INSTRUCTION MANUAL

Model 524 Beacon Receiver

Especially Designed
For Aircraft.

SIGNAL CORPS NOMENCLATURE
BC 1206CM

Manufactured by

SETCHELL CARLSON, INC.

SAINT PAUL MINNESOTA


260
MODEL 524C
SERIAL
MANUFACTURED BY
SETCHELL-CARLSON, INC
VOLUME
TUNE
PHONES

INDEX—MODEL 524 BEACON RECEIVER

ELECTRICAL SPECIFICATIONS

Tube Complement ....14H7 — RF amplifier
14J7 — Mixer
14H7 — IF amplifier
14R7 — Detector - 1st audio
28D7 — Output amplifier

Frequency Range ....195 KC to 420 KC

IF Frequency ....135 KC

Receiver Sensitivity ......3 Microvolts for 10 Milliwatts output.

Output Impedance ....300 Ohms and 4000 Ohms to be selected internally.

Power Output ....230 Milliwatts

Volume Control ....RF Gain Control

Power Supply ....24 - 28 Volts Aeroplane Battery

Current .... .75 Amperes

MECHANICAL SPECIFICATIONS

Height	4"
Width	4"
Length	6⅝"
Total Weight	3 pounds, 14 ounces

GENERAL DESCRIPTION

The 524 Receiver is a small sized, light weight aircraft receiver covering the frequencies from 195 KC to 420 KC. The use of a superheterodyne circuit provides good sensitivity with ample selectivity.

A very desirable feature is that this receiver operates directly from 28 volts which is supplied from the aeroplane battery. No vibrators, motor generators or power packs are necessary as 28 volts is all that is required for "A," "B" and "C" supply

Due to the highly efficient input circuit, the antenna capacity is not critical within wide limits.

DESCRIPTION OF ELECTRICAL CIRCUITS

A conventional superheterodyne circuit is employed in the Model 524 and is arranged so that AVC will prevent overloading on strong signals.

The manual volume control is in the cathode circuits of the RF and IF tubes and controls the gain of tho receiver.

A tuned antenna stage is fed into the first RF amplifier (14H7). This tube is coupled to the mixer tube (14J7) by a high impedance plate winding and a tuned secondary or grid winding. The oscillator section of this mixer tube is tuned by gang No. 3 in conjunction with the oscillator coil. The pentode plate of this mixer tube is connected to the primary of the first IF transformer. The tuned secondary of this transformer is connected to the grid of the IF amplifier (14H7). The plate of this tube is connected to the tuned primary of the second IF transformer. The tuned secondary is connected to the diodes of the second detector (14R7). The audio voltage developed in this detector circuit is coupled through a condenser to the grid of the pentode section of this 14R7 tube. The plate of this 14R7 is coupled through a condenser to the grids of the 28D7 output tube. The cathodes of this output tube are grounded. The proper bias voltage is supplied to the grids of this output tube through a resistor from the oscillator section of the 14J7 tube. The plates of the output tube are connected to the primary of the output transformer. This output transformer has two load impedances, namely, 300 ohms and 4000 ohms.

INSTALLATION INSTRUCTIONS

The Model 524 can be mounted in any position. A good ground is very important and a short lead from the antenna socket of the receiver to the antenna will give best reception with the least amount of interference. Do not coil or hank unused antenna lead as it may cause interference or lessen the sensitivity of the receiver.

Two common methods for mounting the receiver are described below:

First, the front panel construction of this receiver is arranged so that it may be mounted in a standard 3⅛-inch instrument mounting hole. The mounting screws for installation are the four screws located in the front panel of the receiver.

Second, a metal strap of sufficient length should be drawn tightly around the receiver case and fastened securely in the location desired. All tubes are of the indirect heated type and of loctal design and will stand much shock and vibration without endangering their life, therefore shock mounting is ordinarily not required.

ELECTRICAL CONNECTIONS

The ground lead, which is the short black lead, should be connected to the metal structure of the plane. It is important that the negative terminal of the 28-volt plane battery be grounded. This ground lead should be kept as short as possible in order to keep ignition and generator interference to a minimum.

The power lead, which is the longer lead wire, should be connected to the fused positive side of the aeroplane battery. To further assist in the elimination of ignition and generator interference, it is advisable to keep this power lead at maximum distances from the unshielded antenna lead as interference carried back on this lead can radiate to the antenna lead. The antenna lead should be plugged into the receiver and connected to the antenna via the shortest route. Unused antenna lead should be cut off for best reception.

OUTPUT IMPEDANCE ADJUSTMENT

The receiver audio output impedance can be either 300 ohms or 4000 ohms, depending on the internal wiring to the output transformer. ALL RECEIVERS LEAVE THE FACTORY CONNECTED FOR 300 OHMS.

ALIGNMENT PROCEDURE

Adjustment	Connecting Point for Test Oscillator	Alignment Frequency	Dummy Antenna in Series with Test Oscillator
IF Trans.	Mixer Grid Gang No. 2	135 KC	100 Mmfd.
Antenna, RF and Oscillator Trimmers	Antenna Jack	400 KC	100 Mmfd.
Oscillator Padder	Antenna Jack	210 KC	100 Mmfd.

PARTS LIST — MODEL 524

Circuit Reference	Description	Value	Tolerance	Rating
	Resistor	25,000 Ohms	10%	1/5 W.
R	Resistor	1 Megohm	10%	1/5 W.
R4	Resistor	½ Megohm	10%	1/5 W.
R5	Resistor	½ Megohm	10%	1/5 W.
R6	Resistor	2 Megohms	10%	1/5 W.
R8	Resistor	½ Megohm	10%	1/5 W.
R9	Resistor	75,000 Ohms	10%	1/5 W.
R10	Resistor	100,000 Ohms	10%	1/5 W.
R11	Resistor	200,000 Ohms	10%	1/5 W.
R12	Resistor	200,000 Ohms	10%	1/5 W.
VR1	Variable Resistor	100,000 Ohms	20%	1 W.
C1	Condenser	.05 mfd.	20%	200 V.
C2	Condenser	.25 mfd.	20%	200 V.
C3	Condenser (Padder)	300 to 650 mmfd.		400 V.
C4	Condenser	.05 mfd.	20%	200 V.
C5	Condenser (Mica)	.00025 mfd.	10%	400 V.
C6	Condenser (Mica)	.0001 mfd.	10%	400 V.
C7	Condenser	.006 mfd.	20%	400 V.
C8	Condenser	.006 mfd.	20%	400 V.
C9	Condenser	.006 mfd.	20%	400 V.
C10	Condenser	.5 mfd.	20%	200 V.
C12	Condenser (Mica)	.00025 mfd.	10%	400 V.
C13	Condenser	.05 mfd.	20%	200 V.
C14	Condenser (Elect.)	20 mfd.	—20%, +100%	150 WV.
VC1	3-Gang Variable Condenser			
L1	Antenna Coil	L1 and L2 Combined is the AB-501 Assembly		
L2	R.F. Coil			
L3	Oscillator Coil	L3 and C3 Combined is the CC-501 Assembly		
L4	I.F. Coil	Double Tuned 135 K.C.		
L5	I.F. Coil	Double Tuned 135 K.C.		
L6	Iron Core Choke Coil	Plate Supply Filter		
T6	Output Transformer	300 ohm and 4000 ohm secondary		
CH2	Air Core Choke Coil	No. 16 Wire		
J2	Phone Jack	Accommodates Single Circuit Plug		
J3	Antenna Connector	Accommodates Bayonnet Plug		
SW1	Off-On Switch	SPST—Mounted on VR1		

Schematic Diagram Model 524

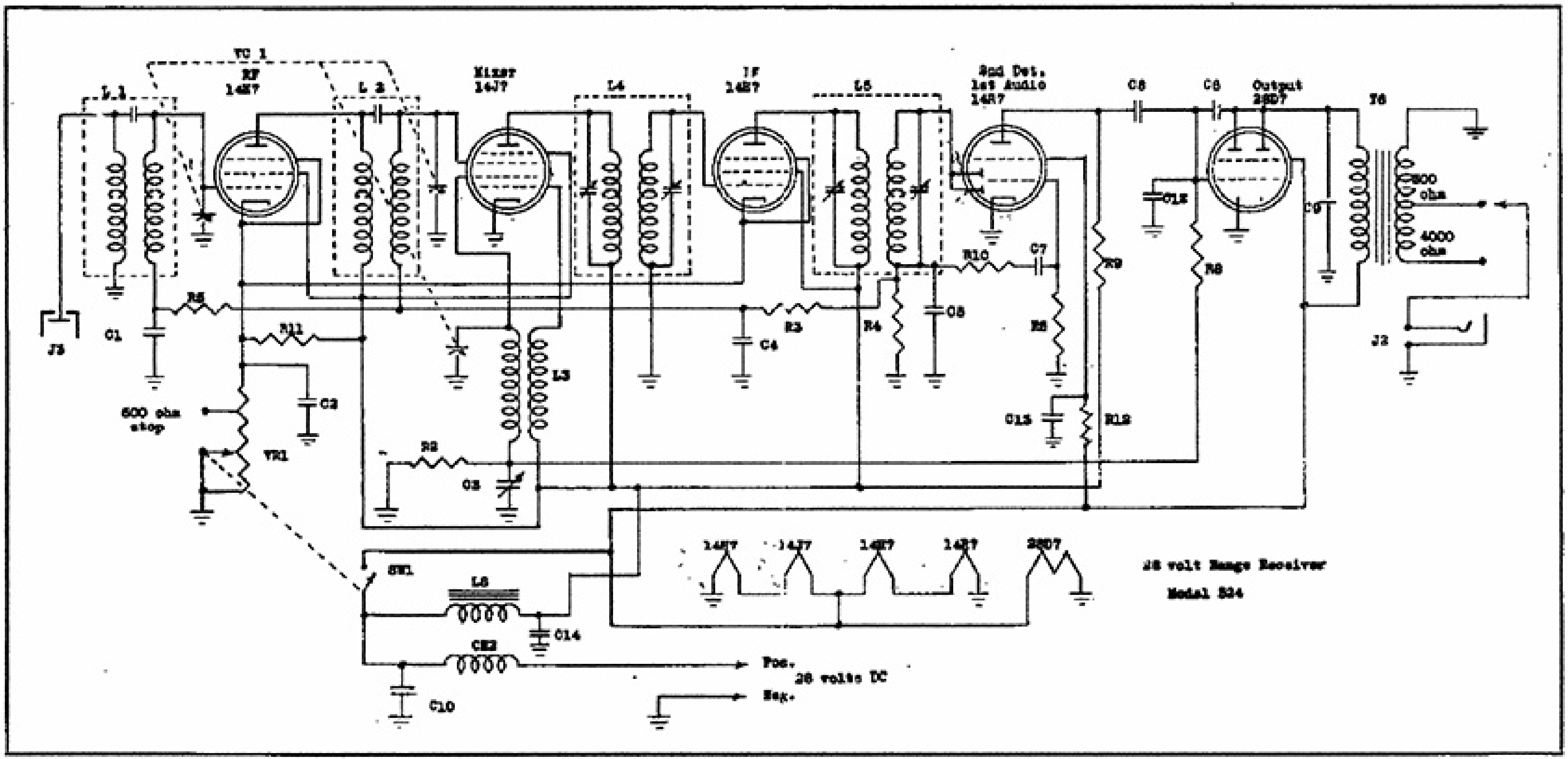
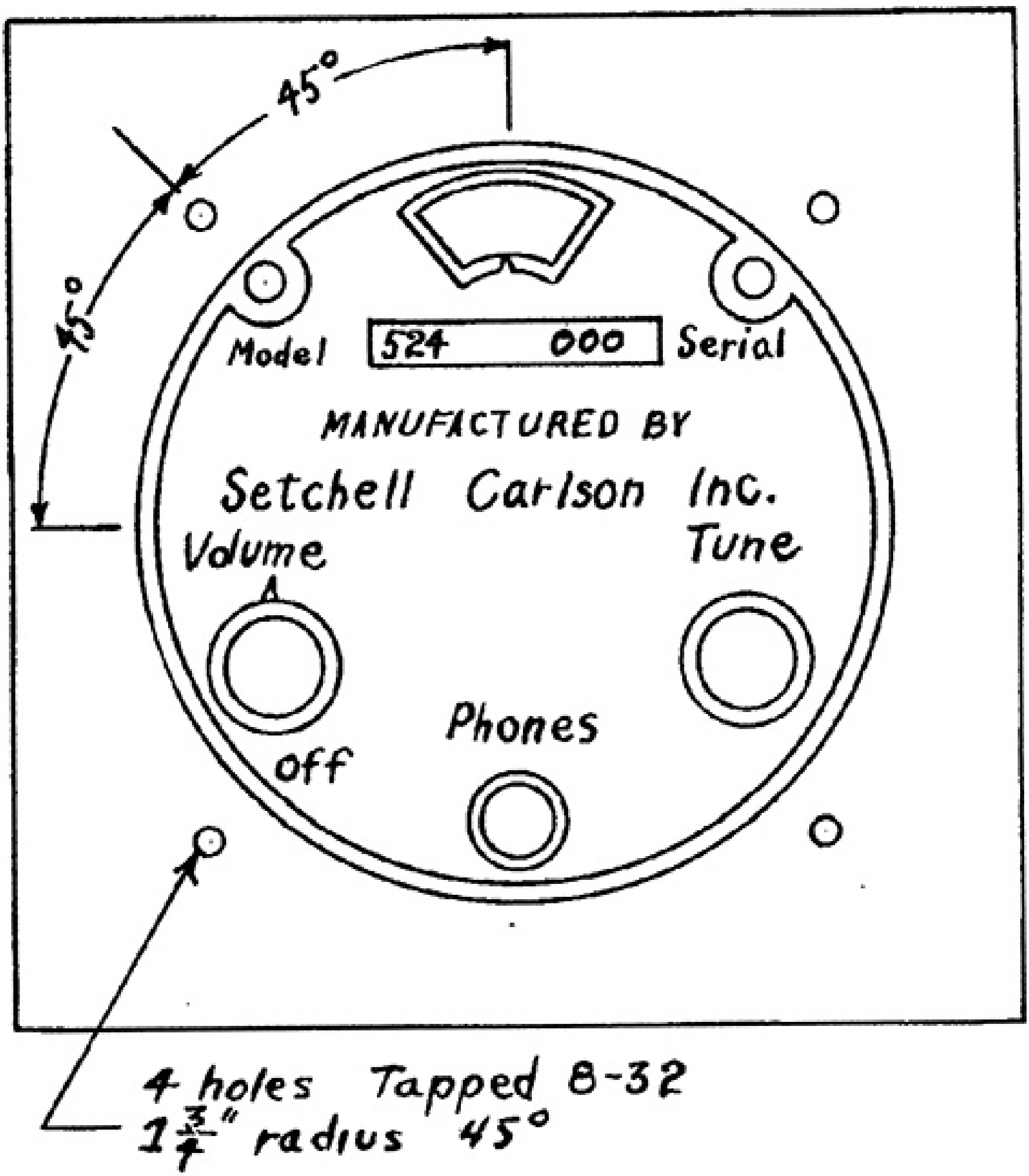
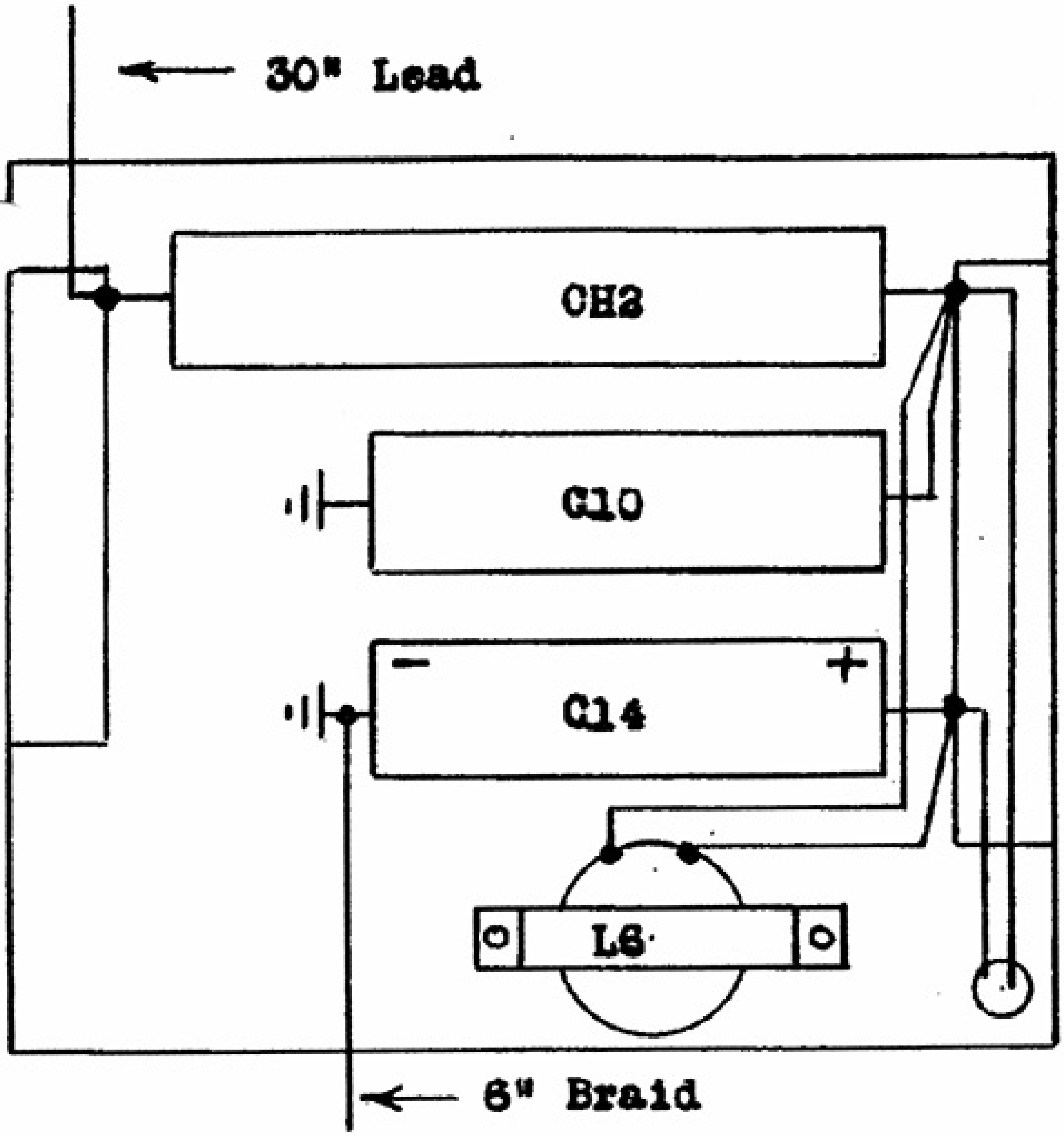


Figure 1



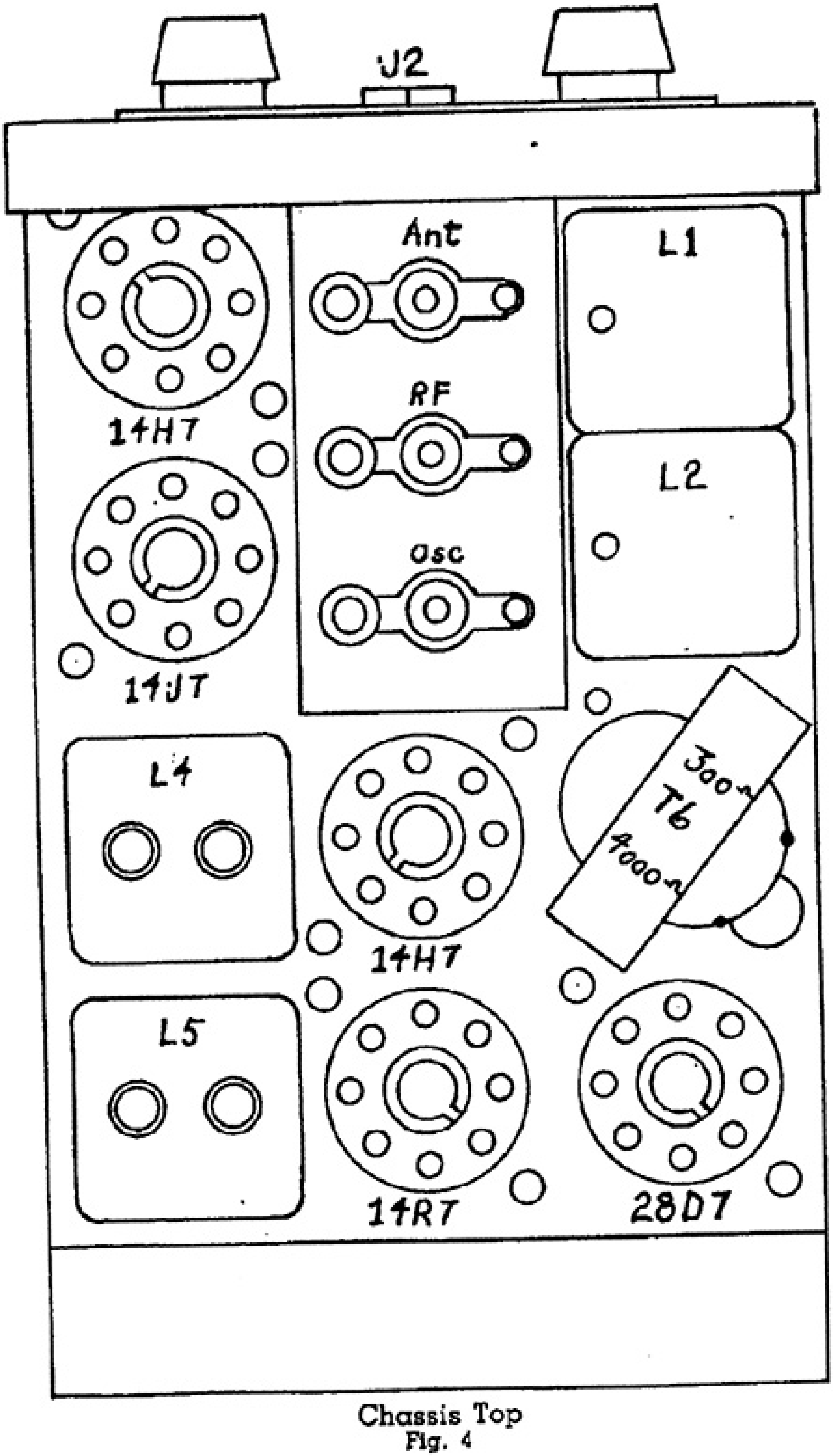
Front Panel

Fig. 2

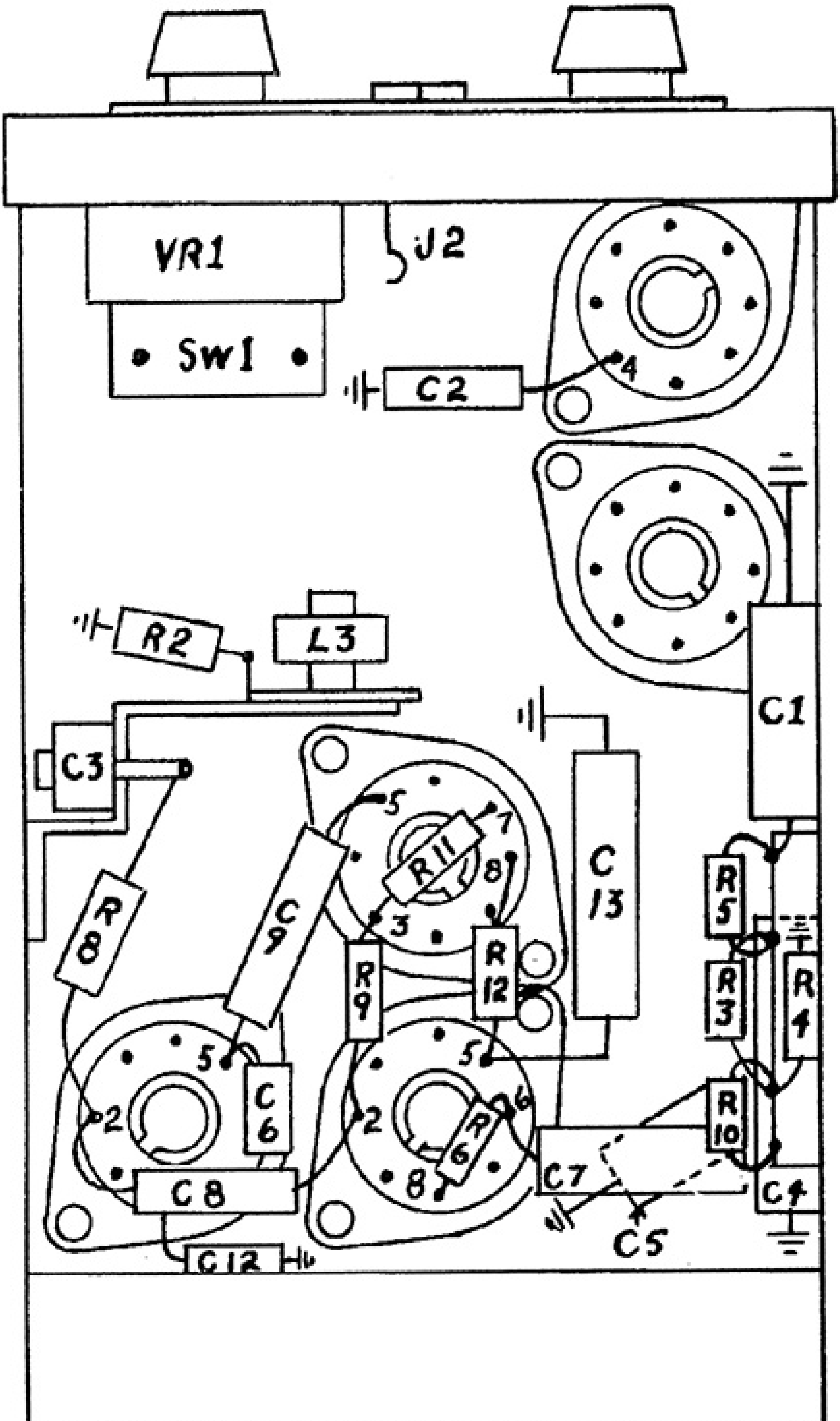


Chassis Back

Fig. 3



Chassis Top
Fig. 4



Chassis Bottom

Fig. 5