

# MODELS A-6B & A-6CB

## Six-Tube, Two-Band, Superheterodyne Battery Receivers

### ELECTRICAL SPECIFICATIONS

Type and Number of Radiotrons -- 1 Type - 1C6, 2 Type - 34, 1 Type 1B5, 1 Type - 30, 1 Type - 19--TOTAL-6  
Intermediate Frequency. . . . . 460 KC  
Total "A" Battery Current. . . . . 0.62 Ampere  
Maximum "B" Battery Current . . . . . 18 M.A.  
Maximum Output . . . . . 1.0 Watt

#### Frequency Ranges

Band A. . . . . 540 - 1,720 KC  
Band C. . . . . 5,600 - 18,000 KC

#### Alignment Frequencies

Band A. . . . . 600 KC(OSC.) 1,720 KC(Osc.,Ant.)  
Band C. . . . . 18,000 KC(Osc.,Ant.)

### PHYSICAL SPECIFICATIONS

	Model A6-B	Model A6C-B
Height. . . . .	19-7/16 Inches. . . . .	38 Inches
Width. . . . .	14-1/2 Inches. . . . .	24 Inches
Length. . . . .	9-15/16 Inches . . . . .	12 Inches

These six tube, battery-operated, Superheterodyne receivers provide excellent reception of standard-wave and short-wave broadcasting stations. High sensitivity, excellent selectivity, economic operation and good fidelity characterize their performance. Outstanding features include a permanent magnet, dynamic type loudspeaker two point tone control, antenna wave trap, Class "B"

output stage, vernier drive and excellent mechanical construction. The chassis is unusually accessible for repair or replacement of parts. A fuse in the "B" battery lead provides protection for the Radiotrons in event of short circuits. Figure 1 shows the schematic diagram, while Figure 2 shows the chassis wiring.

### DESCRIPTION OF ELECTRICAL CIRCUIT

The circuit is of the conventional superheterodyne type, and consists of a combined oscillator-detector stage, two i.f. amplifying stages, a combined second detector automatic volume control and audio amplifier, an audio amplification stage and a Class "B" output stage, a two pole operating switch opens the "+ A" and "+ B" battery leads when the switch is turned to the "off" position.

The signal enters the receiver through a shielded antenna lead and is applied through the wave-trap and the antenna transformer to the grid circuit of the first detector which also serves as the local oscillator for producing a signal 460 KC higher in frequency than the incoming signal. The combined signals after passing through the first detector produce the i.f. signal.

The i.f. amplifier uses two Type 34 Radiotrons in conjunction with three transformers. Two of the transformers are tuned very accurately to the i.f. frequency (460 KC) by means of suitable trimmer capacitors. The third transformer is untuned and couples the output of the second stage to the input of the second detector.

The modulated signal, as obtained from the output of the i.f. system, is detected by the diode section of the Type 1B5. The a.f. voltage appearing across the diode load resistor R-8, is selected by the variable arm of the volume control (R-8) and passed on to the a.f. system for amplification and final reproduction. The d.c. which occurs in resistor R-8 due to signal detection is used for automatic volume control by varying the control-grid bias on the first detector and i.f. tubes.

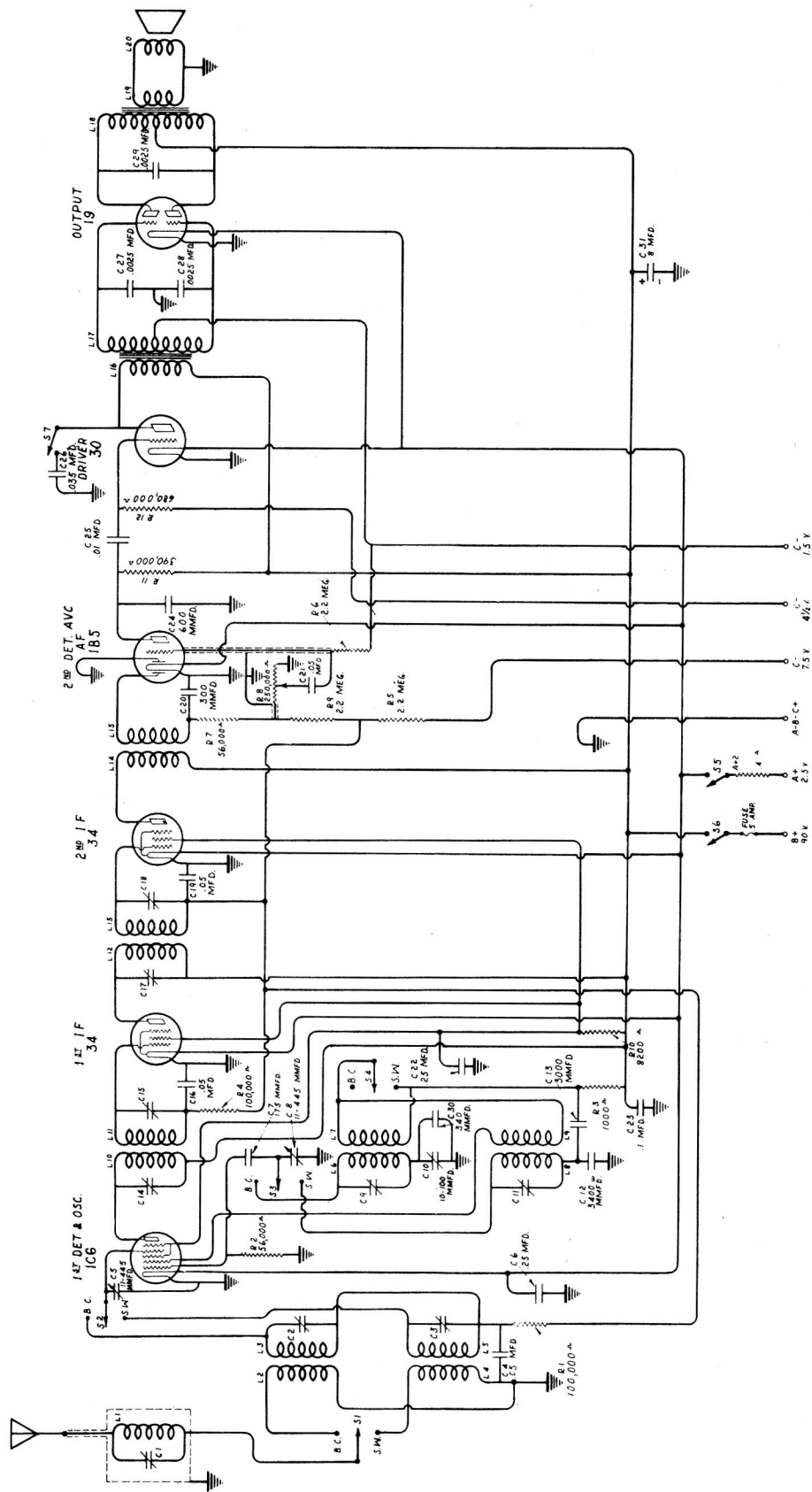


Figure 1 - Schematic Circuit Diagram



Resistance-capacitance coupling is used between the Type 1B5 and the Type 30 driver tube. A high-frequency tone control, consisting of a switch in series with a condenser, is shunted across the plate circuit of the Type 30. When this switch is closed, the high a.f. frequencies are reduced.

The output stage utilizes the twin amplifier Radiotron Type 19, which has two separate sets of elements, and eliminates the necessity of having two separate tubes for a Class "B" output

stage. The plate circuit of this tube is transformer coupled to the cone coil of the permanent magnet, dynamic loudspeaker.

Plate, grid and filament voltages are supplied by individual batteries. Provision is made by means of resistor Stock No. S-1595 in the +A lead, to operate either from a 2.5-volt "Eveready Air Cell", or from a 2-volt storage cell, the resistor is to be removed when the 2-volt storage cell is used.

## SERVICE DATA

### ALIGNMENT PROCEDURE

To properly align this receiver, it is essential that a modulated R.F. oscillator of suitable frequency range such as Stock No. 9595, an output indicator, Stock No. 4317, and an alignment tool, Stock No. 4160, be available. Figure 4 shows the location of the various line-up capacitors.

#### I-F Tuning Adjustments

The i-f amplifier comprises two stages including three transformers. The third transformer is untuned so that only a total of four circuits are to be adjusted.

Refer to Figure 4 and proceed as follows:

- (a) Short circuit the antenna and ground terminals and tune the receiver so that no signal is heard. Set the volume control at maximum and connect a ground to the ground terminal.
- (b) Connect the test oscillator output between the first detector control grid and chassis ground. Assume that a 0.1 mfd. condenser is in the oscillator output lead going to the grid, so as not to short out its grid bias. Connect the output indicator across the voice coil of the loudspeaker and adjust the oscillator output so that with the receiver volume control at maximum, a slight glow is obtained in the output indicator.
- (c) Adjust the secondary and primary of the second and then the first i.f. transformers until a maximum deflection is obtained. The third transformer is untuned and does not require adjusting. Keep the oscillator output at a low value so that only a slight glow is obtained in the output indicator at all times. Go over these adjustments a second time, as there is a slight interlocking of adjustments. This completes the i.f. alignment.
- (d) Connect Test Oscillator to antenna-ground terminals. Adjust wave trap trimmer, C-1, to give minimum receiver output.

### R-F and Oscillator Adjustments

The important points to remember are the need for using the minimum oscillator output to obtain an indication in the output device with the volume control at its maximum position and the manner of obtaining the proper high frequency oscillator and detector adjustments.

The r-f line-up capacitors are located at the bottom of the coil assemblies instead of their usual position on the gang capacitor. They are all accessible from the bottom of the chassis except the 600 KC series capacitor, which is accessible from the top of the chassis. Proceed as follows:

- (a) Connect the output of the oscillator to the antenna and ground terminals of the receiver. Check the position of the dial pointer when the tuning capacitor plates are fully meshed. It should be coincident with the radial line adjacent to the dial reading of 540.

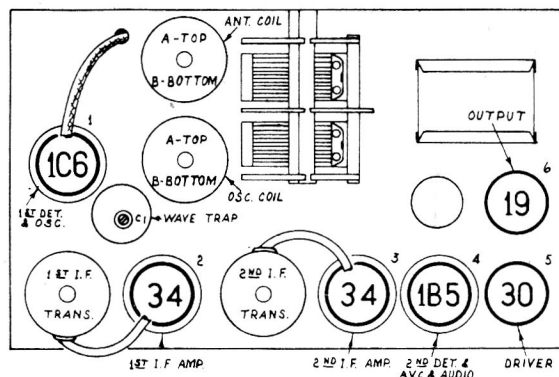


Figure 3 - RADIOTRON and COIL LOCATIONS

- (b) Then set the receiver band switch to its broadcast position, the Test Oscillator at 1720 KC and the dial pointer at 1720. Adjust the oscillator output so that a slight glow will be obtained in the output indicator when the volume control is at its maximum position. Adjust the two trimmers, C-9 and C-2 under the two r-f

Return the receiver tuning to 18,000 KC, readjust C-11 if necessary, and then tune the antenna trimmer C-3, simultaneously rocking the tuning control backward and forward through the signal, until maximum is obtained. Two positions of the trimmer may be found which give this condition - the one of maximum capacitance is correct.

- (c) Change the receiver range switch to its high frequency (short wave) position and tune the Station Selector to a dial reading of 18,000 KC. Adjust the Test Oscillator to this same frequency and regulate its output to give a slight indication on the output meter. Then adjust trimmer C-11 to the point giving maximum receiver output. Two points may be found on the trimmer, C-11, which give this maximum. The one of least capacitance is correct and should be used. To assure that this point has been used tune the receiver to a dial setting of 17,080 KC and increase the output of the Test Oscillator. The "image" of the 18,000 KC signal will be received, if the adjustment of C-11 has been properly made. No adjustments are to be made during the "image" check.

Voltage and current values indicated at the Radiotron socket contacts on Figure 4 form a reference basis for test of the receiver. It is to be noted that all voltages are given with respect to chassis-ground, excepting those appearing across the filament (F-F). The values shown are obtainable when the receiver is in normal operating condition. They do not take into account inaccuracies caused by current consumed in the voltmeter used for the test; the lower the voltmeter resistance, the lower the degree of accuracy. Allowances must therefore be made, dependent upon the type of test instrument used, for the loading effect of the voltmeter on the circuit.

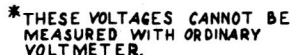


Figure 4 - Line-up Capacitor Locations and Voltage Values at Socket Contacts  
(Volume control at maximum - No Signal - 90 Volt "B" Battery - 7.5 Volt Bias Battery)

## REPLACEMENT PARTS—MODELS A-6B & A-6CB

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