

INSTRUCTION MANUAL

Model 590 Aircraft Receiver
and
Model 24 - ABC - Power Supply

Manufactured by
SETCHELL CARLSON, INC.

SAINT PAUL

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MINNESOTA

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A.R.A.C.C.M.A

INTRODUCTION

MODEL 590 RECEIVER

ELECTRICAL SPECIFICATIONS

A.R.A.C.C.M.A

Tube Complement1LN5 — RF amplifier
1LA6 — Mixer
1LN5 — IF amplifier
1LH4 — Detector - 1st audio
3LF4 — Output amplifier

Frequency Range195 KC to 420 KC

IF Frequency135 KC

Receiver Sensitivity3 Microvolts for 10 Milliwatts output.

Outer Impedance300 Ohms and 4000 Ohms to be select-
ed internally.

Power Output110 Milliwatts

Volume ControlRF Gain Control

Power SupplyABC Pack

Power Supply

Voltage and Drain.....A — 1½ volts .3 Ampere
B — 67½ volts 5 Milliampere
C — 6 volts Negative

MECHANICAL SPECIFICATIONS

Height	4"
Width	4"
Depth	5 ⁵ / ₈ "
Total Weight	3 pounds, 8 ounces

GENERAL DESCRIPTION

The 590 Receiver is a small size, light weight aircraft receiver covering the frequency range from 195 to 420 KC (beacon and weather band). The use of a superheterodyne circuit provides good sensitivity and ample selectivity. Due to the special design of the input circuit of this receiver, the capacity of the antenna employed is not critical within wide limits.

DESCRIPTION OF ELECTRICAL CIRCUITS

A conventional superheterodyne circuit is employed in the 590 receiver, using a total of five tubes. A tuned antenna stage feeds into an RF amplifier (1LN5). This tube is coupled to the mixer tube (1LA6) by a high impedance plate winding and a tuned secondary or grid winding. The oscillator section of this 1LA6 mixer tube is tuned by gang No. 3 in conjunction with an oscillator coil. The pentode plate of this 1LA6 is connected to the first IF transformer. The secondary of this IF transformer is connected to the grid of the IF amplifier 1LN5. The plate of this IF amplifier is connected to the primary of the second IF coil. The secondary of this coil is connected to the diode of the 1LH4. The audio voltage developed in this detector circuit 1LH4 is coupled through an .01 condenser to the grid of the triode section of the 1LH4. The plate of the 1LH4 is connected through an .01 coupling condenser to the grid of the 3LF4 output tube. The plate of the 3LF4 is connected to the primary of the output

transformer. The secondary of this output transformer is tapped to provide two output impedances, 300 ohms and 4000 ohms.

The receiver is designed to operate on $67\frac{1}{2}$ volts of B, $1\frac{1}{2}$ volts of A and negative 6 volts C. Satisfactory performance can be had with B voltage as low as 45 volts by reducing the C voltage to $4\frac{1}{2}$ volts. The maximum B voltage permissible is 90 volts with a negative 9 C voltage.

INSTALLATION INSTRUCTIONS

There are a number of ways of mounting this equipment in an airplane.

Two of the most commonly used methods are described below.

1. The front panel construction of the unit is such that the receiver may be mounted in a standard $3\frac{1}{8}$ " instrument mounting hole.
2. Wherever mounting method No. 1 cannot be utilized, a strap mounting may be employed. A metal strap of sufficient strength should be tightly drawn around the receiver case and fastened to the airplane.

Shockmounting is ordinarily not required for this receiver. There are only a few external connections required to this equipment.

1. The ground lead, which is attached to the rear of the case, shall be bonded to the airplane structure in such a manner that a good, low resistance ground connection is obtained. This connection shall be kept as short as practical and shall not exceed 6 inches, if possible.
2. The battery cable should be routed to the pack location and connected as follows:

Yellow.....+A - 1½ volts
Black.....—A - 1½ volts
Red.....+B - 67½ volts, 90 volts max.
Blue.....—C - —6 volts, —9 volts max.

3. A short connection shall be made from the antenna to the antenna socket located on side near front. A length of wire attached to a plug-in antenna connector is furnished with the equipment.

OUTPUT IMPEDANCE ADJUSTMENT

The receiver audio output is either 300 Ohms or 4000 Ohms, depending on the internal wiring of the output transformer. Either 300 Ohms or 4000 Ohms can be selected by connecting to terminal marked "300 or 4000 Ohms."

All receivers leaving factory are connected for 300 Ohms output.

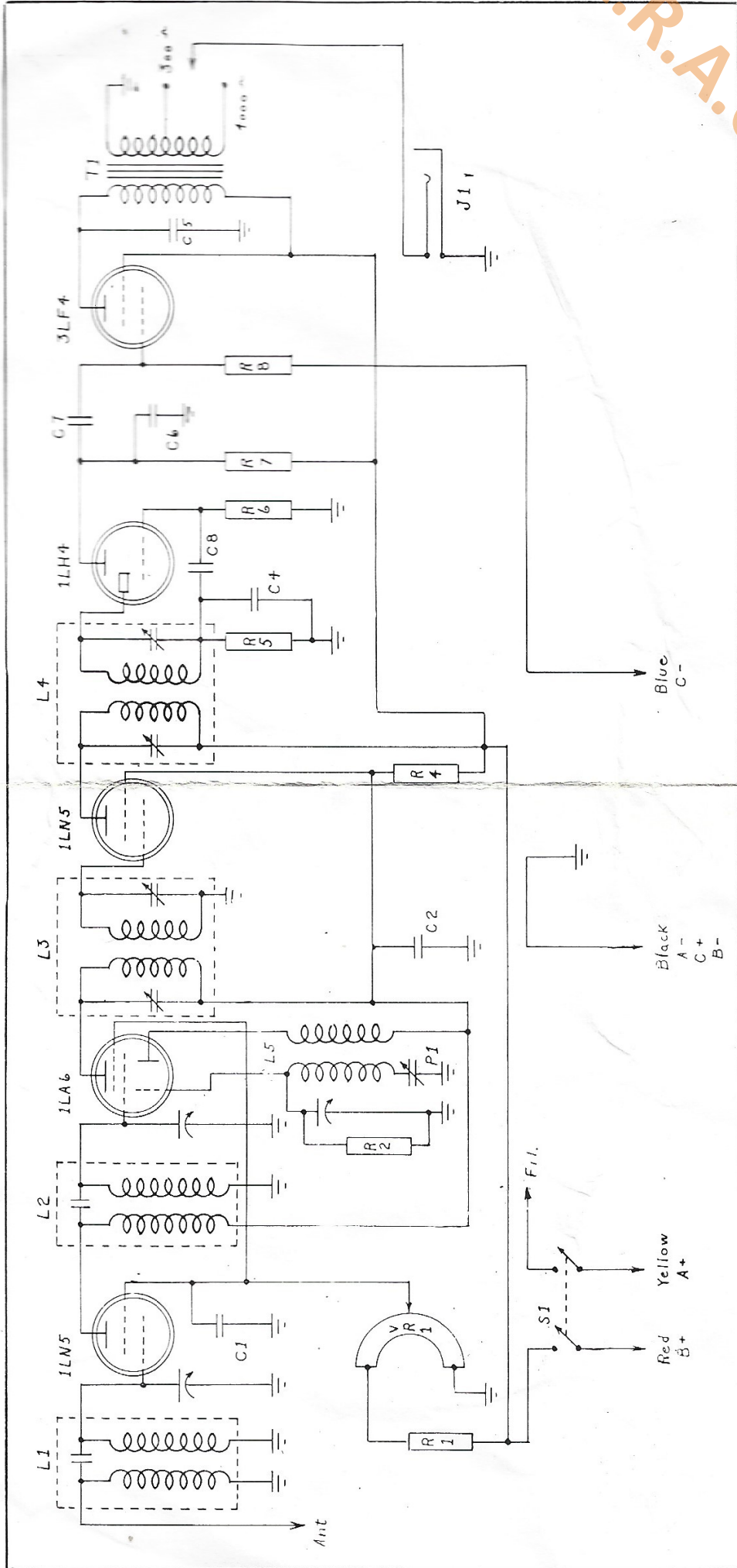
ALIGNMENT PROCEDURE

Adjustment	Connecting Point for Test Oscillator	Alignment Frequency	Dummy Antenna in Series with Test Oscillator
IF Trans.	Osc. Grid Gang No. 3	135 KC	Direct
Antenna, RF and Oscillator Trimmers	Antenna Terminal	400 KC	50 Mmfd.
Oscillator Padder	Antenna Terminal	210 KC	50 Mmfd.

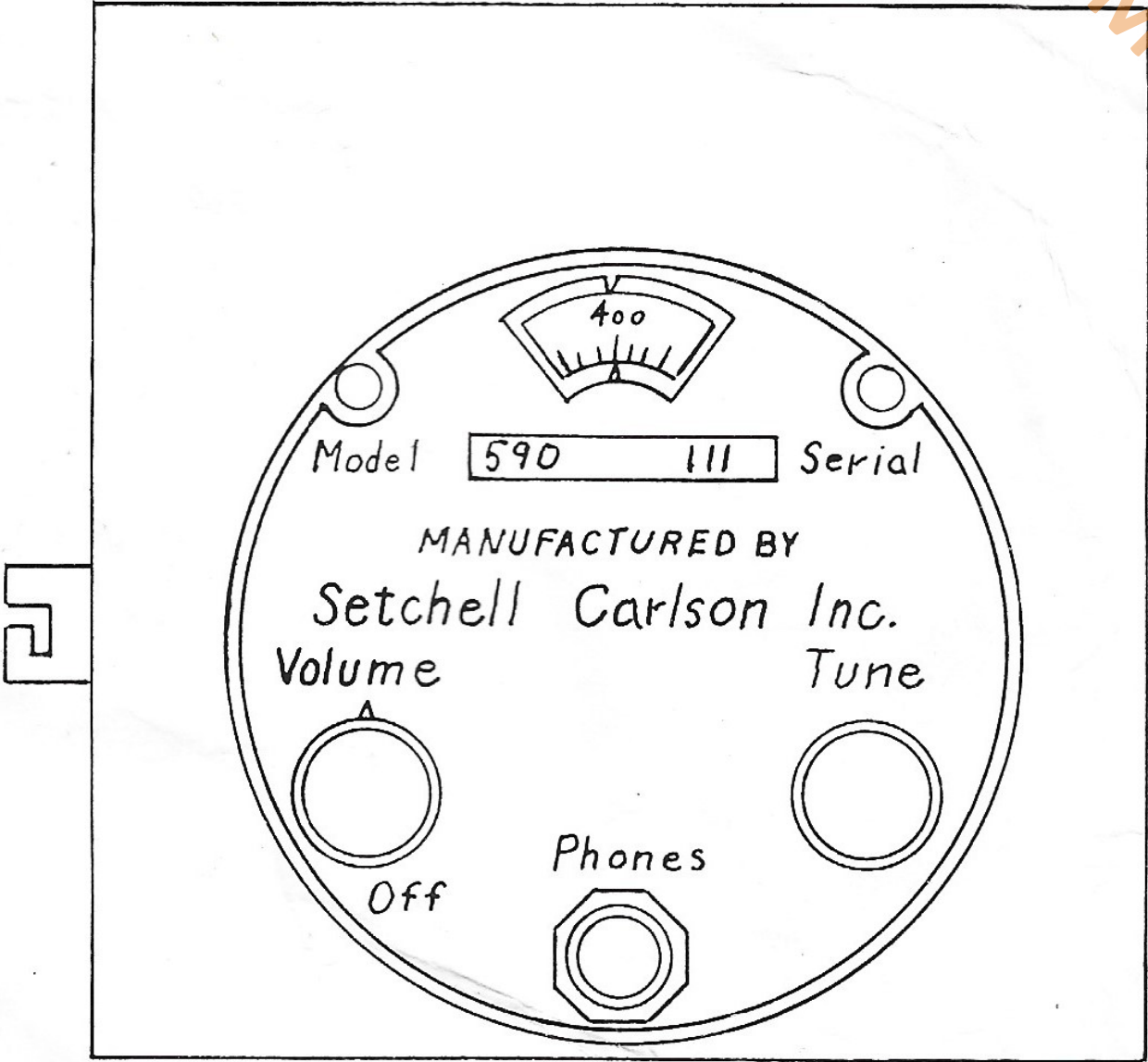
PARTS LIST — MODEL 590

Circuit Reference	Description	Value	Rating
R1	Resistor	25,000 Ohms	1/2 W
R2	Resistor	200,000 Ohms	1/3 W
R4	Resistor	3,000 Ohms	1/2 W
R5	Resistor	500,000 Ohms	1/3 W
R6	Resistor	1 Meg. Ohms	1/3 W
R7	Resistor	1 Meg. Ohms	1/3 W
R8	Resistor	2 Meg. Ohms	1/3 W
VR1	Potentiometer	100,000 Ohms	
P1	No. 650-8 plate padder		
C1	Condenser	.05 mfd.	200 V
C2	Condenser	.05 mfd.	200 V
C4	Condenser	.00025 mfd.	Mica
C5	Condenser	.001 mfd.	400 V
C6	Condenser	.0001 mfd.	Mica
C7	Condenser	.01 mfd.	400 V
C8	Condenser	.01 mfd.	400 V
J1	Phone Jack		
S1	Off-On DPST Switch		
L1	Antenna coil		
L2	RF coil		
L3	IF coil - 135 KC		
L4	IF coil - 135 KC		
L5	Oscillator coil		
T1	Output transformer		

Schematic Diagram Model 590



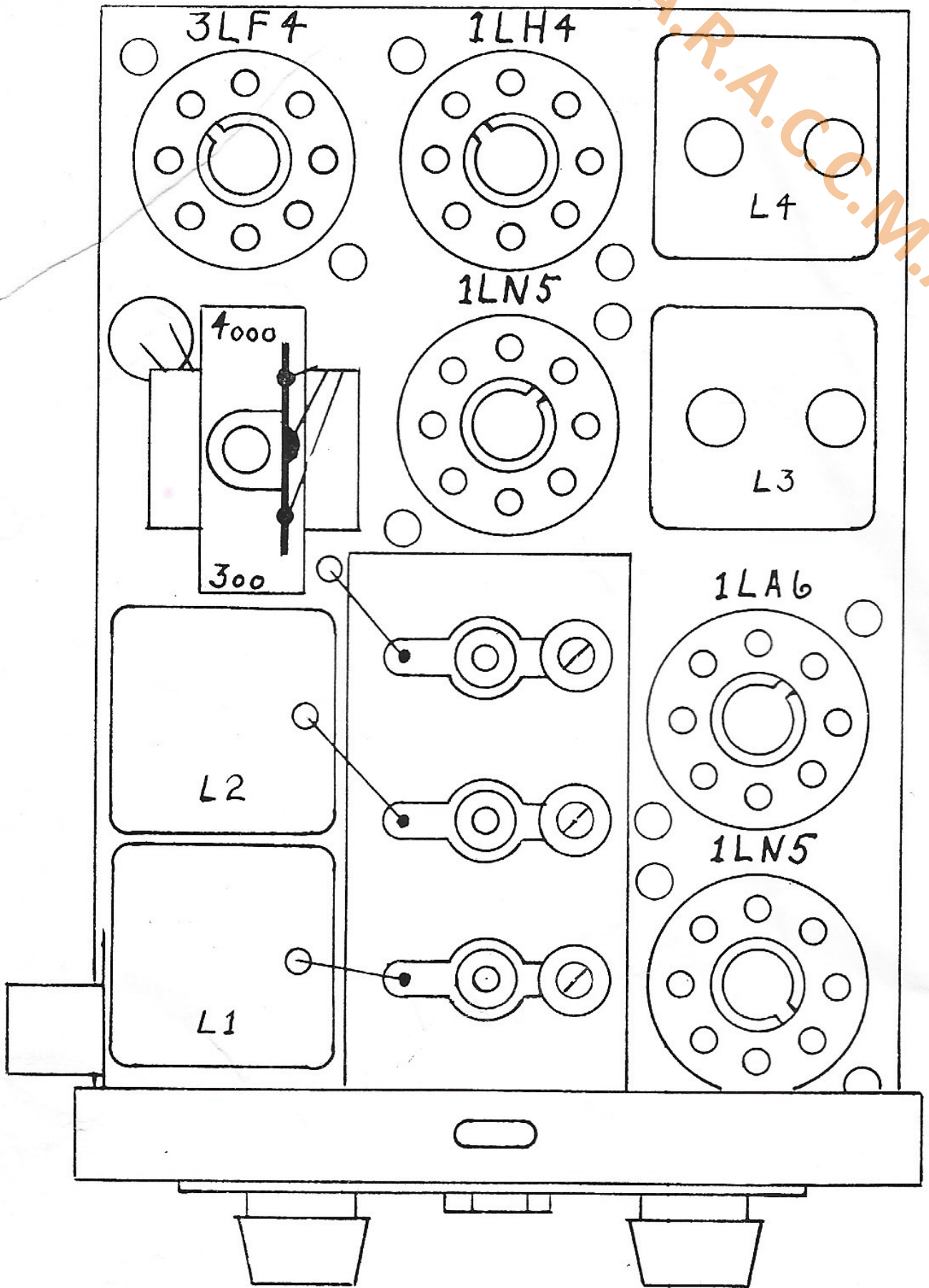
A.R.A.C.C.M.A



Front

Drawing No. 1

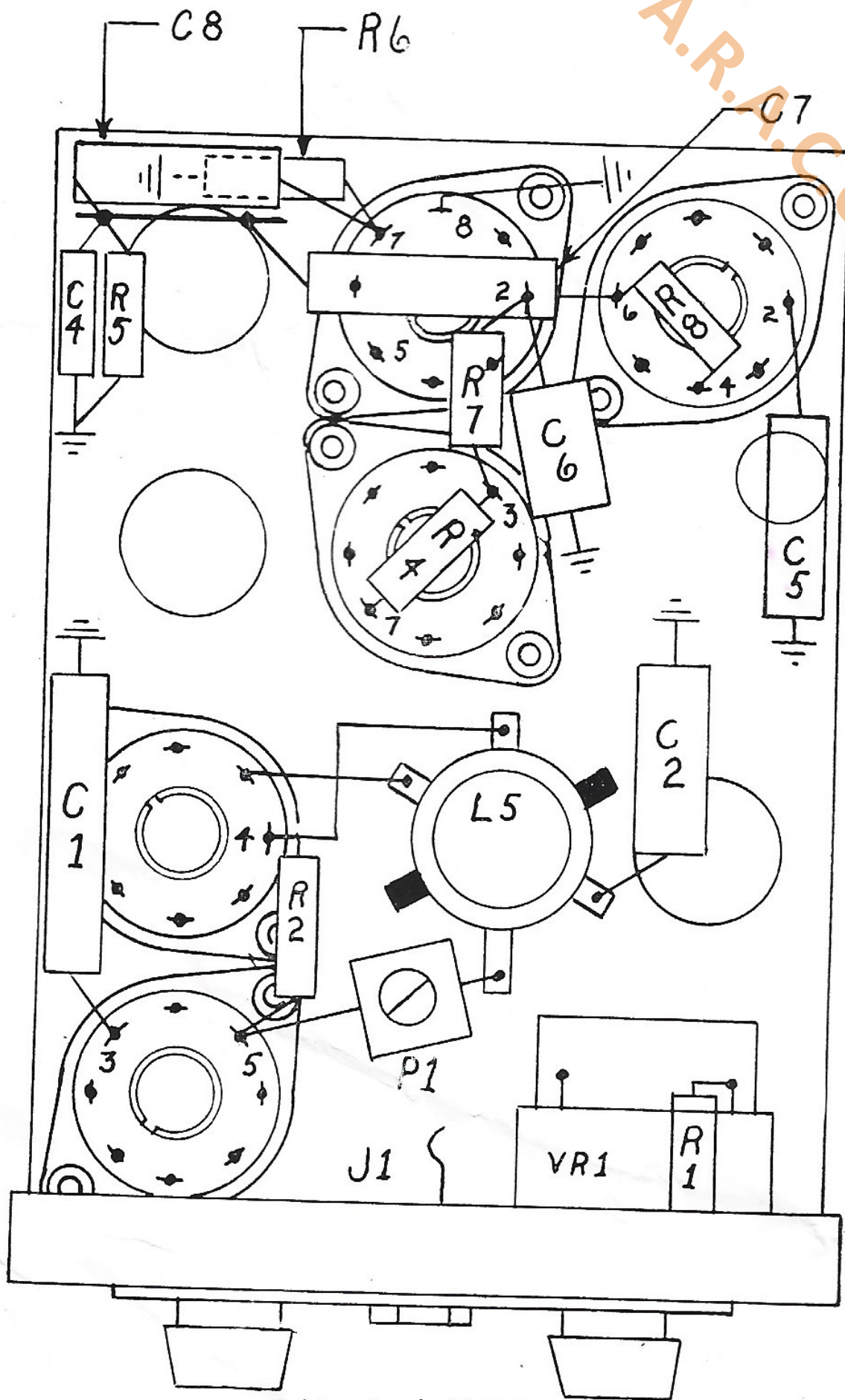
ARACOMA



Model-590

Top

Drawing No. 2



Model-590

Bottom

Drawing No. 3

A.R.A.C.C.M.A

INTRODUCTION

MODEL 24 POWER SUPPLY

ELECTRICAL SPECIFICATIONS

The model 24 ABC Power Supply is designed to operate from a 24-volt DC source. It will operate normally over a voltage range of from 22 to 28 volts. The unit delivers approximately 80 volts of B, 7 volts of C and $1\frac{1}{2}$ volts of A. It is designed to operate a receiver that requires approximately 6 milliamperes of B current, 300 milliamperes of A current and, of course, a negligible drain of C voltage. The input current at 24 volts is .8 ampere with the receiver gain on full.

The circuit employed uses a full wave primary type vibrator and a full wave heater type rectifier tube. The negative B is returned to negative A through a 5000-ohm resistor. A voltage dividing resistor is used across the 5000-ohm resistor to produce the correct negative C voltage.

MECHANICAL SPECIFICATIONS

The model 24 ABC Power Supply is built very sturdy and will withstand a great amount of vibration. The vibrator is held in place by a rubber bumper located on the top cover. The rectifier tube, being a loctal type, insures against the tube jumping out of the socket.

The size of the unit is:

Width	3-15/16"
Depth	3-15/16"
Height	6-3/4"

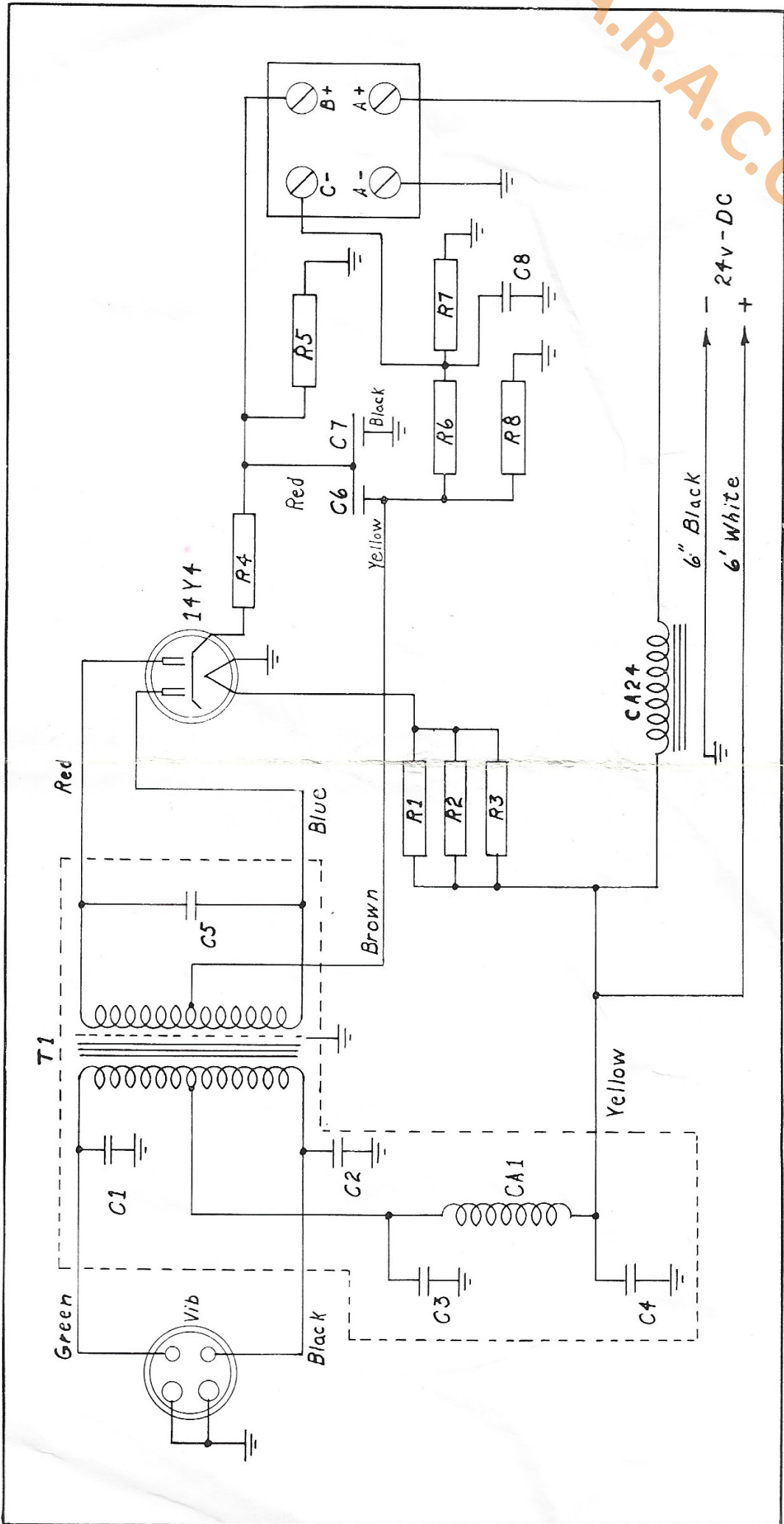
INSTALLATION INSTRUCTIONS

The model 24 Power Supply should be located so that the 4-conductor cable from the receiver can be connected to the four terminals marked A+, A-, B+, and C-. The short black lead should be connected to ground or the negative side of the 24-volt supply. The 6-foot white lead should be routed and connected to a conveniently located off-on switch, which in turn should be connected to the fused hot side or positive 24-volt source. This switch should be used to turn the receiver off and on, making the off-on switch of the receiver unnecessary—and definitely not to be used as the main off-on control.

PARTS LIST — MODEL 24 ABC POWER SUPPLY

Circuit Reference	Description	Value	Rating
R1	Resistor	130 Ohms	2 W
R2	Resistor	130 Ohms	2 W
R3	Resistor	130 Ohms	2 W
R4	Resistor	5,000 Ohms	1/2 W
R5	Resistor	50,000 Ohms	1/2 W
R6	Resistor	1 Meg. Ohms	1/3 W
R7	Resistor	200,000 Ohms	1/3 W
R8	Resistor	5,000 Ohms	1/2 W
C1	Condenser	.05 mfd.	200 V
C2	Condenser	.05 mfd.	200 V
C3	Condenser	.5 mfd.	200 V
C4	Condenser	.25 mfd.	200 V
C5	Condenser	.006 mfd.	1600 V
C6	Condenser	16 mfd.	350 V
C7	Condenser	8 mfd.	350 V
C8	Condenser	.05 mfd.	200 V
T1	24 V Power Tr.		
CA1	A Choke		
CA24	Iron Core A Choke		
Vib.	No. 2440 ATR Vib.		

Schematic Diagram Model 24



A.R.A.C.C.M.A