

# **SEEBURG**

**TORMAT SELECTOR RECEIVER**

**Types**

**TSR6 / TSR7**

# SEEBURG

## TORMAT SELECTION RECEIVER

### TYPE TSR6

The Tormat Selection Receiver, Type TSR6 is the power distribution and control center for operation of the Select-O-Matic mechanism and the Tormat Memory System from the Electrical Selector at the phonograph or by remote control with 3-wire, Wall-O-Matics. Power enters the Receiver through the line cord and main switch and is distributed, at 117 volts or through transformers, to the Electrical Selector, the Select-O-Matic Mechanism, cabinet lighting, program selector, amplifier and the Wall-O-Matics. All connections to the Receiver are made with plugs and connectors of different types and sizes to avoid possibility of incorrect connections.

Included in the Receiver are a Step Switch and Relay Assembly and a pulse amplifier unit. The Step Switch and Relay Assembly and a 2050 thyratron, V504, are for step relay operation for selection from the Wall-O-Matics. The pulse amplifier includes a 12AX7 tube, V501, that amplifies the trip signal from the output loop of the Tormat Memory Unit on the

Select-O-Matic Mechanism. The pulse from the 12AX7 tube controls a 2050 thyratron, V502, which in turn passes current for operation of the trip solenoid of the Select-O-Matic mechanism.

A 6X4 rectifier tube, V503, supplies ground-positive plate power for the 12AX7 pulse amplifier and, with two OA2 regulator tubes, regulated voltage supply for charging condensers from which are taken power for the write-in and read-out pulses to the Tormat Memory Unit.

A full wave selenium rectifier supplies d. c. at approximately 25 volts for some of the relays of the Step Switch Assembly and a timing relay in the Pricing Unit in the phonograph and for grid bias of the 2050 tubes for the trip solenoid and step relays.

All of the mechanism control circuits, plate and bias supplies and tube heater circuits are supplied from the multiple-secondary transformer, T501.

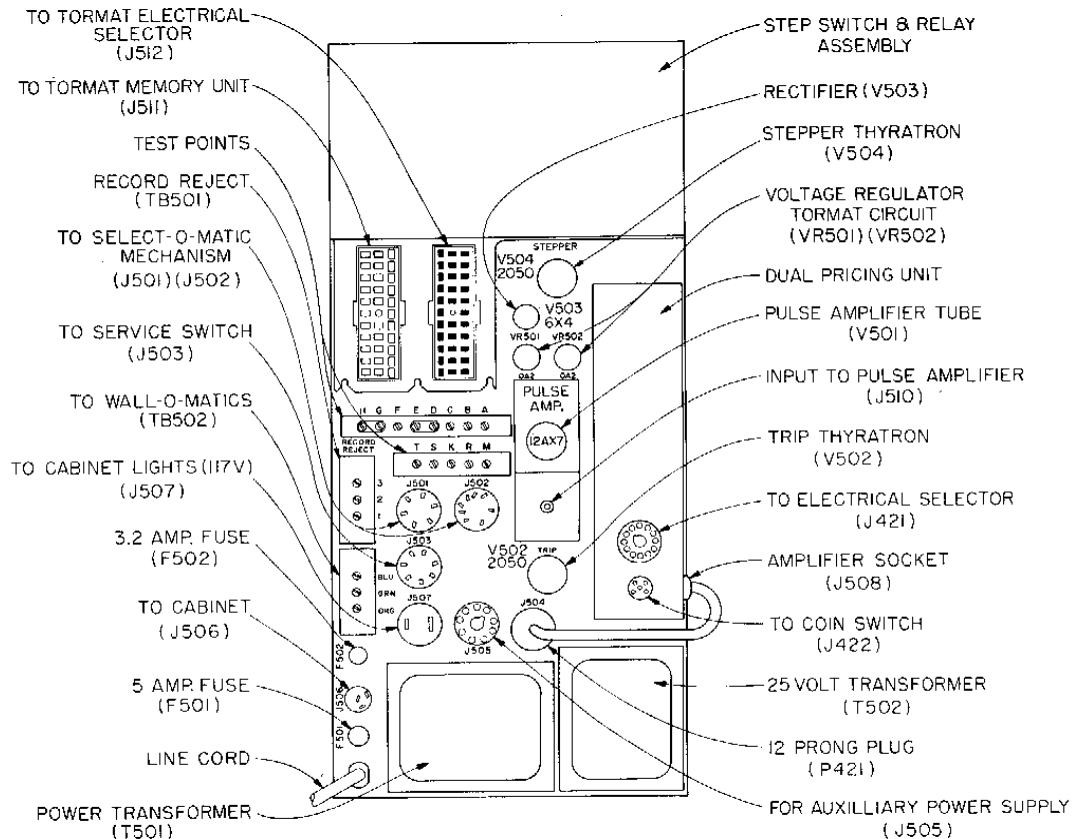
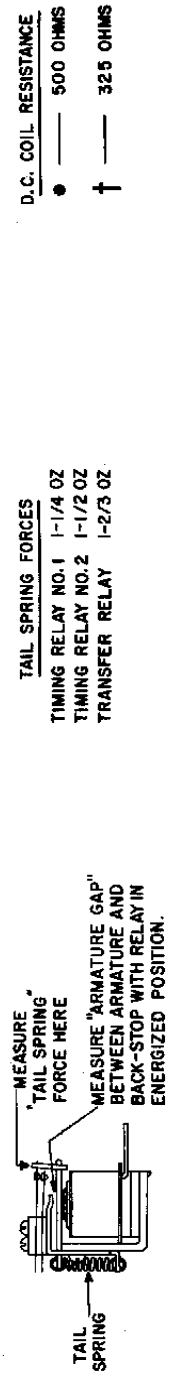
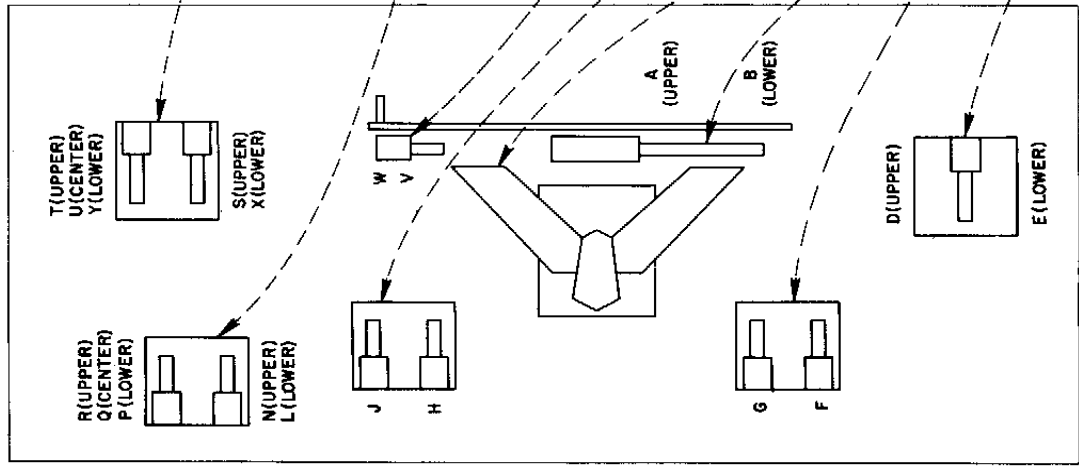


Figure 1.

TORMAT SELECTION RECEIVER, TYPE TSR6

ITEM	OPERATED BY	ARMATURE GAP	CONTACT	CONTACT FUNCTION	GAP	FORCE OUNCES	NORMAL POSITION
TIMING RELAY NO.1*	CONTACT J	3/32	S	WRITE-IN TRIGGER	1/64	1	CLOSED
			T	ENERGIZES PLAY CONTROL ADD SOLENOID THRU L	1/64	3/4	CLOSED
			U	ENERGIZES TIMING RELAY NO.2	1/64	1	OPEN
			X	DIRECTS ALL PULSES TO NUMBER STEPPER AFTER 1ST NUMBER PULSE	1/64	1	OPEN
			Y	ENERGIZES RESET MAGNET WHILE NUMBER STEPPER OPERATES	1/64	1	OPEN
			R	OPENS ELECTRIC SELECTOR WRITE-IN CIRCUIT WHILE NUMBER STEPPER OPERATES	1/64	3/4	CLOSED
TIMING RELAY NO.2*	CONTACT U	3/32	Q	SWITCHES IN STEPPER WRITE-IN CIRCUIT WHILE NUMBER STEPPER OPERATES	1/64	1	OPEN
			P	WRITE-IN TRIGGER	1/64	1	OPEN
			N	OPENS ELECTRIC SELECTOR WRITE-IN CIRCUIT WHILE NUMBER STEPPER OPERATES	1/64	3/4	CLOSED
			L	ENERGIZES PLAY CONTROL ADD SOLENOID THRU T	1/64	1	OPEN
START SWITCH	CAM ON NUMBER STEPPER		V	OPENS ELECTRIC SELECTOR START CIRCUIT	1/64	1/4	CLOSED
NUMBER STEPPER	STEPPER 2050 THRU CONTACTS D, B, W AND H FOR 1ST STEP; THROUGH D, B AND X FOR SUBSEQUENT STEPS.	SEE ADJUSTMENT TEXT	W	DIRECTS 1ST NUMBER PULSE TO NUMBER STEPPER	1/64	1/4	CLOSED
			H	CARRY-OVER FOR W ON 1ST PULSE TO NUMBER STEPPER	1/64	1	OPEN
RESET MAGNET	CONTACTS G OR Y	SEE ADJUSTMENT TEXT	J	ENERGIZES TIMING RELAY NO.1 WHILE NUMBER STEPPER OPERATES	1/64	1	OPEN
TRANSFER SWITCH	CAM ON LETTER STEPPER		A	DIRECTS 1ST AND EARLY PART OF 2ND LETTER PULSES TO LETTER STEPPER	1/64	3/4	CLOSED
			B	DIRECTS END OF 2ND PULSE AND ALL SUBSEQUENT PULSES TO TRANSFER RELAY CONTACTS D OR E	1/64	1	OPEN
LETTER STEPPER	STEPPER 2050 - THRU CONTACTS A OR B AND E.	SEE ADJUSTMENT TEXT	F	ENERGIZES TRANSFER RELAY WHILE LETTER STEPPER OPERATES	1/64	1	OPEN
			G	ENERGIZES RESET MAGNET WHILE LETTER STEPPER OPERATES	1/64	1	OPEN
TRANSFER RELAY	CONTACT F	3/64	D	2050 PULSES TO NUMBER STEPPER	1/32	1	CLOSED
			E	2050 PULSES TO LETTER STEPPER	1/32	1	OPEN



TAIL SPRING FORCES  
 TIMING RELAY NO.1 1-1/4 OZ  
 TIMING RELAY NO.2 1-1/2 OZ  
 TRANSFER RELAY 1-2/3 OZ

D.C. COIL RESISTANCE  
 ● ——— 500 OHMS  
 † ——— 325 OHMS

RELAY ADJUSTMENTS

**TORMAT SELECTION RECEIVER, TYPE TSR6  
STEP SWITCH ASSEMBLY ADJUSTMENTS**

The Pricing Unit in the phonograph and the pulse amplifier connect to the circuits of the Receiver with plugs and sockets. They may be removed for test or service. Access to the interior wiring of the Receiver is had, while it is operating in normal position, by removing the cover plate on the outside of the rear door of the phonograph. The cover plate can be removed by taking out two screws at the left side of the plate that are accessible when the door is open.

The Selection Receiver may be removed from its mounting by removing the cover plate and loosening the four screws holding the flanges of the unit and the four screws holding the audio amplifier. With the screws loosened, slide the units away from each other to disengage the locating pins and amplifier socket connection between them. It may then be lifted from the mounting frame.

**RATCHET RETURN SPRING**

The return spring tension for the Letter step switch should require 90 to 115 grams (3-¼ to 4 oz.) tangential force to move the ratchet to the 5th position of the step switch. This force is measured at the point of a ratchet tooth with the switch contact plates removed. It will be approximately correct if the spring is wound one full turn when the switch is in the rest position.

The return spring tension for the Number step switch should require 60 to 75 grams (2 to 2-¾ oz.) tangential force to move the ratchet to the 5th position. The tension will be approximately correct if the spring is wound ¾-turn when the switch is in the rest position.

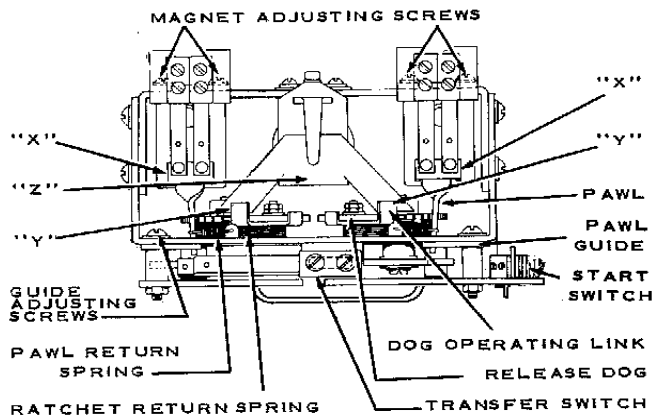


Figure 2.

**STEP RELAY MAGNET POSITION**

Adjust the step relay magnet vertically so the ratchet wheel tooth will over-ride the end of the release dog .010" to .020" when the armature is seated. *Figure 3.*

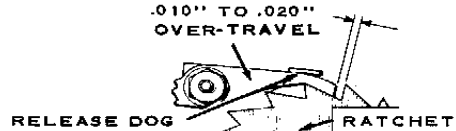


Figure 3.

With the pawl against the upper edge of the pawl guide opening, the clearance between the ratchet teeth and the pawl should not be less than .005".

**PAWL GUIDE AND RETURN SPRING**

Adjust the pawl guides so the pawls will strike the bottom of the ratchet teeth when the pawl engages the ratchet. *Figure 4.* The adjustment must be made so there will be a .004" to .010" gap between the pawl and the guide at the bottom of the stroke. *Figure 5.*

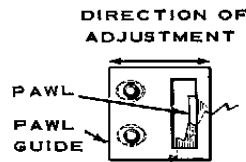


Figure 4.

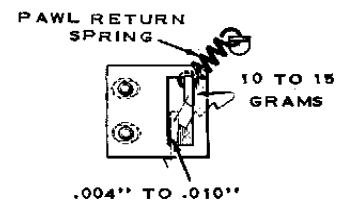


Figure 5.

The pawl return spring tension should require 10 to 15 grams (½ oz.) force to start the pawl from the side of the guide. Measure this force at the spring with the pawl in the rest position.

**STEP MAGNET TAIL SPRINGS**

The tail spring force, measured at the front of the bridge on the step magnet armature ("X", *Figure 2*) should be 50 to 75 grams (1-¾ to 2-½ oz.) to just close the switch contacts (when the contacts are correctly adjusted).

**CONTACT PLATE SWITCH BLADES**

The switch blades should have 10 to 35 grams force against the contacts. The force will be approximately correct if the blades are formed so their tips extend 5/32" above the contact assembly when the plates are removed. *Figure 6.*

## TORMAT SELECTION RECEIVER, TYPE TSR6

When the contact plates are in position the blades should move freely over the contacts. If the contacts become rough or gummed, they should be cleaned with a clean cloth moistened, slightly, with light oil. *Do not use sandpaper or emery cloth and do not lubricate them with vaseline or grease.*

### CONTACT PLATE POSITION

Each contact plate should be positioned so the outer blade of the step switch is approximately centered on the lowest contact (on the contact plate) when the stud on the side of the ratchet wheel is against the stop on the stepper frame and so the blade is approximately centered on each successive contact as it is advanced, step by step, through its full movement. The mounting holes at the corners of the contact plates are slotted to permit this adjustment.

### RESET MAGNET POSITION

Adjust the reset magnet vertically so the release dogs engage the ratchet teeth with the armature extension clearing the dimples ("Y", Figure 2) on the dog operating links  $1/64$ " when the magnet is energized. Figure 7.

NORMAL POSITION OF CONTACT PLATE



Figure 6.

The armature travel must be sufficient to permit the release dogs to clear the ratchet teeth  $.010$ " minimum when the magnet is not energized.

The tabs on the release dog operating links which engage the dogs and couple them to the reset magnet should not bind tightly but should not permit more than  $.005$ " free travel between the dogs and the links.

### RESET MAGNET TAIL SPRING

The force applied to the end of the reset magnet armature ("Z", Figure 2) to start it from the rest position should be 100 to 140 grams ( $3\frac{1}{2}$  to 5 oz.).

### RELEASE DOG SPRINGS

An upward force of 15 to 25 grams ( $\frac{1}{2}$  to  $\frac{3}{4}$  oz.) applied at the dimple on the release dog operating links ("Y", Figure 2) should start

the dogs from seated position. This force will be approximately correct if the springs are wound  $\frac{1}{2}$  to  $\frac{3}{4}$  turn.

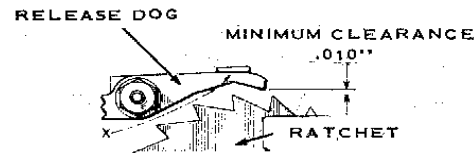


Figure 7.

### TRANSFER SWITCH POSITION

Adjust the position of the switch on the mounting bracket so the roller is in the notch of the contactor assembly disc and the first operation of the step magnet causes no change of the roller blade. The second operation of the step magnet should raise the roller to the outer diameter of the disc. The flanges of the roller should not drag on the disc and the roller bracket should not strike the switch contact plate.

- With the step switch in the rest position so the roller is in the notch of the contactor disc, adjust the lower blade for  $\frac{1}{2}$  to  $\frac{3}{4}$  oz.
- Adjust contact "B" gap  $1/64$ ".

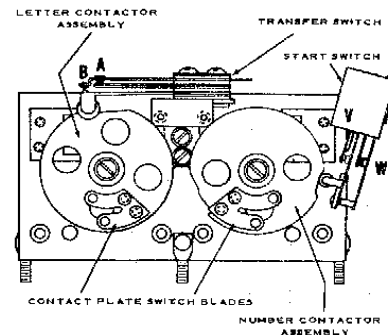


Figure 8.

- Adjust contact "A" force 1 oz.
- The second operation of the step magnet should result in closing contact "B" with 1 oz. force and opening contact "A"  $1/64$ " to  $1/32$ " gap.

### LUBRICATION

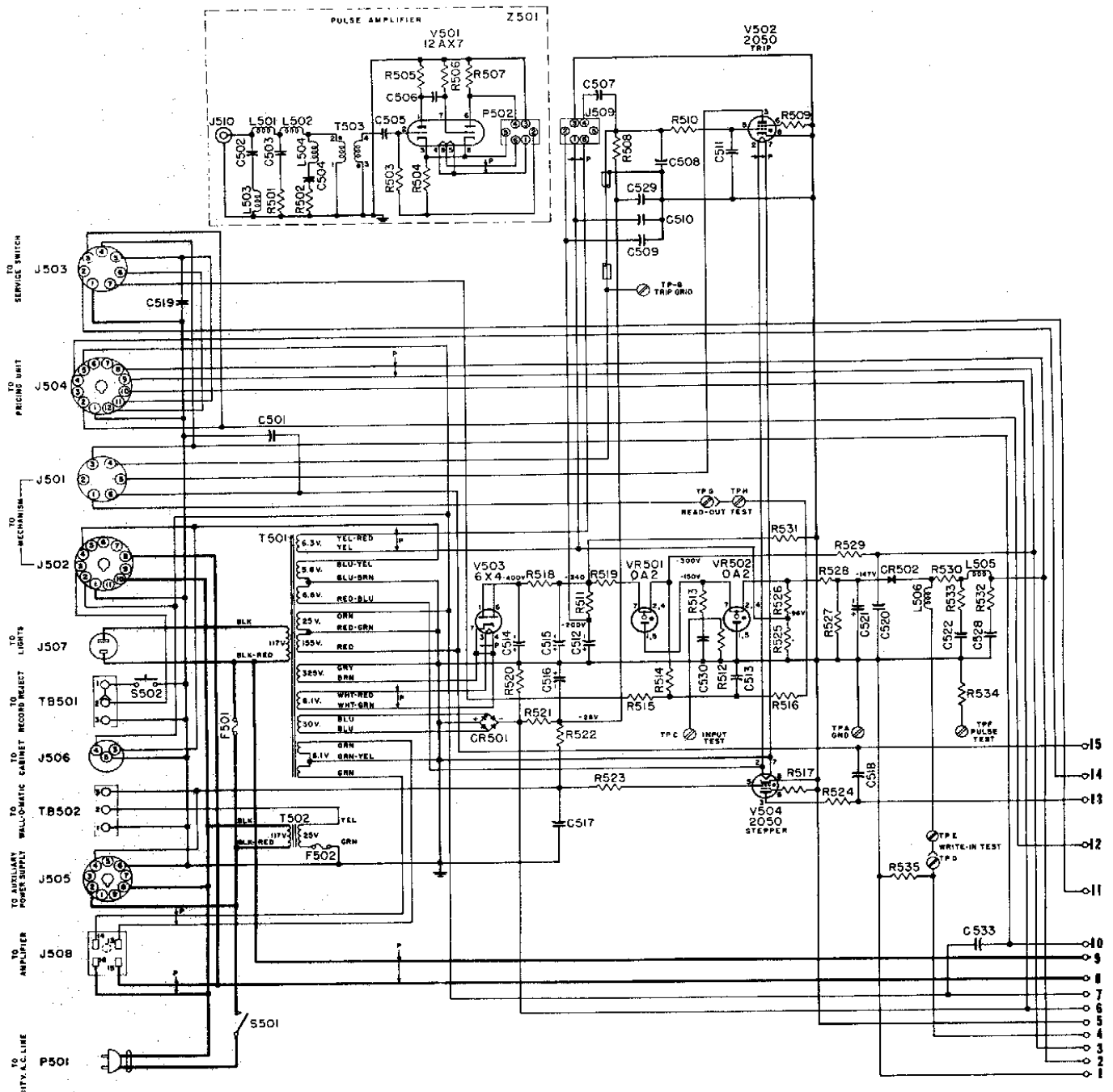
Lubricate with a drop of Seeburg No. 53014 Special Purpose Oil:

- Pawl Pivots and sliding surfaces of the pawls on the step relay armatures.
- Pawl guides at area of contact with pawls.
- Step switch shaft bearings.
- Roller on roller blade of transfer switch.
- Relay hinges.

# TORMAT SELECTION RECEIVER, TYPE TSR6

**NOTE:**

1. ALL SOCKETS AS VIEWED FROM SOLDERED END.
2. ALL PLUGS AS VIEWED FROM CABLE END.
3. LUGS 1 THRU 30 OF J511 & J512 ARE CONNECTED IN PARALLEL.
4. "P" INDICATES TWISTED LEADS.



**Schematic Diagram**

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## TORMAT SELECTION RECEIVER TYPE TSR7

The Tormat Selection Receiver, Type TSR7, is the power distribution and control center of the Select-O-Matic "200" R. C. Special, Model H-201 for operation from wired Wall-O-Matics, Types HD-3WA, D-3WA and S-3WA. Power enters the Receiver through the line cord and main switch and is distributed, directly at 117-volts or through transformers, to the Select-O-Matic Mechanism, the cabinet lighting, the amplifier, and the Wall-O-Matics. All connections to the Receiver are made with plugs which are of different types and sizes to avoid possibility of incorrect connections. Included in the Receiver are a Step Switch and Relay Assembly, and a 2050 tube, for selection of records from Wired Wall-O-Matics.

A 25-volt transformer supplies power for up to six Wall-O-Matics. Another transformer, the selection receiver power transformer, has seven output windings for control circuits, and heater current for the tubes in the High Fidelity Master Amplifier.

One of the secondaries of the selection receiver power transformer provides approximately 30-volts, a.c. This 30-volt output is rectified by a full-wave selenium rectifier for 25-volt d.c. supply for some of the relays of the Step Switch and Relay Assembly, and for bias supply for the 2050 tubes. Another secondary provides approximately 150 volts for operating the step switches through the plate circuit of a 2050 tube.

Operation of Selection Receiver, Type TSR7, is the same as that of the Type TSR6. Service notes, schematic diagrams and parts lists applying to the Type TSR6 also apply to the Type TSR7 with the following exceptions: There is no Dual Credit Unit for the operation of an electrical selector; the pricing circuit of the selection receiver differs as indicated on Page 5160; an 8-prong socket, J507, Part No. 84306 is used for lighting connections.

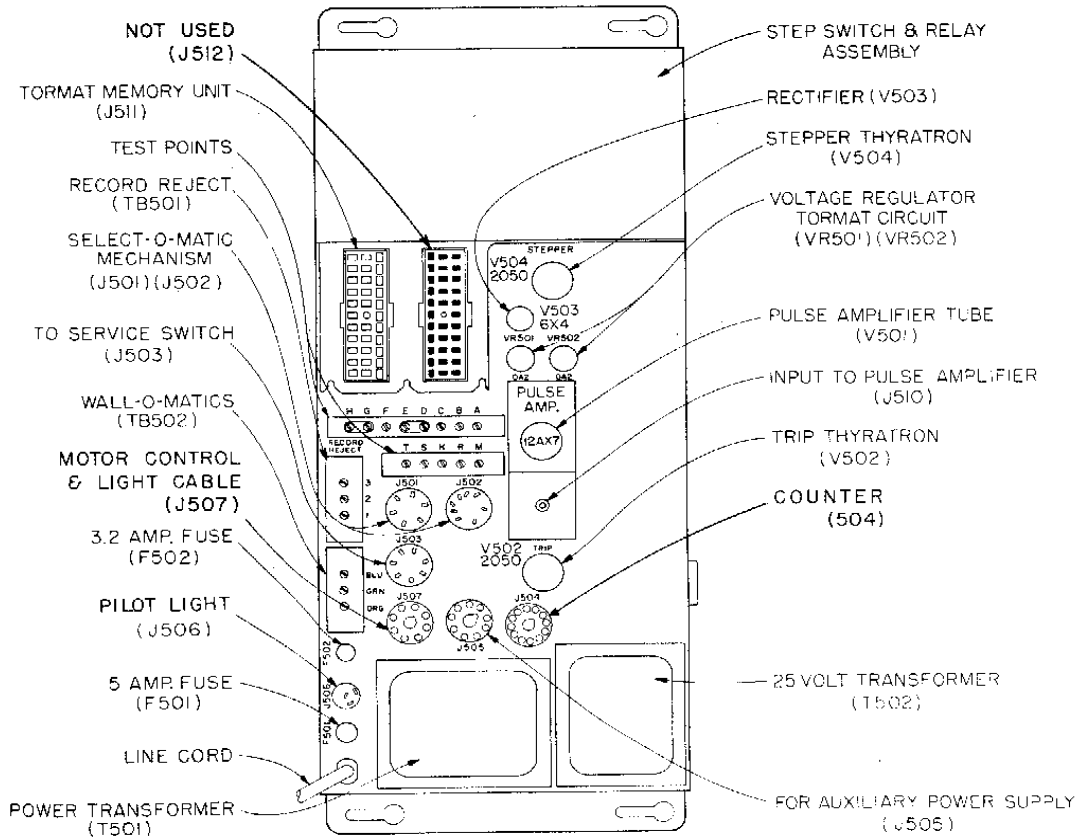


Figure 1.

# TORMAT SELECTION RECEIVER, TYPE TSR7

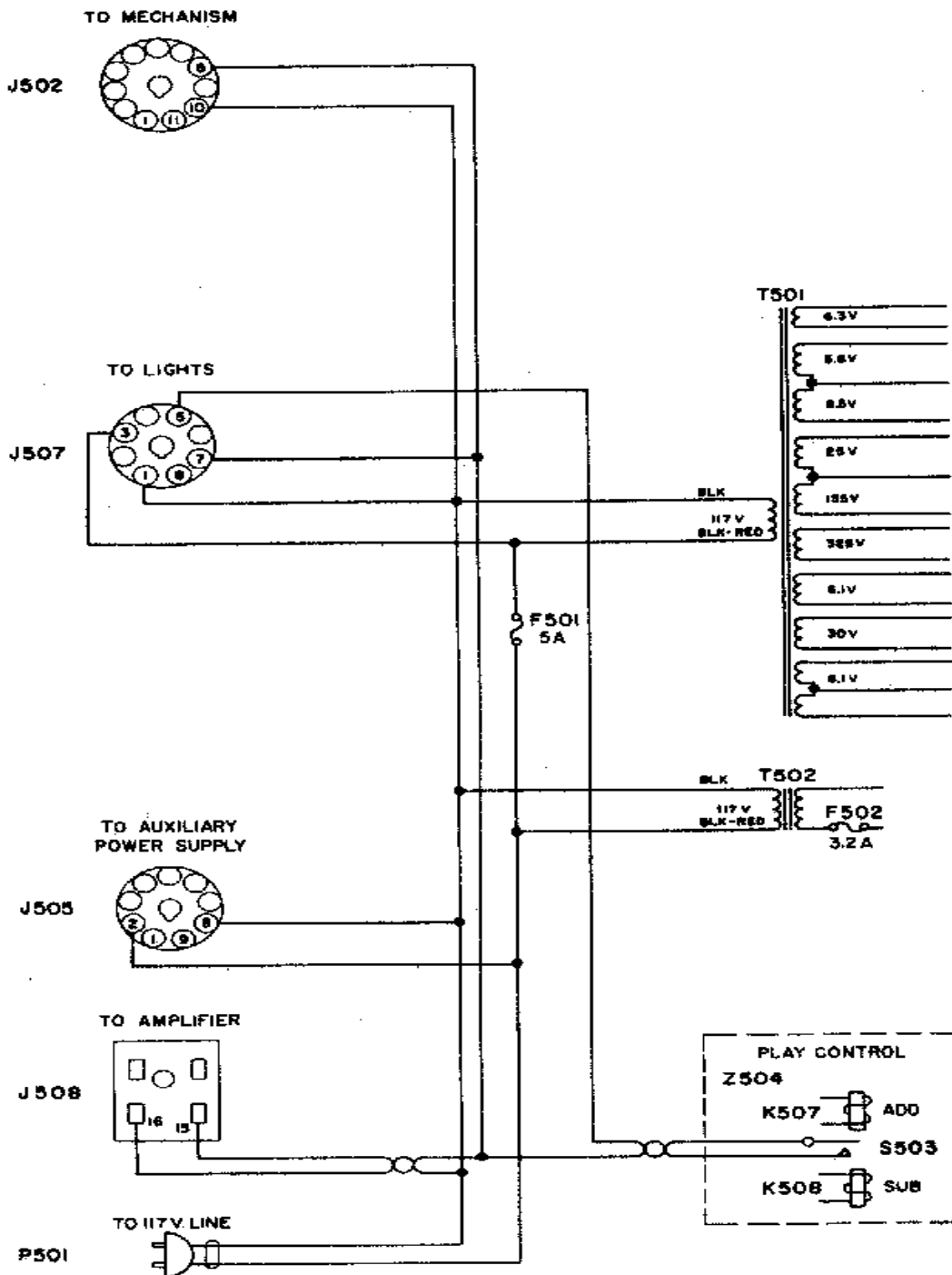


Figure 2. Primary Circuit Schematic