

SECTION IX
RECTIFIER POWER UNIT
CRV-20136

TECHNICAL SUMMARY

ELECTRICAL CHARACTERISTICS—

Power Supply:

Rating 110-120/220-240 volts, 50/6 cycles, single phase
Power Consumption (normal) 300 watts
Fuse Protection 5 amperes

Output Rating:

Plate Supply 400 ma at 137 volts d-c
Bias Voltage (maximum) 15 volts d-c
Filament Supply 25 amperes at 8 volts a-c

TUBE COMPLEMENT—

Function:

Bias Rectifier 1 RCA-83
Plate Rectifier 1 GE Tungar 16X897

MECHANICAL SPECIFICATIONS—

Dimensions:

Panel Size 19 inches (width) x 21 inches (height)
Unit Depth 9⁵/₈ inches
Weight (net) 123 pounds

DESCRIPTION

Except for the plate voltage to the suppressor tube in the tone keyer or audio-frequency amplifier units, all operating voltages required by a three-unit diversity radio receiving equipment are obtained from the rectifier power unit. Voltages available at the output terminals of this unit are as follows: 8 volts a-c for filaments and heaters; 137 volts d-c for plate and screen supply; and 15 volts d-c for bias supply.

The rectifier power unit contains two full wave rectifier circuits, supplied from a power transformer which is common to both. Plate and screen voltage is obtained from a low-reactance, choke-input, filter network fed by the rectified output of a G. E. type 16 x 897 "Tungar" tube. Bias

voltage is obtained from a high reactance, choke-input, filter network fed by the rectified output of an RCA-83 tube.

The voltage output of the respective rectifier circuits is indicated on voltmeters which are connected across the output terminals of those circuits. Current drawn from the plate and screen rectifier circuit is indicated on a milliammeter which is connected in the output lead (positive) of that circuit. A voltmeter is also provided in the a-c input circuit and, when the associated toggle type switch is operated, this meter will indicate the applied line voltage or the regulated load voltage.

OPERATION

After the power switch has been closed, the pilot lamp will glow. The regulated (a-c) load voltage should be measured to make certain that the correct potential is being applied.

In its initial operation after installation, or after a tube replacement, the plate rectifier tube may sputter due to globules of mercury adhering to the anodes. Before applying the load, sufficient time must be permitted to elapse for the

sputtering to cease. It is only after the sputtering has completely stopped that the output voltage will become stable.

The voltmeter across the plate supply circuit will indicate a constant value of voltage when stabilization is reached. Bias voltage is adjustable by means of a rheostat to the operating limit required for the application.

SERVICE

Service generally consists of replacement of rectifier tubes which have become reduced in efficiency by continual usage. In the event of a failure in the power supply unit, note first whether the a-c voltmeter (M601) indicates the presence of line voltage. Turn the power switch (S601) to an "ON" position and throw the voltmeter switch (S602) to the "LINE" side. If no meter reading is obtained, check the line fuses (F601, F602) and replace them if they are found to be defective. Should the fuses be intact, it is evident that no power is being applied.

In the event that the meter reads the applied line voltage, throw the switch (S602) over so that the meter can now read the regulated voltage being applied to the input of the power transformer. Should the meter give no deflection, substitute for the receiver a resistive load of 40 ohms (capable of dissipating 500 watts) and measure the output voltage of the regulator unit directly. If no deflection occurs, the trouble is entirely within the voltage regulator, and reference should be made to Section X for further instructions.

In the event that an output voltage is obtained with the resistive load on the regulator, test all of the power transformer windings for continuity and for grounds using an ohmmeter. Also test the filter chokes (L603, L604, L605, L606) and the bias rheostat (R601) for continuity and

grounds. In the event of a defect in any of those components, replace where necessary with equipment having identical characteristics.

A partial or complete breakdown of one or more of the filter capacitors (C601, C602, C603, C604, C605) will result in a partial or complete short circuit in that winding of the secondary which is shunted by the defective capacitors. A complete short circuit will result in excessive heating of the secondary winding, with probability of permanent damage. A partial short circuit will also result in heating of the secondary winding and in reduction of the rectified output.

It should be noted that in testing filter capacitors for open and short circuits, it is necessary for the capacitor under test to be disconnected from the circuit. As a matter of precaution, any element under test should not be connected in the circuit while undergoing examination, thus preventing any possibility of error.

Should it become necessary to remove the a-c power switch, the knob is removed by pulling it forward and at the same time turning it counterclockwise. Before working on the conductors connected to the switch, power should be removed from the complete equipment. Where soldering is required, a large iron should be used to insure rapid application of heat to the terminal without excessive transfer of heat to the switch contacts.

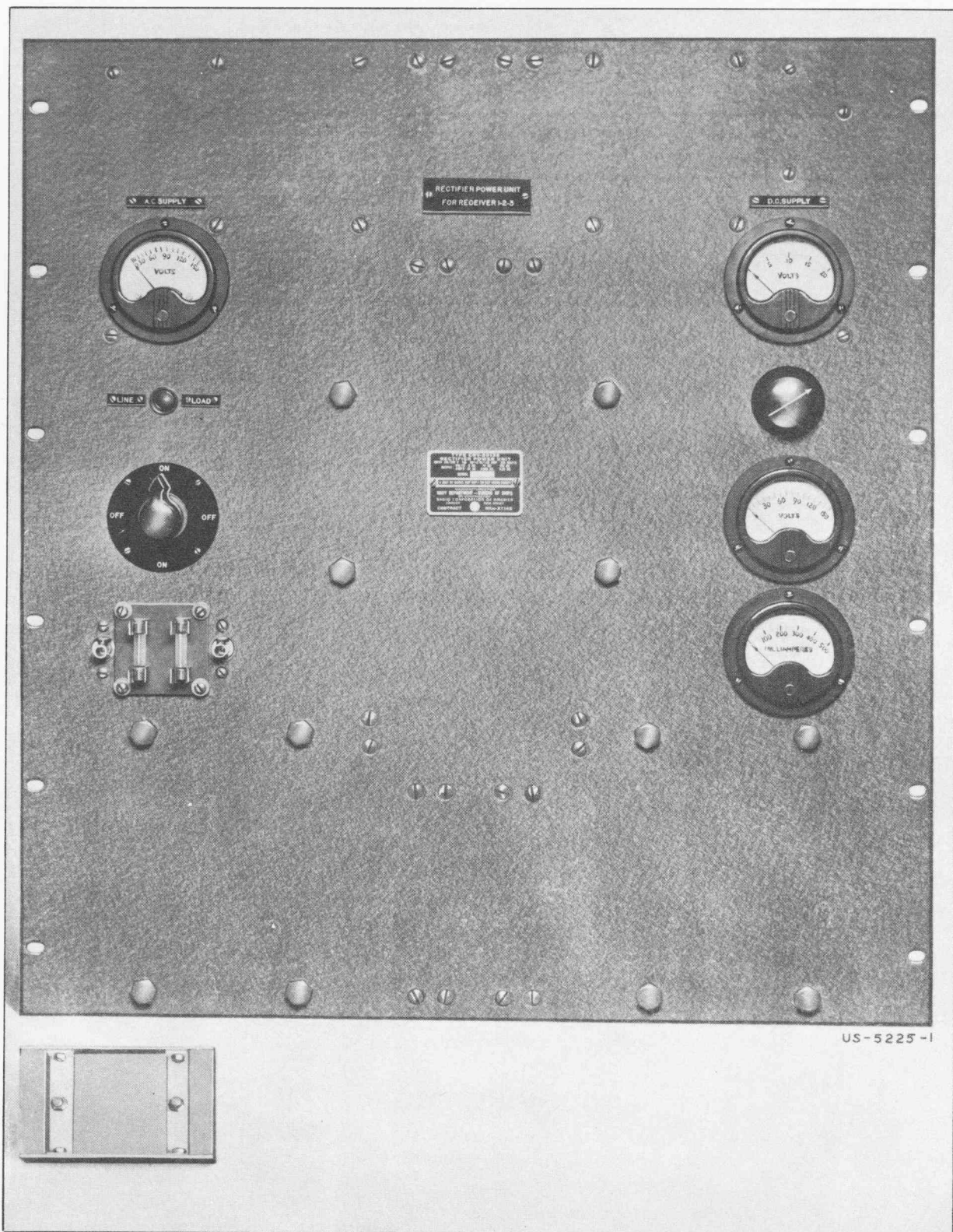


Figure 1—Type CRV-20136 Rectifier Power Unit (Front View, Fuse Cover Removed)

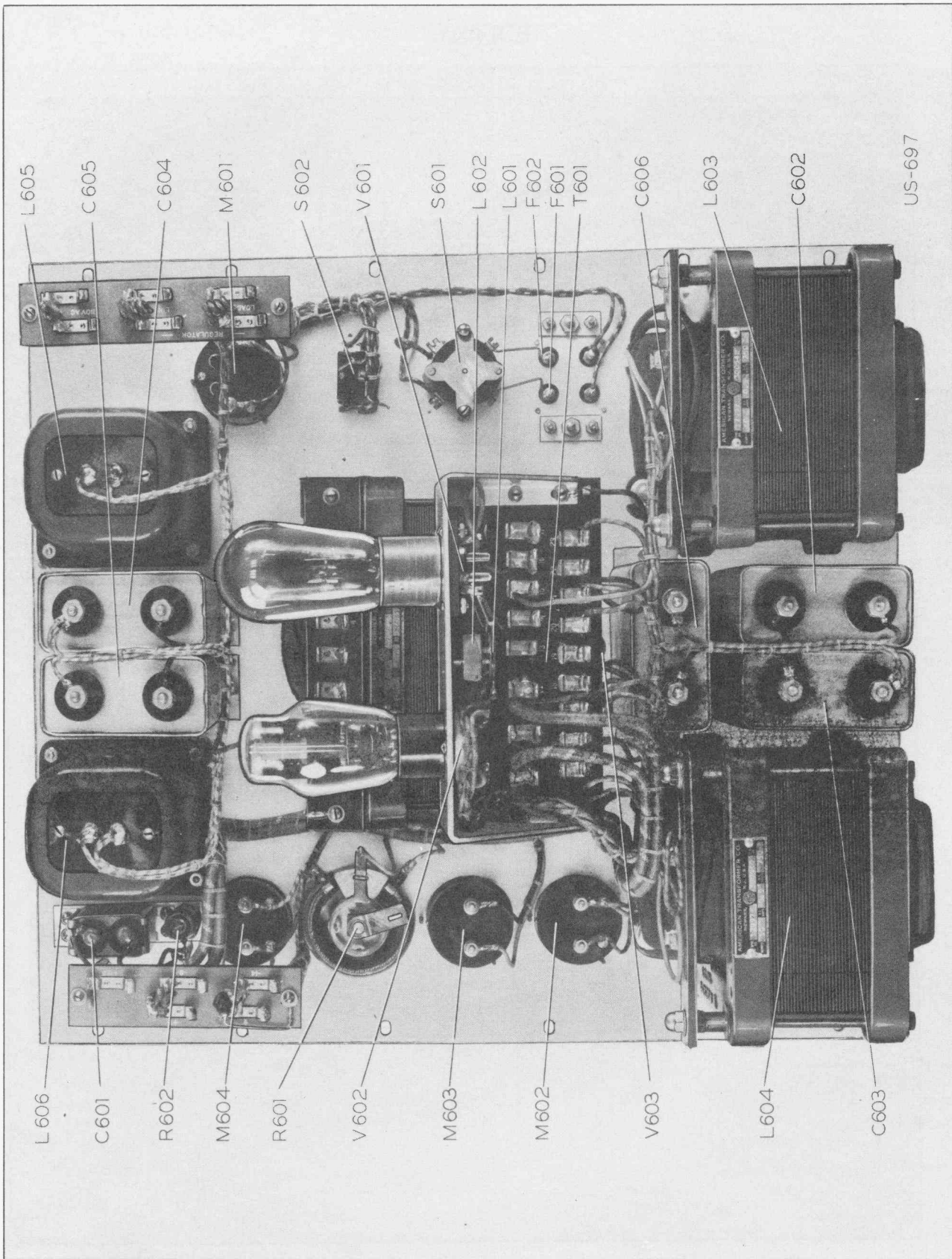


Figure 2—Type CRV-20136 Rectifier Power Unit (Rear View)

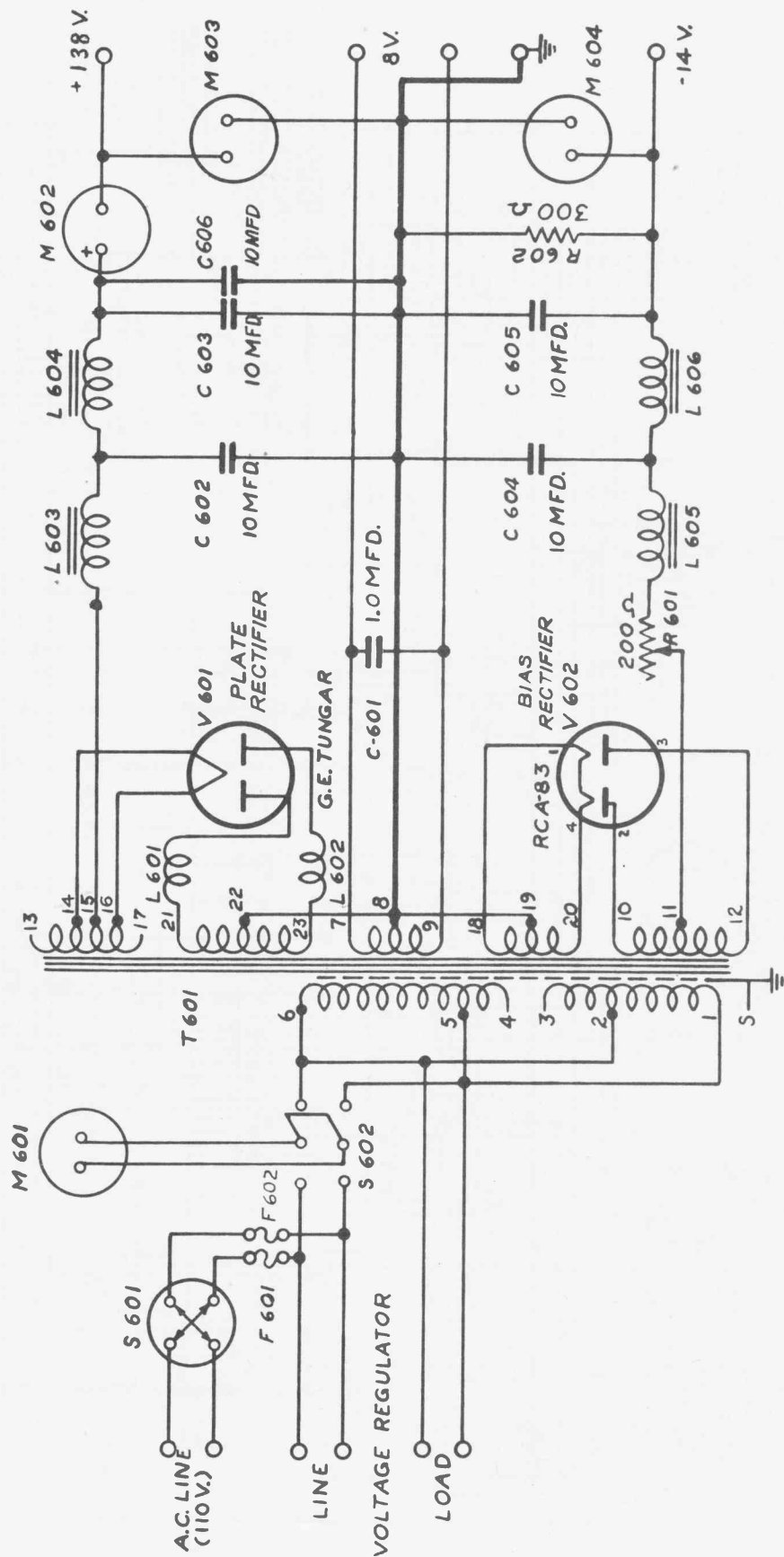
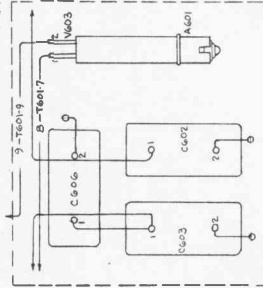


Figure 3—Type CRV-20136 Rectifier Power Unit Schematic (M-440499—Sub. 1)

WIRE NUMBER	DESCRIPTION	WIRE NUMBER
1	RED-TEL. TR.	17 TO 3 INCL.
2	BLU-TEL. TR.	5 TO 9 INCL.
3	RED	10 TO 13 INCL.
4	BLK	15 TO 19 INCL.
5	BLK	20 TO 24 INCL.
6	BLK	25 TO 30 INCL.
7	RED-TEL. TR.	31 TO 41
8	RED-TEL. TR.	42 TO 50 INCL.
9	RED-TEL. TR.	51 TO 60 INCL.
10	RED-TEL. TR.	61 TO 67 INCL.
11	RED-TEL. TR.	68 TO 70
12	RED-TEL. TR.	71 TO 80 INCL.
13	RED-TEL. TR.	81 TO 87
14	RED-TEL. TR.	88 TO 90 INCL.
15	RED-TEL. TR.	91 TO 99 INCL.
16	RED-TEL. TR.	100 TO 108 INCL.
17	RED-TEL. TR.	109 TO 117 INCL.
18	RED-TEL. TR.	118 TO 126 INCL.
19	RED-TEL. TR.	127 TO 135 INCL.
20	RED-TEL. TR.	136 TO 144 INCL.
21	RED-TEL. TR.	145 TO 153 INCL.
22	RED-TEL. TR.	154 TO 162 INCL.
23	RED-TEL. TR.	163 TO 171 INCL.

NOTE 1:—CODING INSERTED IN WIRES INDICATES WIRE NUMBER AND DESTINATION OF WIRE REPAIR. THIS IS 45-560H WHERE A #2 ONLY IS GIVEN. WIRE #2 IS INTENDED. A NUMBER PRECEDED BY A LETTER INDICATES THE WIRE NUMBER TO PART #23 ON WIRING MATERIAL LIST.

NOTE 2:—CUT WIRES TO LENGTH, STRIP AND TIN TO SUIT FORM WIRES INTO CABLE WHERE POSSIBLE AND FACE USING P20, WITH LOCK STITCH APPROX. 1/8" SPACING. SOLDER ALL CONNECTIONS USING P18. DO NOT CRIMP WIRES.



(2) SAME AS P.1 EXCEPT AS SHOWN FOR SCHEMATIC SEE M-427196

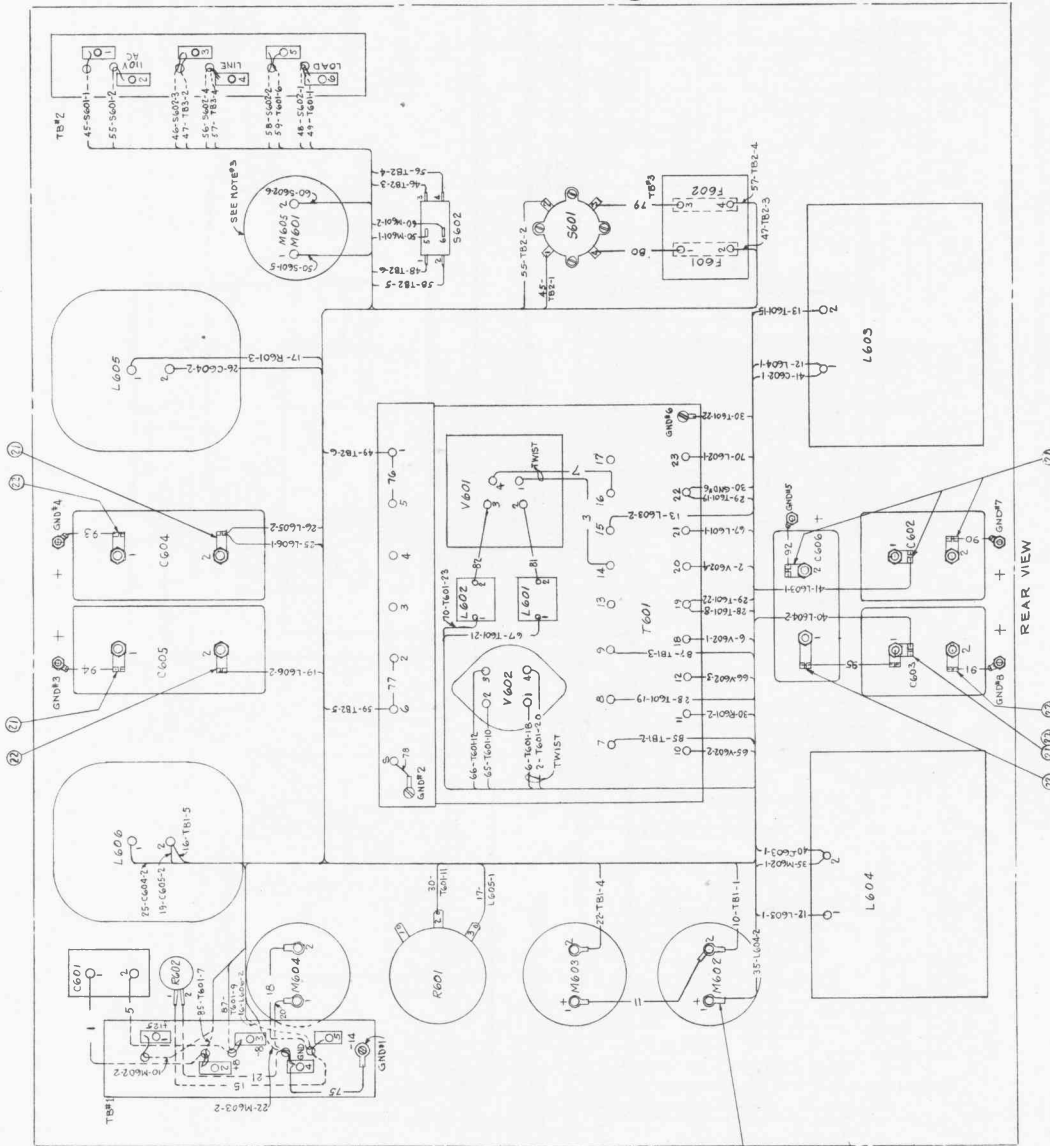


Figure 4—Type CRV-20136 Rectifier Power Unit Connections (T-621123—Sub. 1)