

# PHILCO TRANSITONE SERVICE BROADCAST

JULY, 1936

## POLICE AUTO RADIO — MODELS 811PA, 811PB AND 811PV

There are two new types of Philco police auto radio Receivers, each designed to meet the special requirements of this particularly rigorous service: The Model 811PV, a variable tuning Police Receiver — and the Model 811P, a crystal controlled, fixed frequency Receiver, the DeLuxe Police Auto Radio.

**HOUSING, PLATING, FINISH** Both are single unit Receivers, housed in containers,  $10\frac{3}{4}$  inches long by  $7\frac{5}{8}$  inches wide by 5-15/16 inches deep. The chassis, housing and covers are all steel and are plated to prevent rusting. They are given an exterior black wrinkle finish.

**MOUNTING BRACKETS** Hanger brackets riveted to the Receiver, hook on to a dash bracket which is permanently installed in the car, while a single bolt at the bottom fastens the Receiver securely to the dash. This makes the installation and removal of the Receiver a simple, rapid operation.

**CONTROL SHAFTS, CONNECTIONS** The volume control and (in case of 811PV) the tuning control couplers, the "A" battery and the antenna connectors are located on one end of the housing. The shafts are the rapid coupling type with the locking gland nut at the Receiver end. The "A" battery and antenna connections are quick detachable bayonet locking type, with the "A" fuse placed in the "A" lead.

**CONDENSER MOUNTING** The tuning condenser is mounted on live rubber. This prevents microphonic trouble from developing in the condenser and is a patented Philco feature.

**CONDENSER DRIVE** The condenser drive gear ratio (Model 811PV) is 16:1. This eliminates practically all back lash and due to the mechanism used, prevents the tuning condenser from detuning from vibration. This high gear ratio also makes accurate tuning much easier.

**CONTROL UNIT** The control unit for the Model 811PV is for installation on the edge of the instrument board. It contains the "On-Off" switch and the volume and tuning control knobs. The calibrated scale is illuminated. The Model 811P, fixed frequency Receiver, utilizes a single control knob, which is mounted on the instrument board. This controls the "On-Off" switch and the volume.

**SUPERHETERODYNE RANGE 811PV DRIFT** A superheterodyne circuit is used for the 811PV, also the 811P. The frequency coverage of the Model 811PV is from 1560 K.C. to 2600 K.C. continuously in one band. The oscillator and I.F. circuits are especially designed to reduce frequency drift to a minimum.

**RANGE 811P** The Model 811P, the fixed frequency Receiver, can be furnished adjusted for any one particular frequency within the limits of the regular police band, i. e., from 1630 K. C. to 1712 K. C. and from 2382 K. C. to 2490 K. C.

**CRYSTAL CONTROL** A crystal controlled oscillator circuit is employed in the Model 811P. The crystal control holds the oscillator on the required frequency and is

responsible, in a large measure, for the greatly improved performance of this Receiver.

**TUBE EQUIPMENT** The tubes used in the 811P and 811PV are:

- 78 Tube — Tuned R. F. Amplifier with A. V. C.
- 6A7 Tube — First Detector — Oscillator with A. V. C.
- 78 Tube — I. F. Amplifier
- 75 Tube — Second Detector and "Q" Relay Stage.
- 75 Tube — First A. F. Amplifier with "Q" Control.
- 41 Tube — Power Output Stage
- 84 Tube — Full Wave Rectifier.

**ANTENNAS** Both Receivers employ antenna circuits that will track satisfactorily on any antenna capacity between 100 and 2500 mmf. This permits satisfactory operation on inserted metal top, door, spare wheel and other special types of antennas.

**A. V. C.** Both the R. F. stage and the first detector stage have full automatic volume control supplied by the diode detector.

**"Q" CIRCUIT** In addition to this, the Receivers also have a "Q" or carrier relay circuit. The function of this circuit is to completely silence the Receiver when tuned off carrier, or when the carrier goes off the air. The correct values of the resistor network have been determined and used for satisfactory city operation where it is desirable to exclude street car noises, etc. A switch is provided on the end of the Receiver housing, to open or close this circuit, since, when in remote sections of the territory, where the police transmitter signal might be very weak, slight additional sensitivity can be obtained with the "Q" circuit cut out. This "Q" circuit should not be confused with the conventional squelch circuit. The "Q" relay circuit operates on a carrier field strength equivalent to approximately 3 microvolts in the antenna. A carrier below this strength is almost always of insufficient strength to give satisfactory reception, especially in noisy locations.

**DYNAMIC SPEAKER SPECIAL AUDIO** A full-powered electro-dynamic speaker is used to give clarity of reproduction and better articulation. The audio and the speaker circuits are especially designed to give the best reproduction of the voice frequencies. The Receiver and speaker are capable of delivering considerably greater undistorted output than is normally required.

**POWER SUPPLY** The power supply is self contained and is not polarized. The Receiver can be stalled in any car without reversing battery connection. Philco's Improved Full-wave Vibrator is used.

These models are without peer and are the best modern police Receivers obtainable. They represent the best designing, engineering and production skill in the industry.

## I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 3.)

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 1.

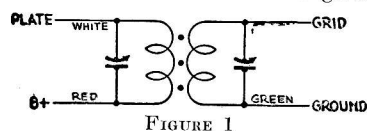


FIGURE 1

If replacements are ever necessary, replace the entire coil assembly, 32-2160 for the first I. F. stage and 32-2164 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

## ADJUSTMENTS — MODELS 811PA AND 811PB

The fixed frequency Auto Radio Receivers are identical, except for the crystals used to obtain the various oscillator frequencies.

The Receivers, when used with the proper crystals, can be adjusted for any specified frequency between the limits of 1630 K. C. and 1712 K. C. (Model 811 PA) and 2382 K. C. and 2490 K. C. (Model 811 PB). Different crystals are used to obtain these frequencies. The crystal frequency, however, is no indication of the Receiver frequency adjustment.

FREQ. OF CRYSTAL	RECEIVER FREQ.	PART NO. CRYSTAL
1908 K. C.	1630-1634-1642 1650-1658-1666 K. C.	45-2194
1953 K. C.	1674-1682-1690 1698-1706-1712 K. C.	45-2195
2658 K. C.	2382-2390-2398 2406-2414 K. C.	45-2196
2696 K. C.	2422-2430-2442 2450 K. C.	45-2197
2734 K. C.	2458-2466-2474 2482-2490 K. C.	45-2198

The I. F. frequency used in each Receiver is the difference between the frequency of the crystal in the Receiver and the frequency of the transmitter, i. e.: the transmitter frequency is 2422 K. C., the crystal used is 2696 K. C., the difference is 274 K. C., which is the frequency to which the I. F. amplifier must be tuned.

The Receivers are carefully adjusted to the required frequency at the factory and ordinarily need no readjustments except when the transmitter frequency is changed. Then the Receiver must be padded while warm.

The Receiver must be set up for operation and the volume control set at maximum. The Receiver "Q" switch must be in the off position, cutting out the carrier relay circuit. Use a quality modulated oscillator or signal generator for the test signal, with an output meter connected across the output terminals. The signal from the signal generator should be attenuated so that the output signal is just sufficient to actuate the output meter. The signal should not be strong enough to operate the automatic volume control.

I. F. STAGES — The signal generator must be set exactly on the predetermined frequency and the generator lead connected to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser. Adjust the padders 22, 24 on the second I. F. transformer for maximum output.

In a like manner, connect the signal generator lead to the grid cap of the 6A7 detector oscillator tube and adjust the padders 19 and 21 on the first I. F. transformer.

Check the adjustments of the second I. F. transformer and the first I. F. transformer.

R. F. — Tune the signal generator to the frequency of the transmitter and connect the output of the generator to the Receiver antenna lead, through a 200 mmfd. dummy antenna.

The variable condenser is locked in place with two set screws. Adjust these and tune the variable condenser to the input frequency. If the crystal oscillator circuit does not function at first, loosen the padder 13 on the oscillator section of the tuning condenser and also the series padder 17. If the oscillator output is low, it can be increased by adjusting the padder 13 for the higher frequencies and the padder 17 for the lower frequencies.

Adjust the R. F. and detector padders 6 and 10 for maximum output. If after adjusting, they are loose, back out the tuning condenser slightly — or if they are too tight, turn the condenser in slightly. Then readjust the padders.

On the Model 811PA (lower frequency band) adjust the series padder 17 for maximum output reading, and on the Model 811PB (higher frequency band) adjust the high frequency padder 13. The adjustment will not give a sharp peak, but it is possible to adjust for the maximum output. After this is obtained, back off the adjusting nut a half turn.

After completing these adjustments, recheck all the padders. This time, using a carefully calibrated signal generator, or better still, test tone from the police transmitter, connected to the Receiver antenna lead through a 200 mmfd. dummy antenna. Recheck the padders 6, 10, 13 and 17 on the gang condenser. Using the same signal, adjust the second I. F. and first I. F. padders for maximum output.

IMPORTANT — These adjustments should be repeated after the Receiver has been operated at 8 volts for approximately 8 hours.

DO NOT OPEN THE CRYSTAL HOLDER. If, for any reason whatever it has been opened, the crystal and plates should be very carefully cleaned with carbon tetrachloride. After cleaning, the crystal must not be touched by the fingers. Use a clean cloth for handling.

## ADJUSTMENTS — MODEL 811PV

The Model 811PV is a variable frequency Auto Radio Receiver with a frequency range of 1560 K. C. to 2600 K. C. The scale is calibrated only between 1575 K. C. and 1750 K. C., and between 2100 K. C. and 2500 K. C., since these are the conventional emergency police bands. The Model 811PV has an intermediate frequency of 260 K. C. and does not employ crystal control.

The Receiver must be set up for operation and the volume control set at maximum. The Receiver "Q" switch must be in the off position, cutting out the carrier relay circuit. Use a quality modulated oscillator or signal generator for the test signal, with an output meter connected across the output stage. The signal from the generator should be atten-

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uated so that the output signal is just sufficient to actuate the output meter. The signal should not be strong enough to operate the automatic volume control.

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 1.)

**I. F. STAGES** — The signal generator must be set at exactly 260 K. C. and the generator lead connected to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser. Adjust the padders 22 and 23 on the second I. F. transformer for maximum output.

In a like manner, connect the signal generator lead to the grid caps of the 6A7 detector oscillator tube and adjust the padders on the first I. F. transformer.

**R. F.** — Connect a 2600 K. C. signal to the grid of the 78 R. F. amplifier tube in series with a .1 mfd. condenser. Set the tuning condenser at minimum capacity, using a strip of bond paper as a gauge under the heel of the rotor plates.

Adjust the first detector and oscillator padders 10 and 13 for maximum output.

Reset the signal generator for a 1600 K. C. signal. Tune in the signal and roll the variable condenser while adjusting the oscillator series padder 17.

Recheck the oscillator padder adjustment at 2600 K. C. Connect the signal generator to the Receiver antenna lead, using a 200 mmfd. condenser dummy antenna and adjust the antenna padder 6 at 2600 K. C.

**IMPORTANT** — All adjustments should be repeated after the Receiver has been operated at 8 volts for approximately 8 hours.

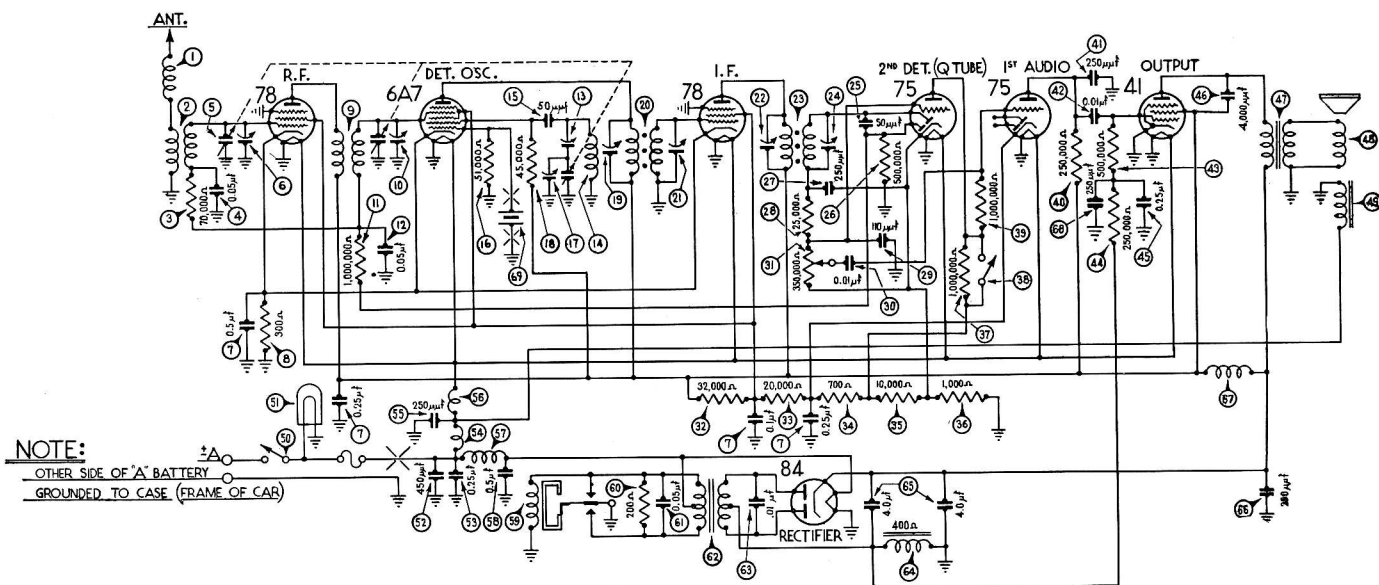


FIGURE 2 — 811 P

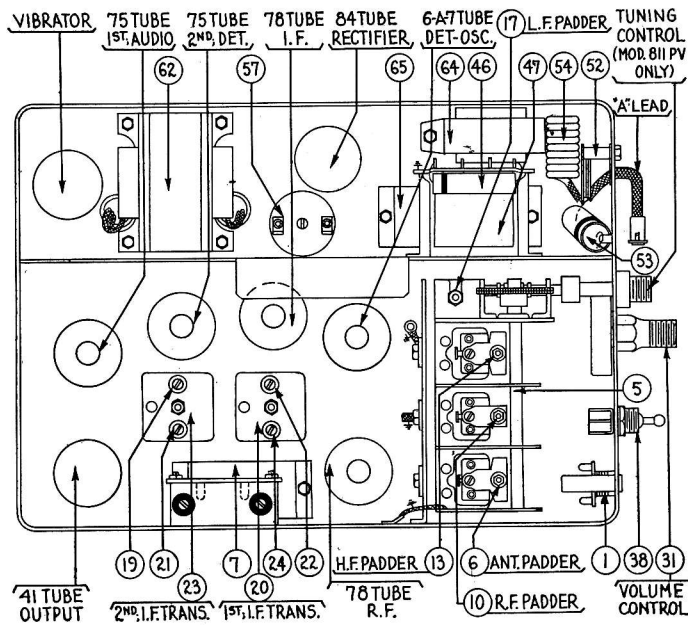


FIGURE 3 — MODELS 811 P AND 811 PV

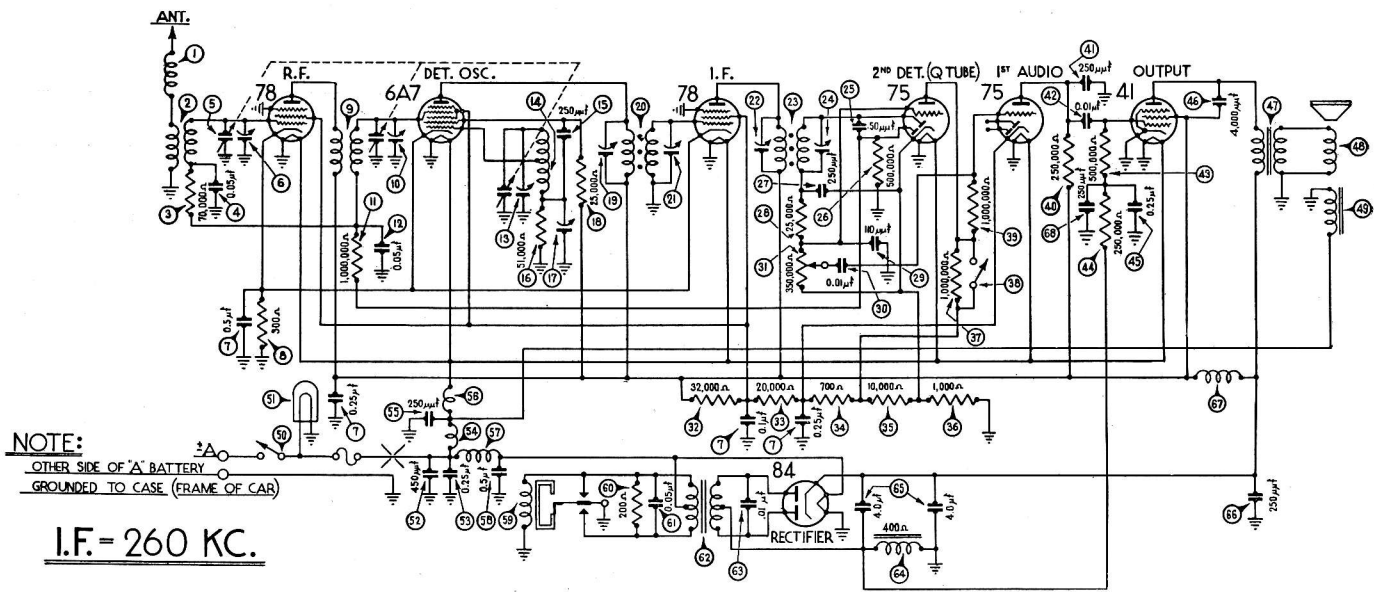


FIGURE 4 — 811 PV

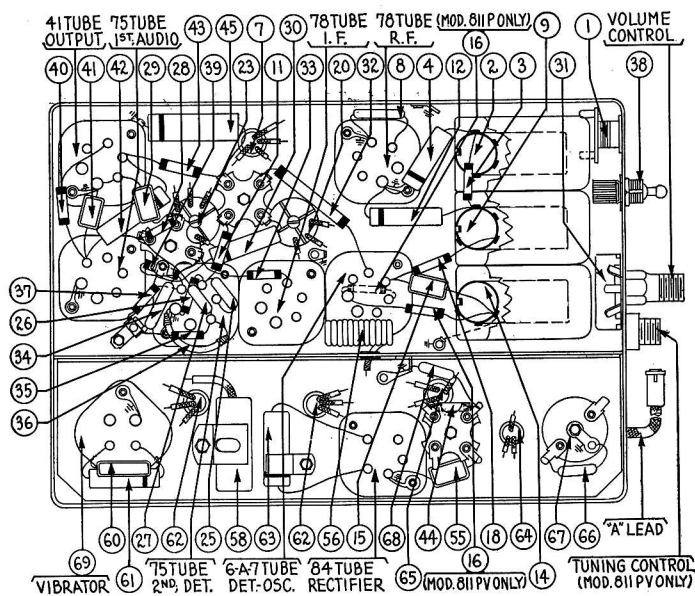


FIGURE 5 — MODELS 811P AND 811PV

PARTS LIST — MODELS 811P AND 811PV

- |  |  |  |   |
|--|--|--|---|
| ① Antenna Choke . . . . . 38-7210            | ②③ Padder (Sec. 1st I. F. Trans.)            | ④⑤ On and Off Switch (811P) 42-1188        | 2696 K. C. Crystal . . . . . 45-2197      |
| ② Antenna Transformer . . . . . 32-2111      | ④⑤ Padder (Pri. 2nd I. F. Trans.)            | ④⑥ On and Off Switch (811PV) 42-1160       | Frequencies 2422-2430-2442-               |
| ③ Resistor (70,000 ohms) . . . . . 33-370134 | ⑥ Second I. F. Transformer . . . . . 32-2164 | ④⑦ Pilot Lamp (811 PV Only) 34-2040        | 2450 K. C.                                |
| ④ Condenser (.05 mfd.) . . . . . 30-4444     | ⑦ Fadder (Sec. 2nd I. F. Trans.)             | ④⑧ Condenser (450 mmfd.) . . . . . 31-6065 | 2734 K. C. Crystal . . . . . 45-2198      |
| ⑤ Tuning Condenser (811 P.V.) 31-1831        | ⑧ Condenser (50 mmfd.) . . . . . 30-1029     | ④⑨ Condenser (25 mfd.) . . . . . 30-4446   | Frequencies 2458-2466-2474-               |
| ⑥ Tuning Condenser (811F) . . . . . 31-1872  | ⑨ Resistor (500,000 ohms) 33-449344          | ④⑩ "A" Choke . . . . . 32-1464             | 2482-2490 K. C.                           |
| ⑦ First Padder (on Tun. Cond.) . . . . .     | ⑩ Condenser (250 mmfd.) . . . . . 30-1032    | ④⑪ Condenser (250 mmfd.) . . . . . 30-1032 | Four-prong Socket . . . . . 27-6044       |
| ⑧ Condenser                                  | ⑪ Resistor (25,000 ohms) 33-325344           | ④⑫ Filament Choke . . . . . 32-1930        | Five-prong Socket . . . . . 27-6035       |
| (.1-.25-.25-.5 mfd.) . . . . . 30-4374       | ⑫ Condenser (110 mmfd.) . . . . . 30-1031    | ④⑬ Vibrator Choke . . . . . 32-1968        | Six-prong Socket . . . . . 27-6036        |
| ⑨ Resistor (300 ohms) . . . . . 33-1214      | ⑬ Condenser (.01 mfd.) . . . . . 30-4124     | ④⑭ Condenser .5 mfd.) . . . . . 30-4047    | Seven-prong Socket . . . . . 27-6037      |
| ⑩ R. F. Transformer (811P) 32-2112           | ⑭ Volume Control (350,000 ohms)              | ④⑮ Vibrator . . . . . 41-3186              | Relay Circuit Switch Plate 28-2415        |
| ⑪ R. F. Transformer (811PV) 32-2168          | . . . . . 33-5139                            | ④⑯ Resistor (200 ohms) . . . . . 33-1210   | Speaker Clamps . . . . . 29-3131          |
| ⑫ Second Padder (on Tun. Cond.)              | ⑮ Resistor (32,000 ohms) 33-332434           | ④⑰ Condenser (.05 mfd.) . . . . . 30-4444  | Control Assembly (811FV) 42-5585          |
| ⑬ First Padder (on Tun. Cond.)               | ⑯ Resistor (20,000 ohms) 33-320334           | ④⑱ Power Transformer . . . . . 32-7482     | Control Assembly (811P) . . . . . 42-5591 |
| ⑭ Oscillator Transformer (811P) 32-2131      | ⑰ Resistor (700 ohms) . . . . . 33-1220      | ④⑳ Condenser (.01 mfd.) . . . . . 30-4381  | Bracket (811PV) . . . . . 28-3711         |
| ⑮ Oscillator Transformer                     | ⑱ Resistor (10,000 ohms) 33-310134           | ④㉑ Filter Choke . . . . . 32-7491          | Scale Assembly (811PV) . . . . . 42-5590  |
| (811PV) . . . . . 32-2113                    | ⑲ Resistor (1,000 ohms) . . . . . 33-3017    | ④㉒ Filter Condenser (4-4 mfd.) 30-2145     | Tuning and Volume                         |
| ⑯ Resistor (50 mmfd.) 811P 30-1029           | ⑲ Resistor (1,000,000 ohms) 33-510344        | ④㉓ Condenser (250 mmfd.) . . . . . 30-1032 | Shaft (811FV) . . . . . 28-8595           |
| ⑰ Condenser (250 mmfd.)                      | ⑳ Resistor (250,000 ohms) 33-424344          | ④㉔ "B" Choke . . . . . 32-1932             | Volume Shaft (811P) . . . . . 28-8620     |
| (811FV) . . . . . 30-1032                    | ㉑ Condenser (250 mmfd.) . . . . . 30-1032    | ④㉕ Condenser (250 mmfd.) . . . . . 30-1032 | Tuning and Volume                         |
| ⑱ Resistor (51,000 ohms) . . . . . 33-351344 | ㉒ Condenser (.01 mfd.) . . . . . 30-4145     | ④㉖ Crystal (811P)                          | Knob (811PV) . . . . . 27-4288            |
| ⑲ Low Frequency Padder . . . . . 31-6056     | ㉒ Resistor (500,000 ohms) 33-449344          | 1908 K. C. Crystal . . . . . 45-2194       | Volume Knob (811P) . . . . . 27-4208      |
| ⑳ Resistor (25,000 ohms)                     | ㉒ Resistor (250,000 ohms) 33-424344          | Frequencies 1630-1634-1642-                | Switch Lever Knob (811PV) 27-4314         |
| (811PV) . . . . . 33-325344                  | ㉓ Condenser (250 mmfd.) . . . . . 30-1032    | 1650-1658-1666 K. C.                       | Antenna Lead Assembly . . . . . 41-3191   |
| ㉑ Resistor (45,000 ohms)                     | ㉓ Condenser (.25 mfd.) . . . . . 30-4446     | 1953 K. C. Crystal . . . . . 45-2195       | Fuse . . . . . 7227                       |
| (811P) . . . . . 33-345344                   | ㉓ Condenser (4000 mmfd.) . . . . . 30-4185   | Frequencies 1674-1682-1690-                | Fuse Insulator . . . . . 27-7729          |
| ㉒ Padder (Pri. 1st I. F. Trans.)             | ㉔ Output Transformer . . . . . 32-7495       | 1698-1706-1712 K. C.                       | Receiver Mounting Plate . . . . . 28-3086 |
| ㉒ First I. F. Transformer . . . . . 32-2160  | ㉔ Cone and Voice Coil . . . . . 36-3526      | 2658 K. C. Crystal . . . . . 45-2196       | Receiver Housing . . . . . 38-1657        |
|  | ㉔ Field Coil . . . . . 32-9236               | Frequencies 2382-2390-2398-                |   |
|  |  | 2406-2414 K. C.                            |   |

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