

IMPORTANT:—

For Your Service Department
Victor Division
RCA Victor Company, Inc.
Camden, N. J.



Service Bulletin No. 25-A

This bulletin supersedes Service Bulletin No. 25



VICTOR MICRO-SYNCHRONOUS RADIO
R-32, R-52, RE-45, and RE-75

The Victor Micro-Synchronous Radio is a power operated tuned radio frequency receiver of the antenna type, employing an antenna coupling stage and four stages of tuned and neutralized radio frequency amplification, a detector, a first stage audio, and a power stage of push pull amplification.

A high degree of sensitivity is made possible by means of a system of micrometer adjustments on the tuning condensers, permitting precision automatic alignment or synchronization of the tuned radio frequency stages thruout the entire tuning range at all times. Each set of condensers is thus properly aligned at the factory and locked into position. A new method of stabilizing the radio frequency circuit permits a high degree of selectivity without causing any decrease in sensitivity.

The instrument comprises three standard units as follows:

(1) Radio, in which are contained the R. F. stages and the detector; (2) Power Amplifier, containing the first audio, the power stage of push pull amplification, and the rectifier; (3) Electro Dynamic Reproducer. The units are so designed that all parts are readily accessible for servicing.

Six Radiotrons UX-226 are used in the R. F. and first audio amplifier stages, a UY-227 detector, and two UX-245 in the power stage. The Radiotron UX-280 is used as a rectifier.

The Victor Radio is designed for operation on 105 to 120 volts, 50 to 60 cycles, alternating current. Special equipment is available for operation on 105 to 120 volts, 25 to 40 cycles. The power consumption when operating the radio is approximately 105 Watts, and approximately 160 watts when operating the Electrola.

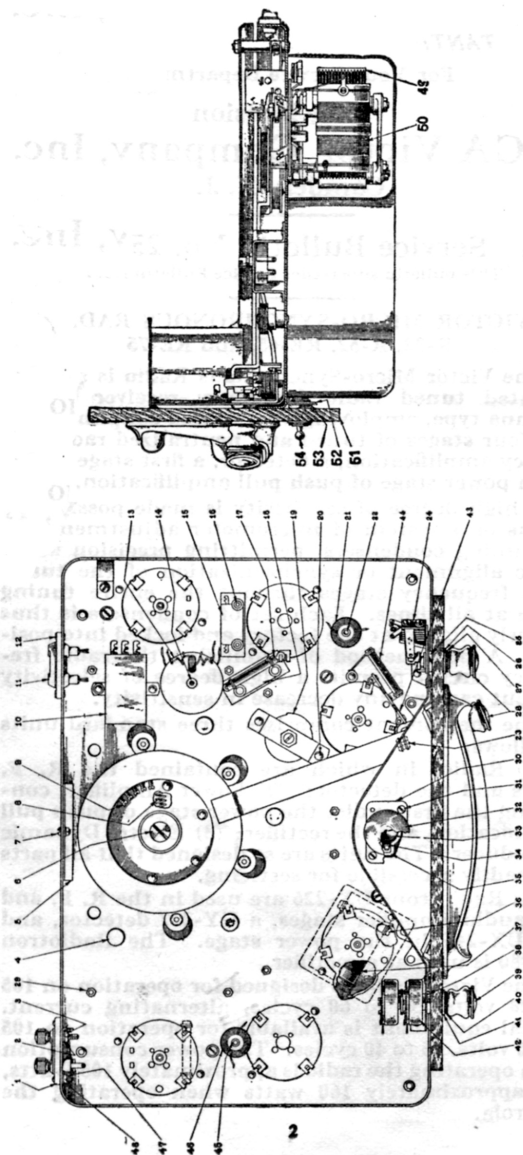


Fig. 1—Top and Side Views of Radio with Cover Removed, Showing Parts

PARTS LIST RADIO UNIT, STOCK No. A-2300

	Name of Part	Stock Number
1.	Twin Binding Post (Antenna and Ground)	A2308
2.	Nut	A2701
3.	Lock Washer	A2910
5.	Cable Clamp	
6.	Nut	
	Lock Washer	
7.	Screw	A3133
	Nut	A2703
	Lock Washer	A2910
8.	Tuning Condenser Spring	A1605
9.	Cam Adjusting Screw	
10.	By-Pass Condenser (3 of .25 Mfd. each)	A206
11.	Twin Pin Jack, Input Unit	A903
12.	Rivet	A703
13.	Detector Input R. F. Transformer Coil	A102
14.	Rivet	A704
15.	By-Pass Condenser, Plate Circuit UY-227 (.001 Mfd.)	A205
16.	Rivet	A701
17.	Grid Leak ($\frac{1}{2}$ Meg.)	A303
18.	Grid Condenser (.00025 Mfd.)	A204
19.	UY-227 Hum Control with Bracket	A304
20.	Rivet	A702
21.	Detector Plate Choke Coil	A101
22.	Rivet	A704
23.	Tuning Lever Roller	A2305
24.	Transfer Switch (complete)	A401
25.	Nut	A2704
26.	Washer	A2911
27.	Nut	A2705
28.	Knob	A2304
	Set Screw	A3116
29.	Nut	A2701
	Lock Washer	A2909
30.	Pilot Lamp Socket Cover	
31.	Pilot Lamp Socket Screw	A3119
32.	Pilot Lamp	A2310
33.	Pilot Lamp Socket	A500
34.	Pilot Lamp Socket Insulating Strip	
35.	Pilot Lamp Socket Base	
36.	Stabilizer Resistor (800 Ohms)	A301
37.	R. F. Transformer (Volume Control) (2nd R. F.)	A104
38.	Nut	A2704
39.	Knob	A2304
40.	Nut	A2705
41.	Washer	A2911
42.	Volume Control (Radio) (complete)	A305
43.	Mid-Tap Resistor Across UX-226 Fil. (20 Ohms)	A302
44.	UX-226 Grid Bias Resistor	A300
45.	Rivet	A704
46.	Antenna Choke Coil	A100
47.	Nut	A2701
48.	Lock Washer	A2910
49.	Tuning Condenser (One Complete)	A203
50.	R. F. Coil (3 per Unit)	A103
51.	Radio Panel (Wood Only)	A2303
52.	Toggle Switch Insulator	A2309
53.	Nut	A2706
54.	Toggle Switch (Off and On)	A402
	Metal Shield for UY-227 (RE-45 only)	A2319
	Tuning Dial Scale	A2314
	Multiple Plug (12 Prong)	A904

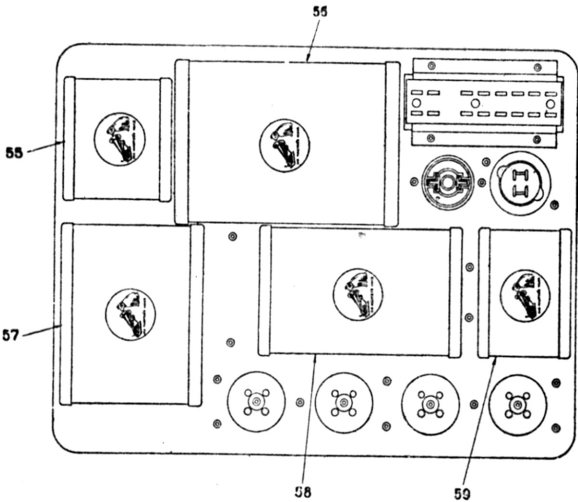


Fig. 2—Top View of Power Amplifier Unit, Showing Parts

PARTS LIST POWER AMPLIFIER UNIT
STOCK No. A-2301

- | | | |
|-----|-----------------------------------|------|
| 55. | Filter Choke Coil | A4 |
| 56. | Filter Condenser Bank | A200 |
| 57. | Power Transformer (60 Cycles) | A1 |
| | Power Transformer (25 Cycles) | A5 |
| 58. | Interstage and Output Transformer | A3 |
| 59. | Input Transformer | A2 |

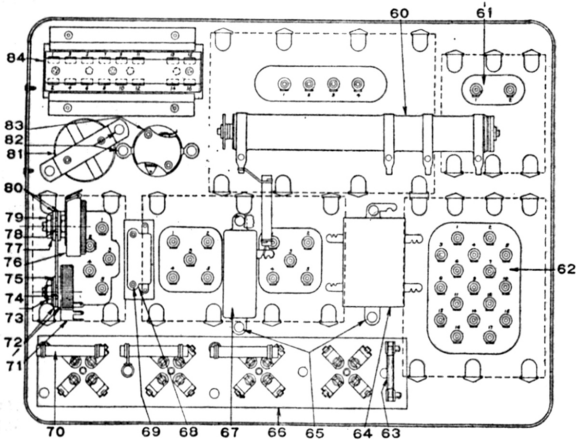


Fig. 3—Bottom View of Power Amplifier Unit, Showing Parts

PART LIST—Continued

60. Voltage Divider Resistor	A308
61. Filter Choke Coil (Same as 55)	
62. Power Transformer (Same as 57)	
63. 2 Ampere Fuse	A2369
64. By-Pass Condenser (Two of .1 Mfd. each and one of .125 Mfd.)	A201
65. Rivet	A701
66. Socket Strip	A502
67. By-Pass Condenser ($\frac{1}{2}$ Mfd.)	A214
68. By-Pass Condenser (.002 Mfd.)	A202
69. Rivet	A701
70. Grid Leak, $\frac{1}{2}$ Meg. (3 Used)	A303
71. Hum Control Potentiometer (20 Ohms) UX-226	A306
72. Fibre Washer (2 Used)	A2926
73. Nut	A2709
74. Washer	
75. Lock Washer	A2913
76. Tone Control	A307
77. Lock Washer	A2914
78. Washer (Same as 74)	
79. Nut	A2710
80. Fibre Washer (Same as 72)	
81. Power Input Plug	A907
82. Rivet	A702
83. Motor Plug	A906
84. Multi-Plug Socket	A905
85. Clamp (2 Used)	A718

INSTALLATION

1. ANTENNA—For best average sensitivity and selectivity the antenna should be from 50 to 75 feet long including the lead-in and ground wires, and should be as high above ground as possible. A short antenna tends to decrease the sensitivity and increase the selectivity) a long antenna tends to increase the sensitivity and decrease the selectivity. For local reception sufficient sensitivity can usually be obtained except in shielded locations by using a five or six foot length of wire as an antenna.

2. GROUND—A good ground connection is highly important for the proper operation of the instrument and must be used at all times. The connection should be made to a well scraped and cleaned portion of a water pipe by clamping with a ground clamp. If such a connection is not available, a pipe or metal rod may be driven three or four feet into the ground, preferably where the soil is moist. Attention is called to the fact that a spark may be produced if the ground is connected to the instrument while the power plug is attached. This condition, which is caused by the condenser discharge from the power line, is quite normal and will cause no harm to the instrument.

3. POWER LINE VOLTAGE—The power line voltage should be measured with an A. C. voltmeter at the time of installation; If the voltage is above 125 volts, a tapped resistor such as stock No. A-310 should be connected in series with one side of the power line and the resistance varied until input voltage at the instrument is 115 volts. If the voltage fluctuates badly, the co-operation of the power company should be secured, and an attempt made to eliminate such fluctuation.

4. ADJUSTING HUM CONTROLS—The two hum control potentiometers, shown at 19, Fig. 1, and 68, Fig. 3, should be adjusted at the time of installation in the following manner:

- a. Place the transfer switch in the "record" position to the right.
- b. With a small screw driver turn the UX-226 hum control in the base of the power amplifier unit slightly in either direction as required until the hum is a minimum.
- c. Turn the transfer switch to the left to the "radio" position, turn the radio volume control to minimum, and adjust the UY-227 hum control near the UY-227 in the radio set until the hum is a minimum.

5. ADJUSTING HARMONIC MODULATOR—The harmonic modulator or tone control in the bottom of the power amplifier controls emphasis on the bass section of the scale, increasing the bass and decreasing the high notes as the adjusting screw is turned to the right. Ordinarily, the control will not require any change in setting from that made in the factory.

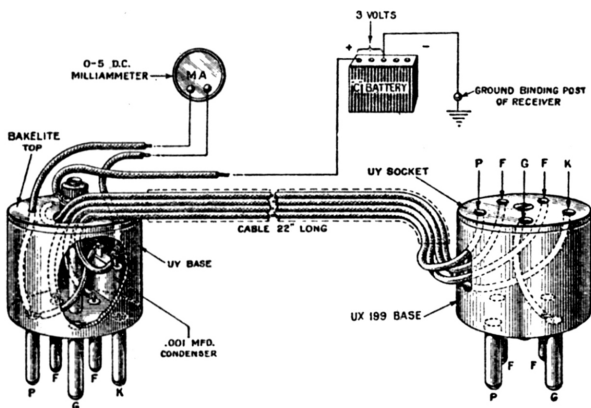


Fig. 4—Circuit for Tube Voltmeter, Na-Ald. No. 982

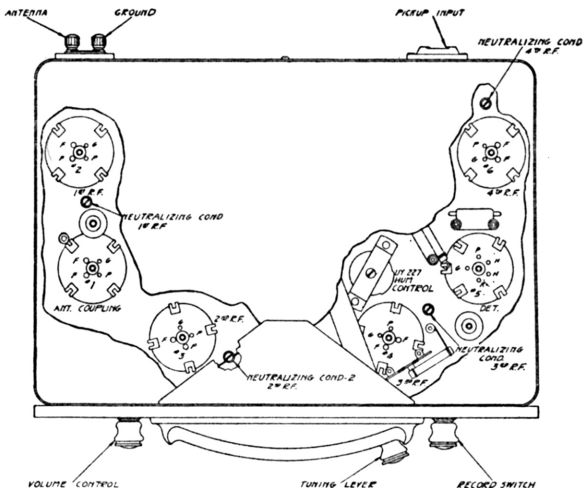


Fig. 5—Top View of Radio, Showing Radiotron Sockets

It may be desirable in some cases, however, to change the adjustment because of unusual room characteristics, a customer's preference for stronger bass, or to reduce record scratch and static. The control arm can be turned with a small screw driver as desired.

GENERAL TESTS

1. EXCESSIVE HUM—This condition can be caused by:

- a. Improperly adjusted or faulty hum controls. See subject 4, under Installation.
- b. Defective UX-280 or UY-227.
- c. Wire or terminal grounded to the frame, or open circuit in any of the various ground connections.
- d. Shorted condenser, 10, Fig. 1, across UX-226 filament supply.
- e. Open or shorted center tap resistor, 43, Fig. 1, across UX-226 filament supply.
- f. Shorted condenser, 64, Fig. 3, across power line in power-amplifier unit.
- g. Shorted condenser in condenser bank, 56, Fig. 2, of power-amplifier unit.

2. HOWL—Microphonic howl can be traced to:

- a. Defective Radiotron, particularly in the detector or audio stages.
- b. Improper neutralization. See subject 1 under Special Adjustments below.
- c. Speaker not felt insulated from baffle. Remove speaker and arrange felt properly.
- d. Open condenser, 15, Fig. 1.

- e. Loose metal parts such as shielding, screws, etc., or improperly centered cone may set up a howl or mechanical rattle. See subject 2 under Special Adjustments for method of centering cone.

3. DISTORTED REPRODUCTION—Distortion may be caused by any of the following:

- Low emission Radiotron, particularly in the detector or in the power supply unit. For best reproduction the plate currents of the two UX-245 should balance within 2 milliamperes.
- Operation with volume control advanced too far on powerful local stations, causing overloading of the detector.
- Incorrect setting of the tone control in the base of the power-amplifier. See subject 5, under Installation.
- Improper neutralization. See subject 1, under Special Adjustments.
- Cone in speaker unit improperly centered. See subject 2 under Special Adjustments.

4. NOISY REPRODUCTION—Station carrier noise, static, and power line disturbances should not be confused with noise which is set up within the receiver. This latter condition may be caused by any one of the following:

- Volume Control.** Dirt or corrosion on the resistance wire or contact arms of the volume control will produce noise when the control is operated. This condition can usually be corrected by rubbing the parts lightly with very fine sandpaper and then cleaning with gasoline.
- Shorted Tuning Condenser.** If the plates of one or more of the tuning condensers are shorted, noise will

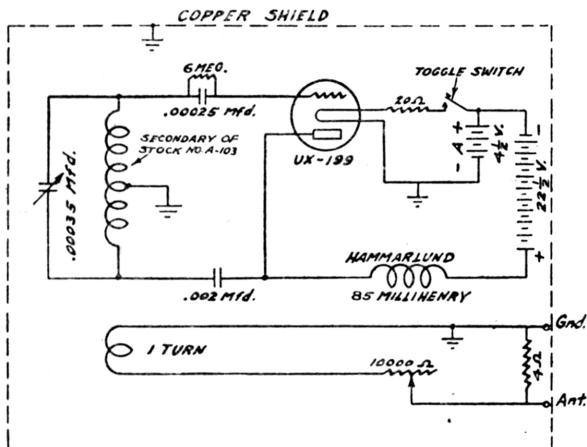


Fig. 6—Schematic Wiring Diagram, Modulated Oscillator

be produced when the tuning lever is operated. If such a condition is found, the faulty condenser should be replaced.

- c. *Intermittent short or open circuit* in any of the various soldered connections or in power switch.
- d. *High resistance grid leak*. Any of the grid leaks which have developed an excessive high resistance will produce a "frying noise."
- e. *Faulty power or audio transformer* will also produce this same type noise.

5. WEAK RECEPTION—This condition can be caused by:

- a. *Faulty antenna*, characterized by weak reception, intermittent reception, or grating noise. Examine the antenna for poor contact at the lead-in connection to the radio set, poor soldered connections, grounded or partially grounded lightning arrester, or contact with surrounding objects. See subject 1, under Installation for further details of antenna.

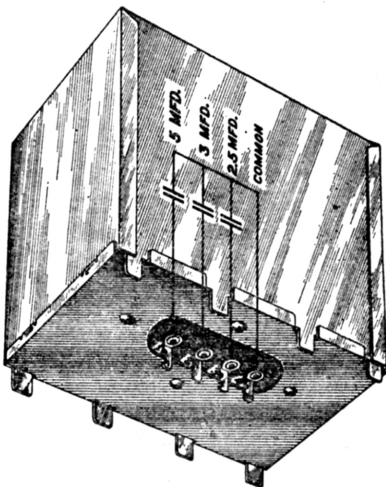


Fig. 7—Internal Connections of Filter Condenser Bank

- b. *Faulty ground*, characterized by weak reception, intermittent reception, grating noise, or oscillation. Examine the ground wire for poor contact at the ground binding post connection the the radio set, poor soldered connections, corroded connection at ground clamp.
- c. *Low power line voltage*. Test power outlet with A. C. voltmeter. Voltage should be between 105 and 125 volts, for radio instruments and between 105 and 120 volts for instruments with Electrola.
- d. *Defective Radiotron* in any of the various sockets.
- e. *Defect in radio set or power amplifier*. See subjects 5, 6 and 8 below for method of isolating trouble.

- f. **Improper neutralization.** This condition is characterized by a tendency of the set to oscillate. See subject 1 under Special Adjustments for method of neutralizing.
- g. **Improper alignment of tuning condensers.** This adjustment requires special attention and **IT IS RECOMMENDED THAT YOU CONSULT YOUR DISTRIBUTOR BEFORE MAKING ANY CHANGES IN THE CONDENSER ALIGNMENT.**

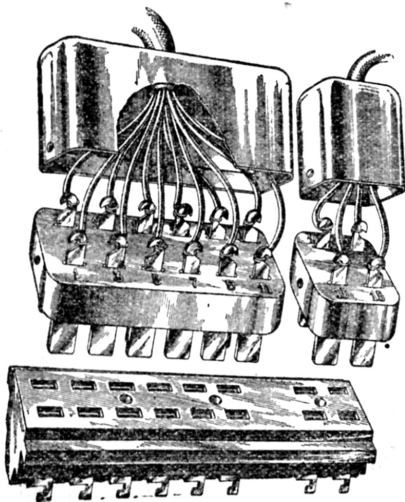


Fig. 8—Multi-Plug Terminals

1. Brown-white tracer—UX-226 Filament
2. Blue—Transfer Switch
3. Brown-white tracer—UX-226 Filament
4. White—Transfer Switch
5. Brown-blue tracer—UY-227 Filament
6. Black-red tracer—Power Switch
7. Brown-blue tracer—UY-227 Filament
8. Black-red tracer—Power Switch
9. Braided Copper Shield—Ground
10. Brown-red tracer—Pilot Lamp
11. Red-yellow tracer—B UX-226
12. Brown-red tracer—Pilot Lamp
13. Red-yellow tracer—Field
14. White—Voice Coil
15. Red-green tracer—Field
16. Black—Voice Coil

6. LACK OF REPRODUCTION—PRELIMINARY TESTS—After it has been definitely determined that the trouble is not due to a faulty tube, antenna or ground, place the instrument in operation with the transfer switch in the “record” position. Note that

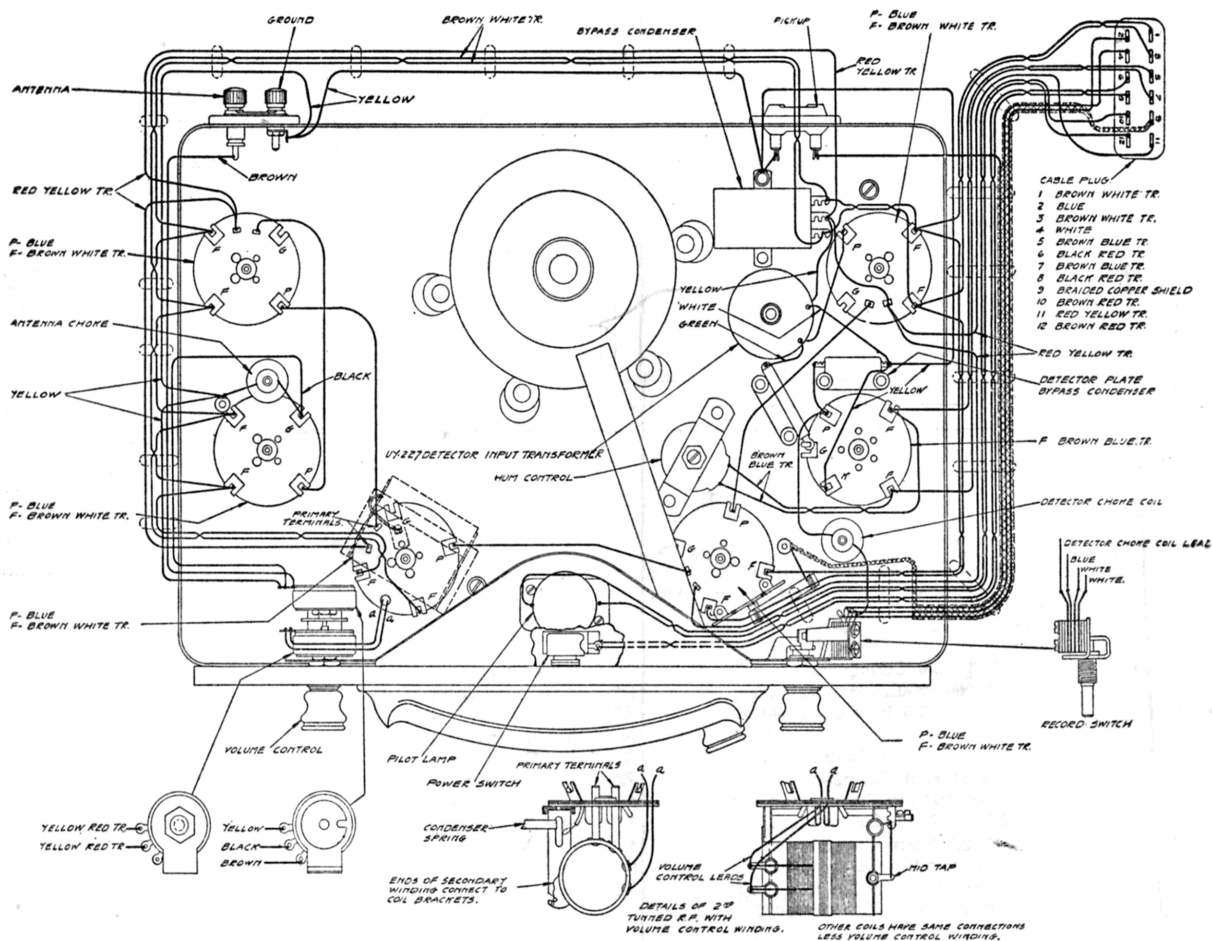


Fig. 9—Top View of Radio, Showing Wiring Between Terminals

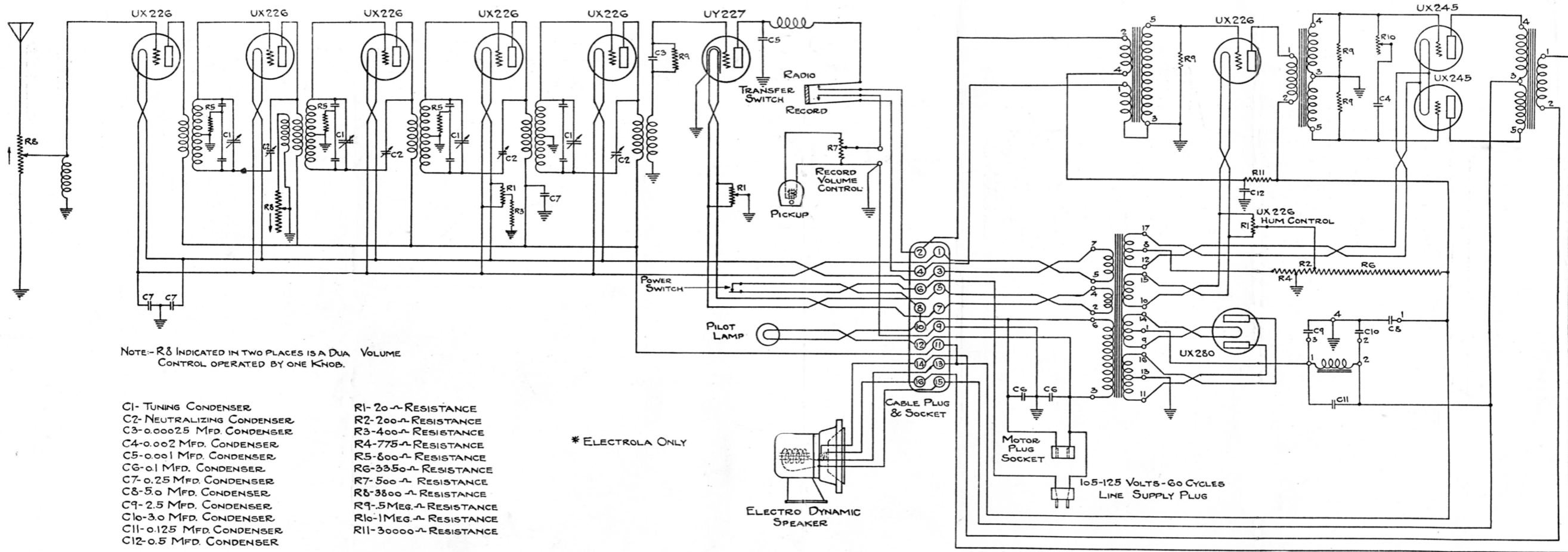


Fig. 10—Schematic Wiring Diagram Victor Radio and Victor Radio with Electrola

all tubes are lighted, and that all cables are connected. In the combination models, play a record in the usual manner with the volume control advanced to maximum. On the radio models without Electrola, connect two wires to the terminals of a dry cell or to the 1½ volt terminals of a "C" battery. Touch these wires across the two pin jack terminals marked "Phono," and note any click in the reproducer when this is done. If the record reproduction is correct, or if there is a noticeable click when the pickup pin jack terminals are tested in this manner, the trouble must lie in the radio set, and reference should be made to subject 7 below. If there is no record reproduction, reference should be made to subjects 8 and 9 below. It is recommended that a tube voltmeter, such as shown in Fig. 4 and a Weston or Jewell test box be used for isolating trouble in the radio set.

SOCKET NO.	READING NO SIGNAL	READING WITH SIGNAL
1	.45 Milliamperes	.45 Milliamperes
2	.45 Milliamperes	.50 Milliamperes
3	.45 Milliamperes	.65 Milliamperes
4	.45 Milliamperes	1.80 Milliamperes
5	.45 Milliamperes	4.50 Milliamperes

7. LACK OF REPRODUCTION—RADIO—After definitely determining that the trouble lies in the radio set, make the following tests with the tube voltmeter and test box:

- a. Place the transfer switch in the "radio" position.
- b. Remove the UY-227 detector tube, and insert the UY adapter in this socket.
- c. Remove the tube in socket No. 1, Fig. 5, (coupling stage), place the UX adapter in this socket with the UY-227 in the socket of the adapter. Note the meter reading when all connections are made in accordance with Fig. 4 and no station is being received.
- d. Place the UX adapter in socket No. 2, Fig. 5, (1st R. F.), and note a slight increased meter reading when a powerful local station is tuned in. Note: If such a broadcast signal is not available, a modulated oscillator, such as shown in Fig. 6, can be used.
- e. Take readings in this same manner for sockets 3, 4, and 5. An additional increase, corresponding to an increase in signal strength, should be noted as readings are taken progressively, from one socket to another. In the first R. F. socket which does not show any further increase in meter reading from that of the preceding socket will be found the source of trouble. These readings are entirely arbitrary and are intended to indicate gain per stage only. They will vary with different stations and with different milliameters. The following is a typical set of readings obtained in this test.

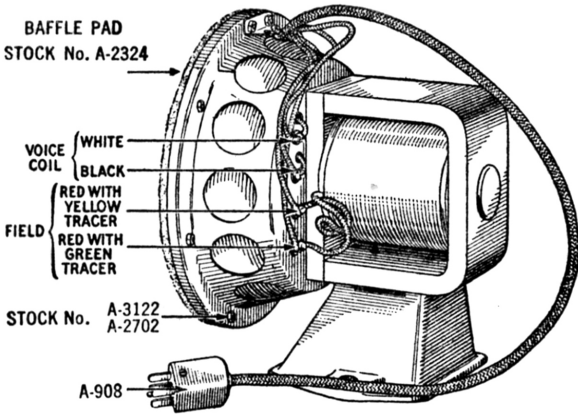


Fig. 12—Terminal Strip and Parts of Electro Dynamic Reproducer Stock No. A-2302

f. After locating the particular stage in which the trouble exists, test with the Weston or Jewell test box to determine the exact location of the faulty part or connection. The "Radio Voltage Tests" table lists the approximate voltage readings which should be obtained in each of the sockets at 110 volts power input and the possible location of the fault if these readings are not obtained.

If the above tests do not locate the trouble the fault must then be caused by improper neutralization, defective volume control, or improper alignment or shorted plates of tuning condensers.

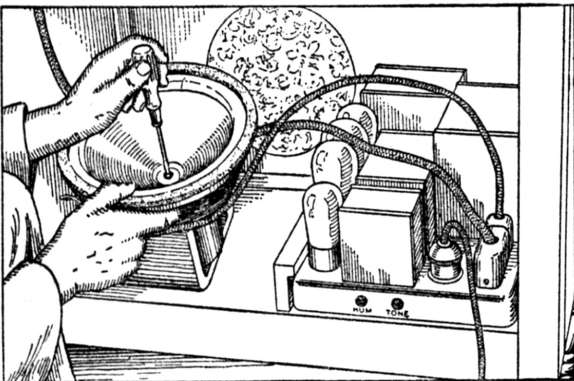


Fig. 13—Centering Cone in Electro Dynamic Reproducer

RADIO VOLTAGE TESTS

NOTE:—The following tests are to be made after determining that the trouble lies in the radio receiver and not the power amplifier unit as described in subject 6 above.

TEST	SOCKET NO.	NORMAL VOLTAGE	LACK OF VOLTAGE OR ABNORMAL VOLTAGE INDICATES
Filament	1	1.40 Volts A. C.	Poor socket contact, broken connection, shorted condenser, 10, Fig. 1.
	2	1.40 Volts A. C.	
	3	1.40 Volts A. C.	
	4	1.45 Volts A. C.	
	5	2.1 Volts A. C.	
	6	1.50 Volts A. C.	
Plate	1	105 Volts D. C.	Poor socket contact; broken connection; open 20 ohm resistor, 43, Fig. 1; open grid bias resistor, 44, Fig. 1; shorted condenser, 10, Fig. 1; open primary R. F. transformer; shorted neut. condenser open R. F. choke, 22, Fig. 1; faulty transfer switch; shorted .001 mfd. condenser, 15, Fig. 1.
	2	105 Volts D. C.	
	3	105 Volts D. C.	
	4	105 Volts D. C.	
	5	40 Volts D. C.	
	6	105 Volts D. C.	
Grid	1	9 Volts D. C.	Poor socket contact; broken connection; open 20 ohm resistor, 43, Fig. 1, across filament UX-226; open grid bias resistor, 44, Fig. 1; shorted condenser, 10, Fig. 1; open secondary R. F. transformer; shorted neut. condenser; faulty volume control and R. F. choke, 42 and 46, Fig. 1.
	2	9 Volts D. C.	
	3	9 Volts D. C.	
	4	9 Volts D. C.	
	5	0 Volts D. C.	
	6	9 Volts D. C.	

POWER AMPLIFIER VOLTAGE TESTS

TEST	SOCKET	NORMAL VOLTAGE	LACK OF VOLTAGE OR ABNORMAL VOLTAGE INDICATES
Filament	UX-226	1.40 Volts A. C.	Poor socket contact; broken connection; defective UX-226 (amp.l.) filament winding of power transformer, 57, Fig. 2.
	UX-245	2.2 Volts A. C.	Poor socket contact; broken connection; defective UX-245 filament winding of power transformer, 57, Fig. 2.
	UX-280	4.6 Volts A. C.	Poor socket contact; broken connection; defective UX-280 filament winding in power transformer, 57, Fig. 2.
Plate	UX-226	100 Volts D. C.	Low emission UX-280; poor socket contact; broken connection, open primary, interstage transformer, 58; defective voltage divider resistor, 60; shorted condenser in condenser bank, 56; open filter choke, 55; open or poor connection in UX-226 hum control 68, Figs. 2 and 3.
	UX-245	230 Volts D. C.	Low emission UX-280; poor socket contact; broken connection; open primary, output transformer, 58; open filter choke, 55; shorted condenser in condenser bank, 56; defective voltage divider resistor, 60, Figs. 2 and 3.
	UX-226	6 Volts D. C.	Low emission UX-280; poor socket contact; broken connection; open secondary, input transformer, 59; defective voltage divider resistor, 60; poor or open contact in UX-226 hum control, 68; shorted condenser in condenser bank, 56, Figs. 2 and 3.
Grid	UX-245	40 Volts D. C.	Low emission UX-280; poor socket contact; broken connection; open secondary, interstage transformer, 58; defective voltage divider resistor, 60; shorted condenser in condenser bank, 56, Figs. 2 and 3.

CABLE TERMINAL VOLTAGE TESTS

TEST BETWEEN TERMINALS	NORMAL VOLTAGE	LACK OF VOLTAGE OR ABNORMAL VOLTAGE INDICATES
1 and 3	1.70 Volts A. C.	Broken connection; defective UX-226 (radio) secondary winding of power transformer, 57, Fig. 3.
5 and 7	2.35 Volts A. C.	Broken connection; defective UY-227 secondary winding of power transformer, 57, Fig. 3.
2 and 9	39 Volts D. C.	Defective UX-280; broken connection; open radio primary, input transformer, 59, open filter choke; 61, defective voltage divider resistor, 60, shorted condenser, 56, Figs. 2 and 3.
9 and 11	105 Volts D. C.	Defective UX-280; broken connection; defective voltage divider resistor; open choke 61; shorted condenser, 56, Figs. 2 and 3.
13 and 15	185 Volts D. C.	Low emission UX-280; poor socket contact broken connection; open choke, 61, defective voltage divider, 60; shorted condenser in condenser bank, 56, Figs. 1 and 2.

8. LACK OF REPRODUCTION—SPEAKER—If there is no reproduction on either radio or record, the trouble may be in the field or voice coil or in the cable leads of the speaker. Turn off the power switch, remove the speaker cable plug from the amplifier, test for voice coil continuity between terminals 14 and 16 (black and white), and for field continuity between terminals 13 and 15 (red with green tracer and red with yellow tracer).

POWER AMPLIFIER CONTINUITY TESTS
(Transfer switch in "Radio" position)

TEST BETWEEN TERMINALS	LACK OF VOLTAGE INDICATES
4 and 9	Open record primary of input transformer, 59, Fig. 2.
10 and 12	Open primary of power transformer, 62, Fig. 2.
14 and 16	Open secondary of output transformer, 58, Fig. 2.

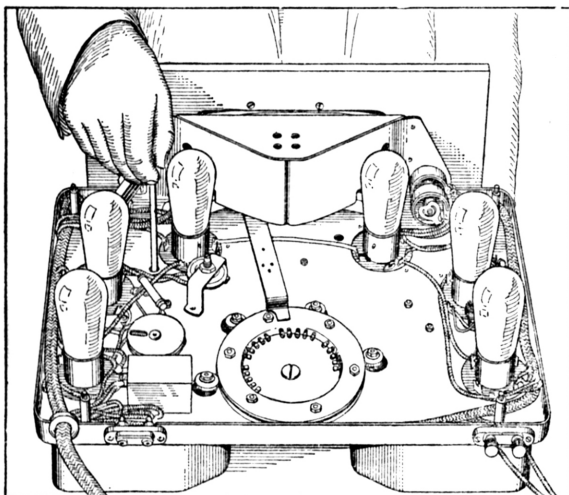


Fig. 14—Method of Neutralizing Victor Radio

9. LACK OF REPRODUCTION—POWER AMPLIFIER UNIT—If the speaker has been found correct, the trouble must then lie in the power amplifier unit, which should be tested in the following manner:

- a. Make the power-amplifier socket voltage tests with the Weston or Jewell test box. The "Power-Amplifier Voltage Tests" table lists the approximate voltage readings which should be obtained in each of the sockets at 110 volts power input, and the possible location of the fault if these readings are not obtained.
- b. If the trouble is not yet located, remove the screws in the metal cap over the terminal connections in the multi-plug, and make the Cable Terminal Voltage Tests with the plug in its socket of the amplifier, and the radio set in operation.
- c. Connect a $4\frac{1}{2}$ volt "C" battery in series with the voltmeter binding posts of the test box, and with the cable plugs disconnected from the amplifier, test between the following multi-plug socket terminals for continuity.

SPECIAL ADJUSTMENTS

1. NEUTRALIZING—Improper neutralization is characterized by oscillation and lack of sensitivity. First be sure that the instrument has a good ground connection, since a poor ground will also cause oscillation. If oscillation still persists, the set should be neutralized in the following manner, using a dummy tube, made by cutting off one of the filament prongs of a UX-226, and a neutralizing screw driver such as Stock No. A6000.

- a. Remove the four hex nuts which hold the plate.
- b. Tune in a powerful local station, preferably near the high frequency end of the scale. If such a signal is not available, a modulated oscillator, such as shown in Fig. 6, can be used to supply the signal. If the oscillator is used, it should be placed near the radio set and approximately three feet of wire used as an antenna on the set.

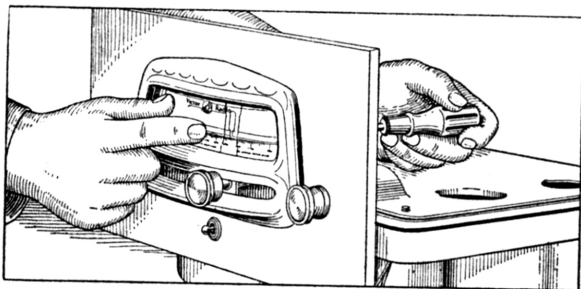


Fig. 15—Replacing Station Selector Dial

- c. Remove the UX-226 from the first tuned R. F. stage (socket No. 2, Fig. 5), replace with the dummy UX-226, and adjust the corresponding neutralizing condenser to give minimum signal in the loudspeaker. The volume control may be set to obtain a signal loud enough for accurate neutralization, but not so loud as to cause the minimum to be blurred.
- d. Replace the UX-226 in socket No. 2, and repeat the procedure for sockets 3, 4 and 5, adjusting the corresponding neutralizing condenser in each case. After completing the neutralization in this manner, turn back the neutralizing condenser for socket No. 5 approximately $\frac{1}{2}$ turn counter-clockwise.

Note:—The first UX-226, antenna coupling stage, is not neutralized.

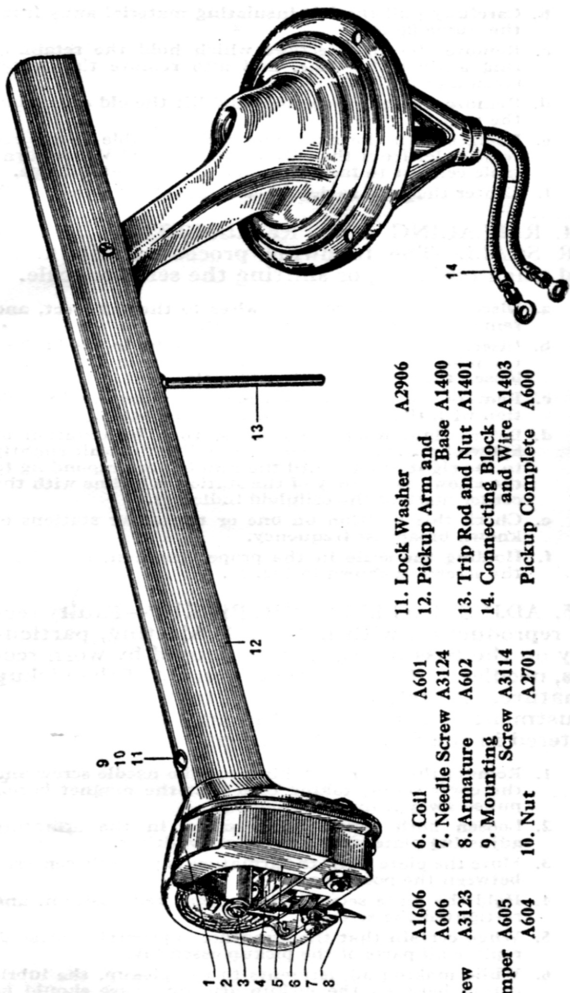
If the instrument continues to oscillate, it is probable that the condensers are out of alignment. This adjustment requires special attention, and it is recommended that you consult your distributor before making any changes in the setting.

2. CENTERING CONE IN ELECTRO DYNAMIC REPRODUCER—Improper centering of the fabric cone in the speaker is characterized by a noticeable rattle or buzz when the volume control is advanced. Such a rattle can sometimes be traced to faulty tubes in the detector or audio stages; this possibility should first be eliminated before attempting to center the cone. If the voice coil is improperly centered,

- a. Remove the two large mounting screws in the base of the speaker and pull the unit away from the front of the cabinet.
- b. Place the instrument in operation with the transfer switch in the "record" position.
- c. Turn the UX-226 hum control all the way to the right or left to produce a loud 60 cycle hum.
- d. Loosen the center screw as shown in Fig. 13, and then re-tighten the screw.
- e. Ordinarily, the cone should now be properly centered, which condition can be determined by the sound of the 60 cycle vibration. When the cone is improperly centered, a 60 cycle mechanical buzz will be heard as contrasted with a 60 cycle musical note when the coil is free and properly centered. In some cases it may be necessary to press the outer edge slightly while tightening the center screw in order to obtain proper voice coil clearance.
- f. Replace the speaker and re-adjust the UX-226 hum control.

3. REPLACING CLOTH CONE—Should it become necessary to replace the cloth cone because of an open voice coil or other defect, the following procedure should be used:

- a. Unsolder the voice coil leads (black and white) from the terminals on the side of the frame.



- | | | | | | |
|----------------|-------|-----------------|-------|-----------------------|-------|
| 1. Spring | A1606 | 6. Coil | A601 | 11. Lock Washer | A2906 |
| 2. Cover | A606 | 7. Needle Screw | A3124 | 12. Pickup Arm and | |
| 3. Cover Screw | A3123 | 8. Armature | A602 | Base | A1400 |
| 4. Rubber | | 9. Mounting | | Nut and Nut | A1401 |
| Damper | A605 | Screw | A3114 | 13. Trip Rod and Wire | A1403 |
| 5. Magnet | A604 | A2701 | | 14. Connecting Block | |
| | | | | and Wire | A1403 |
| | | | | Pickup Complete | A600 |

Fig. 16—Electric Pickup, Pickup Arm, and Base

- b. Carefully pull the felt insulating material away from the frame flange.
- c. Remove the eight screws which hold the retaining ring against the cone, and also remove the center screw and washer.
- d. Remove the retaining ring, and lift the old cone from the unit.
- e. Replace with the new cone and assemble in the reverse order from that given above, using Victor turntable cement to fasten the felt to the metal flange.
- f. Center the cone as described in subject 2 above.

4. REPLACING AND RE-ADJUSTING SELECTOR SCALE—The following procedure should be used when replacing or shifting the selector scale.

- a. Disconnect the cable and wires to the radio set, and remove the set from the cabinet.
- b. Insert a screw driver through the holes in the back of the pilot lamp compartment as shown in Fig. 16, and loosen the clamps on the old scale.
- c. Remove the old scale, and place the new one in position with the ends under the metal clamps.
- d. Before tightening the clamps, tune in a station of known broadcast frequency, and slide the scale slightly to the right or left until the number corresponding to the known frequency of the station is in line with the center mark of the celluloid indicator.
- e. Check this position on one or two other stations of known broadcast frequency.
- f. Holding the scale in the proper position, re-tighten the screws as shown in Fig. 16.

5. ADJUSTING ELECTRIC PICKUP—Faulty record reproduction with noticeable blasting, particularly on the bass notes, may be caused by worn records, needles, or by improper centering of the pickup armature. If such a condition is traced to improper adjustment of the pickup, the armature should be centered in the following manner:

1. Remove the cover by taking out the needle screw and the cover screw, taking care that the magnet is not pulled away from the assembly.
2. Loosen both round head screws in the armature adjusting plate with a small screw driver.
3. Move the plate until the armature is properly centered between the pole pieces.
4. Hold the plate securely in its centered position, and re-tighten the screws.
5. When certain that the armature is properly centered, replace all parts of the pickup assembly.
6. While making adjustments to the pickup, the lubrication between the pickup arm and base should be checked. Victor Motor Grease should be placed on the bearing surface to insure free motion of the arm.