MODELS A-6B & A-6CB

Six-Tube, Two-Band, Superheterodyne Battery Receivers

ELECTRICAL SPECIFICATIONS

Type and Number of Radiotrons 1 Type - 106,2 Type - 34,1 Type 1B5,1 Type - 30,1 Type - 19TOTAL-6
Intermediate Frequency
Total "A" Battery Current
Maximum "B" Battery Current
Maximum Output
Frequency Ranges Alignment Frequencies
Band A
DLIVEIC AT SPECIFIC ATIONS

PHYSICAL SPECIFICATIONS

Model A6-B

Width	19-7/16 Inches	24 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 characterise 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.

Model A6C-B

DESCRIPTION OF ELECTRICAL CIRCUIT

The circuit is of the conventional superheterodyne type, and consists of a combined oscillatordetector 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 then 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.

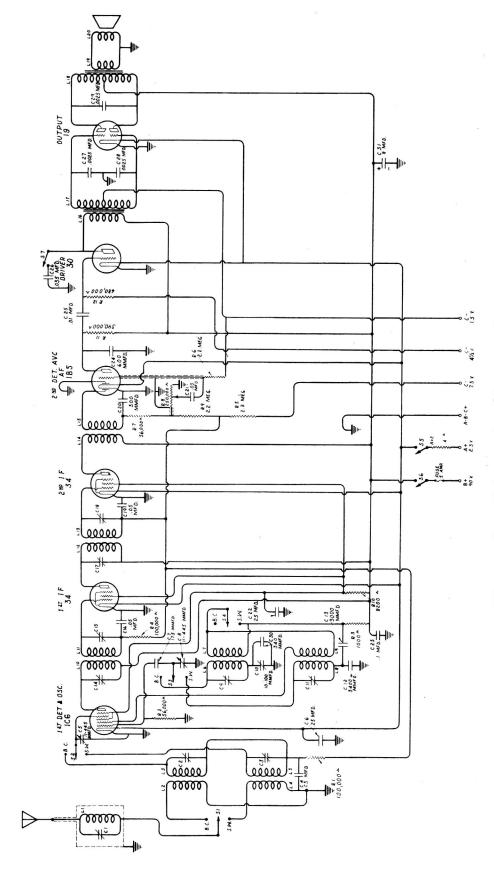


Figure 1 - Schematic Circuit Diagram

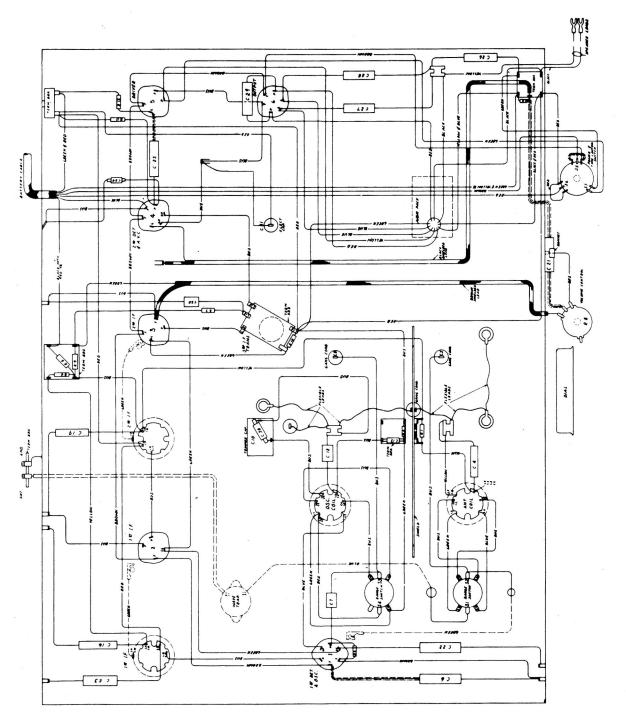


Figure 2 - Chassis Wiring Diagram.

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. Assure 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.

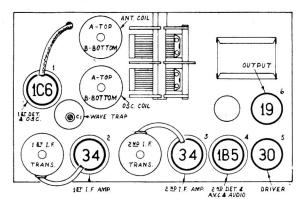


Figure 3 - RADIOTRON and COIL LOCATIONS

(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

coils, see Figure 4, until a maximum output is obtained. Then shift the Test Oscillator frequency to 600 KC. The trimmer capacitor, C-10, accessible from the top of the chassis, should now be adjusted for maximum output while rocking the main tuning capacitor back and forth through the signal. Then repeat the 1720 KC adjustment.

(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-ll to the point giving maximum receiver output. Two points may be found on the trimmer, C-ll, 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-ll has been properly made. No adjustments are to be made during the "image" check.

Return the receiver tuning to 18,000 KC, readjust C-ll 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.

Radiotron Socket Voltages

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.

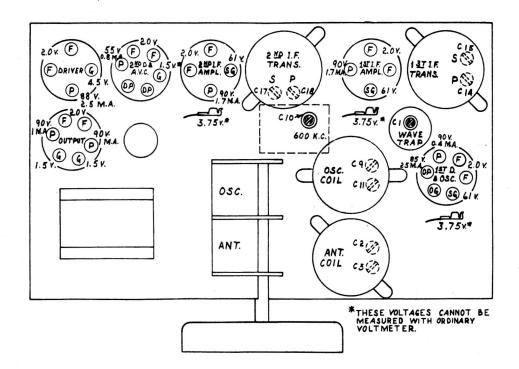


Figure 4 - Line-up Capacitor Locations and Voltage Values at Socket Contacts
(Volume control at maximum - No Signal - 90 Volt "B" Battery - 7.5 Volt Bias Battery)

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

		T	-	
STOCK NO.	Description	STOCE NO.	Description	
	RECEIVER ASSEMBLIES		DRIVE ASSEMBLIES	
4427 4244 5-1360 11623	Bracket - Volume control & tone control mounting bracket Cap - Grid contact cap - Package of 2 Capacitor - Adjustable capacitor Capacitor (C-10) Capacitor - 175 Mmfd. (C-7)	4475	Pointer - Station selector pointer (Console Model)	
S-1590 4811 S-1591 S-1589 4439 5107 4858	Capacitor - 300 Mmfd. (C-20)	S-145)	Drive - Variable tuning condenser drive assembly complete	
4518	Capacitor035 Mfd. (C-26) Capacitor05 Mfd. (C-21) Capacitor05 Mfd. (C-19,C-16,C-4) Capacitor10 Mfd. (C-23)		REPRODUCER ASSEMBLIES (Table Model)	
4791 S-1592 S-1582 5087	Capacitor10 Mfd. (C-23) Capacitor25 Mfd. (C-6,C-22) Capacitor - 8 Mfd. (C-31) Coil - Antenna coil (L-2,L-3,L-4,L-5)	9540	Magnet Assembly Comprising cone bracket, core and magnet Reproducer complete	
5089	C-2,C-3)			
4504 S-1560	condenser (C-5,C-8)	,	REPRODUCER ASSEMBLIES (Console Model)	
4519 47 30	trap circuit (L-1,C-1)		Cone - Reproducer cone (L-20) Magnet Assembly - Comprising cone bracket, core magnet and	
5029 5145	Resistor - 56,000 Ohms - Carbon Type- 1/4 Watt (R-2,R-7) Resistor -100,000 Ohms - Carbon Type- 1/4 Watt (R-1,R-4)	7819	terminal board	
S-1593	Resistor -390,000 Ohms - Carbon Type- 1/4 Watt (R-11)			
S-1594 11626	Resistor -680,000 Ohms - Carbon Type- 1/4 Watt (R-12)		MISCELLANEOUS ASSEMBLIES	
7800	1/4 Watt (R-5,R-9,R-6)		Dial - Station selector dial (Console Model)	
S-1140 3056	Shield - First detector, oscillator and second detector radiotron shield Shield - First and second intermediate frequency radiotron shield		Cable Model)	
4794	Socket - Six contact radiotron socket Socket - Four contact radiotron socket Switch - Range switch (S-1,S-2,S-3,	G-5075	Model Escutcheon - Station selector escutcheon and glass (Table	
	S-4) Switch - Operating and tone control switch (S-5,S-6,S-7)	4449	Model	
S-1576	Transformer - Audio transformer pack comprising driver and output transformer (L-16,L-17,L-18,L-19)		2 Knob - Range switch knob Knob - "off" and "on" and tone	9
S-1577	Transformer - First intermediate frequency transformer (L-10,L-11, C-14,C-15).		control knob	ž
S-1578	Transformer - Second intermediate frequency transformer (L-12,L-13, C-17,C-18)		and flexible resistor	
s-1579	Transformer - Third intermediate frequency transformer (L-14,L-15)		Resistor40 ohms - Flexible type-Filament series resistor	