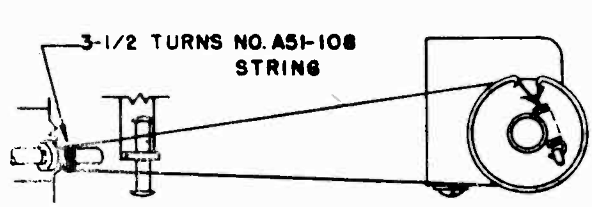
**CAUTION:** Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.




DIAL POINTER STRINGING




DIAL DRIVE STRINGING

MODEL 602-170144

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| Dial Setting | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1B | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C1A | Maximum | Antenna |

NOTE: The antenna trimmer condenser, C3, (see Fig. 2) should be adjusted after the radio is installed in the car. Tune the receiver to a weak station at about 1100 KC and adjust this trimmer for maximum volume.

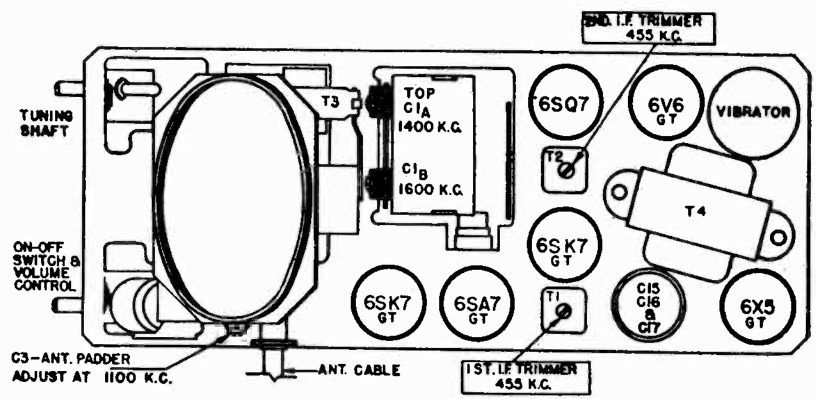



Fig. 5. Tube, Rectifier and Trimmer Locations

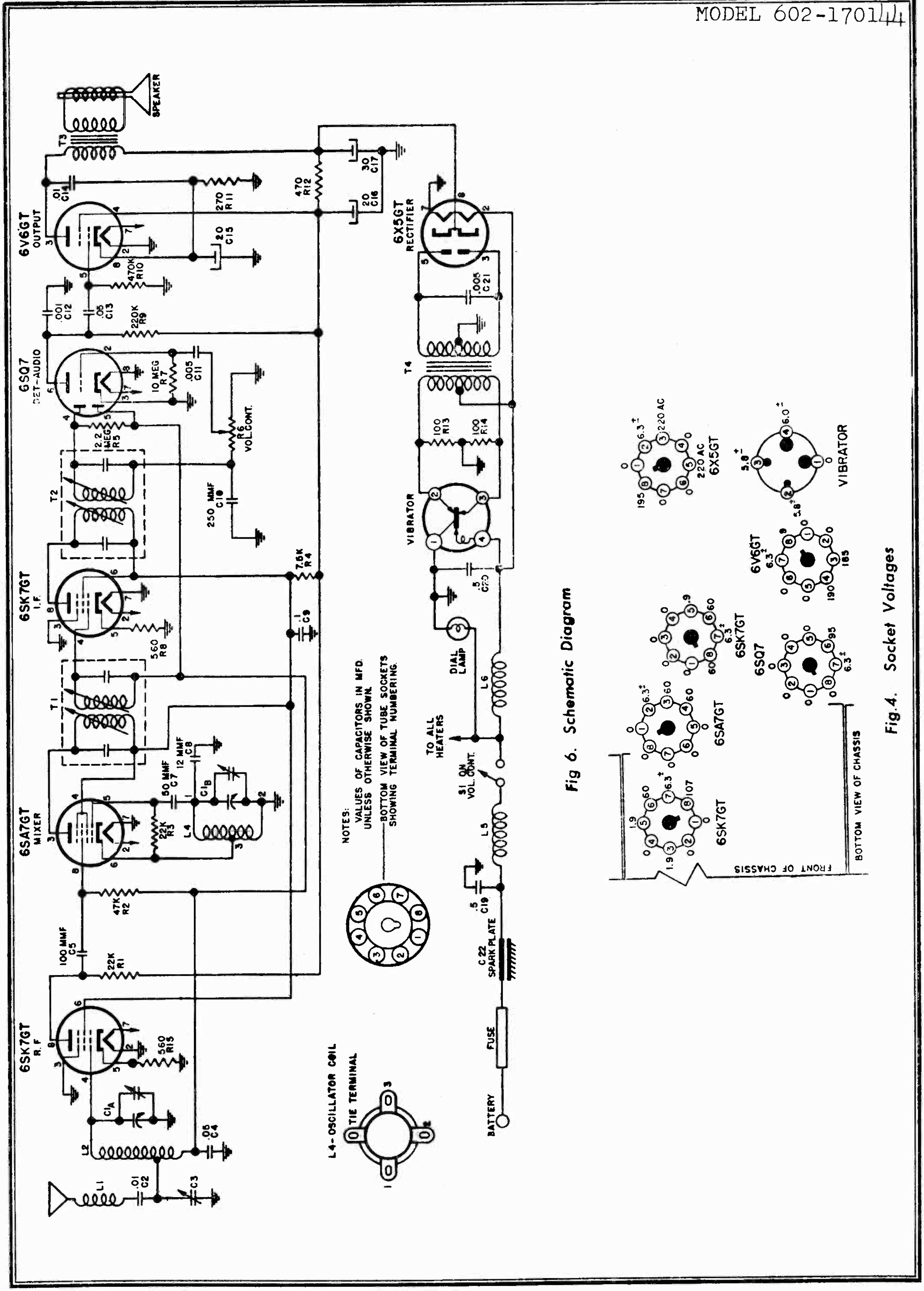



Fig 6. Schematic Diagram

Fig.4. Socket Voltages

MODEL 602-170144

# PARTS LIST

## CONDENSERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| C1A, C1B | B19-201 | Variable condenser |
| C2, C14 | A16-192 | .01 MFD 400 volt condenser |
| C3 | A20-145 | Trimmer condenser |
| C4 | A16-189 | .05 MFD 400 volt condenser |
| C5 | A15-196 | 100 MMFD ceramic condenser |
| C7 | A15-204 | 50 MMFD ceramic condenser |
| C8 | A15-205 | 12 MMFD ceramic condenser, temp. comp. |
| C9 | A16-187 | .1 MFD 400 volt condenser |
| C10 | A15-176 | 250 MMFD mica condenser |
| C11 | A16-190 | .005 MFD 600 volt condenser |
| C12 | A16-195 | .001 MFD ceramic condenser |
| C13 | A16-193 | .05 MFD 600 volt condenser |
| C15 | A18-289 | 20 MFD 25 volt electrolytic condenser |
| C16 | A18-289 | 20 MFD 350 volt electrolytic condenser |
| C17 | A18-289 | 30 MFD 350 volt electrolytic condenser |
| C19, C20 | A16-184 | .5 MFD 100 volt condenser |
| C21 | A16-185 | .005 MFD 1600 volt oil filled condenser |

## RESISTORS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| R1, R3 | A60-659 | 22K ohm ½ watt 20% resistor |
| R2 | A60-685 | 47K ohm ½ watt 20% resistor |
| R4 | A60-769 | 7.5K ohm 2 watt 10% resistor |
| R5 | A60-726 | 2.2 megohm ½ watt 20% resistor |
| R6 | A24-177 | Volume control, 500,000 ohm, with switch |
| R7 | A60-728 | 10 megohm ½ watt 20% resistor |
| R8, R15 | A60-758 | 560 ohm ½ watt 10% resistor |
| R9 | A60-667 | 220K ohm ½ watt 20% resistor |
| R10 | A60-731 | 470K ohm ½ watt 20% resistor |
| R11 | A60-771 | 270 ohm ½ watt 10% resistor |
| R12 | A60-770 | 470 ohm ½ watt 10% resistor |
| R13, R14 | A60-752 | 100 ohm ½ watt 10% resistor |

## COILS AND TRANSFORMERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| L1 | A10-527 | Antenna Loading Coil |
| L2 | B10-511 | Antenna Coil |
| L4 | A10-512 | Oscillator Coil |
| L5 | A33-229 | Choke, "A" Line |
| L6 | A33-228 | Choke, vibrator hash |
| T1 | A10-508 | 1st I.F. Transformer |
| T2 | A10-509 | 2nd I.F. Transformer |
| T3 | B80-242 | Output Transformer (Part of Speaker, not furnished separately) |
| T4 | B80-243 | Power transformer |

## DIAL PARTS

| Part No. | Description |
|---|---|
| A11-303 | Bracket, Dial Scale |
| B11-328 | Bracket, String Guide |
| A72-29 | Bushing, Tuning Shaft Bearing |
| A70-130 | Clip, Spring, for Tuning Shaft |
| A58-55 | Dial Pointer |
| B67-551 | Dial Scale |
| A28-101 | Gasket for Speaker |
| A52-304 | Knob |
| A11-329 | Link, String Guide |
| A89-10 | Pilot Light, Type G.E. No. 422 |
| A65-37 | Rivet, Shoulder, for Dial Pointer Stringing |
| A65-42 | Rivet, Shoulder, for String Guide Brkt. and Link |
| A65-12 | Rivet, Shoulder, for Dial Drive Stringing |
| A75-70 | Shaft, tuning |
| A75-74 | Shaft, for Dial Pointer |
| A70-132 | Spring, for Pilot Light Socket |
| A70-135 | Spring, Dial Drive String Tension |
| A70-142 | Spring, Pointer Drive String Tension |
| A51-105 | String, Pointer Travel, 17" |
| A51-108 | String, Condenser Drive, 19" |

## MISCELLANEOUS

| Part No. | Description |
|---|---|
| S84-233 | "A" lead assembly |
| A83-421 | Clip, I.F. Transformer Mounting |
| A83-517 | Clip, Oscillator Coil Mounting |
| A43-10 | Fuse, 15 Amp. |
| A47-112 | Grommet, rubber, (Spkr. & Gang mounting) |
| B31-134 | Mounting strap, rear |
| B31-158 | Mounting Plate, Front |
| S84-192 | Mounting parts kit |
| A87-38 | Receptacle, Antenna Cable |
| B79-379 | Speaker, 4" P.M. (includes Output Transformer) |
| S84-322 | Suppression Kit Assembly |
| A34-105 | Vibrator |
| A83-519 | Wiper, grounding, for case covers |

Note: Tubular condensers must be high temperature (85°C) wax type.

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, and generator condenser. By referring to Figures 1 and 2, and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 7/32″ holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided, and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed to the correct angles, as illustrated in Figure 2, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8″ drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4″ bolt, lock washer and nut furnished with the receiver.

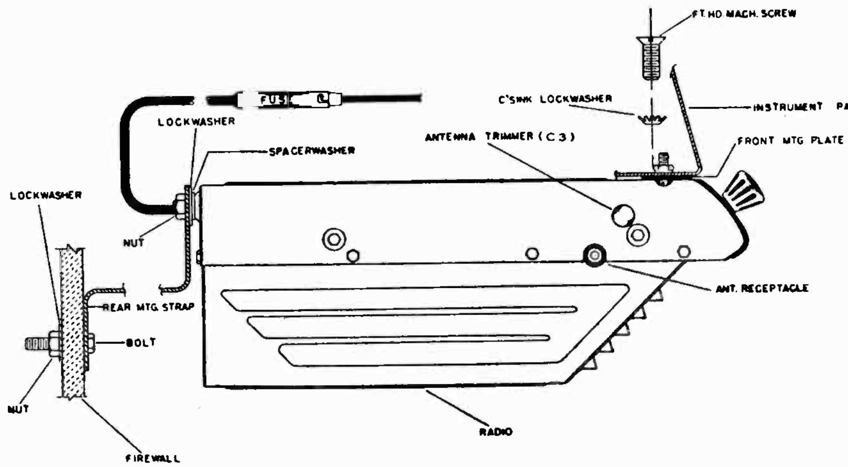



*Fig. 2. Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the socket provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1100 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 2) and adjust the trimmer for maximum volume. A small screw driver will be needed for this purpose.

## ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S84-192, and the Suppression & Misc. Parts Kit, part No. S84-445, as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-158.

NOTE: For shipping, the two control knobs have been removed from the tuning and volume control shafts. To install the knobs, line up the flat side of the knob spring (inside knob), with the flat side of the control shaft and push the knob forward until it stops.

### S84-192 MOUNTING PARTS KIT

- 1 1/4″ Bolt
- 2 1/4″ Lock Washers
- 2 1/4″ Hexagon Nuts
- 2 10-32 x 5/8″ Screws
- 2 10-32 x 3/8″ Screws
- 2 External Tooth Lock Washers
- 2 Internal Tooth Lock Washers
- 2 10-32 Hexagon Nuts
- 1 Washer-Spacer

### S84-445 SUPPRESSION KIT & MISC. PARTS ASSEMBLY

| | |
|---|---|
| 1—S84-233 | "A" lead assembly |
| 1—A43-10 | Fuse |
| 2—A52-314 | Control knobs |
| 1—A81-13 | Sleeve (for fuse) |
| 1—S84-322 | Suppression Kit consisting of:<br>1—.5 MFD Condenser<br>1—Distributor Suppressor<br>20″—Wire Braid |

MODEL 6Ø2-18214

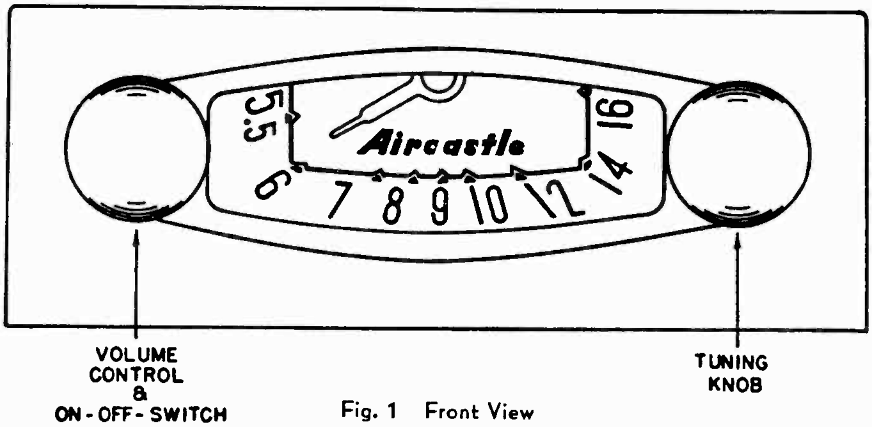



Fig. 1 Front View

# SUGGESTIONS FOR ELIMINATING POSSIBLE MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise. (The following steps may not be necessary in all cases. Install your radio and operate it before making changes.)

## GENERATOR CONDENSER

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## DISTRIBUTOR SUPPRESSOR

Detach the high tension wire where it goes into the top of the distributor cap and cut two inches off the end. Screw the piece you cut off into one end of the distributor suppressor and then screw the other end of the suppressor on the long wire which leads to the coil. Insert the wire back into the distributor cap.

## 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 .5 MFD condenser. It must be installed from the battery side of the ignition coil to the closest ground on the instrument panel.

Short wires 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 wire from the coil to the distributor.

## HIGH AND LOW TENSION WIRES

In many cases the low tension battery leads, etc., are grouped together with the high tension wires. These wires 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. These wires should be placed in a flexible wire shield and the shield grounded to frame or motor. 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 wires.

## BONDING OF FIRE WALL

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to connect a .5 MFD by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

# ELECTRICAL SPECIFICATIONS

Power Supply........................6.3 volts DC
Current...........................6.2 amp. average
Frequency Range...................540 to 1600 KC
I. F. Frequency...........................455 KC
Speaker...................................4" P. M.
Power Output.................1.2 watts, undistorted
2.5 watts, maximum
Sensitivity........10 microvolt average for 1 watt output
Selectivity...50 KC broad at 1000 times signal, at 1000 KC

This receiver contains the following:

1—6SK7GT—R. F. Amplifier.
1—6SA7GT—Converter.
1—6SK7GT—I.F. Amplifier.
1—6SQ7—Detector—AVC—1st audio.
1—6V6GT—Power output.

A 6X5GT Rectifier is used.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage chart, (Fig. 4).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

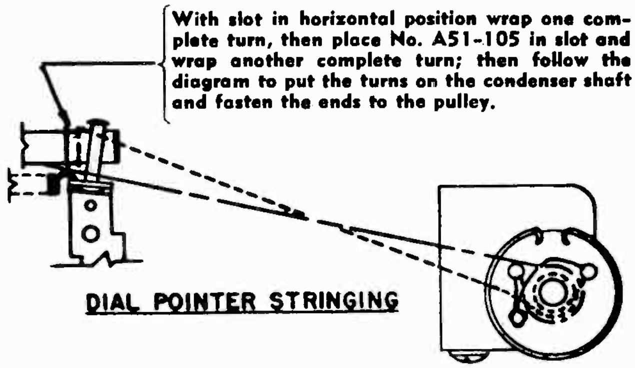
## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

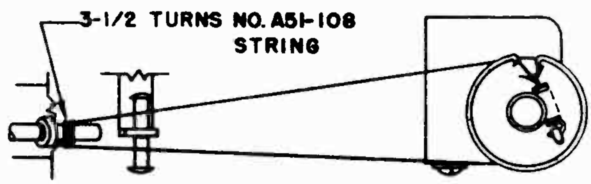
**CAUTION:** Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.




DIAL POINTER STRINGING




DIAL DRIVE STRINGING

MODEL 602-18214

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| Dial Setting | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 455 KC | 75 MMFD. | Ant. lead | L3 | Minimum | Wave trap |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1B | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C3 | Maximum | Antenna |

NOTE: The antenna trimmer condenser, C3, (see Fig. 2) should be adjusted after the radio is installed in the car. Tune the receiver to a weak station at about 1100 KC and adjust this trimmer for maximum volume.

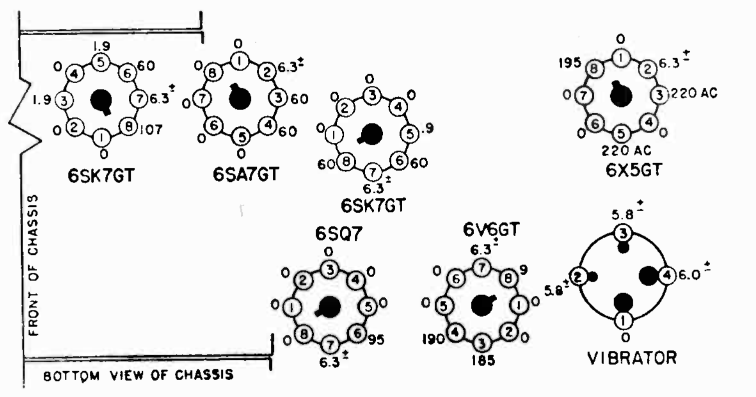



Fig.4. Socket Voltages

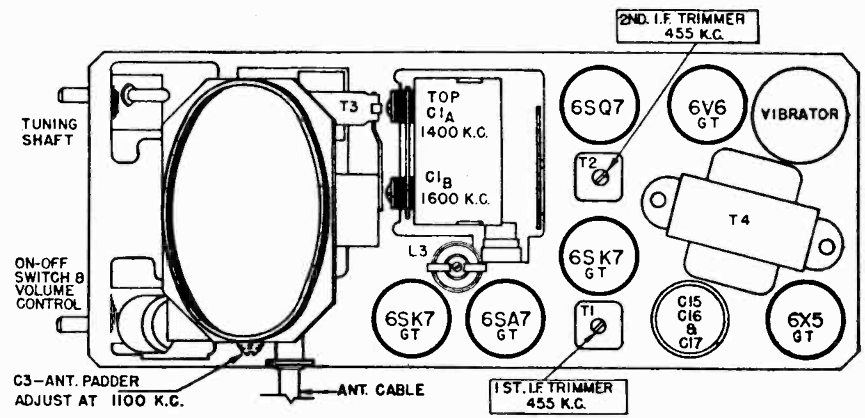



Fig. 5. Tube, Rectifier and Trimmer Locations

MODEL 602-182144

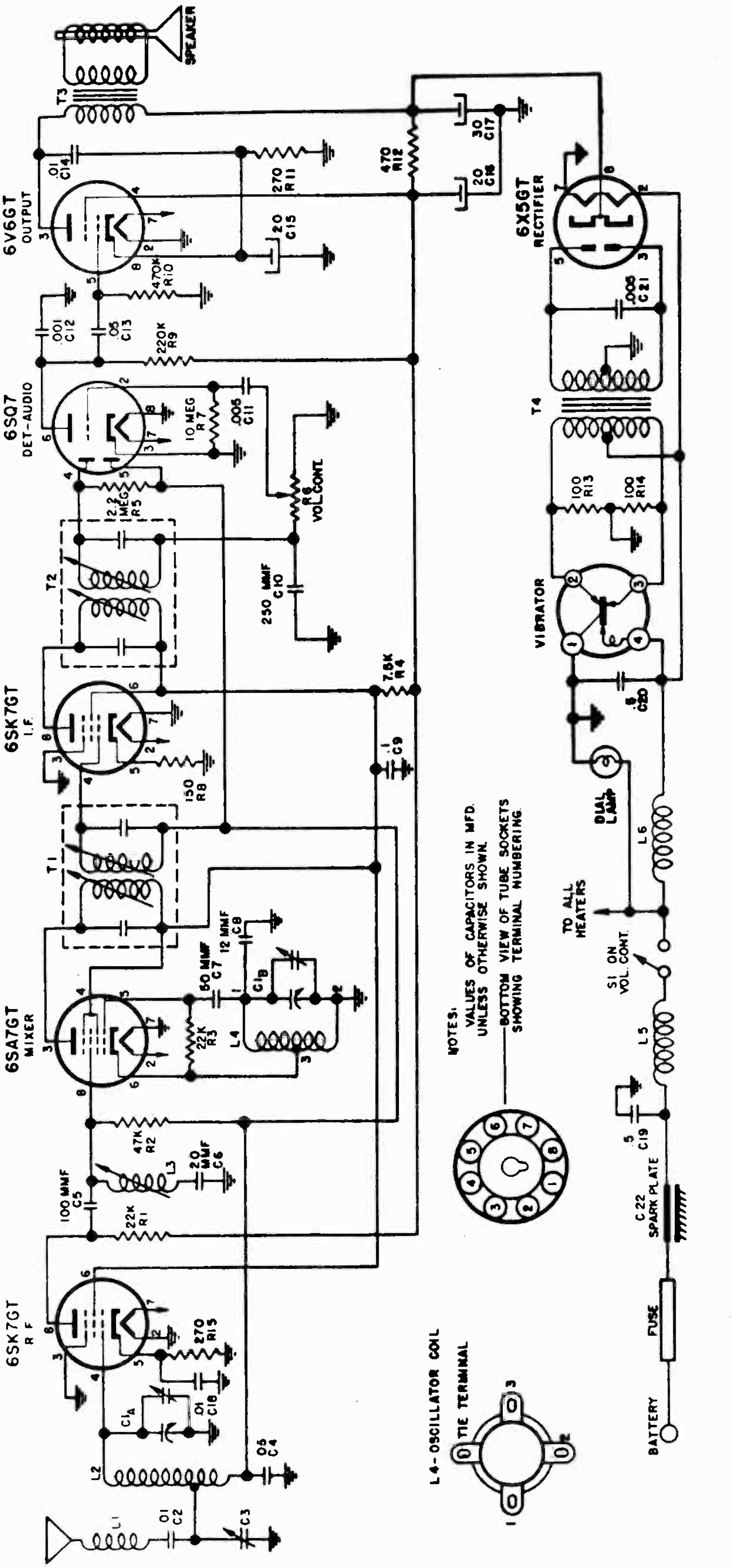



*Fig 6. Schematic Diagram*

MODEL 602-18214

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| | | **CONDENSERS** |
| C1A, C1B | B19-201 | Variable condenser |
| C2, C14, C18 | A16-192 | .01 MFD 400 volt condenser |
| C3 | A20-145 | Trimmer condenser |
| C4 | A16-189 | .05 MFD 400 volt condenser |
| C5 | A15-196 | 100 MMFD ceramic condenser |
| C6 | A15-202 | 20 MMFD ceramic condenser |
| C7 | A15-204 | 50 MMFD ceramic condenser |
| C8 | A15-205 | 12 MMFD ceramic condenser, temp. comp. |
| C9 | A16-187 | .1 MFD 400 volt condenser |
| C10 | A15-176 | 250 MMFD mica condenser |
| C11 | A16-190 | .005 MFD 600 volt condenser |
| C12 | A16-195 | .001 MFD ceramic condenser |
| C13 | A16-193 | .05 MFD 600 volt condenser |
| C15<br>C16<br>C17 | A18-289 | 20 MFD 25 volt electrolytic condenser<br>20 MFD 350 volt electrolytic condenser<br>30 MFD 350 volt electrolytic condenser |
| C19, C20 | A16-184 | .5 MFD 100 volt condenser |
| C21 | A16-185 | .005 MFD 1600 volt oil filled condenser |
| | | **RESISTORS** |
| R1, R3 | A60-659 | 22K ohm ½ watt 20% resistor |
| R2 | A60-685 | 47K ohm ½ watt 20% resistor |
| R4 | A60-769 | 7.5K ohm 2 watt 10% resistor |
| R5 | A60-726 | 2.2 megohm ½ watt 20% resistor |
| R6 | A24-182 | Volume control, 500,000 ohm, with switch |
| R7 | A60-728 | 10 megohm ½ watt 20% resistor |
| R8 | A60-767 | 560 ohm ½ watt 10% resistor |
| R9 | A60-667 | 220K ohm ½ watt 20% resistor |
| R10 | A60-731 | 470K ohm ½ watt 20% resistor |
| R11, R15 | A60-771 | 270 ohm ½ watt 10% resistor |
| R12 | A60-770 | 470 ohm ½ watt 10% resistor |
| R13, R14 | A60-752 | 100 ohm ½ watt 10% resistor |
| | | **COILS AND TRANSFORMERS** |
| L1 | A10-527 | Antenna Loading Coil |
| L2 | B10-511 | Antenna Coil |
| L3 | A10-510 | I.F. Trap Coil |
| L4 | A10-512 | Oscillator Coil |
| L5 | A33-229 | Choke, "A" Line |
| L6 | A33-228 | Choke, vibrator hash |
| T1 | A10-508 | 1st I.F. Transformer |
| T2 | A10-509 | 2nd I.F. Transformer |
| T3 | B80-242 | Output Transformer (Part of Speaker, not furnished separately) |
| T4 | B80-243 | Power transformer |
| | | **DIAL PARTS** |
| | A11-303 | Bracket, Dial Scale |
| | B11-328 | Bracket, String Guide |
| | A72-36 | Bushing, Tuning Shaft Bearing |
| | A70-130 | Clip, Spring, for Tuning Shaft |
| | A58-55 | Dial Pointer |
| | B67-551 | Dial Scale |
| | A28-101 | Gasket for Speaker |
| | A52-314 | Knob |
| | A11-329 | Link, String Guide |
| | A89-10 | Pilot Light, Type G.E. No. 422 |
| | A65-37 | Rivet, Shoulder, for Dial Pointer Stringing |
| | A65-42 | Rivet, Shoulder, for String Guide Brkt. and Link |
| | A65-12 | Rivet, Shoulder, for Dial Drive Stringing |
| | A75-83 | Shaft, tuning |
| | A75-74 | Shaft, for Dial Pointer |
| | A70-132 | Spring, for Pilot Light Socket |
| | A70-135 | Spring, Dial Drive String Tension |
| | A70-142 | Spring, Pointer Drive String Tension |
| | A51-105 | String, Pointer Travel, 17" |
| | A51-108 | String, Condenser Drive, 19" |
| | | **MISCELLANEOUS** |
| | S84-233 | "A" lead assembly |
| | A83-421 | Clip, I.F. Transformer Mounting |
| | A83-517 | Clip, Oscillator Coil Mounting |
| | A43-10 | Fuse, 15 Amp. |
| | A47-112 | Grommet, rubber, (Spkr. & Gang mounting) |
| | B31-134 | Mounting strap, rear |
| | B31-158 | Mounting Plate, Front |
| | S84-192 | Mounting parts kit |
| | A87-38 | Receptacle, Antenna Cable |
| | B79-360 | Speaker, 4" P.M. (includes Output Transformer) |
| | S84-322 | Suppression Kit Assembly |
| | A34-105 | Vibrator |
| | A83-519 | Wiper, grounding, for case covers |

Note: Tubular condensers must be high temperature (85°C) wax type.

MODEL 606-400WB

## DESCRIPTION

Your New Aircastle Radio is a 4-Tube Superhetrodyne receiver designed to cover a frequency range of from 540 kilocycles to 1725 kilocycles (K.C.). The tubes used are--

1A7 GT--Osc. Converter
1N5 GT--I.F. Amplifier
1H5 GT--AVC Det. Audio Amplifier
3Q5 GT--Power Output

## INSTALLATION

This receiver has been designed to operate on a self-contained battery containing both the 'B' battery (90 Volts) and the 'A' Battery (1½ Volts) Aircastle No. 1491.

After inserting the battery plug of the receiver into the socket on the battery, the battery may be placed inside the cabinet in the space provided.

Anyone of the following batteries may also be used with this receiver: Eveready No. 748, General No. 60D1-11 L, Burgess No. 17G-D60, Ray-O-Vac No. AB 82.

For best results an outside antenna about 75-100 feet long, including the lead-in, should be used. It should be erected as high as possible, and as far away from surrounding objects as practical. When the receiver is used close to powerful broadcasting stations it may be desirable to use a shorter antenna. (For most ordinary instalations use Aircastle House Mast Aerial No. 1396.)

To obtain the best possible performance a good ground should be used. This can be a water pipe, or a galvanized pipe driven into the ground. It should be connected to the ground lead (black) of the receiver. Connect the antenna wire to the other lead coming from the receiver.

## OPERATION

Turn the 'On-Off' Switch and Volume Control (left-hand Control) to the right about half its range. This supplies power to the receiver. Now select the desired station by rotating the 'Station Selector', (right-hand Control). For best tone, always tune the desired station with the Volume turned low. This enables you to get the exact point where the station comes in best. Then adjust the Volume Control to the desired level.

## 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.

The following equipment is necessary for proper alignment:
- Signal generator that will provide the test frequencies as listed, 30% modulated, 400 c.p.s.
- Output meter.
- Non-metallic screwdriver.
- Dummy antennas--.1 mfd., .00025 mfd.

| Position of Variable | Generator Frequency | Dummy Ant. Mfd. | Generator Connections | Trimmer Adjust-ment | Trimmer Function |
|---|---|---|---|---|---|
| Fully open | 455 KC | .1 | 1A7 Grid (Stator of C1A) | T2 | Output I.F. |
| Fully open | 455 KC | .1 | 1A7 Grid (Stator of C1A) | T1 | Input I.F. |
| Fully open | 1725 KC | .00025 | Antenna Lead | C1B | Oscillator |
| Tune in signal from generator | 1400 KC | .00025 | Antenna Lead | C1A | Antenna |

## 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, the "A" section 1½ volts.

| TUBE | PIN NUMBERS 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1A7 | 0 | 1.5 | 85 | 37 | 0 | 85 | 0 | 0 |
| 1N5 | 0 | 1.5 | 85 | 85 | 0 | 0 | 0 | 0 |
| 1H5 | 0 | 1.5 | 17 | 0 | 0 | 0 | 0 | 0 |
| 3Q5 | 0 | 1.5 | 83 | 85 | 0 | 5 | 1.5 | |

MODEL 606-400WB

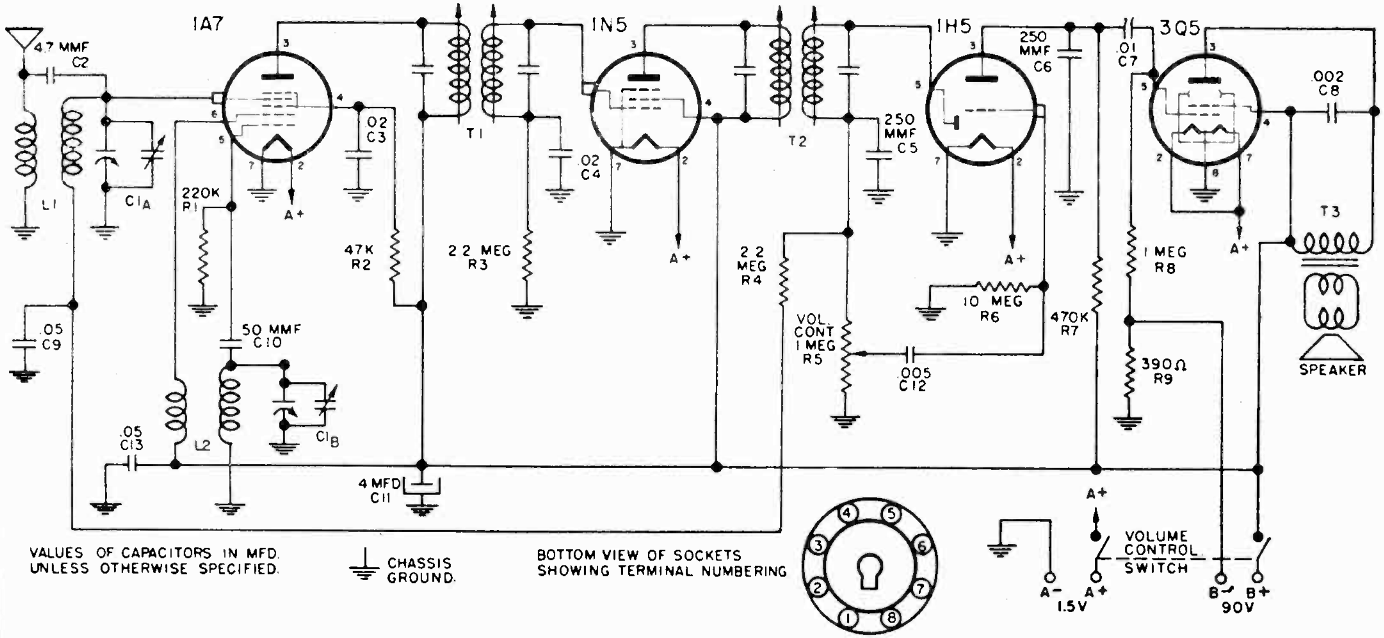
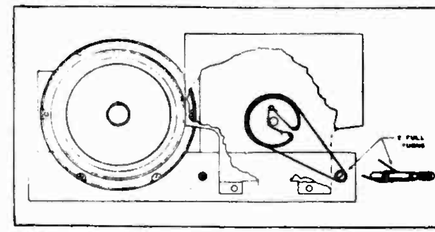



FIG. 1 SCHEMATIC DIAGRAM



Dial Mechanism

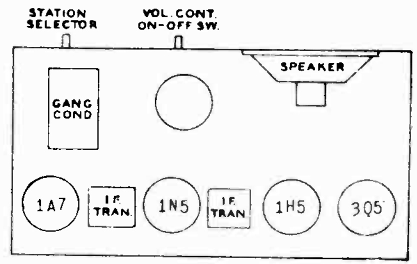



FIG. 2 TUBE AND TRIMMER LOCATIONS

## HOW TO ORDER REPAIR PARTS

Always give the part No. (No. printed on the part if different from that shown on this list), and the name of the part. When number is not available give complete description of the part. Be sure to always give the Model No. and Catalog No. The Model No. will be found on either the metal plate at the rear of the chassis or on a printed label which may be found on the chassis or cabinet.

| Circuit Diagram Reference | Part No. | Description |
|---|---|---|
| C1A, C1B | B19-188 | Variable Condenser |
| C2 | A83-355 | 4.7 MMFD Condenser |
| C3, C4 | A16-150 | .02 MFD 400 volt condenser |
| C5, C6 | A15-176 | 250 MMFD mica condenser |
| C7 | A16-156 | .01 MFD 400 volt condenser |
| C8 | A16-155 | .002 MFD 600 volt condenser |
| C9, C13 | A16-152 | .05 MFD mica condenser |
| C10 | A15-175 | 50 MMFD mica condenser |
| C11 | A18-273 | 4 MFD 150 volt electrolytic condenser |
| C12 | A16-153 | .005 MFD 600 volt condenser |
| R1 | A60-667 | 220K ohm ½ watt resistor |
| R2 | A60-685 | 47K ohm ½ watt resistor |
| R3, R4 | A60-684 | 2.2 megohm ½ watt resistor |
| R5 | A24-170 | Volume control, 1 megohm |
| R6 | A60-663 | 10 megohm, ½ watt resistor |
| R7 | A60-662 | 470K ohm ½ watt resistor |
| R8 | A60-668 | 1 megohm ½ watt resistor |
| R9 | A60-665 | 390 ohm ½ watt resistor |
| L1 | A10-485 | Antenna coil |
| L2 | A10-505 | Oscillator coil |
| T1, T2 | A10-506 | 1st and 2nd I.F. transformer |
| T3 | B80-232 | Output transformer |
| | B79-352 | Speaker, 5" P.M. |
| | A75-60 | Tuning Shaft |
| | A45-118 | Battery plug |
| | B67-515 | Dial scale |
| | 58-31 | Dial pointer |
| | 48-21 | Dial crystal |
| | D42-437 | Cabinet walnut, wood |
| | A52-245 | knob, walnut |

# TECHNICAL INFORMATION FOR SERVICE

## ALIGNMENT PROCEDURE

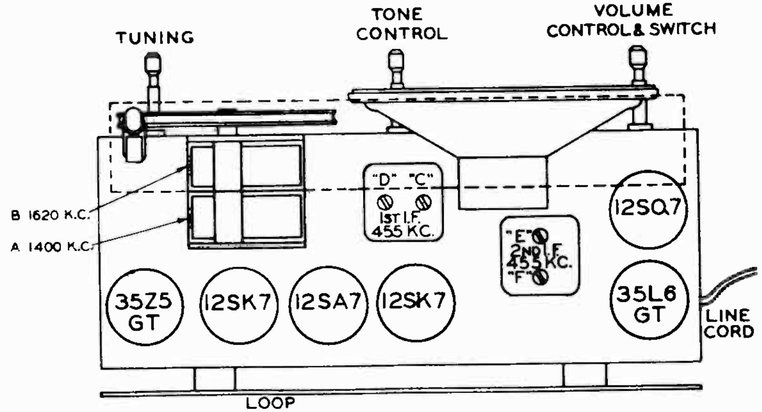
**GENERAL DATA.** The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

**CORRECT ALIGNMENT PROCEDURE.** The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

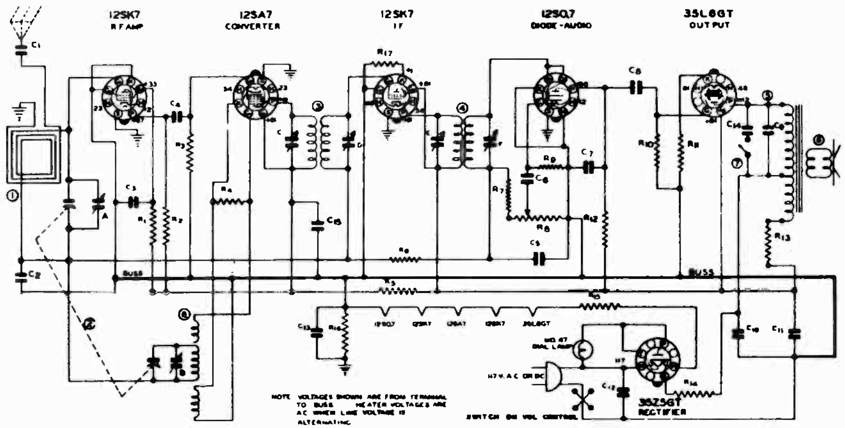
**I.F. ALIGNMENT.** Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective position on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

**BROADCAST BAND ALIGNMENT.** Connect the test oscillator to a dummy loop which can be made by coiling 2 turns of hookup wire about 6" in diameter. Place this dummy loop about a foot from the loop on the receiver and in the same plane as the receiver loop. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on the gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

## TUBE LOCATION CHART




# SCHEMATIC DIAGRAM AND PARTS LIST




| Circuit Diagram Reference | Part No. | Description |
|---|---|---|
| C1, C8, C9 | N-1344 | Condenser, Paper .01 MFD. 400V. |
| C2 | N-1345 | Condenser, Paper .05 MFD. 200V. |
| C4 | N-2383 | Condenser, Mica 150 MMFD. 500V. 20% |
| C5 | N-1374 | Condenser, Mica 100 MMFD. 500V. 20% |
| C6 | N-4894 | Condenser, Paper .005 MFD. 600V. |
| C7 | N-4890 | Condenser, Paper .0005 MFD. 600V. |
| C10, C11 | N-5051 | Electrolytic {40 MFD. 150V., 40 MFD. 150V.} |
| C12, C14 | N-1346 | Condenser, Paper .05 MFD. 400V. |
| C13 | N-5160 | Condenser, Paper .2 MFD. 200V. |
| C15 | N-1351 | Condenser, Paper .1 MFD. 200V. |
| R1, R3, R7 | N-4063 | Resistor 47,000 Ohm ½W. 20% |
| R2 | N-4896 | Resistor 2,200 Ohm ½W. 10% |
| R4 | N-5351 | Resistor 22,000 Ohm ½W. 20% |
| R5 | N-4066 | Resistor 470 Ohm ½W. 10% |
| R6 | N-1262 | Resistor 1.0 Megohm ½W. 20% |
| R8 | N-5026 | Resistor 0.5 Megohm Volume Control |
| R9 | N-4061 | Resistor 4.7 Megohm 0.5W. 20% |
| R10 | N-4027 | Resistor 470,000 Ohm ½W. 20% |
| R11 | N-4067 | Resistor 180 Ohm ½W. 10% |
| R12, R16 | N-4026 | Resistor 220,000 Ohm ½W. 20% |
| R13 | N-4900 | Resistor 1200 Ohm 1.0W. 10% |
| R14 | N-4022 | Resistor 33 Ohm ½W. 20% |
| R15 | N-4628 | Resistor 33 Ohm 1.0W. 10% |
| R17 | N-5857 | Resistor 82 Ohm ½W. 10% |
| 1 | N-5765 | Antenna Loop Coil |
| 2 | N-7106 | Variable Condenser |
| 3 | N-4872 | 1st I.F. Transformer |
| 4 | N-5571 | 2nd I.F. Transformer |
| 5 | N-4875 | Output Transformer |
| 6 | N-4868 | 5" P.M. Speaker |
| 7 | N-4942 | Tone Switch |
| 8 | N-7139 | Oscillator Coil |
|  | # 222 | Cabinet — Ivory Plastic |
|  | # 248 | Cabinet — Walnut Plastic |

MODEL 610.C300,
Chevrolet

# INSTALLATION

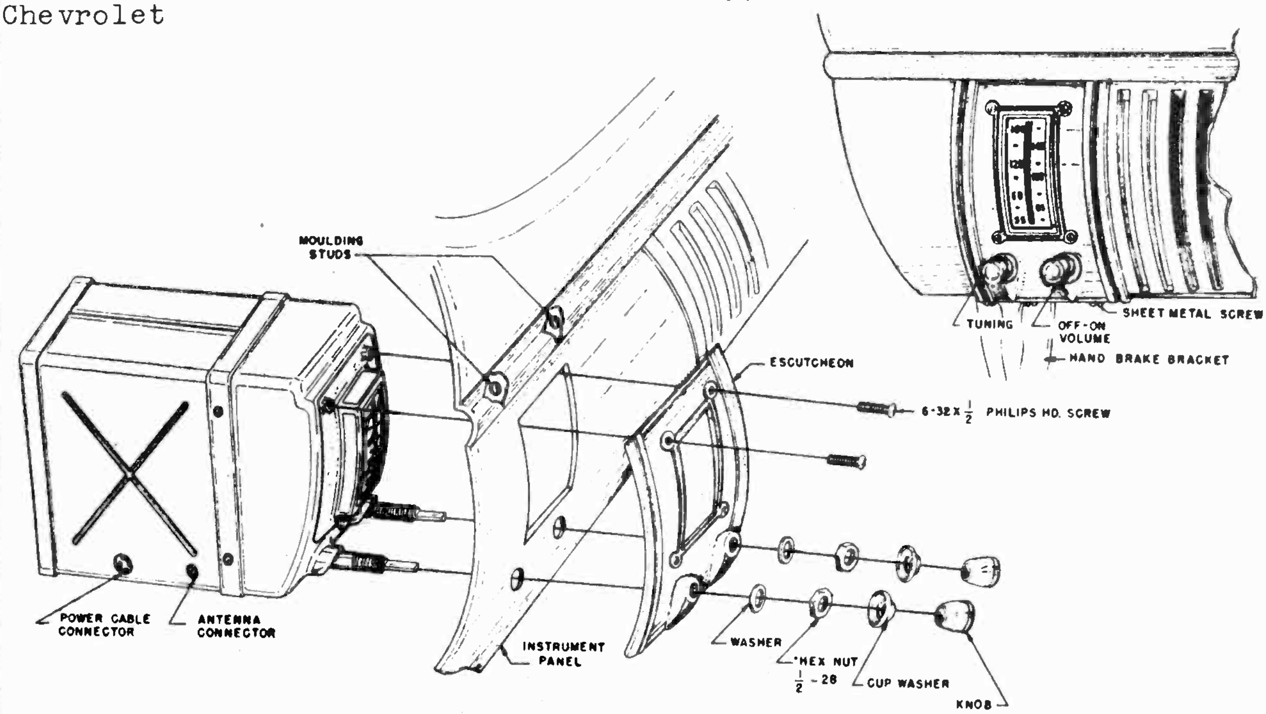



Fig. 1

## R. F. TUNING UNIT

1. Loosen nuts on the two moulding studs located behind the instrument panel cover plate.
2. Remove sheet metal screw from the lower edge of the instrument panel cover plate and the two screws and washers attaching the hand brake to the instrument panel. Keep these parts.
3. Remove instrument panel cover plate and discard.
4. Tighten nuts on the two moulding studs located behind the instrument panel cover plate.
5. Drop vent controls by removing screws, lockwashers, and flat washers securing these controls to the instrument panel. This will facilitate installation of both receiver units. Save parts removed.
6. Install R.F. Tuning Unit behind instrument panel so that mounting bushings and tuningshafts protrude through the instrument panel.
7. Slide plastic escutcheon over mounting bushings and secure with flat washers, nuts, cup washers, and knobs as shown in Fig. 1
8. Secure top part of plastic escutcheon to R.F. Tuning Unit with two No. 6-32 x ½" long Philips Head screws.

## POWER SUPPLY UNIT

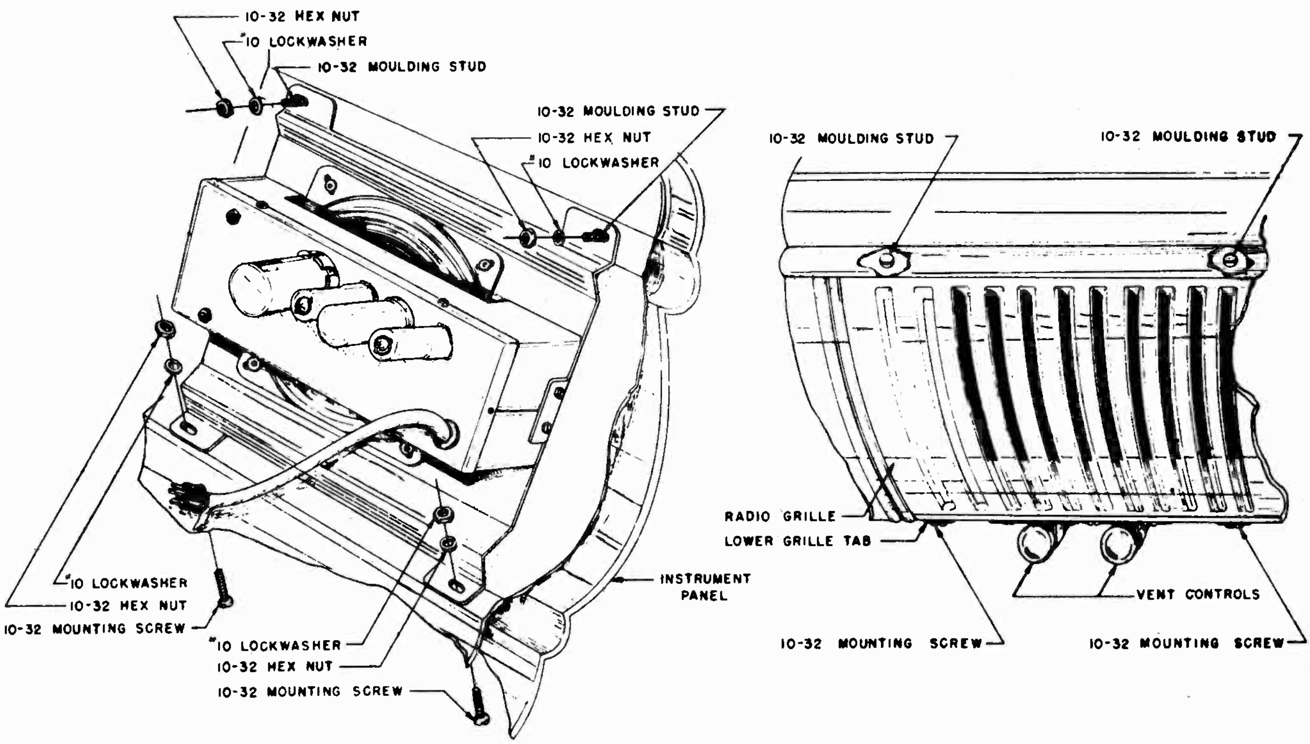
1. Insert a thin blade screwdriver or a flat strip of metal through the Radio Grille and slit fiberboard Radio Grille screen. Reach in back of Radio Grille and remove screen by grasping slit edge. Discard fiberboard screen.
2. Remove 10-32 nuts and washers from the moulding studs behind the Radio Grille.
3. Remove 10-32 nuts, screws, and washers securing the lower tabs of the Radio Grille to the instrument panel.
4. Install Power Supply Unit behind Radio Grille and position into place so that holes in top of unit slide over moulding studs as shown in Fig. 2.

NOTE: It may be more convenient, in car models with air conditioner heaters, to remove the vibrator before installing this unit. The vibrator can be replaced after the power unit is mounted.

5. Replace 10-32 nuts and washers on moulding studs.
6. Replace lower grille tab 10-32 mounting screws, nuts, and washers so that screws secure the lower grille tabs and Power Supply Unit to the instrument panel.
7. Connect cable from Power Supply Unit to R.F. Tuning Unit.
8. Replace vent controls.
9. Replace screws and washers securing hand brake.

Connect battery lead to terminal on *Ignition Switch.*

Plug Antenna cable into receiver.




POWER SUPPLY UNIT DETAIL MOUNTING ASSEMBLY

Fig. 2

# MOTOR NOISE ELIMINATION

## SUPPRESSION KIT

A suppression kit is shipped with this receiver. It contains the following parts:
1 Generator Condenser.
1 Distributor Suppressor.

### GENERATOR CONDENSER

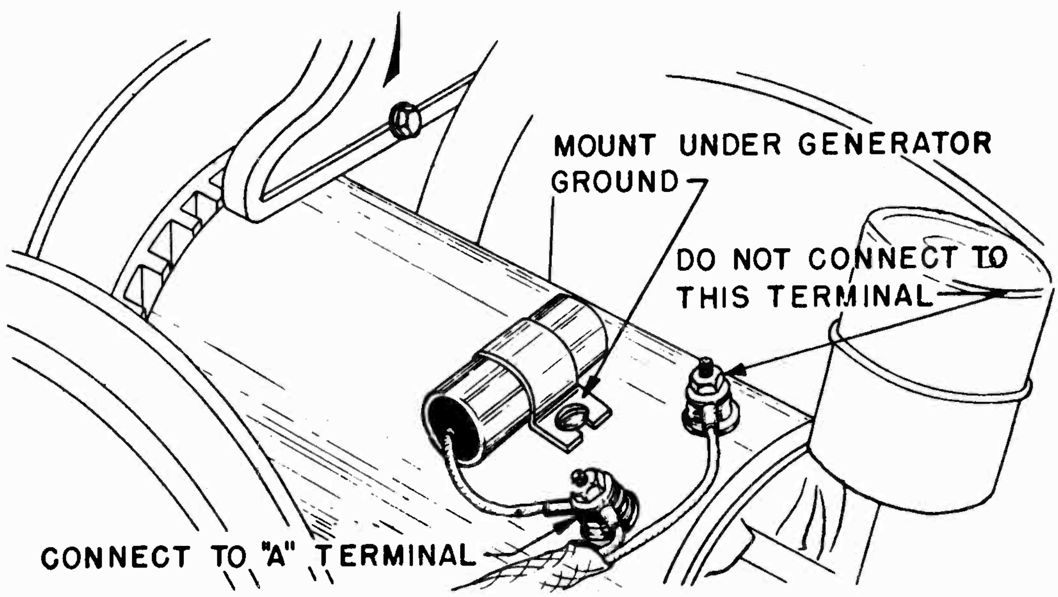



Fig. 3

MODEL 610.C300,
Chevrolet

## DISTRIBUTOR SUPPRESSOR

Disconnect the center lead in the distributor head of the motor. Cut lead approximately 2 inches back from metal tip end. Screw suppressor into cut end of long lead. Screw cut end of short lead into suppressor. Plug lead, with attached suppressor, back into distributor head.

### WHEEL STATIC

Wheel static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present, it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

### AMMETER CONDENSER

A .5 MFD by-pass condenser should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby.

### ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays or gauges, may cause interference while in operation. Proper procedure in such cases is to connect a .5 MFD by-pass condenser from ground to the suspected accessory until the source of interference is found. The condenser then should be permanently mounted in this location.

## HOW TO ORDER PARTS

Always give the part No. (No. printed on the part if different from that shown on this list), and the name of the part. When No. is not available, give complete description of part. Be sure to always give the Model No. and Catalog No. The Model No. will be found on either the metal plate at the rear of the chassis or on a printed label which may be on the chassis or cabinet.

# SERVICE DATA FOR PROFESSIONAL SERVICE MEN

## ELECTRICAL SPECIFICATIONS

Power Supply.....6.3 Volts DC
Current.....5.5 Amp. average
Frequency Range.....538-1600 KC
Speaker.....5¼" PM
Power Output.....2 watts, undistorted
3 watts, maximum
Sensitivity.....2-3 microvolts average for 1 watt output
Selectivity.....40 KC broad at 1000 times signal, at 1000 KC

This receiver contains the following:
1—6BA6—RF Amplifier
1—6BE6—Converter
1—6BA6—I. F. Amplifier
1—6AT6—Detector—AVC—1st Audio
1—6AQ5—Power Output
1—6X4—Rectifier

### SERVICE NOTES

Voltage taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 Ohms per volt. These voltages are clearly shown on the voltage chart, (Fig. 5).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

### ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components such as tubes, condensers, resistors, etc. are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "Alignment Procedure". After realignment has been completed repeat the procedure as final check.

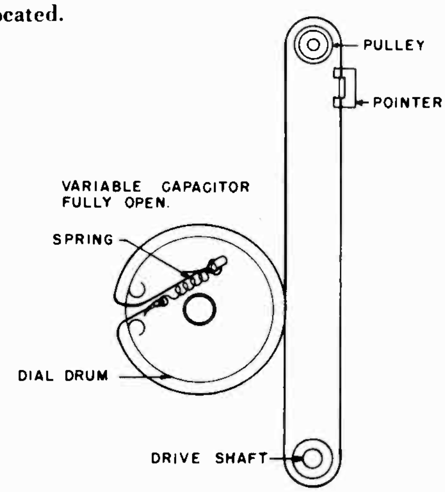



Fig. 4 DIAL CORD DRIVE (REAR VIEW)

MODEL 610.C300,
Chevrolet

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.
No signal applied to antenna.
Power input—6.3 volts.
Connect dummy antenna in series with output lead of signal generator.
Connect ground lead of signal generator to chassis.
Repeat alignment procedure as a final check.

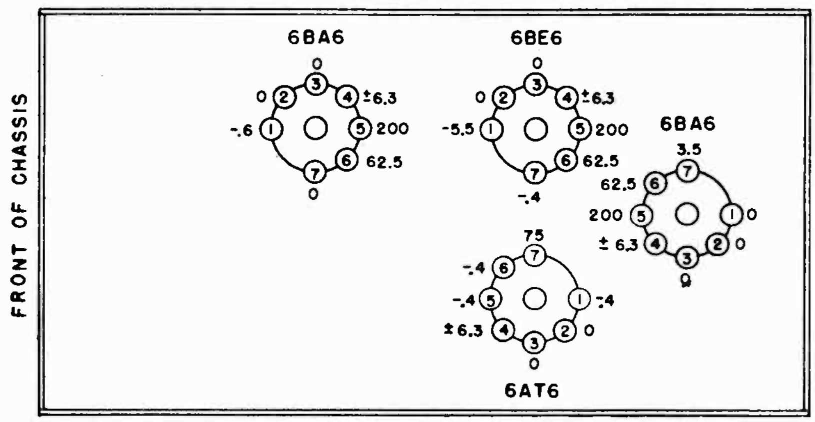
The following equipment is necessary for proper alignment:
- Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.
- Non-metallic screwdriver.
- Output meter. (1.8 volt for 1 watt output.)
- Dummy antennas—.1 MFD., 100 MMFD.

For alignment points refer to Schematic Diagram.

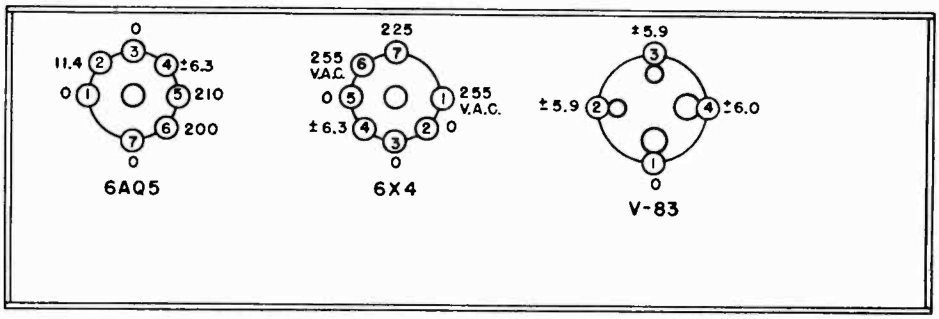
| *Dial Setting* | *Generator Frequency* | *Dummy Ant.* | *Generator Connector* | *Trimmer Reference* | *Trimmer Adjustment* | *Trimmer Function* |
|---|---|---|---|---|---|---|
| 1) Fully open | 455 KC | .1 MFD | 6BE6 Grid | T1 Top & bottom | Maximum | Output I.F. |
| 2) Fully open | 455 KC | .1 MFD | 6BE6 Grid | T2 Top & bottom | Maximum | Input I.F. |
| 3) Fully open | 1600 KC | 100 MMFD | Ant. lead | CV2 | Maximum | Oscillator |
| 4) Tune in signal from generator | 1400 KC | 100 MMFD | Ant. lead | CV3 | Maximum | RF Stage |
| 5) Tune in signal from generator | 1400 KC | 100 MMFD | Ant. lead | CV1 | Maximum | Antenna |
| 6) Tune in signal from generator | 600 KC | 100 MMFD | Ant. lead | L3 | Maximum | RF Stage |
| 7) Tune in Signal from generator | 600 KC | 100 MMFD | Ant. lead | L2 | Maximum | Antenna |

8) Repeat steps 4 and 5

BOTTOM VIEW OF CHASSIS




BOTTOM VIEW OF POWER PACK




SOCKET VOLTAGES

Fig. 5

MODEL 610.C300

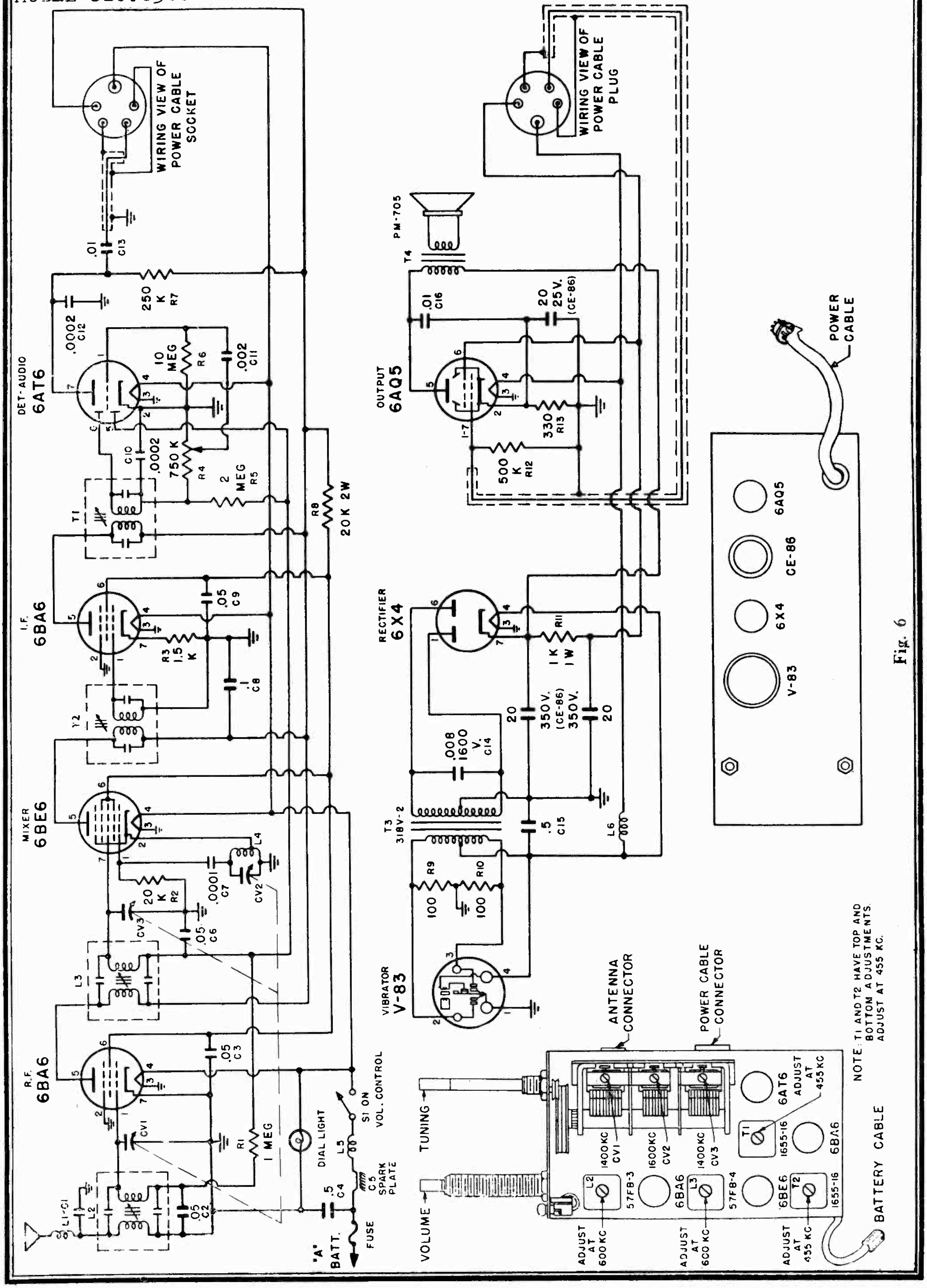



Fig. 6

MODEL 610.C300, Chevrolet

# PARTS AND PRICE LIST

## CONDENSERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| C2, C3, C6, C9 | C207 | .05 MFD 200 volt condenser |
| C4, C15 | C209 | .5 MFD 100 volt condenser |
| C7 | CC200 | 100 MMFD ceramic condenser |
| C8 | C210 | .1 MFD 400 volt condenser |
| C10, C12 | CC201 | 200 MMFD ceramic condenser |
| C13, C16 | C206 | .01 MFD 600 volt condenser |
| C14 | C205 | .008 MFD 1600 volt condenser |
| C11 | C211 | .002 MFD 400 volt condenser |
| CE-86 | CE-86 | 20 MFD 350 volt electrolytic condenser<br>20 MFD 350 volt electrolytic condenser<br>20 MFD 25 volt electrolytic condenser |
| CV1-CV2-CV3 | CV-300 | 3 section variable tuning |

## RESISTORS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| R1 | R309 | 1 megohm 1/2 watt 20% resistor |
| R2 | R306 | 20K ohm 1/2 watt 20% resistor |
| R3 | R314 | 1.5K ohm 1/2 watt 20% resistor |
| R4 | RV-300 | Volume control 3/4 megohm with switch |
| R5 | R310 | 2 megohm 1/2 watt 20% resistor |
| R6 | R311 | 10 megohm 1/2 watt 20% resistor |
| R7 | R307 | 250K ohm 1/2 watt 20% resistor |
| R8 | R313 | 20K ohm 2 watt 20% resistor |
| R9, R10 | R301 | 100 ohm 1/2 watt 20% resistor |
| R11 | R312 | 1K ohm 1 watt 20% resistor |
| R12 | R308 | 500K ohm 1/2 watt 20% resistor |
| R13 | R303 | 330 ohm 1/2 watt 20% resistor |

## COILS AND TRANSFORMERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| L1-C1 | L200 | Motor noise elimination unit |
| L2 | 57FB-3 | Antenna coil |
| L3 | 57FB-4 | R.F. coil |
| L4 | L201 | R.F. oscillator coil |
| L5 | L203 | Choke, "A" line |
| L6 | L202 | Choke, vibrator hash |
| T1 | 1655-16 | 2nd IF transformer |
| T2 | 1655-16 | 1st IF transformer |
| T3 | TV-100 or 318V-2 | Vibrator transformer |
| T4 | | Output transformer (Part of speaker not furnished separately) |

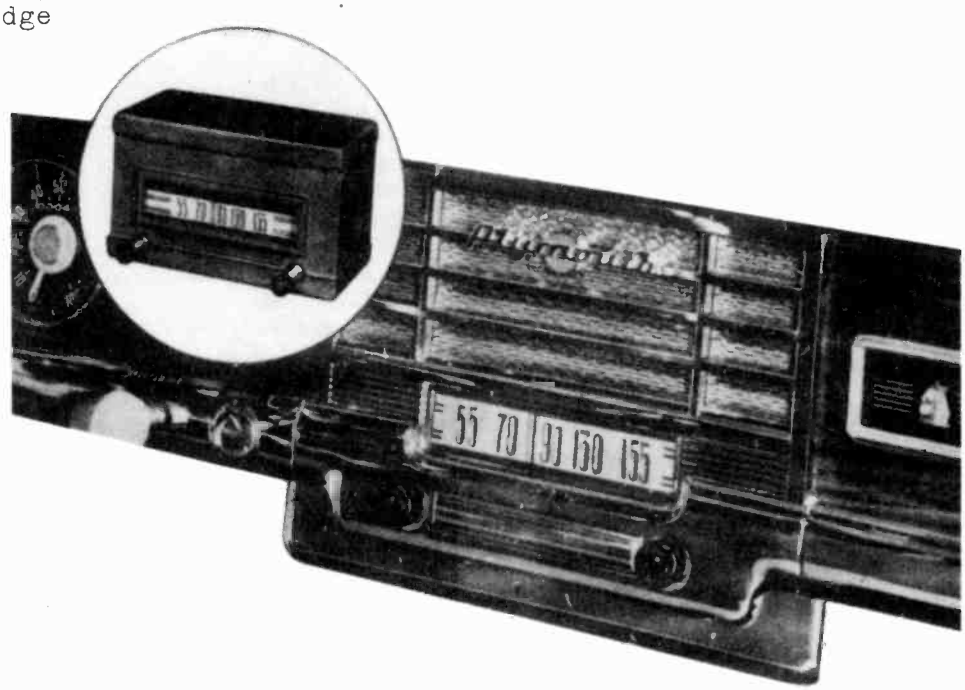
## DIAL PARTS

| Part No. | Description |
|---|---|
| D300 | Dial Scale |
| PS300 | Dial Pointer |
| DS300 | Drive Shaft Assembly |
| H201 | Grommet, rubber drive |
| T51 | Pilot Light |
| H214 | Pilot Light Socket |
| H203 | Pulley, idler |
| H204 | Spring, Dial drive String Tension |
| H215 | String, dial drive |

## MISCELLANEOUS

| Part No. | Description |
|---|---|
| A300 | "A" lead assembly |
| H301 | Case, less covers for Power Supply Unit |
| H300 | Case, complete with covers for R.F. tuning unit |
| H207 | Clip, Anti-rattle |
| H208 | Clip, coil mounting |
| H302 | Cover, power supply unit mounting (with speaker louvres) |
| A201 | Fuse 15 Amp. |
| 504PC-300 | Power Cable Assembly (complete with plug) |
| H212 | Receptacle, Antenna cable |
| 504-FC | Socket, power cable |
| PM-705 | Speaker, 5 1/4" PM (includes output transformer) |
| V-83 | Vibrator |
| H310 | Knob |
| H311 | Cup washer |
| H312 | Plastic Escutcheon |

MODEL 610.D200,
Plymouth, Dodge



# INSTALLATION

## PLYMOUTH P18 SPECIAL DELUXE

1. Remove four screws securing Radio Grill in place and remove Radio Grill.
2. Remove dummy plates covering radio dial and control openings.
3. Enlarge holes in radio control cover plate to ½ inch.
4. Remove knobs, cup washers, hex nuts and washers from control shafts and mounting bushings.
5. Secure two mounting brackets to Radio Grill with ⅜ inch long 10-32 self-tapping screws and cup washers as shown in detail assembly drawing.
6. Place radio control cover plate over mounting bushings.
7. Position receiver behind Radio Grill so that mounting bushings and shafts protrude through the grill.
8. Attach receiver by replacing washers and hex nuts on mounting bushings.
9. Replace cup washers and knobs over shafts.
10. Secure receiver to mounting brackets with two No. 8 self-tapping wing nuts.
11. Insert radio with attached grill through front opening on instrument panel.
12. Replace grill mounting screws.
13. Connect battery lead to terminal marked "ACC" on ignition switch.
14. Plug antenna cable into receiver.

## DODGE "CORONET"

**Install in the same manner as outlined for the P18 DeLuxe Plymouth except do not remove radio grill.**

## PLYMOUTH P17, P18 4-DOOR DELUXE AND P18 CLUB COUPE DELUXE DODGE "WAYFARER" AND "MEADOWBROOK"

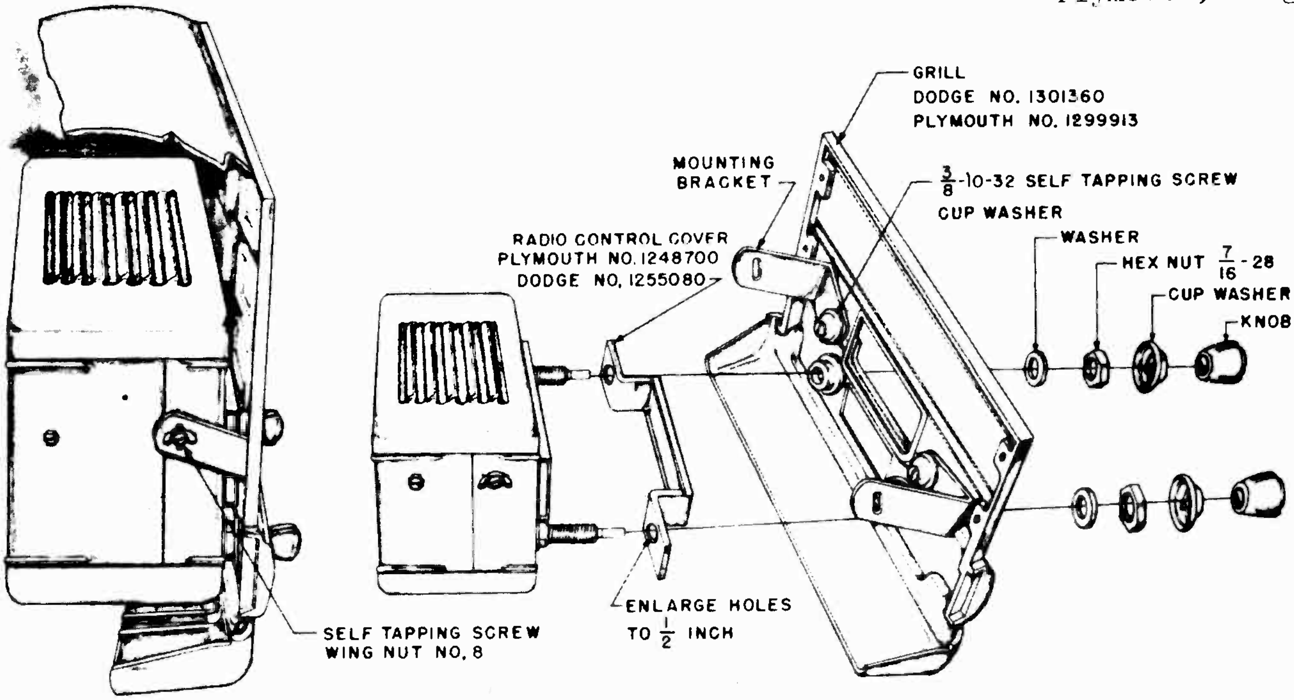
These models are not equipped by the car manufacturers with a radio grill or a radio control cover plate.

The following parts must be obtained from any authorized Plymouth or Dodge dealer before an installation can be made in any of these cars.

Plymouth P17, P18 4-Door DeLuxe, P18 Club Coupe DeLuxe
Radio Grill No. 1299913
Radio control cover No. 1248700

Dodge "Meadowbrook" or "Wayfarer"
Radio Grill No. 1301360
Radio control cover No. 1255080

MODEL 610.D200,
Plymouth, Dodge




COMPLETE ASSEMBLY

DETAIL ASSEMBLY

## ACCESSORIES FURNISHED FOR INSTALLATION

MOUNTING PARTS KIT

The following mounting hardware parts are shipped attached to the receiver. (See detail assembly drawing FIG. 2)

2 Washers
2 $\frac{7}{16}$-28 hex nuts
2 Cup washers
2 Knobs
2 Mounting Brackets
2 No. 8 self-tapping wing nut screws

An envelope containing additional mounting hardware is supplied with this receiver. It contains the following parts:

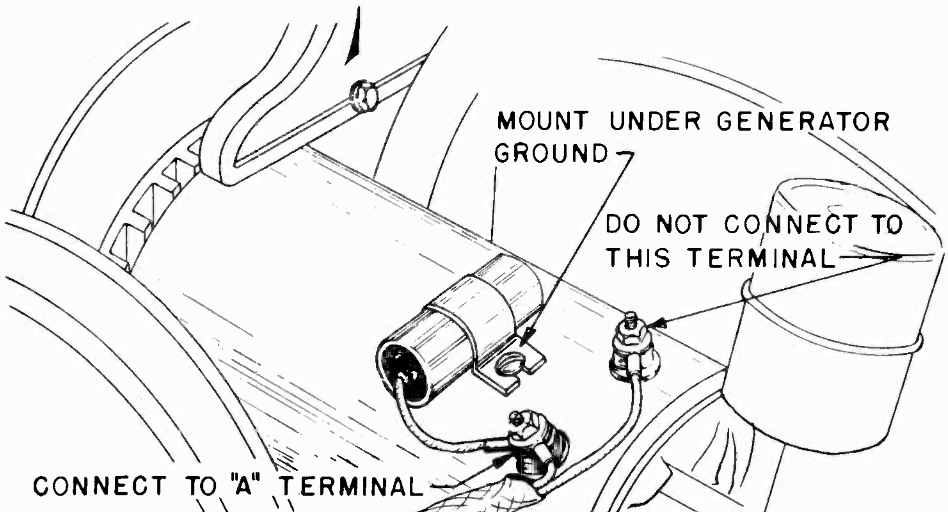
2 $\frac{3}{8}$ 10-32 self-tapping screws
2 Cup washers

SUPPRESSION KIT

1 Distributor Suppressor
1 .5 MFD Generator Condenser

# MOTOR NOISE ELIMINATION

## GENERATOR CONDENSER



MODEL 610.D200,
Plymouth, Dodge

## DISTRIBUTOR SUPPRESSOR

NOTE: 1950 Dodge and Plymouth automobiles do *not* require distributor suppressors.

1949 DODGE AND PLYMOUTH

Remove metal tip from the distributor center tower lead and screw lead into the suppressor. Plug suppressor with attached lead back into distributor head.
The generator condenser and distributor suppressor should eliminate all objectionable motor noise in most cases. If the motor noise persists the following steps should be taken. Check operation of radio as each step is made.

WHEEL STATIC

Wheel static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present, it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

AMMETER CONDENSER

A .5 MFD by-pass condenser should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby.

ELECTRICAL ACCESSORIES

In some cases, it may be found that car accessories such as electric heaters, lighters, automatic relays or gauges, may cause interference while in operation. Proper procedure in such cases is to connect a .5 MFD by-pass condenser from ground to the suspected accessory until the source of interference is found. The condenser then should be permanently mounted in this location.

## ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.
No signal applied to antenna.
Power input—6.3 volts.
Connect dummy antenna in series with output lead of signal generator.
Connect ground lead of signal generator to chassis.
Repeat alignment procedure as a final check.

The following equipment is necessary to proper alignment:
Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.
Non-metallic screwdriver.
Output meter. (1.8 volt for 1 watt output.)
Dummy antennas—.1 MFD., 100 MMFD.
For alignment points refer to *Schematic Diagram*

| *Dial Setting* | *Generator Frequency* | *Dummy Ant.* | *Generator Connector* | *Trimmer Reference* | *Trimmer Adjustment* | *Trimmer Function* |
|---|---|---|---|---|---|---|
| 1) Fully open | 455 KC | .1 MFD | 6BE6 Grid | T4 Top & bottom | Maximum | Output I.F. |
| 2) Fully open | 455 KC | .1 MFD | 6BE6 Grid | T3 Top & bottom | Maximum | Input I.F. |
| 3) Fully open | 1600 KC | 100 MMFD | Ant. lead | CV2 | Maximum | Oscillator |
| 4) Tune in signal from generator | 1400 KC | 100 MMFD | Ant. lead | CV3 | Maximum | RF Stage |
| 5) Tune in signal from generator | 1400 KC | 100 MMFD | Ant. lead | CV1 | Maximum | Antenna |
| 6) Tune in signal from generator | 600 KC | 100 MMFD | Ant. lead | T2 | Maximum | RF Stage |
| 7) Tune in Signal from generator | 600 KC | 100 MMFD | Ant. lead | T1 | Maximum | Antenna |
| 8) Repeat steps 4 and 5 | | | | | | |

## HOW TO ORDER REPAIR PARTS

Always give the part No. (No. printed on the part if different from that shown on this list), and the name of the part. When No. is not available, give complete description of part. Be sure to always give the Model No. and Catalog No. The Model No. will be found on either the metal plate at the rear of the chassis or on a printed label which may be on the chassis or cabinet.

MODEL 610.D200, Plymouth, Dodge

# PARTS AND PRICE LIST

## CONDENSERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| C2, C3, C4 | C207 | .05 MFD 200 volt condenser |
| C5 | CC200 | 100 MMFD ceramic condenser |
| C6, C13, C14 | CC201 | 200 MMFD ceramic condenser |
| C7 | C203 | .002 MFD 200 volt condenser |
| C8, C9 | C206 | .01 MFD 600 volt condenser |
| C10, C11 | C209 | .5 MFD 100 volt condenser |
| C12 | C205 | .008 MFD 1600 volt condenser |
| CE-86 | CE-86 | 20 MFD 350 volt electrolytic condenser<br>20 MFD 350 volt electrolytic condenser<br>20 MFD 25 volt electrolytic condenser |
| CV-200 | CV-200 | 3 section variable tuning condenser |

## RESISTORS

| | | |
|---|---|---|
| R1 | R309 | 1 megohm ½ watt 20% resistor |
| R2 | R306 | 20K ohm ½ watt 20% resistor |
| R3 | R305 | 2K ohm ½ watt 20% resistor |
| R4 | R310 | 2 megohm ½ watt 20% resistor |
| R5 | R311 | 10 megohm ½ watt 20% resistor |
| R6 | R307 | 250K ohm ½ watt 20% resistor |
| R7 | R308 | 500K ohm ½ watt 20% resistor |
| R8 | R303 | 330 ohm ½ watt 20% resistor |
| R9 | R313 | 20K ohm 2 watt 20% resistor |
| R10, R11 | R301 | 100 ohm ½ watt 20% resistor |
| R12 | R312 | 1K ohm 1 watt 20% resistor |
| RV-200 | RV-200 | Volume control ¾ megohm with switch |

## COILS AND TRANSFORMERS

| | | |
|---|---|---|
| L1-C1 | L200 | Motor noise elimination unit |
| L2 | 57FB-3 | Antenna Coil |
| L3 | 57FB-4 | RF coil |
| L4 | L201 | RF Oscillator coil |
| L5 | L202 | Choke, vibrator hash |
| L6 | L203 | Choke, "A" line |
| T1 | 1655-16 | 1st IF transformer |
| T2 | 1655-16 | 2nd IF transformer |
| T3 | | Output transformer (Part of speaker not furnished separately) |
| T4 | TV-200 | Vibrator transformer |

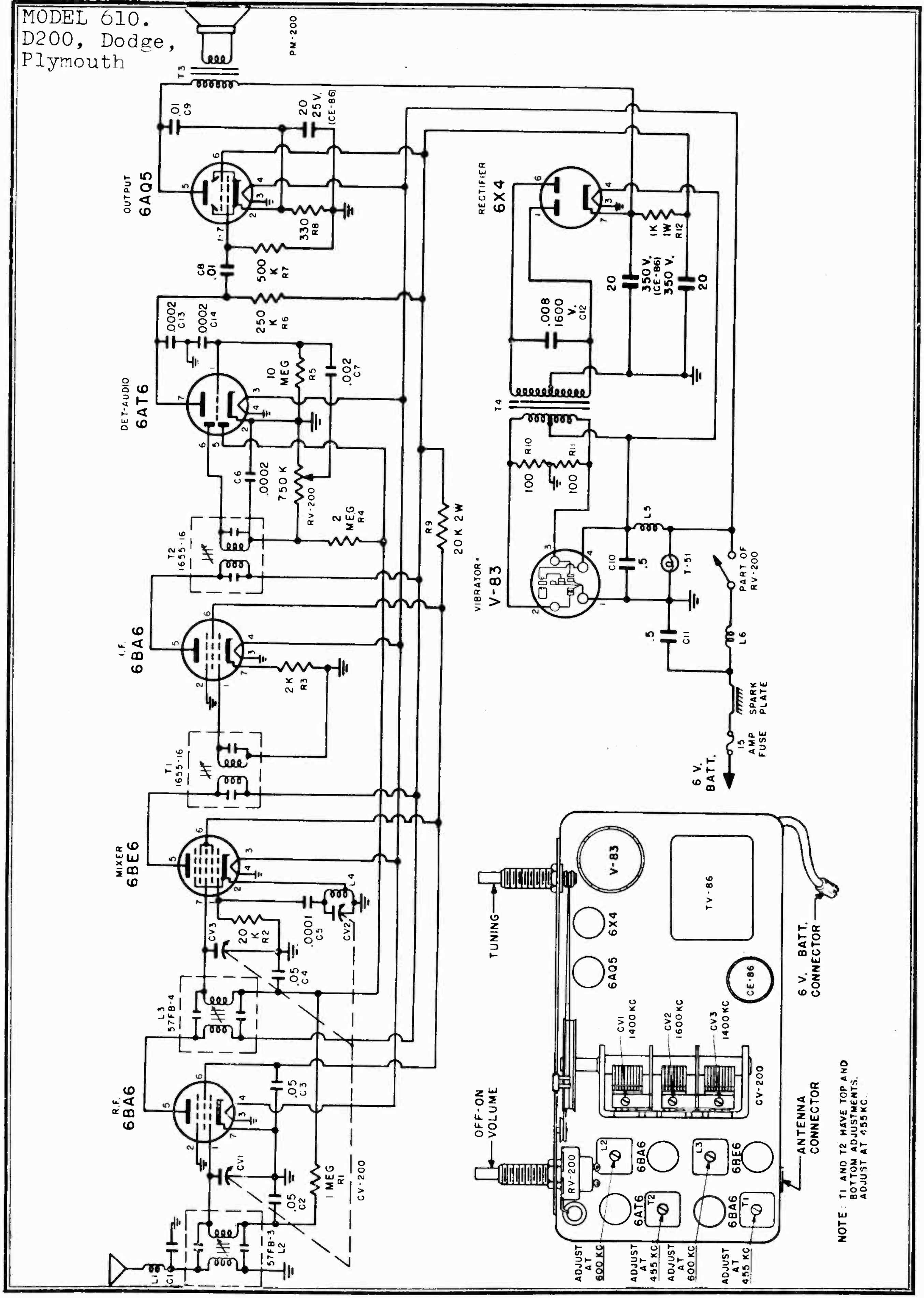
## DIAL PARTS

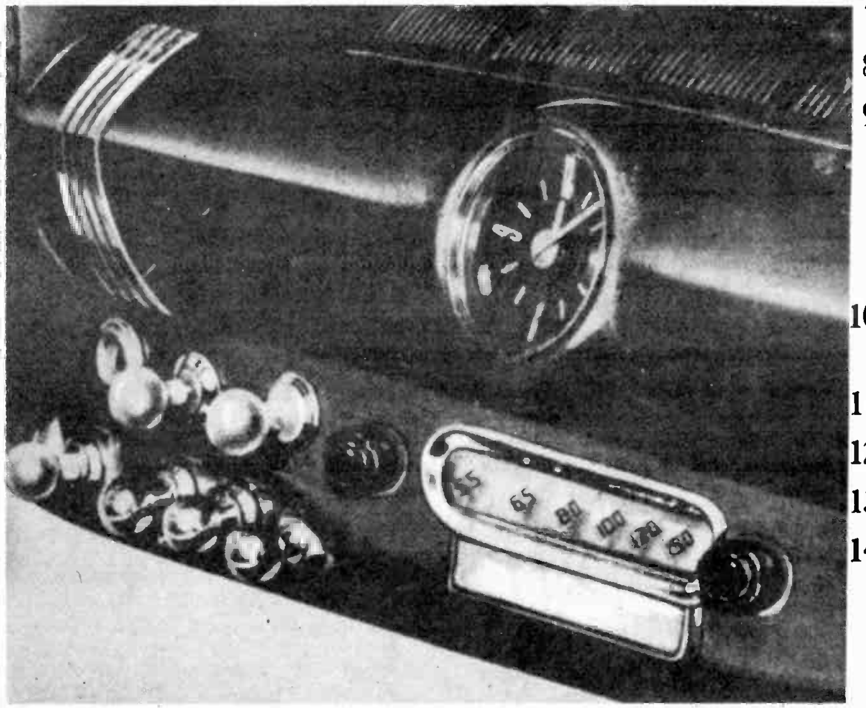
| | |
|---|---|
| D200 | Dial Scale |
| PS200 | Dial Pointer |
| DS200 | Drive shaft assembly |
| H201 | Grommet, rubber drive |
| T51 | Pilot light |
| H202 | Pilot light socket |
| H203 | Pulley, idler |
| H204 | Spring, Dial Drive Spring Tension |
| H205 | String |

## MISCELLANEOUS

| | |
|---|---|
| A200 | "A" lead assembly |
| H206 | Case (less covers) |
| H207 | Clip, anti-rattle |
| H208 | Clip, coil mounting |
| H209 | Cover, bottom case |
| H210 | Cover, top case (with speaker louvres) |
| A201 | Fuse, 15 Amp. |
| H211 | Grommet, rubber, gang mounting |
| H212 | Receptacle, antenna cable |
| PM-200 | Speaker 4" x 6" PM (includes output transformer) |
| V-83 | Vibrator |

MODEL 610.
D200, Dodge,
Plymouth





# INSTALLATION

1. Remove two speed nuts securing radio opening cover plate to instrument panel.
2. Remove cover plate.
3. Place speaker and power pack unit over four threaded stud bolts located on the underside of the instrument panel. (Position power pack unit so that power cable is located on the right hand side.) See Fig. 1.
4. Secure power pack into position with four 8-32 wing nuts supplied in kit of mounting hardware.
5. Remove knobs, cup washers and hex mounting nuts from tuning unit. *Do not remove* escutcheon.
6. Place tuning unit behind instrument panel so that mounting bushings and shafts protrude through the front panel.
7. Attach tuning unit with a hex nut on each mounting bushing.
8. Replace cup washers and knobs over shafts.
9. Secure a supporting bracket (2 supplied in kit of hardware) to each side of the power pack unit by means of two No. 8 self tapping screws. Use end of supporting bracket with round hole. If more convenient, these brackets may be attached before power pack unit is positioned in place.
10. Swing supporting brackets so that slotted holes are in line with the holes on each side of the tuning unit.
11. Secure to tuning unit with two No. 8 self tapping screws.
12. Insert power cable plug into socket on rear of tuning unit.
13. Plug antenna cable into tuning unit.
14. Connect "A" lead to accessory terminal marked RAD. GA, on the ignition switch.

## PARTS AND PRICE LIST

### CONDENSERS

| SCHEMATIC DIAGRAM REFERENCE | PART NO. | DESCRIPTION |
|---|---|---|
| C2, C3, C6, C9 | C207 | .05 MFD 200 volt condenser |
| C4, C15 | C209 | .5 MFD 100 volt condenser |
| C7 | CC200 | 100 MMFD ceramic condenser |
| C8 | C210 | .1 MFD 400 volt condenser |
| C10, C12 | CC201 | 200 MMFD ceramic condenser |
| C13, C16 | C206 | .01 MFD 600 volt condenser |
| C14 | C205 | .008 MFD 1600 volt condenser |
| CE-86 | CE-86 | 20 MFD 350 volt electrolytic conden.<br>20 MFD 350 volt electrolytic conden.<br>20 MFD 25 volt electrolytic conden. |
| CV-300 | CV-300 | 3 section variable tuning |

### RESISTORS

| SCHEMATIC DIAGRAM REFERENCE | PART NO. | DESCRIPTION |
|---|---|---|
| R1 | R309 | 1 megohm ½ watt 20% resistor |
| R2 | R306 | 20 K ohm ½ watt 20% resistor |
| R3 | R314 | 1.5 K ohm ½ watt 20% resistor |
| R4 | RV-300 | Volume control 3/4 megohm with switch |
| R5 | R310 | 2 megohm ½ watt 20% resistor |
| R6 | R311 | 10 megohm ½ watt 20% resistor |
| R7 | R307 | 250 K ohm ½ watt 20% resistor |
| R8 | R313 | 20K ohm 2 watt 20% resistor |
| R9, R10 | R301 | 100 ohm ½ watt 20% resistor |
| R11 | R312 | 1K ohm 1 watt 20% resistor |
| R12 | R308 | 500K ohm ½ watt 20% resistor |
| R13 | R303 | 330 ohm ½ watt 20% resistor |

MODEL 610.
F100, Ford

## COILS AND TRANSFORMERS

| | | |
|---|---|---|
| L1-C1 | L200 | Motor noise elimination unit |
| L2 | 57FB-3 | Antenna coil |
| L3 | 57FB-4 | R.F. coil |
| L4 | L201 | R.F. oscillator coil |
| L5 | L203 | Choke, "A" line |
| L6 | L202 | Choke, vibrator hash |
| T1 | 1655-16 | 1st IF transformer |
| T2 | 1655-16 | 2nd IF transformer |
| T3 | TV100 or | Vibrator transformer |
| | 318V-2 | Output transformer (Part of speaker not furnished separately) |

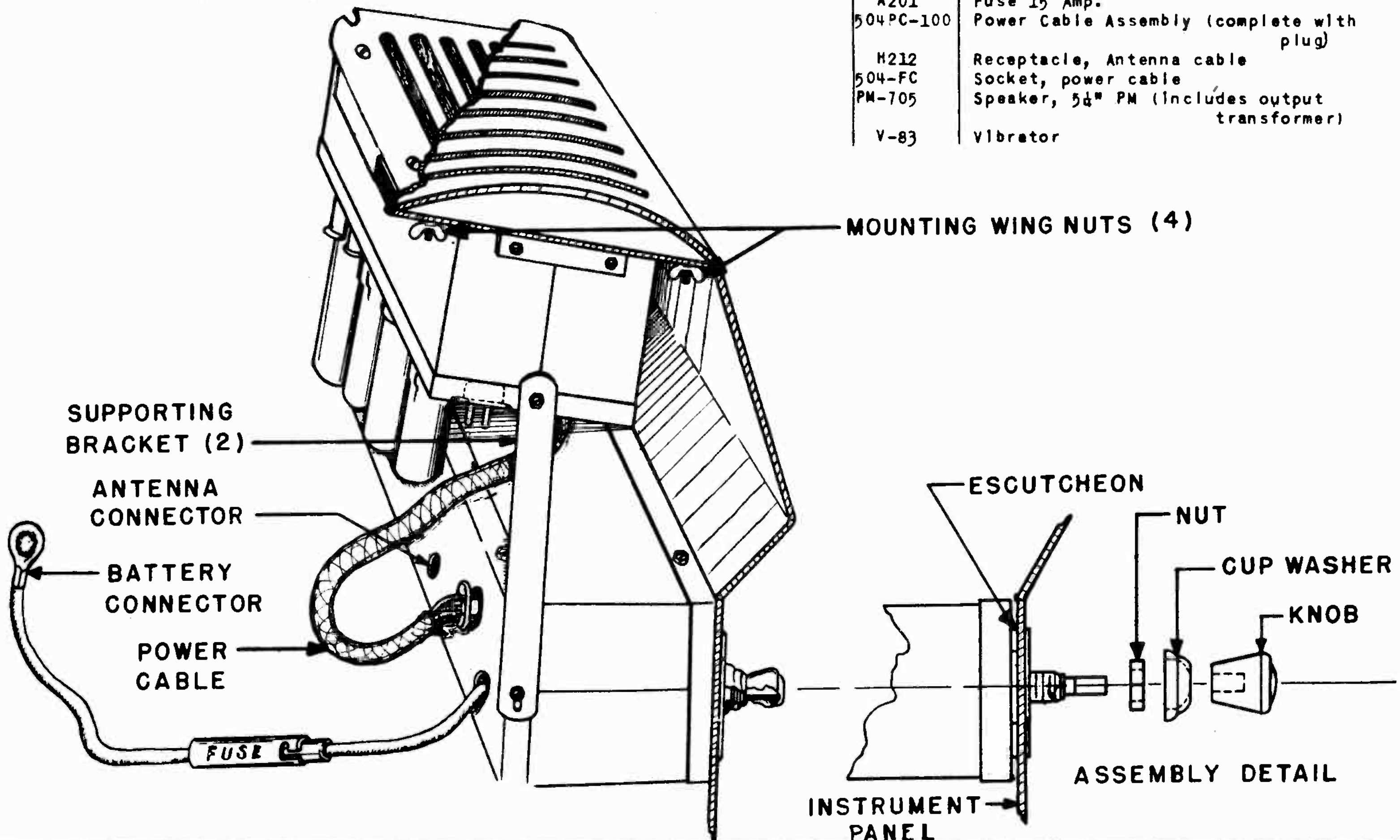
## DIAL PARTS

| | |
|---|---|
| F-100 | Dial Scale |
| PS-800 | Dial Pointer |

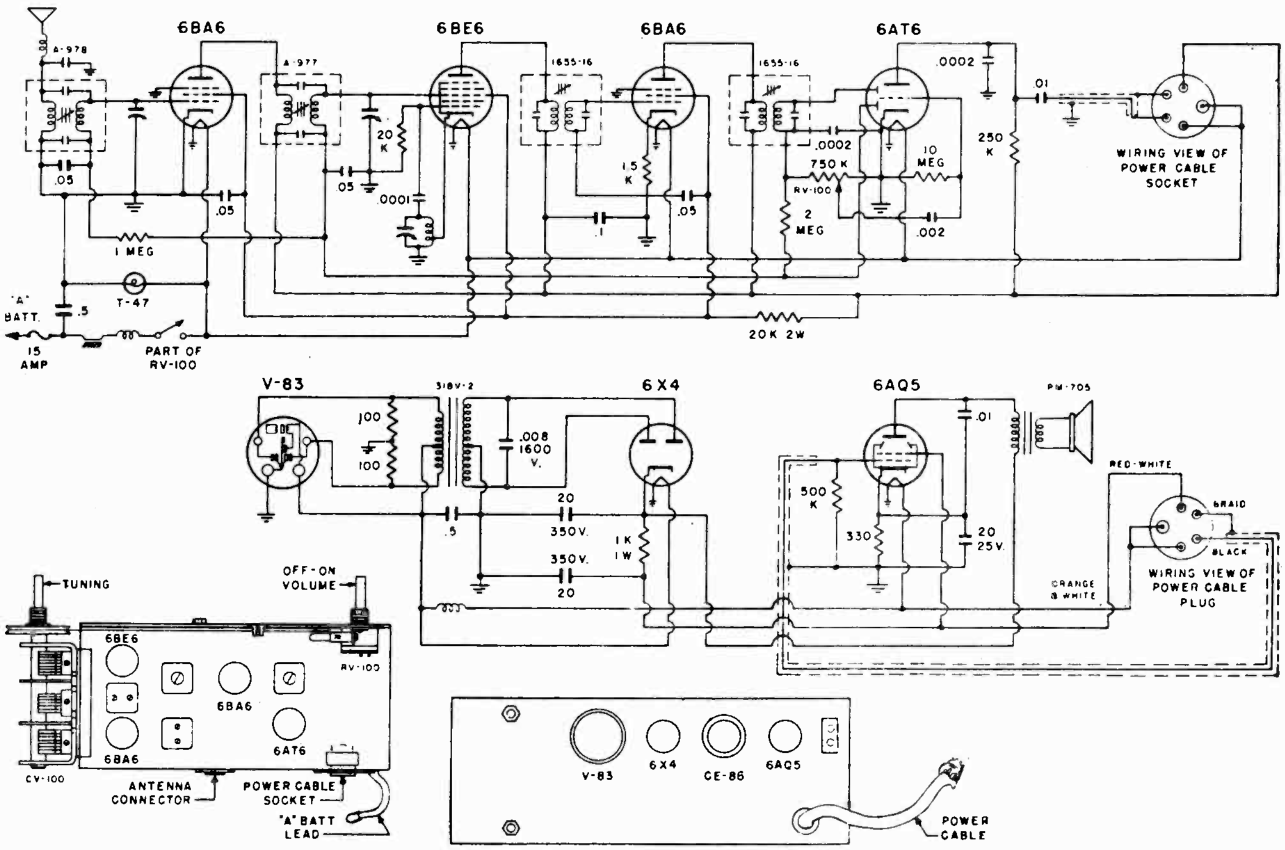
| | |
|---|---|
| H201 | Grommet, rubber drive |
| T51 | Pilot Light |
| H214 | Pilot Light Socket |
| H203 | Pulley, idler |
| H204 | Spring, Dial drive String Tension |
| H215 | String, dial drive |

## MISCELLANEOUS

| | |
|---|---|
| A100 | "A" lead assembly |
| H101 | Case, less covers for Power Supply unit |
| H100 | Case, complete with covers for R.F. tuning unit |
| H207 | Clip, Anti-rattle |
| H208 | Clip, coil mounting |
| H102 | Cover, power supply unit mounting (with speaker louvres) |
| A201 | Fuse 15 Amp. |
| 504PC-100 | Power Cable Assembly (complete with plug) |
| H212 | Receptacle, Antenna cable |
| 504-FC | Socket, power cable |
| PM-705 | Speaker, 5¼" PM (includes output transformer) |
| V-83 | Vibrator |



MODEL 610.F100,
Ford




## ALIGNMENT PROCEDURE

Volume control— Maximum, all adjustments.
No signal applied to antenna.
Power input—6.3 volts.
Connect dummy antenna in series with output lead of signal generator.
Connect ground lead of signal generator to chassis.
Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:
Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.
Non-metallic screwdriver.
Output meter. (1.8 volt for 1 watt output.)
Dummy antennas—.1 MFD., 100 MMFD.
For alignment points refer to Schematic Diagram.

| *Dial Setting* | *Generator Frequency* | *Dummy Ant.* | *Generator Connector* | *Trimmer Reference* | *Trimmer Adjustment* | *Trimmer Function* |
|---|---|---|---|---|---|---|
| 1) Fully open | 455 KC | .1 MFD | 6BE6 Grid | T2 Top & bottom | Maximum | Output I.F. |
| 2) Fully open | 455 KC | .1 MFD | 6BE6 Grid | T1 Top & bottom | Maximum | Input I.F. |
| 3) Fully open | 1600 KC | 100 MMFD | Ant. lead | CV2 | Maximum | Oscillator |
| 4) Tune in signal from generator | 1400 KC | 100 MMFD | Ant. lead | CV3 | Maximum | RF Stage |
| 5) Tune in signal from generator | 1400 KC | 100 MMFD | Ant. lead | CV1 | Maximum | Antenna |
| 6) Tune in signal from generator | 600 KC | 100 MMFD | Ant. lead | L3 | Maximum | RF Stage |
| 7) Tune in Signal from generator | 600 KC | 100 MMFD | Ant. lead | L2 | Maximum | Antenna |
| 8) Repeat steps 4 and 5 | | | | | | |

MODELS 9012I, 9012W

# TECHNICAL INFORMATION FOR SERVICE

## ALIGNMENT PROCEDURE

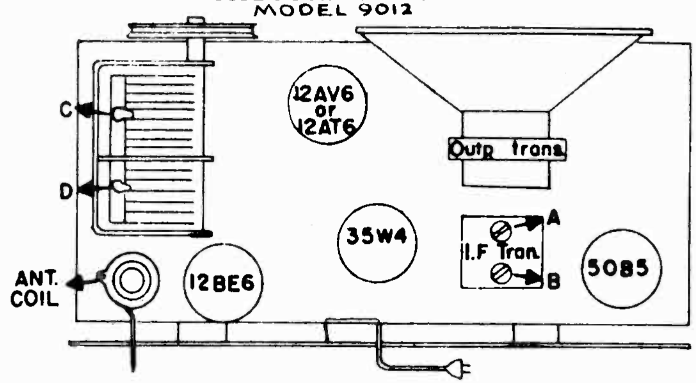
### I. F. Alignment

1. Set variable condenser to high frequency end of dial.
2. Connect suitable output meter to voice ccil of speaker.
3. Connect signal generator to grid of BE6 through .05 condenser. Connect ground side of generator to B-.
4. Adjust trimmers A and B for maximum output at 455 Kc.
5. Repeat trimmer adjustment for peak sensitivity.

### R. F. Alignment

1. Set variable condenser to extreme high frequency end of dial.
2. Connect signal generator to antenna input terminal on antenna coil through 50 mmf. condenser.
3. Set generator to 1720 Kc.
4. Set trimmer C to 1720 Kc.
5. Set generator to 1400 Kc. and tune receiver dial to maximum response.
6. Adjust trimmer D for maximum output at 1400 Kc.
7. Check tracking and make necessary compensations.

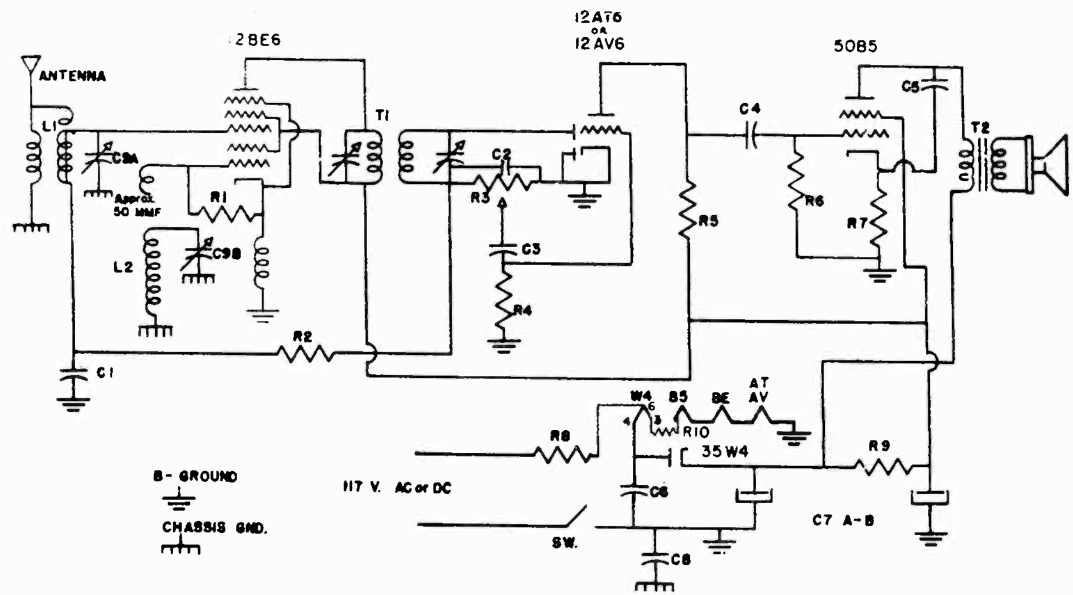
TUBE LOCATION CHART
MODEL 9012




| CIR. | SYM. | PART NO. | DESCRIPTION | |
|---|---|---|---|---|
| R1 | | RC-31002 | RESISTOR CARBON | 10,000 Ohm 1/2 W |
| R2 | | RC-32204 | " " | 2.2 MEG Ohm 1/2 W |
| R3 | | VC-12106-E | VOLUME CONTROL | 1 MEG WITH SWITCH |
| R4 | | RC-31005 | RESISTOR CARBON | 10 MEG Ohm 1/2 W |
| R5, 6 | | RC-34703 | " " | 470,000 Ohm 1/2 W |
| R7 | | RC-31500 | " " | 150 Ohm 1/2 W |
| R8 | | RC-40220 | " " | 22 Ohm 1 W |
| R9 | | RC-31001 | " " | 1000 Ohm 1/2 W |
| T1 | | TS-10039 | TRANSFORMER I.F. | |
| T2 | | SR-10007 | TRANSFORMER OUTPUT & SPEAKER | |
| R10 | | RC-40470 | RESISTOR CABBON | 47 Ohm – 1 W |

| CIR. | SYM. | PART NO. | DESCRIPTION | | |
|---|---|---|---|---|---|
| C1 | | CP-12203 | CONDENSER | PAPER .02 MFD | 200 V. |
| C2 | | CM-25251 | " | MICA 250 MMF | |
| C3,4 | | CP-12502 | " | PAPER .005 MFD | 200 V. |
| C5 | | CP-14103 | " | PAPER .01 MFD | 400 V. |
| C6,8 | | CP-12503 | " | PAPER .05 MFD | 200 V. |
| C7 | | CL-10017 | " | ELECT. 30/20 MFD | 150 V. |
| C9 A-B | | CV-10018A | " | VARIABLE | |
| L1 | | TRF-10018 | ANTENNA COIL | | |
| L2 | | TRC-10017 | OSCILLATOR COIL, 5 LUG | | |

CHASSIS MODEL 9012




# PARTS LIST

| | PART | DESCRIPTION |
|---|---|---|
| C7 | CLP-10017 | Cond. electrolytic, 30-20 mfd. 150 V. |
| C2 | CMP-15251 | Cond. mica, .00025 mfd. 500 V. |
| C1 | CPP-12203 | Capacitor paper tubular .02 mfd. 200 V.D.C. |
| C3,4 | CPP-12502 | Capacitor paper tubular .005 mfd. 200 V (D.C.) |
| C6,8 | CPP-12503 | Capacitor paper tubular .05 mfd. 200 V (D.C.) |
| C5 | CPP-14103 | Capacitor paper tubular .01 mfd. 400 |
| C9A-B | CVP-100018A | Condenser variable, osc. 162 19 plates, 450 mfd. |
| R4 | RC-31005 | Resistor carbon 10 meg. ½ watt |
| R1 | RC-31002 | Resistor carbon 10,000 ohm, ½ watt |
| R7 | RC-31500 | Resistor carbon 150 ohm, ½ watt |
| R2 | RC-32204 | Resistor carbon 2.2 meg. ½ watt. 20% |
| R5,6 | RC-34703 | Resistor carbon 470,000 ohm. ½ watt, 20% |
| R8 | RC-40220 | Resistor carbon 22 ohm, 1 watt |
| R9 | RC-31001 | Resistor carbon 1000 ohm, ½ watt |
| R10 | RC-40470 | Resistor carbon 47 ohm. 1 watt 20% |
| T2 | SRP-10007 | Speaker, 3 inch transformer mounted |
| L2 | TRC-10017 | Oscillator coil, 5 lug |
| L1 | TRF-10018 | Antenna coil |
| T1 | TS-10039 | I.F. transformer (automatic No. 1455-11) |
| R3 | VC-12106E | Volume control with switch 1 meg-¼ inch shaft |
| | XC-10020 | Back cover plate, cardboard, non-waxed |
| | DS-10112 | Dial scale and nameplate |
| | HF-1003 | Washer, white felt ¼ inch I.D.x5/80. D.x1/16 thick |
| | HX-10027 | "T" fastner (to fit .150 hole) |
| | K-10036W | Knob, set screw Ivory or Walnut |
| | K-10042W | Knob push-on with pointer Ivory or Walnut |
| | ZP-10025WorU | Cabinet |

# INSTALLATION

This radio comes to you complete with all hardware necessary for mounting, and also with a distributor suppressor, ammeter condenser and generator condenser. By referring to Figures 1 and 2, and following the instructions outlined below, you will find that it is very simple to install.

First determine where the receiver is to be mounted by holding it with the hands in the approximate location in the car. Using the front mounting bracket as a template, mark and drill two 5/8″ holes in the instrument panel flange. Now secure the mounting bracket to the radio receiver with the screws provided, and then mount the front of the radio to the instrument panel, using the bolts, lock washers and nuts provided for this purpose. The back of the radio is supported by means of the rear mounting strap. The mounting strap should be formed to the correct angles, as illustrated in Figure 2, so that it can then be fastened to the fire wall. After marking and center-punching the fire wall at the correct location, drill with a 3/8″ drill. The mounting strap is then secured to the radio and fastened to the fire wall of the car with the 1/4″ bolt, lock washer and nut furnished with the receiver.

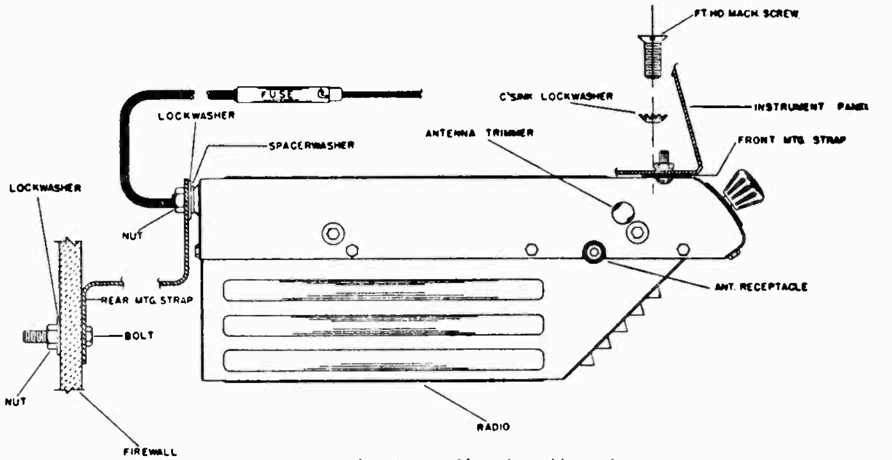



*Fig. 3. Side View, Showing Mounting*

## CONNECTING THE RADIO

The antenna cable should be connected to the radio by inserting the jack into the socket provided on the side of the radio. Connect the battery cable to the hot side of the ammeter behind the instrument panel. The fuse should then be inserted into the cable receptor.

## FINAL ADJUSTMENTS

The input circuit has been especially designed to be used with a low capacity antenna, of the fish pole or whip type.

To adjust the antenna trimmer condenser, carefully tune the receiver to a weak station at approximately 1100 kilocycles (K.C.). Remove the snap button covering the antenna trimmer (See Figure 3) and adjust the trimmer for maximum volume. A small screw driver will be needed for this purpose.

# ACCESSORIES FURNISHED FOR INSTALLATION

All of the parts that are needed for installing this receiver are furnished in the Mounting Parts Kit, part No. S84-192, and the Suppression & Misc. Parts Kit, part No. S84-344, as listed below. Also supplied are the rear mounting strap, part No. B31-134, and the front mounting plate, part No. A31-148.

NOTE: For shipping, the two control knobs have been removed from the tuning and volume control shafts. To install the knobs, line up the flat side of the knob spring, (inside knob) with the flat side of the control shaft and push the knob forward until it stops.

## S84-192 MOUNTING PARTS KIT

| | | | |
|---|---|---|---|
| 1 | 1/4″ Bolt | 2 | External Tooth Lock Washers |
| 2 | 1/4″ Lock Washers | 2 | Internal Tooth Lock Washers |
| 2 | 1/4″ Hexagon Nuts | 2 | 10-32 Hexagon Nuts |
| 2 | 10-32 x 5/8″ Screws | | |

## S84-344 SUPPRESSION KIT & MISC. PARTS ASSEMBLY

| | |
|---|---|
| 1—S84-233 | "A" lead assembly |
| 1—A43-10 | Fuse |
| 2—A52-295 | Control knobs |
| 1—A81-13 | Sleeve (for fuse) |
| 1—S84-193 | Suppression Kit consisting of:<br>2—.5 MFD Condensers<br>1—Distributor Suppressor<br>20″—Wire Braid |

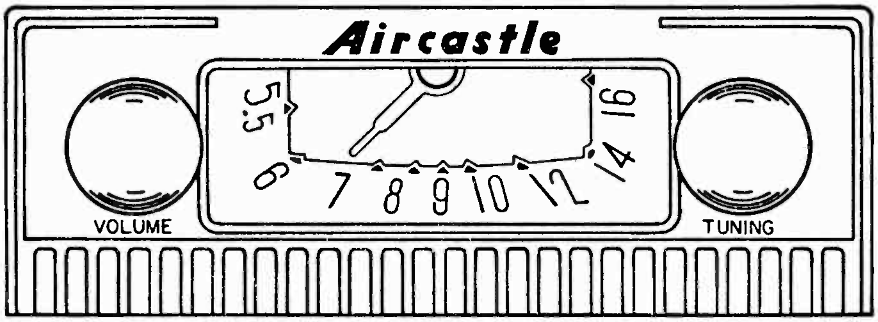



Fig. 1 Front View

# SUGGESTIONS FOR ELIMINATING POSSIBLE MOTOR NOISE

**IMPORTANT:** Special care should be taken when mounting the radio to make sure all paint, grease, rust, etc., is removed from all three mounting points. A good electrical contact at these points will aid materially in eliminating motor noise. (The following steps may not be necessary in all cases. Install your radio and operate it before making changes.)

## GENERATOR CONDENSER

The generator condenser must be connected to the battery terminal of the generator in all cases. If your car is equipped with a generator using an automatic regulator, make sure the condenser IS NOT fastened to the field winding terminal. If in doubt, your local car dealer can advise you as to where the car manufacturer recommends connecting it.

## AMMETER CONDENSER

A .5 MFD bypass condenser is furnished for attaching to the ammeter. This should be connected to either side of the ammeter with the ground lug fastened to a good ground nearby. In most cases the use of this condenser, the distributor suppressor, and the generator condenser, will eliminate all objectionable ignition interference.

## DISTRIBUTOR SUPPRESSOR

Detach the high tension wire where it goes into the top of the distributor cap and cut two inches off the end. Screw the piece you cut off into one end of the distributor suppressor and then screw the other end of the suppressor on the long wire which leads to the coil. Insert the wire back into the distributor cap.

## 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 .5 MFD condenser. It must be installed from the battery side of the ignition coil to the closest ground on the instrument panel.

Short wires 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 wire from the coil to the distributor.

## HIGH AND LOW TENSION WIRES

In many cases the low tension battery leads, etc., are grouped together with the high tension wires. These wires 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. These wires should be placed in a flexible wire shield and the shield grounded to frame or motor. 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 wires.

## BONDING OF FIRE WALL

Bonding the steering column to the fire wall with a short braid may also be effective. Clean the paint from the steering column at the fire wall where the column enters the motor compartment, and solder on a short piece of braid. Ground the end of the braid to the fire wall.

In some cases it may be necessary to ground the tubes and rods coming through the fire wall in order to reduce the interference. Clean them with emery cloth and spot-solder the braid, fastening the end under a convenient screw. A 1/4" piece of wire braid 20 inches long is furnished in the suppression kit assembly for this purpose.

## WHEEL STATIC

Wheel Static is a form of interference caused by the rotation of the front wheels of the car, and it is, of course, only noticed when the car is in motion. If this form of interference is present it can be eliminated by installing wheel static collector springs between the inner hub cap and the spindle shaft.

## ELECTRICAL ACCESSORIES

In some cases it may be found that car accessories such as electric heaters, lighters, automatic relays, or gauges, may cause interference while in operation. Proper procedure in such cases is to connect a .5 MFD by-pass condenser from ground to the suspected accessory until the source of the interference is found. The condenser then should be permanently mounted in this location.

# ELECTRICAL SPECIFICATIONS

Power Supply .......................... 6.3 volts DC
Current ............................ 5.5 amp. average
Frequency Range ...................... 540 to 1600 KC
I. F. Frequency ............................ 455 KC
Speaker ................................... 4" P. M.
Power Output .................. 1.2 watts, undistorted
2.5 watts, maximum
Sensitivity ....... 10 microvolts average for 1 watt output
Selectivity ... 40 KC broad at 1000 times signal, at 1000 KC

This receiver contains the following:

1—6SK7GT—R. F. Amplifier.
1—6SA7GT—Converter.
1—6SK7GT—I.F. Amplifier.
1—6SQ7—Detector—AVC—1st audio.
1—6V6GT—Power output.
1—6X5GT—Rectifier.

## SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage chart, (Fig. 4).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

## ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

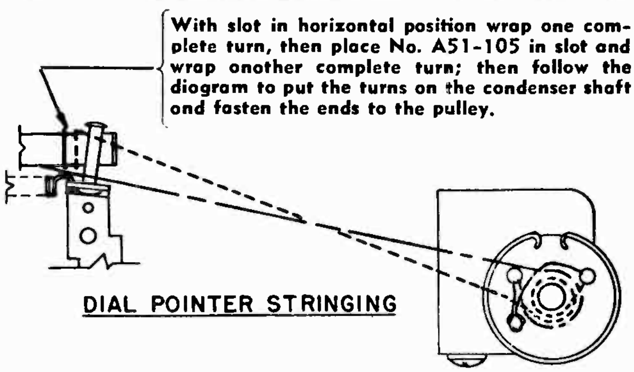
## INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

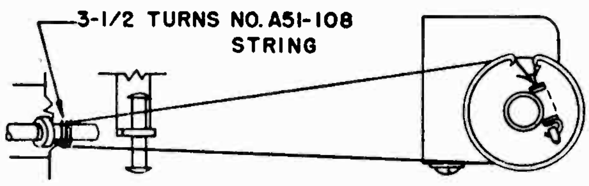
**CAUTION:** Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.




DIAL POINTER STRINGING




DIAL DRIVE STRINGING

MODEL 159144

# ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.

Non-metallic screwdriver.

Output meter. (1.8 volt for 1 watt output.)

Dummy antennas—.1 MFD., 75 MMFD.

For alignment points refer to Figures 5 and 6.

| Dial Setting | Generator Frequency | Dummy Ant. | Generator Connections | Trimmer Reference | Trimmer Adjustment | Trimmer Function |
|---|---|---|---|---|---|---|
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T2 | Maximum | Output I.F. |
| Fully Open | 455 KC | .1 MFD. | 6SA7 Grid | T1 | Maximum | Input I.F. |
| Fully Open | 455 KC | 75 MMFD. | Ant. lead | L3 | Minimum | Wave trap |
| Fully Open | 1600 KC | 75 MMFD. | Ant. lead | C1B | Maximum | Oscillator |
| Tune in signal from generator | 1400 KC | 75 MMFD. | Ant. lead | C19 | Maximum | Antenna |

NOTE: The antenna trimmer condenser, C3, (see Fig. 2) should be adjusted after the radio is installed in the car. Tune the receiver to a weak station at about 1100 KC and adjust this trimmer for maximum volume.

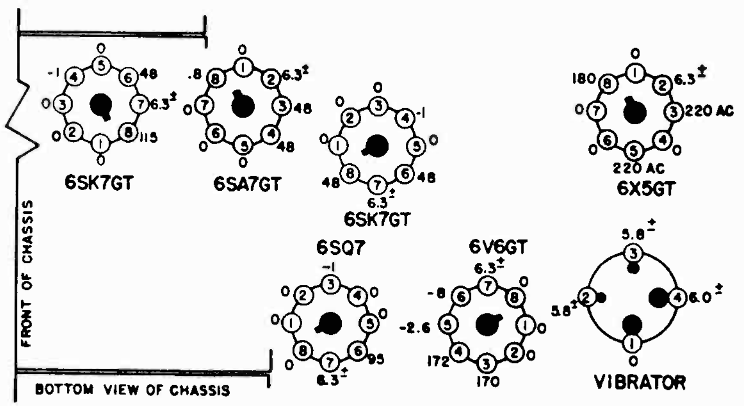



Fig. 4 Socket Voltages

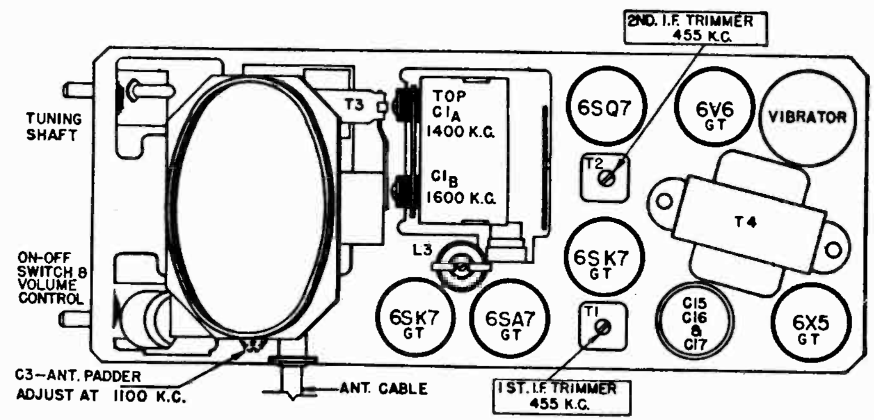



Fig. 5 Tube, Rectifier, and Trimmer Locations

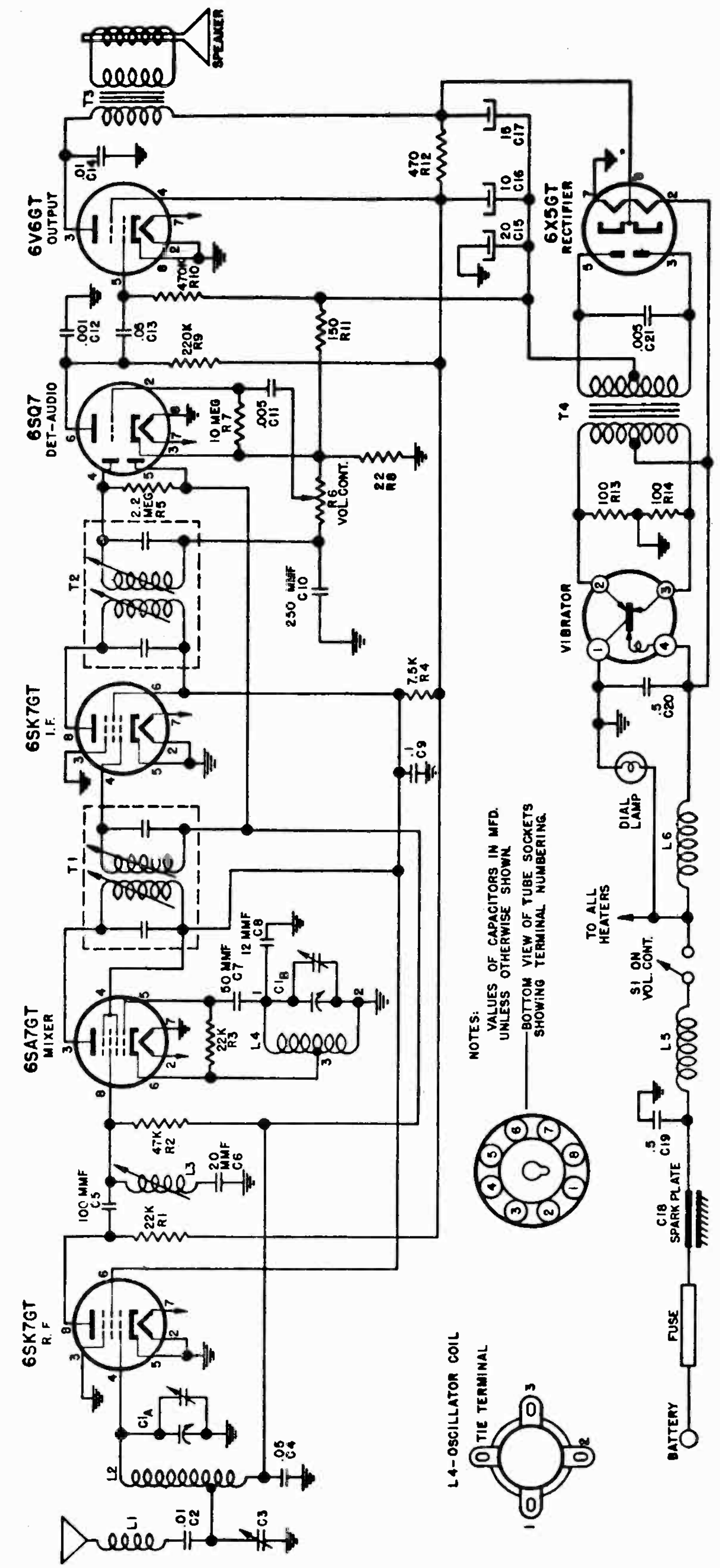



*Fig. 3 Schematic Diagram*

MODEL 159144

## CONDENSERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| C1A, C1B | A19-201 | Variable condenser |
| C2, C14 | A16-192 | .01 MFD 400 volt condenser |
| C3 | A20-145 | Trimmer condenser |
| C4 | A16-189 | .05 MFD 400 volt condenser |
| C5 | A15-196 | 100 MMFD ceramic condenser |
| C6 | A15-202 | 20 MMFD ceramic condenser |
| C7 | A15-204 | 50 MMFD ceramic condenser |
| C8 | A15-205 | 12 MMFD ceramic condenser, temp. comp. |
| C9 | A16-187 | .1 MFD 400 volt condenser |
| C10 | A15-176 | 250 MMFD mica condenser |
| C11 | A16-190 | .005 MFD 600 volt condenser |
| C12 | A16-195 | .001 MFD ceramic condenser |
| C13 | A16-193 | .05 MFD 600 volt condenser |
| C15<br>C16<br>C17 | A18-293 | 20 MFD 25 volt electrolytic condenser<br>10 MFD 350 volt electrolytic condenser<br>15 MFD 350 volt electrolytic condenser |
| C19, C20 | A16-184 | .5 MFD 100 volt condenser |
| C21 | A16-185 | .005 MFD 1600 volt oil filled condenser |

## RESISTORS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| R1, R3 | A60-659 | 22K ohm ½ watt 20% resistor |
| R2 | A60-685 | 47K ohm ½ watt 20% resistor |
| R4 | A60-769 | 7.5K ohm 2 watt 10% resistor |
| R5 | A60-726 | 2.2 megohm ½ watt 20% resistor |
| R6 | A24-177 | Volume control, 500,000 ohm, with switch |
| R7 | A60-728 | 10 megohm ½ watt 20% resistor |
| R8 | A60-768 | 22 ohm ½ watt 10% resistor |
| R9 | A60-667 | 220K ohm ½ watt 20% resistor |
| R10 | A60-731 | 470K ohm ½ watt 20% resistor |
| R11 | A60-767 | 150 ohm ½ watt 10% resistor |
| R12 | A60-770 | 470 ohm ½ watt 10% resistor |
| R13, R14 | A60-752 | 100 ohm ½ watt 10% resistor |

## COILS AND TRANSFORMERS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| L1 | A10-527 | Antenna Loading Coil |
| L2 | B10-511 | Antenna Coil |
| L3 | A10-510 | I.F. Trap Coil |
| L4 | A10-512 | Oscillator Coil |
| L5 | A33-229 | Choke, "A" Line |
| L6 | A33-228 | Choke, vibrator hash |
| T1 | A10-508 | 1st I.F. Transformer |
| T2 | A10-509 | 2nd I.F. Transformer |
| T3 | B80-242 | Output Transformer (Part of Speaker, not furnished separately) |
| T4 | B80-243 | Power transformer |

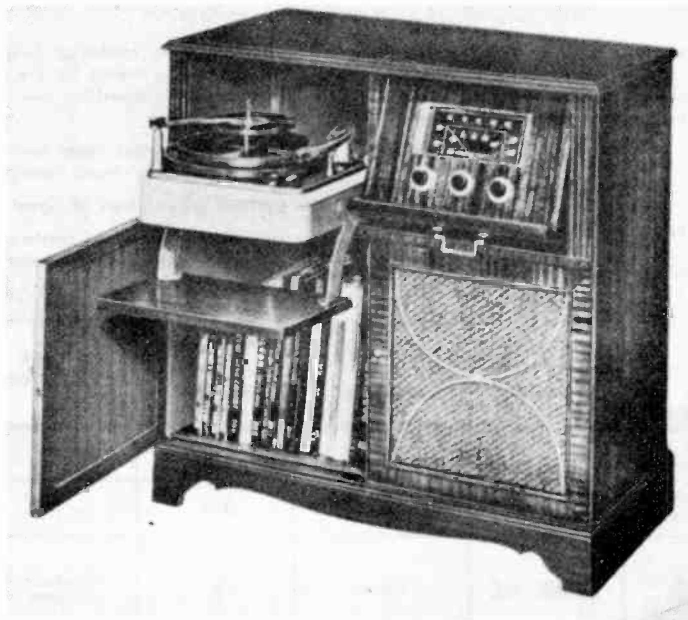
## DIAL PARTS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| | A11-303 | Bracket, Dial Scale |
| | B11-328 | Bracket, String Guide |
| | A72-29 | Bushing, Tuning Shaft Bearing |
| | A70-130 | Clip, Spring, for Tuning Shaft |
| | A40-146 | Dial Escutcheon |
| | A58-55 | Dial Pointer |
| | B67-544 | Dial Scale |
| | A28-101 | Gasket for Speaker |
| | A52-295 | Knob |
| | A11-329 | Link, String Guide |
| | A89-10 | Pilot Light, Type G.E. No. 422 |
| | A65-37 | Rivet, Shoulder, for Dial Pointer Stringing |
| | A65-41 | Rivet, Shoulder, for String Guide Brkt. and Link |
| | A65-12 | Rivet, Shoulder, for Dial Drive Stringing |
| | A75-70 | Shaft, tuning |
| | A75-74 | Shaft, for Dial Pointer |
| | A70-132 | Spring, for Pilot Light Socket |
| | A70-133 | Spring, Dial Drive String Tension |
| | A70-142 | Spring, Pointer Drive String Tension |
| | A51-105 | String, Pointer Travel, 17" |
| | A51-108 | String, Condenser Drive, 19" |

## MISCELLANEOUS

| Schematic Diagram Reference | Part No. | Description |
|---|---|---|
| | S84-233 | "A" lead assembly |
| | A83-421 | Clip, I.F. Transformer Mounting |
| | A83-517 | Clip, Oscillator Coil Mounting |
| | A43-10 | Fuse, 15 Amp. |
| | A47-112 | Grommet, rubber, (Spkr. & Gang mounting) |
| | B31-134 | Mounting strap, rear |
| | B31-148 | Mounting Plate, Front |
| | S84-192 | Mounting parts kit |
| | A87-38 | Receptacle, Antenna Cable |
| | B79-362 | Speaker, 4" P.M. (includes Output Transformer) |
| | S84-193 | Suppression Kit Assembly |
| | A34-105 | Vibrator |
| | A83-519 | Wiper, grounding, for case covers |

Note: Tubular condensers must be high temperature (85°C) wax type.



## GENERAL SPECIFICATIONS

**FREQUENCY RANGES:**
AM—540 to 1700 Kc.
FM— 88 to 108 Mc.

**TUNING CAPACITOR:**
6 section gang (3-AM and 3-FM); entire R.F. tuning assembly is rubber mounted.

**I.F. FREQUENCY:**
AM—455 Kc.
FM—10.7 Mc.

**POWER SUPPLY:**
117 volts A.C.
Radio — 85 watts
Phono—115 watts

**SPEAKER:**
10 inch P.M. Dynamic
Voice coil impedance—3.2 ohms

**POWER OUTPUT:**
Undistorted—2.8 watts
Maximum —5.4 watts

**ANTENNAS:**
AM—Low impedance loop
FM—Single ended half wave dipole

**RECORD CHANGER:**
Automatic-intermix type; 3-speed

**WEIGHT:**
Packed—120 lbs.

**DIMENSIONS:**
Length—36"
Height—34"
Depth —18"

**SENSITIVITY:**
AM—20 microvolts per meter (average) for 0.5 watt output. This measurement must be made with the R.F. signal generatar (modulated 30% at 400 cycles) coupled to the receiver by means of a standard test loop antenna.

FM—10 microvolts per meter (average) for 0.5 watt output. This measurement must be made with the R.F. signal generator (frequency modulated 30%—22½ Kc. deviation—at 400 cycles) coupled to the receiver thru appropriate size carbon resistors to match the 300 ohm antenna input circuit.

## HOW TO REMOVE CHASSIS FROM CABINET

1. Remove all knobs by pulling them forward.
2. Disconnect all antenna leads from the terminal strip labeled "FM—FM—AM—AM."
3. Disengage phono pick-up plug from its socket at rear of chassis.
4. Disengage phono motor plug and socket.
5. Disconnect the leads from speaker at bottom left section of cabinet.
6. Remove "ON-OFF" indicator lamp and socket from bottom center of cabinet.
7. Remove bracket which clamps dial plate to front panel of cabinet.
8. Take out the four chassis hold-down screws that are located at each corner of the pan and serve to retain the unit in position on the tilt-out panel. Chassis can now be removed by lifting it out of cabinet.

MODEL 9150-B

## BROADCAST BAND—"AM"—ALIGNMENT PROCEDURE

1. Disconnect leads from FM-AM antenna terminal strip (labeled FM—FM—AM—AM) at back of chassis; also disconnect speaker leads and phono plugs. Remove chassis and speaker from cabinet. If desired, allow speaker to remain in cabinet and connect to receiver by extension leads.
2. Loop antenna leads (on cabinet) do not have to be connected to terminal strip on chassis while I.F. stages are being aligned. Before starting alignment of Ant., R.F., and Osc. stages, reconnect AM loop antenna leads to AM antenna terminal strip—do not attempt to use extension leads; place chassis as close as required to cabinet so that connections may be made direct to antenna terminal strip at back.
3. With the gang condenser fully meshed, dial pointer should be in the position indicated by the last division below 55 on the dial. If it is set incorrectly, hold tuning shaft steady and reposition pointer.
4. Connect an output meter across speaker voice coil, or from plate of 6V6GT tube to chassis through a 0.1 Mfd. condenser.
5. Connect ground lead of signal generator to the receiver chassis.
6. Set volume control to maximum volume position and use a weak signal from the signal generator.
7. Set band switch to the "AM" (middle) position.

| DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR | CONNECT HIGH SIDE OF SIGNAL GENERATOR TO | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|---|---|---|---|---|---|---|
| .1 MFD. Condenser | Lug on trimmer No. 6 at top of gang (see figure below for location of trimmer). | 455 KC | Any point where it does not affect the signal. | 1-2 | 2nd I.F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | 3-4 | 1st I.F. | |
| 260 MMFD. Mica Condenser | External Antenna Clip | 1500 KC | 1500 KC | 5 | Broadcast Oscillator | Adjust for maximum output. |
| 260 MMFD. Mica Condenser | External Antenna Clip | 1500 KC | Tune to 1500 Kc. generator signal. | 6 | Broadcast R.F. | Adjust for maximum output. |
| | | | | 7 | Broadcast Antenna | Adjust for maximum output. |
| 260 MMFD. Mica Condenser | External Antenna Clip | 600 KC | Tune to 600 Kc. generator signal. | 8 | Adjustable core of Broadcast R.F. Coil. | Adjust for maximum output. |
| | | | | 9 | Adjustable core of Broadcast Antenna Coil. | Adjust for maximum output. |

Repeat adjustment of trimmers 6 & 7 and slugs 8 & 9 until one no longer detunes the other.

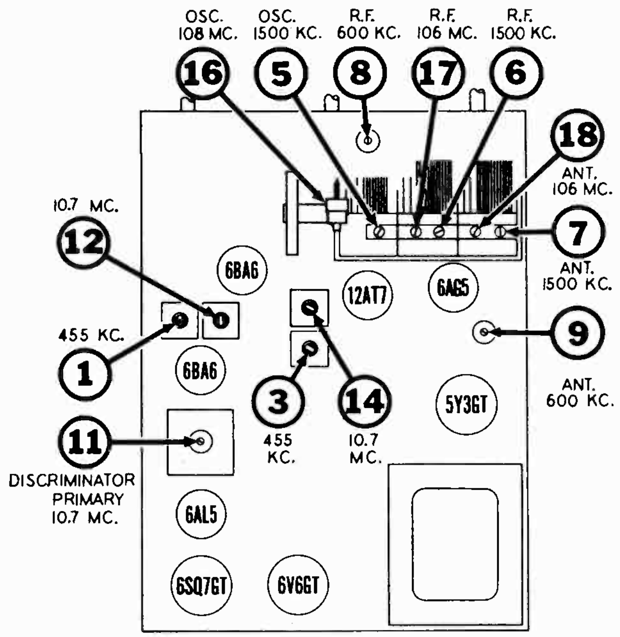



FIG. 1
Top View of Chassis

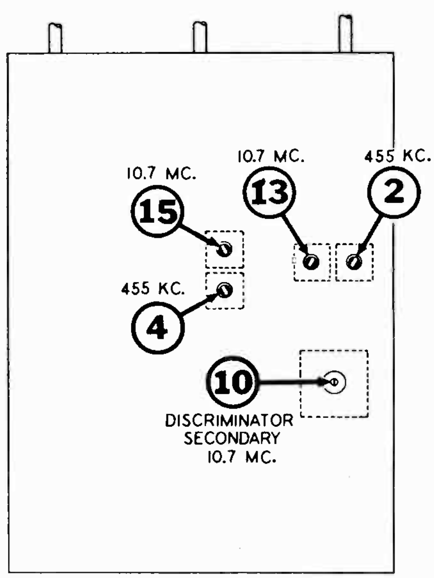
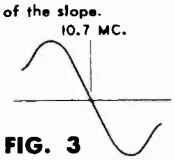



FIG. 2
Bottom View of Chassis

MODEL 9150-B

# FREQUENCY MODULATION—"FM"—ALIGNMENT PROCEDURE

1. If alignment of both AM and FM channels is required it is necessary to align the AM channel first, then align the FM channel as instructed in chart below (AM alignment procedure is given on the preceding page).
2. Disconnect all leads from antenna terminal strip (labeled FM—FM—AM—AM) at back of chassis; also disconnect speaker leads and phono plugs. Remove chassis and speaker from cabinet. If desired, allow speaker to remain in cabinet and connect to receiver by extension leads.
3. With the gang condenser fully meshed, dial pointer should be in the position indicated by the last division below 88 on the dial. If it is set incorrectly, hold tuning shaft steady and reposition pointer.
4. Set volume control at maximum volume position and use a weak signal from the signal generator.
5. Dress FM circuit leads as short and straight as possible, particularly those in the oscillator circuit. I.F. plate and grid leads should also be kept short and straight.
6. Set band switch to the FM (extreme counter-clockwise) position.

| STANDARD SIGNAL GENERATOR | | SWEEP GENERATOR | | VTVM OR OUTPUT METER CONNECTIONS | OSCILLOSCOPE CONNECTIONS | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TYPE OF ADJUSTMENT AND OUTPUT INDICATION |
|---|---|---|---|---|---|---|---|---|
| CONNECTIONS | FREQUENCY | CONNECTIONS | FREQ. | | | | | |
| Connect high side to lug on trimmer #17 (see Fig. 1 for location of trimmer) using a .01 Mfd. condenser in series with generator lead. Connect ground lead to the receiver chassis in vicinity of gang condenser. | **10.7 MC.** Unmodulated | Not used. | —— | Connect VTVM as shown in Fig. 4. | Not used. | Any position where it does not affect the signal. | **#10** Discriminator secondary<br>**#11** Discriminator primary<br>**#12-13** 2nd IF<br>**#14-15** 1st IF | Adjust these trimmers for maximum meter reading — the output voltage will be of negative polarity. |
| Same as above. | Same as above. | Not used. | —— | Connect VTVM as shown in Fig. 5. | Not used. | Same as above. | **#10** Discriminator secondary | Note that as slug #10 is rotated, a point will be found where the voltmeter will swing rather sharply from a positive to a negative reading or vice versa. The correct setting is obtained when the meter reads zero as the slug is moved thru this point. |
| Same as above. | Same as above.<br>——<br>Attenuate signal to prevent overload and distortion of response curve. | Connect high side to lug on trimmer #17 (see Fig. 1 for location of trimmer) using a .01 Mfd. condenser in series with generator lead. Connect ground lead to the receiver chassis in vicinity of gang condenser. | **10.7 MC** Sweeping ±300 Kc. | Not used. | Connect as shown in Fig. 5.<br>——<br>Set vertical amplifier of 'scope for maximum amplification.<br>——<br>Synchronize oscilloscope with sweep generator by connecting "horizontal input" terminals of 'scope to source of horizontal sweep modulating voltage on the sweep generator. | Same as above. | **#10** Discriminator secondary | A pattern similar to that shown in Fig. 3 should appear on the oscilloscope screen. Check for symmetry about the 10.7 Mc. center point and linearity of the slope.<br><br>**FIG. 3**<br>If the characteristic is not shaped properly, attempt to obtain symmetry by changing the setting of slug #10. Should that fail to produce the desired results, then a slight readjustment of slugs #11, 12, 13, 14 and 15 should be undertaken. |

MODEL 9150-B

## FREQUENCY MODULATION—"FM"—ALIGNMENT PROCEDURE (Continued)

| STANDARD SIGNAL GENERATOR | | SWEEP GENERATOR | | VTVM OR OUTPUT METER CONNECTIONS | OSCILLOSCOPE CONNECTIONS | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TYPE OF ADJUSTMENT AND OUTPUT INDICATION |
|---|---|---|---|---|---|---|---|---|
| CONNECTIONS | FREQUENCY | CONNECTIONS | FREQ. | | | | | |
| Connect generator "high" side in series with a 270 ohm carbon resistor to end terminal marked "FM" on strip at back of chassis. Generator ground lead must connect to next terminal marked "GND." | **108 MC.** with 400 cycle AM Modulation. | Not used. | — | Connect VTVM as shown in Fig. 5. | Not used. | **108 MC.** | **#16** FM Oscillator | Set trimmer #16 to receive 108 Mc. signal as indicated by maximum meter reading. |
| Same as above. | **106 MC.** with 400 cycle AM Modulation. | Not used. | — | Same as above. | Not used. | Tune to 106 Mc. generator signal. | **#13** FM RF<br>**#18** FM ANT. | Adjust trimmer for maximum meter reading. |

Check calibration and tracking of receiver with input signals of 88, 98 and 106 MC. If difference between dial pointer setting and these frequencies does not exceed ±0.3 MC. and R.F. circuit is tracking properly, then alignment may be considered satisfactory and no further adjustment is necessary. Where the calibration error is greater than ±0.3 MC., it is advisable to make the following adjustments:

Tune receiver to an 88 MC. signal and note whether dial pointer is above or below correct calibration point. Then tune receiver so that dial pointer is at the 88 MC. position. If generator signal was previously received at a setting above 88 MC., it will be necessary to slightly spread the windings of the FM oscillator coil so that signal will now be received at the correct dial setting. On the other hand, if generator signal was received at a dial setting below 88 MC., then slightly compress the windings of the oscillator coil until the signal comes in at the correct calibration point.

Check calibration at 108 MC. and if it is in error by more than ±0.3 MC., readjust setting of trimmer #16. Then repeat adjustments of trimmers #17 and 18 at 106 MC. Repeat calibration adjustment at 88, 106 and 108 MC. until desired accuracy is obtained.

Observe dial calibration at 106 MC. If it is found to be incorrect by an appreciable amount, then make a very slight adjustment in the spacing of the gang condenser plates to receive the 106 MC. signal at the correct dial setting. Then check adjustment of R.F. trimmer #17 and ANT. trimmer #18 to obtain maximum output indication at 106 MC.

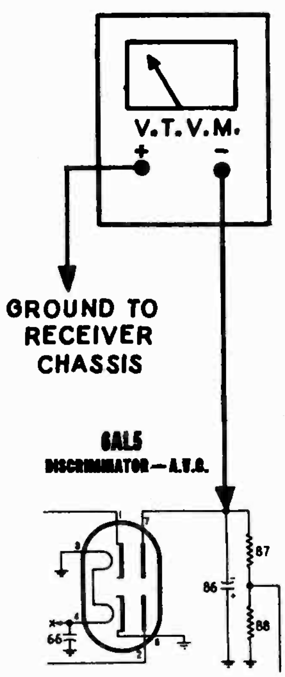



**FIG. 4**
**VTVM Connections for I.F. Alignment**

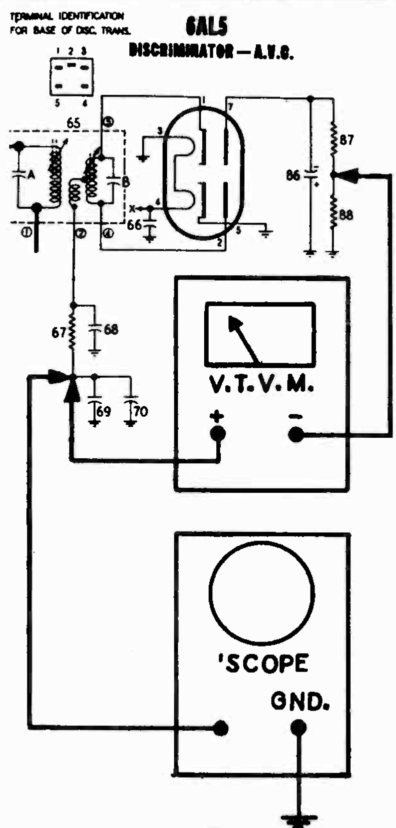
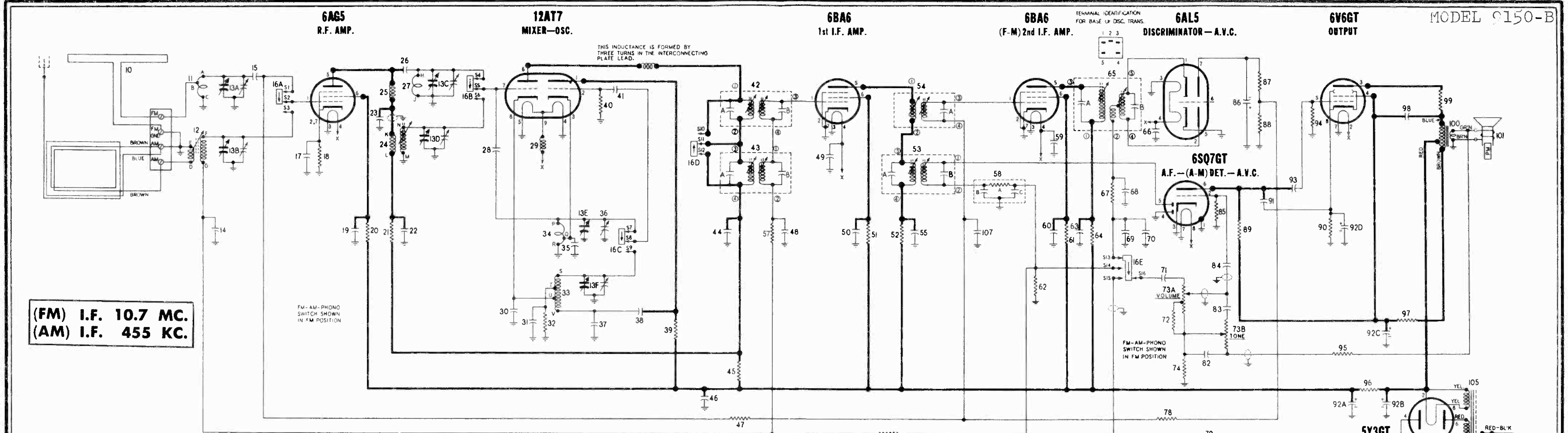



**FIG. 5**
**VTVM and Oscilloscope Connections for Discriminator Alignment**

MODEL 9150-B




# PARTS LIST

WARNING: Some parts listed below have special characteristics. Do not use substitutes for replacement purposes.

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | | **CONDENSERS** |
| 13-A to F | 506348 | Condenser—variable gang (with drum) |
| 14 | 512027 | Condenser—.05 Mfd. 200 volt |
| 15 | 513406 | Condenser—ceramic 22 Mmfd. 500 volt (Temperature compensating) |
| 17 | 513002 | Condenser—ceramic 47 Mmfd. 500 volt |
| 19 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 22 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 23 | 513002 | Condenser—ceramic 47 Mmfd. 500 volt |
| 26 | 513401 | Condenser—ceramic 5 Mmfd. ±2% 500 volt (Temperature compensating) |
| 28 | 513000 | Condenser—ceramic 1.0 Mmfd. 500 volt |
| 30 | 513007 | Condenser—ceramic 330 Mmfd. 500 volt |
| 31 | 512009 | Condenser—.01 Mfd. 200 volt |
| 35 | 513429 | Condenser—ceramic 10 Mmfd. ±10% 500 volt (Temperature compensating) |
| 36 | 506336 | Condenser—trimmer; 3 to 30 Mmfd. |
| 37 | 513442 | Condenser—ceramic 10 Mmfd. ±10% 500 volt (Temperature compensating) |
| 38 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 41 | 513409 | Condenser—ceramic 39 Mmfd. ±5% 500 volt (Temperature compensating) |
| 42-A | 506080 | Condenser—ceramic 33 Mmfd. (part of 1st FM I.F. transformer) |
| 42-B | 506080 | Condenser—ceramic 72 Mmfd. (part of 1st FM I.F. transformer) |
| 43-A, B | 506333 | Condenser—ceramic 330 Mmfd. (part of 1st AM I.F. transformer) |
| 44 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 46 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 48, 49, 50 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 53-A | 505797 | Condenser—ceramic 107 Mmfd. (part of 2nd AM I.F. transformer) |
| 53-B | 505797 | Condenser—ceramic 86 Mmfd. (part of 2nd AM I.F. transformer) |
| 54-A | 505905 | Condenser—ceramic 83 Mmfd. (part of 2nd FM I.F. transformer) |
| 55 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 58-B, C | 506338 | Condenser—ceramic 100 Mmfd. (part of diode filter unit) |
| 59, 60 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 63 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 65-A | 506332 | Condenser—ceramic 8 Mmfd. (part of discriminator transformer) |
| 65-B | 506332 | Condenser—ceramic 47 Mmfd. (part of discriminator transformer) |
| 66 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 68 | 513007 | Condenser—ceramic 330 Mmfd. 500 volt |
| 69 | 512005 | Condenser—.003 Mfd. 600 volt |
| 70 | 513003 | Condenser—ceramic 100 Mmfd. 500 volt |
| 71 | 512027 | Condenser—.05 Mfd. 200 volt |
| 76 | 512011 | Condenser—.01 Mfd. 400 volt |
| 82 | 512033 | Condenser—.1 Mfd. 200 volt |
| 83 | 512001 | Condenser—.001 Mfd. 600 volt |
| 84 | 512009 | Condenser—.01 Mfd. 200 volt |
| 86 | 504937 | Condenser—electrolytic 5 Mfd. 50 volt |
| 91 | 513008 | Condenser—ceramic 470 Mmfd. 350 volt |
| 92-A,B,C,D | 505908 | Condenser—electrolytic<br>A—30 Mfd. 450 volt<br>B—40 Mfd. 450 volt<br>C—10 Mfd. 450 volt<br>D—20 Mfd. 25 volt |

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 93 | 512009 | Condenser—.01 Mfd. 200 volt |
| 98 | 512001 | Condenser—.001 Mfd. 600 volt |
| 106 | 512256 | Condenser—.01 Mfd. 600 volt |
| 107 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| | | **RESISTORS** |
| 18 | 510117 | Resistor—carbon 82 Ohms ±10% ½ watt |
| 20 | 510164 | Resistor—carbon 33,000 Ohms ½ watt |
| 21 | 510237 | Resistor—carbon 1000 Ohms 1 watt |
| 32 | 510141 | Resistor—carbon 1800 Ohms ±10% ½ watt |
| 39 | 510237 | Resistor—carbon 1000 Ohms 1 watt |
| 40 | 510155 | Resistor—carbon 10,000 Ohms ½ watt |
| 45 | 510237 | Resistor—carbon 1000 Ohms 1 watt |
| 47 | 510167 | Resistor—carbon 47,000 Ohms ½ watt |
| 51 | 510165 | Resistor—carbon 39,000 Ohms ±10% ½ w. |
| 52 | 510237 | Resistor—carbon 1000 Ohms 1 watt |
| 56 | 510193 | Resistor—carbon 2.2 Meg. ½ watt |
| 57 | 510173 | Resistor—carbon 100,000 Ohms ½ watt |
| 58-A | 506338 | Resistor—carbon 47,000 Ohms (part of diode filter unit) |
| 61 | 510165 | Resistor—carbon 39,000 Ohms ±10% ½ w. |
| 62 | 510185 | Resistor—carbon 470,000 Ohms ½ watt |
| 64 | 510237 | Resistor—carbon 1000 Ohms 1 watt |
| 67 | 510159 | Resistor—carbon 18,000 Ohms ±10% ½ w. |
| 72 | 510170 | Resistor—carbon 68,000 Ohms ½ watt |
| 73-A, B, C | 508483 | Volume and tone control<br>A—2 Meg.<br>B—2 Meg.<br>C—"ON-OFF" switch |
| 74 | 510128 | Resistor—carbon 330 Ohms ½ watt |
| 75 | 510170 | Resistor—carbon 68,000 Ohms ½ watt |
| 77 | 510179 | Resistor—carbon 220,000 Ohms ½ watt |
| 78 | 510193 | Resistor—carbon 2.2 Meg. ½ watt |
| 85 | 510195 | Resistor—carbon 4.7 Meg. ½ watt |
| 87, 88 | 510153 | Resistor—carbon 8200 Ohms ±10% ½ watt |
| 89 | 510179 | Resistor—carbon 220,000 Ohms ½ watt |
| 90 | 510128 | Resistor—carbon 330 Ohms ½ watt |
| 94 | 510185 | Resistor—carbon 470,000 Ohms ½ watt |
| 95 | 510149 | Resistor—carbon 4700 Ohms ½ watt |
| 96 | 510732 | Resistor—wire wound 2000 Ohms ±10% 10 watts |
| 97 | 510261 | Resistor—carbon 22,000 Ohms 1 watt |
| 99 | 510113 | Resistor—carbon 47 Ohms ½ watt |
| | | **TRANSFORMERS AND COILS** |
| 10 | 508395 | Antenna—built-in (FM) |
| 11 | 506353 | Coil—FM Antenna |
| 12 | 506354 | Coil—AM Antenna |
| | 506349 | Slug core for AM antenna coil |
| 24 | 506345 | Coil—AM R.F. |
| | 506344 | Slug core for AM R.F. coil |
| 25 | 507935 | Coil—choke |
| 27 | 506351 | Coil—FM R.F. |
| 29 | 507586 | Coil—choke |
| 33 | 506335 | Coil—AM Oscillator |
| 34 | 506352 | Coil—FM Oscillator |
| 42 | 506080 | Transformer—1st FM I.F. |
| 43 | 506333 | Transformer—1st AM I.F. |
| 53 | 505797 | Transformer—2nd AM I.F. |
| 54 | 505905 | Transformer—2nd FM I.F. |
| 65 | 506332 | Transformer—discriminator |
| | 508841 | Slug core for primary or secondary of discriminator transformer |
| 100 | 508486 | Transformer—output |
| 105 | 506709 | Transformer—power |

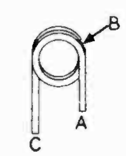
| PART NO. | DESCRIPTION |
|---|---|
| 507802 | Pull-out mechanism for record changer compartment (right side) |
| 508840 | Record changer base assembly |
| 507807 | Rod—tie; for record changer pull-out mechanism |
| 160496 | Rubber pad between dial plate and retaining bracket |
| 160496 | Rubber pad for mounting chassis |
| 118621 | Rubber pad for record changer pull-out mechanism |
| 170167 | Screw—#8-32x⅞"; for mounting chassis |
| 508480 | Socket for indicator lamp at base of cabinet (with leads) |
| 506760 | Spring—compression for record changer pull-out mechanism and radio compartment tilt mechanism |
| 506761 | Spring—tension for radio compartment tilt mechanism |
| 507821 | Spring—tension for record changer pull-out mechanism |
| 507822 | Trim strip for record changer base |
| | **MISCELLANEOUS PARTS** |
| 506369 | Background for dial (foil) |
| 301270 | Base for mounting electrolytic condenser |
| 505165 | "C" washer for tuning shaft or pointer shaft |
| 508488 | Clamp—retains dial scale |
| 506343 | Clip for mounting AM antenna or R.F. coil |
| 505101 | Clip for mounting I.F. transformer |
| 160326 | Clip—retains dial background |
| 114955 | Clip—retainer on end of dial card |
| 117057 | Cord—dial drive (3 ft. required) per ft. |
| 508481 | Dial scale—glass |
| 501031 | Plug far phano. motar cable |
| 500966 | Plug for phona. pick-up cable |
| 506370 | Painter |
| 119087 | Ring for dial cord |
| 38501 | Rubber bushing for band switch |
| 116584 | Rubber spacer for mounting dial scale |
| 503588 | Shaft and drum for dial |
| 162148 | Shaft and link assembly; Band switch |
| 508485 | Shaft—tuning |
| 506349 | Slug core for AM antenna cail |
| 506344 | Slug core for AM R.F. coil |
| 508841 | Slug core for primary or secondary of discriminator transformer |
| 505307 | Socket and phono. motor cable |
| 506372 | Socket—dial lamp; pair (with leadi |
| 504597 | Socket—miniature (7 pin) |
| 506331 | Socket—miniature (9 pin) |
| 116690 | Socket—octal base |
| 160392 | Socket—octal (rectifier) |
| 160039 | Socket—phono. plug |
| 505161 | Spring—dial cord tension |
| 505924 | Terminal strip (FM-FM-AM-AM) |
| 111456 | Washer—spring washer for tuning shaft or pointer shaft |

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | | **OTHER ELECTRICAL PARTS** |
| 16-A ta E | 506347 | Switch—FM-AM-Phono |
| 58-A, B, C | 506338 | Diode filter unit<br>A—Resistor-carbon 47,000 Ohms 1/5 watt<br>B—Condenser-ceramic 100 Mmfd. 400 volt<br>C—Condenser-ceramic 100 Mmfd. 400 volt |
| 101 | 506464 | Speaker—P.M. Dynamic (10 inch) |
| 102, 103, 104 | 118921 | Lamp—dial (Mazda 47) 6-8 volt 150 Ma. |
| | | **RECORD CHANGER PARTS** (for mechanicol parts, see record ch'g'r sec. of manual.) |
| | 508222 | Record Changer (3 speed) |
| 79 | 508432 | Crystal Cartridge |
| 80 | 508120 | Motor—115 volt 60 cycle |
| 81 | 505269 | Switch—"ON-OFF" for record changer |
| | 508434 | Needle—phonograph; for "Fine Groove" and "Microgroove" records |
| | 508433 | Needle—phonograph; for "Standard" records |
| | | **CABINET PARTS** |
| | 508217 | Bracket for mounting OFF-ON indicator lite at base of cabinet |
| | 508487 | Bracket—retains dial plate |
| | 506757 | Bracket—slide; retains radio compartment |
| | 507808 | Bracket—tie for record changer pull-out mechanism |
| | 117131 | Bull's-eye for OFF-ON indicator lite at base of cabinet |
| | 508399 | Cabinet |
| | 508499 | Catch far recard storage compartment |
| | 508495 | Daar and radia tilt campartment assembly (less hardware) |
| | 508494 | Daor far record changer campartment (less hardware) |
| | 508496 | Door for record storage compartment (less hardware) |
| | 508493 | Escutcheon—dial |
| | 506380 | Fastener for laop antenna |
| | 508497 | Handle for radio or record changer door |
| | 508498 | Handle for record storage compartment doar |
| | 506640 | Hinge—for recard storage compartment; per pair |
| | 508492 | Knob—"PHO. AM FM" |
| | 508490 | Knob—"TONE" |
| | 508491 | Knob—"TUNE" |
| | 508489 | Knob—"VOLUME-ON" |
| | 170188 | Nut—Wing #10-24; for tension adjustment of radio compartment tilt mechanism |
| | 507809 | Nut—wing #10-32; for tension adjustment on record changer pull-out mechanism |
| | 508397 | Pivot bolt for radio tilt compartment |
| | 507801 | Pull-out mechanism for record changer compartment (left side) |

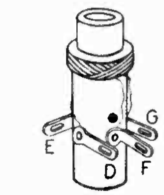
TERMINAL Q IS LOCATED ⅞ TURN FROM TERMINAL R


FM OSC. COIL 506352

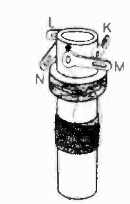
TERMINAL B IS LOCATED 1¼ TURN FROM TERMINAL A



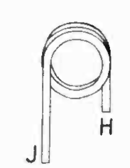

FM ANT. COIL 506353



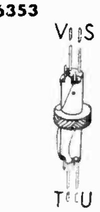

AM ANT. COIL 506354



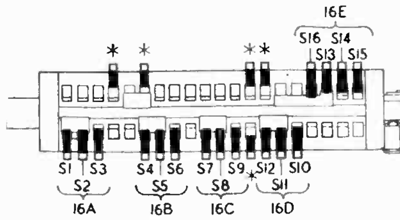

AM R.F. COIL 506345




FM R.F. COIL 506351




AM OSC. COIL 506335




★ Not used; may serve as wiring junction point.

BAND SWITCH 506347

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

## STAGE GAIN MEASUREMENT PROCEDURE

**REQUIRED INSTRUMENTS:** The amount of amplification or "gain" of each of the stages of this receiver can be measured with an A.C. Vacuum Tube Voltmeter of the high frequency type (uniform response up to 100 MC.). An AM (600 KC.) as well as an FM (98 MC.) signal source is required. For gain measurements in the FM antenna—FM converter—FM 1st I.F. stages, a microvolt calibrated FM signal generator should preferably be used.

**PROCEDURE:** It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F., I.F. and Discriminator stages are carefully and accurately aligned by utilizing the alignment procedure given on pages 1950-49 and 1950-50.

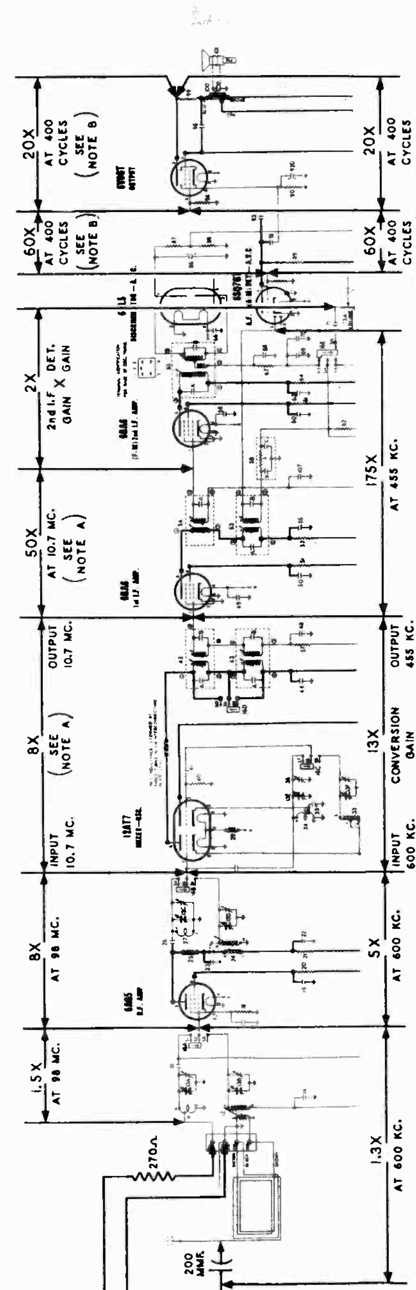
2. Connect Signal Generator as shown below. Note that generator connections differ for "AM" and "FM" measurements.

3. For "AM" measurements, set signal generator to 600 KC. (400 cycle modulation) and then carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.

4. For "FM" measurements, set signal generator to 98 MC. (400 cycle modulation with 22½ KC. deviation) and then carefully tune radio receiver to this signal by using a D.C. Vacuum Tube Voltmeter as an output indicator—meter must be connected between pin No. 7 of 6AL5 tube and chassis. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.

5. The values of stage gain which are given here were measured with a fixed bias of −3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. system. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to both A.V.C. supply lines by effecting a common connection to terminal 4 of 2nd FM I.F. transformer and junction of resistors 56 and 57. Then connect the positive battery lead to the receiver chassis.

6. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.



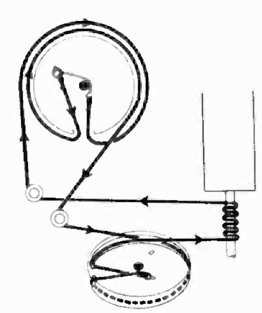

**NOTE A:** When making this measurement connect signal generator to pin 7 of 12AT7 and adjust frequency to 10.7 MC. Also short oscillator grid, pin 2, to ground so that local oscillator will be inoperative.

**NOTE B:** Tone control set to its maximum clockwise position.

**DIFFERENCES** in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

### DIAL AND POINTER DRIVE CORD ARRANGEMENT

SIDE VIEW



To string dial cord, set gang condenser to fully open position and use the following parts:
114955 Clip on end of cord
117057 Cord (3 feet)
119087 Ring for dial cord
505161 Tension spring







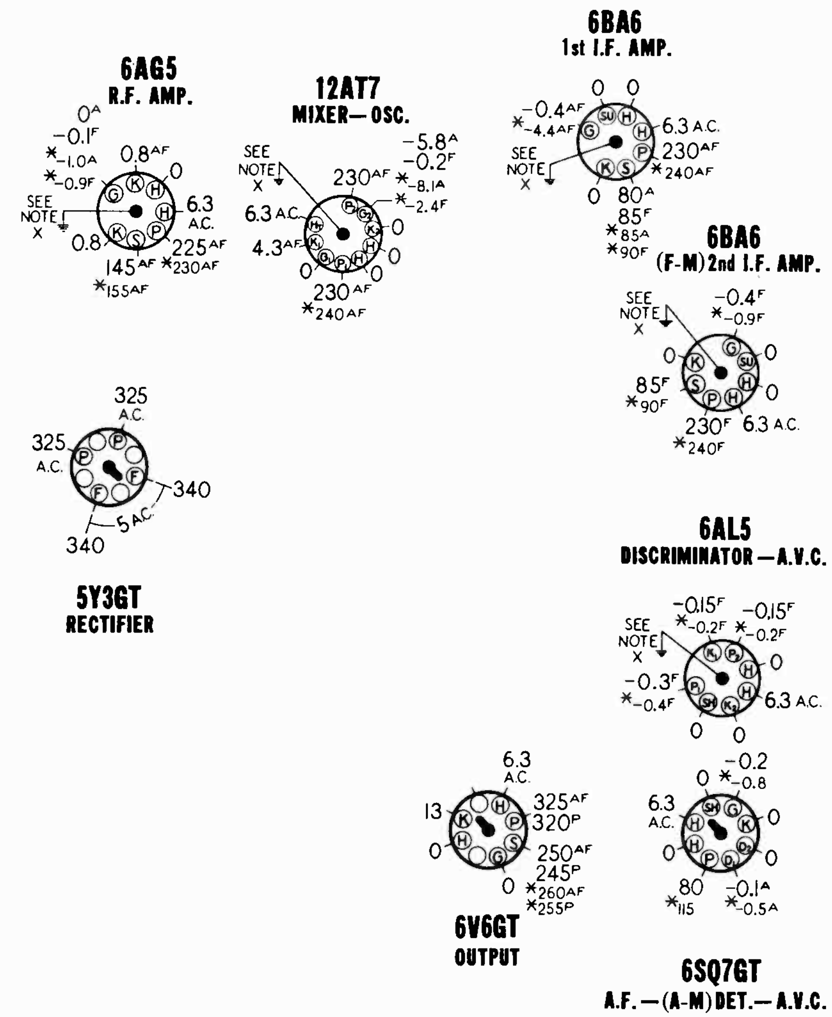
## SOCKET VOLTAGES

### THE VOLTAGE SHOWN IN THIS CHART WERE MEASURED UNDER THE FOLLOWING CONDITIONS

1. Power Supply—117 volts 60 cycles A.C.
2. All voltages are measured between socket terminals and chassis unless otherwise indicated on the chart.
3. All measurements made with a voltmeter having a sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
4. Where a particular voltage is dependent upon band switch position, the value shown on the chart carries a letter suffix which is interpreted as follows (no suffix letter indicates that voltage is the same for any of the three switch positions).
   "A" indicates band switch set to "AM" (center) position.
   "F" indicates band switch set to "FM" (counter-clockwise) position.
   "P" indicates band switch set to "PHO" (clockwise) position.
5. When measuring FM voltages, receiver should be tuned to 88 Mc.
6. When measuring AM voltages, receiver should be tuned to 540 Kc.
7. All terminals on strip labeled "FM—FM—AM—AM" at rear of chassis are shorted together by using a jumper wire.
8. Volume control set to maximum position with no signal.
9. Tone control set to maximum clockwise position.

### BOTTOM VIEW OF CHASSIS

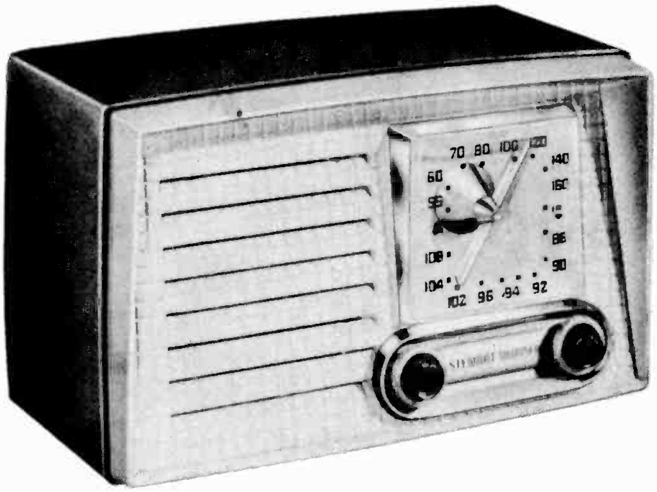
117 VOLT 60 CYCLE A.C.
POWER SUPPLY USED
FOR THESE MEASUREMENTS.
ALL VOLTAGES MEASURED BETWEEN
SOCKET TERMINALS AND CHASSIS
UNLESS OTHERWISE INDICATED.




REAR OF CHASSIS

**NOTE X:** Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

MODEL 9151-A



## GENERAL SPECIFICATIONS

**SPEAKER:**

6 inch P-M Dynamic

Voice coil impedance—3.2 ohms

**POWER OUTPUT:**

Undistorted—1.2 watts

Maximum—2.3 watts

**ANTENNAS:**

AM—High impedance loop

FM—Built-in line cord type

**WEIGHT:**

13 pounds

**DIMENSIONS:**

Length—15"

Heigth—9¼"

Depth—8¼"

**FREQUENCY RANGES:**

AM—540 to 1700 KC.

FM—88 to 108 MC.

**TUNING CAPACITOR:**

4 section gang (2-AM and 2-FM) rigid mounting.

**I.F. FREQUENCY:**

AM—455 KC.

FM—10.7 MC.

**POWER SUPPLY:**

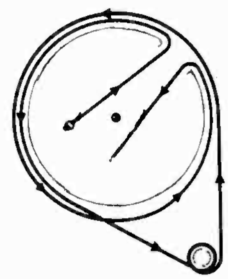
117 volts A.C. or D.C.

40 watts

## HOW TO REMOVE CHASSIS FROM CABINET

1. Remove all knobs by pulling them forward.
2. Take off dial scale by pressing down on top center of plastic dial enclosure and at the same time pulling it forward.
3. Remove pointer by pulling it forward.
4. Remove cabinet back by taking out three screws and two clips. Note: Cabinet back has a power cord interlock which is automatically disconnected when back is removed.
5. Take out two chassis mounting screws at bottom of cabinet. Chassis may now be readily removed by sliding it out of cabinet.
6. When replacing cabinet back be sure that it is parallel to loop and power cord interlock plug fits into socket on chassis.

## DIAL POINTER DRIVE CORD ARRANGEMENT



To string dial cord, turn the main drive drum to maximum counter-clockwise position and use following parts:

114955 Clip on end of cord
117057 Cord (3½ ft. required)
119087 Ring for dial cord
161384 Spring

## SOCKET VOLTAGES

### THE VOLTAGES SHOWN IN THIS CHART WERE MEASURED UNDER THE FOLLOWING CONDITIONS

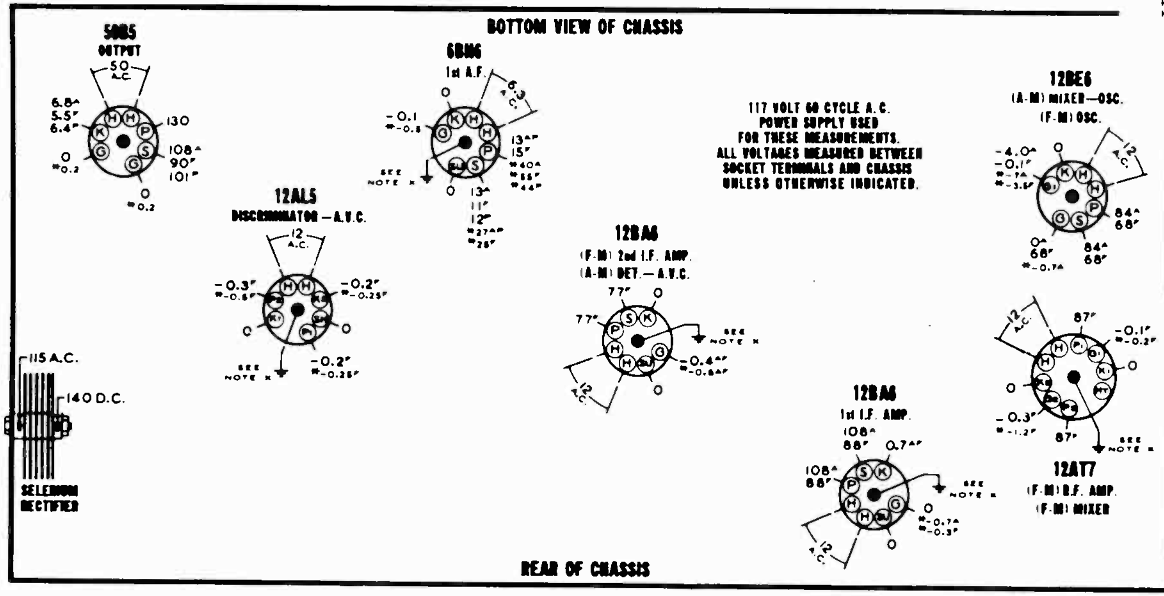
1. Power Supply—117 volts 60 cycles A.C.
2. All voltages are measured between socket terminals and chassis unless otherwise indicated on the chart.
3. All measurements made with a voltmeter having a sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
4. Where a particular voltage is dependent upon band switch position, the value shown on the chart carries a letter suffix which is interpreted as follows:
   "A" indicates band switch set to "AM" (counter-clockwise) position.
   "F" indicates band switch set to "FM" (center) position.
   "P" indicates band switch set to "PHO" (clockwise) position.
   No suffix letter indicates that voltage is the same for any of the three switch positions.
5. When measuring FM voltages, receiver should be tuned to 88 Mc.
6. When measuring AM voltages, receiver should be tuned to 540 Kc.
7. Terminals on AM loop antenna are shorted together.
8. Built-in FM antenna lead is disconnected from the "FM ANT." terminal.
9. Volume control set to maximum with no signal.

# STAGE GAIN MEASUREMENT PROCEDURE

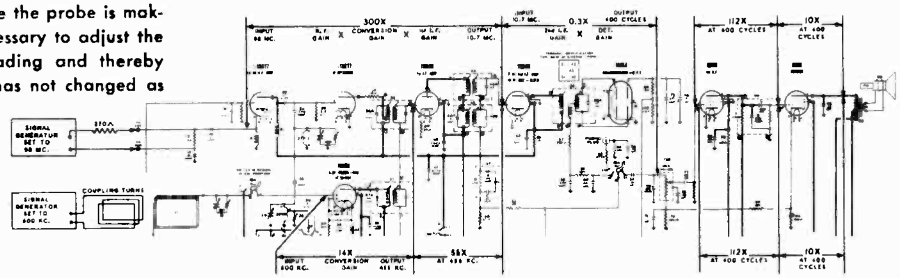
**REQUIRED INSTRUMENTS:** The amount of amplification or "gain" of each of the stages of this receiver should be measured with an A. C. Vacuum Tube Voltmeter of the high frequency type (uniform response up to 100 MC). A conventional "AM" type signal generator may be used but it must be capable of producing **fundamental** frequencies of 600 KC. and 98 MC—**avoid using a generator that produces the 98 MC. signal by means of harmonics.**

**PROCEDURE:** It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F., I.F. and Discriminator stages are carefully and accurately aligned by utilizing the alignment procedure given on page 1950-7.
2. Connect Signal Generator as shown below. Note that generator connections differ for "AM" and "FM" measurements.
3. For "AM" measurements, set signal generator to 600 KC. and then carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
4. For "FM" measurements, set signal generator to 98 MC. and then carefully tune radio receiver to this signal by using a D. C. Vacuum Tube Voltmeter as an output indicator—meter must be connected between pin 2 of 12AL5 tube and chassis ground. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. The values of stage gain which are given here were measured with a fixed bias of 3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to A.V.C. at terminal 3 of the 1st AM I.F. transformer and connect the positive battery lead to chassis ground.
6. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.




**NOTE X:** Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

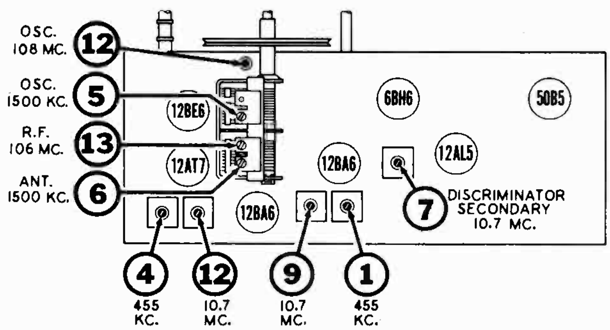



**DIFFERENCES** in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies from the values shown above.

# BROADCAST BAND—"AM"—ALIGNMENT PROCEDURE

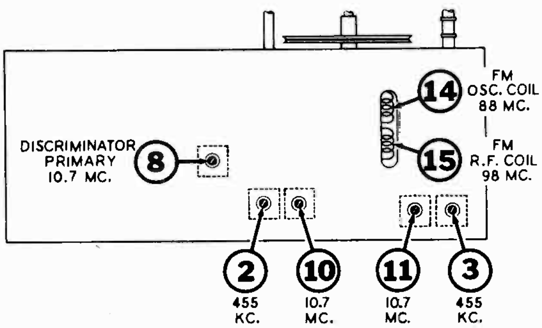
1. If alignment of both AM and FM channels are required, it is advisable to align the AM channel first; then align the FM channel as instructed on Page 1950-7.
2. Remove chassis and loop antenna (which is mounted to chassis) from cabinet by following procedure outlined on Page 1950-3. Allow loop to remain attached to chassis.
3. In order to provide a coupling for signal generator during R.F. alignment as instructed in chart below, wind several turns of wire in a circular shape so that it may be placed adjacent and parallel to the loop.
4. Connect an output meter across the speaker voice coil or from the plate of the 50B5 tube to chassis through a 0.1 Mfd. condenser.
5. Set band switch to the "AM" (counter-clockwise) position.
6. Set volume control at maximum and use a weak signal from the signal generator.
7. Since the dial scale is a part of the cabinet, when completely assembled, it becomes necessary to provide a temporary means of locating the dial to obtain calibration points. Rotate gang condenser fully counter-clockwise and replace pointer so that it is **parallel** with base of the chassis. Now, hold dial scale in front of pointer in such a position that the ends of the indicator point to the "AM" and "FM" markers. While holding the dial scale in this position, rotate tuning sleeve until pointer indicates desired frequency.

| SIGNAL GENERATOR CONNECTIONS: CONNECT HIGH SIDE OF SIGNAL GENERATOR TO | SIGNAL GENERATOR CONNECTIONS: CONNECT GROUND LEAD OF SIGNAL GENERATOR TO | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|---|---|---|---|---|---|---|
| Lug on trimmer #6 at top of gang (see figure 1 for location of trimmer). | Chassis ground. CAUTION: If your signal generator is designed with an AC-DC type power supply, connect ground lead of signal generator to receiver chassis through a .25 Mfd. condenser. | 455 KC | Any point where it does not affect the signal. | 1 and 2 | 2nd I.F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | 3 and 4 | 1st I.F. | |
| Connect directly to coupling turn. See Step 3 above for instruction on coupling loop. | | 1500 KC | 1500 KC See Step 7 above for instructions on how to obtain this calibration point. | 5 | AM Oscillator | Adjust for maximum output. |
| Connect directly to coupling turn. See Step 3 above for instruction on coupling loop. | | 1500 KC | Tune to 1500 Kc. generator signal. | 6 | AM Antenna | Adjust for maximum output. |




Top View of Chassis

FIG. 1




Bottom View of Chassis

FIG. 2

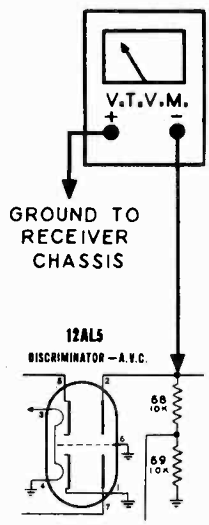



FIG. 3
VTVM Connections for IF Alignment

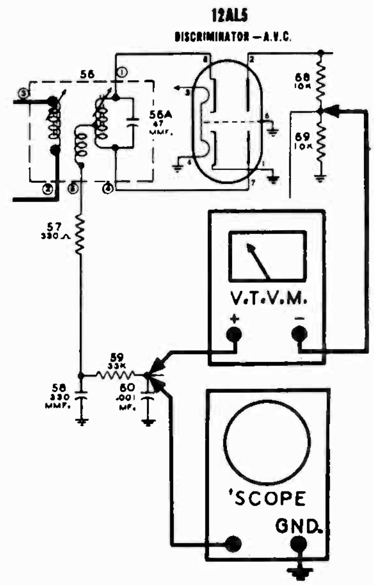
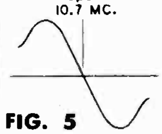



FIG. 4
VTVM and Oscilloscope Connections for Discriminator Alignment

MODEL 9151-A

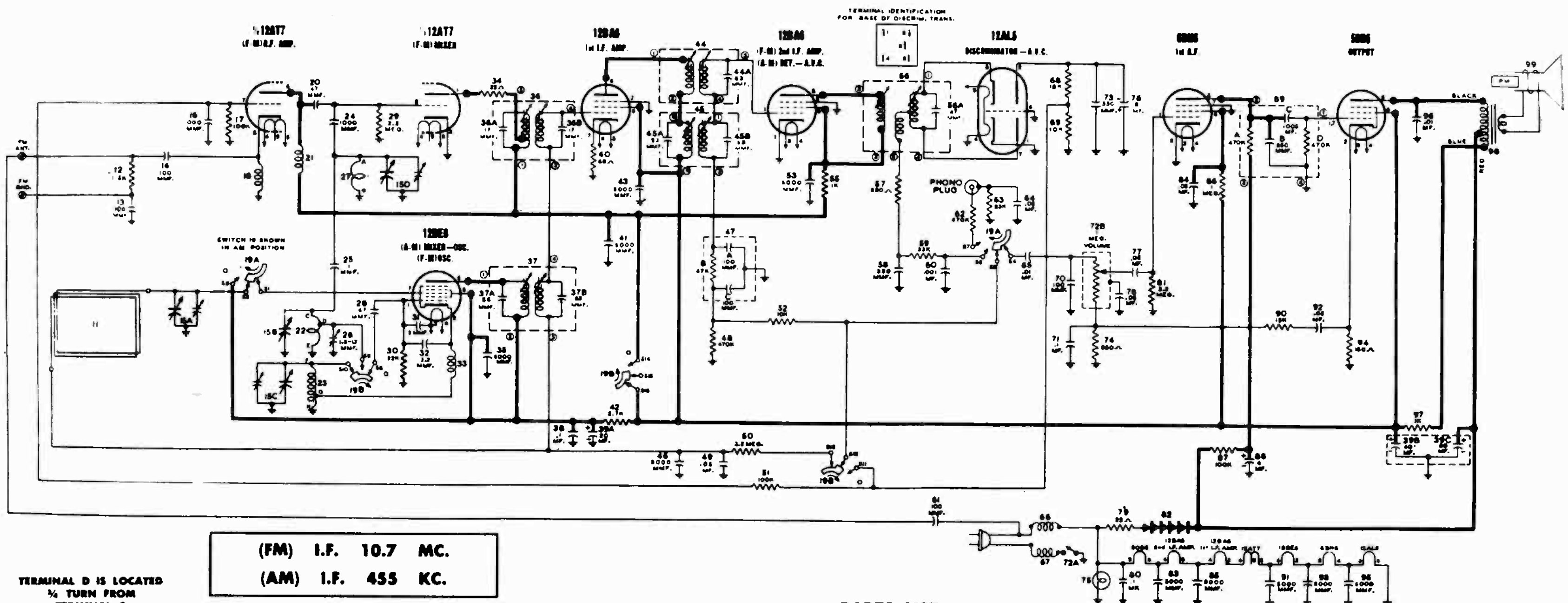
# FREQUENCY MODULATION—"FM"—ALIGNMENT PROCEDURE

1. If alignment of both AM and FM channels are required it is advisable to align the AM channel first as instructed in chart on Page 1950-6. Then, accomplish FM channel alignment by using the procedure outlined in the chart below.
2. Remove chassis and loop antenna (which is mounted to chassis) from cabinet by following procedure outlined on Page 1950-3. Allow loop to remain attached to chassis.
3. Disconnect built-in FM lead from "FM ANT." terminal at back of chassis.
4. Set band switch to the "FM" (middle) position.
5. Set volume control at maximum and use a weak signal from the signal generator.
6. Dress FM circuit leads as short and straight as possible, particularly those in the oscillator circuit. IF plate and grid leads should also be kept short and straight.
7. Since the dial scale is a part of the cabinet, when completely assembled, it becomes necessary to provide a temporary means of locating the dial to obtain calibration points. Rotate gang condenser fully counter-clockwise and replace pointer so that it is **parallel** with base of the chassis. Now, hold dial scale in front of pointer in such a position that the ends of the indicator point to the "AM" and "FM" markers. While holding the dial scale in this position, rotate tuning sleeve until pointer indicates desired frequency.

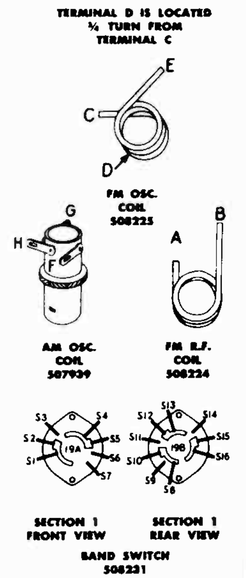
| STANDARD SIGNAL GENERATOR | | SWEEP GENERATOR | | VTVM OR OUTPUT METER CONNECTION | OSCILLOSCOPE CONNECTIONS | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TYPE OF ADJUSTMENT AND OUTPUT INDICATION |
|---|---|---|---|---|---|---|---|---|
| CONNECTIONS | FREQUENCY | CONNECTIONS | FREQ. | | | | | |
| Connect high side to lug on trimmer #13 (see Fig. 1 for location of trimmer) using a .01 Mfd. condenser in series with generator lead. Connect ground lead to the receiver chassis in vicinity of gang condenser.<br>CAUTION: If your signal generator is designed with an AC-DC type power supply, connect ground lead of signal generator to receiver chassis through a .25 Mfd. condenser. | 10.7 MC.<br>Unmodulated | Not used. | —— | Connect VTVM as shown in Fig. 3. | Not used. | Any position where it does not affect the signal. | #7 Discriminator secondary<br>#8 Discriminator primary<br>#9—10 2nd IF<br>#11—12 1st IF | Adjust these trimmers for maximum meter reading — the output voltage will be of negative polarity. |
| Same as above. | Same as above. | Not used. | —— | Connect VTVM as shown in Fig. 4. | Not used. | Same as above. | #7 Discriminator secondary | Note that as slug #7 is rotated, a point will be found where the voltmeter will swing rather sharply from a positive to a negative reading or vice versa. The correct setting is obtained when the meter reads zero as the slug is moved thru this point. |
| Same as above. | Same as above.<br>Attenuate signal to prevent overload and distortion of response curve. | Connect high side to lug on trimmer #13 (see Fig. 1 for location of trimmer) using a .01 Mfd. condenser in series with generator lead. Connect ground lead to the receiver chassis in vicinity of gang condenser.<br>CAUTION: If your signal generator is designed with an AC-DC type power supply, connect ground lead of signal generator to receiver chassis through a .25 Mfd. condenser. | 10.7 MC<br>Sweeping ±300 Kc. | Not used. | Connect as shown in Fig. 4.<br>Set vertical amplifier of 'scope for maximum amplification.<br>Synchronize oscilloscope with sweep generator by connecting "horizontal input" terminals of 'scope to source of horizontal sweep modulating voltage on the sweep generator. | Same as above. | #7 Discriminator secondary | A pattern similar to that shown in Fig. 5 should appear on the oscilloscope screen. Check for symmetry about the 10.7 Mc. center point and linearity of the slope.<br>10.7 MC.<br><br>FIG. 5<br>If the characteristic is not shaped properly, attempt to obtain symmetry by changing the setting of slug #7. Should that fail to produce the desired results, then a slight readjustment of slugs #8, 9, 10, 11 and 12 should be undertaken. |
| Connect high side in series with a 270 ohm carbon resistor to "FM ANT." terminal at rear of chassis. Connect ground lead to "FM GND." terminal. | 108 MC.<br>with 400 cycle AM Modulation. | Not used. | —— | Connect VTVM as shown in Fig. 3. | Not used. | 108 Mc. See Step 7 above for instructions on how to obtain this calibration point. | #12 FM Oscillator | Set trimmer #12 to receive 108 Mc. signal as indicated by maximum meter reading. |
| Same as above. | 108 MC.<br>with 400 cycle AM Modulation. | Not used. | —— | Same as above. | Not used. | Tune to 108 Mc. generator signal. | #13 FM RF | Adjust trimmer for maximum meter reading. |

Check calibration and tracking of receiver with input signals of 88 and 98 MC. If difference between dial pointer setting and the above mentioned frequencies does not exceed ±0.3 MC. and RF circuit is tracking properly then alignment may be considered satisfactory and no further adjustment is necessary.
Where the calibration error is greater than ±0.3 MC. it is advisable to make the following adjustments:
Tune receiver to an 88 MC. signal and note whether dial pointer is above or below correct calibration point. Then tune receiver so that dial pointer is at the 88 MC. position. If generator signal was previously received at a setting above 88 MC., it will be necessary to slightly spread the windings of the FM oscillator coil (#14 in Fig. 2) so that signal will now be received at the correct dial setting. On the other hand, if generator signal was received at a dial setting below 88 MC., then slightly compress the windings of the oscillator coil until the signal comes in at the correct calibration point.
Check calibration at 108 MC. and if it is in error by more than ±0.3 MC., readjust setting of trimmer # 12. Repeat calibration adjustment at 88 and 108 MC. until desired accuracy is obtained.
Observe dial calibration at 98 MC. If it is found to be incorrect by an appreciable amount, then make a very slight adjustment in the spacing of the gang condenser plates to receive the 98 MC. signal at the correct dial setting. Then check adjustment of RF trimmer #13 to obtain maximum output indication at 98 MC.

MODEL 9151-A




(FM) I.F. 10.7 MC.
(AM) I.F. 455 KC.



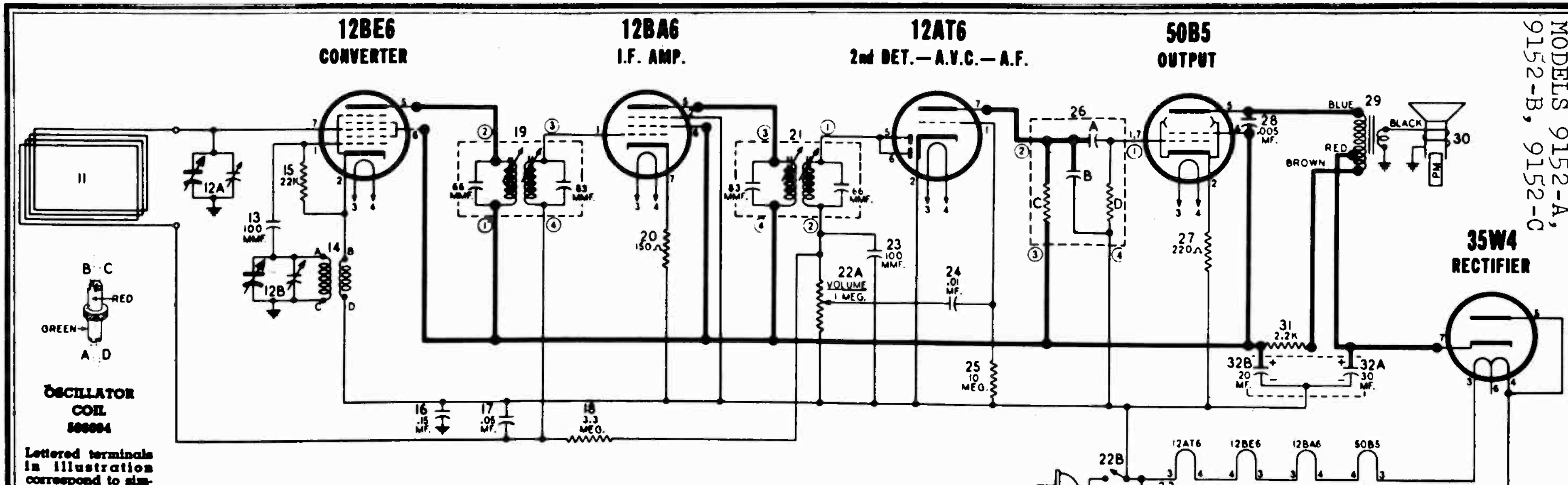

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

## PARTS LIST

WARNING: Some parts listed below have special characteristics. Do not use substitutes for replacement purposes.

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | | **CONDENSERS** |
| 13, 14 | 513003 | Condenser—ceramic 100 Mmfd. 500 volt |
| 15-A to D | 508253 | Condenser—variable gang (includes drum) |
| 16 | 513009 | Condenser—ceramic 1000 Mmfd. 500 volt |
| 20 | 513002 | Condenser—ceramic 47 Mmfd. 500 volt |
| 24 | 513009 | Condenser—ceramic 1000 Mmfd. 500 volt |
| 25 | 513000 | Condenser—ceramic 1.0 Mmfd. 500 volt |
| 26 | 507940 | Condenser—trimmer 1.5-12 Mmfd. |
| 28 | 513002 | Condenser—ceramic 47 Mmfd. 500 volt |
| 31 | 513400 | Condenser—ceramic 3 Mmfd. ±15% 500 v. (Temperature compensating) |
| 32 | 513001 | Condenser—ceramic 2.2 Mmfd. 500 volt |
| 35 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 36-A, B | 507943 | Condenser—ceramic 17 Mmfd. (part of 1st FM I.F. transformer) |
| 37A | 505867 | Condenser—ceramic 66 Mmfd. (part of 1st AM I.F. transformer) |
| 37B | 505867 | Condenser—ceramic 83 Mmfd. (part of 1st AM I.F. transformer) |
| 38 | 512033 | Condenser—.1 Mfd. 200 volt |
| 39-A, B, C | 507947 | Condenser—electrolytic A—20 Mfd. 150 volt; B—40 Mfd. 150 volt; C—80 Mfd. 150 volt |
| 41 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 43 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 44-A | 505905 | Condenser—ceramic 83 Mmfd. (part of 2nd FM I.F. transformer) |
| 45-A | 505867 | Condenser—ceramic 83 Mmfd. (part of 2nd AM I.F. transformer) |
| 45-B | 505867 | Condenser—ceramic 66 Mmfd. (part of 2nd AM I.F. transformer) |
| 46 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 47-A | 506338 | Condenser—ceramic 100 Mmfd. 400 volt (part of diode filter unit) |
| 47-C | 506338 | Condenser—ceramic 100 Mmfd. 400 volt (part of diode filter unit) |
| 49 | 512027 | Condenser—.05 Mfd. 200 volt |
| 53 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 56-A | 507945 | Condenser—ceramic 47 Mmfd. (part of discriminator transformer) |
| 58 | 513007 | Condenser—ceramic 330 Mmfd. 500 volt |
| 60 | 512001 | Condenser—.001 Mfd. 600 volt |
| 61 | 513003 | Condenser—ceramic 100 Mmfd. 500 volt |
| 64 | 512015 | Condenser—.02 Mfd. 200 volt |
| 65 | 512009 | Condenser—.01 Mfd. 200 volt |
| 70 | 513003 | Condenser—ceramic 100 Mmfd. 500 volt |
| 71 | 512033 | Condenser—.1 Mfd. 200 volt |
| 73 | 513007 | Condenser—ceramic 330 Mmfd. 500 volt |
| 76 | 507946 | Condenser—electrolytic 3 Mfd. 50 volt |
| 77 | 512027 | Condenser—.05 Mfd. 200 volt |
| 78 | 512027 | Condenser—.05 Mfd. 200 volt |
| 80 | 512037 | Condenser—.1 Mfd. 600 volt |
| 83 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 84 | 512027 | Condenser—.05 Mfd. 200 volt |
| 85 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 88 | 502547 | Condenser—electrolytic 4 Mfd. 150 volt |
| 89-B | 505858 | Condenser—ceramic 250 Mmfd. 450 volt (part of audio coupling unit) |
| 89-C | 505858 | Condenser—ceramic .005 Mfd. 450 volt (part of audio coupling unit) |
| 91 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 92 | 512027 | Condenser—.05 Mfd. 200 volt |
| 93 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 95 | 513013 | Condenser—ceramic 5000 Mmfd. 450 volt |
| 96 | 512011 | Condenser—.01 Mfd. 400 volt |
| | | **RESISTORS** |
| 12 | 510139 | Resistor—carbon 1500 Ohms ±10% ½ w |
| 17 | 510173 | Resistor—carbon 100,000 Ohms ½ watt |
| 29 | 510193 | Resistor—carbon 2.2 Meg. ½ watt |
| 30 | 510161 | Resistor—carbon 22,000 Ohms ½ watt |
| 34 | 510106 | Resistor—carbon 22 Ohms ±10% ½ w |
| 40 | 510116 | Resistor—carbon 68 Ohms ½ watt |
| 42 | 510144 | Resistor—carbon 2700 Ohms ±10% ½ w |
| 47-B | 506338 | Resistor—carbon 47,000 Ohms (part of diode filter unit) |
| 48 | 510185 | Resistor—carbon 470,000 Ohms ½ watt |
| 50 | 510193 | Resistor—carbon 2.2 Meg. ½ watt |
| 51 | 510173 | Resistor—carbon 100,000 Ohms ½ watt |
| 52 | 510155 | Resistor—carbon 10,000 Ohms ½ watt |
| 55 | 510137 | Resistor—carbon 1000 Ohms ½ watt |
| 57 | 510128 | Resistor—carbon 330 Ohms ½ watt |
| 59 | 510164 | Resistor—carbon 33,000 Ohms ½ watt |
| 62 | 510185 | Resistor—carbon 470,000 Ohms ½ watt |
| 63 | 510164 | Resistor—carbon 33,000 Ohms ½ watt |
| 68, 69 | 510154 | Resistor—carbon 10,000 Ohms ±10% ½ w |
| 72-A, B | 508229 | Volume control—1 Meg. (with switch) |
| 74 | 510132 | Resistor—carbon 560 Ohms ±10% ½ w |
| 79 | 510207 | Resistor—carbon 22 Ohms 1 watt |
| 81 | 510193 | Resistor—carbon 2.2 Meg. ½ watt |
| 86 | 510191 | Resistor—carbon 1 Meg. ½ watt |
| 87 | 510173 | Resistor—carbon 100,000 Ohms ½ watt |
| 89-A | 505858 | Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit) |
| 89-D | 505858 | Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit) |
| 90 | 510158 | Resistor—carbon 15,000 Ohms ½ watt |
| 94 | 510222 | Resistor—carbon 150 Ohms 1 watt |
| 97 | 510337 | Resistor—carbon 1000 Ohms 2 watt |
| | | **COILS AND TRANSFORMERS** |
| 11 | 508234 | Loop antenna |
| 18 | 507586 | Coil—choke |
| 21 | 507935 | Coil—choke |
| 22 | 508225 | Coil—FM oscillator |
| 23 | 507939 | Coil—AM oscillator |
| 27 | 508224 | Coil—FM R.F. |
| 33 | 507586 | Coil—choke |
| 36 | 507943 | Transformer—1st FM I.F. |
| 37 | 505867 | Transformer—1st AM I.F. |
| 44 | 505905 | Transformer—2nd FM I.F. |
| 45 | 505867 | Transformer—2nd AM I.F. |
| 56 | 507945 | Transformer—discriminator |
| 66, 67 | 507934 | Coil—choke |
| 98 | 507937 | Transformer—output |
| | | **OTHER ELECTRICAL PARTS** |
| 19-A, B | 508231 | Switch—PHO-FM-AM |
| 47-A, B, C | 506338 | Diode Filter Unit: A—Condenser—ceramic 100 Mmfd. 400 volt; B—Resistor—carbon 47,000 Ohms 1/5 watt; C—Condenser—ceramic 100 Mmfd. 400 volt |
| 75 | 506183 | Lamp—dial 115 volt, 10 watt |
| 89-A to D | 505858 | Audio Coupling Unit: A—Resistor—carbon 470,000 Ohms 1/5 watt; B—Condenser—ceramic 250 Mmfd. 450 volt; C—Condenser—ceramic .005 Mfd. 450 volt; D—Resistor—carbon 470,000 Ohms 1/5 watt |
| 82 | 504972 | Rectifier—selenium |
| 99 | 508226 | Speaker—P.M. Dynamic (6") |
| | | **MISCELLANEOUS PARTS** |
| | 508237 | Back for cabinet (less power cord) |
| | 162106 | Bracket and shield for dial light mounting |
| | 508710 | Cabinet |
| | 506343 | Clip for mtg. AM oscillator coil |
| | 505101 | Clip for mtg. I.F. transformer and FM sound discriminator |
| | 508233 | Clip—mounts electrolytic condenser |
| | 114955 | Clip—retainer on end of dial cord |
| | 508235 | Clip—retains cabinet back & loop antenna |
| | 506431 | Clip—retains tuning sleeve |
| | 117057 | Cord—dial drive (3½ ft. required) |
| | 508236 | Dial scale (plastic) |
| | 508248 | Escutcheon—for controls |
| | 508230 | Insulator insert for control shaft |
| | 508221 | Insulator insert for mounting chassis |
| | 508227 | Insulator insert for power cord interlock socket |
| | 508240 | Knob—"PHO FM AM" (brown) |
| | 508239 | Knob—"TUNE" (tan) |
| | 508238 | Knob—"VOLUME OFF" (brown and tan) |
| | 508241 | Pointer |
| | 507699 | Power cord assembly (includes plugs at both ends) |
| | 119087 | Ring for dial cord |
| | 170818 | Screw—#8-32 x ⅜"; mounts chassis |
| | 508232 | Sleeve, tuning |
| | 506460 | Socket—dial light (with leads) |
| | 507932 | Socket—male, power cord interlock |
| | 507364 | Socket—miniature (7 pin) |
| | 506576 | Socket—miniature (7 pin) (for 6BE6) |
| | 506331 | Socket—miniature (9 pin) (for 12AT7) |
| | 161384 | Spring—dial cord tension |
| | 507933 | Terminal strip—antenna connections and phono socket |

MODELS 9152-A, 9152-B, 9152-C

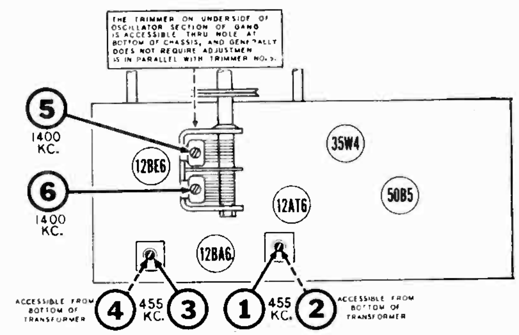



# ALIGNMENT PROCEDURE

1. Remove chassis and loop antenna (mounted to chassis) from cabinet allow loop to remain attached to chassis.
2. Replace the dial scale on the shaft of the gang condenser.
3. Since the "position indicator" for the dial scale is an integral part of the cabinet, it becomes necessary to install a "temporary pointer" when the chassis is removed from the cabinet. This can readily be accomplished by securing a piece of heavy wire under the right front gang condenser mounting screw and shaping the free end of the wire so that it can be placed in a vertical position directly in front of the dial scale. With the gang condenser fully meshed, the "temporary pointer" should appear directly in front of the fine line preceding "55" on the dial scale.
4. Couple the signal generator to the receiver by connecting its output to several turns of wire formed in a circular shape so that it may be placed adjacent and parallel to the receiver loop antenna.
5. Connect an output meter across the speaker voice coil or from the plate of the 50B5 tube to B through a 0.1 Mfd. condenser.
6. Set volume control at maximum volume position and use a weak signal from the signal generator.

**I.F. 455 KC.**

| DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR | SIGNAL GENERATOR CONNECTION | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|---|---|---|---|---|---|---|
| None | Connect directly to coupling turn as instructed in Step 4 above | 455 KC | Any point where it does not affect the signal. | 1-2 | 2nd I.F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | 3-4 | 1st I.F. | |
| None | Connect directly to coupling turn as instructed in Step 4 above | 1400 KC | 1400 KC | 5 | Broadcast Oscillator | Adjust for maximum output. |
| None | Connect directly to coupling turn as instructed in Step 4 above | 1400 KC | Tune to 1400 KC generator signal. | 6 | Broadcast Antenna | Adjust for maximum output. |




TRIMMER LOCATIONS

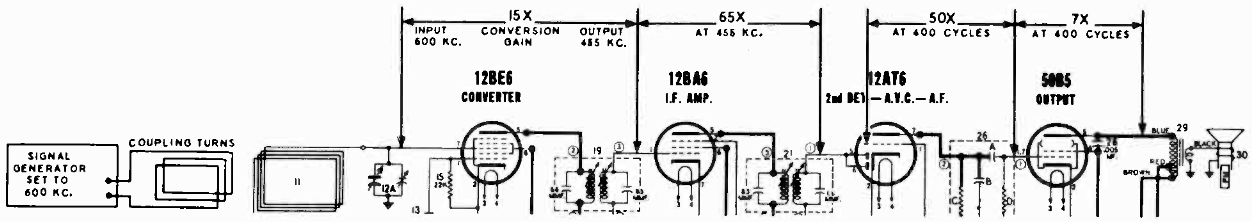
MODELS 9152-A, 9152-B, 9152-C

# STAGE GAIN MEASUREMENT PROCEDURE

REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given above.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to A.V.C. at terminal #4 of the 1st I.F. transformer and connect the positive battery lead to B— in receiver chassis.
4. Set Signal Generator for operation at 600 Kc with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.




DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

## PARTS LIST

**ORDER PARTS FROM YOUR STEWART-WARNER DISTRIBUTOR ONLY**

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | | **CONDENSERS** |
| 12-A, B | 508143 | Condenser—variable gang (with drum) |
| 13 | 512503 | Condenser—mica 100 Mmfd. 500 volt |
| 16 | 512040 | Condenser—.15 Mfd. 400 volt |
| 17 | 512028 | Condenser—.05 Mfd. 400 volt |
| 23 | 512503 | Condenser—mica 100 Mmfd. 500 volt |
| 24 | 512010 | Condenser—.01 Mfd. 400 volt |
| 26-A | 505858 | Condenser—ceramic .005 Mfd. 450 volt (part of audio coupling unit) |
| 26-B | 505858 | Condenser—ceramic 250 Mmfd. 450 volt (part of audio coupling unit) |
| 28 | 512006 | Condenser—.005 Mfd. 600 volt |
| 32-A, B | 508147 | Condenser—electrolytic A—30 Mfd. 150 volt; B—20 Mfd. 150 volt |
| 33 | 512030 | Condenser—.05 Mfd. 600 volt |
| | | **RESISTORS** |
| 15 | 510161 | Resistor—carbon 22,000 Ohms ½ watt |
| 18 | 510194 | Resistor—carbon 3.3 Meg. ½ watt |
| 20 | 510122 | Resistor—carbon 150 Ohms ½ watt |
| 22-A, B | 508087 | Volume control 1 Meg. (with switch) |
| 25 | 510197 | Resistor—carbon 10 Meg. ½ watt |
| 26-C, D | 505858 | Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit) |
| 27 | 510125 | Resistor—carbon 220 Ohms ½ watt |
| 31 | 510243 | Resistor—carbon 2,200 Ohms 1 watt |
| | | **OTHER ELECTRICAL PARTS** |
| 11 | 508148 | Loop Antenna |
| 14 | 508094 | Coil—oscillator |
| 19 | 505867 | Transformer—1st I.F. |
| 21 | 505867 | Transformer—2nd I.F. |
| 26 | 505858 | Audio coupling unit: A—Condenser—ceramic .005 Mfd. 450 volt; B—Condenser—ceramic 250 Mmfd. 450 volt; C—Resistor—carbon 470,000 Ohms 1/5 watt; D—Resistor—carbon 470,000 Ohms 1/5 watt |
| 29 | 508146 | Transformer—output |
| 30 | 506079 | Speaker—P.M. dynamic (4 inch) |
| | | **MISCELLANEOUS** |
| | 508244 | Back for cabinet |
| | 508245 | Background for dial (foil) |
| | 505165 | "C" washer for tuning shaft |
| | 508643 | Cabinet—Model 9152-A |
| | 508644 | Cabinet—Model 9152-B |
| | 508645 | Cabinet—Model 9152-C |
| | 505101 | Clip for mounting I.F. transformer |
| | 508149 | Clip for mounting loop antenna |
| | 114955 | Clip—retainer on end of dial cord |
| | 508235 | Clip—retains cabinet back |

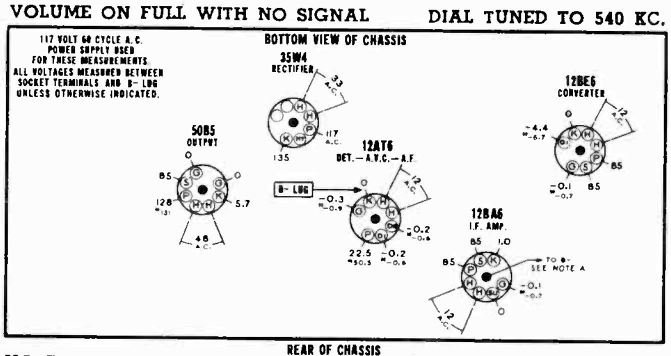
| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | 117057 | Cord dial drive (2 ft. required) per ft. |
| | 508246 | Dial scale |
| | 508248 | Escutcheon—for controls |
| | 508247 | Knob—green; Models 9152-A and 9152-C |
| | 508658 | Knob—brown; Model 9152-B |
| | 18785 | Screw #8x⅞" chassis mounting |
| | 506085 | Shaft—tuning |
| | 507364 | Socket—miniature (7 pin) |
| | 505161 | Spring (dial cord tension) |

## SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

LOOP ANTENNA TERMINALS SHORTED TOGETHER

VOLUME ON FULL WITH NO SIGNAL DIAL TUNED TO 540 KC.




NOTE A: The center stud of this tube must be connected to B— to reduce capacity coupling between other pins. Oscillation may result if this connection is omitted.

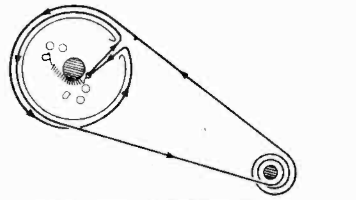
DRIVE CORD ARRANGEMENT

To string dial cord, turn the main drive drum to maximum counter - clockwise position and use following parts:

114955 Clip on end of cord

117057 Cord (2 feet)

505161 Tension Spring



MODEL 9153-A


## GENERAL SPECIFICATIONS

**FREQUENCY RANGE:**

540 to 1600 KC.

**TUNING CAPACITOR:**

2 section gang, shock mounted, Planetary drive.

**I.F. FREQUENCY:**

455 KC.

**ANTENNA:**

High impedance loop.

**POWER SUPPLY:**

| | |
|---|---|
| Power line Operation | 117 volts A.C. or D.C.<br>15 watts |
| Portable Operation | 1—67½ volt "B" Battery<br>5— 1½ volt "A" Batteries |

**POWER OUTPUT:**

Undistorted—60 milliwatts

Maximum—110 milliwatts

**SPEAKER:**

4 inch P.M. Dynamic

Voice coil impedance—3.2 ohms

**DIMENSIONS:**

Length—9½"

Height—6⅞"

Depth—4¾"

**WEIGHT:**

7 pounds

## HOW TO REMOVE CHASSIS FROM CABINET

1. Remove volume and the dual tuning knobs by pulling them forward.

2. To remove cabinet back first swing handle outward and note finger grip recess at back edge of cabinet. Grasp back at this recess and pull outward until it is free. Disconnect leads to loop antenna by slipping pin type connectors out of the electrical clips attached to loop.

3. Loosen set screw in hinge pin collar. Then, push hinge pin into one end of handle and withdraw it completely by pulling out of the other end.

4. Remove three chassis mounting screws, two of which are located along one edge and the other located on the opposite edge. To gain access to one of the chassis mounting screws it will first be necessary to remove "A" battery hold down plate as instructed on label attached to this plate.

5. Chassis is now free and may be lifted out of cabinet.

6. Bottom cover on chassis may be removed by taking out three screws at the sides.

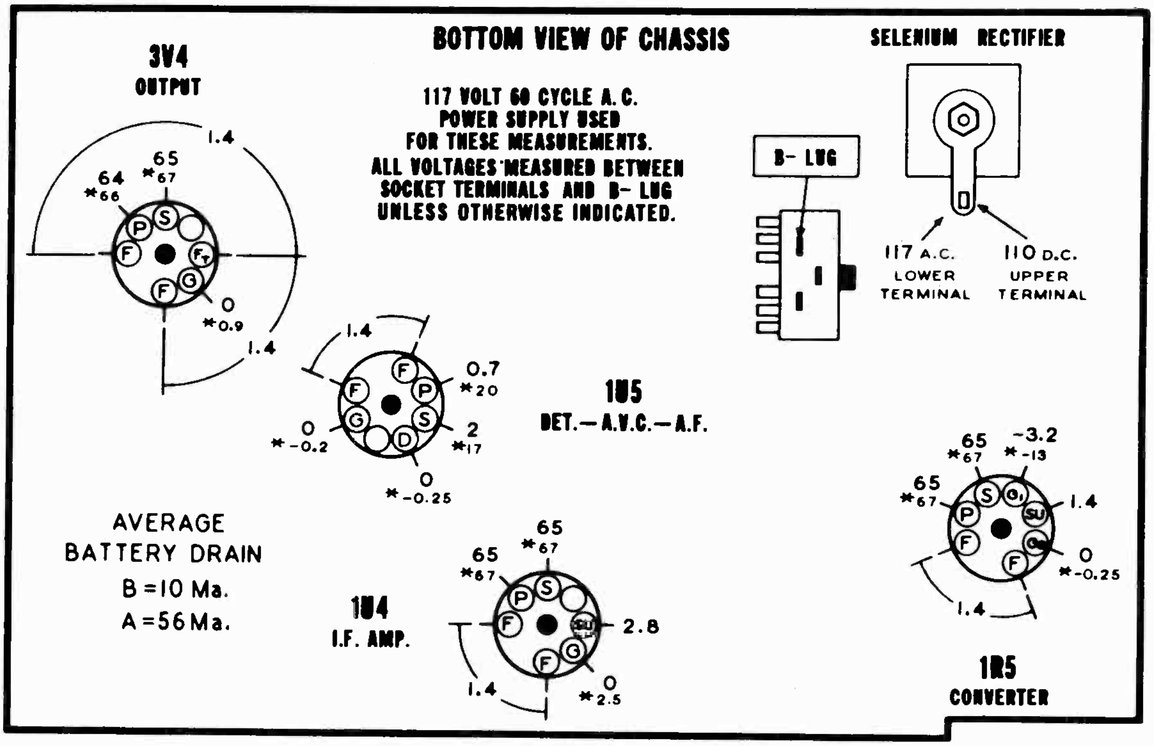
# SOCKET VOLTAGES

## THE VOLTAGES SHOWN IN THIS CHART WERE MEASURED UNDER THE FOLLOWING CONDITIONS

1. Power supply—117 V. 60 cycles, A.C.
2. All voltages were measured between socket terminals and B— unless otherwise indicated on the chart.
3. All measurements were made with a voltmeter having a sensitivity of 1000 Ohms per volt except where indicated by (*).

The (*) symbol designates a vacuum tube voltmeter measurement.

4. Receiver should be tuned to 540 KC.
5. Loop antenna terminals should be shorted together.
6. The volume control was set to maximum position with no signal.

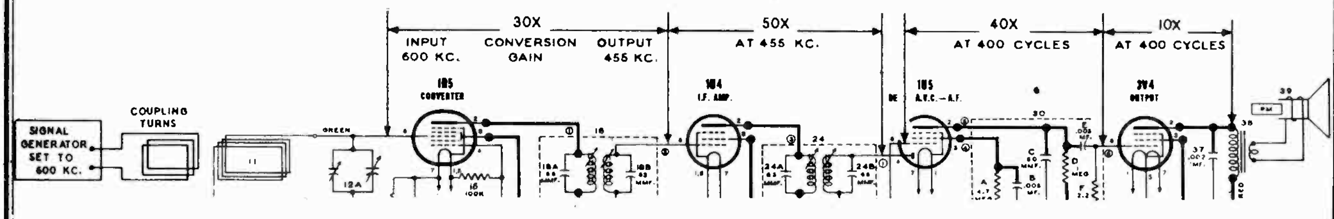



# STAGE GAIN MEASUREMENT PROCEDURE

**REQUIRED INSTRUMENTS:** The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given on page 1950-118A.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 1½ volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 1½ volt battery to A.V.C. at frame of gang condenser and connect the positive battery lead to B - in receiver chassis.
4. Set Signal Generator for operation at 600 Kc. with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.




DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.

MODEL 9153-A

## ALIGNMENT PROCEDURE

1. Remove chassis from cabinet by following procedure described on page 117. Reconnect loop antenna leads to clips on cabinet back. As battery position slightly affects R.F. alignment, it is preferable to have batteries in proper place during this procedure.

2. Replace dial scale and tuning knob on shafts of the gang condenser.

3. Since the "position indicator" for the dial scale is an integral part of the cabinet, it becomes necessary to install a temporary pointer when the chassis is removed from the cabinet. This can readily be accomplished by securing a piece of heavy wire under the chassis bottom cover mounting screw and then shaping the free end of the wire so that it can be placed in a vertical position directly in front of the dial scale. The dial scale should be installed on the gang condenser shaft so that when the condenser is fully meshed the smaller 5 of the 55 on the scale is directly under the pointer.

4. In order to provide a coupling for the signal generator during R.F. alignment, wind several turns of wire in a circular shape so that it may be placed adjacent and parallel to the loop antenna. Position cabinet back so that loop antenna is in approximately the same position as when receiver is completely assembled.

5. Solder approximately 5 in. of insulated wire to each of "soldering lugs" on **secondary** of output transformer. Connect output meter to these extension leads.

6. Set volume control at maximum and use a weak signal from the signal generator.

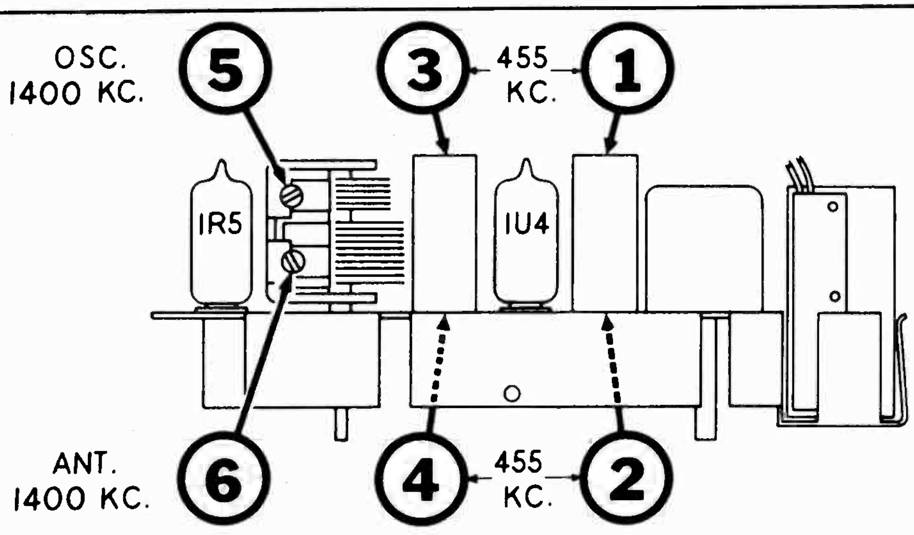
7. Operate the receiver from a 117 V. AC or DC line.

| SIGNAL GENERATOR CONNECTIONS | | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER OR SLUG NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|---|---|---|---|---|---|---|
| CONNECT HIGH SIDE OF SIGNAL GENERATOR TO | CONNECT GROUND LEAD OF SIGNAL GENERATOR TO | | | | | |
| Lug on trimmer #6 at side of gang (see chart below for location of trimmer). | B— lug in chassis. CAUTION If your signal generator is designed with an AC-DC type power supply, connect ground lead of signal generator to receiver through a .25 Mfd. condenser. | 455 KC | Any point where it does not affect the signal. | 1 and 2 | 2nd I.F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | 3 and 4 | 1st I.F. | |
| Connect directly to coupling turn. See Step 4 above for instructions on coupling loop. | | 1400 KC | 1400 KC See Step 3 above for instructions on how to obtain this calibration point. | 5 | Broadcast Oscillator | Adjust for maximum output. |

**IMPORTANT:**—Before undertaking alignment of the antenna circuit it is necessary to reassemble the chassis in the cabinet. When reinstalling cabinet back be sure that extension leads previously soldered to secondary of output transformer extend through ventilation slot on edge of back. Now, replace back and be sure that it snaps into proper position. To gain access to antenna trimmer #6 it will be necessary to first lift off the snap button at bottom of cabinet. Now complete the alignment procedure as follows.

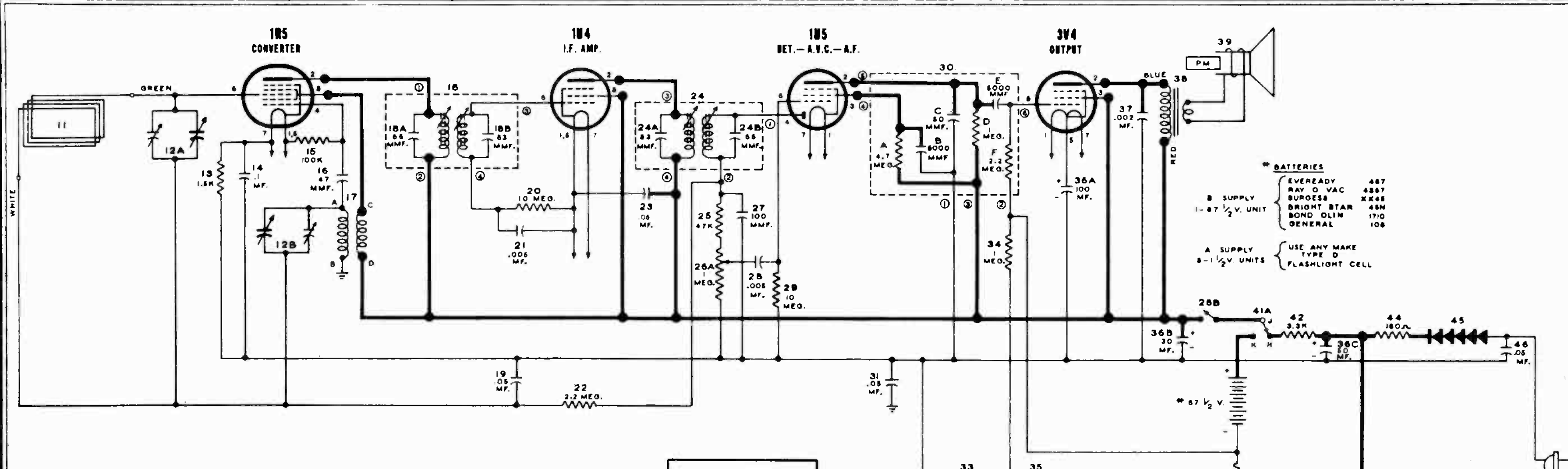
| | | | | | | |
|---|---|---|---|---|---|---|
| Connect directly to coupling turn. See Step 4 above for instructions on coupling loop. | | 1400 KC | Tune to 1400 Kc. generator signal. | 6 | Broadcast Antenna | Adjust for maximum output. |

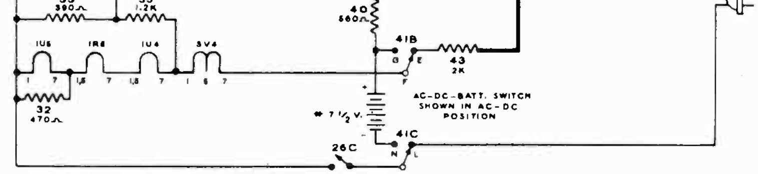
Open cabinet back and unsolder two extension leads attached to secondary of output transformer.

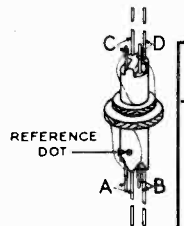



SIDE VIEW OF CHASSIS

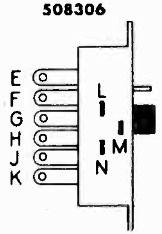
MODEL 9153-A




**OSCILLATOR COIL 508306**




**AC-DC—BATT. SWITCH 508258**

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

## PARTS LIST

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | | **CONDENSERS** |
| 12-A,B | 508278 | Condenser—variable gang |
| 14 | 512035 | Condenser—.1 Mfd. 400 volt |
| 16 | 513002 | Condenser—ceramic 47 Mmfd. 500 volt |
| 18-A | 506809 | Condenser—ceramic 66 Mmfd. (part of 1st I.F. transformer) |
| 18-B | 506809 | Condenser—ceramic 83 Mmfd. (part of 1st I.F. transformer) |
| 19 | 512027 | Condenser—.05 Mfd. 200 volt |
| 21 | 512007 | Condenser—.005 Mfd. 600 volt |
| 23 | 512027 | Condenser—.05 Mfd. 200 volt |
| 24-A | 506809 | Condenser—ceramic 83 Mmfd. (part of 2nd I.F. transformer) |
| 24-B | 506809 | Condenser—ceramic 66 Mmfd. (part of 2nd I.F. transformer) |
| 27 | 513003 | Condenser—ceramic 100 Mmfd. 500 volt |
| 28 | 512007 | Condenser—.005 Mfd. 600 volt |
| 30-B | 508309 | Condenser—ceramic 5000 Mmfd. (part of Audio Coupling Unit) |
| 30-C | 508309 | Condenser—ceramic 50 Mmfd. (part of Audio Coupling Unit) |
| 30-E | 508309 | Condenser—ceramic 5000 Mmfd. (part of Audio Coupling Unit) |
| 31 | 512214 | Condenser—.05 Mfd. 400 volt |
| 36-A,B,C | 508269 | Condenser—electrolytic A—100 Mfd. 25 volt B— 30 Mfd. 150 volt C— 50 Mfd. 150 volt |
| 37 | 512003 | Condenser—.002 Mfd. 600 volt |
| 46 | 512145 | Condenser—.05 Mfd. 400 volt |
| | | **RESISTORS** |
| 13 | 510139 | Resistor—carbon 1500 Ohms ± 10% ½ w. |
| 15 | 510173 | Resistor—carbon 100,000 Ohms ½ w. |
| 20 | 510197 | Resistor—carbon 10 Meg. ½ watt |
| 22 | 510193 | Resistor—carbon 2.2 Meg. ½ watt |
| 25 | 510167 | Resistor—carbon 47,000 Ohms ½ watt |
| 26-A,B,C | 508274 | Volume control—1 Meg. (with switch) |
| 29 | 510197 | Resistor—carbon 10 Meg. ½ watt |
| 30-A | 508309 | Resistor—carbon 4.7 Meg. (part of Audio Coupling Unit) |
| 30-D | 508309 | Resistor—carbon 1 Meg. (part of Audio Coupling Unit) |

**I.F. 455 KC.**

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 30-F | 508309 | Resistor—carbon 2.2 Meg. (part of Audio Coupling Unit) |
| 32 | 510310 | Resistor—carbon 470 Ohms ± 10% ½ w. |
| 33 | 510129 | Resistor—carbon 390 Ohms ± 10% ½ w. |
| 34 | 510191 | Resistor—carbon 1 Meg. ½ watt |
| 35 | 510138 | Resistor—carbon 1200 Ohms ± 10% ½ w. |
| 40 | 510132 | Resistor—carbon 560 Ohms ± 10% ½ w. |
| 42 | 510245 | Resistor—carbon 3300 Ohms ± 10% 1 w. |
| 43 | 510732 | Resistor—wire wound 2000 Ohms ± 10% 10 watt |
| 44 | 510731 | Resistor—wire wound 160 Ohm ± 10% 3 watt |
| | | **COILS AND TRANSFORMERS** |
| 11 | 508312 | Loop antenna |
| 17 | 508306 | Coil—oscillator |
| 18 | 506809 | Transformers—1st I.F. (includes condensers 18-A and 18-B) |
| 24 | 506809 | Transformer—2nd I.F. (includes condensers 24-A and 24-B) |
| 38 | 508271 | Transformer—output |
| | | **OTHER ELECTRICAL PARTS** |
| 30-A to F | 508309 | Audio coupling unit A—Resistor—carbon 4.7 Meg. B—Condenser—ceramic 5000 Mmfd. C—Condenser—ceramic 50 Mmfd. D—Resistor—carbon 1 Meg. E—Condenser—ceramic 5000 Mmfd. F—Resistor—carbon 2.2 Meg. |

| DIAGRAM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 39 | 508255 | Speaker—P.M. dynamic (4 inch) |
| 41-A,B,C | 508258 | Switch—"AC-DC—Batt." |
| 45 | 508305 | Selenium rectifier |
| | | **MISCELLANEOUS PARTS** |
| | 508301 | Back for cabinet |
| | 504981 | Base for mtg. electrolytic condenser |
| | 509042 | Cabinet (less handle and back) |
| | 162119 | Chassis bottom cover |
| | 505101 | Clip for mtg. I.F. transformer |
| | 508257 | Clip for mtg. power cord retainer |
| | 130931 | Clip for retaining back cover to cabinet |
| | 509057 | Collar and set screw for hinge pin |
| | 508310 | Connector for "B" battery (includes leads) |
| | 508319 | Dial scale |
| | 508316 | Escutcheon for knobs |
| | 508302 | Handle |
| | 508313 | Hinge pin for handle |
| | 508317 | Knob—"OFF VOLUME" |
| | 508318 | Knob—tuning |
| | 162115 | Plate and contacts for retaining "A" batteries |
| | 508304 | Retainer for power cord (fibre tube) |
| | 508277 | Shield for volume control |
| | 507364 | Socket—miniature (7 pin) |

## SPECIFICATIONS

| | |
|---|---|
| Voltage Rating — Radio | 117 Volts AC-DC |
| Type of Circuit | Superheterodyne |
| Tuning Range | 540-1640 Kc |
| Input Power Rating | 30 Watts |
| Intermediate Frequency | 455 Kc |
| Speaker Voice Coil Impedance | 3 Ohm |
| Power Output | 1.5 Watts at 10% Distortion |

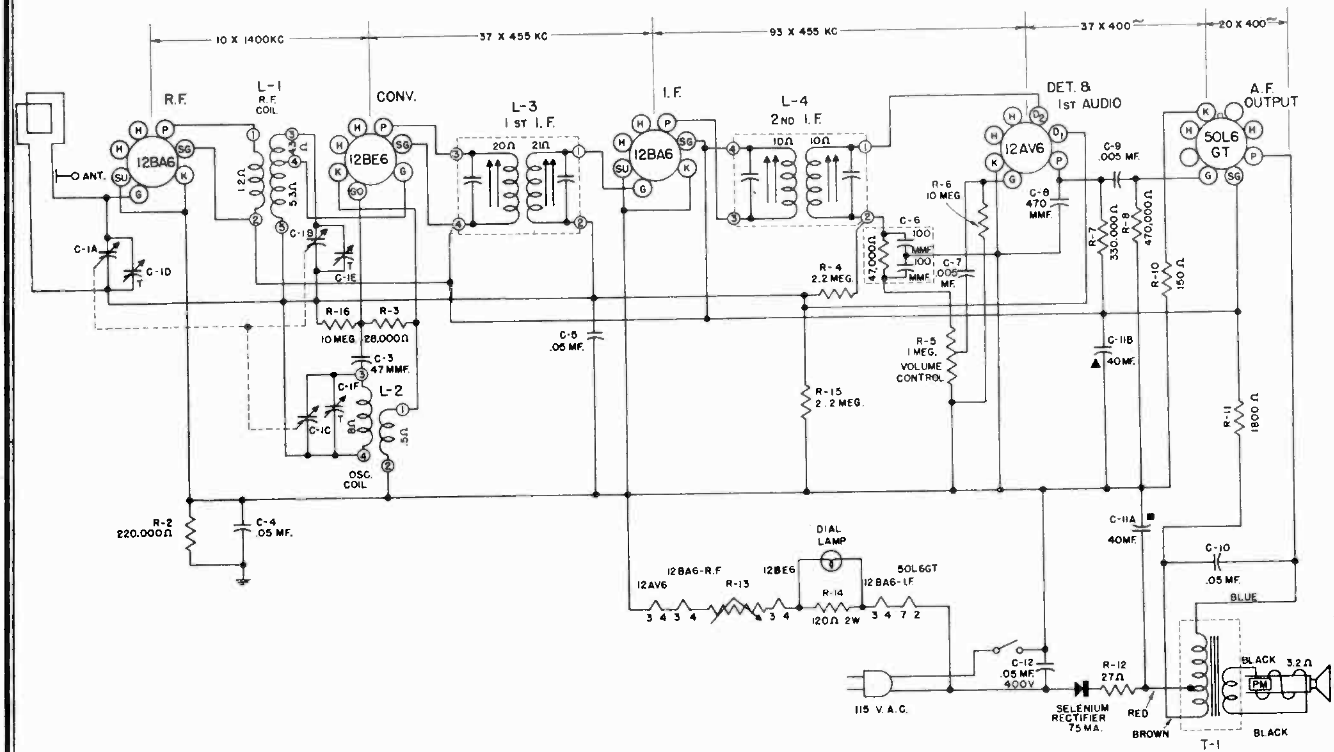
## TUBE COMPLEMENT

2 12BA6 Miniature RF and IF Amplifier

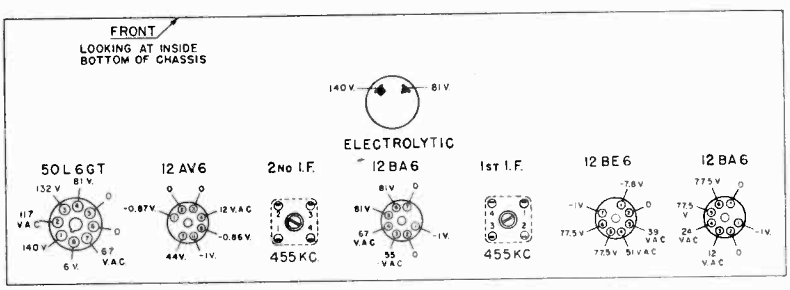
1 12BE6 Miniature Converter

1 12AV6 Miniature Detector, AVC and Audio Driver

1 50L6GT Power Output




## Voltage and Tube Location Chart




Measurements are made at 117V line, using electronic Voltmeter. Except where otherwise inditated, volages are D.C. and are positive with respect to the reference point which is the common Black-White lead.

MODEL 1500

# ALIGNMENT PROCEDURE

CAUTION: As this is a transformless Receiver, observe all usual precautions. The Black-White (B-) lead is common to one side of the 117 Volt Power Line Cord.

| Pointer Setting | Generator Setting | Input and Dummy | VTVM and Scope Connection and Scale | Adj. and Notes |
|---|---|---|---|---|
| **I. F. ADJUSTMENT** | | | | |
| (1) Low frequency end of dial | 455 kc. 400 cy. mod. | Pin #7, 12BE6 tube 0.01 mfd. dummy | -3V DC Scale Green-White (AVC) lead and Black-White (B-) lead. | Adj. top and bottom cores of each I. F. transformer with non-metallic screwdriver for maximum voltage. |
| (2) " | 455 kc. Swept 15 kc. | " | Scope to Junction C-6 and Volume Control | Adj. same cores as above for best over-lapping curve on scope. |
| **R. F. ADJUSTMENT** | | | | |
| (1) 1650 kc. Condenser plates all way out | 1650 kc. 400 cy. mod. | Ant. terminal 0.01 mfd. dummy | " | Adj. Osc. (front) trimmer on variable condenser for maximum voltage. |
| (2) 1400 kc. | 1400 kc. 400 cy. mod. | " | " | Adj. R. F. and Loop trimmers on variable condenser for maximum voltage. |

| Circuit Symbol | S-C Part No. | Capacity | Voltage |
|---|---|---|---|
| C-1 | 110026 | Variable | |
| C-3 | 110458 | 47 MMF | 400 V |
| C-4 | 40632 | .05 MF | 400 V |
| C-5 | 40632 | .05 MF | 400 V |
| C-6 | 110478 | Diode Filter | |
| C-7 | 27760 | .005 MF | 600 V |
| C-8 | 110464 | 470 MMF | 400 V |
| C-9 | 27760 | .005 MF | 600 V |
| C-10 | 40632 | .05 MF | 400 V |
| C-11 | 111032 | 2-40 MF | 200 V |
| C-12 | 40632 | .05 MF | 400 V |

| Circuit Symbol | S-C Part No. | Description |
|---|---|---|
| L-1 | 114055 | RF COIL ASSEMBLY |
| L-2 | 114056 | OSC. COIL ASSEMBLY |
| L-3 | 114336 | 1st IF TRANSFORMER |
| L-4 | 114337 | 2nd IF TRANSFORMER |
| T-1 | 161413 | OUTPUT TRANSFORMER |

| Circuit Symbol | S-C Part No. | Resistance | Watt | Tol. |
|---|---|---|---|---|
| R-2 | 149115 | 220K ohms | ½ | 20% |
| R-3 | 149109 | 22K ohms | ½ | 20% |
| R-4 | 149121 | 2.2 megohms | ½ | 20% |
| R-5 | 145032 | 1 megohm | | Pot. |
| R-6 | 149125 | 10 megohms | ½ | 20% |
| R-7 | 149116 | 330K ohms | ½ | 20% |
| R-8 | 149117 | 470K ohms | ½ | 20% |
| R-10 | 28148 | 150 ohms | ½ | 10% |
| R-11 | 149047 | 1800 ohms | 2 | 10% |
| R-12 | 149244 | 27 ohms | 2 | 10% |
| R-13 | 149243 | Special NTC | | |
| R-14 | 149035 | 120 ohms | 2 | 10% |
| R-15 | 149121 | 2.2 megohms | ½ | 20% |
| R-16 | 149125 | 10 megohms | ½ | 20% |

**Miscellaneous**

| | |
|---|---|
| 139035 | LOOP ASSEMBLY |
| 117008 | POWER CORD |
| 122032 | DIAL LENS |
| 124016 | DIAL DRIVE CORD |
| 144018 | POINTER |
| 30933 | PILOT LAMP |
| 152096 | PILOT LIGHT SOCKET |
| 152040 | SOCKET 7-PT. MIN. |
| 152041 | SOCKET 8-PT. OCTAL. |
| 162034 | SELENIUM RECTIFIER — 75 MA |
| 108065 | WALNUT CABINET |
| 134004 | BROWN KNOB |
| 108066 | IVORY CABINET |
| 134005 | IVORY KNOB |
| 108169 | RED CABINET |
| 134137 | BLACK KNOB |
| 108170 | TAN CABINET |
| 155187 | SPEAKER |

**POWER SOURCES:** This receiver is designed for operation on either an external power source or on the enclosed batteries.

**AC OR DC OPERATION:** This receiver may be operated on 50 to 60 cycle, 110 to 125 volt AC current or 110 to 125 DC current.

**CAUTION:** Never plug this receiver into a 220 volt line as this will seriously damage the component parts which have been designed for 110 to 125 volt operation only.

To operate on AC or DC open the small door at the right in the back of the cabinet. Pull out the power cord and plug into a convenient outlet of the proper voltage and current. Follow instructions under "Controls."

To operate on the enclosed batteries, follow instructions under "Controls."

**ANTENNA:** This receiver is equipped with a sensitive loop antenna and requires no external antenna wire. However, due to the directional qualities of the loop some stations may appear to be weak in reception. This condition may be remedied by rotating or changing the position of the receiver.

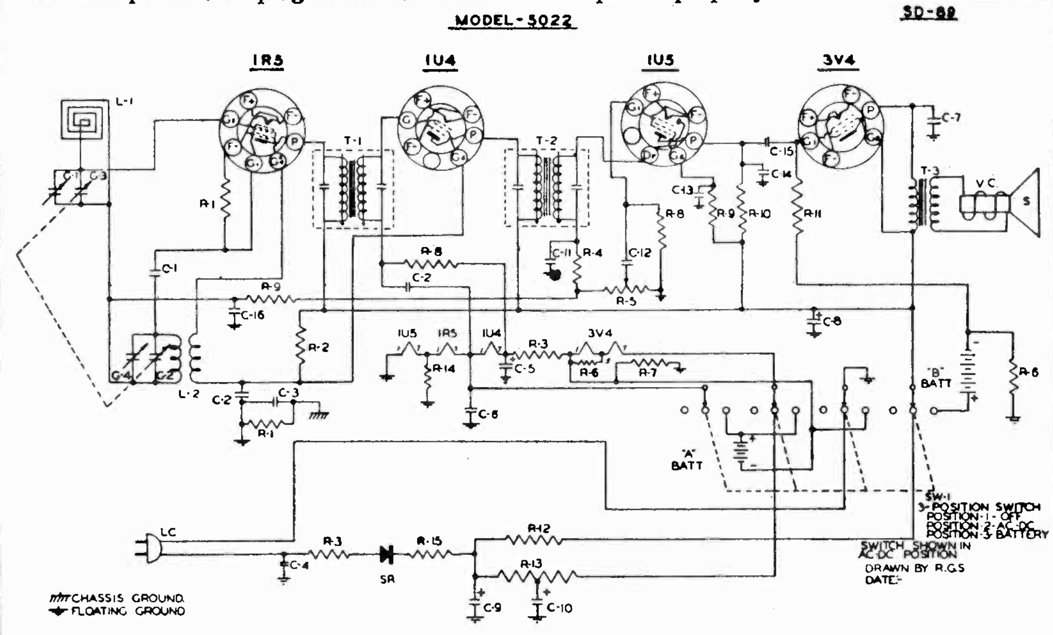
**CONTROLS:** This receiver has three control knobs which are located on the front panel of the cabinet.

**STATION SELECTOR KNOB:** The center knob is the station selector. Rotate this knob to the right or left to select your desired station. The dial scale is calibrated in kilocycles. By mentally adding a zero to the numbers on the scale, the result will be read directly in (KC) kilocycles. (i.e., 60 plus 0 equals 600 KC or 140 plus 0 equals 1400 KC).

**POWER SELECTOR SWITCH:** The right hand knob is the power selector. It has three positions which are indicated on the front panel. The extreme left hand position is the "OFF" position. The small dot on this knob must point to "OFF" when the receiver is not in use. The center position is "AC-DC" and is used when it is desired to operate the receiver from a power line source. The extreme right hand position is "BATT" and is used when it is desired to operate on the enclosed batteries.

**AC OPERATION:** When an AC power source is used, set the power selector knob to "AC-DC" after the power cord has been plugged into a convenient outlet. The receiver is now ready for operation.

**DC OPERATION:** If the receiver does not operate after a few seconds, reverse the power cord plug in the outlet and it will operate properly.




| PART NO. | | DESCRIPTION |
|---|---|---|
| 1R-20 | R-1 | 220M~ RESISTOR 1/2W 20 % |
| 1R-37 | R-2 | 10M~ RESISTOR 1/2W 20 % |
| 1R-17 | R-3 | 33~ RESISTOR 1/2W 20 % |
| 1R-31 | R-4 | 82M~ RESISTOR 1/2W 10 % |
| VC-11 | R-5 | 1MEG VOLUME CONTROL |
| 1R-33 | R-6 | 270~ RESISTOR 1/2W 10 % |
| 1R-39 | R-7 | 620~ RESISTOR 1/2W 5 % |
| 1R-3 | R-8 | 10MEG RESISTOR 1/2W 20 % |
| 1R-23 | R-9 | 3.3MEG RESISTOR 1/2W 20 % |
| 1R-12 | R-10 | 1MEG RESISTOR 1/2W 20 % |
| 1R-13 | R-11 | 2.2MEG RESISTOR 1/2W 20 % |
| 1R-40 | R-12 | 3900~ RESISTOR 1W 10 % |
| WR-7 | R-13 | 1050-1050 CANDOHM RESISTOR 5W 5 % |
| 1R-1 | R-14 | 470~ RESISTOR 1/2W 20 % |
| 1R-41 | R-15 | 47~ RESISTOR 1W 10 % |
| MC-2 | C-1 | 100MMFD. MICA CONDENSER |
| PC-7 | C-2 | .01MFD. CONDENSER 400 W V. |
| PC-8 | C-3 | .1 MFD. CONDENSER 400 W V |
| PC-5 | C-4 | .05 MFD CONDENSER 400 W V |
| EC-6 | C-5 | 70MFD. 10WV ELECTROLYTIC |

| PART NO. | | DESCRIPTION |
|---|---|---|
| PC-3 | C-6 | .1 MFD. CONDENSER 200 W.V |
| PC-6 | C-7 | .005MFD. CONDENSER 600 W V |
| EC-14 | C-8 | 40 MFD. 150 W V ELECTROLYTIC |
| | C-9 | 40 MFD. |
| | C-10 | 20 MFD. |
| MC-7 | C-11 | 150MMFD. |
| | C-12 | .002MFD. |
| | C-13 | .005MFD. |
| | C-14 | 100 MFD. |
| | C-15 | .005MFD. |
| PC-2 | C-16 | .05MFD. CONDENSER 200 W V |
| | G-1 | ANT. TRIMMER |
| GC-6 | G-2, G-3 | GANG CONDENSER |
| LL-23 | L-1 | LOOP ANTENNA |
| LO-8 | L-2 | OSC. COIL |
| SA-2 | SR | SELENIUM RECTIFIER |
| CO-1 | LC- | LINE CORD |
| SW-8 | SW-1 | 4 POLE 3 POSITION SWITCH |
| | "A" BATT | 2 "D" SIZE FLASHLITE CELLS. 1½ VOLTS |
| | "B" BATT | 1-67½ VOLT BATTERY |

| PART NO. | | DESCRIPTION |
|---|---|---|
| LI-5 | T-1 | INPUT IF TRANSFORMER |
| LI-5 | T-2 | OUTPUT IF TRANSFORMER |
| SPK-16 | T-3 | SPEAKER OUTPUT TRANSFORMER |
| | VC | VOICE COIL |
| | S | 3½" PM SPEAKER |
| | G-4 | OSC. TRIMMER |
| TU-39 | — | 1R5-1U4-1U5-3V4 |

MODEL 5022

**BATTERY OPERATION:** The power cord is not used for battery operation and may be hanked and put back in the cabinet. Set the power control knob to "BATT" and the receiver is ready for operation on the enclosed batteries.

**CAUTION:** When the receiver is not in use, the power selector knob must be turned to "OFF." If the knob is allowed to remain in "BATT" position, the batteries will be in use constantly. The volume control does not control the batteries and they are still in operation even though the volume control is turned all the way off.

**VOLUME CONTROL:** The left hand knob is the volume control. After the power selector knob has been properly set and the receiver is in operation, rotate the volume control knob to the right to increase volume or to the left to decrease volume.

## BATTERY SUPPLIERS

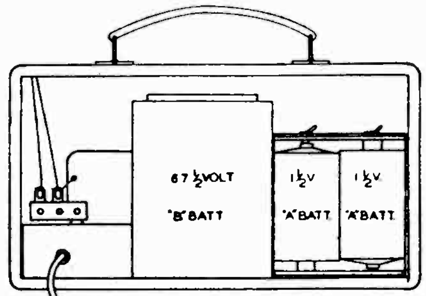
The batteries for this receiver may be purchased from any reliable dealer.

For proper operation this receiver requires two "A" batteries and one "B" battery.

The "A" batteries are size "D" flashlight cells and are made by all battery manufacturers.

The "B" battery is a 67½ volt battery and is made by the following manufacturers.

| | | |
|---|---|---|
| Eveready | 67½ vlt. | #467 |
| Burgess | 67½ vlt. | #XX45 |
| General | 67½ vlt. | #W45A |
| Ray-O-Vac | 67½ vlt. | #4367 |




BATTERY LOCATION
FIGURE-1

## BATTERY SERVICING (See Fig. No. 1)

To replace the batteries in this receiver. Remove the back.

To the right, looking into the rear of the cabinet is the "A" or flashlight battery container. To the left is the "B" or 67½ volt battery.

To replace the "A" batteries, pull the old batteries out of the container. Replace with fresh batteries, making sure the batteries are inserted according to the diagram on the inside of the container.

To replace the "B" battery, disconnect the snap fastener connectors. Replace with a fresh battery and snap the connectors into place. Replace the battery in the cabinet as shown in Fig. No. 1, making sure that the connector end faces the top of the cabinet.

After the batteries have been installed, replace the back, making sure that the two washers in the bottom of the back fit into the slot near the bottom edge of the cabinet.

## ALIGNMENT AND SERVICE DATA

**(See Fig. No. 2 For Trimmer Location)**

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

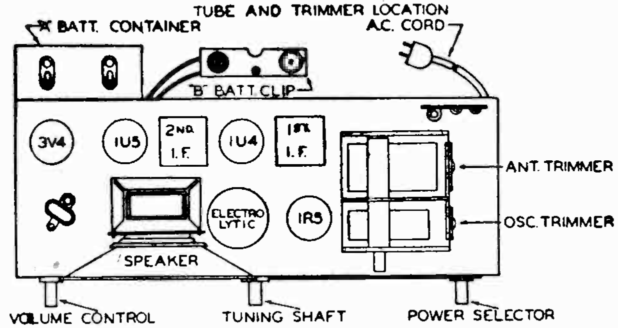
The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

**FIRST STEP:** Connect the hot lead from the generator to the ANT. Section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans. These IF adjustments are made in the top and in the bottom of the can under the chassis. Adjust the cores until a maximum reading is noted on the output meter.

**SECOND STEP:** With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

**THIRD STEP:** Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer through the hole which is provided in the end of the cabinet until a maximum signal is noted on the output meter. The ANT. trimmer hole in the side of the cabinet is covered by a small plug button. Replace this button after adjustment has been made. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

TUBE AND TRIMMER LOCATION




MODEL-5022
FIGURE-2
TL-89

## WARRANTY

This receiver has been carefully tested and was shipped from our factory in perfect operating condition. If the set arrives damaged in any way, it is important that you file claim immediately against the carrier. We warrant this receiver to be free from defective materials and workmanship. We agree to exchange any part, which under normal use, becomes defective within a period of 90 (ninety) days from the date of sale to the original purchaser. If this receiver does not operate, it should be returned for service to the dealer from whom it was purchased.

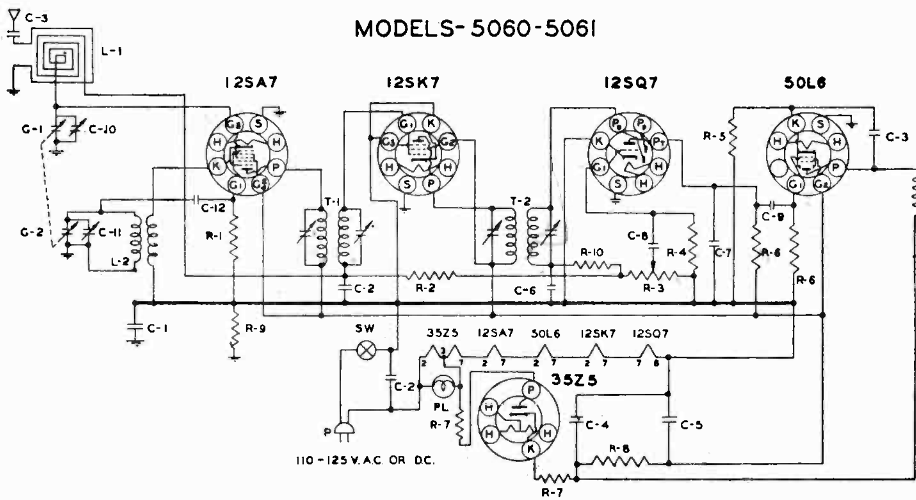
This warranty does not apply if the receiver has been damaged, tampered with, or misused. If the receiver is returned to the factory, transportation charges must be prepaid. No receiver may be returned without our written consent.

MODELS 5060, 5061

## SCHEMATIC DIAGRAM — MODELS 5060 and 5061

MODELS-5060-5061

SD-92-U




CHASSIS GROUND

| PART NO. | | DESCRIPTION |
|---|---|---|
| IR-9 | R-1 | 22000 Ω RESISTOR 1/2W 20% |
| IR-23 | R-2 | 3.3MEG. RESISTOR 1/2W 20% |
| VC-3 | R-3 | 1MEG. VOLUME CONTROL |
| IR-13 | R-4 | 2.2MEG. RESISTOR 1/2W 20% |
| IR-14 | R-5 | 150 Ω RESISTOR 1/2W 20% |
| IR-11 | R-6 | 470M Ω RESISTOR 1/2W 20% |
| IR-17 | R-7 | 33 Ω RESISTOR 1/2W 20% |
| IR-25 | R-8 | 2200 Ω RESISTOR 1 W 10% |
| IR-20 | R-9 | 220M Ω RESISTOR 1/2W 20% |
| IR-10 | R-10 | 47000 Ω RESISTOR 1/2W 20% |
| PC-8 | C-1 | .1MFD. CONDENSER 400V |
| PC-5 | C-2 | .05MFD. CONDENSER 400V. |
| PC-7 | C-3 | .01 MFD. CONDENSER 400 V. |
| EC-12 | C-4 | 40MFD. 150V. ELECTROLYTIC |
| | C-5 | 20MFD. |
| MC-8 | C-6 | 220MMFD. |
| | C-7 | 220MMFD. |
| | C-8 | .002MFD. |
| | C-9 | .005MFD. |
| | C-10 | ANT. TRIMMER. |
| | C-11 | OSC. TRIMMER |
| MC-4 | C-12 | 50MMFD. MICA CONDENSER |
| GC-6A | G-1 | GANG CONDENSER |
| | G-2 | |
| LL-6 | L-1 | LOOP ANTENNA |
| LO-13 | L-2 | OSC COIL |
| LI-6 | T-1 | INPUT I.F. TRANSFORMER |
| LI-7 | T-2 | OUTPUT I.F. TRANSFORMER. |
| SPK-12B | T-3 | SPEAKER OUTPUT TRANSFORMER |
| | V.C. | VOICE COIL. |
| | S | P.M. SPEAKER |
| PB-1 | PL | #47 PILOT BULB |
| | SW | A.C. SWITCH ON VOLUME CONTROL |
| CO-1 | P | LINE CORD |

MODELS 5060-5061
TUBE AND TRIMMER LOCATION

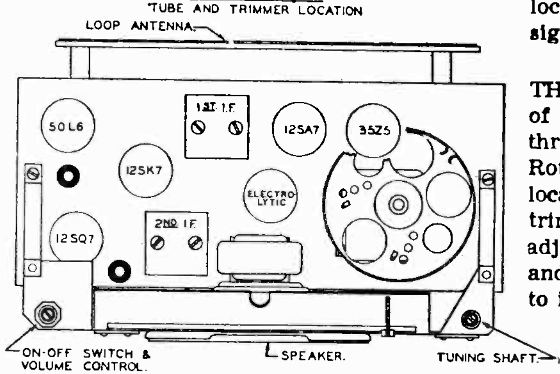



FIGURE-1

## ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the top of the ANT. section of the gang condenser. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

## GENERAL:

Signal Seeking Tuners are used on the following radios:

| | | | Bulletin No. |
|---|---|---|---|
| Buick | | | |
| Model | 980899 | 1950 | 6D- 929 |
| Cadillac | | | |
| Model | 7258865 | 1950 | 6D-1060 |
| Oldsmobile | | | |
| Model | 982482 | 1950 | 6D- 987 |
| Model | 982483 | 1950 | 6D- 987 |

The service bulletin for any radio using this tuner will refer to this bulletin for tuner servicing.

This bulletin covers the theory of operation, adjustments, replacements and trouble-shooting procedure.

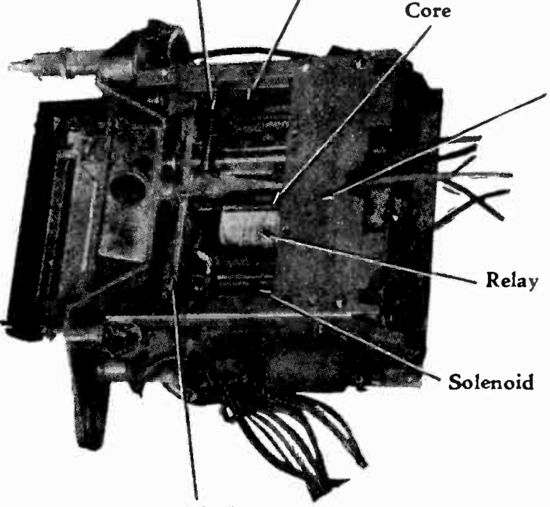



Fig. 1

## THE SIGNAL SEEKING TUNER

The Signal Seeking Tuner is an electronically controlled automatic tuner by which the operator can change stations by merely depressing a single station selector bar on the radio or an auxiliary foot switch. The seeking operation is a uni-directional sweep of the broadcast band from low to high frequency with a nearly instantaneous return. The tuning mechanism is driven by a spring loaded mechanical motor which is stopped on station by a triggering circuit actuated by voltage developed from an incoming signal.

The number of stations on which the tuner will stop can be regulated by use of the Sensitivity Control. It is a step control which in the extreme clockwise position gives maximum stopping sensitivity, while it allows the tuner to stop only on strong local stations when in the minimum sensitivity or extreme counterclockwise position. This control is in the circuit only while the tuner is seeking and does not affect the "on station" sensitivity of the receiver.

## THEORY OF OPERATION

This discussion of the operation of the Signal Seeking Tuner does not refer to any particular model radio. It covers the overall operation and the bulletin for the particular radio involved will give the details of the circuit used in the actual receiver.

### Sweep and Return Cycle (See Fig. 2)

One Power Spring, which is fastened to the lower plate of the Planetary Arm, pulls this arm around its pivot. The Planetary Arm is linked to the Core Bar. Thus, as the spring contracts and moves the Planetary Arm it also pulls the core bar and its iron cores from the tuning coils thereby changing the tuned frequency of the radio towards the high end of the broadcast band. After the tuner has swept beyond the top broadcast frequency, the High Frequency Switch Operating Cam on the lower Planetary Arm trips the Tuner Return Switch which in turn energizes the Solenoid and this quickly returns the Planetary Arm to its original position with the cores inserted fully into the coils (low frequency) and the power spring is now under maximum tension. As the Planetary Arm returns, the Low Frequency Switch Operating Cam trips the Tuner Return Switch to its original position thus de-energizing the Solenoid and completing the cycle.

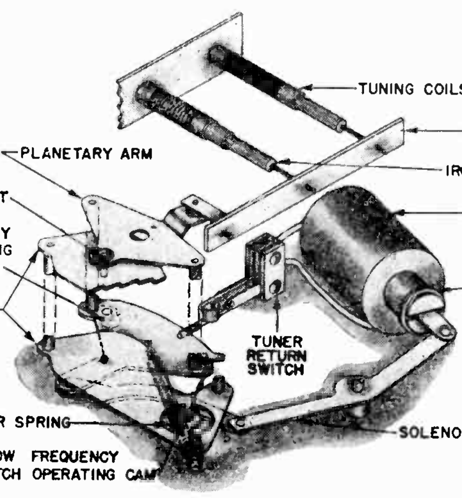



Fig. 2

### Motor and Control (See Fig. 3)

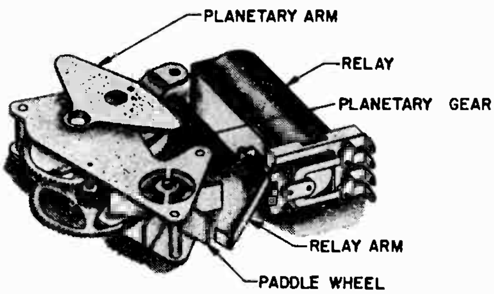


Fig. 3

The Power Spring tends to move the Planetary Arm about its pivot point thereby starting the Planetary Gear and its meshed train in motion. This motion is transferred through the gear train to the Paddle Wheel which acts as an air vane governor keeping the motion at a constant speed. This movement of the Planetary Arm is then controlled by merely freeing or blocking the Paddle Wheel with the Relay Arm. Thus, the movement of the Planetary Arm which moves the tuning cores is started or stopped by the action of the Relay Arm.

### Manual Tuning Gear Operation (See Fig. 4)

Manual tuning is accomplished by turning the Manual Control Shaft which turns the Worm Gear in its bracket. The Worm Gear is meshed with the Manual Drive Gear which in turn is meshed with the Planetary Pinion Gear. During manual tuning the Paddle Wheel is held in place by the Relay Arm and this Pinion Gear is not free to rotate, thus effectively locking the Planetary Arm to the outer edge of the Manual Drive Gear. Therefore as the Manual Drive Gear turns, the Planetary Arm moves in unison with it and varies the frequency of the tuner by varying the position of the iron cores in the tuning coils. (Notice that when the set is being tuned automatically and the Paddle Wheel is rotating, the Manual Drive Gear is held securely in place by the Worm Gear while the Planetary Pinion Gear "walks around" the periphery of the Manual Drive Gear thereby causing the Planetary Arm to move and change the position of the tuning cores.)

On sets which have no manual drive, the Manual Drive Gear is secured to the Motor Frame and the Control Shaft and Worm Gear are eliminated.

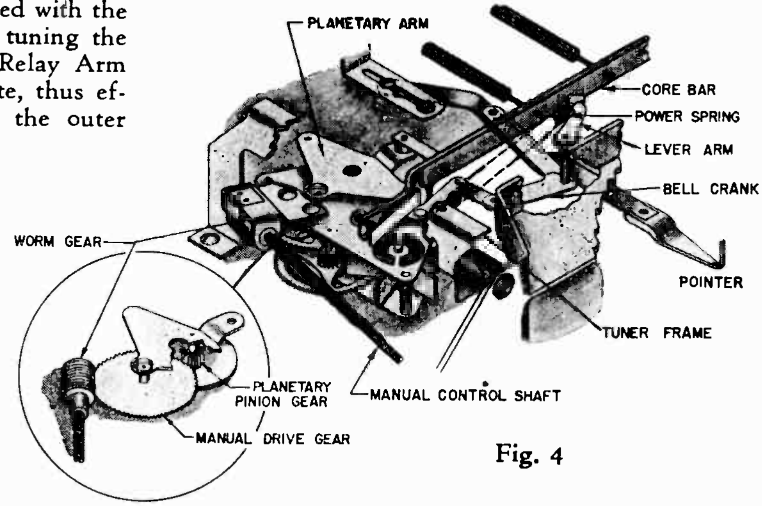


Fig. 4

### Pointer and Core Bar Linkage (See Fig. 4)

The second power spring is shown in this view. It has a dual purpose, serving both as a power spring and an antibacklash spring. The primary linkage is from the tuner frame to the Lever Arm which is securely staked to the Bell Crank. At the Bell Crank the linkage splits, with one arm linked to the core bar at the extreme left end, and the other arm linked to the pointer. Thus, this spring helps pull the core bar in the high frequency direction when it is free to move and provides a spring loaded linkage between the core bar and the pointer preventing any tendency for backlash.

### Clutching Operations (See Fig. 5)

**The Ratchet Pawl and Wheel** are used so that the Solenoid can cock the power springs without running the entire gear train in the reverse direction during the return sweep. Notice that the Ratchet also is used when the dial pointer has reached the high end of the band while tuning manually. Then the Planetary Arm has reached the end of its tuning arc and so the planetary pinion tends to be rotated by the Manual Drive Gear (see Fig. 3). This turns the Ratchet Wheel out of the Pawl and allows the pinion gear to turn freely without exerting further force on the Planetary Arm and thereby eliminates any possible damage to the mechanism.

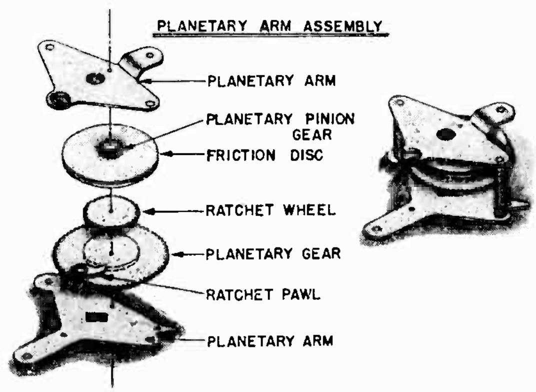


Fig. 5

The purpose of the Friction Disc is to prevent damage to the mechanism when manually tuned past the low frequency stop. This is accomplished because the disc slips before excessive pressure is exerted when the Pinion Gear tends to rotate the Planetary Gear. The Friction Disc is not found on radios without a manual drive.

MODEL 6D-620,
Tuner

### Tuner Sweep Cycle Outline (Fig. 6)

I. Tuner is started by removing Relay Arm from Paddle Wheel
   - A. Spring driven gear train begins to sweep. (Fig. 3)
   - B. Planetary Arm moves. (Fig. 2)
   - C. Tuning cores are moved toward higher frequency by core bar linkage to Planetary Arm.
   - D. Spring loaded dial pointer scans dial. (Fig. 4)

II. Signal actuates relay causing arm to stop paddle wheel
   - A. Gear train stops. (Fig. 3)
   - B. Planetary Arm is stopped.
   - C. Core bar movement is stopped.
   - D. Dial pointer sweep is stopped.

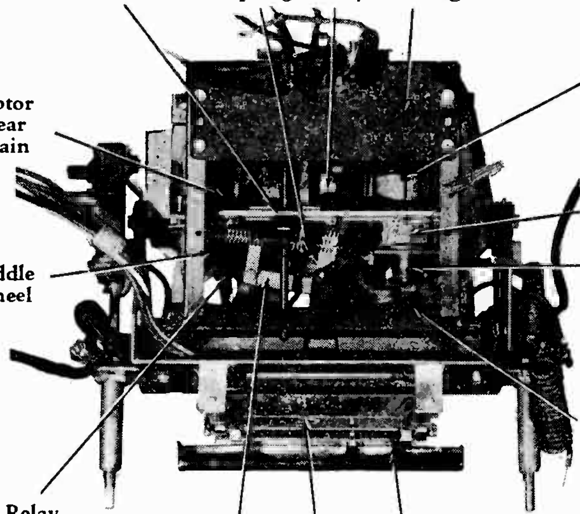



Fig. 6

III. When tuner reaches high end of dial after last stop.
   - A. The High Frequency Switch Operating Cam trips Tuner Return Switch. (Fig. 2)
   - B. Solenoid is energized.
   - C. Plunger is pulled into the Solenoid.
   - D. Planetary Arm and pointer are returned to low end of dial.
   - E. The Low Frequency Switch Operating Cam trips the Tuner Return Switch in the opposite direction. (Fig. 2)
   - F. The Solenoid is de-energized and the sweep starts from the low frequency stop.

## ELECTRICAL OPERATION

The purpose of the electrical components associated with the tuner is to control the relay so the operator may start the tuner sweeping cycle by merely depressing the station selector bar and so that the sweeping operation will continue until a signal is received. At that time it is the function of this circuit to accurately tune to the frequency of the selected station. It also provides the necessary conditions to keep the tuner on the station until a change is desired. The operational cycle of the electronic control system of the signal seeker tuner is outlined

### The Electrical Cycle Outline (Fig. 7)

I. Starting the Tuner Seeking (Energizing the Relay)—The Station Selector Bar (27) is momentarily depressed.
   - A. Contact #2 of the Station Selector Switch opens first, ungrounding secondary of the output transformer therefore muting the set as contact #1 closes.
   - B. Contact #1 closes and provides a circuit from B+ through the relay winding, the 15,000 ohm resistor (30), the Selector Switch contacts, and the delay circuit resistor network to ground.
   - C. The current through this circuit energizes the Relay and removes the Relay Arm from the Paddle Wheel—thus starting the tuner, opening contacts #2 and #4, and grounding relay contacts #1 and #3.

II. Keeping the Tuner Seeking after the Selector Bar is released (Keeping the Relay Energized)
   - A. Relay contact #3 is closed providing a path to ground for the cathodes of the R.F. and I.F. amplifier tubes. This path is through the Sensitivity Control so the sensitivity of the set can be controlled during the sweeping operation.
   - B. Relay contact #1 is grounded thus lowering the cathode to ground resistance of the Relay Section of the Trigger Tube by putting the 6,800 ohm resistor (24) in parallel with the 47,000 ohm cathode resistor (26).

MODEL 6D-620,
Tuner

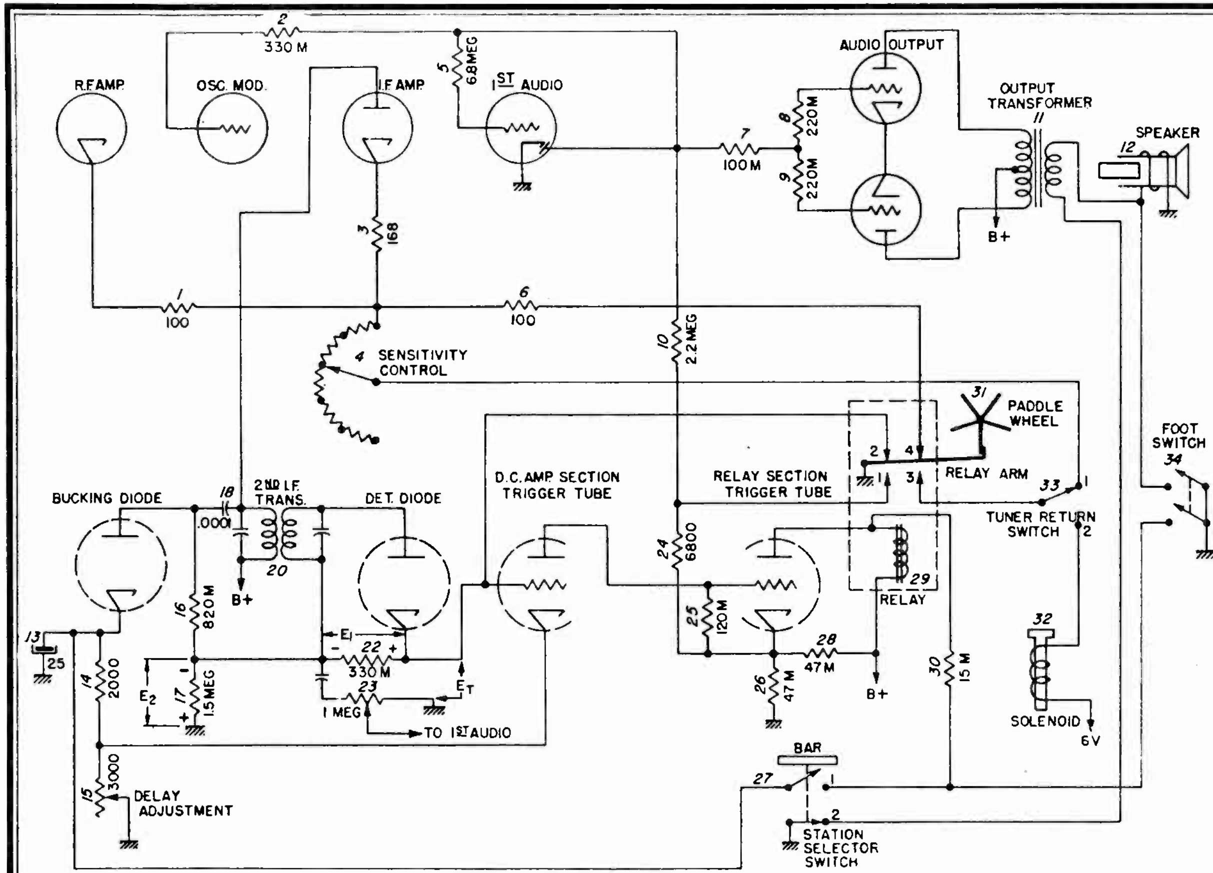



Fig. 7

This Diagram Does Not Refer to Any Particular Radio Model

**The Electrical Cycle Outline (Continued)**

This causes a lowering of the cathode voltage thereby causing an increased plate current flow which is sufficient to keep the relay energized and the tuner seeking.

III. Stopping the Tuner on Station with an Incoming Signal (De-energizing the Relay)

A. A voltage from the incoming signal is developed in the primary and secondary of the 2nd I.F. transformer (20).

B. The voltage in the secondary of the I.F. coil is rectified by the Detector Diode developing a D.C. voltage across the 330,000 ohm resistor (22).

C. The voltage in the primary of the I.F. coil is rectified by the Bucking Diode developing a D.C. voltage across the 1.5 megohm resistor (17).

D. The voltage developed by the Bucking Diode across the 1.5 megohm resistor (17) opposes the voltage developed by the Detector Diode across the 330,000 ohm resistor (22). The resultant voltage is applied to the grid of the D.C. Amplifier Section of the Trigger Tube. This triggering voltage gives a substantially constant tuning accuracy for all signals.

E. When the resultant triggering voltage on the grid of the D.C. Amplifier becomes positive it causes the tube to conduct.

F. The plate current flow in the D.C. amplifier section develops a biasing voltage across the 120,000 ohm resistor (25) which is between grid and cathode of the Relay Section of the Trigger Tube, making the grid more negative than the cathode thus reducing the plate current.

G. The decrease in plate current flow causes the relay to be de-energized and the Relay Arm again engages the Paddle Wheel thereby stopping the tuner sweep on a station, opening contacts #1 and #3 and grounding relay contacts #2 and #4.

IV. Holding the Tuner on Station until a new Station is Desired (Holding the Relay De-energized):

A. Relay contact #1 is opened, ungrounding the 6800 Ohm Resistor (24), thus preventing any appreciable current flow in the relay.

B. Relay contact #4 is grounded and this grounds the cathode circuits of the R.F. and I.F. amplifiers effectively by-passing the sensitivity control (4), which is now ungrounded, and leaving the set at normal sensitivity.

C. Relay contact #2 is grounded thereby grounding out the grid of the D.C. Amplifier. Any voltage now developed across the 330,000 ohm resistor (22) keeps the Bucking Diode from conducting by applying a negative voltage to its plate and the Detector Diode now functions as a conventional detector.

## The Tuner Detection Circuit (See Figs. 7 and 8)

The purpose of the tuner detection circuit is to take input signal voltages of varying strength and trigger the relay tube so that the tuner will stop accurately on the station frequency. A positive voltage developed by the signal on the grid of the D.C. Amplifier Section causes the tuner to trigger and stop. This is accomplished by using the Detector Diode and Bucking Diode to develop voltages of opposite polarity ($E_1$ and $E_2$) between grid and ground of the D.C. Amplifier Section of the Trigger Tube, thus effectively applying the algebraic sum of these voltages ($E_t$) to this signal grid. (Note that contacts #2 and #4 of the relay are open.) These relative voltages plotted against frequency are shown in Fig. 8 using a station frequency of 1200 KC. Notice that the response curve of the voltage ($E_2$) across the 1.5 megohm resistor (17) is broader and not as large as the voltage ($E_1$) developed across the 330,000 ohm (22) detector load. This is because the detector voltage has benefit of one more tuned circuit which gives the narrower curve. Also there is a positive voltage appearing at the cathode of the Bucking Diode which will have the effect of lowering the voltage ($E_2$) across the 1.5 megohm resistor (17) because it will introduce a delay before the Bucking Diode will begin to conduct. This delay can be controlled by the Delay Adjustment in the cathode of the Bucking Diode. This Delay Adjustment also controls the trigger level so

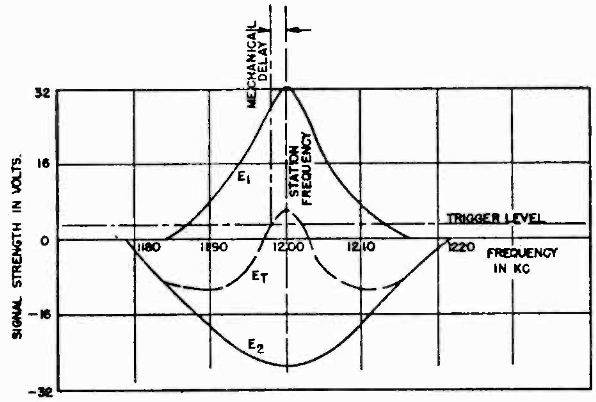



Fig. 8

that the mechanical delay is compensated for and the tuner stops exactly on station. It is a factory adjustment and SHOULD not be adjusted unless it is proven faulty.

Since the two diodes obtain their voltages from the same incoming signal, the strength of both voltages will vary directly with the strength of the incoming signal. Therefore, while they both rise and fall with variation in signal strength, their difference ($E_t$), which is effectively the trigger pulse, will tend to remain constant. Thus, a station will be tuned in with the same degree of accuracy whether it is a strong or weak signal.

## Tuner Muting (See Fig. 7)

Various methods of muting are employed in the signal seeker tuner operated radios. To prevent a click in the speaker as the station selector bar energizes the relay, the output transformer circuit is opened (contact #2 of Station Selector Switch (27), before contact #1 is made. Or, in the case of the foot switch, the speaker voice coil is grounded and the set muted before the relay energizing contact is made.

The receiver is also muted when the solenoid is energized during the return cycle of the tuner. This is accomplishd because when the tuner return switch (33) is mechanically tripped to position #2 it ungrounds the Sensitivity Control which is the cathode return for the R.F. and I.F. amplifier tubes thus momentarily disabling the set.

The receiver also may be muted during the sweep cycle of the tuner by applying the negative oscillator voltage to the grids of the audio tubes to cut them off during the sweep time. Then, when the relay stops the paddle wheel on station and contact #1 is ungrounded enough positive voltage is applied through the 2.2 megohm resistor (10) to counteract the negative voltage from the oscillator and return the output tubes to normal operation. Any excess positive voltage will leak off through the diode to ground in the 1st audio tube.

## Sensititivity Control

The sensitivity control is a step resistor which is inserted into the cathodes during the tuning sweep when relay contact #3 is grounded and is the means by which the operator controls the number of stations on which the tuner will stop.

MODEL 6D-620,
Tuner

## ADJUSTMENTS

All illustration numbers in this section can be used in conjunction with the bulletin for the radio involved and do not refer to the Theory of Operation portion of this bulletin.

All adjustments on Signal Seeking Tuners are made accurately at the factory and do not require further adjustment unless it is definitely proven they are wrong or tuner parts are replaced. These adjustments are readily accessible and can be made without removing the tuner from the radio. All adjustments are made with the antenna disconnected from the radio. All adjustments can be reached by removing the front and rear covers of the radio and the adjustment cover on the top of the radio. The correct procedures for making these adjustments are as follows:

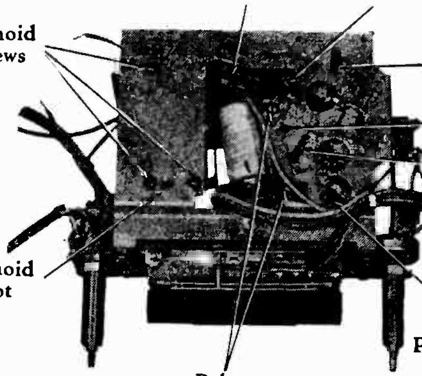
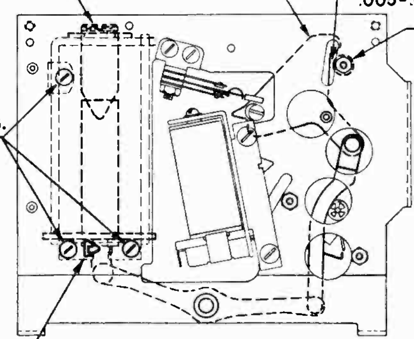



**Fig. 9**

### Solenoid Pole Piece Adjustment (Fig. 10)

This adjustment should be made whenever the Solenoid or Solenoid Plunger is replaced. Its purpose is to obtain the correct amount of force from the Solenoid and to prevent the Solenoid Plunger from sticking.

1. With a screwdriver back the Solenoid Pole Piece out of the Solenoid.
2. Bottom the Solenoid Plunger in the Solenoid. The plunger is bottomed when the "C" washer collar on the plunger hits the frame of the Solenoid.
3. Screw the Solenoid Pole Piece into the Solenoid until it just touches the plunger.
4. Back the pole piece off exactly 1½ turns.
5. Tighten the hex locking nut and seal with glyptal or shellac.




SOLENOID POSITIONING ADJUSTMENT

**Fig. 10**

### Solenoid Adjustment (Fig. 10)

The Solenoid adjustment should be made whenever solenoid or Solenoid plunger is replaced. Its purpose is to provide the correct amount of solenoid plunger movement to move the tuner to the low frequency end of the broadcast band.

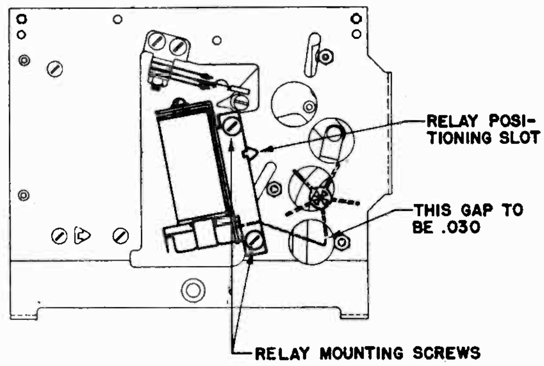
1. With the radio turned off, connect a jumper wire across the 0.5 mfd condenser, Illustration #43, on the cold side of the Solenoid. This is the only paper condenser found on the tuner.
2. Turn the radio on. (This energizes the Solenoid.)
3. Energize the Relay by momentarily depressing the Station Selector Bar.
4. Loosen but do not remove the three solenoid mounting screws.
5. Using a screwdriver in the Solenoid Positioning Slot, turn the screwdriver and move the Solenoid until there is a 0.005 to 0.020 inch gap between the Planetary Arm and its Low Frequency Stop.
6. Tighten the three Solenoid Mounting Screws.
7. Turn the radio off and remove the jumper wire from the condenser.

MODEL 6D-620, Tuner

## Relay Adjustment (Fig 11)

This adjustment should be made whenever the relay is replaced. This is the only adjustment of the relay that should be attempted in the field. The adjustment of the relay is to position the relay arm to have the correct engagement and clearance with the gear train paddle wheel.

1. With the radio turned off, connect a jumper wire across the 0.5 mfd condenser, Illustration #43, on the cold side of the Solenoid. This condenser is found on the tuner.
2. Turn the radio on. (This energizes the Solenoid.)
3. Energize the Relay by momentarily depressing the Station Selector Bar.
4. Loosen but do not remove the two Relay Mounting Screws.
5. Using a screwdriver in the Relay Positioning Slot, turn the screwdriver and move the relay until there is a gap of approximately 0.030 or 1/32 inch between the top of the Relay Arm and the tip of the blades on the Paddle Wheel.
6. Tighten the two Relay Mounting Screws.
7. Turn the radio off and remove the jumper wire from the condenser.




RELAY POSITIONING ADJUSTMENT

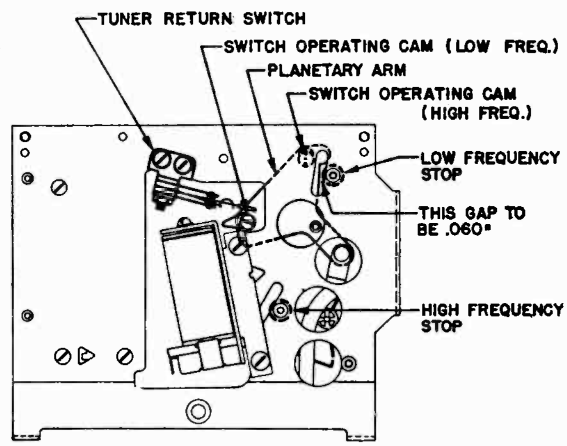
Fig. 11

## Switch Operating Cam Adjustment (Fig. 12)

This adjustment should be made whenever the Motor Gear Train or the Tuner Return Switch is replaced. Its purpose is to set the timing of the Tuner Return Switch.

1. With the radio turned off, insert a 0.060 inch feeler gauge through the slot against the Low Frequency Stop. Number 14 bare wire is a satisfactory gauge.
2. Position the Planetary Arm against the feeler gauge. This can be done with the manual tuning control or on radios without this control the Planetary Arm can be moved directly or by moving the core guide bar to the low frequency end of the broadcast band (tuning cores all the way in the coils).

   CAUTION: ON RADIOS HAVING NO MANUAL TUNING CONTROL, THE PLANETARY ARM CAN BE MOVED ONLY TOWARD THE LOW FREQUENCY STOP WITHOUT DAMAGING THE MOTOR GEAR TRAIN.
3. With a small screwdriver, move the Low Frequency Switch Operating Cam to a position furthest from the Tuner Return Switch.
4. Trip the Tuner Return Switch so that its operating arm is toward the cam.
5. Turn the Low Frequency Switch Operating Cam in a counter clockwise direction until it trips the switch.
6. Insert a 0.060 inch feeler gauge through the slot against the High Frequency Stop.
7. Position the planetary arm against the feeler gauge. CAUTION: DO NOT USE DIRECT FORCE TO MOVE THE PLANETARY ARM. The Planetary Arm can be positioned either by using the manual tuning control or on radios without a manual control as follows:
   (a) Turn the radio on and depress the Station Selector Bar.
   (b) Turn the radio off very close to the high frequency end of the broadcast band.
   (c) With a screwdriver turn the Switch Operating Cam to the position furthest from the Tuner Return Switch.
   (d) Turn the radio on and depress the Station Selector Bar.
   (e) Allow the Planetary Arm to run against the feeler gauge.
   (f) Turn the radio off.
8. Turn the Switch Operating Cam to the position furthest from the Tuner Return Switch if this has not already been done.
9. Trip the Tuner Return Switch so that its operating arm is towards the cam.
10. Turn the High Frequency Switch Operating Cam in a clockwise direction until it trips the Tuner Return Switch.




SWITCH OPERATING CAM ADJUSTMENTS

Fig. 12

MODEL 6D-620,
Tuner

### Cathode Delay Adjustment

This adjustment controls the tuning accuracy of the radio and is carefully adjusted at the factory. It should not be made unless the part is replaced. It is adjusted as follows:

1. With the antenna disconnected turn the radio on. If the bulletin for the radio involved specifies the adjustment to be made with the radio "seeking" depress the station selector bar.
2. Adjust the input voltage to the radio to exactly 6 volts at the "A" connector or the spark plate.
3. Connect a meter from the cathode of the D.C. amplifier section of the trigger tube (pin 8 of the 12AU7 tube) to chassis and adjust the cathode delay rheostat, illustration 110, so the meter reads the voltage specified under "Adjustment Procedure" in the service bulletin for the model radio involved.

## REPLACEMENTS

All illustration numbers in this section can be used in conjunction with the bulletin for the radio involved and do not refer to the Theory of Operation portion of this bulletin.

This tuner has been designed to provide a maximum of servicing efficiency. All service parts have been made very accessible and easy to replace. The wiring to the tuner has been made long enough so that the tuner can be dismounted from the radio case and worked on without disconnecting any leads. (NOTE: It may be necessary to remove some connections of bond straps.) For most replacements such as the relay, the tuner return switch, etc., no special instructions other than being sure the proper adjustments are made are necessary. However, to facilitate fast replacement of some parts, the following instructions are included:

### Solenoid or Solenoid Plunger Replacement (Fig. 10)

1. Remove the radio rear cover and adjustment cover. (Note: It will be necessary to remove the front cover on some radios.)
2. Remove the three solenoid mounting screws found on the top of the tuner.
3. Disconnect the two leads to the solenoid.
4. Remove the solenoid and bracket from the rear of the tuner. (It will be necessary to disconnect one lead of a 0.5 mfd condenser on some radios to give sufficient clearance.)
5. Remove the solenoid plunger from its linkage by removing the spring clip holding this linkage to it.
6. Place the plunger in the solenoid and make the **Solenoid Pole Piece Adjustment.**
7. Install the solenoid plunger and solenoid in the tuner.
8. Fasten the solenoid plunger to its linkage with the spring clip.
9. Solder the leads to the terminals from which they were removed. (If the 0.5 mfd condenser lead was removed, solder it in place).
10. Mount the solenoid to the tuner with the three screws and make the **solenoid adjustment.**

### Station Selector Switch Replacement (Fig. 13)

1. Remove the escutcheon from the front of the radio.
2. Remove the Station Selector Bar and switch assembly which is held in place with two screws through the mounting plate.
3. Remove the switch and disconnect the leads.
4. Connect the leads to the new switch and assemble to mounting plate.
5. Adjust the position of the Switch Operating Ring so that it overtravels the opening and closing of the switch contacts in both directions about .030 or 1/32 inch. This adjustment is made by inserting a screwdriver in the slot on the ring and sliding on the selector bar shaft.
6. Return the selector bar and switch assembly to the radio and fasten with the two screws.

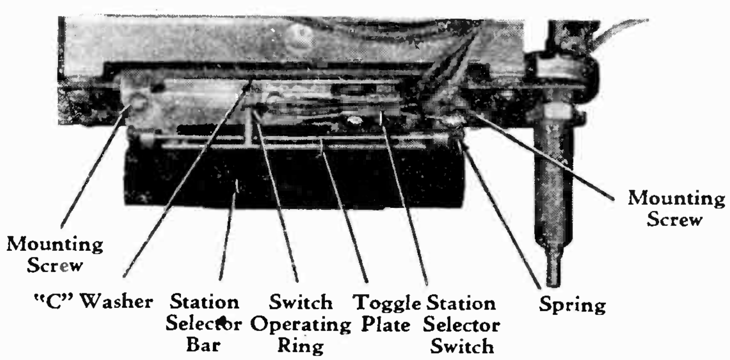



Fig. 13

## Station Selector Bar Replacement (Fig. 13)

1. Remove the station selector bar and switch assembly from the radio as described in steps 1 and 2 of **Station Selector Switch Replacement.**
2. Remove the small "C" washer from the end of the station selector bar shaft.
3. Remove the two springs that hold the station selector bar and toggle plate to the mounting plate.
4. Assemble the new station selector bar and toggle plate with the two springs to the mounting plate as shown.
5. Place the "C" washer on the shaft and secure.
6. Adjust the position of the switch operating ring as described in step 5 of **Station Selector Switch Replacement.**
7. Return assembly to the radio and mount with the two screws.

## Motor Gear Train Replacement (Fig. 14)

1. Remove the front and rear cover of the radio.
2. Dismount the tuner from the case and move it out of case far enough so that it can be worked on.
3. Divide the tuner into two parts by:
   (a) Removing the spring clip holding the gear train planetary arm to the core guide bar linkage.
   (b) Removing the four tuner assembly screws. (Some tuners have two additional screws.)
   (c) Separating the two halves of the **tuner.**

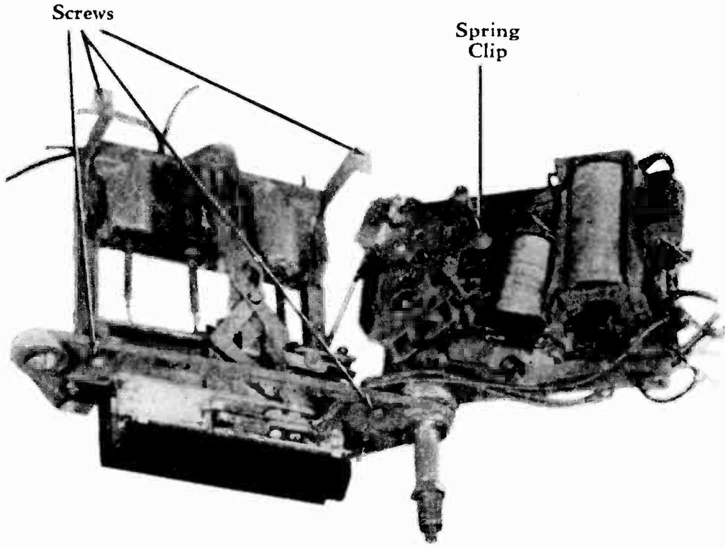



Fig. 14

4. On radios having a manual tuning control, remove the worm gear and bracket from the gear train.
5. Disconnect the motor gear train from the solenoid plunger linkage by removing the spring clip holding them together.
6. Remove the three nuts mounting the motor gear train.
7. Mount the new motor gear train to the tuner with the three nuts.
8. Connect the gear train to the solenoid linkage with the spring clip.
9. On radios having a manual tuning control, remove the screw holding the manual gear of the gear train in position and mount the worm gear and bracket to the gear train. Be careful to get good gear mesh and do not lose the anti-squeak spring on the worm gear bracket.
10. Reassemble the tuner and make the **Switch Operating Cam Adjustment.**

## THE TROUBLE SHOOTER'S GUIDE

All illustration numbers in this section can be used in conjunction with the bulletin for the radio involved and do not refer to the Theory of Operation portion of this bulletin.

To facilitate rapid diagnosis of troubles which may develop in the Signal Seeking Tuner, those most likely to occur have been classified and listed in a trouble shooting chart. Three fundamental tests which are easily made on the radio are the basis for this chart. The normal indication for each test is shown just to the right of the test block in solid lines and if the indication is normal the next basic test should be made. However, if the normal indication does not apply to the radio under test, the various abnormal indications that could result from the check are shown in irregular line blocks below the normal condition. When the block which applies to the radio being checked is reached, a chart which will contain a simplified partial schematic will be referred to. The checks necessary to isolate the defective components will also be included in this chart and components common to all sets are assigned illustration numbers which are the same as those in the individual bulletins for each specific set. Thus, through the use of these charts, the vast majority of the troubles can be isolated in a very short period of time.

## Initial Trouble-Shooting Tests

NOTE: Read the chart from LEFT to RIGHT until the specified condition does not apply to the radio being tested, then read down until the condition listed is identical to that of the radio under test. See the chart indicated for further analysis.

**TEST I** — TURN ON RADIO AND ALLOW RADIO TO WARM UP

Dial pointer remains stationary

- Dial pointer begins sweeping —See Chart 3, Conditions 2 & 3

**TEST II** — DEPRESS STATION SELECTOR BAR

Dial pointer sweeps range from below 550 KC to above 1600 KC in satisfactory manner.

- Pointer starts but stops when selector bar is released — See Chart 4
- Pointer does not sweep smoothly thru its complete range. See Chart 5
- Pointer is stuck at end of dial. See Chart 1
- Pointer stuck at a midway point, remove adjustment plate - Observe Relay as bar is depressed
  - Relay energizes See Chart 2
  - Relay does not energize See Chart 3, Condition 1

**TEST III** — WITH ANTENNA CONNECTED, DEPRESS SELECTOR BAR

Radio stops on stations normally received

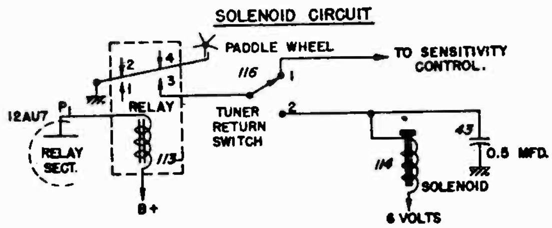
- Tuner doesn't stop on stations normally received - Check radio operation independent of tuner. Chart 6
- Tuner stops at various points on dial, but no sound from the speaker.
  Buick - See Chart 8
  Oldsmobile - See Chart 8
  Cadillac - See Chart 7
- Stopping action of tuner is unsatisfactory for other reasons See Chart 10

CHECK RADIO INSTALLATION IN AUTOMOBILE

INITIAL PREPARATIONS FOR TEST:

1. Check tubes and vibrator.
2. Adjust input to 6 volts at receiver spark plate.
3. Adjust sensitivity control and volume control to maximum positions—all tests.
4. Leave antenna disconnected until the chart indicates connection to be made; when it is connected, antenna trimmer MUST be peaked.

## CHART 1




**Solenoid Circuit**

CONDITION 1: TUNER WILL NOT START. POINTER STATIONARY AT END OF DIAL

**IF** STUCK AT HIGH END OF DIAL, momentarily short out the solenoid condenser, Illus. 43

**IF** THE TUNER RETRACES

Check

1. Adjustment of high frequency cam which closes tuner return switch at high end of the band. Illus. 116
2. Tuner return switch, Illus. 116, for sticking open.
3. Ground connection of relay armature.
4. Relay Contact #3 for open.

**IF** THE TUNER WON'T RETRACE

Check

1. Solenoid, Illus. 114, for open.
2. Solenoid for short. (Fuse blows when bar is depressed)
3. Voltage across solenoid with solenoid condenser, Illus. 43, shorted out. Solenoid voltage should be at least 5.5 volts.
4. Solenoid positioning adjustment.
5. For mechanical bind by grasping planetary arm and cocking motor gear train by hand.

**IF** STUCK AT LOW END OF THE DIAL, make a visual inspection of the position of the tuner return switch, Illus. 116.

**IF** TUNER RETURN SWITCH IS CLOSED

(Position 2)

Check

1. Adjustment of cam which opens tuner return switch at low end of the band. (See Adjustment)
2. Tuner return switch for sticking closed.

**IF** TUNER RETURN SWITCH IS OPEN

(Position 1)

Check

1. Switch for possible shorted terminals.
2. Mechanical portion of tuner for a bind or a defective motor.
3. 0.5 mfd solenoid condenser, Illus. 43, for short.
4. Cold side of solenoid for short to chassis.

IMPORTANT: IF ABOVE CHECKS PROVE THE SOLENOID CIRCUIT TO BE SATISFACTORY GO TO CHART 2 AND CHECK FOR A MECHANICAL DEFECT.

MODEL 6D-620,
Tuner

## CHART 2

### Relay Energizes But Tuner Will Not Start

I. DEPRESS STATION SELECTOR BAR AND NOTICE WHETHER RELAY ARM DISENGAGES PADDLE WHEEL. IF IT DOESN'T—SEE RELAY POSITIONING ADJUSTMENT.

II. VISUALLY CHECK FOR CAUSE OF BIND. INSPECT TUNER FOR IMPROPERLY ROUTED WIRES FOULING MECHANISM.

III. REMOVE TUNER FROM THE RADIO. SEPARATE THE TWO HALVES OF THE TUNER.

A. CHECK THE TOP HALF OF TUNER FOR BIND BY MOVING THE CORE BAR WITH YOUR FINGER.

IF

Top half doesn't bind, check bottom half.

IF

Top half binds, remove clip from connecting link between core bar and pointer, and check each separately for bind.

B. CHECK BOTTOM HALF OF TUNER FOR BIND BY REMOVING CLIP FROM MOTOR SIDE OF SOLENOID LINKAGE.

CHECK

For bind in solenoid by moving solenoid linkage by hand.

IF

Bind occurs in solenoid linkage, remove clip from solenoid end of solenoid linkage to determine if bind is in solenoid plunger or linkage. If the solenoid linkage and solenoid are O. K., connect the gear train and soleniod together again.

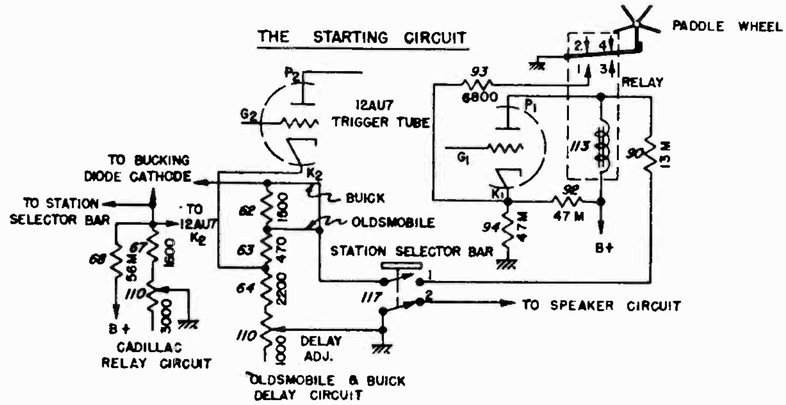
CHECK

Gear train for bind by pressing the plunger into the solenoid then carefully moving the relay arm out of the paddle wheel. The paddle wheel should start running.

IF

The paddle wheel doesn't begin running, the gear train is defective and should be replaced.

## CHART 3




**The Starting Circuit**

CONDITION 1: THE TUNER WILL NOT START. RELAY DOES NOT ENERGIZE WHEN THE STATION SELECTOR BAR IS DEPRESSED.

MEASURE THE VOLTAGE BETWEEN THE CHASSIS AND THE SWITCH SIDE OF THE 13M OHM RESISTOR (ILLUS. 90)—(WITH RADIO ON AND AN INPUT OF 6 VOLTS, THIS VOLTAGE MUST BE AT LEAST 180 VOLTS FOR PROPER OPERATION OF THE RELAY.)

IF

VOLTAGE IS ZERO, check for

1. Open relay winding.
2. Open 13M ohm resistor.
3. Inoperative power supply or short in B voltage line.

VOLTAGE IS LOW check, for

1. Defect in power supply.
2. Low input voltage.

IF

VOLTAGE APPROXIMATES THE B VOLTAGE, depress the station selector bar and again note the voltage.

IF

THE VOLTAGE DROPS, (normal drop approximately 65 volts)

Check

1. Relay winding for short or partial short.

   (Normal relay resistance from 3200 - 3600 ohms.)
2. Resistor string from station selector bar switch to ground, for possible excessive resistance.
3. Relay Current. If relay doesn't energize with 9.5MA current relay is defective.

IF

THERE IS NO CHANGE IN VOLTAGE

Check

1. Station selector switch contacts, Illus. 117, for open.
2. Resistor string from station selector bar switch to ground for possible open.

CONDITION 2: THE POINTER COMMENCES SWEEPING ACTION IMMEDIATELY WHEN THE RADIO IS TURNED ON, WITHOUT PREVIOUS DEPRESSION OF THE STATION SELECTOR BAR.

Check for

1. Defective station selector bar switch, (Sticking closed) or a short at the switch terminals.
2. Short to chassis from either end of the 13M ohm resistor (Illus. 90).
3. Short to chassis at Plate (P1) terminal of the 12AU7 tube. (Pin 1)
4. Relay armature stuck in the energized position. (Should return to de-energized position when set is turned off.)

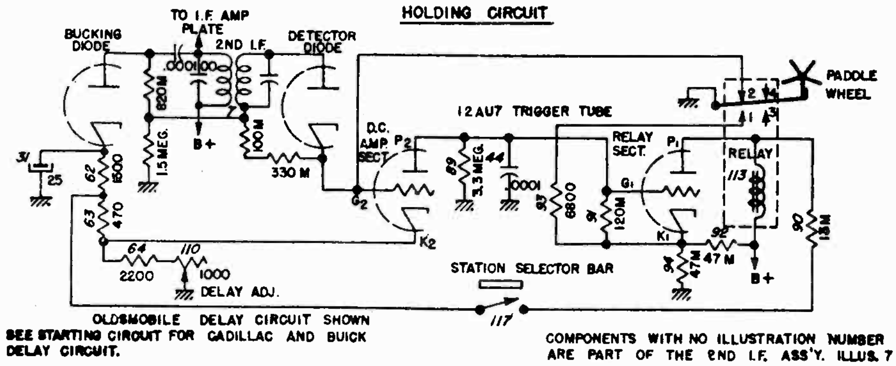
CONDITION 3: POINTER COMMENCES SWEEPING ACTION AFTER WARM UP PERIOD, WITHOUT PREVIOUS DEPRESSION OF THE STATION SELECTOR BAR.

Check for

1. Short from cathode (K1) of 12AU7 (Pin 3) to ground.
2. Contact #1 of the relay switch shorted to ground at all times.

MODEL 6D-620,
Tuner

## CHART 4




**Holding Circuit**

CONDITION: DIAL POINTER STOPS INSTANTLY WHEN STATION SELECTOR BAR IS RELEASED.

I. CHECK TRIGGER TUBE (12AU7). IF OK GO TO NEXT CHECK.

II. MEASURE GRID ($G_1$) (Pin 2) TO CATHODE ($K_1$) (Pin 3) VOLTAGE AT 12AU7 TUBE WITH RADIO TURNED ON. (THIS VOLTAGE MUST BE MEASURED WITH A VACUUM TUBE VOLTMETER.)

IF

VOLTAGE READING IS LESS THAN 25 VOLTS — GO TO CHECK III.

IF

VOLTAGE READING IS ABOVE 25 VOLTS check:

1. Grid ($G_1$) to chassis resistance. If 110,000 ohms or less, check:
   a. .000100 mfd. condenser (Illus. 44) for short or leakage.
   b. $P_2$ (Pin 6) and $G_1$ terminals of 12AU7 for possible shorts to chassis.
2. D.C. amplifier cathode, ($K_2$) of 12AU7 (Pin 8), to ground resistance for possible short.
   a. Check at station selector switch terminals, Illus. 117, for possible short.
   b. Check at D.C. amplifier cathode terminal ($K_2$) for short to chassis or grid ($G_2$) terminal. (Pin 7)
3. 25 mfd electrolytic, Illus. 31, for short.

III REPEAT MEASUREMENT MADE IN TEST II, THIS TIME WITH STATION SELECTOR BAR DEPRESSED.

IF

VOLTAGE IS LESS THAN 8 VOLTS, check for:

1. Open between $P_1$ and relay.
2. Open 6800 ohm resistor. (Illus. 93)
3. Poor relay contact #1.
4. Partially shorted relay. (Resistance should be 3200 - 3600 ohms)

IF

VOLTAGE IS MORE THAN 8 VOLTS, check for:

1. Defective detector tube. (Check by substitution. 6R8 - Buick and Oldsmobile, 6AQ7 - Cadillac)
2. Leaky .000100 mfd. coupling condenser from I.F. amplifier plate to bucking diode plate. (This part in 2nd I.F. assembly. Check by measuring voltage at orange lead of 2nd I.F. with set turned on. A VTVM reading of more than 3 volts positive with respect to ground indicates a leaky condenser.) Replace 2nd I.F.
3. Oscillation in radio. (Check by grounding $G_2$ and depressing bar. If tuner action is now OK trouble is due to oscillation.) (For oscillation - check AVC filter and screen by-pass condensers.)

## CHART 5

### Miscellaneous Defects in the Sweep Action of the Tuner

**CONDITION I.** TUNER DOES NOT SWEEP THROUGH THE COMPLETE FREQUENCY RANGE.

- IF: Tuner retraces before high band edge is reached, adjust high frequency eccentric cam which closes tuner return switch so that retrace occurs at approximately 1620 KC. See adjustments.
- IF: Tuner starts sweeping before low band edge is reached, adjust low frequency eccentric cam which opens tuner return switch so that sweeping starts at a point below 550 KC. See adjustments.

**CONDITION II.** TUNER SWEEP ACTION IS SLOW, JERKY OR ERRATIC.

- CHECK: For pointer drag against escutcheon backplate. If this exists, see adjustments.
- CHECK: For broken or missing motor power spring.
- CHECK: For light mechanical bind - See Chart 2
- CHECK: For defective gear train. See methods for checking outlined on Chart 2

**CONDITION III.** TUNER SWEEPS NORMALLY UNTIL A CERTAIN POINT ON ITS DIAL IS REACHED, WHEN IT STOPS. DEPRESS STATION SELECTOR BAR.

- IF: Tuner can be started again by depression of selector bar, tuner is stopping on an oscillation or feedback in the radio circuit which occurs only at certain points on the dial. Check radio.
- IF: Tuner will not start when selector bar is again depressed, check for mechanical bind. See Chart 2

**CONDITION IV.** TUNER RETURN ACTION ABNORMAL

- IF: Tuner returns to a midway point and sticks there - check solenoid plunger for a bind.
- IF: Pointer rapidly goes back and forth between high end and midway point with a "Machine-gun" like effect.
  - A. Manual worm unmeshed from manual drive gear. (On sets with manual)
  - B. Screw which secures gear just below top plate of planetary arm to the planetary arm missing or loose. (On sets without manual tuning)
  - C. Defect in planetary arm assembly. Replace motor gear train.
- IF: Tuner return action is slow — (About the same speed as sweeping speed)—the defect is in planetary arm assembly — replace gear train.

MODEL 6D-620,
Tuner

# CHART 6

## Procedure for Checking Radio Operation Independent of Tuner

CONDITION I. RADIO HAS MANUAL TUNING KNOB.

Tune radio manually and note number of stations received with listenable volume. Adjust sensitivity control to maximum and note number of stations selected automatically.

IF

Normal number of stations is received manually, but these stations are not received automatically, check tuner. See Chart 9.

IF

Normal number of stations cannot be received, TROUBLE-SHOOT RADIO PROPER.

CONDITION II. RADIO DOES NOT HAVE MANUAL TUNING.

Connect signal generator to antenna connector through a series condenser of the value specified in the service bulletin. Adjust generator output to a high level and tune the generator around the frequency indicated by the radio dial pointer until the signal is tuned in.

IF

RADIO PICKS UP SIGNAL, set the sensitivity control to maximum, peak antenna trimmer and depress the station selector bar.

IF

TUNER STOPS ON THE SIGNAL,

tune generator to frequency of weak station normally heard in the locality. Depress the station selector bar. When the tuner stops on the generator signal, plug in the antenna and again peak the antenna trimmer.

IF STATION CAN BE HEARD

Check the tuner - See Chart 10.

IF STATION CANNOT BE HEARD

Check the radio for defect causing it to be weak.

IF

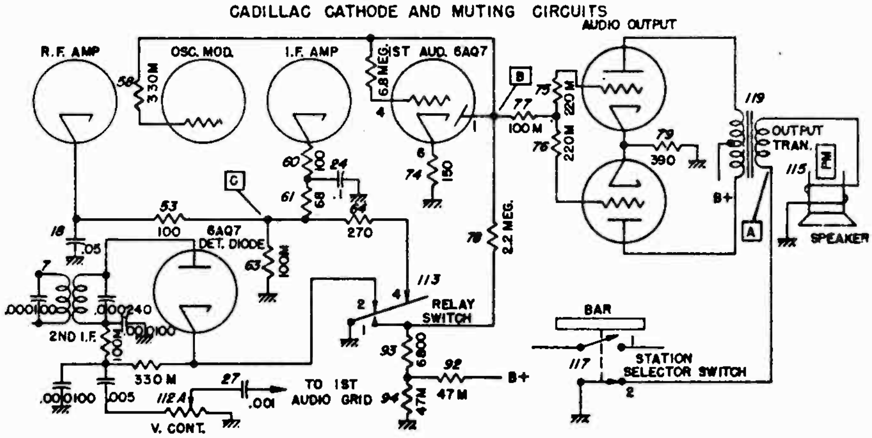
TUNER DOES NOT STOP ON SIGNAL, see Chart 9.

IF

SIGNAL IS NOT PICKED UP BY RADIO, analyze the cause of radio failure.

# CHART 7

CADILLAC CATHODE AND MUTING CIRCUITS




COMPONENTS WITH NO ILLUSTRATION NUMBER ARE PART OF 2ND I.F. ASSEMBLY, ILLUS. 7
SENSITIVITY CONTROL NOT SHOWN.

## Tuner Stops on Signals But No Sound From Speaker

I. SHORT OUTPUT TRANSFORMER SECONDARY LEAD. GOING TO SELECTOR SWITCH, TO CHASSIS. (POINT A).

- IF SOUND COMES FROM SPEAKER, find open between transformer secondary and ground end of muting section of station selector switch contact 2.
- IF RADIO IS STILL DEAD — go to check II.

II. SHORT PIN #1 OF 6AQ7 TUBE TO CHASSIS. (POINT B)

- IF SOUND COMES FROM SPEAKER, check for open between pin #1 at 6AQ7 and connect #1 of relay switch.
- IF RADIO IS STILL DEAD — go to check III.

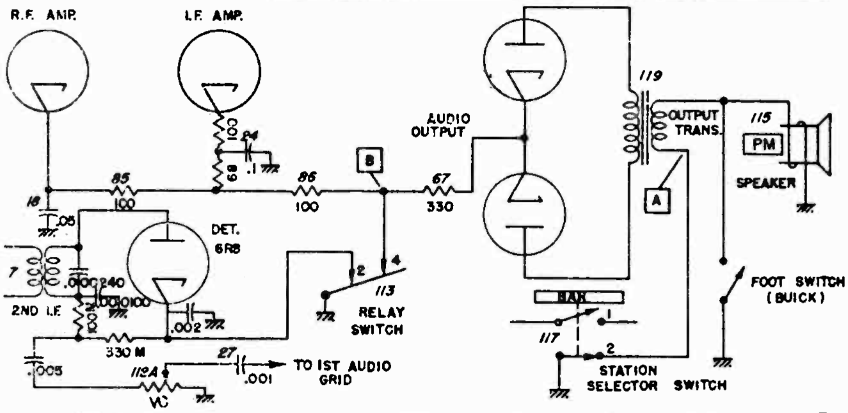
III. SHORT RF AND IF CATHODE STRING TO CHASSIS. (POINT C)

- IF SOUND COMES FROM THE SPEAKER, check for open between cathode string and ground through relay contact #4.
- IF RADIO IS STILL DEAD, make usual radio checks to localize defective part.

MODEL 6D-620,
Tuner

## CHART 8

BUICK & OLDSMOBILE CATHODE AND SPEAKER MUTING CIRCUITS




COMPONENTS WITH NO ILLUSTRATION NUMBERS ARE PART OF 2ND I.F. ASSEMBLY, ILLUS. 7
ONLY RECEIVER DISABLING SECTION OF BUICK FOOT SWITCH SHOWN.
SENSITIVITY CONTROL NOT SHOWN.

### Tuner Stops on Signals But No Sound From Speaker

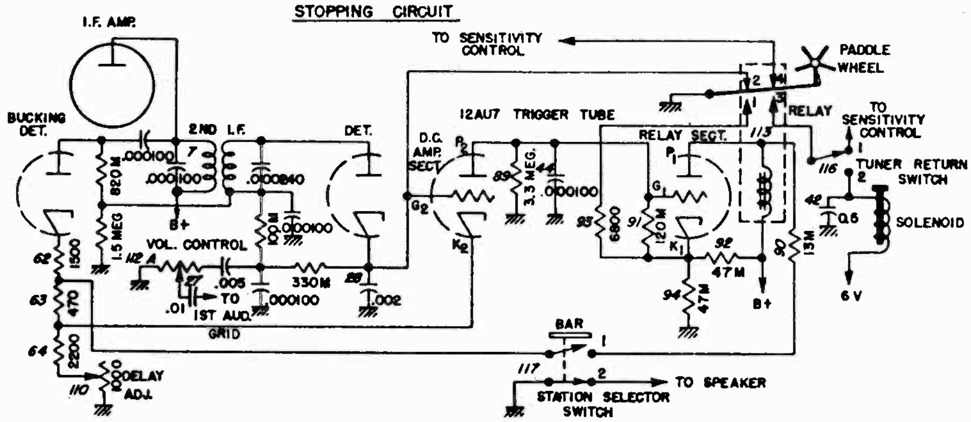
I. SHORT TO CHASSIS THE OUTPUT TRANSFORMER SECONDARY LEAD GOING TO SELECTOR SWITCH. (POINT A)

- IF SOUND COMES FROM SPEAKER, find open between transformer secondary and ground end of muting section of station selector switch. Check for shorted foot switch - (Buick)
- IF RADIO IS STILL DEAD — go to check II.

II. SHORT RF, IF, AND OUTPUT CATHODE CIRCUITS TO CHASSIS AT POINT B.

- IF SOUND COMES FROM SPEAKER, check for open between cathode string and ground through relay contact #4.
- IF RADIO IS STILL DEAD, make usual radio checks to find defective part.

## CHART 9




COMPONENTS WITH NO ILLUSTRATION NUMBERS ARE PART OF 2ND I.F. ASSEMBLY, ILLUS. 7.
OLDSMOBILE DELAY CIRCUIT SHOWN.

### Tuner Will Not Stop on Stations, Radio Otherwise Normal

I. WITH RADIO OFF, CHECK ENGAGEMENT OF RELAY ARM TO PADDLE WHEEL

IF — Relay arm is missing — replace relay.

IF — Relay arm does not engage paddle wheel—check relay positioning adjustment. **(Do not adjust engagement by bending relay arm)**

II. WITH TUNER SWEEPING, MOMENTARILY SHORT 12AU7 CATHODE ($K_2$) (Pin 8) TO GROUND

IF — TUNER STOPS, check:

1. Voltage between D.C. amplifier cathode ($K_2$) and B—.
   **NO VOLTAGE:**
   Open between $K_2$ and ground.
   **WRONG VOLTAGE:** (For correct voltage see bulletin for model radio involved)
   Set delay adjustment rheostat according to bulletin instructions.
2. .002 condenser (Illus. 28) for short, or short from $G_2$ to B— **when relay is energized.**
3. Open between $G_2$ and detector cathode.
4. Open in sensitivity control. (Check continuity from cathode string to B— with relay energized.)
5. Check 2nd I.F. - Procedure listed below.
   (1) Feed a modulated signal from the signal generator into the antenna connector of the receiver through the appropriate series condenser.
   (2) Tune signal generator until signal is heard in receiver. Adjust generator input for an output signal of approximately 1000 micro-volts. On many signal generators this is obtained roughly with the fine attenuator at 1 and the rough attenuator at 1000. If you have no way of knowing how the output of your signal generator is calibrated, set your signal generator coarse attenuator at about the half way mark and vary it about ¼ range each direction, when going through step (6).
   (3) Remove 12AU7 tube from its socket.
   (4) Disconnect the green wire connected between the grid of the 12AU7 ($G_2$) or its equivalent and the relay at the tube socket terminal.
   (5) Connect VTVM between $G_2$ and chassis and re-tune the generator frequency for maximum voltage.
   a. No voltage indication. Defective 2nd I.F.
   b. Voltage which is approximately 90% of the voltage from $K_2$ to chassis - proceed with step (6).
   (6) Change generator signal to an unmodulated signal and vary the signal by a factor of 10 times louder and weaker. On many signal generators this can be accomplished by merely turning the rough attenuator one step on each side of the starting point.
   a. If voltage remains almost constant, increasing slightly with increases in output - the 2nd I.F. is O.K.
   b. If voltage goes through a large variation corresponding to voltage reading taken across detector load—the bucking detector circuit is defective. Check tube containing bucking diode by substitution. If this does not cure trouble, the 2nd I.F. is probably defective.

IF — TUNER DOESN'T STOP, check for

1. Trigger tube defective.
2. Open between grid ($G_1$) at relay section and plate ($P_2$) at D. C. amplifier section of trigger tube.
3. 47,000 ohm resistor (Illus. 92) between B+ and $K_1$ open.
4. Open 120 M ohm resistor (Illus. 91) between $G_1$ and $K_1$.

MODEL 6D-620,
Tuner

## CHART 10

### Miscellaneous Defects in the Tuner

I. TUNER DOES NOT STOP ON THE PEAK OF SIGNALS.

A. Check 2nd IF—See Chart 9.
B. Check relay drop out current. It should not drop out on current above 3.7 MA.
C. Check setting of delay adjustment — See set bulletin.

II. TUNER MOMENTARILY STOPS, THEN STARTS AGAIN OR WILL STOP ONLY ON STRONG STATIONS.

A. This can be caused by improper timing of the relay contacts. To check this, temporarily connect a 10 mfd electrolytic condenser of suitable voltage rating from the terminal on the sensitivity control to which the yellow lead connects, to chassis. If this cures the trouble the defect is due to improper relay point timing and the relay should be replaced.

III. TUNER STOPS ON STATIONS DURING THE TUNER'S RETURN.

A. The sensitivity control circuit is not being opened during the return cycle, because
(1) There is a short to chassis at the sensitivity control terminal of the tuner return switch, or at the sensitivity control.
(2) The cathode string is shorted to chassis elsewhere.

IV. THE TUNER WILL JAR OFF STATION ON ROUGH ROADS.

A. On sets having manual tuning this is due to a defective friction clutch in the planetary arm assy. - Replace the gear train.

V. THE RADIO DOES NOT MUTE IN BETWEEN STATIONS.

A. This is caused either by a lack of muting voltage appearing on the audio grids due to an open between the oscillator grid and the muting line or a defective audio tube. (Check the Cadillac muting circuit on Chart 7)

VI. TUNER STOPS ONLY ON STRONG SIGNALS AND THE RADIO IS OK.

A. Heater to cathode leakage of the 6R8 tube in case of Buick or Oldsmobile; the 6AQ7 tube in the case of Cadillac. This can be checked by increasing the "A" voltage. If situation gets worse with increased "A" voltage, change 6R8 or 6AQ7 tube, whichever applies.
B. Sensitivity control not at maximum sensitivity.

VII. TUNER STOPS ON SIGNALS BUT THE SOUND IS DISTORTED.

Short pin 3 of 6R8 or pin 2 of 6AQ7 (Cadillac) to chassis. If distortion clears, find open between detector cathode and ground through relay contact #2.

## SERVICE PARTS INTERCHANGEABILITY
### FOR 1950 SIGNAL SEEKING TUNERS

| | Buick 980899 | Cadillac 7258865 | Oldsmobile 982582 982583 |
|---|---|---|---|
| Temp. Comp. Cond. | 7257567 | 7257567 (Same) | 7257567 (Same) |
| Dual Trimmer | 7242454 | 7242454 (Same) | 7242454 (Same) |
| Tuning Core | 7259201 | 7259201 (Same) | 7259201 (Same) |
| 2nd I.F. | 1219602 | 1219602 (Same) | 1219602 (Same) |
| 1st I.F. | 1219508 | 1219508 (Same) | 1219508 (Same) |
| Osc. Coil | 7259184 | 7259184 (Same as Buick) | 7259665 |
| Ant. & R.F. Coil | 7257979 | 7257979 (Same) | 7257979 (Same) |
| Det-Aud Tube | 6R8 | 6AQ7GT | 6R8 (Same as Buick) |
| Trigger Tube | 12AU7 | 12AU7 (Same) | 12AU7 (Same) |
| Power Spring | 7259055 | 7259055 (Same) | 7259055 (Same) |
| Selector Bar Switch | 7259012 | 7259012 (Same) | 7259012 (Same) |
| Tuner Return Switch | 7259011 | 7259011 (Same) | 7259011 (Same) |
| Motor Gear Train | 1219610 | 1219610 (Same) | 1219610 (Same) |
| Relay | 7259009 | 7259009 (Same) | 7259009 (Same) |
| Solenoid | 1219661 | 1219661 (Same) | 1219661 (Same) |

MODEL 416270, Packard

**GENERAL**

MOUNTING—All 1950 Packard Cars.

TUBES—Seven, Plus Rectifier.

SPEAKER — 7" Round, Permanent Magnet.

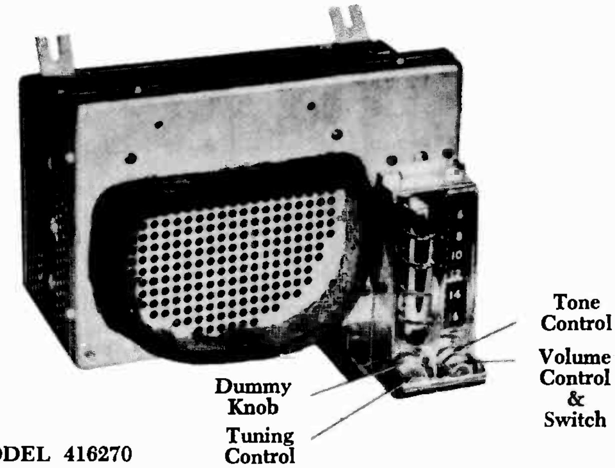
TUNING—Manual and 5 P.B. Mechanical.

ANTENNA TRIMMER COMPENSATION—0.000060 - 0.000085 Mfd.

Tuning Range—540 - 1600 KC.

**PUSHBUTTON SET-UP**

Pull pushbutton down and out. Tune in desired station manually. Push button all the way in.




MODEL 416270

**ALIGNMENT PROCEDURE:**

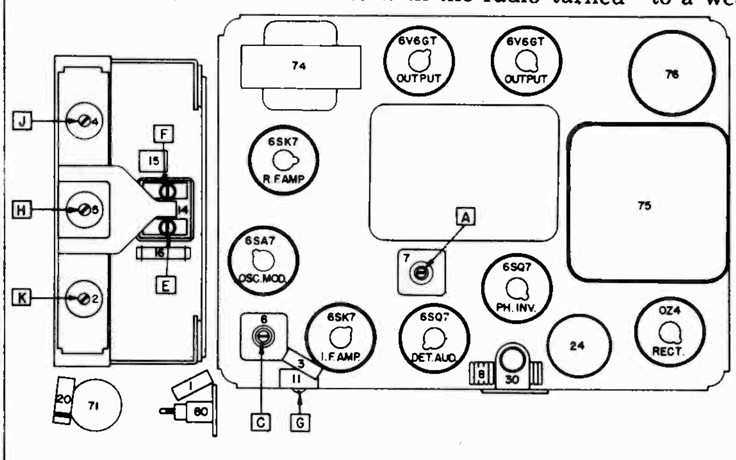
Output Meter Connection ---------- Across Voice Coil
Signal Generator Return ---------- To Chassis
Dummy Antenna ---------- In Series With Generator
Volume Control ---------- Maximum Volume
Tone Control ---------- Treble
Generator Output ---------- Minimum for Readable Indication

| Steps | Series Condenser or Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin #8) | 260 KC | High Freq. Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Gen. Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Gen. Signal | L** |

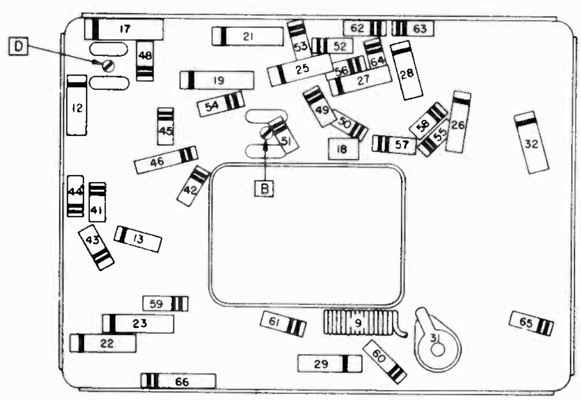
*Before making this adjustment check the mechanical setting of the oscillator core "H." The slotted end of the core should be 1 25/32" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form). If adjustment is necessary, be sure to first dissolve the glyptal seal on the core studs. Core adjustments are made from the mountings end of the coil form with an insulated screwdriver, and core studs should be re-sealed with glyptal or household cement after alignment.

**"L" is the pointer adjustment screw on the pointer connecting link (See tuner drawing). Adjust so pointer reads 1000 KC (on the "10" calibration mark).

With the radio installed and the car antenna plugged in adjust antenna trimmer "G" (See sticker on case) for maximum volume with the radio turned to a weak station near 1400 KC.

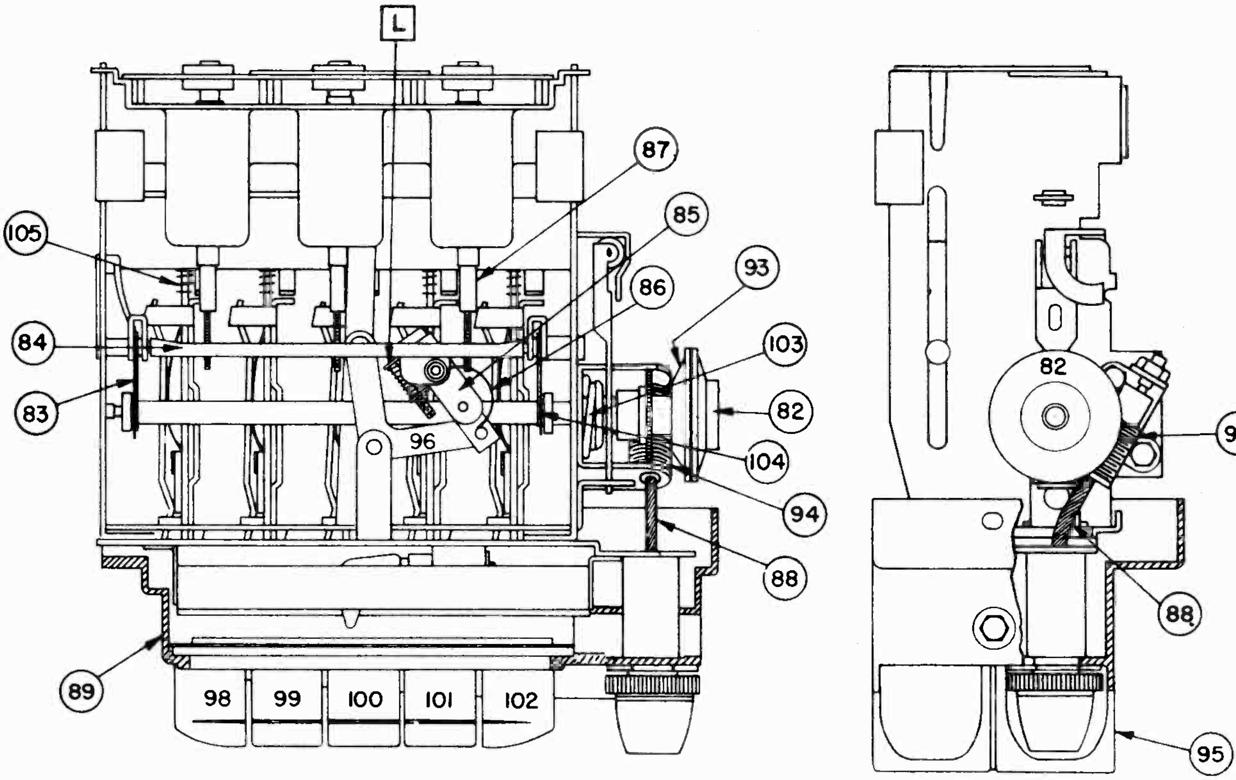



PARTS LAYOUT – TUBE VIEW



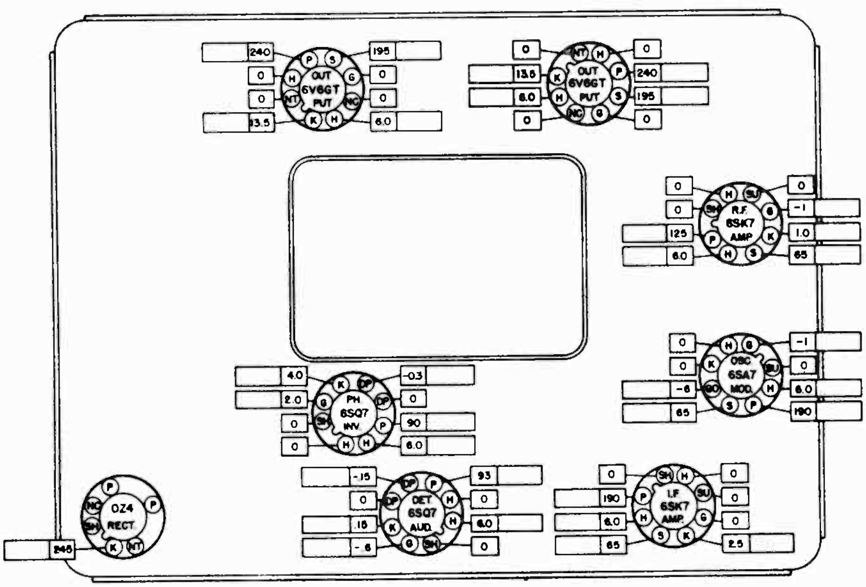

PARTS LAYOUT – CHASSIS VIEW

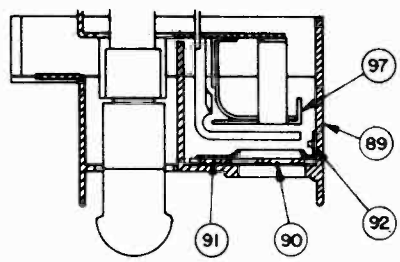
MODEL 416270,
Packard




TUNER

TUBE SOCKET VOLTAGE CHART




ESCUTCHEON CROSS SECTION

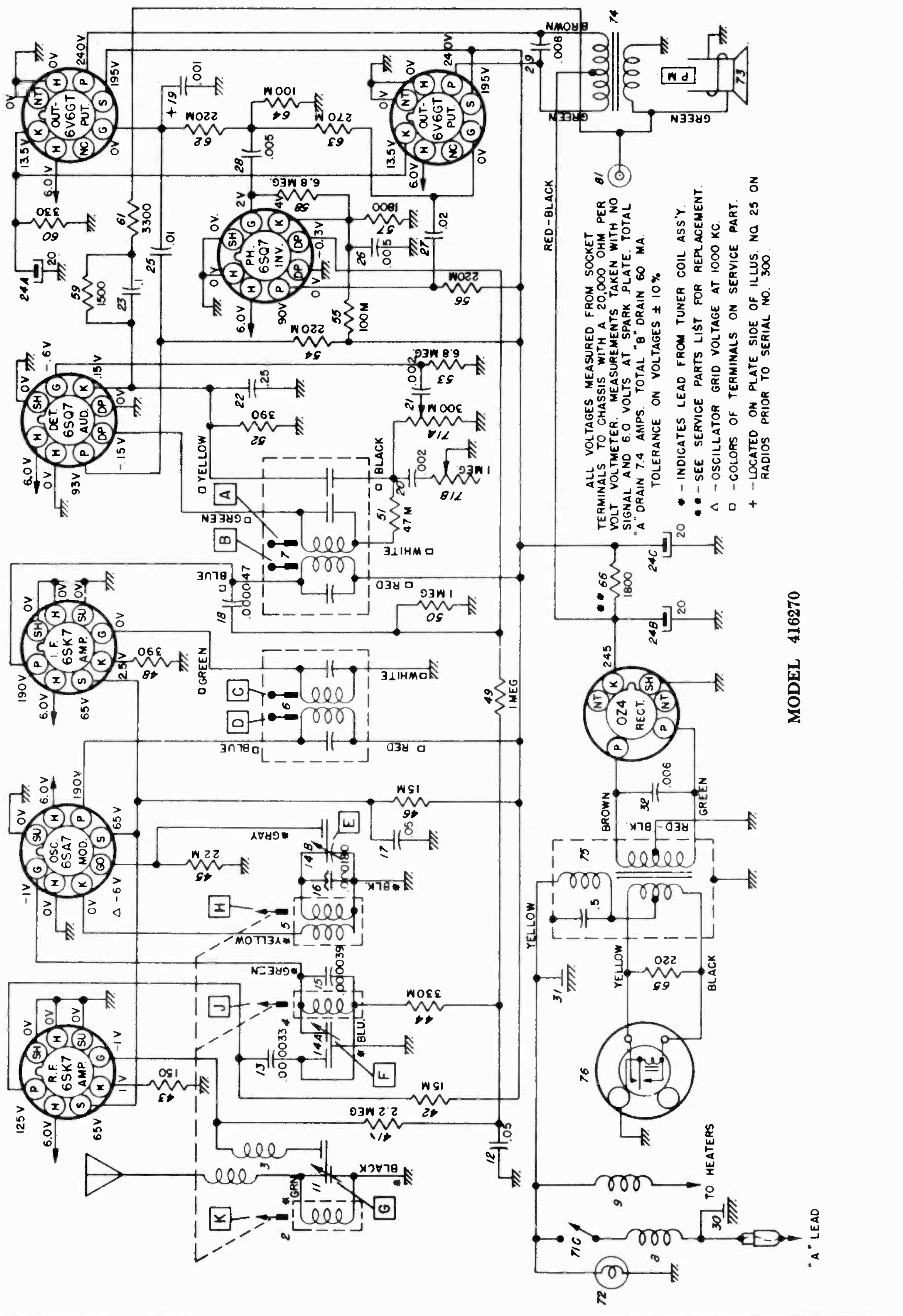
The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown above. The blank spaces are provided so that the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

Voltmeter resistance__________Ohms Per Volt.

Readings taken with______Volts at Spark Plate.

All voltages measured from socket terminals to chassis.

MODEL 416270,
Packard



MODEL 416270,
Packard

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **ELECTRICAL PARTS** | |
| | | **Coils** | |
| 1 | 7258502 | 7258502 | Antenna Series Choke |
| 2 | 7258914 | 7258914 | Antenna |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7258914 | 7258914 | R. F. |
| 5 | 7259687 | 7259687 | Oscillator |
| 6 | 7258849 | 1219508 | 1st I. F. Assembly |
| 7 | 7258850 | 1219509 | 2nd I. F. Assembly |
| 8 | 7259620 | 7259620 | "A" Spark Choke |
| 9 | 7259619 | 1217846 | Hash Choke |
| | | **Condensers** | |
| 11 | 7259597 | 7259597 | Antenna Trimmer |
| 12 | 7236842 | E503 | .05 Mfd. 200 V. Tubular |
| 13 | 7258222 | G330 | .000033 Mfd. Molded |
| 14 | 7242454 | 7242454 | Dual Trimmer |
| 14A | | | R. F. Section |
| 14B | | | Oscillator |
| 15 | 7258223 | G390 | .000039 Mfd. Ceramic |
| 16 | 7257424 | 7257424 | .000180 Mfd. Compensating |
| 17 | 7258125 | E503 | .05 Mfd. 400 V Tubular |
| 18 | 1219551 | G470 | .000047 Mfd. Molded |
| 19 | 1218883 | E102 | .001 Mfd. 600 V Tubular |
| 20 | 7237836 | E202 | .002 Mfd. 600 V Tubular |
| 21 | 7237836 | E202 | .002 Mfd. 600 V Tubular |
| 22 | 1211202 | E254 | .25 Mfd. 200 V. Tubular |
| 23 | 7238789 | E104 | .1 Mfd. 200 V Tubular |
| 24 | 7240724 | M908 | Electrolytic |
| 24A | | | 20 Mfd. 25 V |
| 24B | | | 20 Mfd. 400 V |
| 24C | | | 20 Mfd. 400 V |
| 25 | 1209309 | E103 | .01 Mfd. 400 V Tubular |
| 26 | 7230767 | E502 | .005 Mfd. 600 V Tubular |
| 27 | 7238882 | E203 | .02 Mfd. 400 V Tubular |
| 28 | 7230767 | E502 | .005 Mfd. 600 V Tubular |
| 29 | 1219594 | H802 | .008 Mfd. 800 V Tubular |
| 30 | 7259600 | 7259600 | Spark Plate-"A" Connector Choke Assy. |
| 31 | 1217848 | 1217848 | Chassis Plate Assy. |
| 32 | 7240906 | H602 | .006 Mfd. 1600 V Tubular |
| | | **Resistors** | |
| 41 | 1211147 | A225 | 2.2 Megohms ½ W Insulated |
| 42 | 7237595 | B153 | 15,000 Ohms 1 W Insulated |
| 43 | 1213220 | A151 | 150 Ohms ½ W Insulated |
| 44 | 7240732 | A334 | 330,000 Ohms ½ W Insulated |
| 45 | 1211192 | A223 | 22,000 Ohms ½ W Insulated |
| 46 | 7233653 | C153 | 15,000 Ohms 2 W Insulated |
| 48 | 1213482 | A391 | 390 Ohms ½ W Insulated |
| 49 | 7238873 | A105 | 1 Megohm ½ W Insulated |
| 50 | 7238873 | A105 | 1 Megohm ½ W Insulated |
| 51 | 7240731 | A473 | 47,000 Ohms ½ W Insulated |
| 52 | 1213482 | A391 | 390 Ohms ½ W Insulated |
| 53 | 7241937 | A685 | 6.8 Megohms ½ W Insulated |
| 54 | 1214555 | A224 | 220,000 Ohms ½ W Insulated |
| 55 | 1213270 | A104 | 100,000 Ohms ½ W Insulated |
| 56 | 1214555 | A224 | 220,000 Ohms ½ W Insulated |
| 57 | 7241616 | 7241616 | 1800 Ohms ½ W Insulated |
| 58 | 7241937 | A685 | 6.8 Megohms ½ W Insulated |
| 59 | 1213237 | A152 | 1500 Ohms ½ W Insulated |
| 60 | 7233773 | C331 | 330 Ohms 1 W Wire Wound |
| 61 | 1213481 | A332 | 3300 Ohms ½ W Insulated |
| 62 | 1214555 | A224 | 220,000 Ohms ½ W Insulated |
| 63 | 1214556 | A274 | 270,000 Ohms ½ W Insulated |
| 64 | 1213270 | A104 | 100,000 Ohms ½ W Insulated |
| 65 | 7237994 | B221 | 220 Ohms 1 W Insulated |
| 66 | 1214573 | B562 | 1800 Ohms 2 W Wire Wound (or Replace |
| | | C272 | with 2700 Ohms 2 W and 5600 Ohms 1 W in Parallel) |

MODEL 416270, Packard

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Tubes** | |
| | 7237751 | 5229 | 6SK7 |
| | 7237752 | 5222 | 6SA7 |
| | 7237753 | 5231 | 6SQ7 |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | OZ4 |
| | | **Miscellaneous Electrical** | |
| 71 | 7259601 | 7259601 | Control - Volume, Tone, & Switch |
| 71A | | | Volume Control |
| 71B | | | Tone Control |
| 71C | | | Switch |
| 72 | 125588 | 55 | Lamp - Dial |
| 73 | 7259608 | 7259608 | Speaker P. M. |
| 74 | 7259615 | 7259615 | Transformer - Output |
| 75 | 7259614 | 6060 | Transformer - Power |
| 76 | 7239124 | 8542 | Vibrator - Non-Synchronous |
| | | **MECHANICAL PARTS** | |
| | | **(Chassis)** | |
| 80 | 7239475 | 7239475 | Socket - Antenna |
| | 1219662 | 1219662 | Socket - Dial Light |
| | 7236279 | 7236279 | Socket - Octal Tube |
| 81 | 1216747 | 1216747 | Socket - Rear Seat Speaker |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | **(Tuner)** | |
| | 147481 | 147481 | Ball Bearings (10) |
| 82 | 7258072 | 7258072 | Clutch Disc-Driven |
| 83 | 7258203 | 7258203 | Connecting Link-Core Bar |
| 84 | 7258210 | 7258210 | Core Guide Bar |
| 85 | 7256271 | 7256271 | Connecting Link - Pointer |
| 86 | 7255992 | 7255992 | Spring - Pointer Connecting Link |
| 87 | 7258468 | 7258468 | Core - Iron Tuning |
| 88 | 7259606 | 7259606 | Drive Shaft - Manual |
| 89 | 7259570 | 7259570 | Escutcheon Assy. |
| 90 | 7259569 | 7259569 | Dial Glass |
| 91 | 7259567 | 7259567 | Dial Backplate |
| 92 | 7259565 | 7259565 | Dial Retainer (2) |
| | 7259633 | 7259633 | Filter - Dial Light |
| 93 | 7259539 | 7259539 | Gear and Bushing - Clutch |
| 94 | 7259556 | 7259556 | Gear and Bracket - Worm |
| 95 | 7259568 | 7259568 | Guard - Control Knob |
| | 7259656 | 7259656 | Knob - Control |
| | 7259550 | 7259550 | Knob - Tone & Dummy |
| 96 | 7259584 | 7259584 | Pointer Assembly |
| | 1219663 | 1219663 | Pointer Tip Plate |
| 97 | 7259676 | 7259676 | Pointer Backplate |
| 98 | 1219664 | 1219664 | Push Button and Slide No. 1 |
| 99 | 1219665 | 1219665 | Push Button and Slide No. 2 |
| | 1219666 | 1219666 | Push Button and Slide No. 3 |
| 100 | 1219667 | 1219667 | Push Button and Slide No. 4 |
| 101 | 1219668 | 1219668 | Push Button and Slide No. 5 |
| 102 | 7258756 | 7258756 | Spring - Clutch |
| 103 | 7257415 | 7257415 | Spring - Core Bar Connecting Link |
| 104 | 7259540 | 7259540 | Spring - Slide Return |
| 105 | | | |
| | | **INSTALLATION PARTS** | |
| | 7259642 | 7259642 | "A" Lead and Fuse Connector |
| | 7259644 | 7259644 | Capacitor - Generator |
| | 7259643 | 7259643 | Capacitor - Ignition Coil |
| | 7259646 | 7259646 | Distributor Suppressor |
| | 147685 | 147685 | Fuse 14 Amps |

MODEL 416387,
Packard

## SUBJECT: SERVICE INSTRUCTIONS - PACKARD MODEL 416387

### GENERAL

MOUNTING—All 24 Series Packard Cars.

TUBES—Seven, Plus Rectifier.

SPEAKER — 6" x 9" Elliptical, Permanent Magnet.

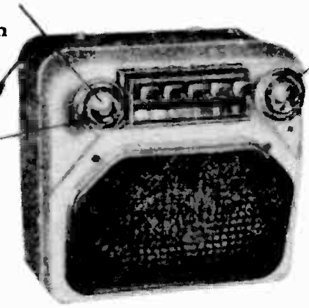
TUNING—Manual and 5 P.B. Mechanical.

ANTENNA TRIMMER COMPENSATION—0.000050 - 0.000090 Mfd.

TUNING RANGE—540 - 1600 KC.

### PUSHBUTTON SET-UP

Pull pushbutton to the left and out. Tune in desired station manually. Push button all the way in.




MODEL 416387

### ALIGNMENT PROCEDURE:

Output Meter Connection .......... Across Voice Coil
Signal Generator Return .......... To Chassis
Dummy Antenna .......... In Series With Generator
Volume Control .......... Maximum Volume
Tone Control .......... Treble
Generator Output .......... Minimum for Readable Indication

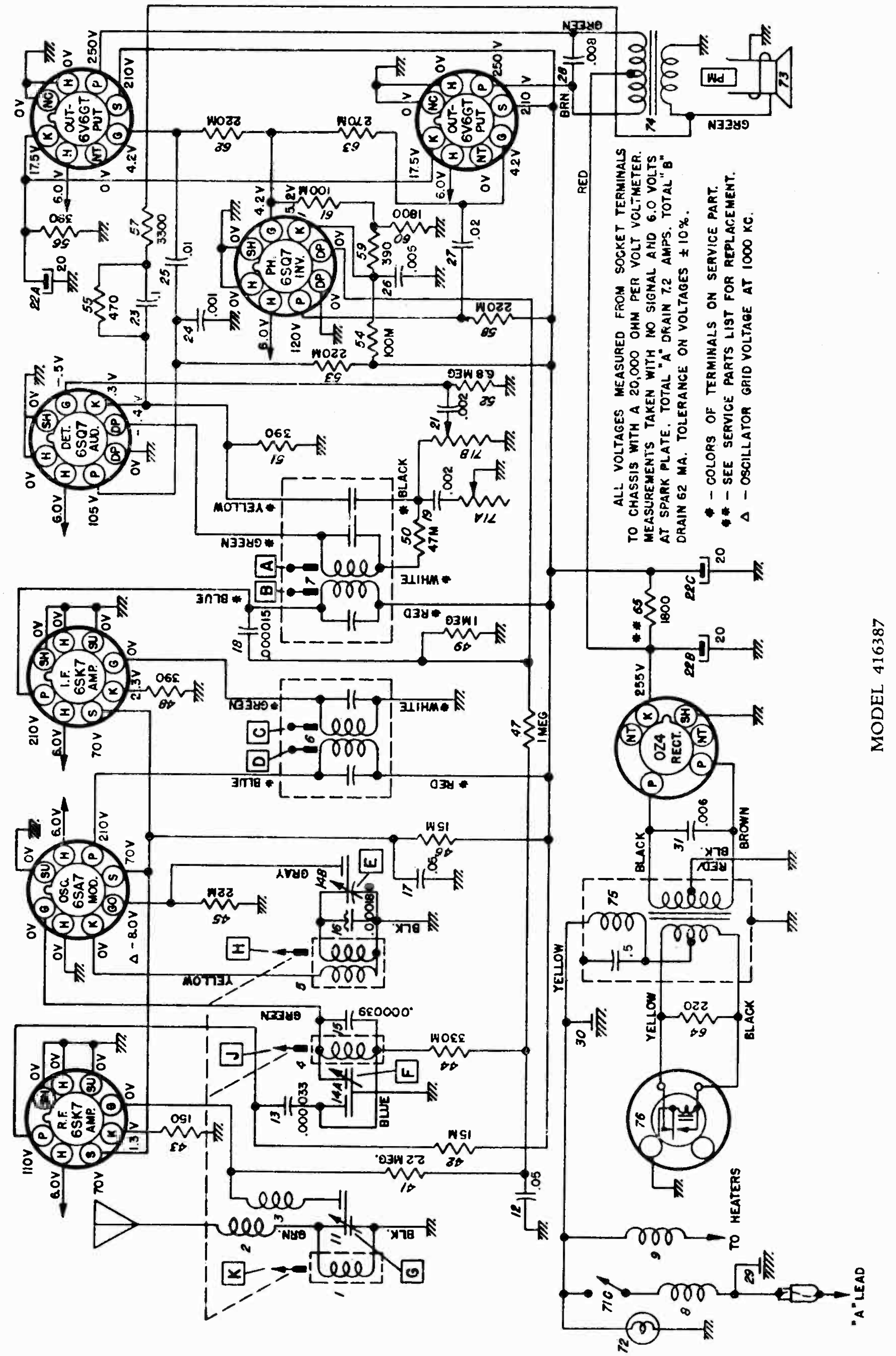
| Steps | Series Condenser or Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1. Mfd. | 6SA7 Grid (Pin #8) | 260 KC | High Freq. Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Gen. Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Gen. Signal | L** |

*Before making this adjustment check the mechanical setting of the oscillator core "H." The slotted end of the core should be 1 25/32" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form). If adjustment is necessary, be sure to first dissolve the glyptal seal on the core studs. Core adjustments are made from the mountings end of the coil form with an insulated screwdriver, and core studs should be re-sealed with glyptal or household cement after alignment.

**"L" is the pointer adjustment screw on the pointer connecting link (See tuner drawing). Adjust so pointer reads 1000 KC (on the "10" calibration mark).

With the radio installed and the car antenna plugged in adjust antenna trimmer "G" (See sticker on case) for maximum volume with the radio turned to a weak station between 600 and 1000 KC.

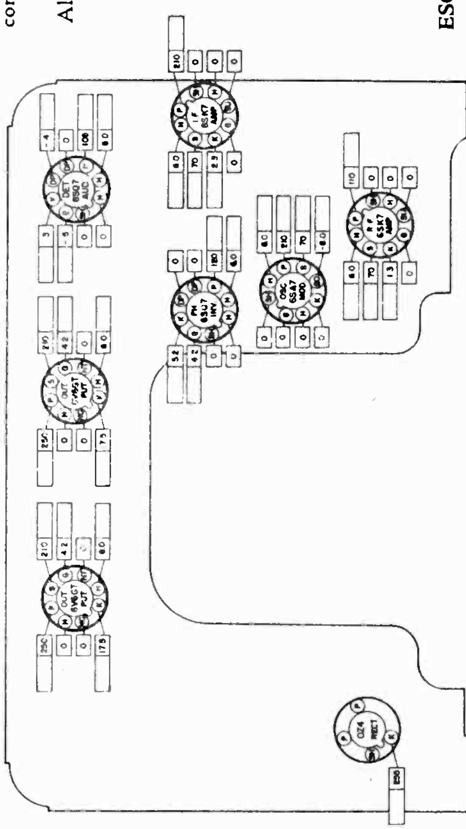
MODEL 416387,
Packard



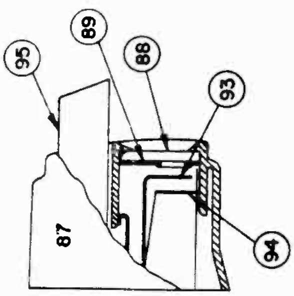
MODEL 416387,
Packard

The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown

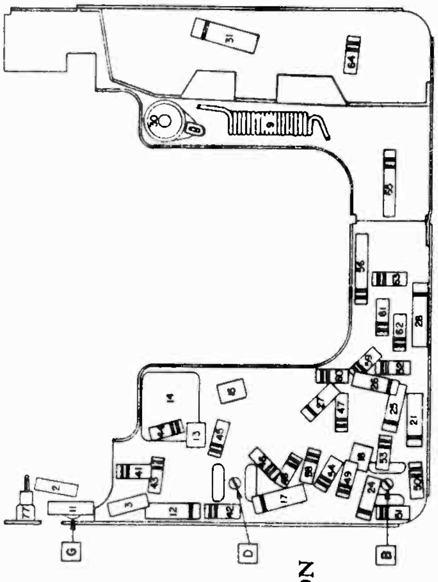
All voltages measured from socket terminals to chassis.



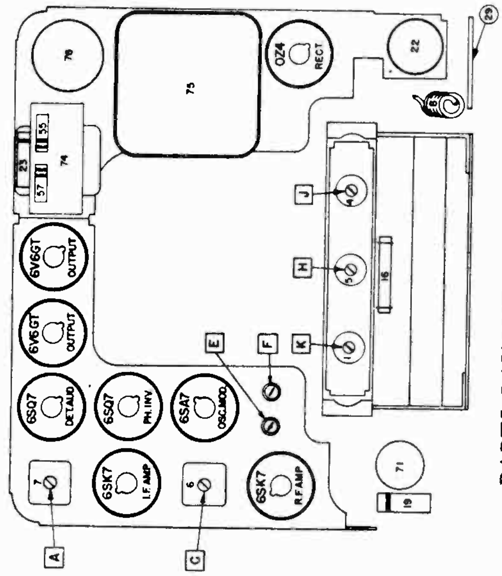

TUBE SOCKET VOLTAGE CHART



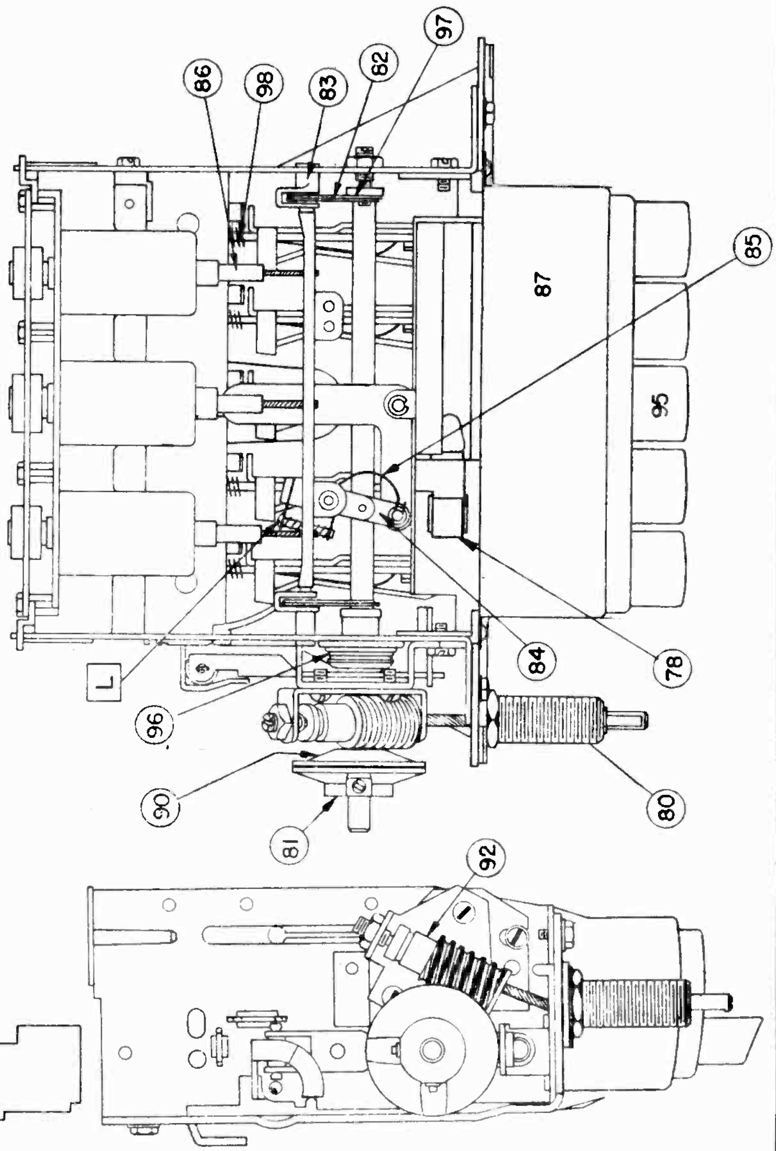

ESCUTCHEON CROSS SECTION




PARTS LAYOUT — CHASSIS VIEW




PARTS LAYOUT — TUBE VIEW



MODEL 416387, Packard

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **ELECTRICAL PARTS** | |
| | | **Coils** | |
| 1 | 7258914 | 7258914 | Antenna |
| 2 | 7255738 | 7255738 | Antenna Series Choke |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7258914 | 7258914 | R.F. |
| 5 | 7259687 | 7259687 | Oscillator |
| 6 | 7258849 | 1219508 | 1st I.F. |
| 7 | 7258850 | 1219509 | 2nd I.F. |
| 8 | 7259187 | 7259187 | "A" Spark Choke |
| 9 | 7237846 | 1217846 | Hash Choke |
| | | **Condensers** | |
| 11 | 7260158 | 7260158 | Antenna Trimmer |
| 12 | 7236842 | E-503 | .05 mfd. 200V Tubular |
| 13 | 7258222 | G-330 | .000033 mfd. Molded |
| 14 | 7242454 | 7242454 | Dual Trimmer |
| 14A | | | R.F.Section |
| 14B | | | Oscillator |
| 15 | 7258221 | G-390 | .000039 mfd. Molded |
| 16 | 7257424 | 7257424 | .000180 mfd. Compensating |
| 17 | 7258125 | E-503 | .05 mfd. 400V Tubular |
| 18 | 7230955 | G-150 | .000015 mfd. Molded |
| 19 | 7237836 | E-202 | .002 mfd. 600V Tubular |
| 21 | 7237836 | E-202 | .002 mfd. 600V Tubular |
| 22 | 7260065 | 7260065 | Electrolytic |
| 22A | | | 20 mfd. 25V |
| 22B | | | 20 mfd. 400V |
| 22C | | | 20 mfd. 400V |
| 23 | 7238789 | E-104 | .1 mfd. 200V Tubular |
| 24 | 1218883 | E-102 | .001 mfd. 600V Tubular |
| 25 | 1209309 | E-103 | .01 mfd. 400V Tubular |
| 26 | 7230767 | E-502 | .005 mfd. 600V Tubular |
| 27 | 7238882 | E-203 | .02 mfd. 400V Tubular |
| 28 | 1219594 | H-802 | .008 mfd. 800V Tubular |
| 29 | 7241259 | 7241259 | Spark Plate |
| 30 | 1217848 | 1217848 | Chassis Plate |
| 31 | 7240906 | H-602 | .006 mfd. 1600V Tubular |
| | | **Resistors** | |
| 41 | 1211147 | A-225 | 2.2 megohms ½ W Insulated |
| 42 | 7237595 | B-153 | 15,000 ohms 1 W Insulated |
| 43 | 1213220 | A-151 | 150 ohms ½ W Insulated |
| 44 | 7240732 | A-334 | 330,000 ohms ½ W Insulated |
| 45 | 1211192 | A-223 | 22,000 ohms ½ W Insulated |
| 46 | 7233653 | C-153 | 15,000 ohms 2 W Insulated |
| 47 | 7238873 | A-105 | 1 megohm ½ W Insulated |
| 48 | 1213482 | A-391 | 390 ohms ½ W Insulated |
| 49 | 7238873 | A-105 | 1 megohm ½ W Insulated |
| 50 | 7240731 | A-473 | 47,000 ohms ½ W Insulated |
| 51 | 1213482 | A-391 | 390 ohms ½ W Insulated |
| 52 | 7241937 | A-685 | 6.8 megohms ½ W Insulated |
| 53 | 1214555 | A-224 | 220,000 ohms ½ W Insulated |
| 54 | 1213270 | A-104 | 100,000 ohms ½ W Insulated |
| 55 | 1213486 | A-471 | 470 ohms ½ W Insulated |
| 56 | 1219690 | 1219690 | 390 ohms 2 W Wire Wound |
| 57 | 1213481 | A-332 | 3300 ohms ½ W Insulated |
| 58 | 1214555 | A-224 | 220,000 ohms ½ W Insulated |
| 59 | 1213482 | A-391 | 390 ohms ½ W Insulated |
| 60 | 7241616 | 7241616 | 1800 ohms ½ W Insulated |
| 61 | 1213270 | A-104 | 100,000 ohms ½ W Insulated |
| 62 | 1214555 | A-224 | 220,000 ohms ½ W Insulated |
| 63 | 1214556 | A-274 | 270,000 ohms ½ W Insulated |
| 64 | 1219738 | B-221 | 220 ohms 1 W Insulated |
| 65 | 1214573 | C-272<br>B-562 | 1800 ohms 2 W Wire Wound (or replace with 2700 ohms 2 W and 5600 ohms 1 W in parallel) |

MODEL 416387,
Packard

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Tubes** | |
| | 7237751 | 5229 | 6SK7 |
| | 7237752 | 5222 | 6SA7 |
| | 7237753 | 5231 | 6SQ7 |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | 0Z4 |
| | | **Miscellaneous Electrical** | |
| 71 | 7260139 | 7260139 | Control - Volume, Tone and Switch |
| 71A | | | Volume Control |
| 71B | | | Tone Control |
| 71C | | | Switch |
| 72 | 187189 | 44 | Light - Dial |
| 73 | 7260362 | 7260362 | Speaker - 6 x 9 p. m. |
| 74 | 7260167 | 7260167 | Transformer - Output |
| 75 | 7259375 | 7255881 | Transformer - Power |
| 76 | 7239124 | 8542 | Vibrator - Non-Synchronous |
| | | **MECHANICAL PARTS** | |
| | | **Chassis** | |
| 77 | 7256742 | 7256742 | Socket - Antenna |
| 78 | 1219747 | 1219747 | Socket - Dial Light |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | **Tuner** | |
| | 147481 | 147481 | Ball Bearings (10) |
| 80 | 7260163 | 7260163 | Bushing & Manual Drive Shaft Assy. |
| | 7260162 | 7260162 | Manual Drive Shaft |
| 81 | 7258072 | 7258072 | Clutch Disc - Driven |
| 82 | 7258203 | 7258203 | Connecting Link - Core Bar |
| 83 | 7260403 | 7260403 | Core Guide Bar |
| 84 | 7256271 | 7256271 | Connecting Link - Pointer |
| 85 | 7255992 | 7255992 | Spring - Pointer Connecting Link |
| 86 | 7258468 | 7258468 | Core - Iron Tuning |
| 87 | 7260325 | 7260325 | Escutcheon Assy. |
| 88 | 7260141 | 7260141 | Dial |
| 89 | 7260125 | 7260125 | Dial Backplate |
| | 7259494 | 7259494 | Retainer Spring - Left Hand |
| | 7259495 | 7259495 | Retainer Spring - Right Hand |
| 90 | 7256495 | 7256495 | Gear & Bushing - Clutch |
| 92 | 7260212 | 7260212 | Gear & Bracket - Worm |
| 93 | 7260199 | 7260199 | Pointer Assembly |
| 94 | 7260265 | 7260265 | Pointer Backplate |
| 95 | 1219200 | 1219200 | Push Button and Slide Assy. |
| 96 | 7258756 | 7258756 | Spring - Clutch |
| 97 | 7257415 | 7257415 | Spring - Core Bar Connecting Link |
| 98 | 7255984 | 7255984 | Spring - Slide Return |
| | | **INSTALLATION PARTS** | |
| | 7260148 | 7260148 | "A" Lead and Fuse Holder Assy. |
| | 7259644 | 7259644 | Condenser - Generator |
| | 7259643 | 7259643 | Condenser - Ignition Coil |
| | 7259646 | 6007 | Distributor Suppressor |
| | 147685 | 147685 | Fuse - 14 Amps |
| | 7260187 | 7260187 | Knob - Control |
| | 7260147 | 7260147 | Lever - Tone Control |
| | 7260149 | 7260149 | Trimplate - Control Knob |

MODEL 416394, Packard

## GENERAL

MOUNTING—All 24 Series Packard Cars.

TUBES—Seven, Plus Rectifier and Trigger.

SPEAKER — 6" x 9" Elliptical, Permanent Magnet.

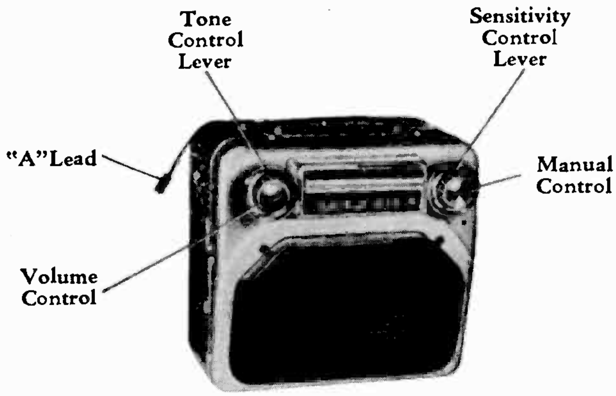
TUNING—Electronic and Manual.

ANTENNA TRIMMER COMPENSATION — 0.000058 - 0.000090 Mfd.

TUNING RANGE—540 - 1600 KC.

## PUSHBUTTON SET-UP

No pushbutton set-up is necessary. However, the number of stations on which the tuner will stop can be controlled by the use of the Sensitivity Control.




MODEL 416394

## SIGNAL SEEKING TUNER ALIGNMENT PROCEDURE:

NOTE: When aligning the signal seeker tuner type radio, be sure to use a vacuum tube voltmeter as indicated and be sure to follow the alignment sequence given—(Notice that the primary of the 2nd I.F. is aligned first.)

Output Meter Connection ........ VTVM From [Z] To Chassis (see parts layout page 2)

Generator Return ........ Receiver Chassis

Dummy Antenna ........ In Series With Generator

Volume Control ........ Maximum Volume

Sensitivity Control ........ Maximum Sensitivity

Tone Control ........ Treble

Generator Output ........ Not To Exceed 2 Volts at VTVM

| Step | Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin 8) | 260 KC | High Freq. Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 600 KC | Signal Gen. Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | Signal Gen. Signal | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Gen. Signal | **L |

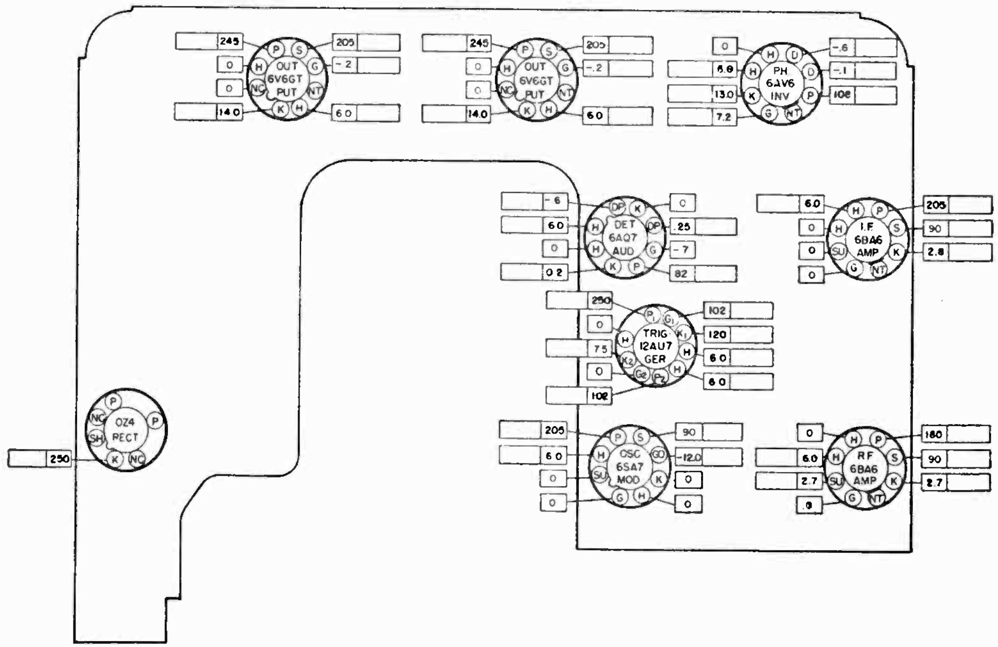
*Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be 1$\frac{23}{32}$" from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with an insulated screw-driver. (It will be necessary to steady the core guide bar by applying a downward pressure at the antenna core end of the bar while making these adjustments.) If this adjustment is necessary, first dissolve the glyptal seal on the core stud and be sure to re-seal after making the adjustment.

**"L" is the pointer adjustment screw on the end of the core guide bar—adjust so pointer reads 1000 KC.

With the radio installed and the antenna plugged in, adjust antenna trimmer "G" (See sticker on case) for maximum volume with the radio tuned to a weak station from 600 to 1000 KC.

MODEL 416394, Packard

## TUBE SOCKET VOLTAGE CHART




The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown above. The blank spaces are provided so that the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

Voltmeter resistance.................................Ohms Per Volt.

Readings taken with.............................Volts At Spark Plate.

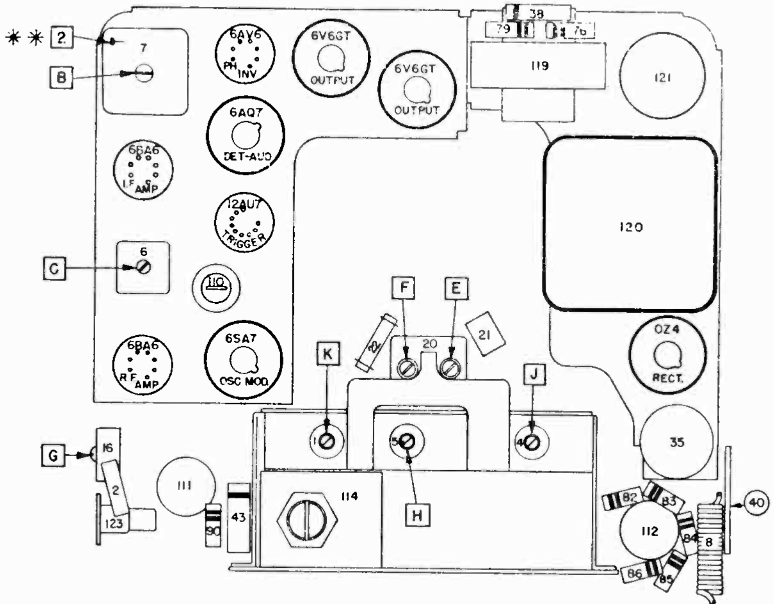
All voltages measured from socket terminals to chassis.

## TUNER ADJUSTMENT PROCEDURE:

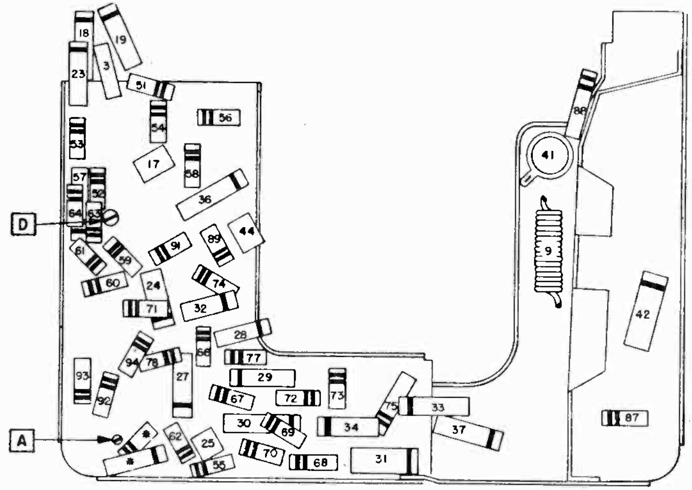
CATHODE DELAY ADJUSTOR (Illustration #110) (This adjustment should be necessary only if the delay adjustor has been replaced or the adjustment has definitely been proven to be faulty).

With exactly 6.0 volts on the spark plate, set the delay adjustor (Illus. 110) so that the voltage at $K_2$ of the 12AU7 trigger tube (Pin #8) is exactly 7.5 volts.

NOTE: For all other tuner adjustments, see Bulletin 6D-620.




PARTS LAYOUT — TUBE VIEW

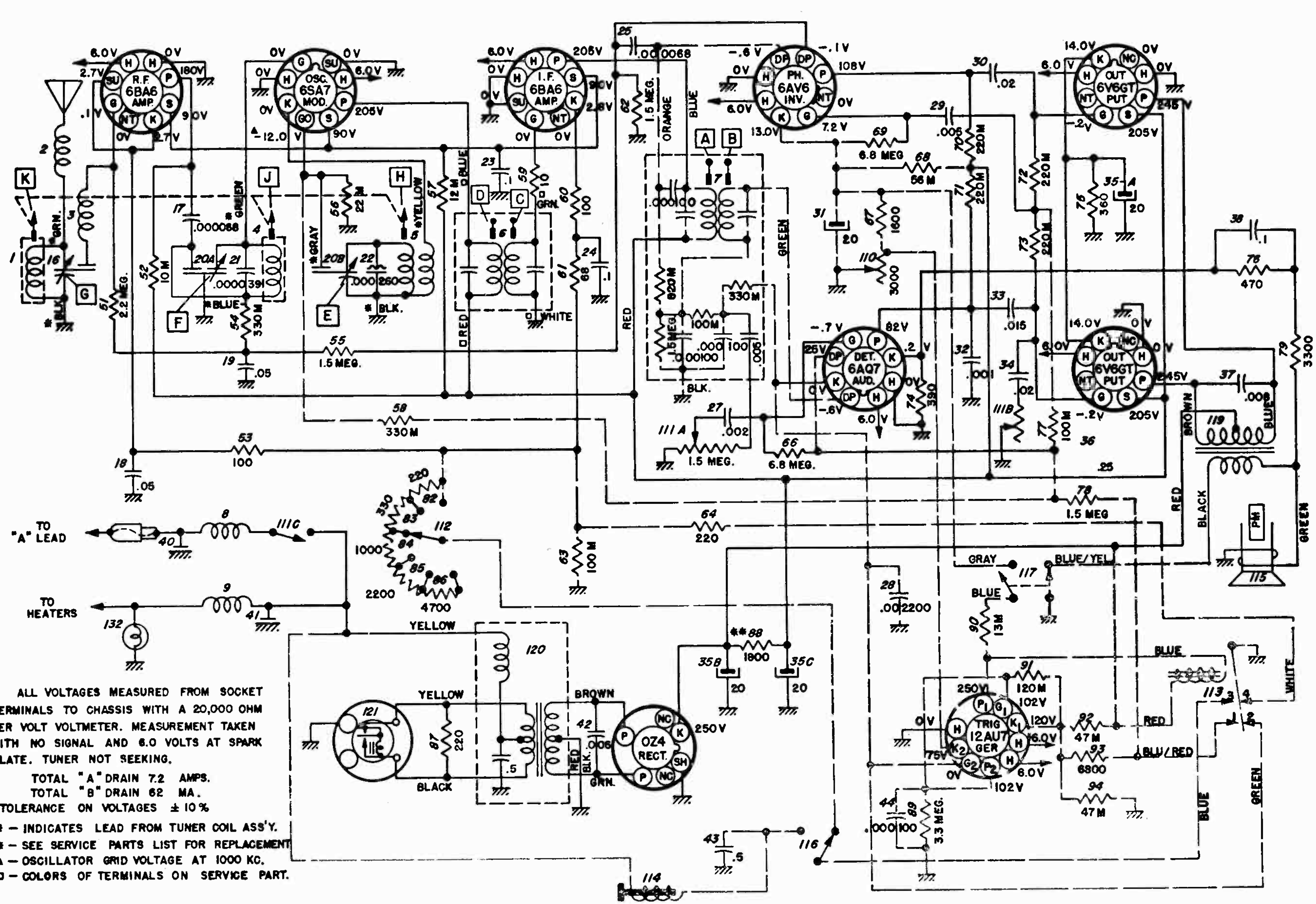


PARTS LAYOUT — CHASSIS VIEW

*Condenser and resistor are included in the 2nd I.F. Coil Assembly.

**Connect a VTVM from this point to ground for output indications during alignment.

MODEL 416394,
Packard




ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENT TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TUNER NOT SEEKING.

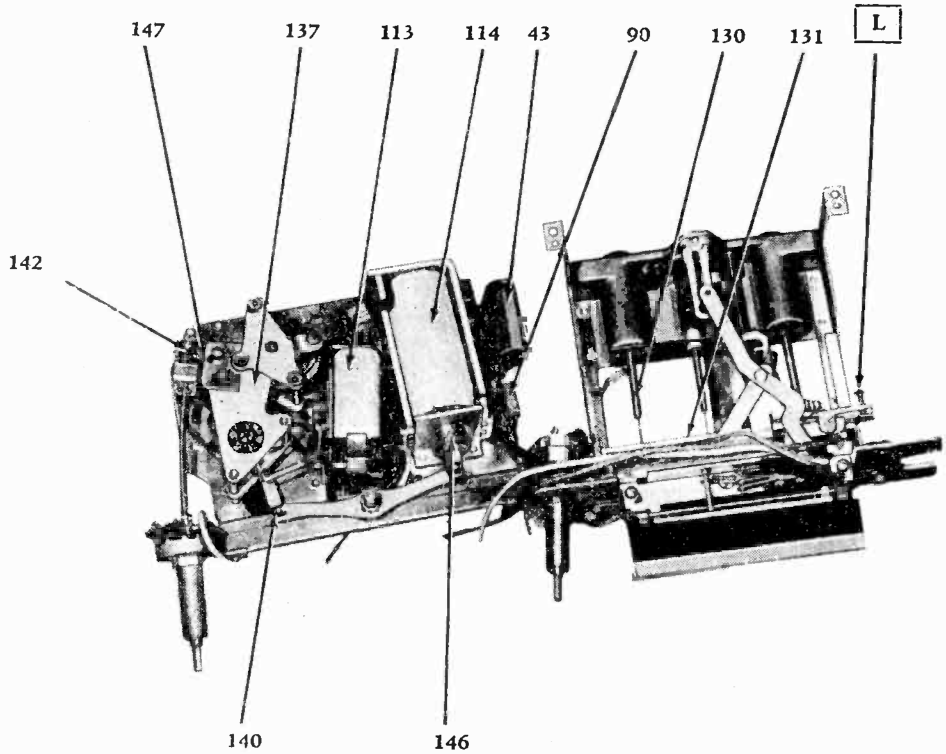
TOTAL "A" DRAIN 7.2 AMPS.
TOTAL "B" DRAIN 62 MA.
TOLERANCE ON VOLTAGES ± 10%

✱ — INDICATES LEAD FROM TUNER COIL ASS'Y.
✱✱ — SEE SERVICE PARTS LIST FOR REPLACEMENT
Δ — OSCILLATOR GRID VOLTAGE AT 1000 KC.
□ — COLORS OF TERMINALS ON SERVICE PART.

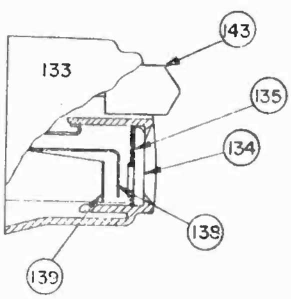
- — — TUNER CIRCUIT COMPONENTS

MODEL 416394

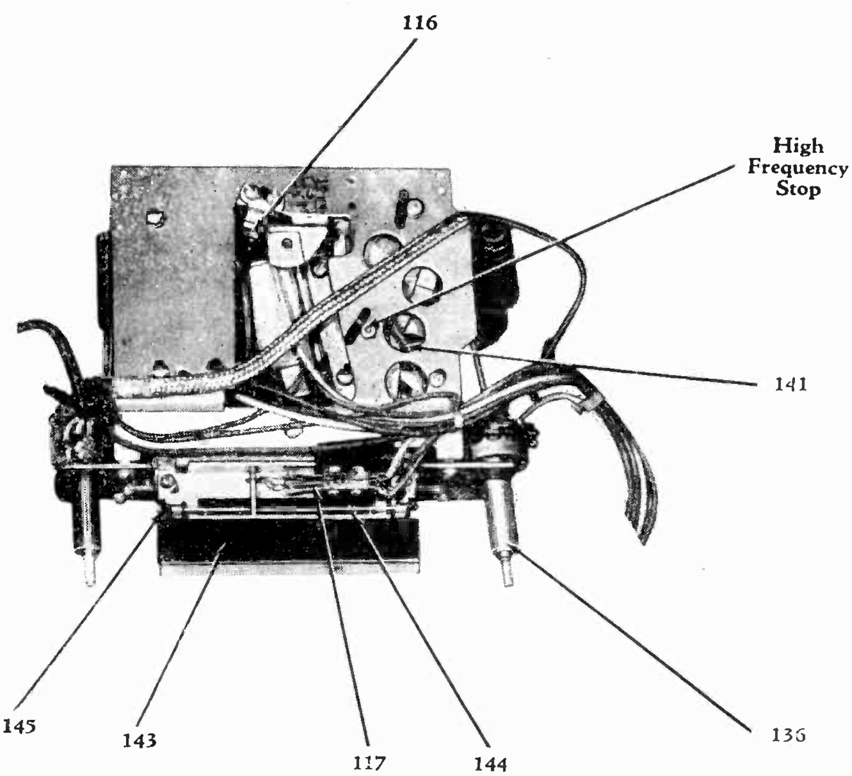
MODEL 416394,
Packard




TUNER — OPEN




ESCUTCHEON
CROSS-SECTION




TUNER

MODEL 416394, Packard

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **ELECTRICAL PARTS** | |
| | | **Coils** | |
| 1 | 7257979 | 7257979 | Antenna |
| 2 | 7255738 | 7255738 | Antenna Series Choke |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7257979 | 7257979 | R. F. |
| 5 | 7259184 | 7259184 | Oscillator |
| 6 | 7259790 | 1219508 | 1st I. F. |
| 7 | 7259290 | 1219602 | 2nd I. F. |
| 8 | 7259187 | 7259187 | "A" Spark Choke |
| 9 | 7256931 | 1217846 | Hash Choke |
| | | **Condensers** | |
| 16 | 7260158 | 7260158 | Antenna Trimmer |
| 17 | 1219550 | G 680 | .000068 mfd. Molded |
| 18 | 1210697 | E 503 | .05 mfd. 200V Tubular |
| 19 | 1210697 | E 503 | .05 mfd. 200V Tubular |
| 20 | 7242454 | 7242454 | Dual Trimmer |
| 20A | | | R. F. Section |
| 20B | | | Oscillator Section |
| 21 | 7258221 | G 390 | .000039 mfd. Molded |
| 22 | 7257567 | 7257567 | .000260 mfd. Compensating |
| 23 | 7238788 | E 104 | .1 mfd. 400V Tubular |
| 24 | 7238789 | E 104 | .1 mfd. 200V Tubular |
| 25 | 1219550 | G 680 | .000068 mfd. Molded |
| 27 | 7237836 | E 202 | .002 mfd. 600V Tubular |
| 28 | 1219553 | 1219553 | .0022 mfd. 600V Tubular |
| 29 | 7230767 | E 502 | .005 mfd. 600V Tubular |
| 30 | 7238882 | E 203 | .02 mfd. 400V Tubular |
| 31 | 1219660 | 1219660 | 20 mfd. 50V Electrolytic |
| 32 | 1218883 | E 102 | .001 mfd. 600V Tubular |
| 33 | 7237719 | 7237719 | .015 mfd. 600V Tubular |
| 34 | 7238882 | E 203 | .02 mfd. 400V Tubular |
| 35 | 7240724 | M 908 | Electrolytic |
| 35A | | | 20 mfd. 25 Volt |
| 35B | | | 20 mfd. 400 Volt |
| 35C | | | 20 mfd. 400 Volt |
| 36 | 1209817 | E 254 | .25 mfd. 200V Tubular |
| 37 | 1219594 | H 802 | .008 mfd. 800V Tubular |
| 38 | 7238789 | E 104 | .1 mfd. 200V Tubular |
| 40 | 7241259 | 7241259 | Spark Plate |
| 41 | 1217848 | 1217848 | Chassis Plate |
| 42 | 7240906 | H 602 | .006 mfd. 1600V Tubular |
| 43 | 1219511 | E 504 | .5 mfd. 100V Tubular |
| 44 | 1219499 | G 101 | .000100 mfd. Molded |
| | | **Resistors** | |
| 51 | 1211147 | A 225 | 2.2 Megohms ½W Insulated |
| 52 | 1211085 | B 103 | 10,000 Ohms 1W Insulated |
| 53 | 1213217 | A 101 | 100 Ohms ½W Insulated |
| 54 | 7240732 | A 334 | 330,000 Ohms ½W Insulated |
| 55 | 1213283 | A 155 | 1.5 Megohms ½W Insulated |
| 56 | 1211192 | A 223 | 22,000 Ohms ½W Insulated |
| 57 | 1212491 | 1212491 | 12,000 Ohms 2W Insulated |
| 58 | 1214557 | A 334 | 330,000 Ohms ½W Insulated |
| 59 | 1215107 | A 100 | 10 Ohms ½W Insulated |
| 60 | 1213217 | A 101 | 100 Ohms ½W Insulated |
| 61 | 1215558 | 1215558 | 68 Ohms ½W Insulated |
| 62 | 1213283 | A 155 | 1.5 Megohms ½W Insulated |
| 63 | 1213270 | A 104 | 100,000 Ohms ½W Insulated |
| 64 | 7237835 | A 221 | 220 Ohms ½W Insulated |
| 66 | 7241937 | A 685 | 6.8 Megohms ½W Insulated |
| 67 | 1219504 | 1219504 | 1600 Ohms ½W Insulated |
| 68 | 1213509 | 1213509 | 56,000 Ohms 1W Insulated |
| 69 | 7241937 | A 685 | 6.8 Megohms ½W Insulated |
| 70 | 1214555 | A 224 | 220,000 Ohms ½W Insulated |
| 71 | 1214555 | A 224 | 220,000 Ohms ½W Insulated |
| 72 | 1214555 | A 224 | 220,000 Ohms ½W Insulated |
| 73 | 1214555 | A 224 | 220,000 Ohms ½W Insulated |
| 74 | 1213482 | A 391 | 390 Ohms ½W Insulated |
| 75 | 7234563 | 7234563 | 360 Ohms 1W Wire Wound |
| 76 | 1213486 | A 471 | 470 Ohms ½W Insulated |
| 77 | 1213270 | A 104 | 100,000 Ohms ½W Insulated |
| 78 | 1213283 | A 155 | 1.5 Megohm ½W Insulated |
| 79 | 1213481 | A 332 | 3300 Ohms ½W Insulated |
| 82 | 7237835 | A 221 | 220 Ohms ½W Insulated |
| 83 | 1213224 | A 331 | 330 Ohms ½W Insulated |
| 84 | 1213235 | A 102 | 1,000 Ohms ½W Insulated |
| 85 | 1214545 | A 222 | 2200 Ohms ½W Insulated |
| 86 | 1214547 | A 472 | 4700 Ohms ½W Insulated |

MODEL 416394,
Packard

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Resistors (Continued)** | |
| 87 | 7237994 | B 221 | 220 Ohms 1W Insulated |
| 88 | 1214573 | { C 272 / B 562 | 1800 Ohm 2W Wire Wound (Use 2700 Ohm 2W and 5600 Ohm 1W in parallel) |
| 89 | 1214564 | A 335 | 3.3 Megohm ½W Insulated |
| 90 | 7231539 | 7231539 | 13,000 Ohms 1W Insulated |
| 91 | 1213271 | 1213271 | 120,000 Ohms ½W Insulated |
| 92 | 1216157 | B 473 | 47,000 Ohms 1W Insulated |
| 93 | 1216154 | 1216154 | 6800 Ohms 1W Insulated |
| 94 | 1216157 | B 473 | 47,000 Ohms 1W Insulated |
| | | **Tubes** | |
| | 1217690 | 5252 | 6BA6 |
| | 7237752 | 5222 | 6SA7 |
| | 1218506 | 5262 | 6AV6 |
| | 1219484 | 5278 | 6AQ7GT |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | OZ4 |
| | 1219485 | 5328 | 12AU7 |
| | | **MISCELLANEOUS ELECTRICAL** | |
| | 7260328 | 7260328 | "A" Lead and Fuse Holder Assy. (Male) |
| 110 | 7259408 | 7259408 | Adjustor - Cathode Delay |
| 111 | 7260230 | 7260230 | Control - Volume - Tone - Switch |
| 111A | | | Volume Control |
| 111B | | | Tone Control |
| 111C | | | Switch |
| 112 | 7260222 | 7260222 | Control - Sensitivity |
| 113 | 7259009 | 7259009 | Relay |
| 114 | 7259010 | 1219661 | Solenoid |
| 115 | 7260362 | 7260362 | Speaker |
| 116 | 7259011 | 7259011 | Switch - Tuner Return |
| 117 | 7259012 | 7259012 | Switch - Station Selector |
| 119 | 7260006 | 7260006 | Transformer - Output |
| 120 | 7259375 | 7255881 | Transformer - Power |
| 121 | 7239124 | 8542 | Vibrator |
| | | **MECHANICAL PARTS** | |
| | | **Chassis** | |
| 123 | 7256742 | 7256742 | Antenna Connector |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7259307 | 7259307 | Socket - 9 Pin Miniature Tube |
| | 7258073 | 7258073 | Socket - 7 Pin Miniature Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | 1219747 | 1219747 | Socket - Dial Light |
| | | **Tuner** | |
| 130 | 7259201 | 7259201 | Core - Tuning |
| 131 | 7259178 | 7259178 | Core Guide Bar |
| 132 | 187189 | 44 | Dial Light |
| 133 | 7260373 | 7260373 | Escutcheon Assy. |
| 134 | 7260262 | 7260262 | Dial |
| 135 | 7260125 | 7260125 | Dial Backplate |
| | 7259494 | 7259494 | Retainer Spring - L. H. |
| | 7259495 | 7259495 | Retainer Spring - R. H. |
| 136 | 7260357 | 7260357 | Manual Drive Shaft |
| 137 | 7259197 | 1219610 | Motor Gear Train Assy. |
| 138 | 7260309 | 7260309 | Pointer Assembly |
| 139 | 7260501 | 7260501 | Pointer Backplate |
| 140 | 7259100 | 6047 | Spring Clip |
| 141 | 7259055 | 7259055 | Spring - Motor Power |
| 142 | 7259207 | 7259207 | Spring - Worm Anti-rattle |
| | 1219751 | 1219751 | Station Selector Bar Pkg. |
| | 7256121 | 7256121 | "C" Washer |
| 143 | 7260223 | 7260223 | Station Selector Bar and Shaft |
| 144 | 7259122 | 7259122 | Retainer Spring |
| 145 | 7259111 | 7259111 | Spring |
| | 7259125 | 7259125 | Switch Operating Ring Toggle Plate |
| 146 | 7259164 | 7259164 | Solenoid Plunger |
| 147 | 7259026 | 7259026 | Worm Gear and Bracket Assy. |
| | | **INSTALLATION PARTS** | |
| | 7260148 | 7260148 | "A" Lead and Fuse Holder Assy. |
| | 7259644 | 7259644 | Condenser - Generator |
| | 7259643 | 7259643 | Condenser - Ignition |
| | 7259646 | 6007 | Distributor - Suppressor |
| | 147685 | 147685 | Fuse - 14 Amps. |
| | 7260187 | 7260187 | Knob - Control |
| | 7260147 | 7260147 | Lever - Tone and Sensitivity |
| | 7260218 | 7260218 | Trimplate - Sensitivity |
| | 7260219 | 7260219 | Trimplate - Tone |

MODEL 980899, Buick

## GENERAL

MOUNTING—All 1950 Buick Cars.

TUBES—Seven, Plus Rectifier.

SPEAKER—8″ Round, Permanent Magnet.

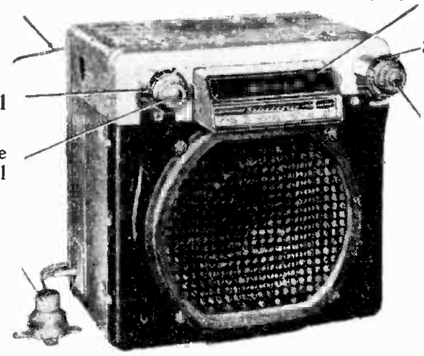
TUNING—Manual and Electronic.

ANTENNA TRIMMER COMPENSATION—For Antennas Between 0.000072 - 0.000088 Mfd.

TUNING RANGE—550 - 1600 KC.

## PUSH BUTTON SET-UP PROCEDURE

No push button set-up is necessary. However, the number of stations on which the tuner will stop can be controlled through use of the Sensitivity Control.




MODEL 980899

## SIGNAL SEEKING TUNER ALIGNMENT PROCEDURE

NOTE: When aligning the signal seeker tuner type radio, be sure to use a vacuum tube voltmeter as indicated and be sure to follow the alignment sequence given—(Notice that the primary of the 2nd I. F. is aligned first.)

Output Meter Connection ........ VTVM from [2] to chassis (see parts layout
Generator Return ........ Receiver Chassis
Dummy Antenna ........ In series with generator
Volume Control ........ Maximum Volume
Tone Control ........ Treble
Generator Output ........ Not to exceed 2 volts at VTVM

| Step | Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence For Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 mfd | 6SA7 Grid (Pin 8) | 260 KC | *High Frequency Stop | A, B, C, D |
| 2 | 0.000082 mfd | Antenna Connector | 1615 KC | High Frequency Stop | **E, F, G |
| 3 | 0.000082 mfd | Antenna Connector | 600 KC | Signal Generator Signal | J, K |
| 4 | 0.000082 mfd | Antenna Connector | 1615 KC | Signal Generator Signal | F, G |
| 5 | 0.000082 mfd | Antenna Connector | 1000 KC | Signal Generator Signal | ***L |

*To tune to high frequency, put a 0.070″ feeler gauge (or bare #13 wire) in slot against the high frequency stop. Depress station selector bar and allow the planetary arm to run against the feeler gauge. Turn the radio off and then back on.

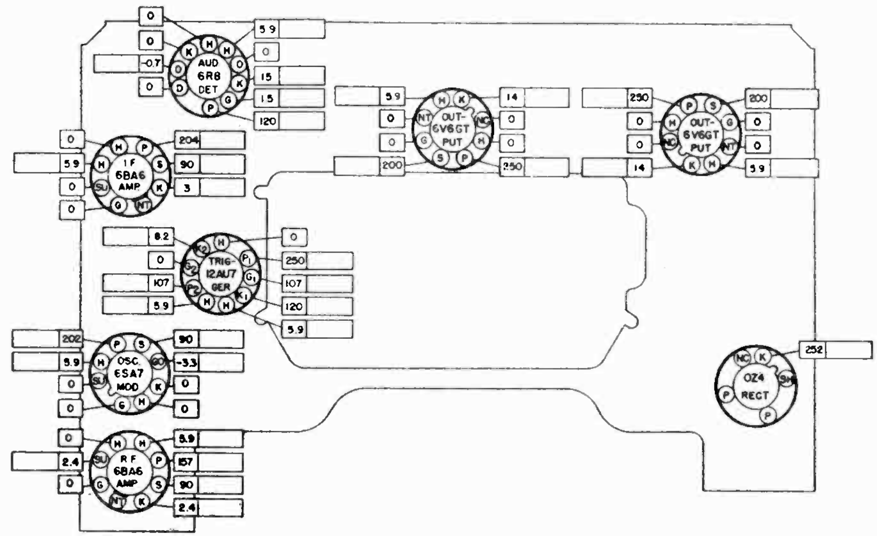
**Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be $1\frac{3}{32}$″ from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with an insulated screwdriver. (It will be necessary to steady the core guide bar while making these adjustments. This can be done by applying a downward pressure on the guide bar at the antenna coil end.) If this adjustment is necessary, first dissolve the glyptal seal on the core stud and be sure to re-seal after making the adjustment.

***"L" is the pointer adjustment screw on the end of the core guide bar—adjust so pointer reads 1000 KC.

With the radio installed and the antenna plugged in, adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case.)

MODEL 980899,
Buick

TUBE SOCKET VOLTAGE CHART




The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown above. The blank spaces are provided so that the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

Voltmeter resistance ............ Ohms Per Volt.

Readings taken with ............ Volts at Spark Plate.

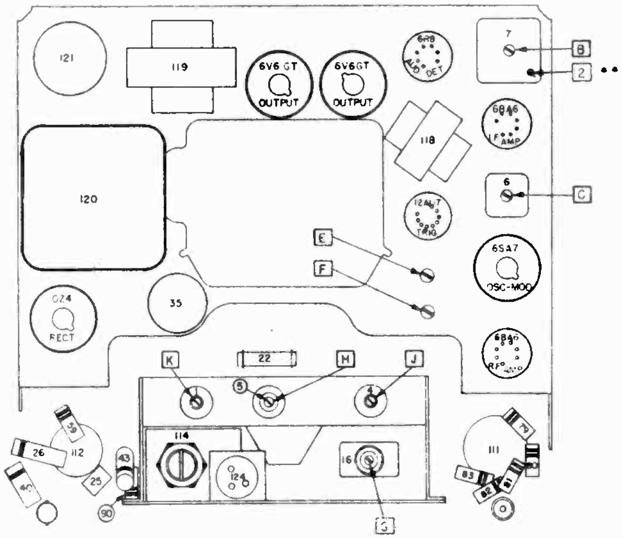
All voltages measured from socket terminals to chassis.

## TUNER ADJUSTMENT PROCEDURE:

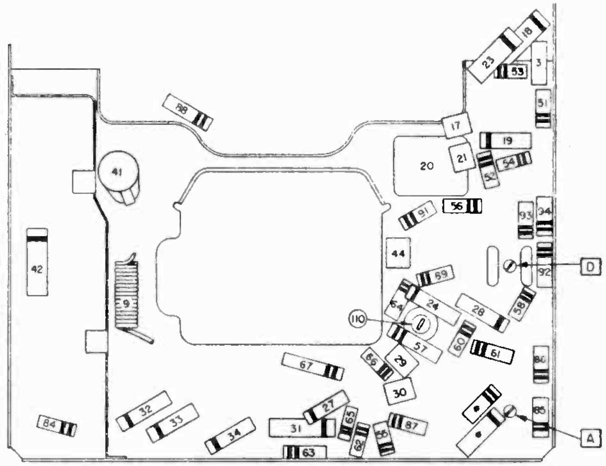
CATHODE DELAY ADJUSTOR (Illustration #110) (This adjustment should not be made unless it is necessary to replace the Delay Adjustor or the setting is definitely proven to be faulty).

1. Disconnect antenna and turn radio on.
2. Allow set to warm up.
3. Momentarily depress station selector bar.
4. Set voltage at $K_2$ of the 12AU7 trigger tube (Pin #8) to 8.0 volts by adjusting Illustration 110 while the tuner is seeking and with exactly 6.0 volts at the spark plate.

NOTE: For all other tuner adjustments, see Bulletin 6D-620.




PARTS LAYOUT — TUBE VIEW

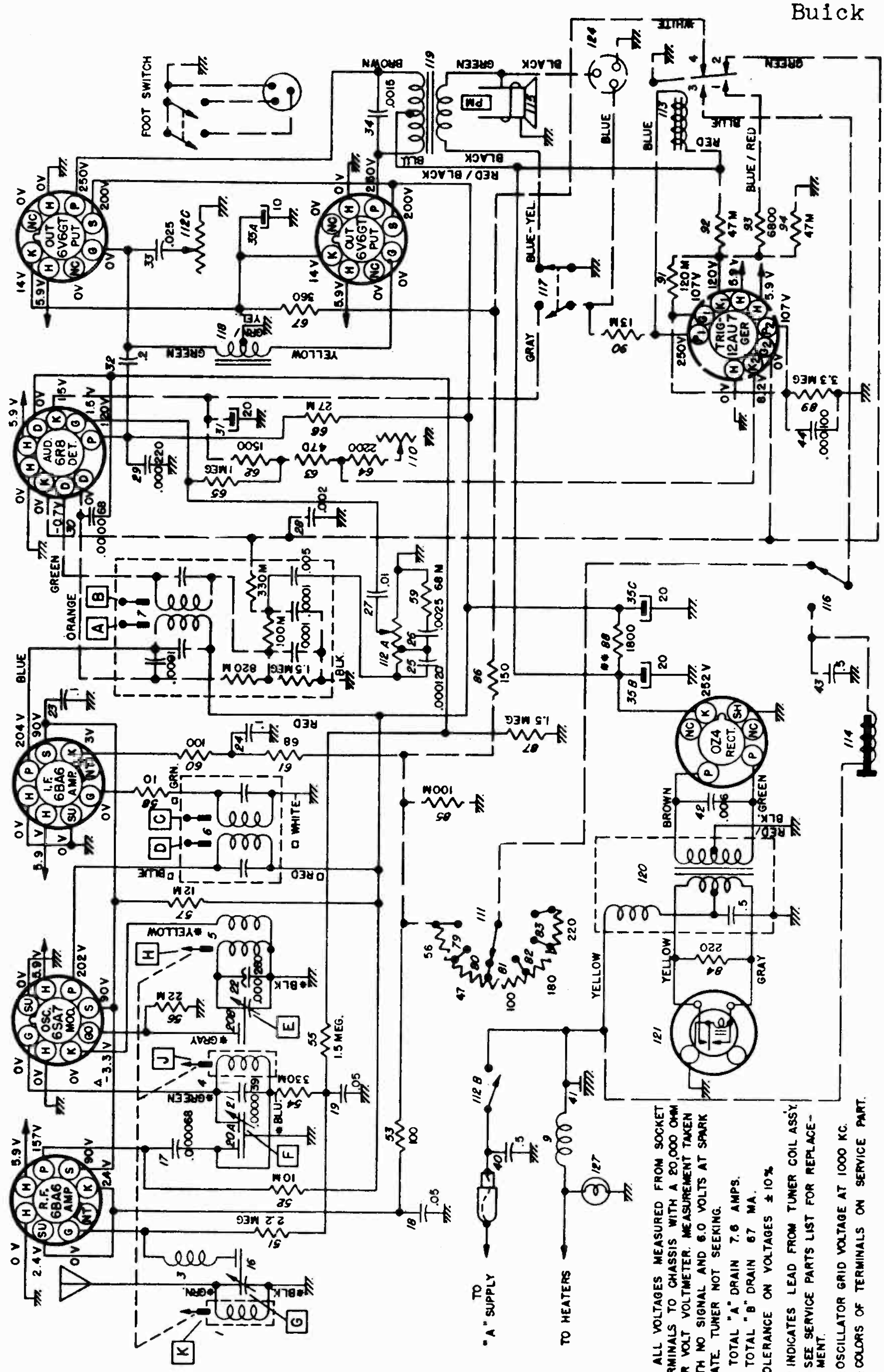



PARTS LAYOUT — CHASSIS VIEW

*The condenser and resistor are included in the 2nd IF Coil Assy.

**Connect VTVM between this point and ground for output indications during alignment procedure.

MODEL 980899, Buick



ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENT TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TUNER NOT SEEKING.

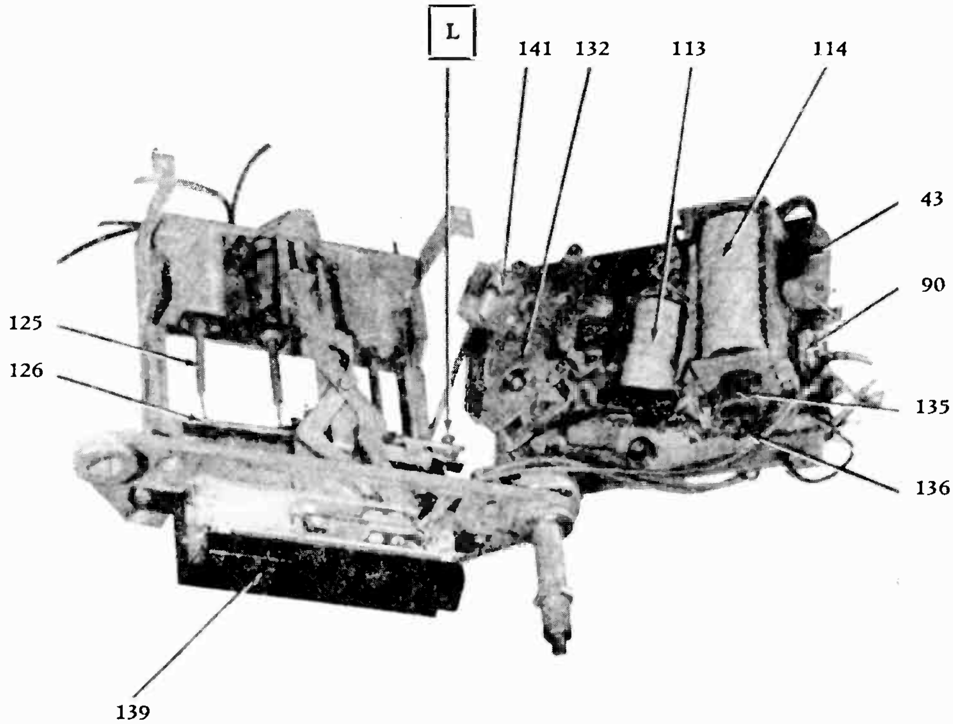
TOTAL "A" DRAIN 7.6 AMPS.
TOTAL "B" DRAIN 67 MA.
TOLERANCE ON VOLTAGES ±10%

* - INDICATES LEAD FROM TUNER COIL ASSY.
** - SEE SERVICE PARTS LIST FOR REPLACEMENT.
Δ - OSCILLATOR GRID VOLTAGE AT 1000 KC.
□ - COLORS OF TERMINALS ON SERVICE PART.

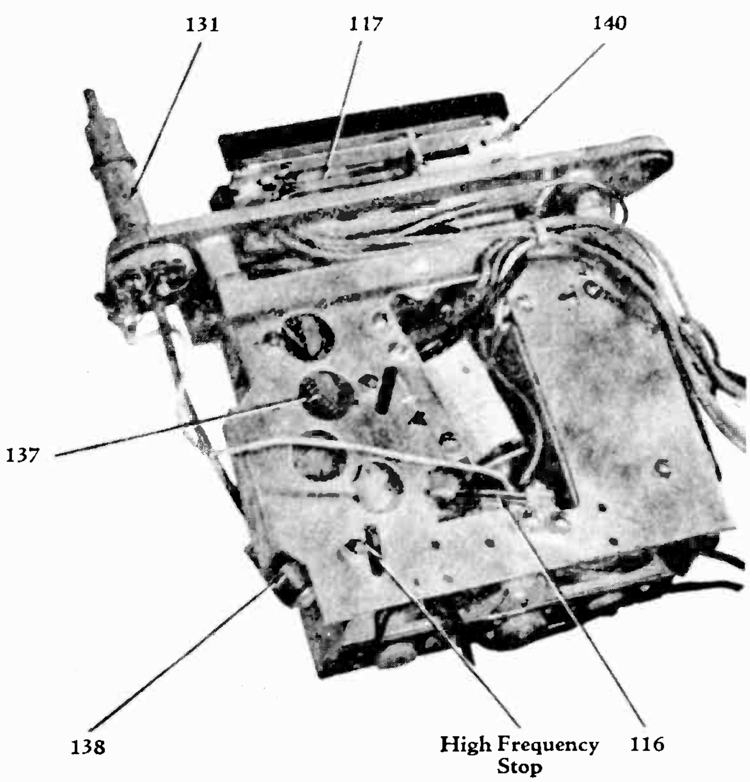
--- TUNER CIRCUIT COMPONENTS

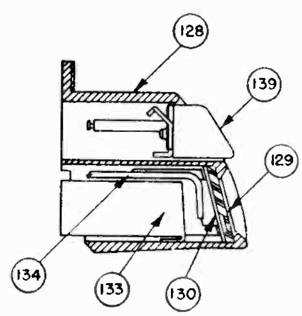
BUICK 980899

MODEL 980399,
Buick




TUNER UNFOLDED




ESCUTCHEON
CROSS-SECTION

MODEL 980899,
Buick

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **ELECTRICAL PARTS** | |
| | | **Coils** | |
| 1 | 7257979 | 7257979 | Antenna |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7257979 | 7257979 | R.F. |
| 5 | 7259184 | 7259184 | Oscillator |
| 6 | 7258849 | 1219508 | 1st I.F. |
| 7 | 7259350 | 1219602 | 2nd I.F. |
| 9 | 7240690 | 1217846 | Hash Choke |
| | | **Condensers** | |
| 16 | 7259308 | 7259308 | Antenna Trimmer |
| 17 | 1219550 | G 680 | .000068 mfd Mica |
| 18 | 7236842 | E 503 | .05 mfd 200 V Tubular |
| 19 | 7236842 | E-503 | .05 mfd 200 V Tubular |
| 20 | 7242454 | 7242454 | Dual Trimmer |
| 20A | | | RF Section |
| 20B | | | Oscillator Section |
| 21 | 7258221 | G 390 | .000039 mfd Ceramic |
| 22 | 7257567 | 7257567 | .000260 mfd Compensating |
| 23 | 7238788 | E 104 | .1 mfd 400 V Tubular |
| 24 | 7238789 | E 104 | .1 mfd 200 V Tubular |
| 25 | 7240577 | 7240577 | .000120 mfd Mica |
| 26 | 7240578 | 7240578 | .0025 mfd 400 V Tubular |
| 27 | 7237957 | E 103 | .01 mfd 400 V Tubular |
| 28 | 7237836 | E 202 | .002 mfd 600 V Tubular |
| 29 | 7238792 | G 221 | .000220 mfd Mica |
| 30 | 1219550 | G 680 | .000068 mfd Mica |
| 31 | 1219660 | 1219660 | 20 mfd 50 V Electrolytic |
| 32 | 7240579 | E 204 | .2 mfd 400 V Tubular |
| 33 | 1211232 | 1211232 | .025 mfd 400 V Tubular |
| 34 | 7236134 | 7236134 | .0015 mfd 800 V Tubular |
| 35 | 7259128 | 7259128 | Electrolytic |
| 35A | | | 10 mfd 100 V |
| 35B | | | 20 mfd 400 V |
| 35C | | | 20 mfd 400 V |
| 40 | 7236621 | E 504 | .5 mfd 200 V Tubular |
| 41 | 1217848 | 1217848 | Chassis Plate Condenser |
| 42 | 7240906 | H 602 | .006 mfd 1600 V Tubular |
| 43 | 1219511 | E 504 | .5 mfd 100 V Tubular |
| 44 | 7239184 | G 101 | .000100 mfd Mica |
| | | **Resistors** | |
| 51 | 1211147 | A 225 | 2.2 Megohms ½ W Insulated |
| 52 | 1211085 | B 103 | 10,000 Ohms 1 W Insulated |
| 53 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 54 | 7240732 | A 334 | 330,000 Ohms ½ W Insulated |
| 55 | 1211142 | A 155 | 1.5 Megohms ½ W Insulated |
| 56 | 1211192 | A 223 | 22,000 Ohms ½ W Insulated |
| 57 | 1212491 | 1212491 | 12,000 Ohms 2 W Insulated |
| 58 | 1215107 | A 100 | 10 Ohms ½ W Insulated |
| 59 | 1213844 | A 683 | 68,000 Ohms ½ W Insulated |
| 60 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 61 | 1215558 | 1215558 | 68 Ohms ½ W Insulated |
| 62 | 1219488 | 1219488 | 1500 Ohms ½ W Insulated |
| 63 | 1219487 | 1219487 | 470 Ohms ½ W Insulated |
| 64 | 1214545 | A 222 | 2200 Ohms ½ W Insulated |
| 65 | 1213282 | A 105 | 1 Megohm ½ W Insulated |
| 66 | 7236080 | B 273 | 27,000 Ohms 1 W Insulated |
| 67 | 7234563 | 7234563 | 360 Ohms 1 W (Wire Wound) |
| 79 | 1214540 | 1214540 | 56 Ohms ½ W Insulated |
| 80 | 1213489 | A 470 | 47 Ohms ½ W Insulated |
| 81 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 82 | 1215559 | 1215559 | 180 Ohms ½ W Insulated |
| 83 | 7237835 | A 221 | 220 Ohms ½ W Insulated |
| 84 | 7237994 | B 221 | 220 Ohms 1 W Insulated |
| 85 | 1211118 | A 104 | 100,000 Ohms ½ W Insulated |
| 86 | 1213220 | A 151 | 150 Ohms ½ W Insulated |
| 87 | 1211142 | A 155 | 1.5 Megohms ½ W Insulated |
| 88 | 1214573 | { C272<br>{ B562 | 1,800 Ohms 2 W Wire Wound (or replace with 2700 Ohms 2 W and 5600 Ohms 1 W in parallel) |
| 89 | 1214564 | A 335 | 3.3 Megohms ½ W Insulated |
| 90 | 7231539 | 7231539 | 13,000 Ohms 1 W Insulated |
| 91 | 1213271 | 1213271 | 120,000 Ohms ½ W Insulated |
| 92 | 1216157 | B 473 | 47,000 Ohms 1 W Insulated |
| 93 | 1216154 | 1216154 | 6800 Ohms 1 W Insulated |
| 94 | 1216157 | B 473 | 47,000 Ohms 1 W Insulated |

MODEL 980899, Buick

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **Tubes** |
| | 1211924 | 5003 | 0Z4 |
| | 1213793 | 5241 | 6V6GT |
| | 1219496 | 5541 | 6R8 |
| | 1217690 | 5252 | 6BA6 |
| | 1219485 | 5328 | 12AU7 |
| | 7237752 | 5222 | 6SA7 |
| | | | **Miscellaneous Electrical** |
| | 7242034 | 7242034 | "A" Lead Connector |
| 112 | 7258683 | 7258683 | Control - Volume - Tone and Switch |
| 112A | | | Volume |
| 112B | | | Tone |
| 112C | | | Switch |
| 111 | 7259311 | 7259311 | Control - Sensitivity |
| 110 | 7242204 | 7242204 | Delay Adjustor |
| 113 | 7259009 | 7259009 | Relay |
| 114 | 7259010 | 1219661 | Solenoid |
| 115 | 7259502 | 7259502 | Speaker 8" PM |
| | 7258903 | 7258903 | Switch - Foot Switch Assy. |
| 116 | 7259011 | 7259011 | Switch - Tuner Return |
| 117 | 7259012 | 7259012 | Switch - Station Selector |
| 118 | 7258941 | 7258941 | Transformer - Input |
| 119 | 7259336 | 7259336 | Transformer - Output |
| 120 | 7258889 | 6060 | Transformer - Power |
| 121 | 7239124 | 8542 | Vibrator - Non-synchronous |
| | | | **MECHANICAL PARTS** |
| | | | **Chassis** |
| | 7242035 | 7242035 | Antenna Connector |
| 124 | 7259392 | 7259392 | Socket - Foot Switch |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7259307 | 7259307 | Socket - 9 Pin Miniature |
| | 7258073 | 7258073 | Socket - 7 Pin Miniature |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | | **Tuner** |
| 125 | 7259201 | 7259201 | Core - Powdered Iron |
| 126 | 7259178 | 7259178 | Core Guide Bar |
| 127 | 125588 | 55 | Dial Light |
| 128 | 7259347 | 7259347 | Escutcheon Assy. |
| 129 | 7259310 | 7259310 | Dial |
| 130 | 7256886 | 7256886 | Dial Backplate |
| 131 | 7259341 | 7259341 | Manual Drive Assy. |
| 132 | 1219610 | 1219610 | Motor Gear Train Assy. |
| 133 | 7259498 | 7259498 | Pointer Backplate |
| 134 | 1219093 | 1219093 | Pointer Tip Pkg. |
| 135 | 7259164 | 7259164 | Solenoid Plunger |
| 136 | 7259100 | 7259100 | Spring Clip |
| 137 | 7259055 | 7259055 | Spring - Motor Power |
| 138 | 7259207 | 7259207 | Spring - Worm Anti-Rattle |
| | 1219612 | 1219612 | Station Selector Bar Pkg. |
| 139 | 7259309 | 7259309 | Station Selector Bar<br>Toggle Plate |
| 140 | 7259111 | 7259111 | Spring (2)<br>"C" Washer |
| | 1219124 | 1219124 | Push Bar Insert "B" |
| | 1219125 | 1219125 | Push Bar Insert "U" |
| | 1219126 | 1219126 | Push Bar Insert "I" |
| | 1219127 | 1219127 | Push Bar Insert "C" |
| | 1219128 | 1219128 | Push Bar Insert "K" |
| 141 | 7259026 | 7259026 | Worm and Bracket Assy. |
| | | | **INSTALLATION PARTS** |
| | 1321178 | 1321178 | "A" Lead Assy. |
| | 1336763 | 6030 | Condenser - Generator |
| | 1910147 | 6030 | Condenser - Ignition |
| | 120151 | 120151 | Fuse - 15 Amp. |
| | 1341337 | 1341337 | Knob - Sensitivity |
| | 1341536 | 1341536 | Knob - Tone Control |
| | 1341566 | 1341566 | Knob - Tuning Control |
| | 7258903 | 7258903 | Switch - Foot Control |
| | 1853686 | 1853686 | Suppressor - Adapter |
| | 1217820 | 1217820 | Suppressor - Distributor |

**SUBJECT:** SERVICE INSTRUCTIONS—OLDSMOBILE 1950 MODELS 982543 AND 982579 DELUXE AUTO RADIO. (These models differ only in accessory parts, the receiver itself being identical in each case. The accessory parts supplied with Model 982543 are for use with 1950 Oldsmobile cars Models 76 and 88. The accessory parts supplied with Model 982579 are for use with 1950 Oldsmobile cars, Model 98).

## GENERAL

MOUNTING..Model 982543 in 1950 Oldsmobile cars Models 76 and 88.
..Model 982579 in 1950 Oldsmobile cars Model 98.

TUBES................Six, plus rectifier

SPEAKER.............................6"x9" Elliptical Permanent Magnetic

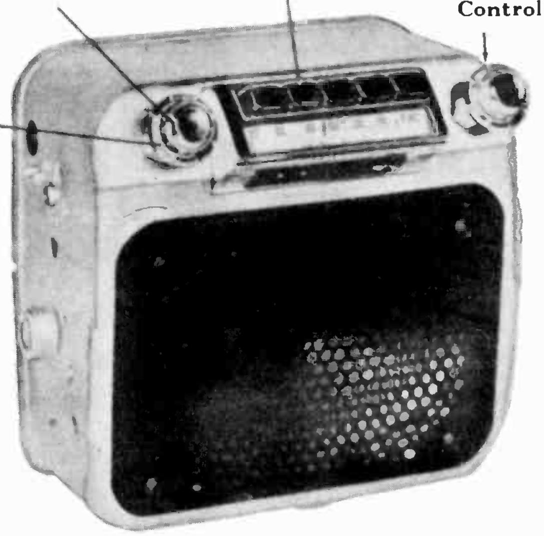
TUNING..Manual and 5 P.B. Mechanical

ANTENNA TRIMMER COMPENSATION............For antennas between 0.000055 - 0.000090 Mfd.

TUNING RANGE......535 - 1610 KC.

## PUSH BUTTON SET-UP

Pull push button to the left and then out. Tune in desired station manually. Push button all the way in.




MODELS 982543 and 982579

## ALIGNMENT PROCEDURE:

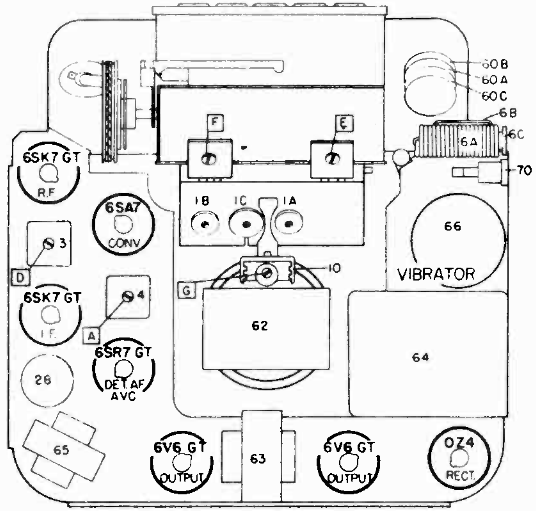
Output Meter Connection.............Across Voice Coil
Generator Return.............To Receiver Chassis
Dummy Antenna.............In Series With Generator
Volume Control Position.............Maximum Volume
Tone Control Position.............Treble
Generator Output.............Minimum for Readable Indication

| Steps | Series Condenser or Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust In Sequence For Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin #8) | 257.5 KC. | High Frequency Stop | A, B, C, D |
| 2 | 0.00007 Mfd. | Antenna Connector | 1610 KC. | High Frequency Stop | E, F, G |

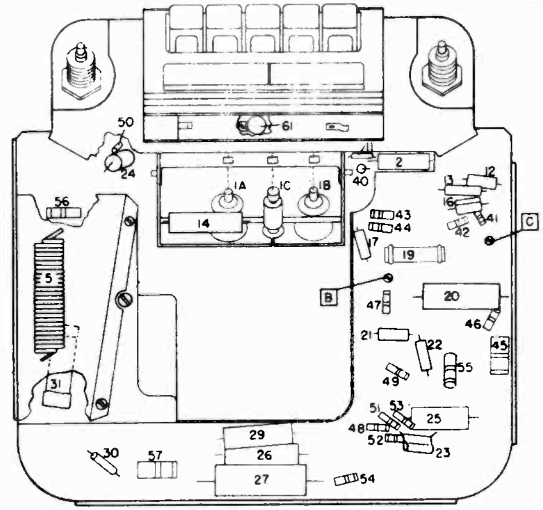
Low frequency alignment not required.

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC.

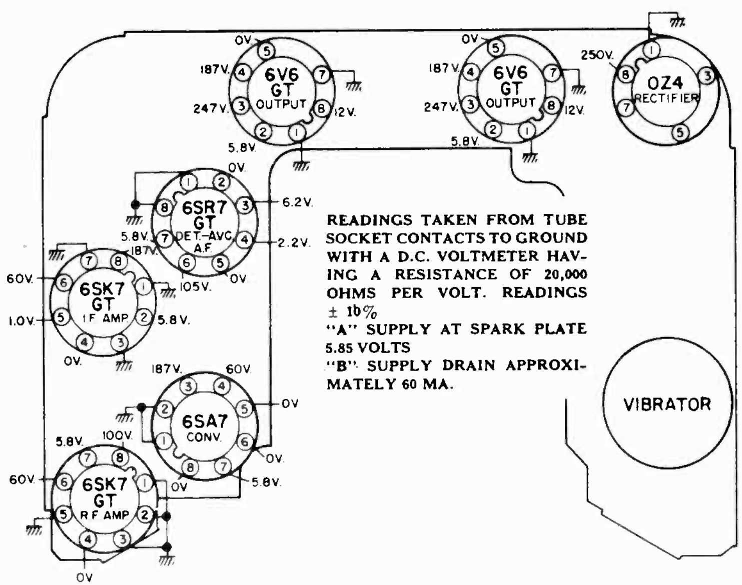
MODELS 982543,
982579, Oldsmobile




PARTS LAYOUT—TUBE VIEW

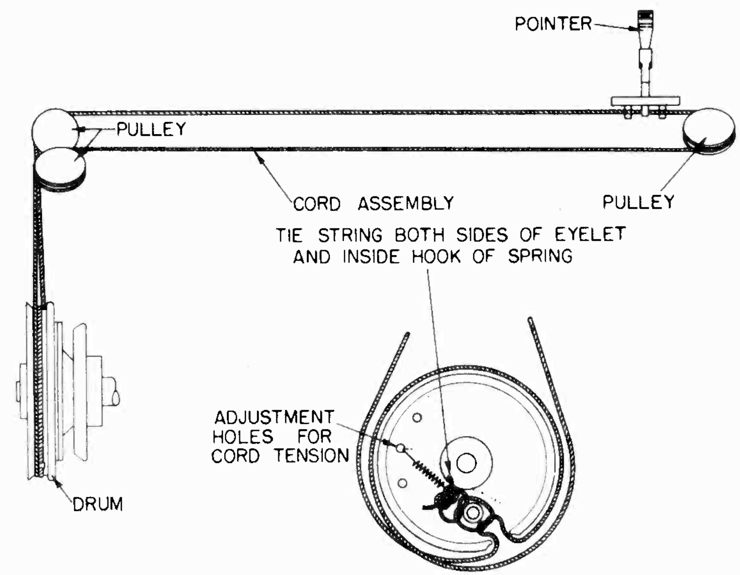


PARTS LAYOUT—CHASSIS VIEW



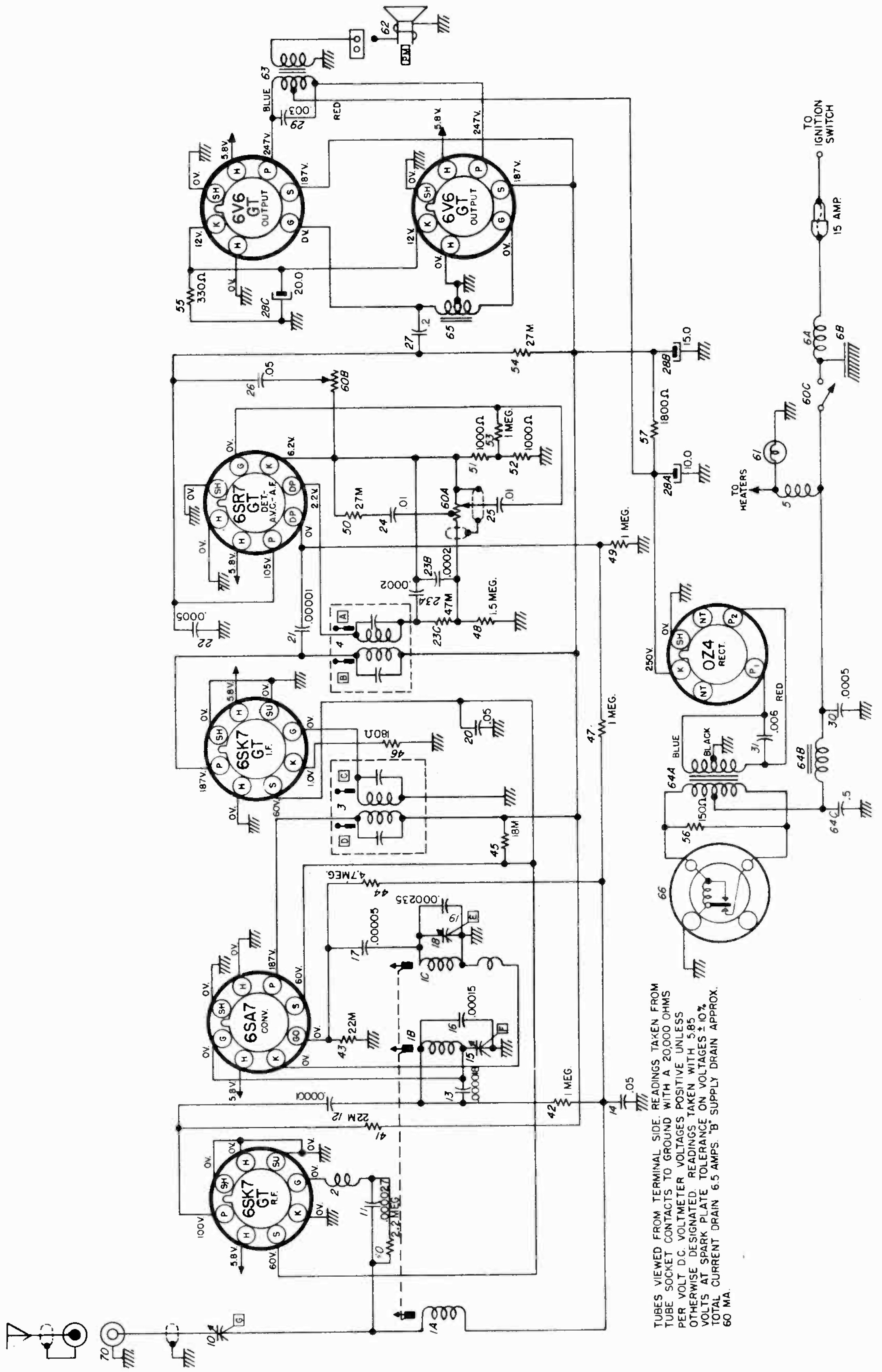

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 20,000 OHMS PER VOLT. READINGS ± 10%
"A" SUPPLY AT SPARK PLATE 5.85 VOLTS
"B" SUPPLY DRAIN APPROXIMATELY 60 MA.

TUBE SOCKET VOLTAGE CHART

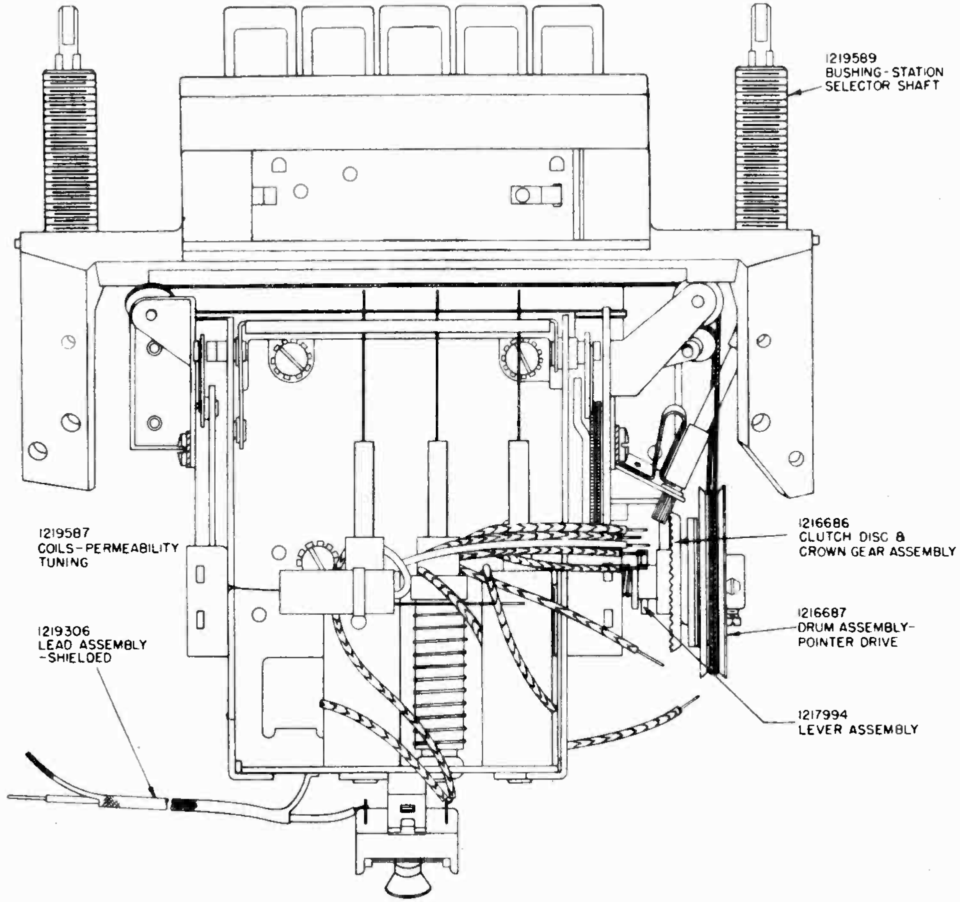


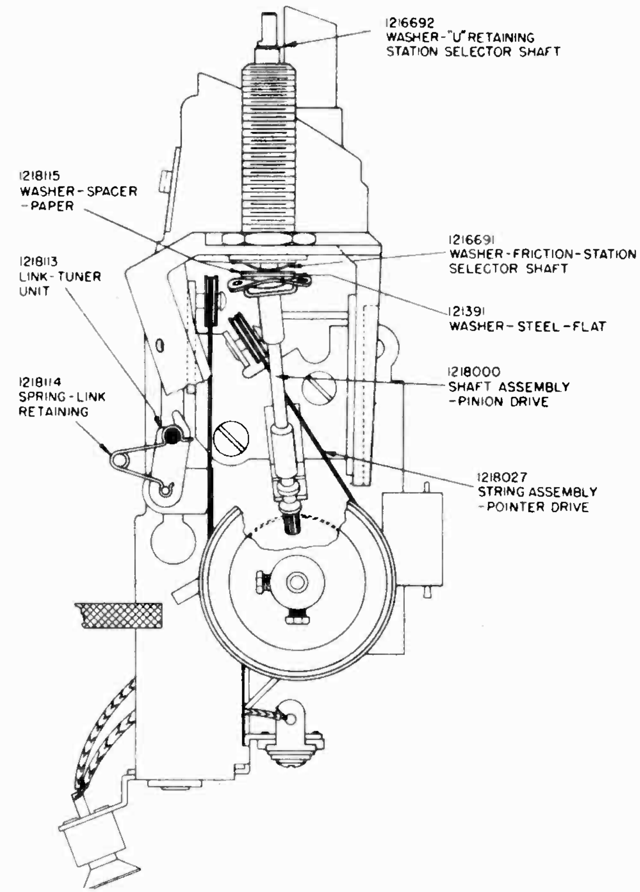

POINTER STRING HOOKUP

MODELS 982543,
982579, Oldsmobile



MODELS 982543, 982579, Oldsmobile




TUNER

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| | | | **ELECTRICAL PARTS** |
| | | | **COILS** |
| 1 | | 1219587 | Coils—Permeability Tuning |
| 1 A | | | Antenna Coil |
| 1 B | | | R.F. Coil |
| 1 C | | | Oscillator Coil |
| 2 | | 1214382 | Antenna Choke |
| 3 | | 1219583 | 1st I.F. Assembly |
| 4 | | 1219584 | 2nd I.F. Assembly |
| 5 | | 1217996 | Filament Choke |
| 6 | | 1219310 | Spark Filter & "A" Connector Assembly |
| A | | | Spark Choke |
| B | | | Spark Plate |
| | | | **CONDENSERS** |
| 10 | | 1219312 | Antenna Trimmer |
| 11 | | 7256259 | .000027 Mfd.—Molded |
| 12 | G 100 | 7234242 | .00001 Mfd.—Molded |
| 13 | | 1217733 | .000018 Mfd.—Molded |
| 14 | E 503 | 7230592 | .05 Mfd.—100 V.—Tubular |
| 15 | | 1218046 | R.F. Trimmer |
| 16 | G 151 | 7230893 | .00015 Mfd.—Molded |
| 17 | G 470 | 1207625 | .00005 Mfd.—Molded |
| 18 | | 1218043 | Oscillator Trimmer |
| 19 | | 1219305 | .000235 Mfd. Temperature Compensating |
| 20 | E 503 | 7230592 | .05 Mfd.—200 V.—Tubular |
| 21 | G 100 | 7234242 | .00001 Mfd.—Molded |
| 22 | G 471 | 7238879 | .0005 Mfd.—Ceramic or Molded |
| 23 | | 1219563 | Diode—Filter Unit |
| A | | | .0002 Mfd. |
| B | | | .0002 Mfd. |
| C | | | 47,000 Ohm |
| 24 | E 103 | 7237957 | .01 Mfd.—100 V.—Tubular |
| 25 | E 103 | 7237957 | .01 Mfd.—100 V.—Tubular |
| 26 | E 503 | 7230592 | .05 Mfd.—200 V.—Tubular |

MODELS 982543, 982579, Oldsmobile

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| 27 | E 204 | 1217876 | .2 Mfd.—200 V.—Tubular |
| 28 | | 1218009 | Electrolytic Condenser |
| A | | | 10 Mfd.—350 V. |
| B | | | 15 Mfd.—350 V. |
| C | | | 20 Mfd.—25 V. |
| 29 | | 1219301 | .003 Mfd.—800 V.—Tubular |
| 30 | G 471 | 7238879 | .0005 Mfd.—Ceramic or Molded |
| 31 | | 1219591 | .006 Mfd.—1600 V.—Tubular |

## RESISTORS

| | | | |
|---|---|---|---|
| 40 | A 225 | 1214563 | 2.2 Megohm—1/2 W. Insulated |
| 41 | A 223 | 1214550 | 22,000 Ohm—1/2 W. Insulated |
| 42 | A 105 | 1213282 | 1 Megohm—1/2 W. Insulated |
| 43 | A 223 | 1214550 | 22,000 Ohm—1/2 W. Insulated |
| 44 | A 475 | 1214566 | 4.7 Megohm—1/2 W. Insulated |
| 45 | C 183 | 7239157 | 18,000 Ohm—2 W. Insulated |
| 46 | A 181 | 1215559 | 180 Ohm—1/2 W. Insulated |
| 47 | A 105 | 1213282 | 1 Megohm—1/2 W. Insulated |
| 48 | A 155 | 1213283 | 1.5 Megohm—1/2 W. Insulated |
| 49 | A 105 | 1213282 | 1 Megohm—1/2 W. Insulated |
| 50 | A 273 | 1214551 | 27,000 Ohm—1/2 W. Insulated |
| 51 | A 102 | 1213235 | 1000 Ohm—1/2 W. Insulated |
| 52 | A 102 | 1213235 | 1000 Ohm—1/2 W. Insulated |
| 53 | A 105 | 1213282 | 1 Megohm—1/2 W. Insulated |
| 54 | A 273 | 1214551 | 27,000 Ohm—1/2 W. Insulated |
| 55 | B 331 | 7233773 | 330 Ohm—1 W. Insulated |
| 56 | B 151 | 1211005 | 150 Ohm—1 W. Insulated |
| 57 | C 182 | 1214573 | 1800 Ohm—2 W. Insulated |

## TUNER PARTS

| | | | |
|---|---|---|---|
| | | 1219589 | Bushing—Station Selector Shaft |
| | | 1219597 | Background Assembly |
| | | 1219588 | Dial Glass—Calibrated |
| | | 1218030 | Pointer & Slide Assembly |
| | | 1218027 | String Assembly—Pointer Drive |
| | | 1219595 | Spring & Sleeve Assembly—Core Lock |
| | | 1219596 | Plate & Socket Assembly—Dial Lamp |
| | | 1219309 | Tuner Unit Assembly—Mechanical portion only (includes Push Buttons, Clutch Disc, and crown gear assembly) |
| | | 1216687 | Drum Assembly—Pointer Drive |
| | | 1216686 | Clutch Disc & Crown Gear Assembly |
| | | 1214876 | Spring—Clutch Compression |
| | | 1217999 | Lever Actuating Plate Assembly |
| | | 1217994 | Lever Assembly |
| | | 1218113 | Link—Tuner Unit |
| | | 1218114 | Spring—Link Retaining |
| | | 1217992 | Screw—10-32 Special |
| | | 1216692 | Washer—"U" Retaining—Station Selector Shaft |
| | | 1216691 | Washer—Friction—Station Selector Shaft |
| | | 1218115 | Washer—Spacing—Paper |

## TUBES

| | | | |
|---|---|---|---|
| | 5230 | 1214292 | 6SK7GT—R.F. Amplifier |
| | 5222 | 7237752 | 6SA7—Oscillator—Translator |
| | 5230 | 1214292 | 6SK7GT—I.F. Amplifier |
| | 5233 | 1218149 | 6SR7GT—Detector—AVC—1st Audio |
| | 5241 | 1213793 | 6V6GT—Audio Output |
| | 5241 | 1213793 | 6V6GT—Audio Output |
| | 5003 | 1211924 | OZ4—Rectifier |

## MISCELLANEOUS ELECTRICAL PARTS

| | | | |
|---|---|---|---|
| 60 | | 1219582 | Control—Volume, Tone & Switch |
| 60A | | | Volume Control |
| 60B | | | Tone Control |
| 60C | | | Switch |
| 61 | | 187189 | Lamp—Dial (Mazda #44) |
| 62 | | 1219291 | Speaker—6" x 9" Elliptical Permanent Magnet |
| 63 | | 1219314 | Transformer—Output |
| 64 | | 1219316 | Power Transformer & Filter Assembly |
| 64A | | | Transformer—Power |
| 64B | | | Hash Choke |
| 64C | | | Condenser—.5 Mfd.—100 V. |
| 65 | | 1219315 | Transformer—Audio Input. |
| 66 | 8542 | 1218006 | Vibrator |

MODELS 982543,
982579, Oldsmobile

| | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| | | **MECHANICAL PARTS** | |
| | | **CHASSIS** | |
| 70 | | 1219311 | Antenna Connector Assembly |
| | | 7236279 | Socket—Tube—8 Prong—Octal |
| | | 1216041 | Socket—Vibrator |
| | | 1219586 | Clip—IF Mounting |
| | | 1219585 | Cover Assembly—Case Back |
| | | **INSTALLATION PARTS MODEL 982543** | |
| | | 414997 | Washer—Flat 33/64 I.D. |
| | | 7255287 | Nut—1/2—28 Hex. |
| | | 7258813 | Knob—Tone and Dummy |
| | | 7257400 | Washer—Wave—3/16 I.D. (Anti-Rattle) Tuning and Volume Control |
| | | 7259663 | Knob—Tuning and Volume Control Includes Set Screw |
| | | 7256654 | Bracket—Receiver Mounting |
| | | 554519 | Bracket—Side Mounting |
| | | 554690 | Bolt—1/4-20x3/8 Truss Head |
| | | 121797 | Bolt—1/4-20x3/8 Hex. Head |
| | | 120706 | Bolt—1/4-20x1/2 Hex. Head |
| | | 120392 | Washer—Flat—17/64 I.D. 5/8 O.D. |
| | | 103319 | Washer—Lock—1/4 (Split) |
| | | 120423 | Washer—Lock—1/4 (Internal-Tooth) |
| | | 7256717 | Spacer—Instrument panel to gasket |
| | | 554691 | "A" Lead Connector and Filter Condenser Assembly |
| | | 120151 | Fuse—15 Amp. 25 V. |
| | | 1912757 | Condenser—Ignition Coil—0.3 Mfd. |
| | | or | |
| | | 555437 | Condenser—Ignition Coil—0.3 Mfd. |
| | | 1911095 | Condenser—Generator—0.3 Mfd. |
| | 6030 | 1912900 | Condenser—Voltage Regulator—0.5 Mfd. |
| | | or | |
| | | 557531 | Condenser—Voltage Regulator—0.5 Mfd. |
| | | 7257239 | Distributor—Suppressor—15,000 Ohms |
| | | 414237 | Insulating Elbow |
| | | 415823 | Static Collector (Front Wheel) |
| | | 555348 | Clip—Hood Grounding |
| | | 164349 | Screw—8-32x1/4 Phillips Head Self-Tapping |
| | | 7256684 | Gasket—Speaker Baffle |
| | | 7259626 | Panel—Radio Control |
| | | **INSTALLATION PARTS MODEL 982579** | |
| | | 414997 | Washer—Flat—33/64 I.D. |
| | | 7255287 | Nut—1/2-28 Hex. |
| | | 7258813 | Knob—Tone and Dummy |
| | | 7257400 | Washer—Wave—3/16 I.D. (Anti-Rattle) Tuning and Colume Control |
| | | 7259663 | Knob—Tuning and Volume Control Includes Set Screw |
| | | 120706 | Bolt—1/4-20x1/2 Hex. Head |
| | | 103319 | Washer—Lock—1/4 (Split) |
| | | 554845 | Washer—Flat |
| | | 554691 | "A" Lead & Filter Condenser Assembly |
| | | 120151 | Fuse—15 Amp. 25 V. |
| | | 1912757 | Condenser—Ignition Coil—0.3 Mfd. |
| | | or | |
| | | 555437 | Condenser—Ignition Coil—0.3 Mfd. |
| | | 1911095 | Condenser—Generator—0.3 Mfd. |
| | 6030 | 1912900 | Condenser—Voltage Regulator—0.5 Mfd. |
| | | or | |
| | | 557531 | Condenser—Voltage Regulator—0.5 Mfd. |
| | | 7257239 | Distributor Suppressor—15,000 Ohms |
| | | 414237 | Insulating Elbow |
| | | 415823 | Static Collector (Front Wheel) |
| | | 555348 | Clip—Hood Grounding |
| | | 164349 | Screw #8-32x1/4 Phillips Head Self-Tapping |
| | | 7258815 | Panel—Radio Control |
| | | 558956 | Gasket—Speaker Baffle |

## GENERAL

MOUNTING—982544 - All 1950 - 76 & 88 Series Oldsmobile Cars. 982573 - All 1950 - 98 Series Oldsmobile Cars.

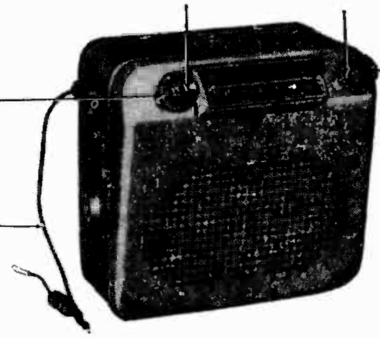
TUBES—Six, Plus Rectifier.

SPEAKER—6"x 9" Elliptical Permanent Magnet.

TUNING—Manual and 5 P. B. Mechanical.

ANTENNA TRIMMER COMPENSATION—For Antennas Between 0.000050 — 0.000070 Mfd.

TUNING RANGE—540 - 1600 KC.




MODELS 982544 982573

## PUSHBUTTON SET-UP

Pull pushbutton to the left and out. Tune in desired station manually. Push button all the way in.

## ALIGNMENT PROCEDURE:

Output Meter Connection ........ Across Voice Coil
Generator Return ........ To Receiver Chassis
Dummy Antenna ........ In Series With Generator
Volume Control Position ........ Maximum Volume
Tone Control Position ........ Treble
Generator Output ........ Minimum for Readable Indication

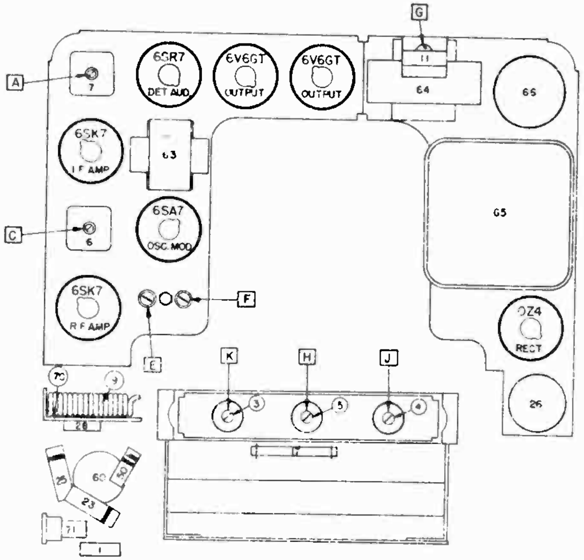
| Steps | Series Condenser or Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence For Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin #8) | 260 KC | High Frequency Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1400 KC | Signal Generator Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Generator Signal | **L |

*Before making this adjustment check the mechanical setting of the oscillator core "H." The slotted end of core should be 1$\frac{25}{32}$" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) If adjustment is necessary, first dissolve the glyptal seal on the studs. Core adjustments should be made with an insulated screwdriver and core studs should be re-sealed in place with glyptal or household cement after alignment.

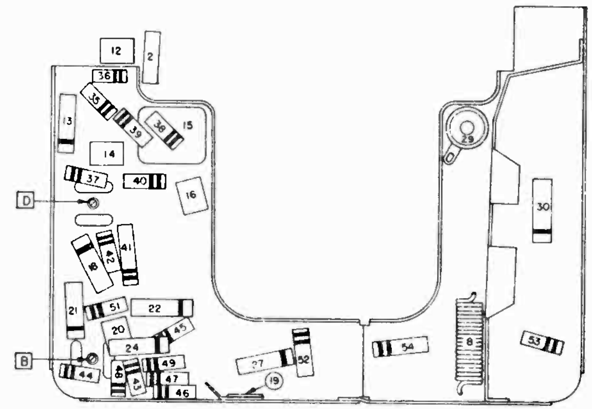
**"L" is the pointer adjustment screw which is on the pointer connecting link (see tuner drawing) and should be adjusted so the pointer reads 1000 KC. (On first "0" of "100.")

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC. (See sticker on case.)

MODELS 982544, 982573, Oldsmobile

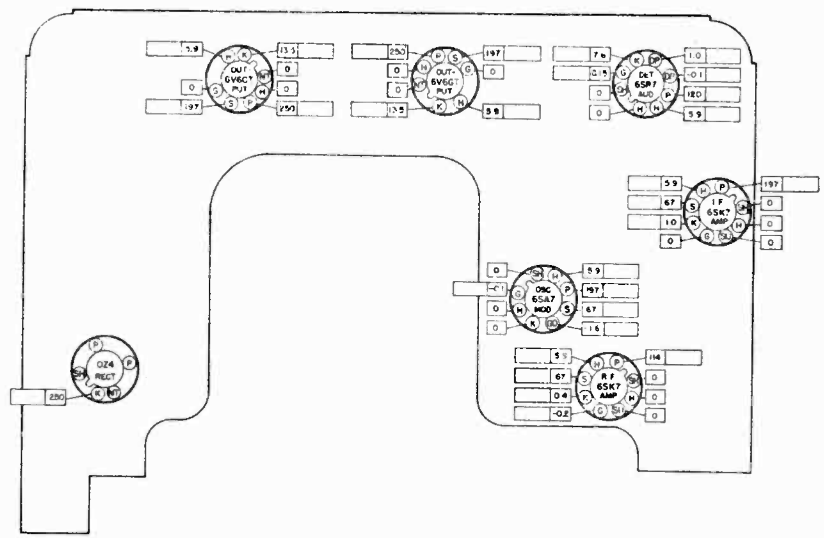



PARTS LAYOUT — TUBE VIEW



PARTS LAYOUT — CHASSIS VIEW

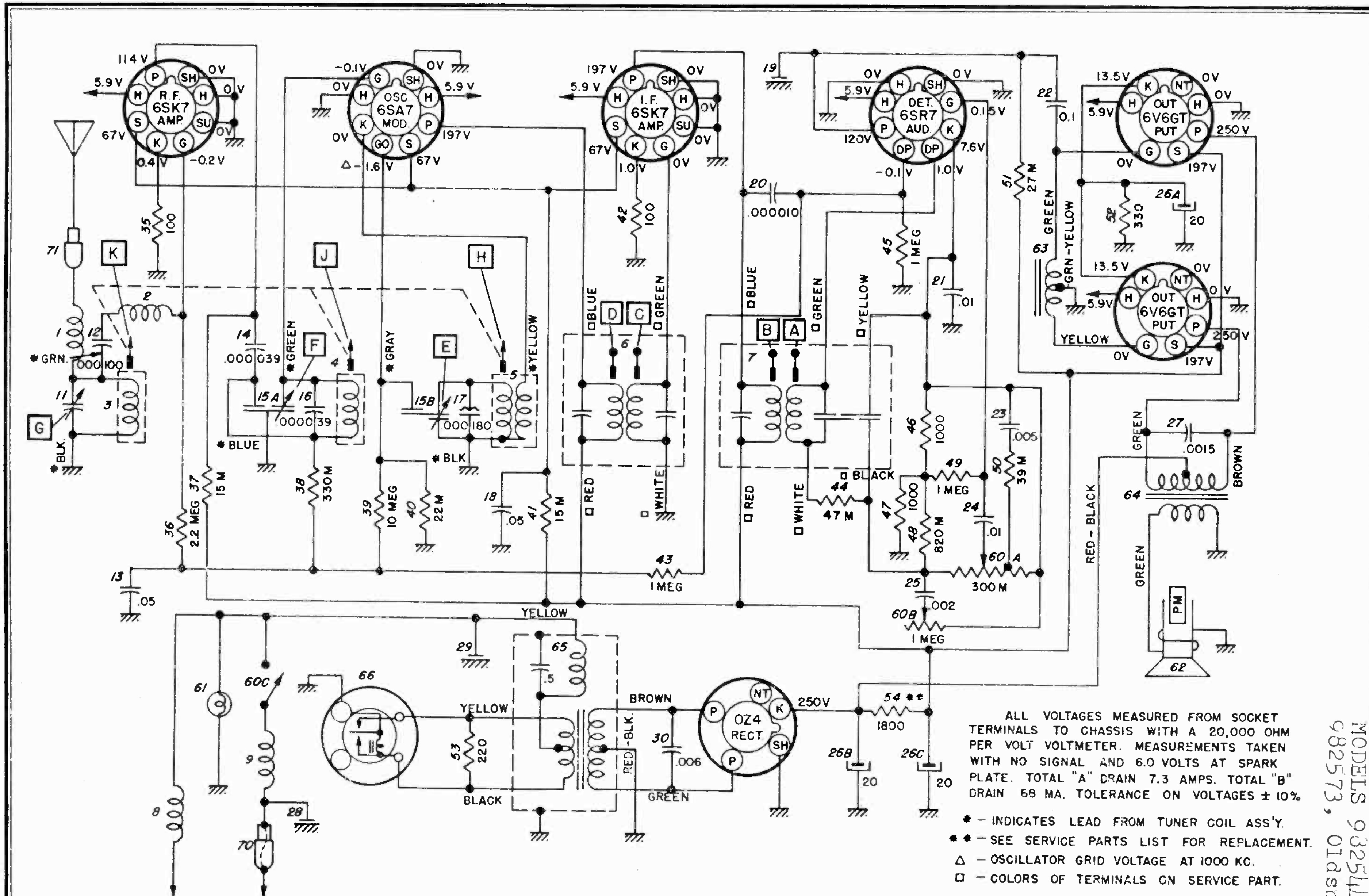
The tube socket voltages as measured at the factory and under the conditions shown on the schematic diagram on Page 3 are shown here. The blank spaces are provided so the serviceman may fill in the actual readings as taken with his own equipment. A normal operating radio should be used for these measurements.



TUBE SOCKET VOLTAGE CHART

VOLTMETER RESISTANCE .......... OHMS PER VOLT. READING TAKEN WITH .......... VOLTS AT SPARK PLATE. THE VOLTAGES ARE MEASURED FROM TUBE SOCKET TERMINALS TO CHASSIS AND ARE POSITIVE UNLESS MARKED OTHERWISE.

MODELS 982544, 982573, Oldsmobile



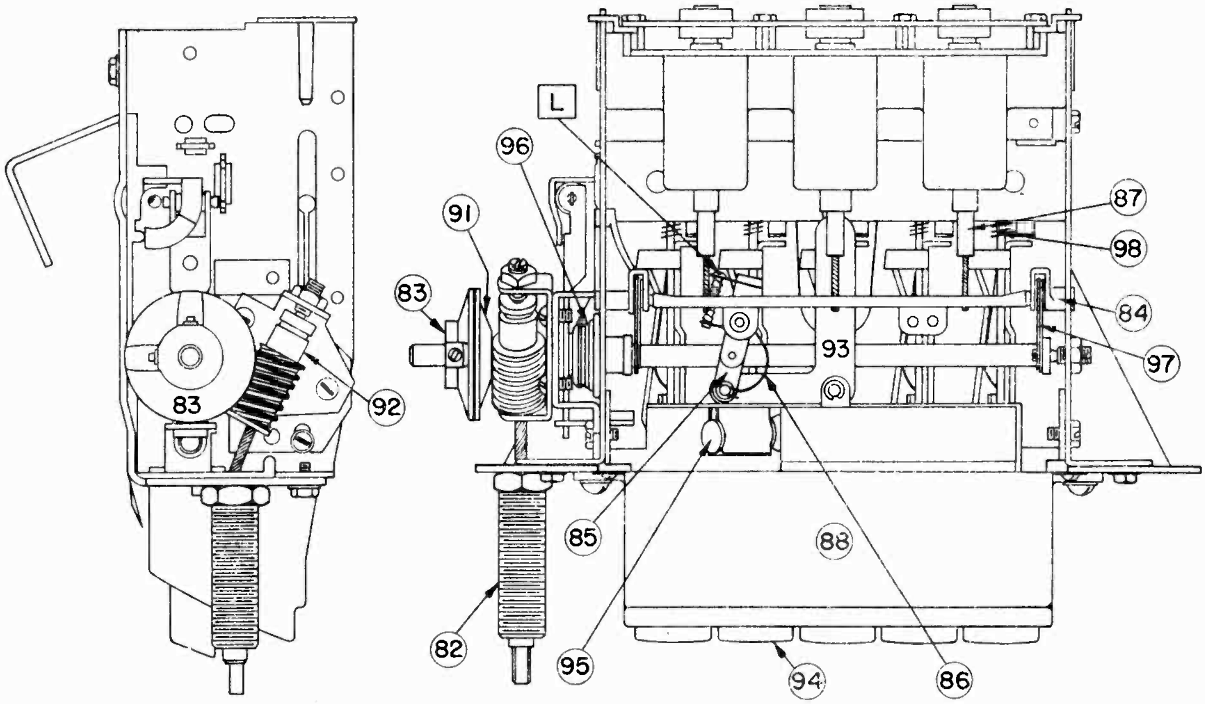

ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TOTAL "A" DRAIN 7.3 AMPS. TOTAL "B" DRAIN 68 MA. TOLERANCE ON VOLTAGES ± 10%

* – INDICATES LEAD FROM TUNER COIL ASS'Y.
** – SEE SERVICE PARTS LIST FOR REPLACEMENT.
△ – OSCILLATOR GRID VOLTAGE AT 1000 KC.
□ – COLORS OF TERMINALS ON SERVICE PART.

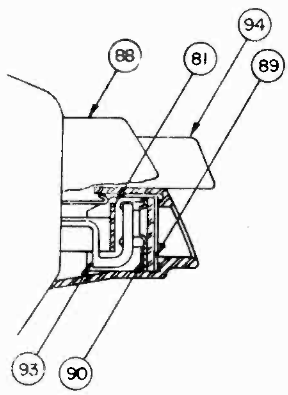
NOTE: Illustration #39, 10 Megohm, ½ Watt Resistor was removed on all sets after serial #44678.

OLDSMOBILE MODELS 982544 982573

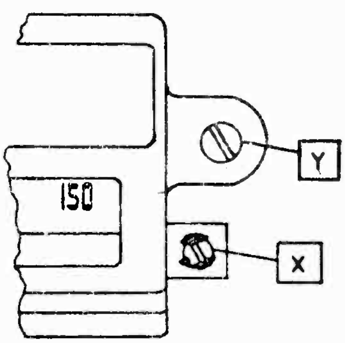
MODELS 982544,
982573, Oldsmobile




TUNER




ESCUTCHEON CROSS SECTION




ESCUTCHEON MOUNTING

## SPECIAL INSTRUCTIONS

Unless special precautions are taken in removing the dial escutcheon, there is a possibility that the dial pointer tip will be broken. Therefore, in removal of the escutcheon the ollowing procedure is recommended:

1. Loosen, but do not remove, the two screws holding the pointer back plate ("X" in Escutcheon Mounting Drawing Above) and loosen the shellac so that the back plate is free to move.
2. Remove the escutcheon mounting screws "Y" (see Escutcheon Mounting).
3. Carefully lift off the escutcheon (DO NOT FORCE). If the dial backplate is free to move slightly downward the escutcheon will come off easily.

The same caution should be exercised when replacing the escutcheon.

MODELS 982544, 982573, Oldsmobile

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **ELECTRICAL PARTS** |
| | | | **Coils** |
| 1 | 7255738 | 7255738 | Antenna Series Choke |
| 2 | 7240251 | 7240251 | Antenna Spark Choke |
| 3 | 7258914 | 7258914 | Antenna |
| 4 | 7258914 | 7258914 | R.F. |
| 5 | 7259687 | 7259687 | Oscillator |
| 6 | 1219508 | 1219508 | 1st I.F. |
| 7 | 1219509 | 1219509 | 2nd I.F. |
| 8 | 1217846 | 1217846 | Hash Choke |
| 9 | 7258434 | 7258434 | Spark Choke |
| | | | **Condensers** |
| 11 | 7258160 | 7258160 | Antenna Trimmer |
| 12 | 1210275 | G 101 | .000100 mfd. Mica |
| 13 | 7236842 | E 503 | .05 mfd. 200 V Tubular |
| 14 | 7258221 | G 390 | .000039 mfd. Mica |
| 15 | 7242454 | 7242454 | Dual Trimmer |
| 15 A | | | R.F. Section |
| 15 B | | | Oscillator Section |
| 16 | 7258221 | G 390 | .000039 mfd. Mica |
| 17 | 7257424 | 7257424 | .000180 mfd. Compensating |
| 18 | 7230892 | E 503 | .05 mfd. 400 V Tubular |
| 19 | 1217848 | 1217848 | Chassis Plate Cond. |
| 20 | 1215189 | G 100 | .000010 mfd. Mica |
| 21 | 7237870 | E 103 | .01 mfd. 400 V Tubular |
| 22 | 1219495 | E 104 | .1 mfd. 400 V Tubular |
| 23 | 7232956 | E 502 | .005 mfd. 600 V Tubular |
| 24 | 7238881 | E 103 | .01 mfd. 400 V Tubular |
| 25 | 7237836 | E 202 | .002 mfd. 600 V Tubular |
| 26 | 7240724 | M 908 | Electrolytic |
| 26 A | | | 20 mfd. 25 V |
| 26 B | | | 20 mfd. 400 V |
| 26 C | | | 20 mfd. 400 V |
| 27 | 7236134 | 7236134 | .0015 mfd. 800 V Tubular |
| 28 | 1212278 | 1212278 | Spark Plate Condenser (included in 7258434) |
| 29 | 1217848 | 1217848 | Chassis Plate Condenser |
| 30 | 7240906 | H 602 | .006 mfd. 1600 V Tubular |
| | | | **Resistors** |
| 35 | 1213217 | A 101 | 100 ohms ½ W Insulated |
| 36 | 1211147 | A 225 | 2.2 megohms ½ W Insulated |
| 37 | 7237595 | B 153 | 15,000 ohms 1 W Insulated |
| 38 | 7240732 | A 334 | 330,000 ohms ½ W Insulated |
| *39 | 1215548 | A 106 | 10 megohms ½ W Insulated |
| 40 | 1211192 | A 223 | 22,000 ohms ½ W Insulated |
| 41 | 7233653 | C 153 | 15,000 ohms 2 W Insulated |
| 42 | 1213217 | A 101 | 100 ohms ½ W Insulated |
| 43 | 7238873 | A 105 | 1 megohm ½ W Insulated |
| 44 | 7240731 | A 473 | 47,000 ohms ½ W Insulated |
| 45 | 7238873 | A 105 | 1 megohm ½ W Insulated |
| 46 | 1213235 | A 102 | 1,000 ohms ½ W Insulated |
| 47 | 1213235 | A 102 | 1,000 ohms ½ W Insulated |
| 48 | 1214561 | 1214561 | 820,000 ohms ½ W Insulated |
| 49 | 7238873 | A 105 | 1 megohm ½ W Insulated |
| 50 | 1217436 | A 393 | 39,000 ohms ½ W Insulated |
| 51 | 7236080 | B 273 | 27,000 ohms 1 W Insulated |
| 52 | 7233773 | B 331 | 330 ohms 1 W Insulated |
| 53 | 7237994 | B 221 | 220 ohms 1 W Insulated |
| 54 | 1214573 | { C 272 <br> B 562 | 1800 ohms 2 W Wire Wound (or replace with 2700 ohm 2 W and 5600 ohm 1 W in parallel) |

*This Resistor was removed on all sets above serial #44678

MODELS 982544,
982573, Oldsmobile

## SERVICE PARTS LIST (Cont.)

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **Tubes** |
| | 1218107 | 5233 | 6SR7 |
| | 1213793 | 5241 | 6V6GT |
| | 7237751 | 5229 | 6SK7 |
| | 7237752 | 5222 | 6SA7 |
| | 1211924 | 5003 | 0Z4 |
| | | | **Miscellaneous Electrical** |
| 60 | 7259447 | 7259447 | Control - Volume, Tone and Switch |
| 60 A | | | Volume Control |
| 60 B | | | Tone Control |
| 60 C | | | Switch |
| 61 | 187189 | 44 | Lamp - Dial Light |
| 62 | 7258146 | 7258146 | Speaker - 6 x 9 P.M. |
| 63 | 7258941 | 7258941 | Transformer - Input |
| 64 | 7259419 | 7259419 | Transformer - Output |
| 65 | 7255881 | 7255881 | Transformer - Power |
| 66 | 7239124 | 8542 | Vibrator - Non-synchronous |
| | | | **MECHANICAL PARTS** |
| | | | **Chassis** |
| 70 | 7258434 | 7258434 | Connector "A" Lead |
| 71 | 7256742 | 7256742 | Connector - Antenna |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | | **Tuner** |
| 81 | 7256688 | 7256688 | Backplate - Pointer |
| | 147481 | 147481 | Ball Bearing Pkg. (12) |
| 82 | 7259443 | 7259443 | Bushing and Manual Drive Shaft |
| 83 | 7258072 | 7258072 | Clutch Disc - Driven |
| 84 | 7258211 | 7258211 | Core Guide Bar - Parallel |
| 85 | 7256271 | 7256271 | Pointer Connecting Link |
| 86 | 7255992 | 7255992 | Spring - Pointer Connecting Link |
| 87 | 7258468 | 7258468 | Core - Powdered Iron |
| 88 | 7259429 | 7259429 | Escutcheon Assy. |
| 89 | 7259430 | 7259430 | Dial |
| 90 | 7259496 | 7259496 | Dial Backplate |
| 91 | 7256495 | 7256495 | Gear and Bushing - Clutch |
| 92 | 7256705 | 7256705 | Gear and Bracket - Worm |
| 93 | 7257898 | 7257898 | Pointer Assy. |
| | 1219174 | 1219174 | Pointer Tip Pkg. |
| 94 | 1219173 | 1219173 | Push Button and Slide Assy. |
| 95 | 1217820 | 1217820 | Socket - Dial Light |
| 96 | 7258756 | 7258756 | Spring - Clutch |
| 97 | 7257415 | 7257415 | Spring - Core Bar Connecting Link |
| 98 | 7255984 | 7255984 | Spring - Slide Return |
| | | | **INSTALLATION PARTS** |
| | 554691 | 554691 | "A" Lead, Condenser, and Fuse Connector, Male |
| | | 6016 | Condenser - "A" Lead |
| | 1911095 | 6030 | Condenser - Generator |
| | 1912757 | 6030 | Condenser - Ignition Coil |
| | 1912900 | 6030 | Condenser - Voltage Regulator |
| | 120151 | 120151 | Fuse - 15 Amps |
| | 555348 | 555348 | Hook Ground Clip |
| | 7259663 | 7259663 | Knob Control |
| | 7258813 | 7258813 | Knob - Tone Control and Dummy |
| | 7240138 | 6013 | Static Collector |
| | 7257239 | 7257239 | Suppressor - Distributor |
| | 414237 | 414237 | Suppressor - Insulator |
| | 7258815 | 7258815 | Trim Plate (98 series) |
| | 7259626 | 7259626 | Trim Plate (76 and 88 series) |

MODELS 982582,
982583, Oldsmobile

## GENERAL

MOUNTING—982582 - All 1950 - 76 & 88 Series Oldsmobile Cars. 982583 - All 1950 - 98 Series Oldsmobile Cars.

TUBES—Seven, Plus Rectifier.

SPEAKER—6" x 9" Elliptical Permanent Magnet.

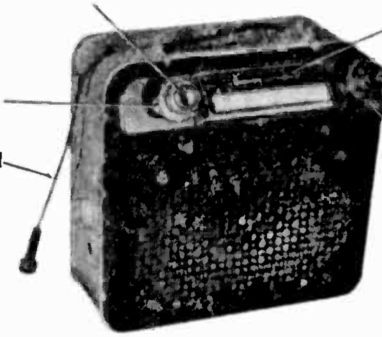
TUNING—Manual and Electronic.

ANTENNA TRIMMER COMPENSATION—For Antennas Between 0.000050 - 0.000070 Mfd.

TUNING RANGE—540 - 1600 KC.

## PUSHBUTTON SET-UP

No Pushbutton Set-up is required. However, the number of stations on which the tuner will stop can be regulated by use of the Sensitivity Control.




MODELS 982582
982583

## SIGNAL SEEKING TUNER ALIGNMENT PROCEDURE:

NOTE: When aligning the signal seeker tuner type radio, be sure to use a vacuum tube voltmeter as indicated and be sure to follow the alignment sequence given—(Notice that the primary of the 2nd I.F. is aligned first.)

Output Meter Connection ........ VTVM From [2] To Chassis (see parts layout page 2)
Generator Return ........ Receiver Chassis
Dummy Antenna ........ In Series With Generator
Volume Control ........ Maximum Volume
Tone Control ........ Treble
Generator Output ........ Not to Exceed 2 Volts at VTVM

| Step | Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence For Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 mfd | 6SA7 Grid (Pin 8) | 260 KC | *High Frequency Stop | A, B, C, D |
| 2 | 0.000068 mfd | Antenna Connector | 1615 KC | High Frequency Stop | **E, F, G |
| 3 | 0.000068 mfd | Antenna Connector | 600 KC | Signal Generator Signal | J, K |
| 4 | 0.000068 mfd | Antenna Connector | 1615 KC | Signal Generator Signal | F, G |
| 5 | 0.000068 mfd | Antenna Connector | 1000 KC | Signal Generator Signal | ***L |

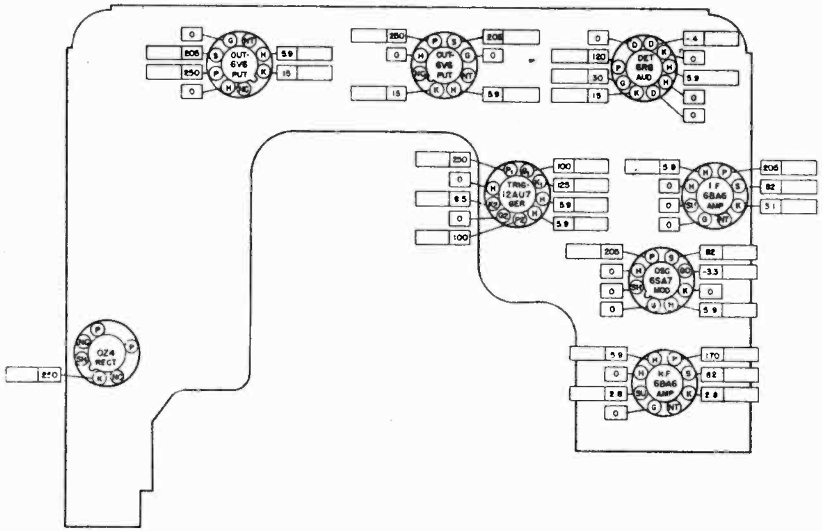
*To tune to high frequency, put a 0.070" feeler gauge (or bare #13 wire) in slot against the high frequency stop. (See tuner pictures). Depress station selector bar and allow the planetary arm to run against the feeler gauge. Turn the radio off and then on.

**Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be 1 3/32" from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with an insulated screwdriver. (It will be necessary to steady the core guide bar by applying a downward pressure at the antenna core end of the bar while making these adjustments.) If this adjustment is necessary, first dissolve the glyptal seal on the core stud and be sure to re-seal after making the adjustment.

***"L" is the pointer adjustment screw on the end of the core guide bar—adjust so pointer reads 1000 KC.

With the radio installed and the antenna plugged in, adjust the antenna trimmer "C" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case).

## TUBE SOCKET VOLTAGE CHART



The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown above. The blank spaces are provided so that the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

Voltmeter resistance ............ Ohms Per Volt.

Readings taken with ............ Volts at Spark Plate.

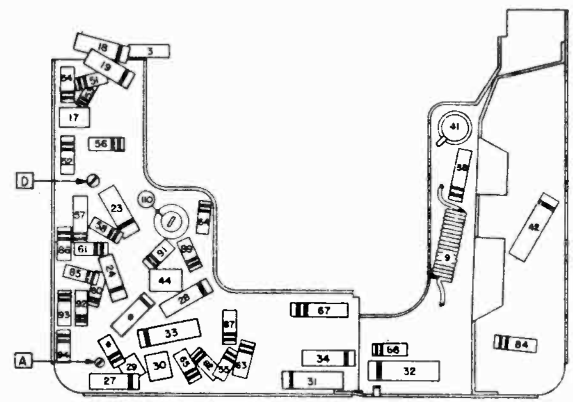
All voltages measured from socket terminals to chassis.

## TUNER ADJUSTMENT PROCEDURE:

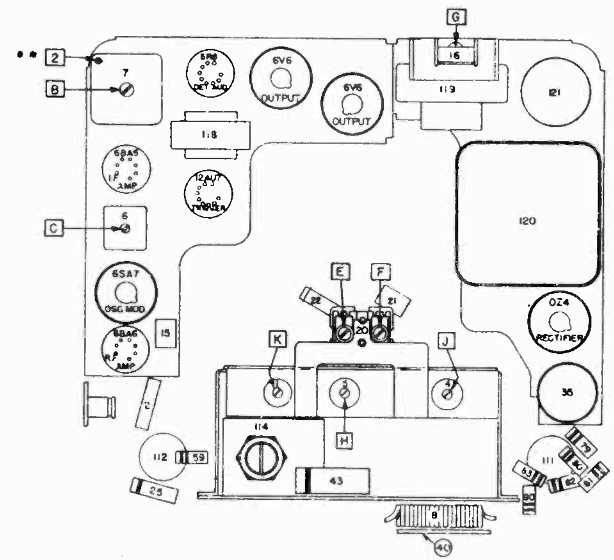
CATHODE DELAY ADJUSTOR (Illustration #110) (This adjustment should not be made unless it is necessary to replace the Delay Adjustor or the setting is definitely proven to be faulty).

1. Disconnect antenna and turn radio on.
2. Allow set to warm up.
3. Depress station selector bar.
4. Set voltage at $K_2$ of the 12AU7 trigger tube (Pin #8) to 8.0 volts by adjusting Illustration 110 while the tuner is seeking and with exactly 6.0 volts at the spark plate.

NOTE: For all other tuner adjustments, see Bulletin 6D-620.



PARTS LAYOUT — CHASSIS VIEW

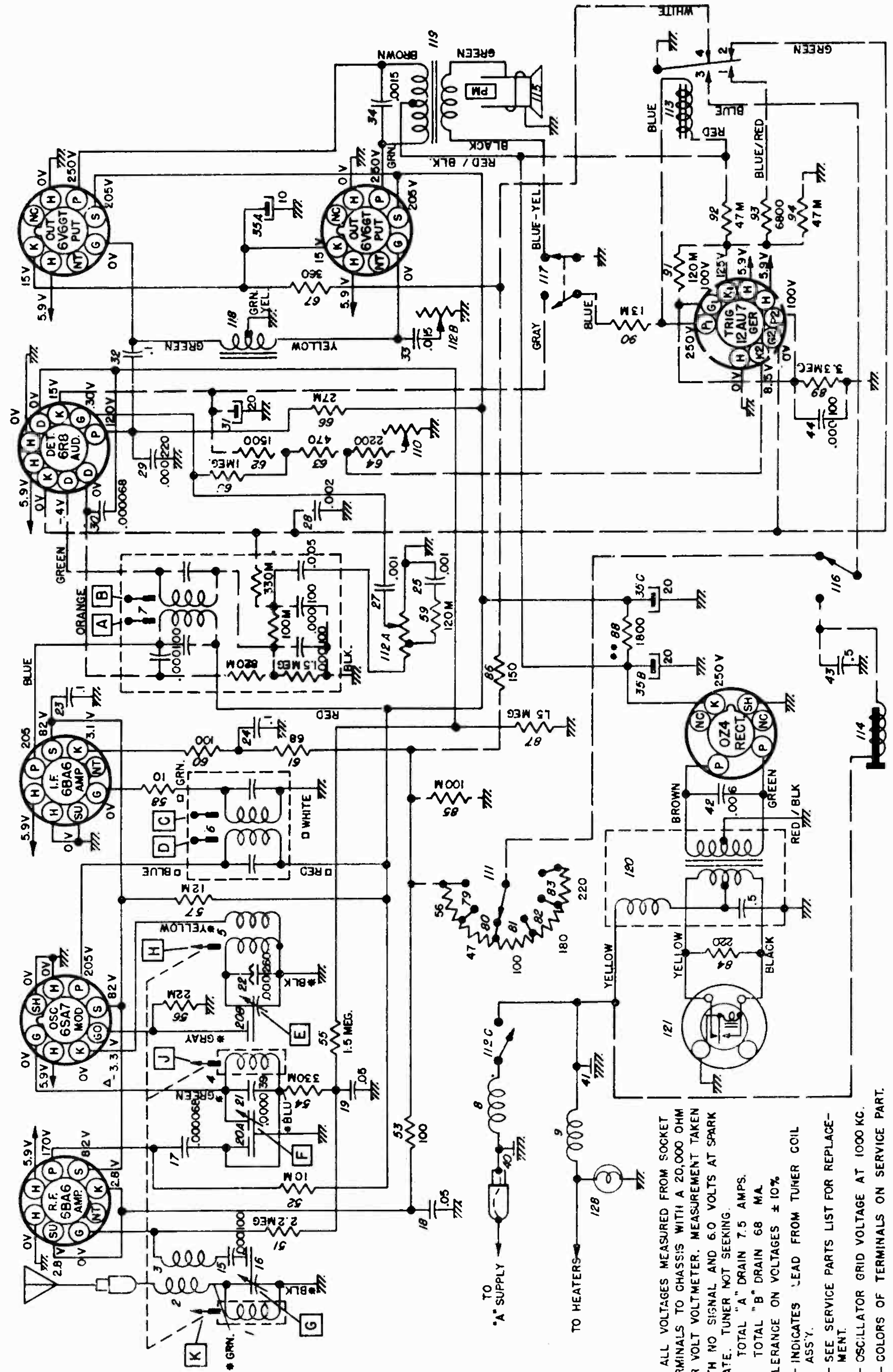


PARTS LAYOUT — TUNER VIEW

*Resistor and condenser are included in the 2nd IF Assy.

**Connect vacuum tube voltmeter between this point and ground during alignment.

MODELS 982582, 982583, Oldsmobile



ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENT TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TUNER NOT SEEKING.

TOTAL "A" DRAIN 7.5 AMPS.

TOTAL "B" DRAIN 68 MA.

TOLERANCE ON VOLTAGES ± 10%

* - INDICATES LEAD FROM TUNER COIL ASS'Y.

** - SEE SERVICE PARTS LIST FOR REPLACEMENT.

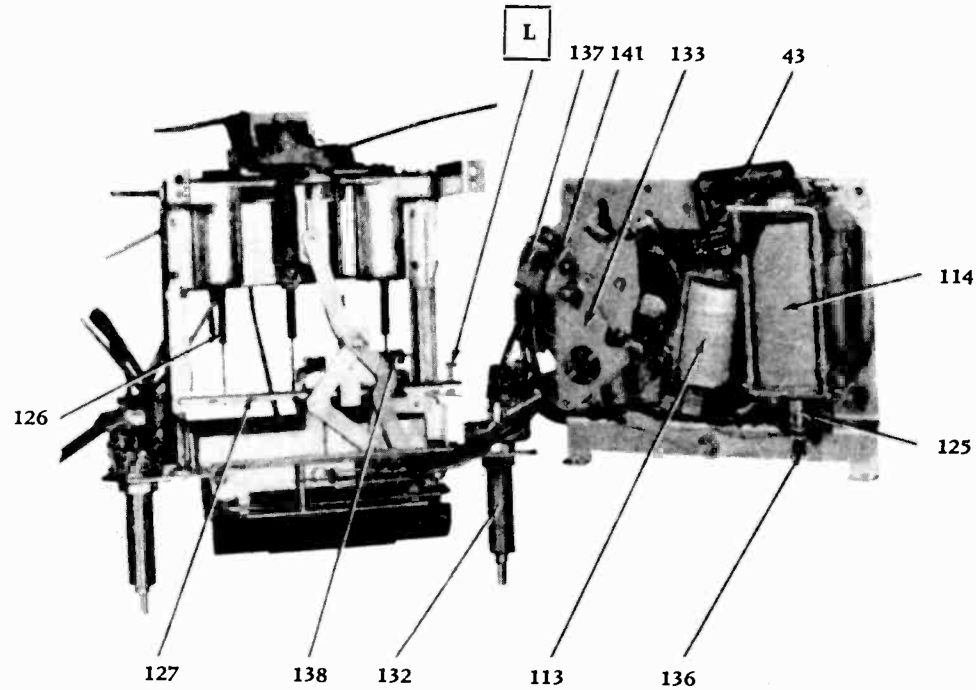
Δ - OSCILLATOR GRID VOLTAGE AT 1000 KC.

□ - COLORS OF TERMINALS ON SERVICE PART.

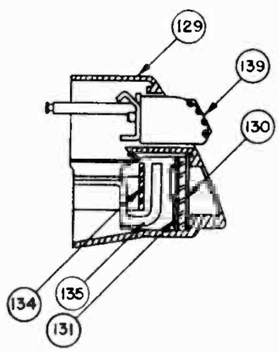
OLDSMOBILE MODELS 982582 982583

TUNER CIRCUIT COMPONENTS

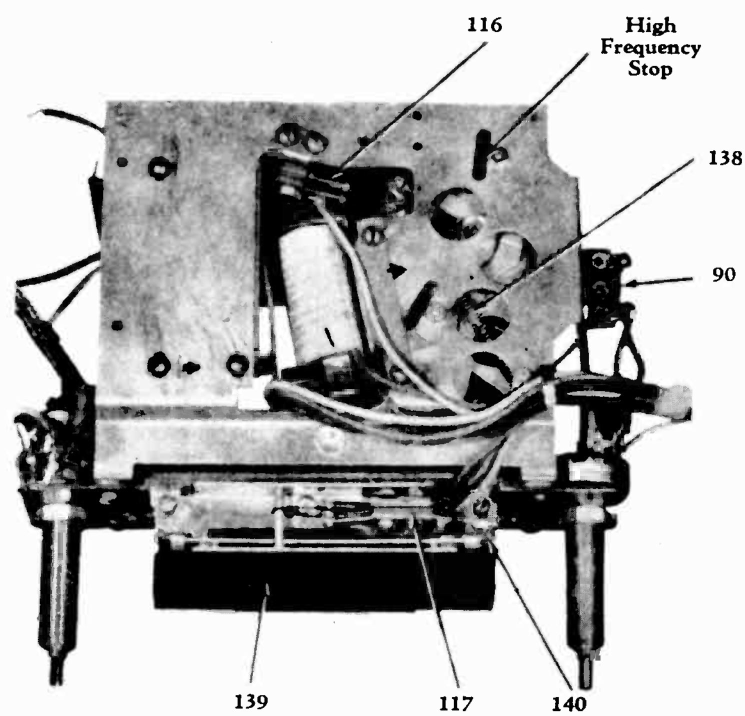
MODELS 982582,
982583, Oldsmobile




TUNER UNFOLDED




ESCUTCHEON
CROSS-SECTION




TUNER

MODELS 982582, 982583, Oldsmobile

## SERVICE PARTS LIST

### ELECTRICAL PARTS

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Coils** | |
| 1 | 7257979 | 7257979 | Antenna |
| 2 | 7255738 | 7255738 | Antenna Series Choke |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7257979 | 7257979 | R.F. |
| 5 | 7259665 | 7259665 | Oscillator |
| 6 | 7258849 | 1219508 | 1st I.F. Assy. |
| 7 | 7259350 | 1219602 | 2nd I.F. Assy. |
| 8 | 1217846 | 1217846 | A Spark Choke |
| 9 | 1217846 | 1217846 | Hash Choke |
| | | **Condensers** | |
| 15 | 7239184 | G 101 | .000100 mfd Mica |
| 16 | 7258160 | 7258160 | Antenna Trimmer |
| 17 | 7238793 | G 680 | .000068 mfd Mica |
| 18 | 7236842 | E 503 | .05 mfd 200 V Tubular |
| 19 | 7236842 | E 503 | .05 mfd 200 V Tubular |
| 20 | 7242454 | 7242454 | Dual Trimmer |
| 20A | | | R.F. Section |
| 20B | | | Oscillator Section |
| 21 | 7258221 | G 390 | .000039 mfd Mica |
| 22 | 7257567 | 7257567 | .000260 mfd Compensating |
| 23 | 7238788 | E 104 | .1 mfd 400 V Tubular |
| 24 | 1209306 | E 104 | .1 mfd 200 V Tubular |
| 25 | 1218883 | E 102 | .001 mfd 600 V Tubular |
| 27 | 1218883 | E 102 | .001 mfd 600 V Tubular |
| 28 | 7237836 | E 202 | .002 mfd 600 V Tubular |
| 29 | 7238972 | G 221 | .000220 mfd Mica |
| 30 | 1219550 | G 680 | .000068 mfd Mica |
| 31 | 1219660 | 1219660 | 20 mfd 50 V Electrolytic |
| 32 | 1219495 | E 104 | .1 mfd 400 V Tubular |
| 33 | 7237719 | 7237719 | .015 mfd 600 V Tubular |
| 34 | 7236134 | 7236134 | .0015 mfd 800 V Tubular |
| 35 | 7259128 | 7259128 | Electrolytic |
| 35A | | | 10 mfd 100 V |
| 35B | | | 20 mfd 400 V |
| 35C | | | 20 mfd 400 V |
| 40 | 7241259 | 7241259 | Spark Plate Assy. |
| 41 | 1217848 | 1217848 | Chassis Plate Condenser |
| 42 | 7240906 | H 602 | .006 mfd 1600 V Tubular |
| 43 | 1219511 | E 504 | .5 mfd 100 V Tubular |
| 44 | 7239184 | G 101 | .000100 mfd Mica |
| | | **Resistors** | |
| 51 | 1211147 | A 225 | 2.2 Megohms ½ W Insulated |
| 52 | 1211085 | B 103 | 10,000 Ohms 1 W Insulated |
| 53 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 54 | 7240732 | A 334 | 330,000 Ohms ½ W Insulated |
| 55 | 1211142 | A 155 | 1.5 Megohms ½ W Insulated |
| 56 | 1211192 | A 223 | 22,000 Ohms ½ W Insulated |
| 57 | 1212491 | 1212491 | 12,000 Ohms 2 W Insulated |
| 58 | 1215107 | A 100 | 10 Ohms ½ W Insulated |
| 59 | 1213271 | 1213271 | 120,000 Ohms ½ W Insulated |
| 60 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 61 | 1215558 | 1215558 | 68 Ohms ½ W Insulated |
| 62 | 1219488 | 1219488 | 1500 Ohms ½ W Insulated |
| 63 | 1219487 | 1219487 | 470 Ohms ½ W Insulated |
| 64 | 1214545 | A 222 | 2200 Ohms ½ W Insulated |
| 65 | 7238873 | A 105 | 1 Megohm ½ W Insulated |
| 66 | 1213342 | B 273 | 27,000 Ohms 1 W Insulated |
| 67 | 7234563 | 7234563 | 360 Ohms 1 W Insulated |
| 79 | 1214540 | 1214540 | 56 Ohms ½ W Insulated |
| 80 | 1213489 | 1213489 | 47 Ohms ½ W Insulated |
| 81 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 82 | 1215559 | 1215559 | 180 Ohms ½ W Insulated |
| 83 | 7257835 | A 221 | 220 Ohms ½ W Insulated |
| 84 | 7237994 | B 221 | 220 Ohms 1 W Insulated |
| 85 | 1213270 | A 104 | 100,000 Ohms ½ W Insulated |
| 86 | 1213220 | A 151 | 150 Ohms ½ W Insulated |
| 87 | 1211142 | A 155 | 1.5 Megohm ½ W Insulated |
| 88 | 1214573 | C 272<br>B 562 | 1800 Ohm 2 W Wire Wound (Replace with C 272 and B 562 in parallel) |
| 89 | 1214564 | A 335 | 3.3 Megohm ½ W Insulated |
| *90 | *7231539 | *7231539 | 13,000 Ohms 1 W Insulated |
| 91 | 1213271 | 1213271 | 120,000 Ohms ½ W Insulated |

*This resistor was 15,000 Ohms until Serial # 82222 - 76 & 88, 83179 - 98 —Use above Value in Service.

MODELS 982582,
982583, Oldsmobile

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Resistors (Continued)** | |
| 92 | 1216157 | B 473 | 47,000 Ohms 1 W Insulated |
| 93 | 1216154 | 1216154 | 6800 Ohms 1 W Insulated |
| 94 | 1216157 | B 473 | 47,000 Ohms 1 W Insulated |
| | | **Tubes** | |
| | 1217690 | 5252 | 6BA6 |
| | 7237752 | 5222 | 6SA7 |
| | 1219485 | 5328 | 12AU7 |
| | 1219496 | 5541 | 6R8 |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | 0Z4 |
| | | **Miscellaneous Electrical** | |
| | 7259352 | 7259352 | A Lead and Fuse Holder Assy. |
| 112 | 7259034 | 7259034 | Control - Volume - Tone and Switch |
| 112A | | | Volume |
| 112B | | | Tone |
| 112C | | | Switch |
| 111 | 7259021 | 7259021 | Control - Sensitivity |
| 110 | 7242204 | 7242204 | Delay Adjustor |
| 113 | 7259009 | 7259009 | Relay |
| 114 | 7259010 | 1219661 | Solenoid |
| 125 | 7259164 | 7259164 | Solenoid Plunger Assy. |
| 115 | 7258146 | 7258146 | Speaker |
| 116 | 7259011 | 7259011 | Switch - Tuner Return |
| 117 | 7259012 | 7259012 | Switch - Station Selector |
| 118 | 7258941 | 7258941 | Transformer - Input |
| 119 | 7259324 | 7259324 | Transformer - Output |
| 120 | 7259375 | 7255881 | Transformer - Power |
| 121 | 7239124 | 8542 | Vibrator - Non-Synchronous |
| | | **MECHANICAL PARTS** | |
| | | **Chassis** | |
| | 7256742 | 7256742 | Antenna Connector |
| | 1217820 | 1217820 | Socket - Dial Light |
| | 7236279 | 7236279 | Socket - Octal |
| | 7259307 | 7259307 | Socket - 9 Pin Miniature |
| | 7258073 | 7258073 | Socket - 7 Pin Miniature |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | **Tuner** | |
| 126 | 7259201 | 7259201 | Core - Tuning Core |
| 127 | 7259178 | 7259178 | Core - Guide Bar |
| 128 | 187189 | 44 | Dial Light |
| 129 | 7259287 | 7259287 | Escutcheon Assy. |
| 130 | 7259344 | 7259344 | Dial |
| 131 | 7259496 | 7259496 | Dial Backplate |
| 132 | 7259017 | 7259017 | Manual Drive Shaft Assy. |
| 133 | 1219610 | 1219610 | Motor Gear Train Assy. |
| 134 | 7256688 | 7256688 | Pointer Backplate |
| 135 | 1219174 | 1219174 | Pointer Tip Pkg. |
| 136 | 7259100 | 7259100 | Spring Clip |
| 137 | 7259207 | 7259207 | Spring - Worm Anti-rattle |
| 138 | 7259055 | 7259055 | Spring - Motor Power |
| 139 | 1219611 | 1219611 | Station Selector Bar Pkg. |
| | 7259028 | 7259028 | Station Selector Bar & Shaft Assy. |
| | 7259125 | 7259125 | Switch Operating Ring |
| | | | Toggle Plate |
| 140 | 7259111 | 7259111 | Spring (2) |
| | 7256121 | 7256121 | "C" Washer |
| 141 | 7259026 | 7259026 | Worm and Bracket Assy. |
| | | **INSTALLATION PARTS** | |
| | 554691 | 554691 | "A" Lead & Condenser Assy. |
| | 1911095 | 6030 | Condenser - Generator |
| | 1912757 | 6030 | Condenser - Ignition |
| | 1912900 | 6030 | Condenser - Regulator |
| | 555348 | 555348 | Clip - Hood Bonding |
| | 414237 | 414237 | Distributor - Insulator Elbow |
| | 7257239 | 7257239 | Distributor - Suppressor |
| | 120151 | 120151 | Fuse - 15 Amps |
| | 7259663 | 7259663 | Knob - Tuner |
| | 7259007 | 7259007 | Knob - Tone Control |
| | 7259008 | 7259008 | Knob - Sensitivity Control |
| | 7240138 | 6013 | Static Collector |
| | 7258815 | 7258815 | Trim Plate - 98 Series |
| | 7259626 | 7259626 | Trim Plate - 88 and 76 Series |

MODEL 986388, Chevrolet

## GENERAL

MOUNTING—All 1950 Chevrolet Cars.

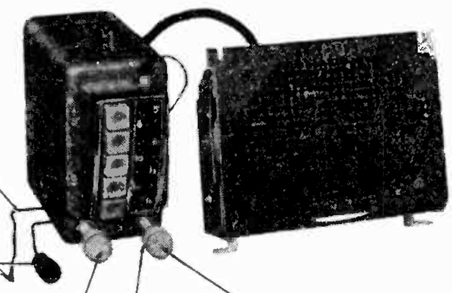
TUBES—Five, plus rectifier.

SPEAKER—6″ x 9″ Elliptical, Permanent Magnet.

TUNING—Manual and 5 P. B. Mechanical.

ANTENNA TRIMMER COMPENSATION—For Antennas Between 0.000058 - 0.000090 Mfd.

TUNING RANGE—550-1600 KC.




MODEL 986388

## PUSH BUTTON SETUP PROCEDURE

Pull Push Button down and out. Tune in desired station manually. Push button all the way in.

## ALIGNMENT PROCEDURE

| | |
|---|---|
| Output Meter Connections | Across Voice Coil |
| Generator Return | To Receiver Chassis |
| Dummy Antenna | In Series With Generator |
| Volume Control Position | Maximum Volume |
| Tone Control Position | Treble |
| Generator Output | Minimum for Readable Indication |

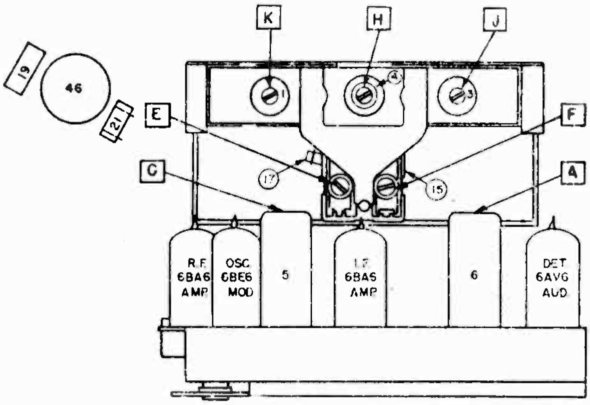
| Steps | Series Condenser or Dummy Antenna | Connect Signal Generator to | Signal Generator Frequency | Tune Receiver to | Adjust in Sequence For Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6BE6 Grid (Pin #7) | 260 KC | High Frequency Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1400 KC | Signal Generator Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Generator Signal | L** |

*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1 25/32″ from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) If adjustment is necessary, first dissolve the glyptal seal on the core studs. Core adjustments should be made with an insulated screw driver, and core studs should be cemented in place with glyptal or household cement after alignment.

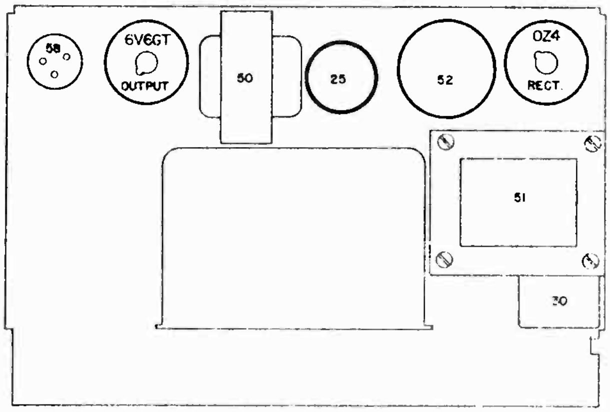
**L is the pointer adjustment screw which is on the connecting link, between the pointer assembly and core guide bar (See tuner Dwg.). It should be adjusted so that when looking directly at the dial the pointer is 3/16″ below the 1000 KC mark. This setting is to give the correct relationship between the pointer and the dial when the radio is installed in a car.

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case).

MODEL 986388,
Chevrolet

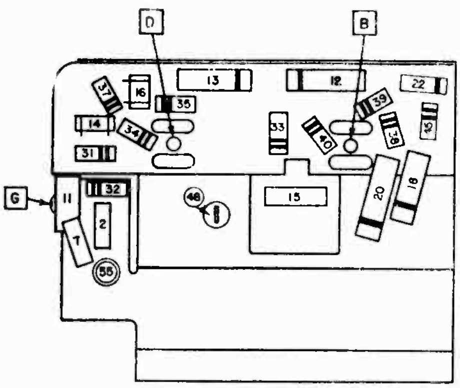



R.F. UNIT

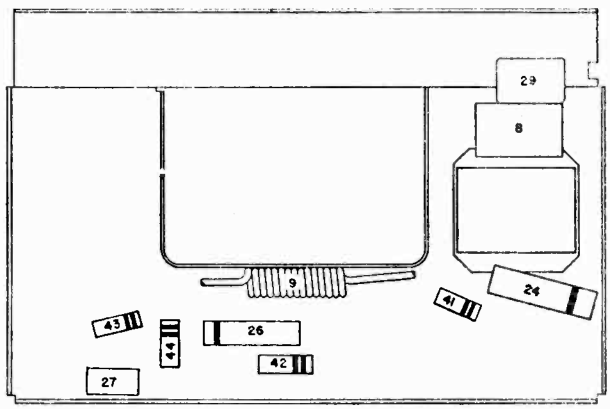



AUDIO UNIT

PARTS LAYOUT — TUBE VIEW

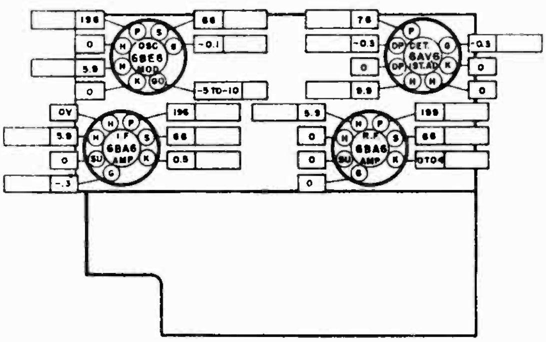



R.F. UNIT

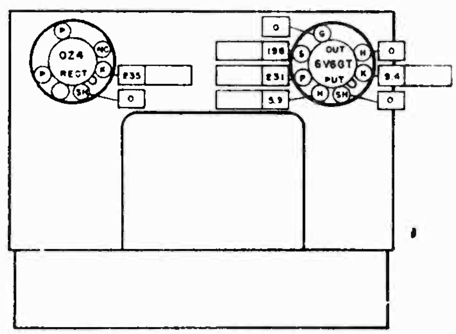


AUDIO UNIT

PARTS LAYOUT — CHASSIS VIEW



R.F. UNIT



AUDIO UNIT

TUBE SOCKET VOLTAGE CHART

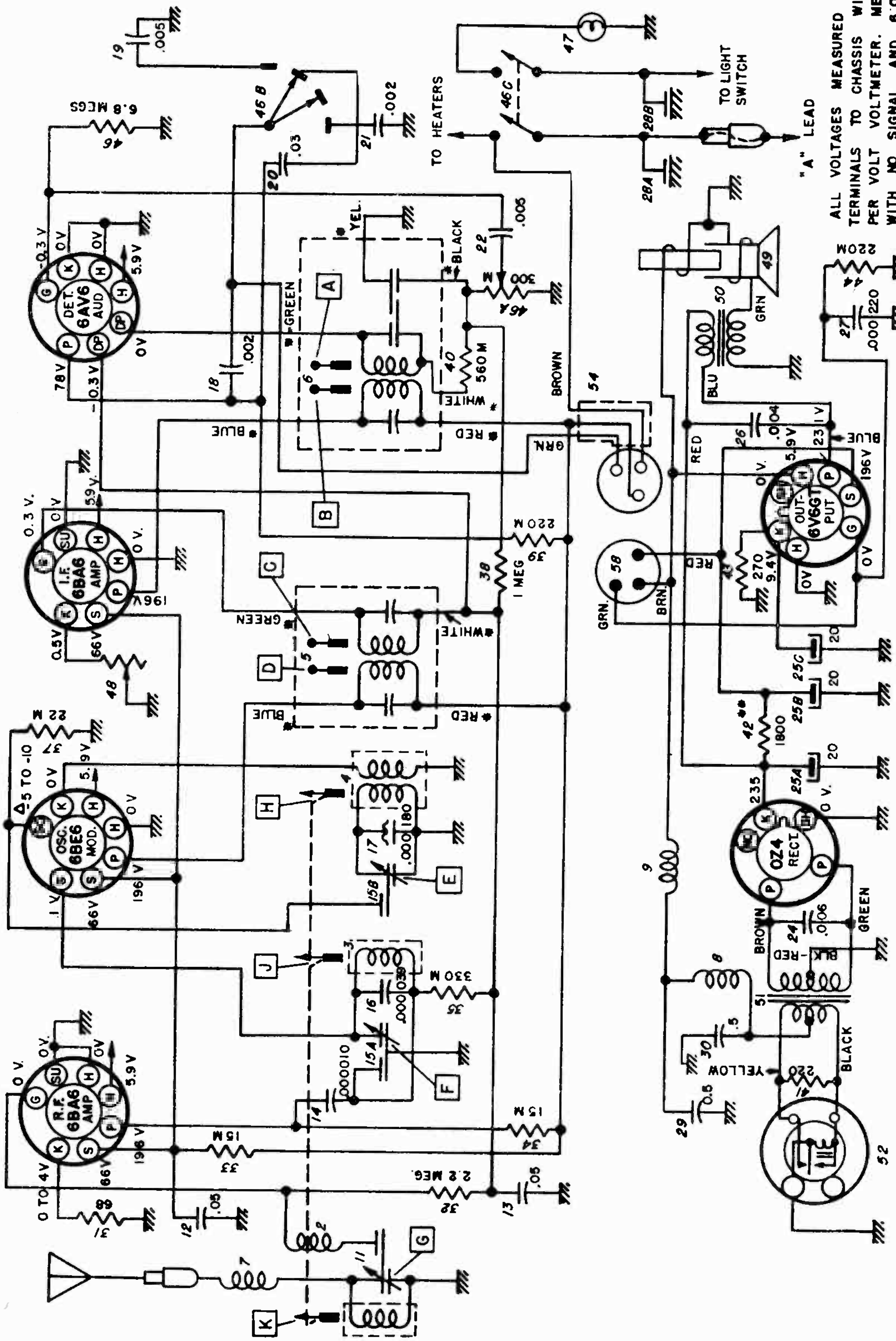
The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram on page 3 are shown above. The blank spaces are provided so the service man may fill in the actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

VOLTMETER RESISTANCE .......... OHMS PER VOLT

READINGS TAKEN WITH ........ VOLTS AT SPARK PLATE

Voltage measured from socket terminals to chassis and are positive unless marked otherwise.

MODEL 986388, Chevrolet




ALL VOLTAGES MEASURED FROM SOCKETS TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TOTAL "A" DRAIN 6.5 AMPS. TOTAL "B" DRAIN 50 MA. TOLERANCE ON VOLTAGES ± 10%.

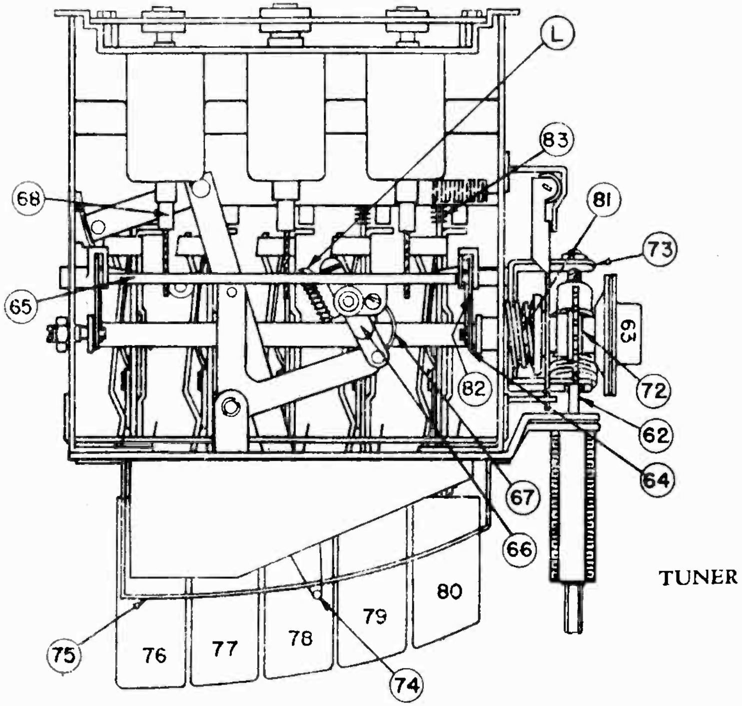
** - SEE SERVICE PARTS LIST FOR REPLACEMENT.

Δ - OSCILLATOR GRID VOLTAGE AT 1000 KC.

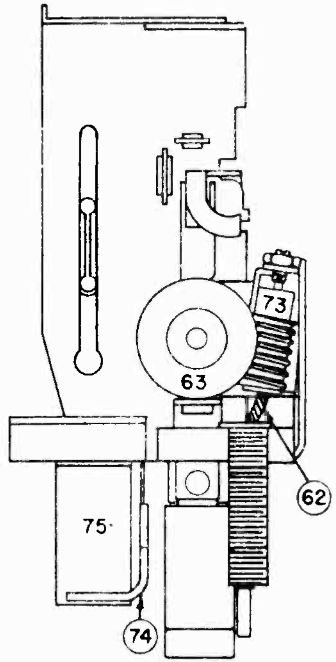
* - COLORS OF TERMINALS ON SERVICE PART

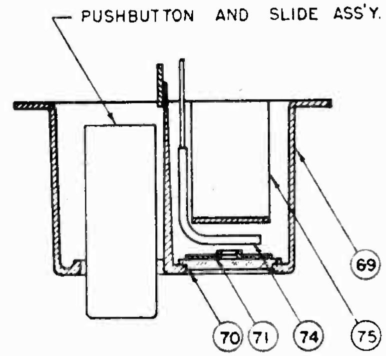
CHEVROLET 986388

MODEL 986388,
Chevrolet




TUNER




ESCUTCHEON CROSS SECTION

# SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **ELECTRICAL PARTS** |
| | | | **Coils** |
| 1 | 7258914 | 7258914 | Antenna |
| 2 | 7240251 | 7240251 | Antenna Spark Choke |
| 3 | 7258914 | 7258914 | R.F. |
| 4 | 7258911 | 7258911 | Oscillator |
| 5 | 7258188 | 1218725 | 1st IF |
| 6 | 7258198 | 1218726 | 2nd IF |
| 7 | 7258502 | 7258502 | Antenna Series Choke |
| 8 | 7258743 | 7258743 | Hash Choke |
| 9 | 7241708 | 7241708 | Hash Choke |
| | | | **Condensers** |
| 11 | 7258000 | 7258000 | Antenna Trimmer Cond. |
| 12 | 7236841 | E 503 | .05 mfd 400 V Tubular |
| 13 | 7236842 | E 503 | .05 mfd 200 V Tubular |
| 14 | 1218371 | G 100 | .000010 mfd Ceramic |
| 15 | 7242454 | 7242454 | Dual Trimmer |
| 15A | | | RF Section |
| 15B | | | Oscillator Section |
| 16 | 7258221 | G 390 | .000039 mfd Ceramic |
| 17 | 7257424 | 7257424 | .000180 mfd Compensating |
| 18 | 1219634 | E 202 | .002 mfd 600 V Tubular |
| 19 | 7230767 | E 502 | .005 mfd 600 V Tubular |
| 20 | 7242448 | E 303 | .03 mfd 400 V Tubular |
| 21 | 1219632 | E 202 | .002 mfd 600 V Tubular |
| 22 | 1219635 | E 502 | .005 mfd 600 V Tubular |
| 24 | 7240906 | H 602 | .006 mfd 1600 V Tubular |
| 25 | 7240724 | M 908 | Electrolytic |
| 25A | | | 20 mfd 400 V |
| 25B | | | 20 mfd 400 V |
| 25C | | | 20 mfd 25 V |
| 26 | 7233243 | H 402 | .004 mfd 800 V Tubular |
| 27 | 7236105 | G 221 | .000220 mfd Molded |
| 28 | 7258332 | 7258332 | Dual Spark Plate |
| 28A | | | "A" Lead Section |
| 28B | | | Dial Light Section |
| 29 | 7257879 | E 504 | .5 mfd 100 V Tubular |
| 30 | 7257879 | E 504 | .5 mfd 100 V Tubular |

# SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **Miscellaneous Electrical Parts** |
| 46 | 7258084 | 7258084 | Control - Volume, Tone and Switch |
| 46A | | | Volume Control |
| 46B | | | Tone Control |
| 46C | | | Switch |
| 47 | 115273 | 51 | Lamp - Dial |
| 48 | 7242204 | 7242204 | Sensitivity Control |
| 49 | 7249381 | 6111 | Speaker - 6 x 9 Elliptical PM |
| 50 | 7256009 | 7256009 | Transformer - Output |
| 51 | 7258747 | 7258747 | Transformer - Power |
| 52 | 7239124 | 8542 | Vibrator - Non-synchronous |
| | | | **MECHANICAL PARTS** |
| | | | **Chassis - RF Unit** |
| 54 | 7258022 | 7258022 | Cable |
| 55 | 7239475 | 7239475 | Socket - Antenna |
| 56 | 1218724 | 1218724 | Socket - Dial Light |
| | 7258073 | 7258073 | Socket - 7 Pin Miniature |
| | | | **Chassis - Audio Unit** |
| 58 | 7258111 | 7258111 | Plug - Cable |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | | **Tuner** |
| | 147481 | 147481 | Ball Bearings (10) |
| 62 | 7258608 | 7258608 | Drive Shaft - Manual |
| 63 | 7258072 | 7258072 | Clutch Disc - Driven |
| 64 | 7258203 | 7258203 | Connecting Link - Core Bar |
| 65 | 7258206 | 7258206 | Core Guide Bar |
| 66 | 7256271 | 7256271 | Connecting Link Pointer |
| 67 | 7255992 | 7255992 | Spring - Pointer Connecting Link |
| 68 | 7258468 | 7258468 | Core - Iron Tuning |
| 69 | 7258963 | 7258963 | Escutcheon |
| 70 | 7258002 | 7258002 | Dial |
| 71 | 7258962 | 7258962 | Dial Backplate |
| 72 | 7259480 | 7259480 | Gear and Bushing |
| 73 | 7258052 | 7258052 | Gear and Bracket - Worm |
| 74 | 7258059 | 7258059 | Pointer Assy. |
| | 1218848 | 1218848 | Pointer Tip Package |
| 75 | 7258961 | 7258961 | Pointer Backplate |
| 76 | 1219558 | 1219558 | Push Button and Slide No. 1 |
| 77 | 1219559 | 1219559 | Push Button and Slide No. 2 |
| 78 | 1219560 | 1219560 | Push Button and Slide No. 3 |
| 79 | 1219561 | 1219561 | Push Button and Slide No. 4 |
| 80 | 1219562 | 1219562 | Push Button and Slide No. 5 |
| 81 | 7258756 | 7258756 | Spring - Clutch |
| 82 | 7257415 | 7257415 | Spring - Core Bar Connecting Link |
| 83 | 7255984 | 7255984 | Spring - Pushbutton Return |

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **INSTALLATION PARTS** |
| | 1912900 | 1912900 | Condenser - Ammeter |
| | 1911095 | 6030 | Condenser - Generator |
| | 1910147 | 6030 | Condenser - Ignition Coil |
| | 1912900 | 1912900 | Condenser - Regulator |
| | 1887829 | 6003 | Distributor Suppressor |
| | 7258880 | 7258880 | Knob - Control |
| | 7258879 | 7258879 | Knob - Dummy |
| | 7258882 | 7258882 | Knob - Tone Control |
| | 7257918 | 7257918 | Nut - Speed |
| | 1888204 | 1888204 | Rubber Nipple - Distributor Suppressor |
| | 7257920 | 7257920 | Spacer - RF Mtg. (inner) |
| | 7257922 | 7257922 | Spacer - RF Mtg. (outer) |
| | 7257925 | 7257925 | Speaker Shroud |
| | 494786 | 6009 | Static Collector - Wheel |
| | 7257917 | 7257917 | Stud - Audio Unit Mtg. |
| | 7257924 | 7257924 | Trim Plate - Instrument Panel |
| | 7257921 | 1218728 | Fuse Holder Body - Male |
| | 1912900 | 1912900 | Condenser, Regulator |
| | | | **Resistors** |
| 31 | 1215558 | 1215558 | 68 Ohms ½ W Insulated |
| 32 | 1211147 | A 225 | 2.2 Megohms ½ W Insulated |
| 33 | 7233653 | C 153 | 15,000 Ohms 2 W Insulated |
| 34 | 7237595 | B 153 | 15,000 Ohms 1 W Insulated |
| 35 | 7240732 | A 334 | 330,000 Ohms ½ W Insulated |
| 37 | 1214550 | A 223 | 22,000 Ohms ½ W Insulated |
| 38 | 7238873 | A 105 | 1 Megohm ½ W Insulated |
| 39 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 40 | 1214560 | A 564 | 560,000 Ohms ½ W Insulated |
| 41 | 7237994 | B 221 | 220 Ohms 1 W Insulated |
| 42 | 1214573 | C 272 / B 562 | 1800 Ohms 2 W Replace with C 272 and B 567 in parallel |
| 43 | 1213846 | B 271 | 270 Ohms 1 W Insulated |
| 44 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 45 | 7241937 | A 685 | 6.8 Megohms ½ W Insulated |
| | | | **Tubes** |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | 0Z4 |
| | 1217690 | 5252 | 6BA6 |
| | 1217691 | 5253 | 6BE6 |
| | 1218506 | 5262 | 6AV6 |

MODEL 986389,
Chevrolet

## GENERAL

MOUNTING — All 1950 Chevrolet Cars

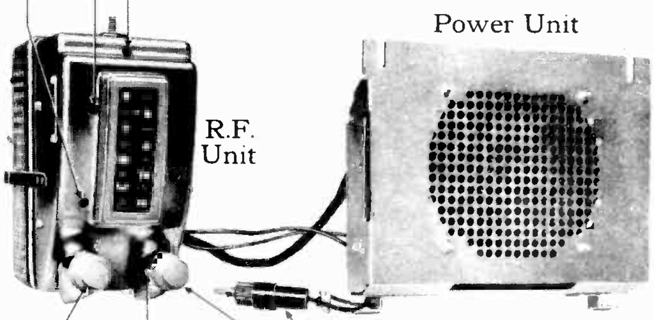
TUBES — Five, plus Rectifier

SPEAKER — 6" Electro-Magnetic or 6" Permanent Magnet

TUNING — Manual

ANTENNA TRIMMER COMPENSATION
—For Antennas Between 0.000060 - 0.000090 Mfd.

TUNING RANGE — 535 - 1610 KC.




MODEL 986389

## ALIGNMENT PROCEDURE:

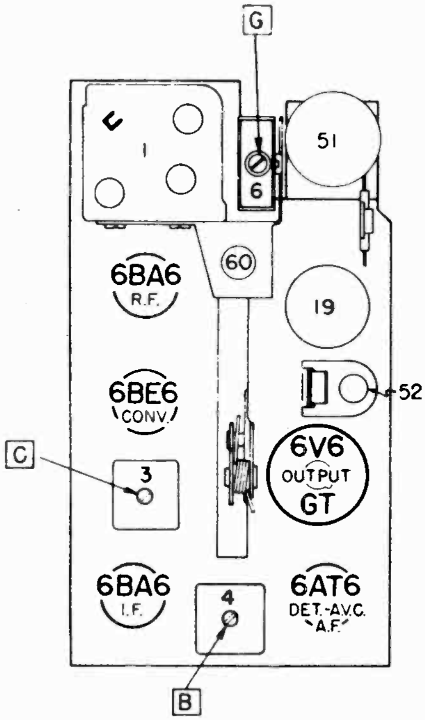
Output Meter Connection ........ Across Voice Coil
Generator Return ........ To Receiver Chassis
Dummy Antenna ........ In Series With Generator
Volume Control Position ........ Maximum Volume
Tone Control Position ........ Treble
Generator Output ........ Minimum for Readable Indication

| Steps | Series Condenser or Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust In Sequence For Max. Output |
|---|---|---|---|---|---|
| 1 | 0.02 Mfd. | 6BE6 Grid (Pin #7) | 257.5 KC. | High Frequency Stop | A, B, C, D |
| 2 | 0.000065 Mfd. | Antenna Connector | 1610 KC. | High Frequency Stop | E, F, G |
| 3 | 0.000065 Mfd. | Antenna Connector | 1400 KC. | Signal Generator Signal | H, J, K |
| 4 | 0.000065 Mfd. | Antenna Connector | 1610 KC. | High Frequency Stop | F, G |
| 5 | 0.000065 Mfd. | Antenna Connector | 1400 KC. | Signal Generator Signal | *Pointer Adjust. Screw |

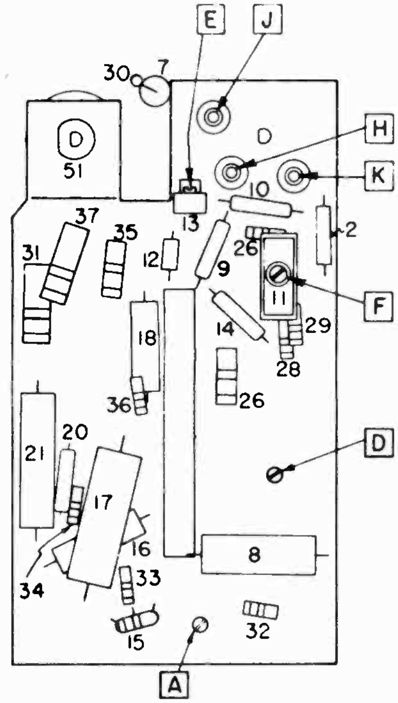
*Refer to the Pointer String Hookup drawing. This should be adjusted so the pointer reads 1400 KC.

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC.

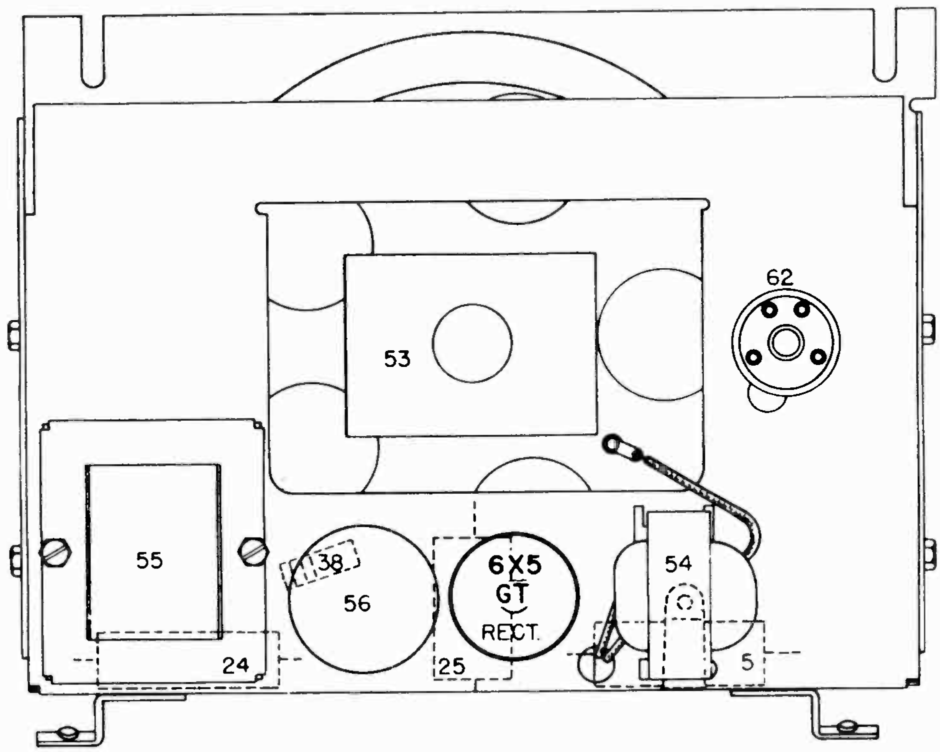
MODEL 986389,
Chevrolet




PARTS LAYOUT—TUBE VIEW

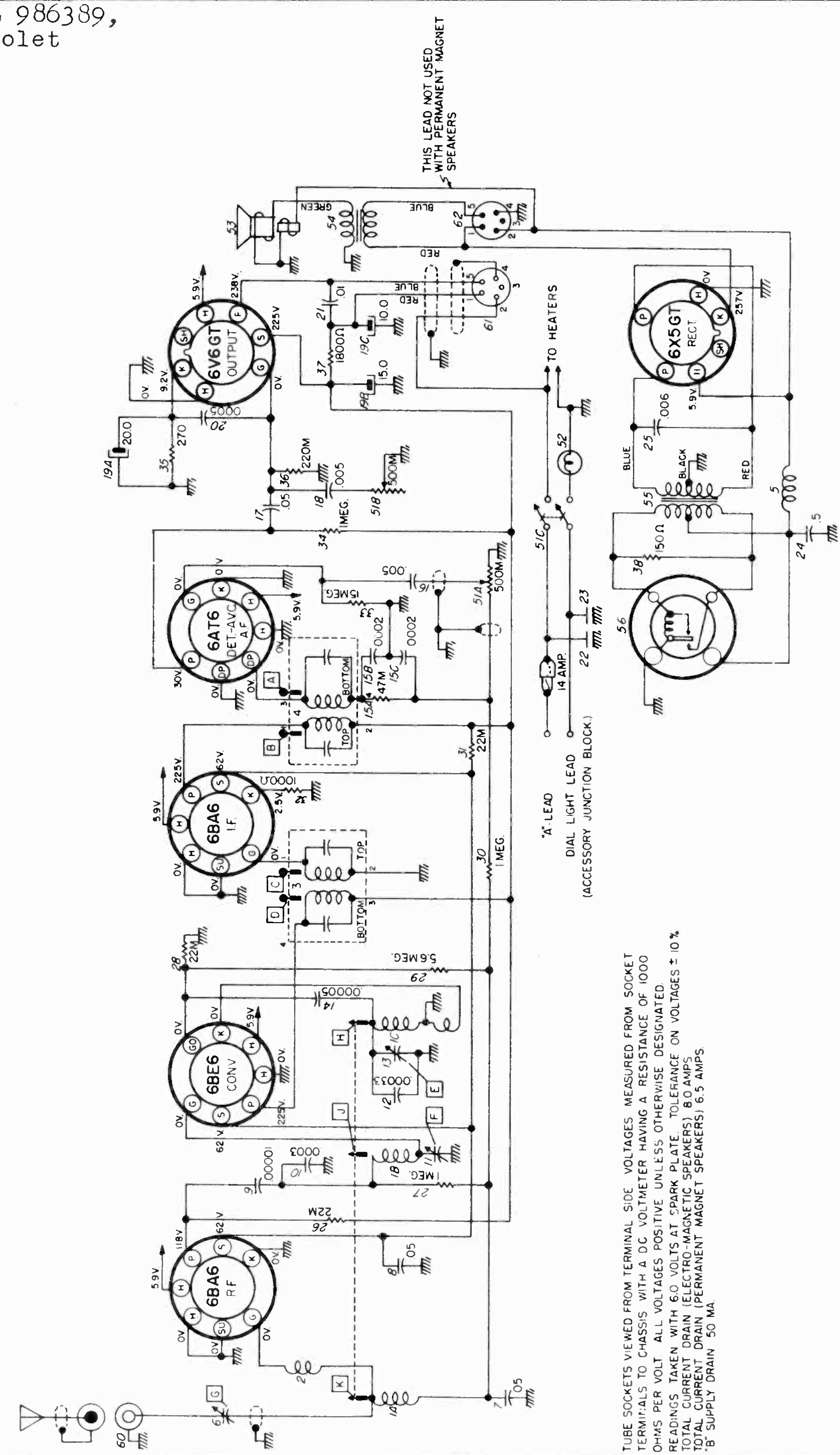



PARTS LAYOUT—CHASSIS VIEW



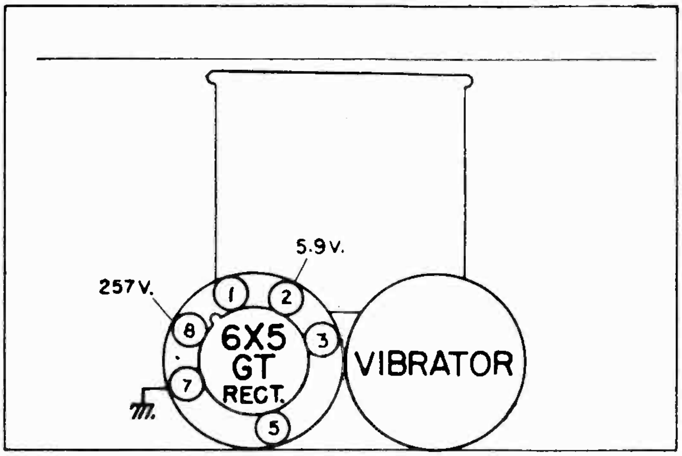

PARTS LAYOUT—POWER UNIT

MODEL 986389,
Chevrolet




TUBE SOCKETS VIEWED FROM TERMINAL SIDE. VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A DC VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT. ALL VOLTAGES POSITIVE UNLESS OTHERWISE DESIGNATED.
READINGS TAKEN WITH 6.0 VOLTS AT SPARK PLATE. TOLERANCE ON VOLTAGES ± 10%.
TOTAL CURRENT DRAIN (ELECTRO-MAGNETIC SPEAKERS) 8.0 AMPS
TOTAL CURRENT DRAIN (PERMANENT MAGNET SPEAKERS) 6.5 AMPS
"B" SUPPLY DRAIN 50 MA

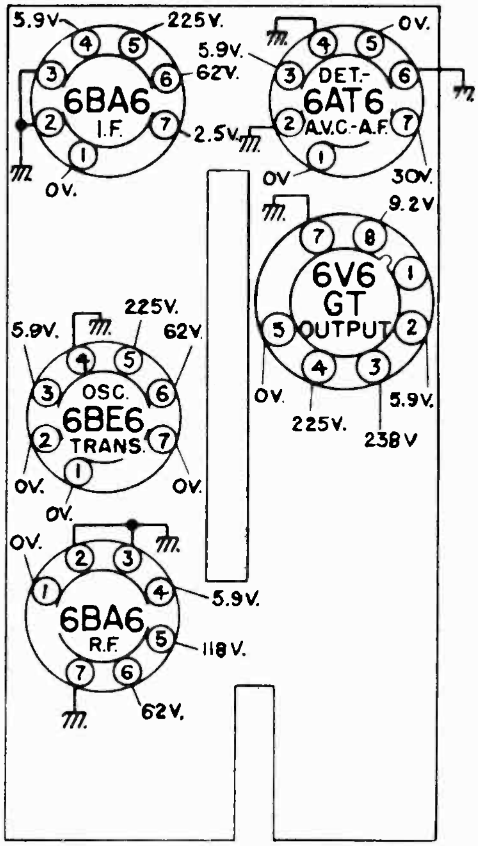
MODEL 986389, Chevrolet



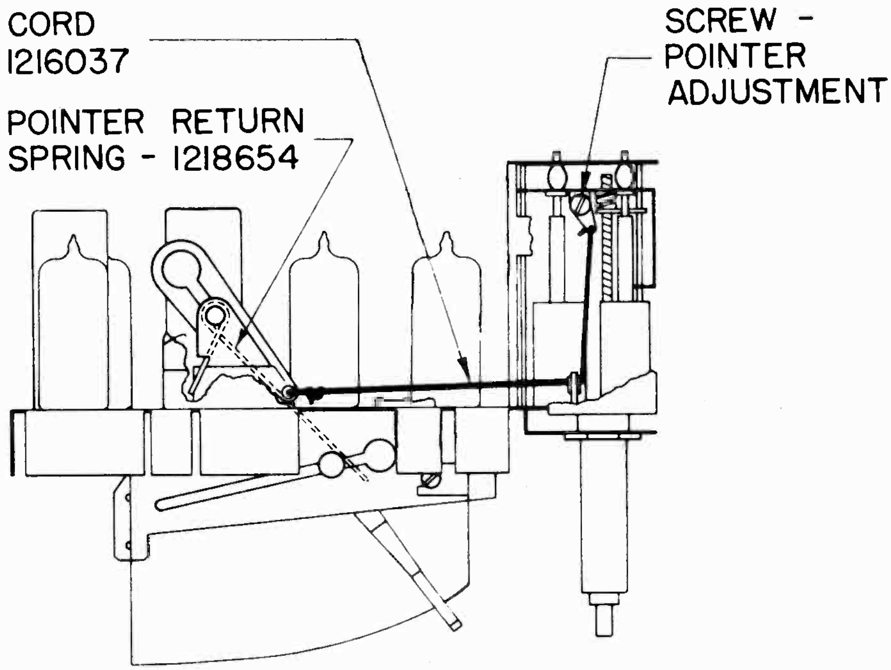

**BOTTOM VIEW OF TUBE SOCKETS**

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO CHASSIS WITH A D. C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT.

"A" SUPPLY AT SPARK PLATE 6.0 VOLTS
"B" SUPPLY DRAIN APPROXIMATELY 50 MA.




**TUBE SOCKET VOLTAGE CHART**




**POINTER STRING HOOKUP**

MODEL 986389,
Chevrolet

## ELECTRICAL PARTS

### COILS

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| 1 | | 1219569 | Coils-Permeability Tuning |
| 1A | | | Antenna Coil |
| 1B | | | R. F. Coil |
| 1C | | | Oscillator Coil |
| 2 | | 1218639 | Antenna Spark Choke |
| 3 | | 1219567 | 1st I. F. Assembly |
| 4 | | 1219568 | 2nd I.F. Assembly |
| 5 | | 1219572 | Hash Choke |

### CONDENSERS

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| 6 | | 1218634 | Antenna Trimmer |
| 7 | E503 | 7230592 | .05 Mfd. 200 V. Tubular |
| 8 | E503 | 7230592 | .05 Mfd. 200 V. Tubular |
| 9 | G100 | 1215189 | .00001 Mfd. Molded |
| 10 | G271 | 1215553 | .0003 Mfd. Molded |
| 11 | | 1218636 | R.F. Trimmer |
| 12 | | 1219566 | .00033 Mfd.—Silver Mica |
| 13 | | 1218635 | Oscillator Trimmer |
| 14 | G470 | 7236141 | .00005 Mfd. Molded |
| 15 | | 1219563 | Diode Filter Unit |
| 15A | | | 47,000 Ohm |
| 15B | | | .0002 Mfd. |
| 15C | | | .0002 Mfd. |
| 16 | | 7230767 | .005 Mfd. 100 V. Tubular |
| 17 | E503 | 7230592 | .05 Mfd. 200 V. Tubular |
| 18 | | 7230767 | .005 Mfd. 100 V. Tubular |
| 19 | | 1218009 | Electrolytic Condenser |
| 19A | | | 20 Mfd. 25 V. |
| 19B | | | 15 Mfd. 350 V. |
| 19C | | | 10 Mfd. 350 V. |
| 20 | | 1216881 | .0005 Mfd. Molded |
| 21 | E103 | 7233608 | .01 Mfd. 600 V. |
| 22 | | 1219577 | Spark Plate |
| 23 | | 1219577 | Spark Plate |
| 24 | | 7240248 | .5 Mfd. 100 V. Tubular |
| 25 | | 1219320 | .006 Mfd. 1600 V. Tubular |

### RESISTORS

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| 26 | B223 | 1216156 | 22,000 Ohm 1 W. Insulated |
| 27 | A105 | 1213282 | 1 Megohm 1/2 W. Insulated |
| 28 | A223 | 1214550 | 22,000 Ohm 1/2 W. Insulated |
| 29 | | 1215562 | 5.6 Megohm 1/2 W. Insulated |
| 30 | A105 | 1213282 | 1 Megohm 1/2 W. Insulated |
| 31 | C223 | 7240590 | 22,000 Ohm 2 W. Insulated |
| 32 | A102 | 1213235 | 1000 Ohm 1/2 W. Insulated |
| 33 | A156 | 1213289 | 15 Megohm 1/2 W. Insulated |
| 34 | A105 | 1213282 | 1 Megohm 1/2 W. Insulated |
| 35 | B271 | 1213846 | 270 Ohm 1 W. Insulated |
| 36 | A224 | 1214555 | 220,000 Ohm 1/2 W. Insulated |
| 37 | C182 | 1214573 | 1800 Ohm 2 W. Insulated |
| 38 | B151 | 1211005 | 150 Ohm 1 W. Insulated |

### TUBES

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| | | 1217690 | 6BA6—R. F. Amplifier |
| | | 1217691 | 6BE6—Oscillator—Translator |
| | | 1217690 | 6BA6—I. F. Amplifier |
| | | 1218105 | 6AT6—Detector—AVC—1st Audio |
| | | 1213793 | 6V6GT—Audio Output |
| | | 1213794 | 6X5GT—Rectifier |

## MISCELLANEOUS ELECTRICAL PARTS

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| 51 | | 1218641 | Control-Volume, Tone & Switch |
| 51A | | | Volume Control |
| 51B | | | Tone Control |
| 51C | | | On-Off Switch |
| 52 | | 125588 | Lamp, Dial (Mazda 55) |
| 53 | | 1219575 | Speaker—6" Electro-Magnetic |
| | | | or |
| 53 | | 1219576 | Speaker—6" Perm. Magnet |
| 54 | | 1219573 | Transformer—Output |
| 55 | | 1219571 | Transformer—Power |
| 56 | 8542 | 1218006 | Vibrator |

## MECHANICAL PARTS

### CHASSIS

| Illus. No. | Service Part No. | Production Part No. | Description |
|---|---|---|---|
| 60 | | 1218651 | Socket—Antenna Connector |
| | | 7236279 | Socket—Octal |
| | | 1219570 | Socket—Miniature |
| | | 7239125 | Socket—Vibrator |
| | | 1218640 | Clip—Pilot Lamp |
| | | 1219586 | Clip—I. F. Transformer Mtg. |
| 61 | | 1218642 | Cable & Socket—Power |
| | | 1218645 | Lead Assy.—Dimmer |
| | | 1219574 | Plug & Leads Assy.—Power Supply & Speaker |
| 62 | | 1218650 | Plug—Plug & Leads Assy. |
| | | 1218655 | Spring—Case Assembly Cover |
| | | 1219579 | "A" Connector Assembly |
| | | 1219556 | Case—Front |

### TUNER PARTS

| Service Part No. | Production Part No. | Description |
|---|---|---|
| | 1218621 | Pointer Arm |
| | 1218623 | Pointer Arm Assembly |
| | 1219564 | Background—Dial |
| | 1219565 | Background—Pointer |
| | 1218644 | Dial |
| | 1218646 | Link & Stud Assy.—Pointer |
| | 1218647 | Nut—Speed—Dial & Dial Background |
| | 1218648 | Pointer—Dial |
| | 1218654 | Spring—Pointer Return |
| | 1218659 | Stud—Top Mounting |

### INSTALLATION PARTS

| Service Part No. | Production Part No. | Description |
|---|---|---|
| | 7257921 | Body, Fuse Holder |
| | 3690332 | Bracket—Receiver Mtg.—Top |
| | 7257984 | Block—Serrated—Radio Mtg. |
| | 7257922 | Bushing—Control |
| | 3690333 | Trim Plate |
| | 147685 | Fuse—14 Amp.—25 V. |
| | 3693934 | Knob—Tone |
| | 7258879 | Knob—Dummy |
| | 7258880 | Knob—Includes Set Screw—Volume & Tuning |
| 6015 | 1911095 | Condenser—Generator |
| | 1910147 | Condenser—Ignition Coil |
| | 1912900 | Condenser—Voltage Regulator |
| | | or |
| | 557531 | Condenser—Voltage Regulator |
| | 494786 | Static Collector Assy. |
| | 1888204 | Nipple—Suppressor |
| | 7257917 | Stud—Power Supply Mtg. |
| | 7257925 | Shroud—Speaker |
| | 1887829 | Suppressor Distributor |

MODEL 986443,
Chevrolet

MOUNTING—All 1950 Chevrolet Trucks.

TUBES—Five, plus rectifier.

SPEAKER—6" x 9" Elliptical, Permanent Magnet.

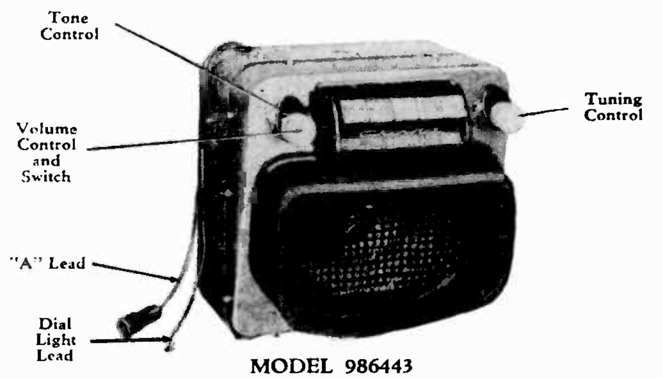
TUNING—Manual and 5 P. B. Mechanical.

ANTENNA TRIMMER COMPENSATION—For Antennas Between 0.000058 - 0.000090 Mfd.

TUNING RANGE—550-1600 KC.

## PUSH BUTTON SET-UP PROCEDURE

Pull Push Button left and out. Tune in desired station manually. Push button all the way in.




MODEL 986443

## ALIGNMENT PROCEDURE

Output Meter Connections ........ Across Voice Coil

Generator Return ........ To Receiver Chassis

Dummy Antenna ........ In Series With Generator

Volume Control Position ........ Maximum Volume

Tone Control Position ........ Treble

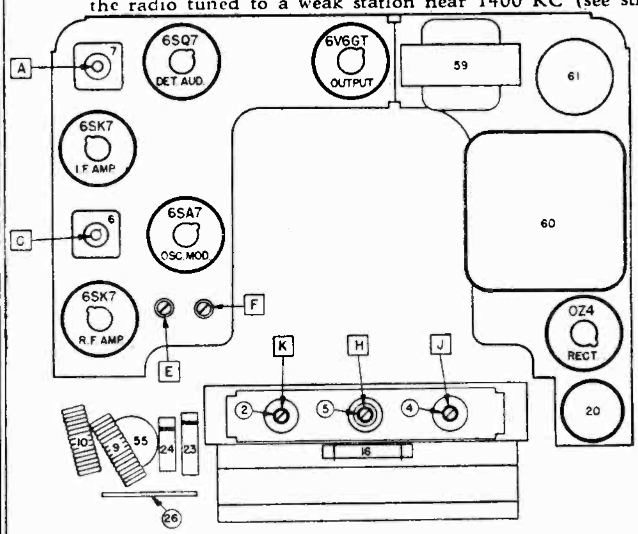
Generator Output ........ Minimum for Readable Indication

| Steps | Series Condenser or Dummy Antenna | Connect Signal Generator to | Signal Generator Frequency | Tune Receiver to | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin #8) | 260 KC | High Frequency Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Generator Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Generator Signal | L** |

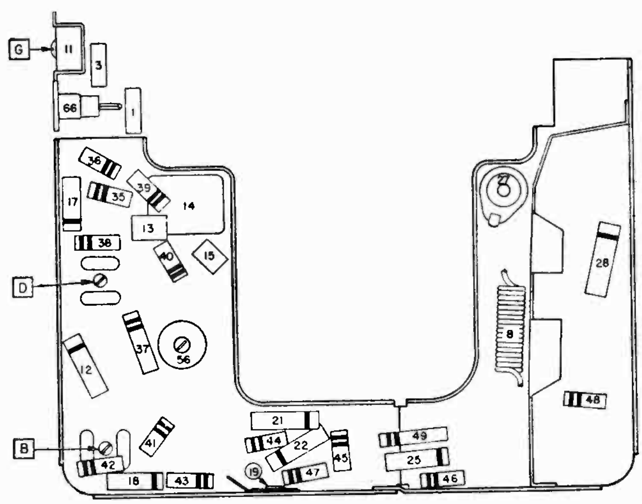
*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1 5/32" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) If adjustment is necessary, first dissolve the glyptal seal on the core studs. Core adjustments should be made with an insulated screw driver, and core studs should be cemented in place with glyptal or household cement after alignment.

**L is the pointer adjustment screw which is on the connecting link, between the pointer assembly and core guide bar (See tuner Dwg.) It should be adjusted so that when looking directly at the dial the pointer is on the 1100 KC mark. This setting is to give the correct relationship between the pointer and the dial when the radio is installed in a car.

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case).

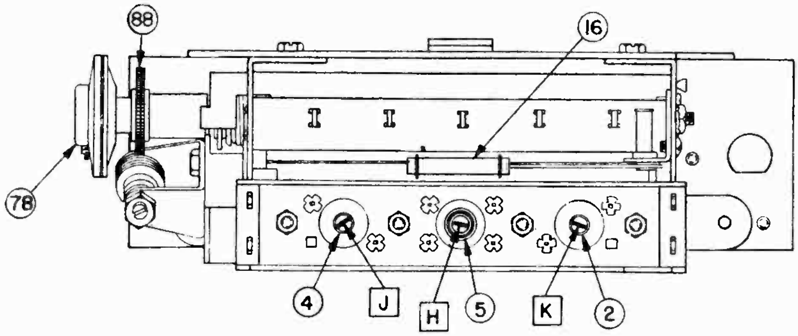



PARTS LAYOUT—TUBE VIEW

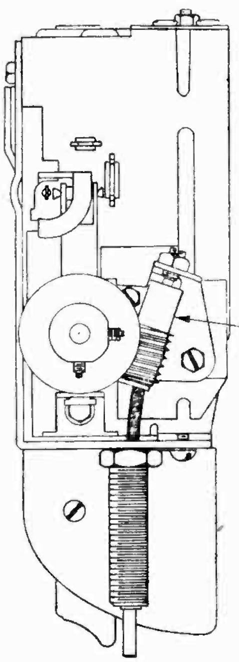


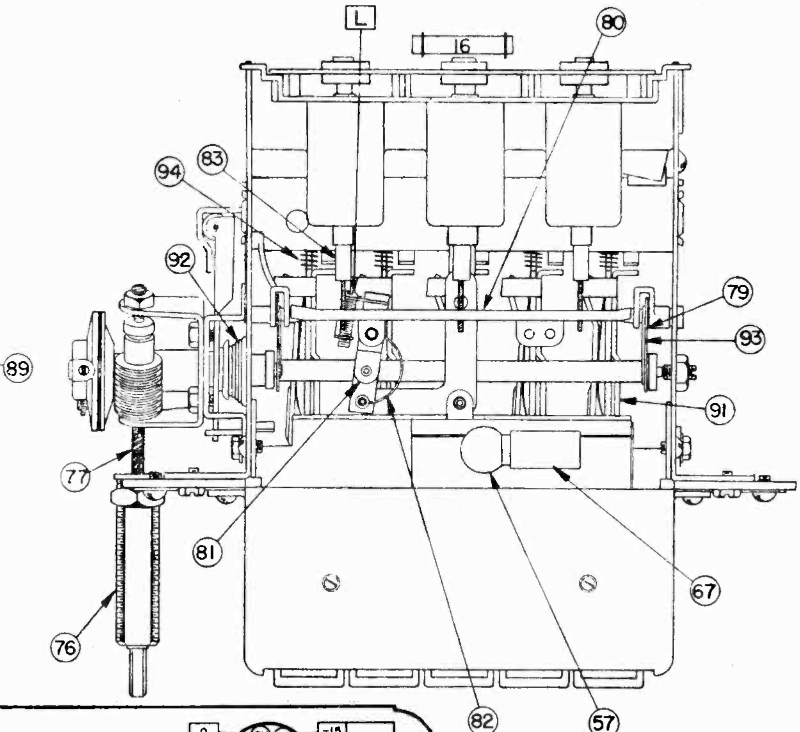

PARTS LAYOUT—CHASSIS VIEW

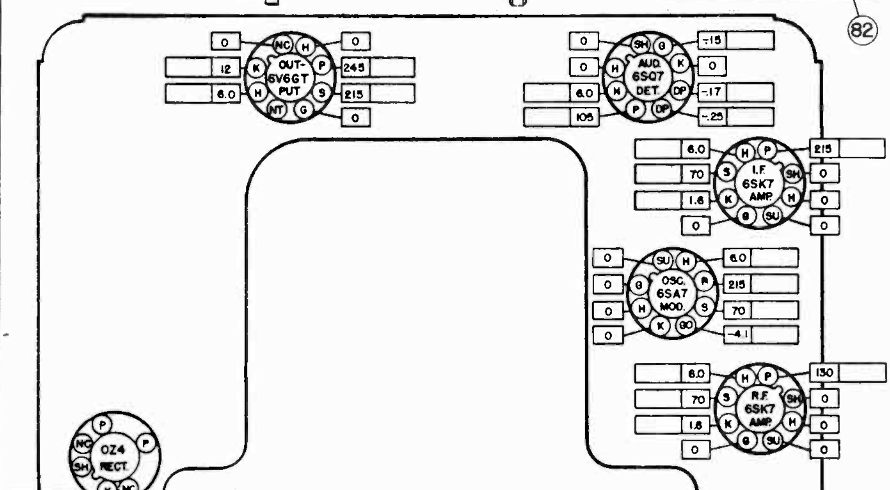
MODEL 986443,
Chevrolet



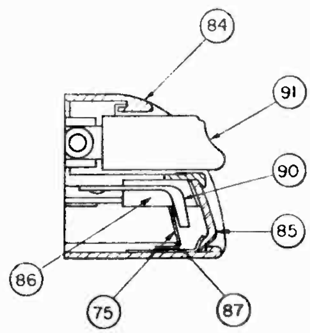

TUNER




TUBE SOCKET VOLTAGE CHART




ESCUTCHEON CROSS SECTION

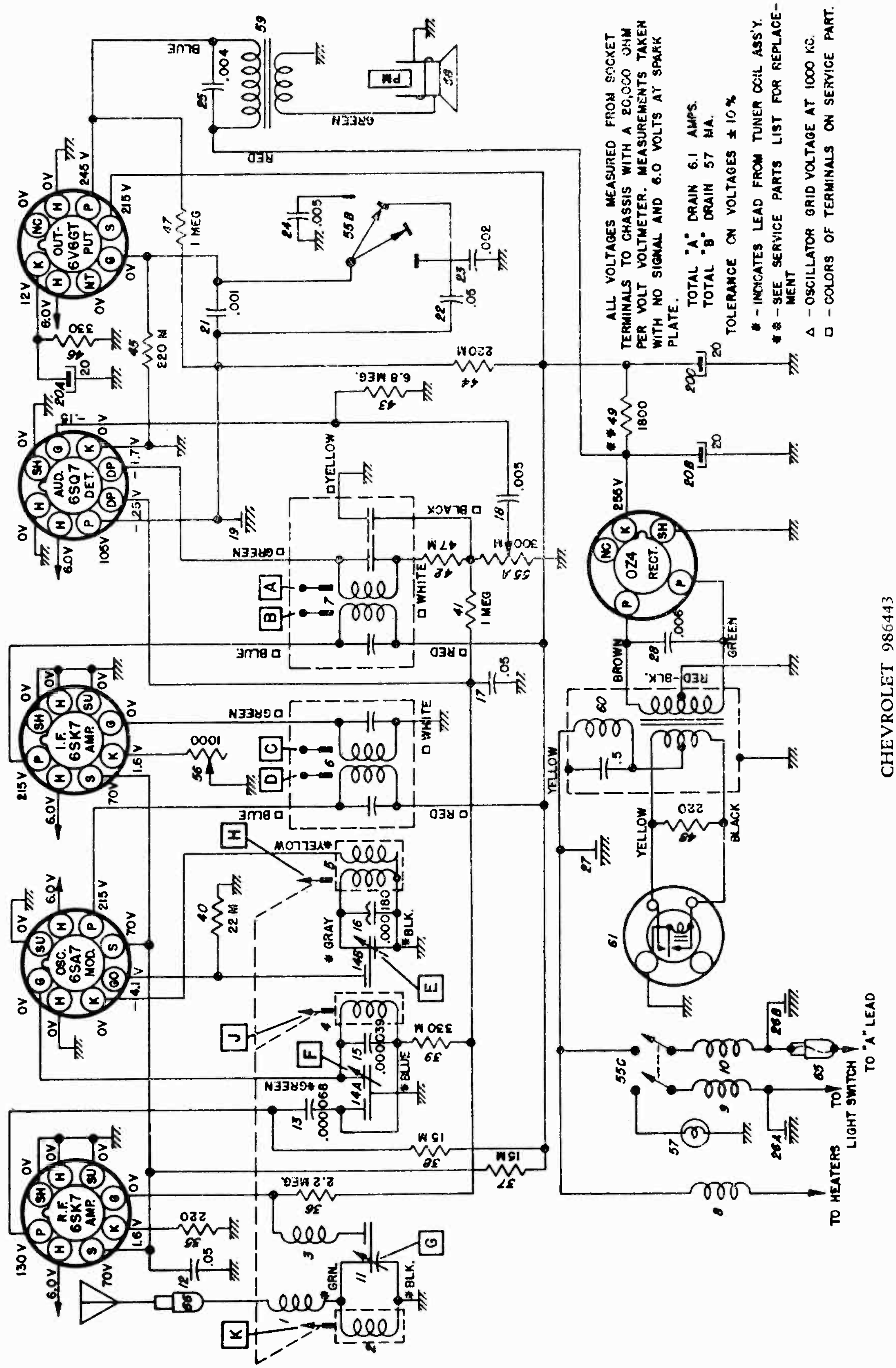
The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram on page 3 are shown above. The blank spaces are provided so the service man may fill in the actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

VOLTMETER RESISTANCE ............ OHMS PER VOLT

READINGS TAKEN WITH ......... VOLTS AT SPARK PLATE

Voltage measured from socket terminals to chassis and are positive unless marked otherwise.

MODEL 986443, Chevrolet




ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE.

TOTAL "A" DRAIN 6.1 AMPS.
TOTAL "B" DRAIN 57 MA.

TOLERANCE ON VOLTAGES ± 10%

# - INDICATES LEAD FROM TUNER COIL ASS'Y.

✱ - SEE SERVICE PARTS LIST FOR REPLACEMENT

Δ - OSCILLATOR GRID VOLTAGE AT 1000 KC.

□ - COLORS OF TERMINALS ON SERVICE PART.

MODEL 986443, Chevrolet

# SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **ELECTRICAL PARTS** | |
| | | **Coils** | |
| 1 | 7255738 | 7255738 | Antenna Series Choke |
| 2 | 7258914 | 7258914 | Antenna |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7258914 | 7258914 | R.F. |
| 5 | 7258911 | 7258911 | Oscillator |
| 6 | 7258188 | 1218725 | 1st I. F. |
| 7 | 7258198 | 1218726 | 2nd I.F. |
| 8 | 7255912 | 7255912 | Hash Choke |
| 9 | 7258554 | 1217846 | "A" Spark Choke |
| 10 | 7258554 | 1217846 | "A" Spark Choke |
| | | **Condensers** | |
| 11 | 7257959 | 7257959 | Antenna Trimmer & Brkt. |
| 12 | 7236841 | E-503 | .05 mfd. 400V Tubular |
| 13 | 1219550 | G 680 | .000068 mfd. Mica |
| 14 | 7242454 | 7242454 | Dual Trimmer |
| 14A | | | R.F. Section |
| 14B | | | Oscillator Section |
| 15 | 7258221 | G 390 | .000039 mfd. Mica |
| 16 | 7257424 | 7257424 | .000180 mfd. Compensating |
| 17 | 7236842 | E 503 | .05 mfd. 200V Tubular |
| 18 | 7230767 | E 502 | .005 mfd. 600V Tubular |
| 19 | 1217848 | 1217848 | Chassis Plate Cond. |
| 20 | 7240724 | M 908 | Electrolytic |
| 20A | | | 20 mfd. 25V |
| 20B | | | 20 mfd. 400V |
| 20C | | | 20 mfd. 400V |
| 21 | 7239188 | E 102 | .001 mfd. 600V Tubular |
| 22 | 7230892 | E 503 | .05 mfd. 400V Tubular |
| 23 | 1219632 | E 202 | .002 mfd. 600V Tubular |
| 24 | 7232956 | E 502 | .005 mfd. 600V Tubular |
| 25 | 7233243 | H 402 | .004 mfd. 800V Tubular |
| 26 | 7258332 | 1219869 | Spark Plate Cond. |
| 26A | | | Pilot Light Section |
| 26B | | | "A" Lead Section |
| 27 | 1217848 | 1217848 | Chassis Plate Cond. |
| 28 | 7240906 | H 602 | .006 mfd. 1600V Tubular |
| | | **Resistors** | |
| 35 | 7237835 | A 221 | 220 ohms ½W Insulated |
| 36 | 1211147 | A 225 | 2.2 megohms ½W Insulated |
| 37 | 7233653 | C 153 | 15,000 ohms 2W Insulated |
| 38 | 7237595 | B 153 | 15,000 ohms 1W Insulated |
| 39 | 7240732 | A 334 | 330,000 ohms ½W Insulated |
| 40 | 1214550 | A 223 | 22,000 ohms ½W Insulated |
| 41 | 7238873 | A 105 | 1 megohm ½W Insulated |
| 42 | 1214553 | A 473 | 47,000 ohms ½W Insulated |
| 43 | 7241937 | A 685 | 6.8 megohms ½W Insulated |
| 44 | 1213479 | A 224 | 220,000 ohms ½W Insulated |
| 45 | 1213479 | A 224 | 220,000 ohms ½W Insulated |
| 46 | 7233773 | C 331 | 330 ohms 1W Insulated |
| 47 | 7238873 | A 105 | 1 megohm ½W Insulated |
| 48 | 7237994 | B 221 | 220 ohms 1W Insulated |
| 49 | 1214573 | C-272<br>B-562 | 1800 ohms 2W wire wound (Replace with 2700 2W and 5600 1W in parallel |
| | | **Tubes** | |
| | 7237751 | 5229 | 6SK7 |
| | 7237752 | 5222 | 6SA7 |
| | 1214293 | 5232 | 6SQ7GT |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | 0Z4 |

MODEL 986443, Chevrolet

# SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **Miscellaneous Electrical Parts** |
| 55 | 7256188 | 7256188 | Control - Volume, Tone & Switch |
| 55A | | | Volume Control |
| 55B | | | Tone Control |
| 55C | | | Switch |
| 56 | 7242204 | 7242204 | Control - Sensitivity |
| 57 | 125588 | 55 | Lamp - Dial Light |
| 58 | 7259381 | 6111 | Speaker - 6x9 Elliptical PM |
| 59 | 7256009 | 7256009 | Transformer - Output |
| 60 | 7255881 | 7255881 | Transformer - Power |
| 61 | 7239124 | 8542 | Vibrator |
| | | | **MECHANICAL PARTS** |
| | | | **Chassis** |
| 65 | 7256250 | 1217950 | "A" Lead & Fuse Holder |
| 66 | 7256742 | 7256742 | Connector - Antenna |
| 67 | 1219619 | 1219619 | Socket - Dial Light |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | | **Tuner** |
| 75 | 7255941 | 7255941 | Backplate - Pointer |
| | 147481 | 147481 | Ball Bearings Pkg. |
| 76 | 7258491 | 7258491 | Bushing & Drive Shaft Assy. |
| 77 | 7258525 | 7258525 | Manual Drive Shaft Assy. |
| 78 | 7258072 | 7258072 | Clutch Disc - Driven |
| 79 | 7258203 | 7258203 | Connecting Link |
| 80 | 7258211 | 7258211 | Core Guide Bar - Parallel |
| 81 | 7256271 | 7256271 | Conn. Link - Pointer |
| 82 | 7255992 | 7255992 | Spring-Conn. Link - Pointer |
| 83 | 7258468 | 7258468 | Core Assy. - Powdered Iron |
| 84 | 7259759 | 7259759 | Escutcheon Assy. |
| 85 | 7259764 | 7259764 | Dial |
| 86 | 7255940 | 7255940 | Dial Backplate - Upper |
| 87 | 7256163 | 7256163 | Dial Backplate - Lower |
| 88 | 7256102 | 7256102 | Gear & Bushing - Clutch |
| 89 | 7259755 | 7259755 | Gear & Bracket - Worm |
| | 7237172 | 7237172 | Grommet - Osc. Coil Mtg. |
| | 7244021 | 7244021 | Grommet - Ant. - RF Coil Mtg. |
| | 7251168 | 7251168 | Grommet - "A" Lead |
| 90 | 7256175 | 7256175 | Pointer Assy. |
| | 1219618 | 1219618 | Pointer Tip Pkg. |
| 91 | 1217837 | 1217837 | Push Button and Slide Assy. |
| 92 | 7258756 | 7258756 | Spring - Clutch |
| 93 | 7257415 | 7257415 | Spring - Core Bar Conn. Link |
| 94 | 7255984 | 7255984 | Spring - Slide Return |
| | | | **INSTALLATION PARTS** |
| | 7257919 | 7257919 | Condenser - Ammeter |
| | 1911095 | 6030 | Condenser - Generator |
| | 1910147 | 6030 | Condenser - Ignition Coil |
| | 1912900 | 6030 | Condenser - Voltage Regulator |
| | 7256098 | 7256098 | Escutcheon - Control Bushing |
| | 147685 | 147685 | Fuse - 14 amps |
| | 7256148 | 7256148 | Knob - Control |
| | 7255935 | 7255935 | Knob - Dummy |
| | 7255936 | 7255936 | Knob - Wing |
| | 7256466 | 7256466 | Spacer - Radio Mtg. - Lower |
| | 7255934 | 7255934 | Spacer - Radio Mtg. - Upper |
| | 494786 | 6009 | Static Collector |
| | 1887829 | 6003 | Suppressor - Distributor |
| | 1888204 | 1888204 | Rubber Nipple |

MODEL 2233297

## GENERAL

MOUNTING—All 1950 GMC Trucks.

TUBES—Five, plus rectifier.

SPEAKER—6" x 9" Elliptical, Permanent Magnet.

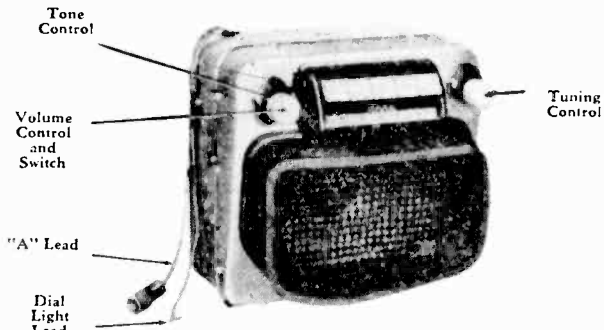
TUNING—Manual and 5 P. B. Mechanical.

ANTENNA TRIMMER COMPENSATION—For Antennas Between 0.000058 - 0.000090 Mfd.

TUNING RANGE—550-1600 KC.

## PUSH BUTTON SET-UP PROCEDURE

Pull Push Button left and out. Tune in desired station manually. Push button all the way in.



MODEL 2233297

## ALIGNMENT PROCEDURE

Output Meter Connections ........ Across Voice Coil

Generator Return ........ To Receiver Chassis

Dummy Antenna ........ In Series With Generator

Volume Control Position ........ Maximum Volume

Tone Control Position ........ Treble

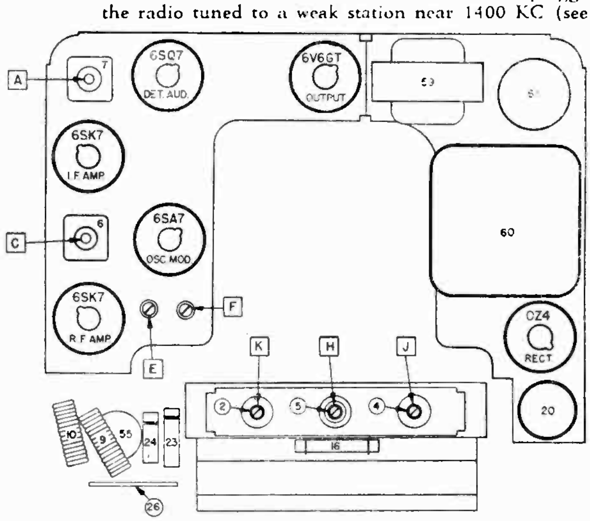
Generator Output ........ Minimum for Readable Indication

| Steps | Series Condenser or Dummy Antenna | Connect Signal Generator to | Signal Generator Frequency | Tune Receiver to | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin #8) | 260 KC | High Frequency Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Generator Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Frequency Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Generator Signal | L** |

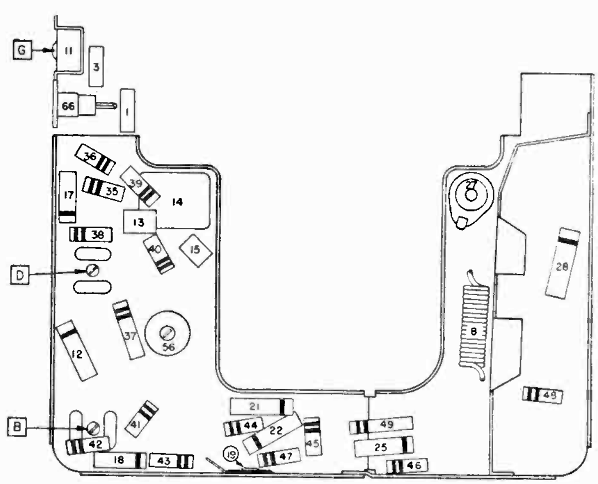
*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1 3/32" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) If adjustment is necessary, first dissolve the glyptal seal on the core studs. Core adjustments should be made with an insulated screw driver, and core studs should be cemented in place with glyptal or household cement after alignment.

**L is the pointer adjustment screw which is on the connecting link, between the pointer assembly and core guide bar (See tuner Dwg.) It should be adjusted so that when looking directly at the dial the pointer is at the 1100 KC mark. This setting is to give the correct relationship between the pointer and the dial when the radio is installed in a car.

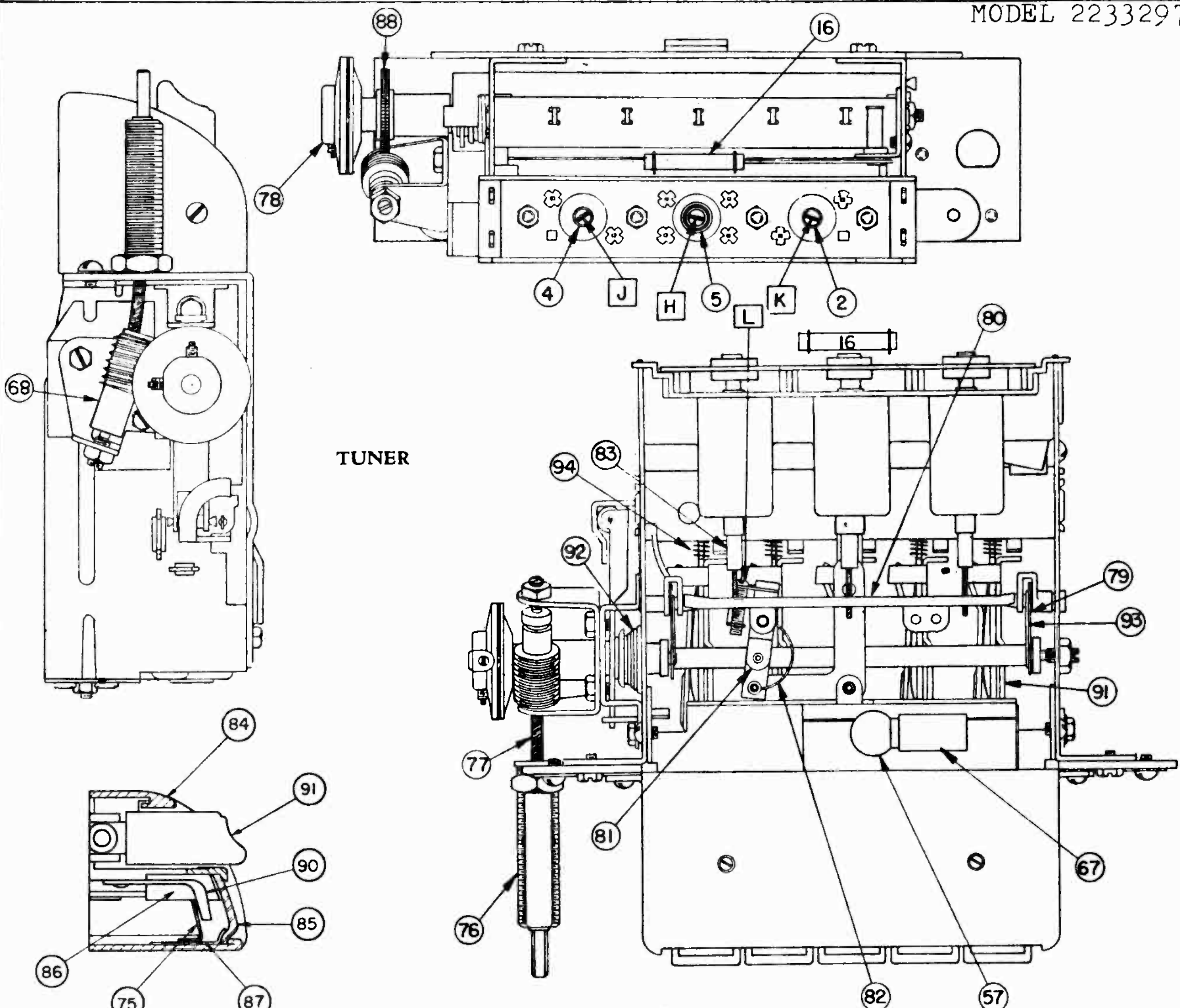
With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case).



PARTS LAYOUT—TUBE VIEW



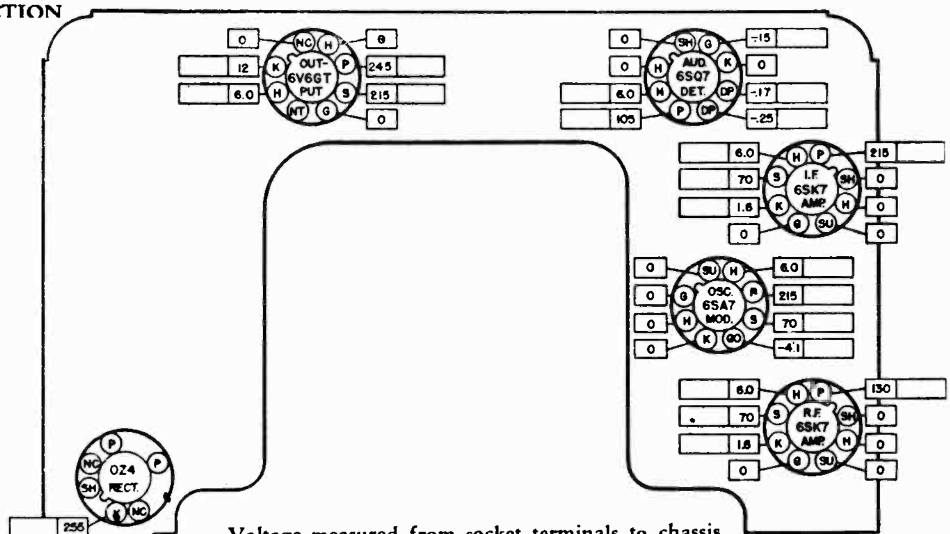
PARTS LAYOUT—CHASSIS VIEW




TUNER

ESCUTCHEON CROSS SECTION

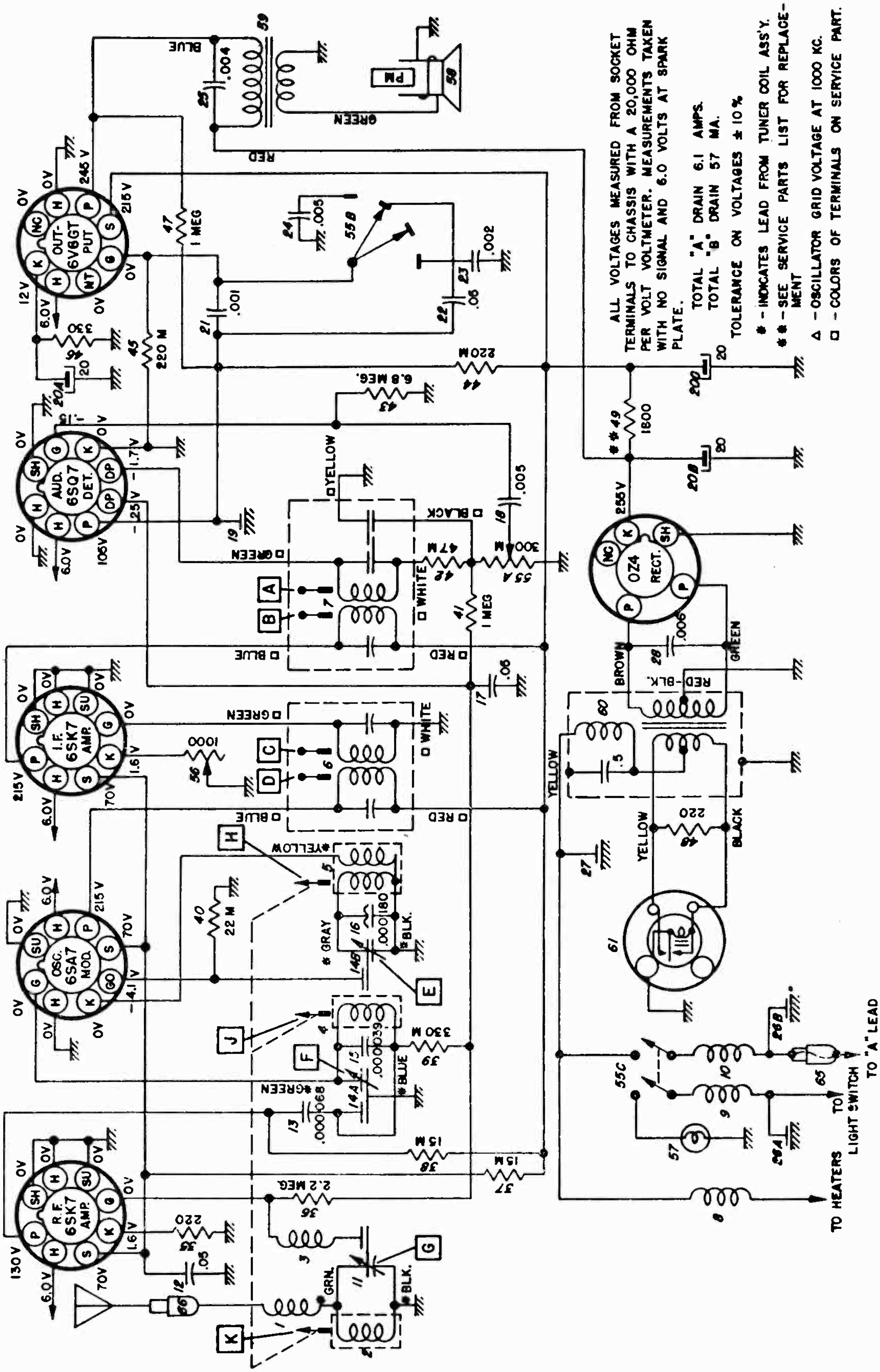
TUBE SOCKET VOLTAGE CHART




Voltage measured from socket terminals to chassis and are positive unless marked otherwise.

The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram on page are shown above. The blank spaces are provided so the service man may fill in the actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

MODEL 2233297




ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE.

TOTAL "A" DRAIN 6.1 AMPS.
TOTAL "B" DRAIN 57 MA.

TOLERANCE ON VOLTAGES ± 10%

* - INDICATES LEAD FROM TUNER COIL ASS'Y.

** - SEE SERVICE PARTS LIST FOR REPLACEMENT

Δ - OSCILLATOR GRID VOLTAGE AT 1000 KC.

□ - COLORS OF TERMINALS ON SERVICE PART.

# SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **ELECTRICAL PARTS** |
| | | | **Coils** |
| 1 | 7255738 | 7255738 | Antenna Series Choke |
| 2 | 7258914 | 7258914 | Antenna |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7258914 | 7258914 | R.F. |
| 5 | 7258911 | 7258911 | Oscillator |
| 6 | 7258188 | 1218725 | 1st I.F. |
| 7 | 7258198 | 1218726 | 2nd I.F. |
| 8 | 7255912 | 7241708 | Hash Choke |
| 9 | 7258554 | 1217846 | "A" Spark Choke |
| 10 | 7258554 | 1217846 | "A" Spark Choke |
| | | | **Condensers** |
| 11 | 7257959 | 7257959 | Antenna Trimmer & Brkt. |
| 12 | 7236841 | E-503 | .05 mfd. 400V Tubular |
| 13 | 1219550 | G 680 | .000068 mfd. Mica |
| 14 | 7242454 | 7242454 | Dual Trimmer |
| 14A | | | R.F. Section |
| 14B | | | Oscillator Section |
| 15 | 7258221 | G 390 | .000039 mfd. Mica |
| 16 | 7257424 | 7257424 | .000180 mfd. Compensating |
| 17 | 7236842 | E 503 | .05 mfd. 200V Tubular |
| 18 | 7230767 | E 502 | .005 mfd. 600V Tubular |
| 19 | 1217848 | 1217848 | Chassis Plate Cond. |
| 20 | 7240724 | M 908 | Electrolytic |
| 20A | | | 20 mfd. 25V |
| 20B | | | 20 mfd. 400V |
| 20C | | | 20 mfd. 400V |
| 21 | 7239188 | E 102 | .001 mfd. 600V Tubular |
| 22 | 7230892 | E 503 | .05 mfd. 400V Tubular |
| 23 | 1219632 | E 202 | .002 mfd. 600V Tubular |
| 24 | 7232956 | E 502 | .005 mfd. 600V Tubular |
| 25 | 7233243 | H 402 | .004 mfd. 800V Tubular |
| 26 | 7258332 | 1219369 | Spark Plate Cond. |
| 26A | | | Pilot Light Section |
| 26B | | | "A" Lead Section |
| 27 | 1217848 | 1217848 | Chassis Plate Cond. |
| 28 | 7240906 | H 602 | .006 mfd. 1600V Tubular |
| | | | **Resistors** |
| 35 | 7237835 | A 221 | 220 ohms ½W Insulated |
| 36 | 1211147 | A 225 | 2.2 megohms ½W Insulated |
| 37 | 7233653 | C 153 | 15,000 ohms 2W Insulated |
| 38 | 7237595 | B 153 | 15,000 ohms 1W Insulated |
| 39 | 7240732 | A 334 | 330,000 ohms ½W Insulated |
| 40 | 1214550 | A 223 | 22,000 ohms ½W Insulated |
| 41 | 7238873 | A 105 | 1 megohm ½W Insulated |
| 42 | 1214553 | A 473 | 47,000 ohms ½W Insulated |
| 43 | 7241937 | A 685 | 6.8 megohms ½W Insulated |
| 44 | 1213479 | A 224 | 220,000 ohms ½W Insulated |
| 45 | 1213479 | A 224 | 220,000 ohms ½W Insulated |
| 46 | 7233773 | B 331 | 330 ohms 1W Insulated |
| 47 | 7238873 | A 105 | 1 megohm ½W Insulated |
| 48 | 7237994 | B 221 | 220 ohms 1W Insulated |
| 49 | 1214573 | { C-272<br>B-562 | 1800 ohms (Replace with 2700 2W and 5600 1W in parallel) |
| | | | **Tubes** |
| | 7237751 | 5229 | 6SK7 |
| | 7237752 | 5222 | 6SA7 |
| | 1214293 | 5232 | 6SQ7GT |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | 0Z4 |

MODEL 2233297

# SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **Miscellaneous Electrical Parts** |
| 55 | 7256188 | 7256188 | Control - Volume, Tone & Switch |
| 55A | | | Volume Control |
| 55B | | | Tone Control |
| 55C | | | Switch |
| 56 | 7242204 | 7242204 | Control - Sensitivity |
| 57 | 125588 | 55 | Lamp - Dial Light |
| 58 | 7259381 | 7259381 | Speaker - 6x9 Elliptical PM |
| 59 | 7256009 | 7256009 | Transformer - Output |
| 60 | 7255881 | 7255881 | Transformer - Power |
| 61 | 7239124 | 8542 | Vibrator |
| | | | **MECHANICAL PARTS** |
| | | | **Chassis** |
| 65 | 7256250 | 1217950 | "A" Lead & Fuse Holder |
| 66 | 7256742 | 7256742 | Connector - Antenna |
| 67 | 1219619 | 1219619 | Socket - Dial Light |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | | **Tuner** |
| 75 | 7255941 | 7255941 | Backplate - Pointer |
| | 147481 | 147481 | Ball Bearings Pkg. |
| 76 | 7258491 | 7258491 | Bushing & Drive Shaft Assy. |
| 77 | 7258525 | 7258525 | Manual Drive Shaft Assy. |
| 78 | 7258072 | 7258072 | Clutch Disc - Driven |
| 79 | 7258203 | 7258203 | Connecting Link |
| 80 | 7258211 | 7258211 | Core Guide Bar - Parallel |
| 81 | 7256271 | 7256271 | Conn. Link - Pointer |
| 82 | 7255992 | 7255992 | Spring-Conn. Link - Pointer |
| 83 | 7258468 | 7258468 | Core Assy. - Powdered Iron |
| 84 | 7259798 | 7259798 | Escutcheon Assy. |
| 85 | 7259799 | 7259799 | Dial |
| 86 | 7255940 | 7255940 | Dial Backplate - Upper |
| 87 | 7256163 | 7256163 | Dial Backplate - Lower |
| 88 | 7256102 | 7256102 | Gear & Bushing - Clutch |
| 89 | 7259755 | 7259755 | Gear & Bracket - Worm |
| | 7237172 | 7237172 | Grommet - Osc. Coil Mtg. |
| | 7244021 | 7244021 | Grommet - Ant. - RF Coil Mtg. |
| | 7251168 | 7251168 | Grommet - "A" Lead |
| 90 | 7256175 | 7256175 | Pointer Assy. |
| | 1219618 | 1219618 | Pointer Tip Pkg. |
| 91 | 1217837 | 1217837 | Push Button and Slide Assy. |
| 92 | 7258756 | 7258756 | Spring - Clutch |
| 93 | 7257415 | 7257415 | Spring - Core Bar Conn. Link |
| 94 | 7255984 | 7255984 | Spring - Slide Return |
| | | | **INSTALLATION PARTS** |
| | 7257919 | 7257919 | Condenser - Ammeter |
| | 1911095 | 6030 | Condenser - Generator |
| | 1910147 | 6030 | Condenser - Ignition Coil |
| | 1912900 | 6030 | Condenser - Voltage Regulator |
| | 7256098 | 7256098 | Escutcheon - Control Bushing |
| | 147685 | 147685 | Fuse - 14 amps |
| | 7256148 | 7256148 | Knob - Control |
| | 7255935 | 7255935 | Knob - Dummy |
| | 7255936 | 7255936 | Knob - Wing |
| | 7256466 | 7256466 | Spacer - Radio Mtg. - Lower |
| | 7255934 | 7255934 | Spacer - Radio Mtg. - Upper |
| | 494786 | 6009 | Static Collector |
| | 1887829 | 6003 | Suppressor - Distributor |
| | 1888204 | 1888204 | Rubber Nipple |

MODEL 7258755,
Cadillac

## GENERAL

MOUNTING—All 1950 Cadillac Cars.

TUBES—Seven, Plus Rectifier.

SPEAKER — 6" x 9" Elliptical, Permanent Magnet.

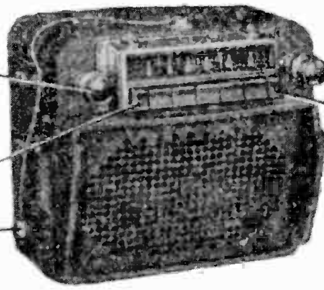
TUNING—Manual and 5 P.B. Mechanical.

ANTENNA TRIMMER COMPENSATION — 0.000060 - 0.000085 Mfd.

TUNING RANGE—550-1600 KC.

## PUSHBUTTON SET-UP

Pull pushbutton to the right and out. Tune in desired station manually. Push button all the way in.




MODEL 7258755

## ALIGNMENT PROCEDURE:

Output Meter Connection ........ Across Voice Coil
Signal Generator Return ........ To Chassis
Dummy Antenna ........ In Series With Generator
Volume Control ........ Maximum Volume
Tone Control ........ Treble
Generator Output ........ Minimum for Readable Indication

| Steps | Series Condenser or Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 Mfd. | 6SA7 Grid (Pin #8) | 260 KC | High Freq. Stop | A, B, C, D |
| 2 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | *E, F, G |
| 3 | 0.000068 Mfd. | Antenna Connector | 1430 KC | Signal Gen. Signal | J, K |
| 4 | 0.000068 Mfd. | Antenna Connector | 1615 KC | High Freq. Stop | F, G |
| 5 | 0.000068 Mfd. | Antenna Connector | 1000 KC | Signal Gen. Signal | L** |

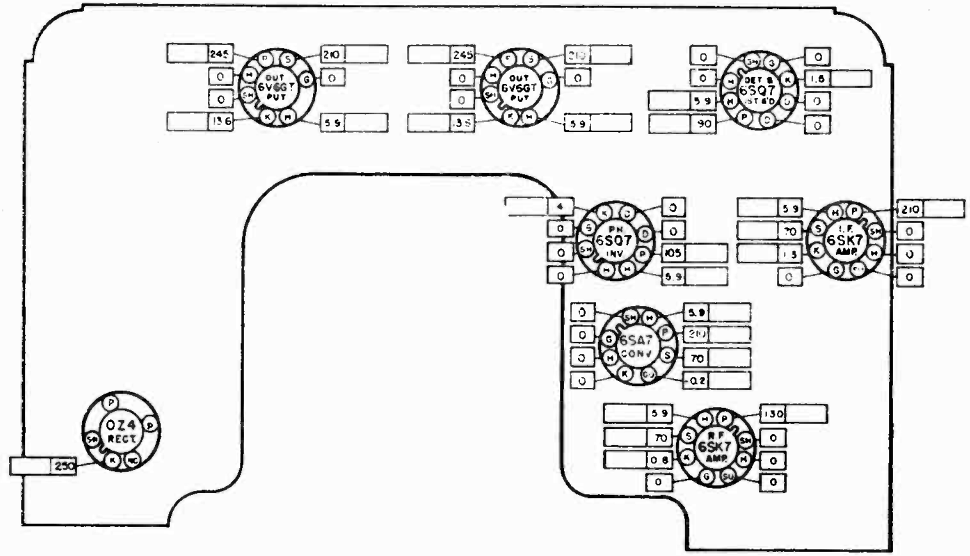
*Before making this adjustment check the mechanical setting of the oscillator core "H." The slotted end of the core should be 1 25/32" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form). If adjustment is necessary, be sure to first dissolve the glyptal seal on the core studs. Core adjustments are made from the mounting end of the coil form with an insulated screwdriver, and core studs should be re-sealed with glyptal or household cement after alignment.

**"L" is the pointer adjustment screw on the pointer connecting link (See tuner drawing). Adjust so pointer reads 1000 KC (on the "10" calibration mark).

With the radio installed and the car antenna plugged in adjust antenna trimmer "G" (See sticker on case) for maximum volume with the radio tuned to a weak station near 1400 KC.

MODEL 7258755,
Cadillac

## TUBE SOCKET VOLTAGE CHART

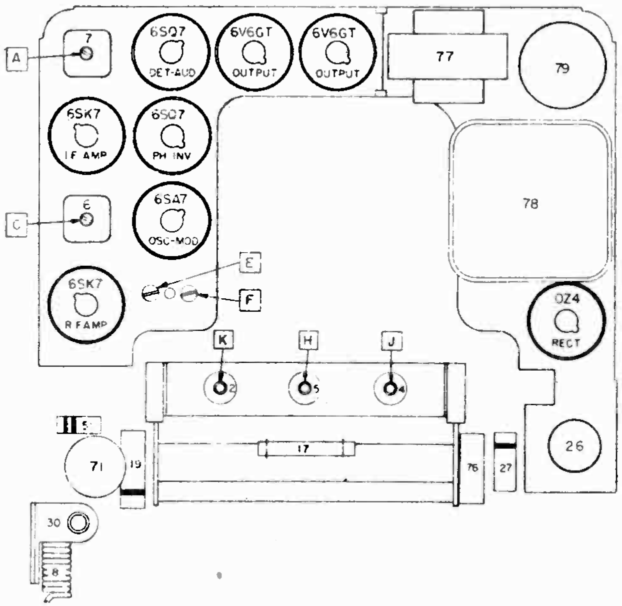



The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown above. The blank spaces are provided so that the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

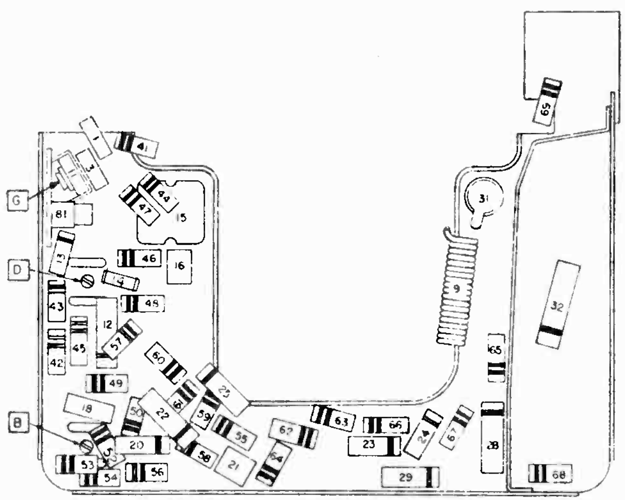
Voltmeter resistance .................... Ohms Per Volt.

Readings taken with .................... Volts at Spark Plate.

All voltages measured from socket terminals to chassis.

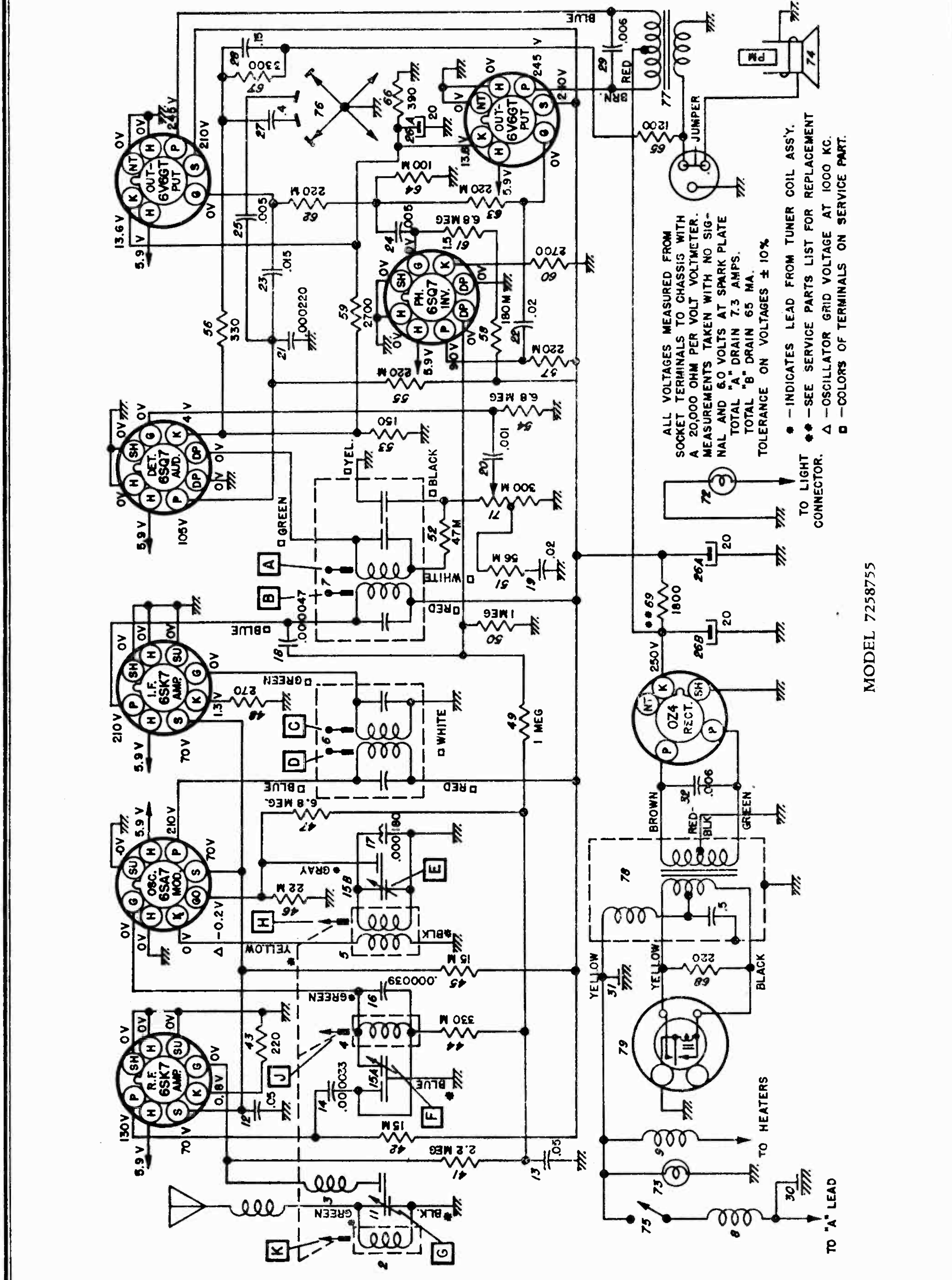



PARTS LAYOUT — TUBE VIEW

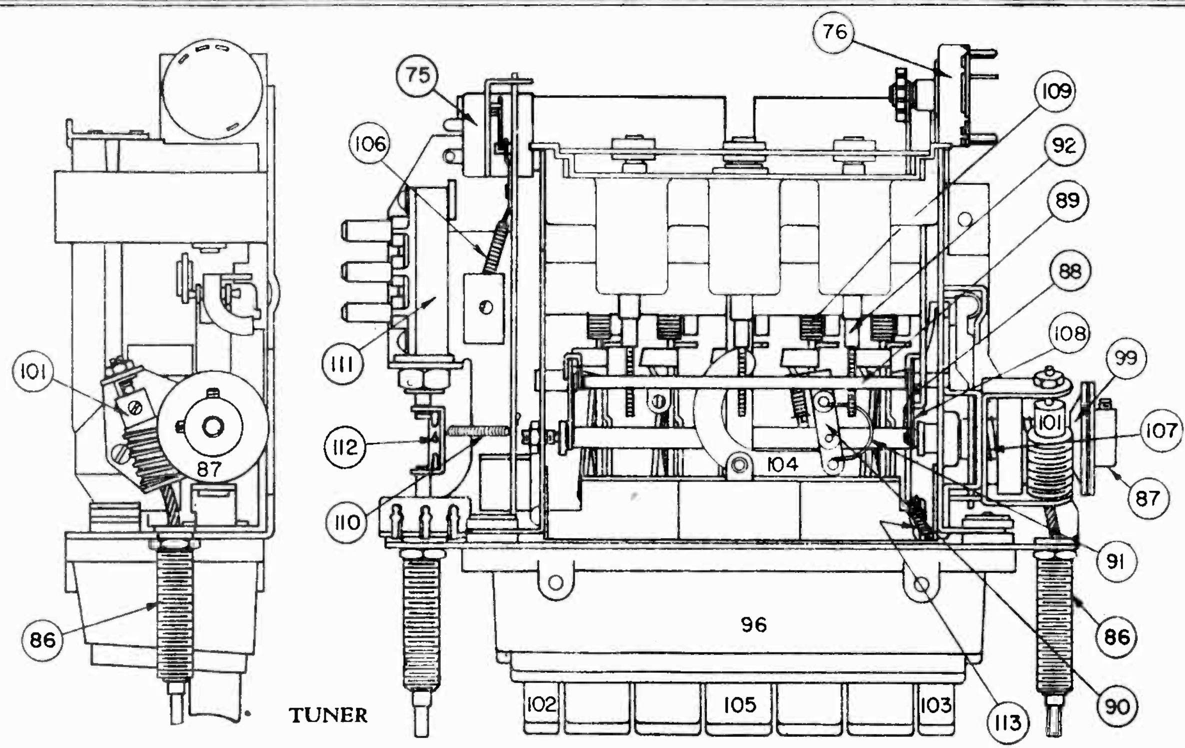


PARTS LAYOUT — CHASSIS VIEW

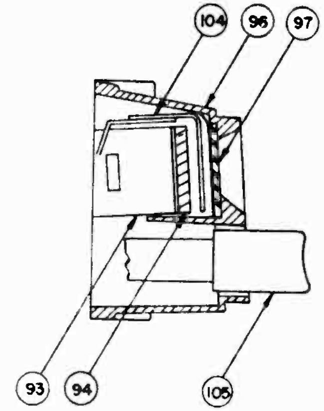
MODEL 7258755,
Cadillac



MODEL 7258755,
Cadillac




TUNER




ESCUTCHEON CROSS SECTION

## SERVICE PARTS LIST

| Illus. No | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **ELECTRICAL PARTS** | |
| | | **Coils** | |
| 1 | 7255738 | 7255738 | Antenna Series Choke |
| 2 | 7258914 | 7258914 | Antenna |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7258914 | 7258914 | R.F. |
| 5 | 7258911 | 7258911 | Oscillator |
| 6 | 7258849 | 1219508 | 1st I.F. |
| 7 | 7258850 | 1219509 | 2nd I.F. |
| 8 | 1217846 | 1217846 | "A" Spark Plate |
| 9 | 1217846 | 1217846 | Hash Choke |
| | | **Condensers** | |
| 11 | 7258226 | 7258226 | Antenna Trimmer |
| 12 | 7258125 | E 503 | .05 Mfd 400 V Tubular |
| 13 | 1210697 | E 503 | .05 Mfd 200 V Tubular |
| 14 | 1218348 | G 330 | .000033 Mfd Ceramic |
| 15 | 7242454 | 7242454 | Dual Trimmer |
| 15A | | | R.F. Section |
| 15B | | | Oscillator |
| 16 | 7258221 | G 390 | .000039 Mfd Ceramic |
| 17 | 7257424 | 7257424 | .000180 Mfd Compensating |
| 18 | 1218202 | G 470 | .000047 Mfd Ceramic |
| 19 | 7237720 | E 203 | .02 Mfd 400 V Tubular |
| 20 | 1218883 | E 102 | .001 Mfd 600 V Tubular |
| 21 | 1218886 | G 221 | .000220 Mfd Ceramic |
| 22 | 7233770 | E 203 | .02 Mfd 600 V Tubular |
| 23 | 7237719 | 7237719 | .015 Mfd 600 V Tubular |
| 24 | 7232956 | E 502 | .005 Mfd 600 V Tubular |
| 25 | 7230767 | E 502 | .005 Mfd 600 V Tubular |
| 26 | 7240724 | M 908 | Electrolytic |
| 26A | | | 20 Mfd 25 V |
| 26B | | | 20 Mfd 400 V |
| 26C | | | 20 Mfd 400 V |
| 27 | 1218882 | 1218882 | .4 Mfd 100 V Tubular |
| 28 | 1218880 | 1218880 | .15 Mfd 100 V Tubular |
| 29 | 7240906 | H 602 | .006 Mfd 600 V Tubular |
| 30 | 7240797 | 7240797 | Spark Plate and Choke Assy. |
| 31 | 1217848 | 1217848 | Chassis Plate Assy. |

MODEL 7258755, Cadillac

# SERVICE PARTS LIST

| Illus. No | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | | **Tubes** |
| | 7237751 | 5229 | 6SK7 |
| | 7237752 | 5222 | 6SA7 |
| | 7237753 | 5231 | 6SQ7 |
| | 1213793 | 5241 | 6V6GT |
| | 1211924 | 5003 | 0Z4 |
| | | | **Miscellaneous Electrical** |
| 71 | 7258954 | 7258954 | Control - Volume |
| 72 | 125588 | 55 | Lamp - Dial Light |
| 73 | 187189 | 187189 | Lamp - Pilot Light |
| 74 | 7258488 | 7258488 | Speaker - 6 x 9 Elliptical P.M. |
| 75 | 7242411 | 7242411 | Switch - "On - Off" |
| 76 | 7258273 | 7258273 | Switch - Tone Control |
| 77 | 7258390 | 7258390 | Transformer - Output |
| 78 | 7255881 | 7255881 | Transformer - Power |
| 79 | 7239124 | 8542 | Vibrator - Non-synchronous |
| | | | **MECHANICAL PARTS** |
| | | | **Chassis** |
| 81 | 7239475 | 7239475 | Socket - Antenna |
| 82 | 1219106 | 1219106 | Socket - Dial Light |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| | | | **Tuner** |
| 86 | 7258957 | 7258957 | Bushing and Manual Drive Shaft |
| 87 | 7258072 | 7258072 | Clutch Disc-Driven |
| 88 | 7258203 | 7258203 | Connecting Link - Core Bar |
| 89 | 7258206 | 7258206 | Core Guide Bar - Parallel |
| 90 | 7256271 | 7256271 | Pointer Connecting Link |
| 91 | 7255992 | 7255992 | Spring - Pointer Connecting Link |
| 92 | 7258468 | 7258468 | Core - Powdered Iron |
| 93 | 1219105 | 1219105 | Dial Backplate Assy. |
| 94 | 7258254 | 7258254 | Dial - Calibration |
| 95 | 7258239 | 7258239 | Dial - Retainer Spring |
| 96 | 7258270 | 7258270 | Escutcheon |
| 97 | 7258236 | 7258236 | Dial Glass |
| 98 | 7258232 | 7258232 | Dial Retainer |
| 99 | 7256760 | 7256760 | Gear and Bushing |
| 101 | 7256758 | 7256758 | Gear and Bracket - Worm |
| 102 | 7258757 | 7258757 | Plunger and Button - "On - Off" |
| 103 | 1219138 | 1219138 | Plunger and Button - Tone Control |
| 104 | 7258269 | 7258269 | Pointer Assy. |
| 105 | 1219104 | 1219104 | Push Button and Slide Assy. |
| 106 | 7257361 | 7257361 | Spring - Toggle Lever |
| 107 | 7258756 | 7258756 | Spring - Clutch |
| 108 | 7257415 | 7257415 | Spring - Core Bar Connecting Link |
| 109 | 7255984 | 7255984 | Spring - Slide Return |
| 113 | 7258786 | 7258786 | Spring - Tone Control |
| 110 | 7258731 | 7258731 | Spring - Yoke |
| 111 | 7258260 | 7258260 | Vacuum Valve |
| 112 | 7258229 | 7258229 | Vacuum Valve Drive Yoke |
| | | | **INSTALLATION PARTS** |
| | 7258542 | 7258542 | "A" Lead and Fuse Connector |
| | 1911095 | 6030 | Capacitor - Generator |
| | 1910147 | 6030 | Capacitor - Ignition Coil |
| | 147685 | 147685 | Fuse - 14 amps |
| | 7240138 | 6013 | Static Collector |
| | 1456932 | 1456932 | Knob - Dummy |
| | 7259369 | 7259369 | Knob - Control |
| | | | **Resistors** |
| 41 | 1211147 | A 225 | 2.2 Megohms ½ W Insulated |
| 42 | 7237595 | B 153 | 15,000 Ohms 1 W Insulated |
| 43 | 7237835 | A 221 | 220 Ohms ½ W Insulated |
| 44 | 7240732 | A 334 | 330,000 Ohms ½ W Insulated |
| 45 | 7233653 | C 153 | 15,000 Ohms 2 W Insulated |
| 46 | 1211192 | A 223 | 22,000 Ohms ½ W Insulated |
| 47 | 1215563 | A 685 | 6.8 Megohms ½ W Insulated |
| 48 | 1214542 | A 271 | 270 Ohms ½ W Insulated |
| 49 | 7238873 | A 105 | 1 Megohm ½ W Insulated |
| 50 | 7238873 | A 105 | 1 Megohm ½ W Insulated |
| 51 | 1213267 | A 563 | 56,000 Ohms ½ W Insulated |
| 52 | 7240731 | A 473 | 47,000 Ohms ½ W Insulated |
| 53 | 1213220 | A 151 | 150 Ohms ½ W Insulated |
| 54 | 7241937 | A 685 | 6.8 Megohms ½ W Insulated |
| 55 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 56 | 1213224 | A 331 | 330 Ohms ½ W Insulated |
| 57 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 58 | 1215560 | 1215560 | 180,000 Ohms ½ W Insulated |
| 59 | 1213240 | 1213240 | 2,700 Ohms ½ W Insulated |
| 60 | 1213240 | 1213240 | 2,700 Ohms ½ W Insulated |
| 61 | 7241937 | A 685 | 6.8 Megohms ½ W Insulated |
| 62 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 63 | 1214555 | A-224 | 220,000 Ohms ½ W Insulated |
| 64 | 1213270 | A 104 | 100,000 Ohms ½ W Insulated |
| 65 | 1213236 | 1213236 | 1200 Ohms ½ W Insulated |
| 66 | 1216149 | B 391 | 390 Ohms 1 W Insulated |
| 67 | 1213481 | A 332 | 3,300 Ohms ½ W Insulated |
| 68 | 7237994 | B 221 | 220 Ohms 1 W Insulated |
| 69 | 1214573 | C 272<br>B 562 | 1800 Ohms 2 W Wire Wound (or Replace with<br>2700 Ohms 2 W and 5600 Ohms 1 W in Parallel) |

MODEL 7258865,
Cadillac

## GENERAL

MOUNTING—All 1950 Cadillac Cars.

TUBES—Eight, Plus Rectifier.

SPEAKER — 6" x 9" Elliptical, Permanent Magnet.

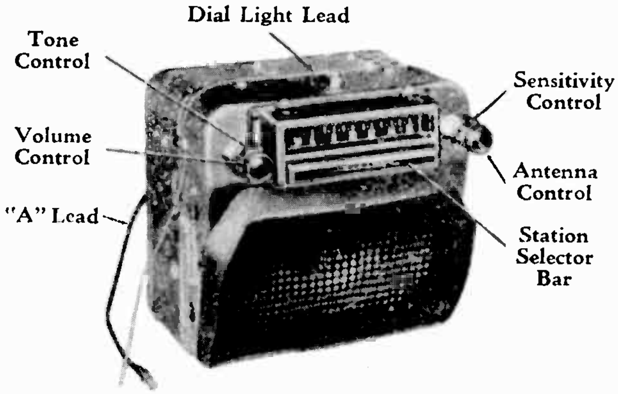
TUNING—Electronic.

ANTENNA TRIMMER COMPENSATION — 0.000060 - 0.000085 Mfd.

TUNING RANGE—540 - 1600 KC.

## PUSHBUTTON SET-UP

No pushbutton set-up is necessary. However, the number of stations on which the tuner will stop can be controlled by the use of the Sensitivity Control.




MODEL 7258865

## SIGNAL SEEKING TUNER ALIGNMENT PROCEDURE:

NOTE: When aligning the signal seeker tuner type radio, be sure to use a vacuum tube voltmeter as indicated and be sure to follow the alignment sequence given—(Notice that the primary of the 2nd I.F. is aligned first.)

Output Meter Connection ........ VTVM From [2] To Chassis (see parts layout page 2)
Generator Return ........ Receiver Chassis
Dummy Antenna ........ In Series With Generator
Volume Control ........ Maximum Volume
Sensitivity Control ........ Maximum Sensitivity
Tone Control ........ Treble
Generator Output ........ Not To Exceed 2 Volts at VTVM

| Step | Dummy Antenna | Connect To | Signal Generator Frequency | Tune Receiver To | Adjust in Sequence for Max. Output |
|---|---|---|---|---|---|
| 1 | 0.1 mfd | 6SA7 Grid (Pin 8) | 260 KC | *High Frequency Stop | A, B, C, D |
| 2 | 0.000068 mfd | Antenna Connector | 1615 KC | High Frequency Stop | **E, F, G |
| 3 | 0.000068 mfd | Antenna Connector | 600 KC | Signal Gen. Signal | J, K |
| 4 | 0.000068 mfd | Antenna Connector | 1615 KC | Signal Gen. Signal | F, G |
| 5 | 0.000068 mfd | Antenna Connector | 1000 KC | Signal Gen. Signal | ***L |

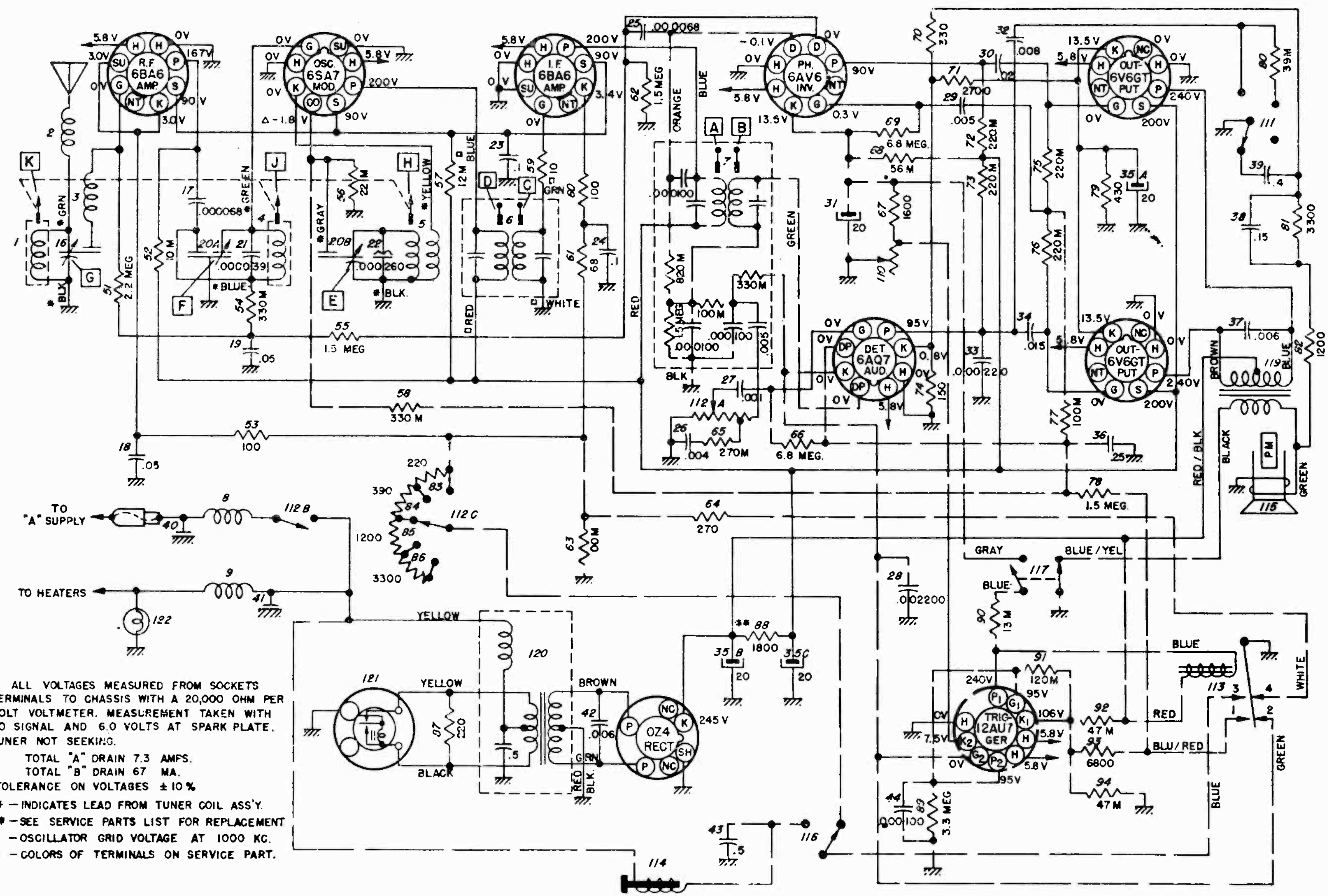
*To tune to high frequency, put a 0.070" feeler gauge (or bare #13 wire) in slot against the high frequency stop. (See tuner picture). Depress station selector bar and allow the planetary arm to run against the feeler gauge. Turn the radio off and then on.

**Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be $1\frac{25}{32}$" from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with an insulated screw-driver. (It will be necessary to steady the core guide bar by applying a downward pressure at the antenna core end of the bar while making these adjustments.) If this adjustment is necessary, first dissolve the glyptal seal on the core stud and be sure to re-seal after making the adjustment.

***"L" is the pointer adjustment screw on the end of the core guide bar—adjust so pointer reads 1000 KC.

With the radio installed and the antenna plugged in, adjust antenna trimmer "G" (See sticker on case) for maximum volume with the radio tuned to a weak station near 1400 KC.

MODEL 7258865,
Cadillac




ALL VOLTAGES MEASURED FROM SOCKETS TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENT TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TUNER NOT SEEKING.

TOTAL "A" DRAIN 7.3 AMPS.
TOTAL "B" DRAIN 67 MA.
TOLERANCE ON VOLTAGES ± 10 %

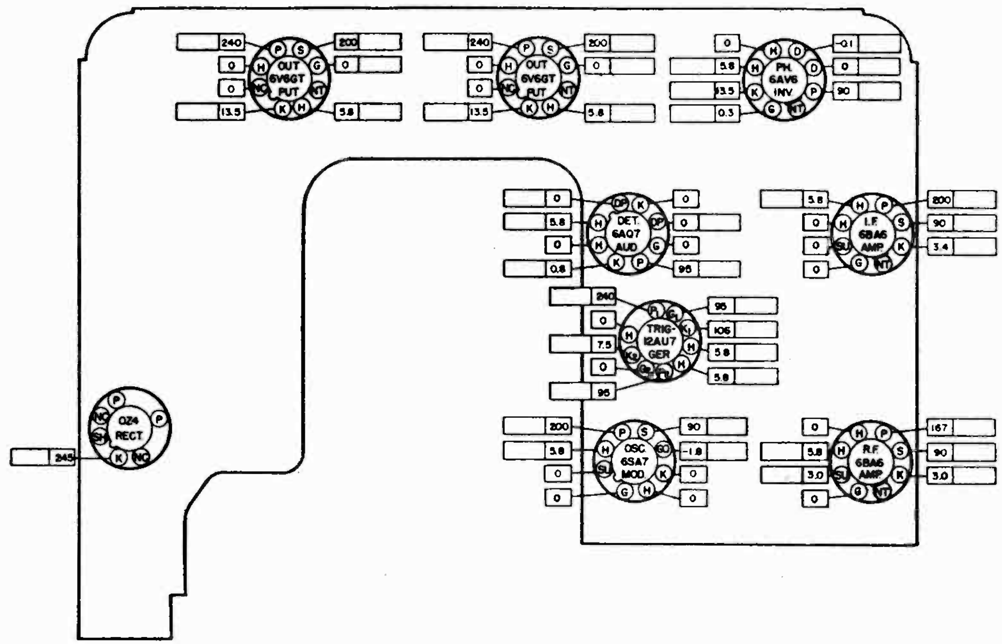
* — INDICATES LEAD FROM TUNER COIL ASS'Y.
** — SEE SERVICE PARTS LIST FOR REPLACEMENT
Δ — OSCILLATOR GRID VOLTAGE AT 1000 KC.
□ — COLORS OF TERMINALS ON SERVICE PART.

---- TUNER CIRCUIT COMPONENTS

MODEL 7258865

MODEL 7258865, Cadillac

## TUBE SOCKET VOLTAGE CHART




The tube socket voltages, as measured at the factory and under the conditions shown on the schematic diagram, are shown above. The blank spaces are provided so that the serviceman may fill in actual voltage readings as taken with his own equipment. A normal operating radio should be used for these measurements.

Voltmeter resistance ............ Ohms Per Volt.

Readings taken with ............ Volts At Spark Plate.

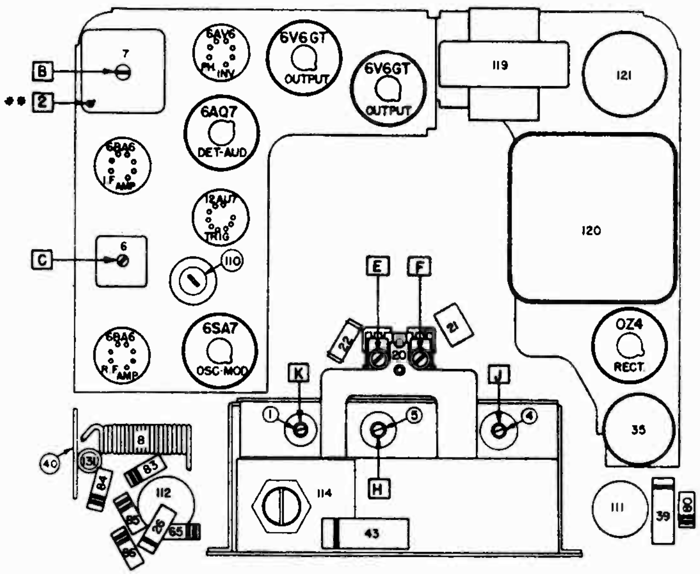
All voltages measured from socket terminals to chassis.

## TUNER ADJUSTMENT PROCEDURE:

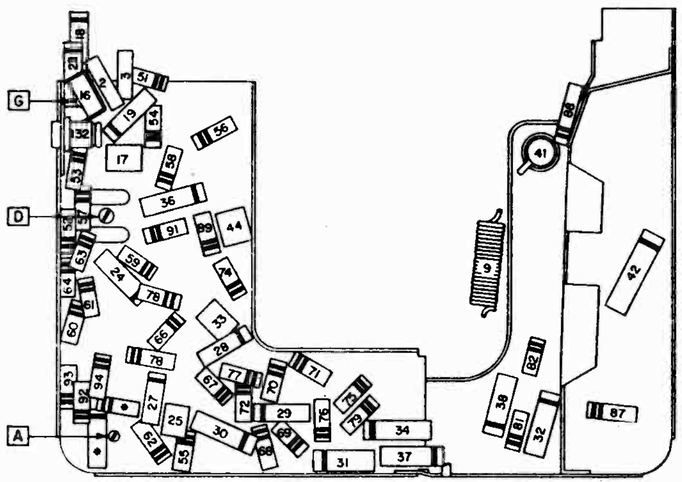
CATHODE DELAY ADJUSTOR (Illustration #110) (This adjustment should be necessary only if the delay adjustor has been replaced or the adjustment has definitely been proven to be faulty).

With exactly 6.0 volts on the spark plate, set the delay adjustor (Illus. 110) so that the voltage at $K_2$ of the 12AU7 trigger tube (Pin #8) is exactly 7.5 volts.

NOTE: For all other tuner adjustments, see Bulletin 6D-620.




PARTS LAYOUT — TUBE VIEW



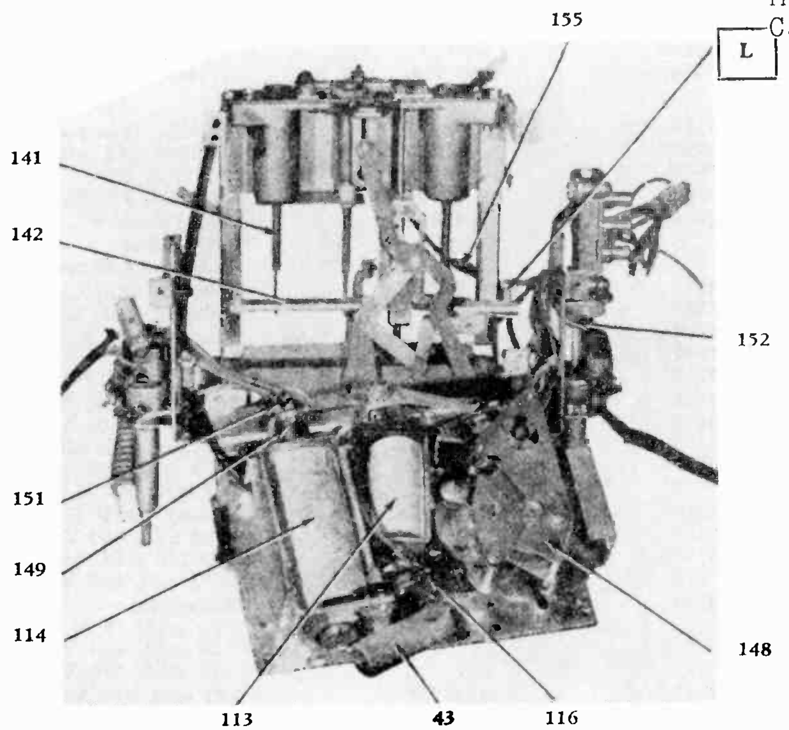
PARTS LAYOUT — CHASSIS VIEW

*Condenser and resistor are included in the 2nd I.F. Coil Assembly.

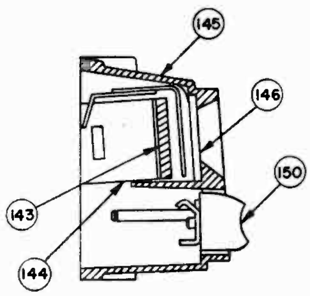
**Connect a VTVM from this point to ground for output indications during alignment.

MODEL 7258865, Cadillac

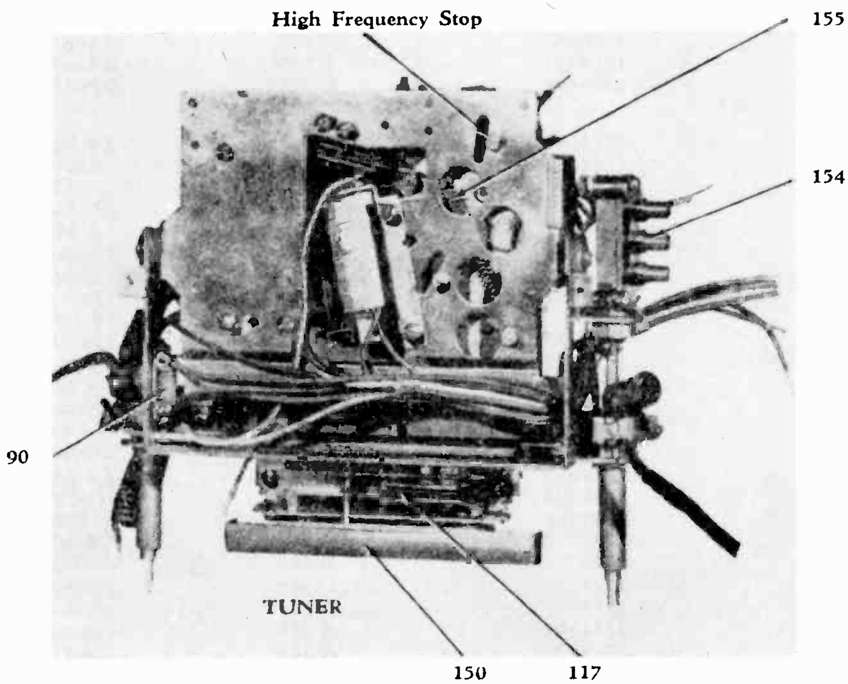
L




TUNER — OPEN




ESCUTCHEON CROSS-SECTION




TUNER

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | ELECTRICAL PARTS | |
| | | Coils | |
| 1 | 7257979 | 7257979 | Antenna |
| 2 | 7258502 | 7258502 | Antenna Series Choke |
| 3 | 7240251 | 7240251 | Antenna Spark Choke |
| 4 | 7257979 | 7257979 | R.F. |
| 5 | 7259184 | 7259184 | Oscillator |
| 6 | 7258849 | 1219508 | 1st I.F. Assy. |
| 7 | 7259290 | 1219602 | 2nd I.F. Assy. |
| 8 | 1217846 | 1217846 | "A" Spark Choke |
| 9 | 1217846 | 1217846 | Hash Choke |

MODEL 7258865

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Condensers** | |
| 16 | 7258226 | 7258226 | Antenna Trimmer |
| 17 | 1219550 | G 680 | 0.000068 mfd. molded |
| 18 | 1210697 | E 503 | 0.05 mfd. 200 V Tubular |
| 19 | 1210697 | E 503 | 0.05 mfd. 200 V Tubular |
| 20 | 7242454 | 7242454 | Dual Trimmer |
| 20A | | | RF Section |
| 20B | | | Oscillator Section |
| 21 | 7258221 | G 390 | 0.000039 mfd. Ceramic |
| 22 | 7257567 | 7257567 | 0.000260 mfd. Compensating |
| 23 | 7238788 | E 104 | 0.1 mfd. 400 V Tubular |
| 24 | 7238789 | E 104 | 0.1 mfd. 200 V Tubular |
| 25 | 1219550 | G 680 | 0.000068 mfd. Molded |
| 26 | 1218969 | E 402 | 0.004 mfd. 600 V Tubular |
| 27 | 1218883 | E 102 | 0.001 mfd. 600 V Tubular |
| 28 | 1219553 | 1219553 | 0.002200 mfd. 600 V Tubular |
| 29 | 7230767 | E 502 | 0.005 mfd. 600 V Tubular |
| 30 | 7233770 | E 203 | 0.02 mfd. 600 V Tubular |
| 31 | 1219660 | 1219660 | 20 mfd. 50 V Electrolytic |
| 32 | 1219463 | 1219463 | 0.008 mfd. 600 V Tubular |
| 33 | 7238792 | G 221 | 0.000220 mfd. Molded |
| 34 | 7237719 | 7237719 | 0.015 mfd. 600 V Tubular |
| 35 | 7240724 | M 908 | Electrolytic |
| 35A | | | 20 mfd. 25 V |
| 35B | | | 20 mfd. 400 V |
| 35C | | | 20 mfd. 400 V |
| 36 | 1209817 | E 254 | 0.25 mfd. 200 V Tubular |
| 37 | 1219084 | H 602 | 0.006 mfd. 800 V Tubular |
| 38 | 1218880 | 1218880 | 0.15 mfd. 100 V Tubular |
| 39 | 1218882 | 1218882 | 0.4 mfd. 100 V Tubular |
| 40 | 7259710 | 7259710 | Spark Plate and "A" Connector |
| 41 | 1217848 | 1217848 | Chassis Plate Condenser |
| 42 | 7240906 | H 602 | 0.006 mfd. 1600 V Tubular |
| 43 | 1219511 | E 504 | 0.5 mfd. 100 V Tubular |
| 44 | 1219499 | G 101 | 0.000100 mfd. Molded |
| | | **Resistors** | |
| 51 | 1211147 | A 225 | 2.2 Megohms ½ W Insulated |
| 52 | 1211085 | B 103 | 10,000 Ohms 1 W Insulated |
| 53 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 54 | 7240732 | A 334 | 330,000 Ohms ½ W Insulated |
| 55 | 1213283 | A 155 | 1.5 Megohms ½ W Insulated |
| 56 | 1211192 | A 223 | 22,000 Ohms ½ W Insulated |
| 57 | 1212491 | 1212491 | 12,000 Ohms 2 W Insulated |
| 58 | 1214557 | A 334 | 330,000 Ohms ½ W Insulated |
| 59 | 1215107 | A 100 | 10 Ohms ½ W Insulated |
| 60 | 1213217 | A 101 | 100 Ohms ½ W Insulated |
| 61 | 1215558 | 1215558 | 68 Ohms ½ W Insulated |
| 62 | 1213283 | A 155 | 1.5 Megohms ½ W Insulated |
| 63 | 1213270 | A-104 | 100,000 Ohms ½ W Insulated |
| 64 | 1214542 | A 271 | 270 Ohms ½ W Insulated |
| 65 | 1214556 | A 274 | 270,000 Ohms ½ W Insulated |
| 66 | 7241937 | A 685 | 6.8 Megohms ½ W Insulated |
| 67 | 1219504 | 1219504 | 1600 Ohms ½ W Insulated |
| 68 | 1213509 | 1213509 | 56,000 Ohms 1 W Insulated |
| 69 | 7241937 | A 685 | 6.8 Megohms ½ W Insulated |
| 70 | 1213224 | A 331 | 330 Ohms ½ W Insulated |
| 71 | 1213240 | 1213240 | 2700 Ohms ½ W Insulated |
| 72 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 73 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 74 | 1213220 | A 151 | 150 Ohms ½ W Insulated |
| 75 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 76 | 1214555 | A 224 | 220,000 Ohms ½ W Insulated |
| 77 | 1213270 | A 104 | 100,000 Ohms ½ W Insulated |
| *78 | *1213283 | *A 155 | 1.5 Megohms ½ W Insulated |
| 79 | 7239745 | 7239745 | 430 Ohms 1 W Wire Wound Insulated |
| 80 | 1213480 | A 393 | 39,000 Ohms ½ W Insulated |
| 81 | 1213481 | A 332 | 3300 Ohms ½ W Insulated |
| 82 | 1213236 | 1213236 | 1200 Ohms ½ W Insulated |
| 83 | 7237835 | A 221 | 220 Ohms ½ W Insulated |
| 84 | 1213482 | A 391 | 390 Ohms ½ W Insulated |
| 85 | 1213236 | 1213236 | 1200 Ohms ½ W Insulated |
| 86 | 1213481 | A 332 | 3300 Ohms ½ W Insulated |
| 87 | 7237994 | B 221 | 220 Ohms 1 W Insulated |
| 88 | 1214573 | { C 272<br>B 562 | 1800 Ohms Wire Wound (Replace with 2700 ohms 2 W and 5600 Ohms I W in parallel) |
| 89 | 1214564 | A 335 | 3.3 Megohms ½ W Insulated |

*This resistor was 2.2 Megohms until Serial #62397—Use above Value in Service.

MODEL 7258865,
Cadillac

## SERVICE PARTS LIST

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | Resistors (Continued) | |
| *90 | *7231539 | *7231539 | 13,000 Ohms 1 W Insulated |
| 91 | 1213271 | 1213271 | 120,000 Ohms ½ W Insulated |
| 92 | 1216157 | B 473 | 47,000 Ohms 1 W Insulated |
| 93 | 1216154 | 1216154 | 6800 Ohms 1 W Insulated |
| 94 | 1216157 | B 473 | 47,000 Ohms 1 W Insulated |
| | | Tubes | |
| | 1217690 | 5252 | 6BA6 |
| | 7237752 | 5222 | 6SA7 |
| | 1218506 | 5262 | 6AV6 |
| | 1219484 | 5278 | 6AQ7GT |
| | 1213793 | 5241 | 6V6GT |
| | 1217924 | 5003 | 0Z4 Rectifier |
| | 1219485 | 5328 | 12AU7 |
| | | Miscellaneous Electrical Parts | |
| 110 | 7259408 | 7259408 | Adjuster Cathode Relay |
| 111 | 7259239 | 7259239* | Control - Tone |
| 112 | 7259240 | 7259240 | Control - Volume, Sensitivity Switch |
| 112A | | | Volume Control |
| 112B | | | Switch |
| 112C | | | Sensitivity Control |
| 113 | 7259009 | 7259009 | Relay |
| 114 | 1219661 | 1219661 | Solenoid |
| 115 | 7258488 | 7258488 | Speaker 6 x 9 Elliptical PM |
| 116 | 7259011 | 7259011 | Switch - Tuner Return |
| 117 | 7259012 | 7259012 | Switch - Station Selector |
| 119 | 7259336 | 7259336 | Transformer - Output |
| 120 | 7259375 | 7255881 | Transformer - Power |
| 121 | 7239124 | 8542 | Vibrator - Non-Synchronous |
| 122 | 125588 | 55 | Lamp - Dial Light |
| | | MECHANICAL PARTS | |
| | | Chassis | |
| 131 | 7259710 | 7259710 | "A" Connector and Spark Plate |
| 132 | 7258520 | 7258520 | Antenna Connector |
| | 7236279 | 7236279 | Socket - Octal Tube |
| | 7259307 | 7259307 | Socket - 9 Pin Miniature Tube |
| | 7258073 | 7258073 | Socket - 7 Pin Miniature Tube |
| | 7239125 | 7239125 | Socket - Vibrator |
| 133 | 1219603 | 1219603 | Socket - Dial Light |
| | | Tuner | |
| 141 | 7259201 | 7259201 | Core - Iron Tuning |
| 142 | 7259178 | 7259178 | Core - Guide Bar |
| 143 | 7259319 | 7259319 | Dial - Calibrated |
| 144 | 7259531 | 7259531 | Dial Backplate Assembly |
| | 187189 | 44 | Pilot Light |
| 145 | 7258270 | 7258270 | Escutcheon Assy. |
| 146 | 7258236 | 7258236 | Dial Glass |
| | 7258232 | 7258232 | Dial Glass Retainer (2) |
| 148 | 1219610 | 1219610 | Motor Gear Train |
| 149 | 7259164 | 7259164 | Plunger - Solenoid |
| 150 | 1219604 | 1219604 | Station Selector Bar Pkg. |
| | | | Station Selector Bar |
| | 7259125 | 7259125 | Switch Operating Collar |
| | | | Toggle Plate |
| | 7259111 | 7259111 | Spring (2) |
| | 1216508 | 1216508 | "C" Washer |
| 151 | 7259100 | 7259100 | Spring Clip |
| 152 | 7257361 | 7257361 | Spring - Vacuum Valve Anti-Rattle |
| | 7258239 | 7258239 | Spring - Calibrated Dial Retainer |
| 154 | 7258260 | 7258260 | Vacuum Valve |
| | 7259264 | 7259264 | Vacuum Valve Shaft |
| 155 | 7259055 | 7259055 | Spring - Motor Power |
| | | INSTALLATION PARTS | |
| | 7258542 | 7258542 | "A" Lead Assy. |
| | 7240138 | 6013 | Static Collector |
| | 1911095 | 6030 | Condenser - Generator |
| | 1910147 | 6030 | Condenser - Ignition Coil |
| | 7259510 | 7259510 | Escutcheon - Sensitivity Control |
| | 7259509 | 7259509 | Escutcheon - Tone Control |
| | 147685 | 147685 | Fuse - 14 Amperes |
| | 7242024 | 7242024 | Fuse Holder Complete |
| | 7259369 | 7259369 | Knob - Control |
| | 7259508 | 7259508 | Knob - Sensitivity Control |
| | 7259507 | 7259507 | Knob - Tone Control |
| | 7259514 | 7259514 | Spring - Tone Control Retainer |

*This resistor was 15,000 Ohms until Serial #62300—Use above Value in Service.

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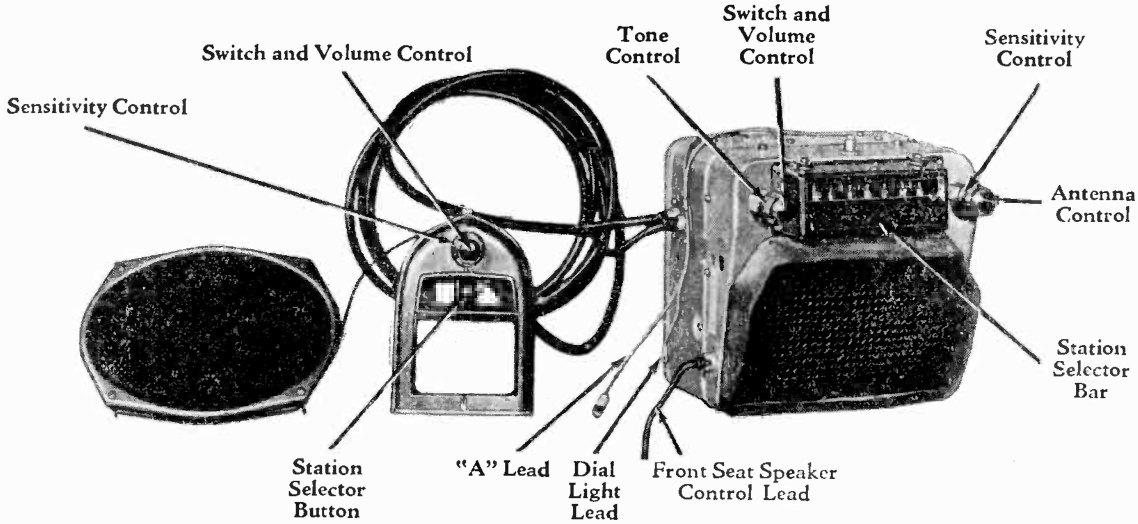
Cadillac

This Model Same as Model 7258865, Except as Indicated by This Bulletin




MODEL 7259825

## GENERAL

MOUNTING—1950 Cadillac 75 Series Cars.

TUBES—Seven, Plus Rectifier and Trigger.

SPEAKER—6" x 9" Elliptical, Permanent Magnet, Front — 6" x 9" Elliptical, Permanent Magnet, Rear.

TUNING—Electronic.

ANTENNA TRIMMER COMPENSATION—0.000060 - 0.000085 Mfd.

TUNING RANGE—540 - 1600 KC.

PUSHBUTTON SET-UP—No pushbutton set-up is necessary. However, the number of stations on which the tuner will stop can be controlled by the use of the Sensitivity Controls.

ALIGNMENT PROCEDURE—Alignment procedure same as that of Model 7258865, Bulletin 6D-1060.

## FUNCTIONAL OPERATION

The Cadillac remote control signal seeker type radio has all the controls of the Cadillac Syncro-Matic Model 7258865 Radio for front seat operation and in addition has a control head mounted in the left rear seat arm rest for rear seat operation. This remote control head has a switch, volume control, and station selector button.

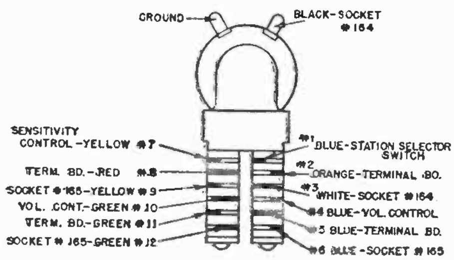
After the rear seat control switch is turned on, only the rear controls operate the radio. The radio can not be operated from the front seat again until the rear control switch is turned off. Two controls that are always operated at the receiver are the tone control and the antenna control.

This radio operates from the front instrument panel in exactly the same manner as the 7258865 Model except for a front speaker switch mounted on the lower edge of the instrument panel to the left of the steering wheel. This switch can only be used when the rear control is in operation, and it gives the front seat occupants the choice of listening at a reduced volume from normal output to the stations selected by the person operating the rear selector button or completely disconnecting the front speaker.

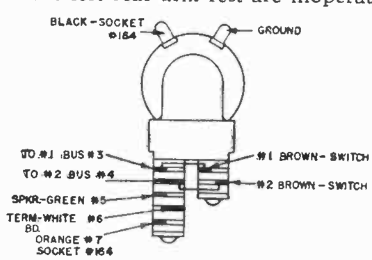
## THEORY OF OPERATION

The energizing of relays, illustration numbers 125 and 126, is accomplished by turning the rear control switch (123C) to to the "on" position. When this switch is turned on, the "A" voltage is applied across the relays, energizing the relays and closing the contacts to the rear controls. With the relays 125 and 126 energized, the rear seat controls are operative and not the front seat controls.

Once these relays are energized, the "A" supply is connected to the power transformer center-tap through contacts 1-2 and 3-4 of relay 126, regardless of the position of the front switch (112B); therefore the radio can not be turned off until the relays are de-energized by turning off the rear switch (123C). With the relays in the de-energized position, all controls are operative at the receiver, while all remote controls in the left rear arm rest are inoperative.




RELAY 125




RELAY 126

Relay leads' destinations and colors are to the respective contacts as numbered on the schematic.

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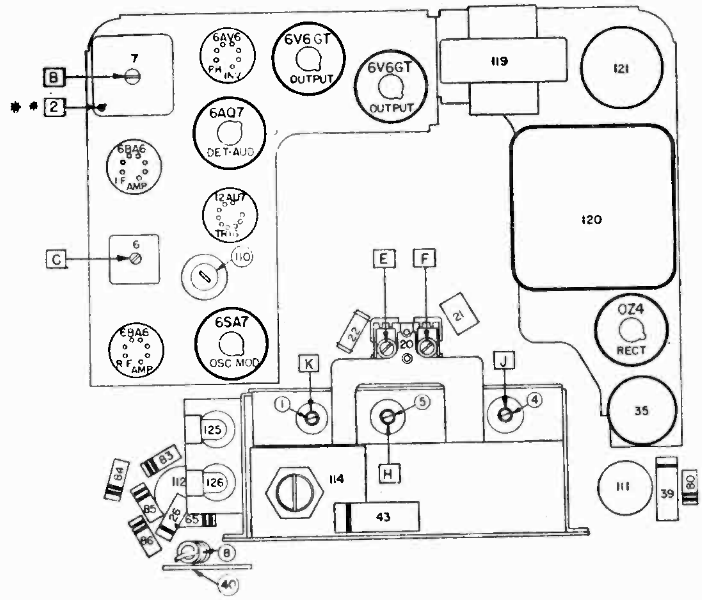
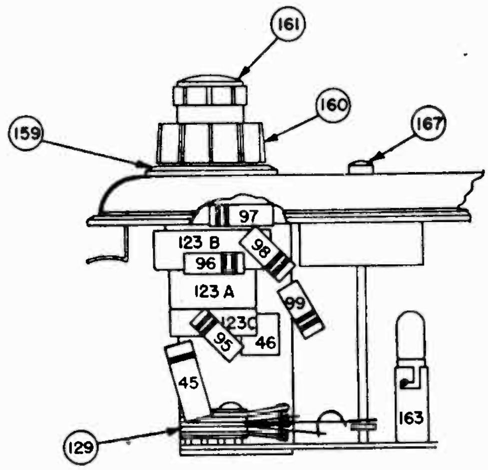



PARTS LAYOUT — TUBE VIEW

**Connect a VTVM from this point to ground for output indications during alignment.




PARTS LAYOUT — REAR CONTROL

## SCHEMATIC DATA

All voltages measured from sockets terminals to chassis with a 20,000 Ohm per volt voltmeter. Measurements taken with no signal and 6.0 volts at spark plate. Oscillator grid voltage taken with the set tuned to 1000 KC. Tuner not seeking.

Total "A" Drain 7.3 Amps.

Total "B" Drain 67MA.

Tolerance on voltages $\pm$ 10%.

*—Indicates lead from tuner coil assy.

**—See Service Parts List for replacement.

☐—Colors of terminals on service part.

Note the red and black circuits are exactly the same as those of Model 7258865. The blue circuit has been added so that the tuner can be controlled from the rear seat location. This circuit is switched in or out of control by the relays which are energized from the rear seat.

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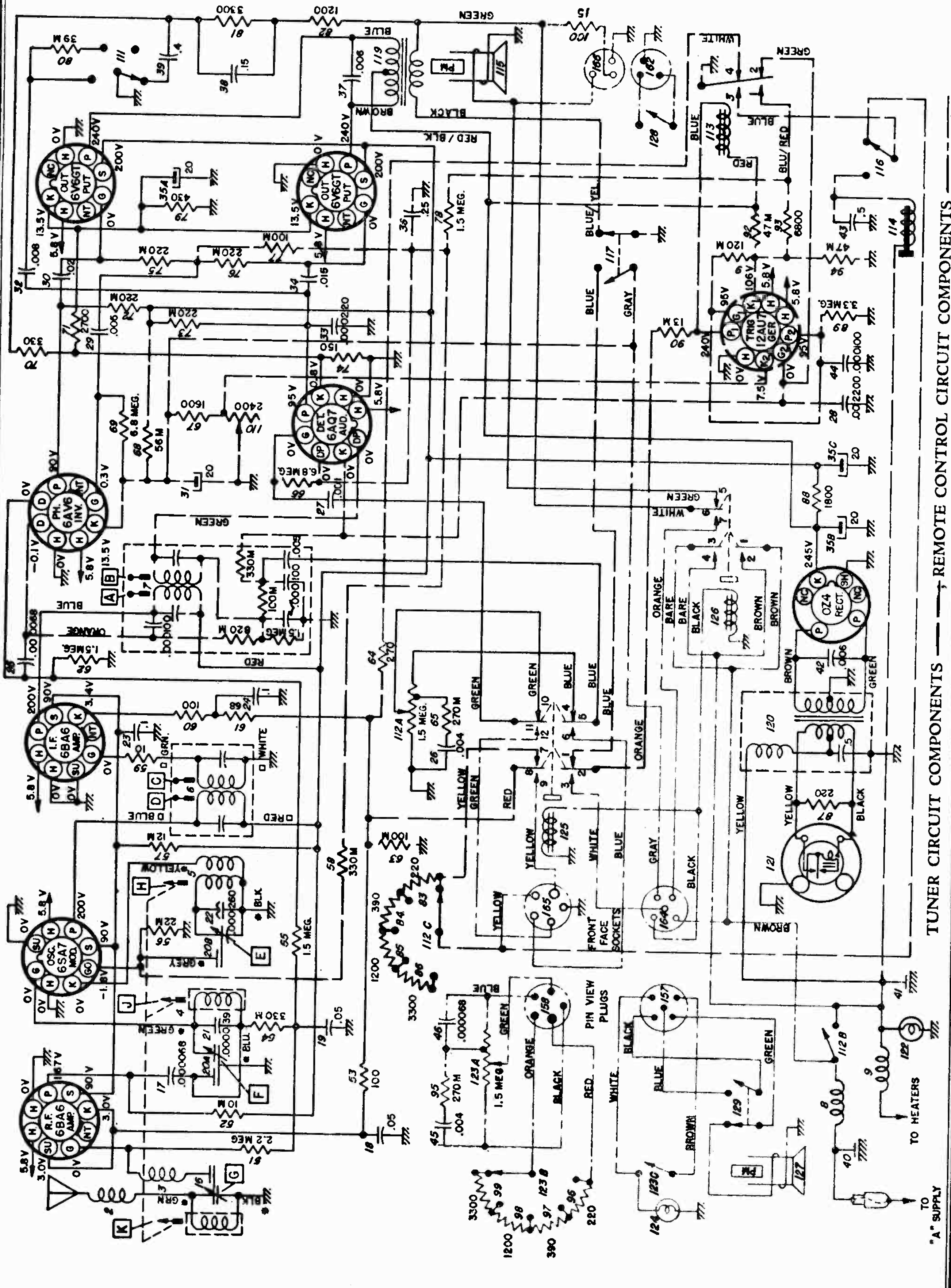
Cadillac



MODEL 7259825, Cadillac

# CADILLAC REMOTE CONTROL SYNCROMATIC MODEL SERVICE PARTS LIST

The Service Parts List of the Cadillac Remote Control Syncromatic Radio is identical to the Cadillac Syncromatic Radio, Model 7258865, except for the illustration numbers and parts listed below: Those parts marked with an asterisk (*) are changed from Model 7258865—the others are added parts.

## ELECTRICAL PARTS

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Condensers** | |
| * 40 | 7241259 | 7241259 | Spark Plate |
| 45 | 1218969 | E 402 | .004 Mfd 600V Tubular |
| 46 | 1219550 | G 680 | .000068 Mfd Molded |
| | | **Resistors** | |
| 95 | 1214556 | A 274 | 270,000 Ohms ½W Insulated |
| 96 | 7237835 | A 221 | 220 Ohms ½W Insulated |
| 97 | 1213482 | A 391 | 390 Ohms ½W Insulated |
| 98 | 1213236 | 1213236 | 1200 Ohms ½W Insulated |
| 99 | 1213481 | A 332 | 3300 Ohms ½W Insulated |
| **100 | 1219672 | 1219672 | 15 Ohms 2W Insulated |
| | | **Miscellaneous** | |
| 123 | 7259947 | 7259947 | Control - Volume, Sensitivity and Switch - Rear |
| 123A | | | Volume |
| 123B | | | Sensitivity |
| 123C | | | Switch |
| 124 | 187189 | 44 | Lamp - Dial Light |
| 125 | 7259951 | 7259951 | Relay - 4 Section |
| 126 | 7259952 | 7259952 | Relay - 3 Section |
| 127 | 1457062 | 1457062 | Speaker - 6x9 Elliptical PM, Rear |
| 128 | 7259950 | 7259950 | Switch - Front Speaker |
| 129 | 7259012 | 7259012 | Switch - Station Selector, Rear |

## MECHANICAL PARTS

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| | | **Chassis** | |
| *131 | 7257891 | 7257891 | A-Lead Assembly |
| | | **Remote Control** | |
| | 7259946 | 7259946 | Cable - Rear Seat |
| 157 | 1219682 | 1219682 | Plug and Shell Pkg. |
| 158 | 1219679 | 1219679 | Plug and Shell Pkg. |
| | 4589122 | 4589122 | Escutcheon - Arm Rest |
| 159 | 7259510 | 7259510 | Escutcheon - Sensitivity Control |
| 160 | 7259508 | 7259508 | Knob - Sensitivity Control |
| 161 | 7259369 | 7259369 | Knob Control |
| 162 | 1219688 | 1219688 | Plug - Front Speaker Switch |
| 163 | 1219686 | 1219686 | Socket Pkg. - Dial Light |
| 164 | 7259944 | 7259944 | Socket - Cable Plug |
| 165 | 7259943 | 7259943 | Socket - Cable Plug |
| 166 | 7258498 | 7258498 | Socket - Front Speaker Plug |
| 167 | 1219687 | 1219687 | Station Selector Button Pkg. |
| | | | Push Button Assy. |
| | 7259125 | 7259125 | Retaining Ring |
| | | | Washer |
| | | | Felt Washer |
| | 7256121 | 7256121 | "C" Washer |

## INSTALLATION PARTS

| Illus. No. | Production Part No. | Service Part No. | Description |
|---|---|---|---|
| * | 7259970 | 7259970 | "A" Lead Assembly |

** Located on the top of the hash cover.