

TEMPORARY CHANGE T-2 TO TECHNICAL MANUAL FOR POWER SUPPLY
PP-1010/UG - NAVSHIPS 92142

Pages 3-2, 3-3, 3-5, Figures 3-3,3-4,3-5:

Add "Note: Connect strap between terminals 4 and 5 of TB-1102 when installing PP-1010/UG".

Add "Note: Remove strap between terminals 4 and 6 of TB-1102 when installing PP-1010/UG".

Remarks: BUSHIPS Drawing RE 67F 2044C, Teletypewriter Power Supplies, Inter-connection Wiring Plan has been revised to include these changes.



**TEMPORARY CORRECTION T-3 TO INSTRUCTION BOOK FOR TELETYPE-
WRITER RECTIFIER AND CABLE ASSEMBLY PP-1010/UG, NAVSHIPS 92142.**

This temporary correction covers information for the 151999 or 152950 Rectifier and Cable Assembly (equipped with silicon diodes) presently manufactured (Figure 4) in place of the 151999 or 152950 Rectifier and Cable Assembly (equipped with selenium rectifiers) previously manufactured (Figure 3). The transformer used with these rectifiers is not interchangeable. Individual parts are still available for the rectifier and cable assembly equipped with selenium rectifiers. The 151999 and the 152950 Rectifier and Cable Assembly are the same except for the cables. The following table indicates the Power Distributor Panels and Rectifier Assemblies used.

Navy Designation Power Distribution Panel	Teletype Code Electrical Service Unit	*Rectifier Assembly		Unit Covered in Manual NAVSHIPS
		Supplied With	Used With	
SB-154/UG	LESU1		151999	91393
SB-154A/UG	LESU5		151999	91713
SB-408/UG	LESU6/119		151999	92361
SB-964/UG	LESU7/147		152950	93241
SB-1061/UG	LESU12	152950		93534
SB-959/UG	LESU13	152950		93534
SB-1302/UG	LESU73	152950		93534
Rectifier and Cable Assembly	Rectifier and Cable As- sembly & Loop Circuit Resistor Assembly			
PP-1010/UG	151999 & 152308	151999		92142 & T-1
PP-1010/UG	179116	151999		92142 & T-1, T-3

*Previous models are equipped with selenium rectifiers, present models are equipped with silicon diodes.

Installation of the present and previous models (151999 Assembly) is the same and is covered in Manual NAVSHIPS 92142. Figure 2 shows circuit wiring for the 151999 Assembly. Installation of the 152950 Rectifier and Cable Assembly is covered in this temporary correction.

1. GENERAL

a. 151999 or 152950 RECTIFIER AND CABLE ASSEMBLY.

(1) The 151999 or 152950 Rectifier and Cable Assembly provides a source of direct current to operate the local selector magnet and the bias winding of the local line relay on the Model 28 Printer when no direct current is available for the installation. The 152950 Assembly also supplies current for a local line test key circuit and supplies loop current when no direct current is available for the installation. For maximum rated output, see Paragraph 1.a.(4).

(2) The rectifier assembly is wired for full wave rectification and consists of an insulated input transformer, two silicon diodes, a filter capacitor, a metal base on which all parts are secured, and wiring cables. The assembly is mounted on the Electrical Service Unit.

(3) The rectifier assembly is 4-3/4" long, 2-7/8" deep, and 5-7/8" high.

(4) The rectifier ratings are:

Input Voltage: 105 to 125 volts, 60 cycles single phase a.c.

Output Voltage: with 115 volts a.c. input:

115 (+ 4) volts d.c. at 0.12 ampere load.

Not over 135 volts d.c. at no load

Not less than 108 volts d.c. at 0.150 ampere load

Continuous output current at 167° F. (75° C.) ambient temperature: 0.150 amperes.

a.c. component in d.c. output: Not more than 2% RMS at 0.12 ampere.

b. 153477 CABLE ASSEMBLY. - This assembly is for converting the 151999 Rectifier and Cable Assembly to a 152950 Assembly.

2. INSTALLATION

a. 153477 CABLE ASSEMBLY (for converting the 151999 to the 152950 Assembly).

(1) Unsolder and remove the 151825 Cable Assembly.

(2) Route and connect the 153477 Cable as shown in Figure 1. Solder the red lead to the plus terminal on the capacitor and the associated black lead to the minus terminal. Solder the white lead to terminal 1 on the transformer and the associated black lead to terminal 2.

(3) To distinguish the converted assembly from a 151999 Assembly, write "152950 Assembly" on the side of the unit. Use black paint, marking crayon, or other form of durable marking.

(4) Follow procedure in Paragraph 2.b.

b. 152950 ASSEMBLY

(1) Remove and discard the center blank plate that is mounted on the electrical service unit.

(2) Mount the 152950 Rectifier Assembly in place of the center blank plate with the transformer toward the front. Tighten the mounting screws so that the 151427 Clamp Plates secure the assembly in position.

(3) Route and connect the 153477 Cable as shown in Figure 1.

3. WIRING

a. 152590 ASSEMBLY (for Electrical Service Unit LESU7)

NOTE

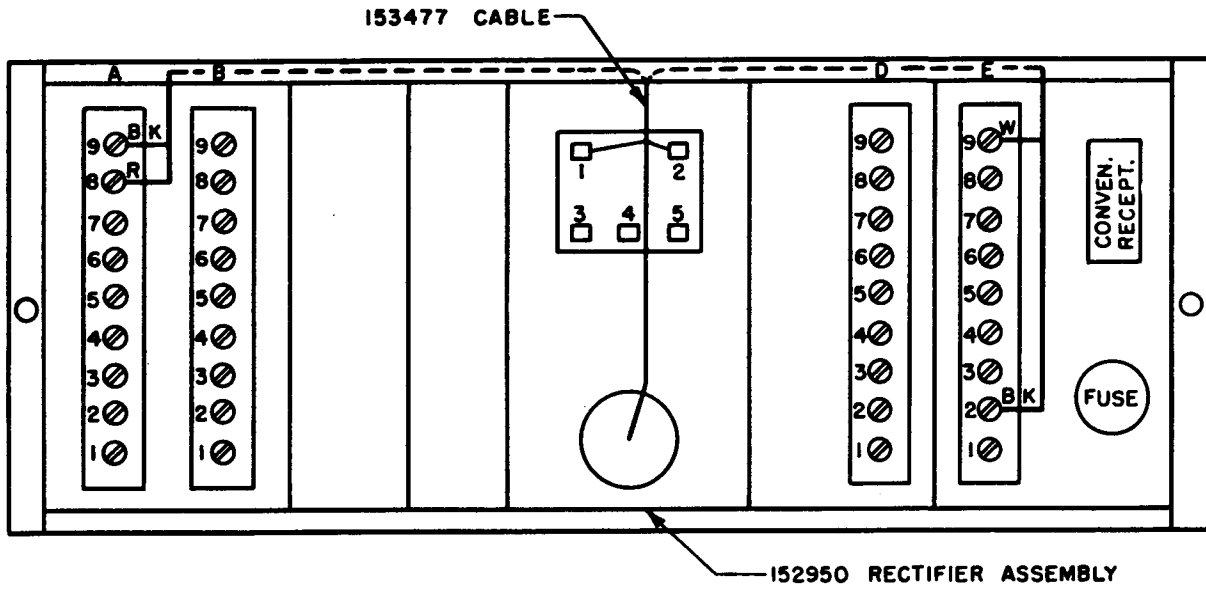
For circuit wiring, see Wiring Diagram 2948WD furnished with the assembly. Figure 1 shows where loose cable connections are to be made.

(1) Connect the black rectifier lead:

(a) For standard operation (rectifier controlled by power switch) to terminal 2 of terminal block e.

(b) For continuous rectifier operation, to terminal 1 of terminal block E.

(c) For rectifier operation controlled by the electrical motor control, to terminal 3 of terminal block E.



BOTTOM VIEW
FIGURE 1

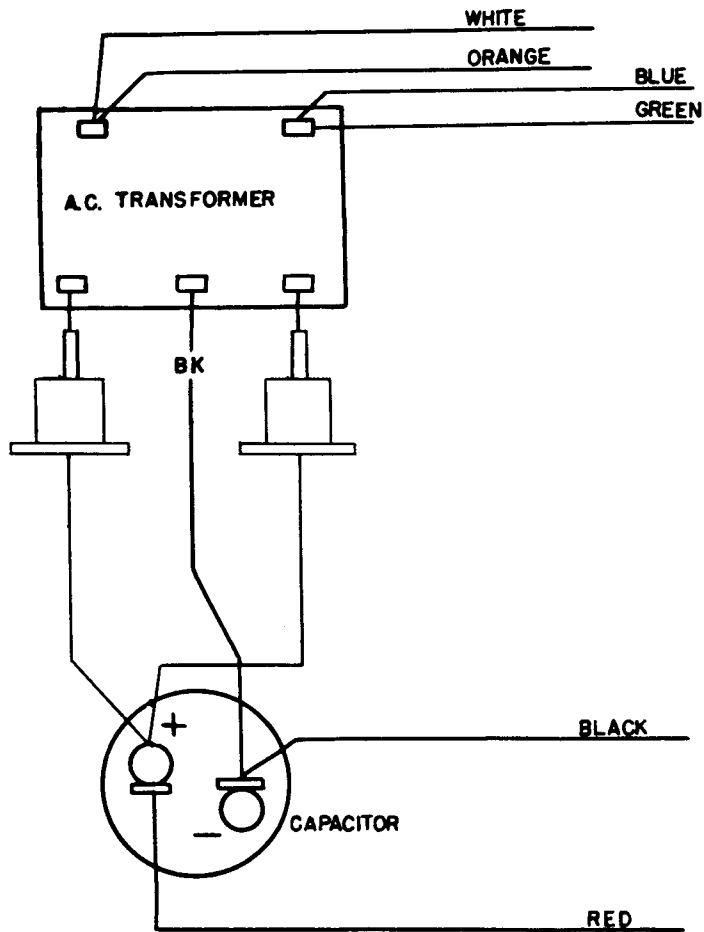


FIGURE 2
CIRCUIT WIRING FOR 151999 ASSEMBLY

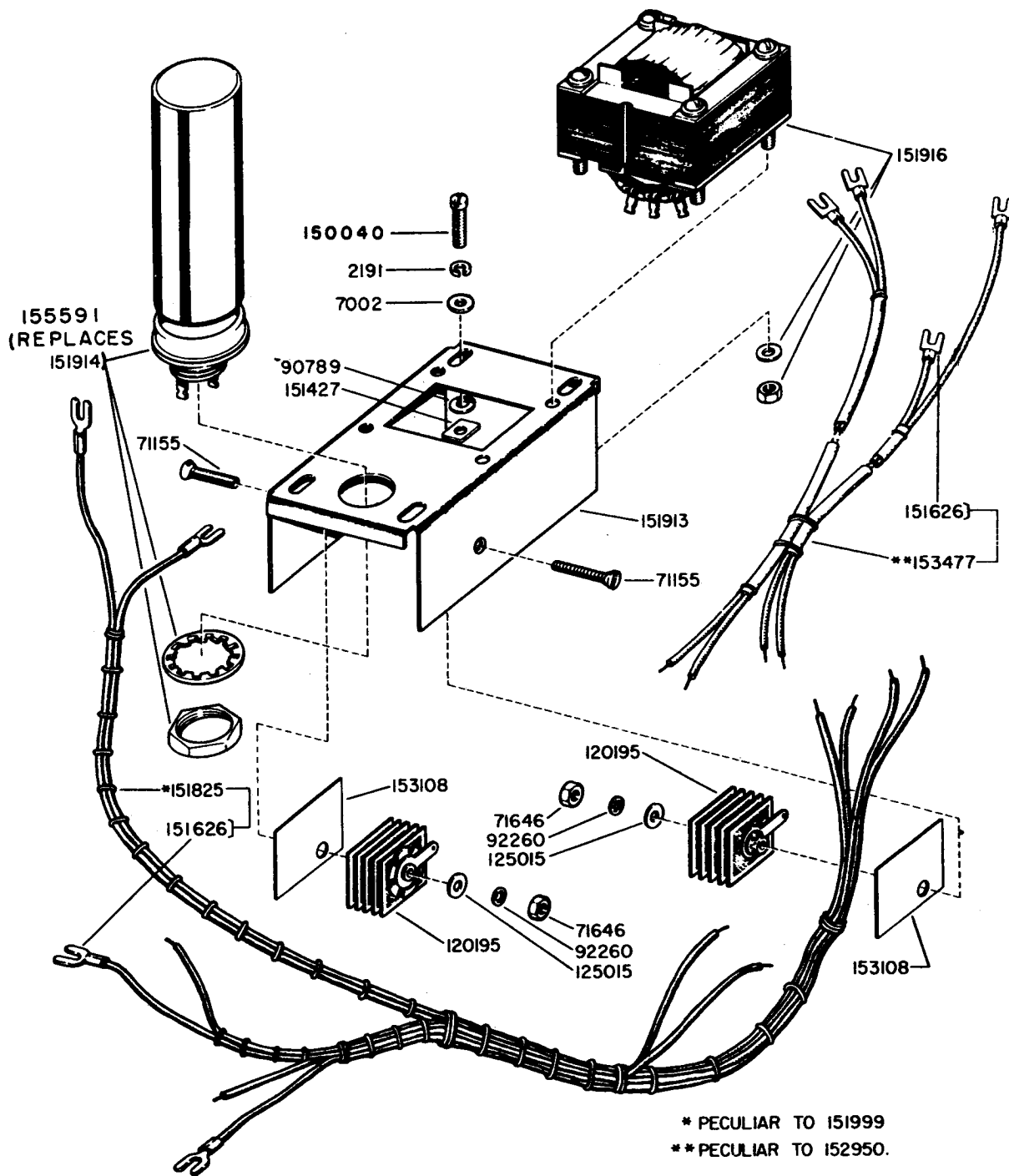
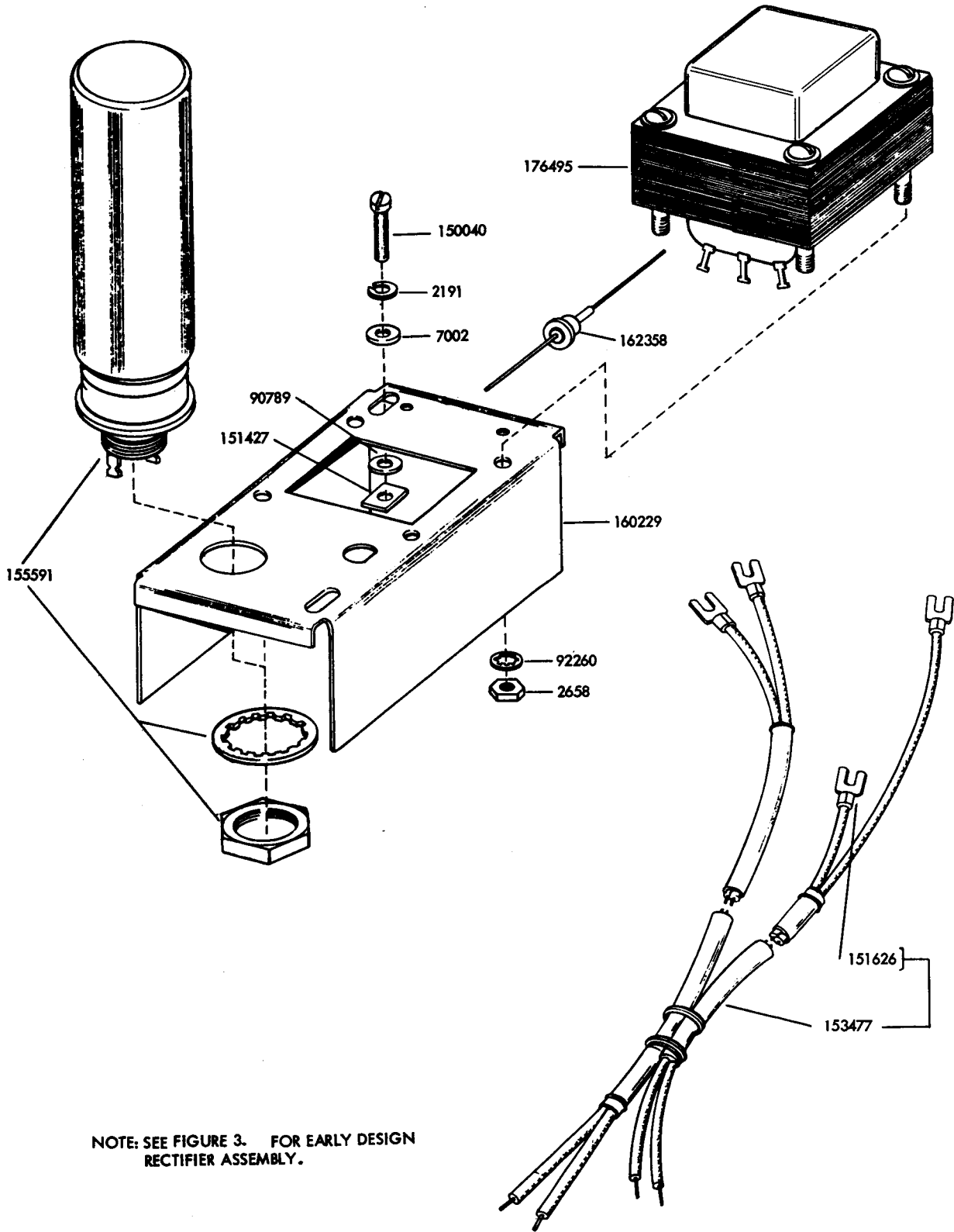


FIGURE 3. (PREVIOUS STYLE) RECTIFIER AND CABLE ASSEMBLIES



PRESENT STYLE
 FIGURE 4. 152950 RECTIFIER ASSEMBLY (150 MA)

**TEMPORARY CORRECTION T-1 TO INSTRUCTION BOOK FOR
TELETYPEWRITER RECTIFIER AND CABLE ASSEMBLY
PP-1010/UG NAVSHIPS 92142**

This Temporary Correction is in effect immediately. It provides a correction in the Actual and the Schematic Wiring Diagrams for the Power Distribution Panels SB-154A/UG and SB-408/UG. The resistor lead connection to terminal 5 of the Power Distribution Panel SB-154/UG terminal board was inadvertently carried over on the SB-154A/UG and SB-408/UG wiring diagrams. The SB-154A/UG and SB-408/UG require the connection to be made at terminal 4 of TB-1102.

After the following pen and ink corrections have been made, insert this Temporary Correction under the front cover of the book.

Page	Figure	Action
3-2	3-3	Connect the red lead from the resistor assembly to terminal No. 4 of the selector magnet terminal board TB-1102 instead of terminal No. 5 as shown.
3-2	3-3	Revise note to read: Move strap from terminals 4 & 6 of TB-1102 to terminals 6 & 9 when resistor assembly is installed
3-3	3-4	Connect lead from R-1201 to terminal No. 4 of TB-1102 instead of terminal No. 5 as shown.
3-3	3-4	Revise note to read: Move strap from terminals 4 & 6 of TB-1102 to terminal 6 & 9 when resistor assembly is installed.
3-5, 3-6	3-5	Connect the lead from resistor R1201 to terminal No. 4 of the selector magnet terminal board instead of No. 5 as shown.
3-5, 3-6	3-5	Revise the word "Strap" near TB-1102 to read: Move strap from terminals 4 and 6 of TB-1102 to terminals 6 & 9 when resistor assembly is installed.
3-7, 3-8	3-6	Add note: Move strap from terminals 4 & 6 of TB-1102 to terminals 6 & 9 when resistor assembly is installed.
3-7, 3-8	3-6	Connect the red lead from the resistor assembly to terminal No. 4 of TB-1102 instead of terminal No. 5 as shown.



NAVSHIPS 92142

INSTRUCTION BOOK
for
TELETYPEWRITER RECTIFIER
AND CABLE ASSEMBLY
PP-1010/UG

TELETYPE CORPORATION
CHICAGO 14, ILLINOIS

DEPARTMENT of the NAVY
BUREAU OF SHIPS

Contract: NObsr—63371

Approved by BuShips: 29 January 1954

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGES IN EFFECT	PAGE NUMBERS	CHANGES IN EFFECT
Title Page	Original	2-1 to 2-4	Original
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i to iii	Original	4-1 to 4-8	Original
1-0 to 1-2	Original	5-1 to 5-5	Original

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS
WASHINGTON 25, D. C.IN REPLY REFER TO
Code 993-100
29 January 1954

From: Chief, Bureau of Ships
To: All Activities Concerned with the
Installation, Operation and Main-
tenance of the Subject Equipment

Subj: Instruction Book for Power Supply
PP-1010/UG NAVSHIPS 92142

1. This is the instruction book for the subject equipment and is in effect upon receipt.
2. When superseded by a later edition, this publication shall be destroyed.
3. Extracts from this publication may be made to facilitate the preparation of other Department of Defense Publications.
4. All Navy requests for NAVSHIPS Electronics publications should be directed to the nearest District Publications and Printing Office. When changes or revised books are distributed, notice will be included in the Bureau of Ships Journal and in the Index of Bureau of Ships General and Electronics Publications, NAVSHIPS 250-020.

W. D. LEGGETT, JR.
Chief of Bureau

RECORD OF CORRECTIONS MADE

CHANGE NO.	DATE	SIGNATURE OF OFFICER MAKING CORRECTION

C

ORIGINAL

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1 Section

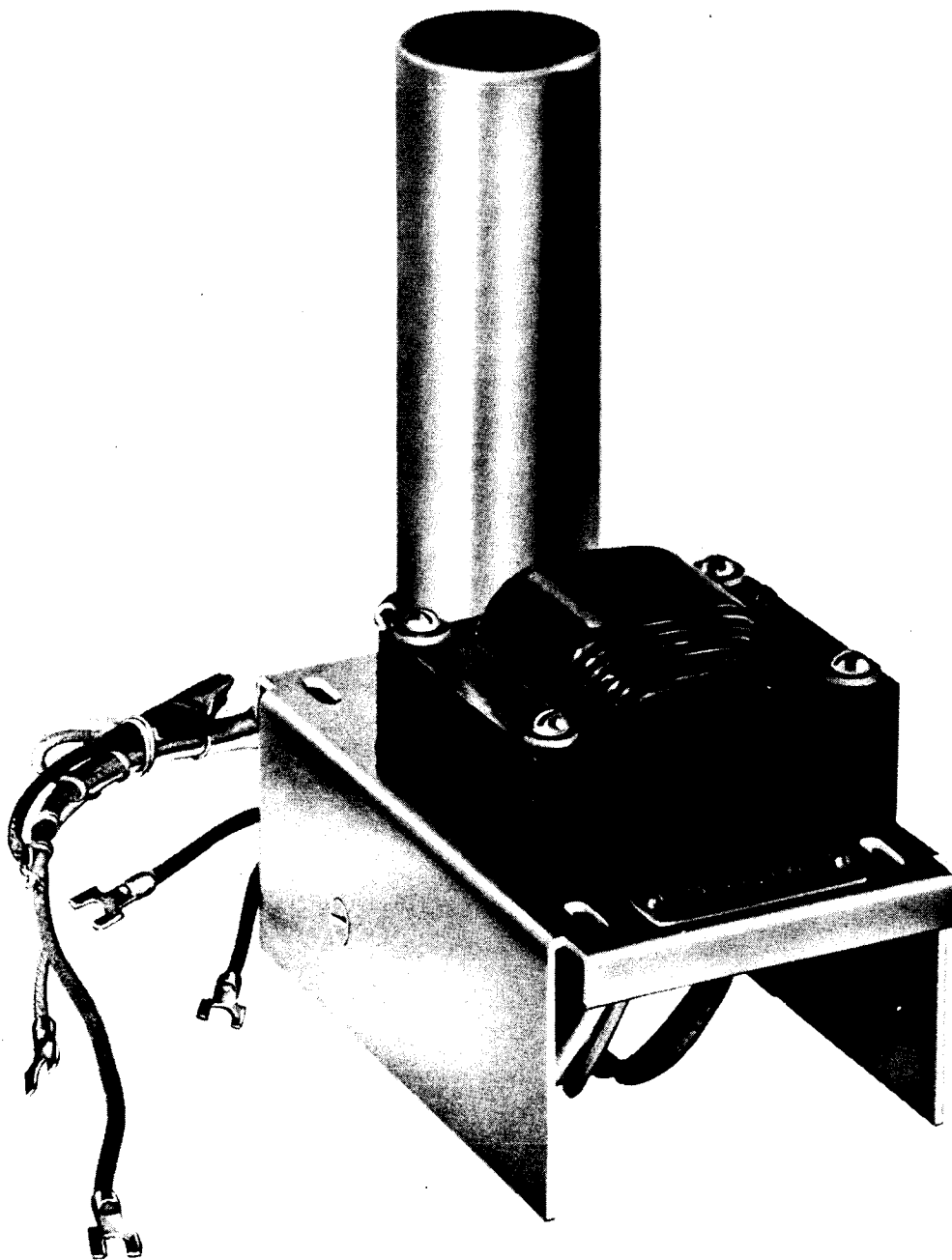


Figure 1-1. Teletypewriter Rectifier and Cable Assembly

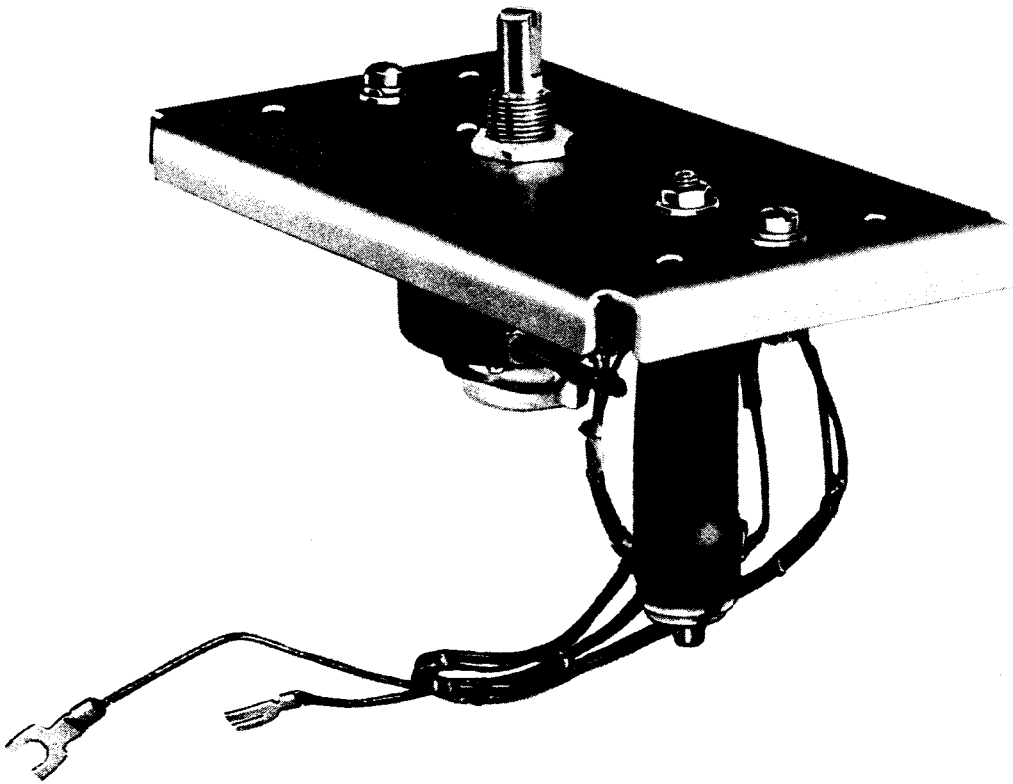


Figure 1-2. Loop Circuit Resistor Assembly

SECTION 1 GENERAL DESCRIPTION

1. INSTRUCTION BOOK COVERAGE.

This instruction book covers the use and installations of the PP-1010/UG RECTIFIER AND CABLE ASSEMBLY on the power distribution panel in a TT-47/UG, TT-48/UG, TT-69/UG, TT-70/UG or TT-47A/UG, TT-48A/UG, TT-69A/UG, TT-70A/UG and the TT-176/UG Teletypewriter. The rectifier and loop resistor assembly description, theory of operation, circuit details and parts ordering information are included.

2. PURPOSE AND BASIC PRINCIPLES.

The PP-1010/UG RECTIFIER is designed to furnish direct current (120 volts DC at 120 MA) to the elements included in a telegraph line loop circuit such as the selector magnets, motor starting relay, etc., on a Teletypewriter. The rectifier will provide signal line voltage (a) between one Teletypewriter and the radio terminal equipment aboard ship or (b) between two Teletypewriters connected in a local wire circuit. When more than one Teletypewriter and a converter unit are used in a circuit aboard ship, the DC voltage for the signal line and associated equipment will require another type of rectifier.

Normal connection of the PP-1010/UG rectifier input will provide a DC voltage when the Teletypewriter power switch is ON. If continuous rectifier operation is required, provision is made for attaching the input terminals to the AC line at a point not affected by the OFF-ON switch.

The loop circuit resistor assembly is arranged so that sufficient resistance may be added to the signal line loop circuit for limiting the current to either 20 or 60 milliamperes required for the installation. However, a higher current (approximately 100 MA) may be obtained by shifting the rheostat setting.

3. DESCRIPTION OF UNIT.

The rectifier consists of a transformer, selenium disks, capacitor, hardware and cable harness which are assembled on a 3" x 4 $\frac{3}{4}$ " aluminum plate and arranged to mount adjacent to the fuse panel on the power dis-

tribution panel of a Teletypewriter. The selenium disks are mounted on each of the two formed over edges of the aluminum plate while the transformer and capacitor extend above the plate.

When the rectifier is mounted on the power distribution panel, all electrical connections are enclosed. The associated cable is formed so as to terminate at the appropriate terminal board or connector on the power distribution panel. The DC output is ungrounded and suitable for neutral operation.

The loop circuit resistor assembly is also attached to a similar aluminum plate. The plate mounts adjacent to the line shunt relay with the rheostat shaft extending above the plate to permit adjustment with a screw driver. The fixed resistor, with its 3700 ohm tap strapped for 60 MA operation, is mounted on the under side of the plate. The strap is removed on installations requiring a lower line current. Final adjustment of the line current is obtained by positioning the slotted shaft of the rheostat. Refer to figure 1-3.

4. REFERENCE DATA.

- a. NOMENCLATURE.—Teletypewriter Rectifier and Cable Assembly PP-1010/UG.
- b. CONTRACT.—NObsr-63371, dated 21 March, 1953.
- c. CONTRACTOR.—Teletype Corporation, Chicago 14, Illinois.
- d. COGNIZANT NAVAL INSPECTOR.—Inspector of Naval Material, Chicago, Illinois.
- e. PACKAGES PER COMPLETE SHIPMENT . One
- f. CUBIC CONTENTS.
Crated . . 0.11 cu. ft. Uncrated . . 0.072 cu. ft.
- g. TOTAL WEIGHTS.
Crated 3 $\frac{3}{4}$ lb. Uncrated 3 lb.
- h. POWER SUPPLY.
. 115 Volts (Nominal) 50 to 60 cycles.
- i. POWER CONSUMPTION 23 Watts.
- j. OUTPUT POWER . 120 Volts DC at 0.12 ampere.

TABLE 1-1. SHIPPING DATA

SHIPPING BOX No.	CONTENTS		OVER ALL DIMENSIONS			VOL-UME	WEIGHT
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
1 OF 2	TELETYPEWRITER RECTIFIER AND CABLE ASSEM.	PP-1010/UG	6 1/2"	3 1/2"	5 1/4"	0.07	2 1/2 LB.
2 OF 2	RESISTOR ASSEMBLY	—	3 1/2"	3 1/2"	5 1/4"	0.04	3/4 LB.

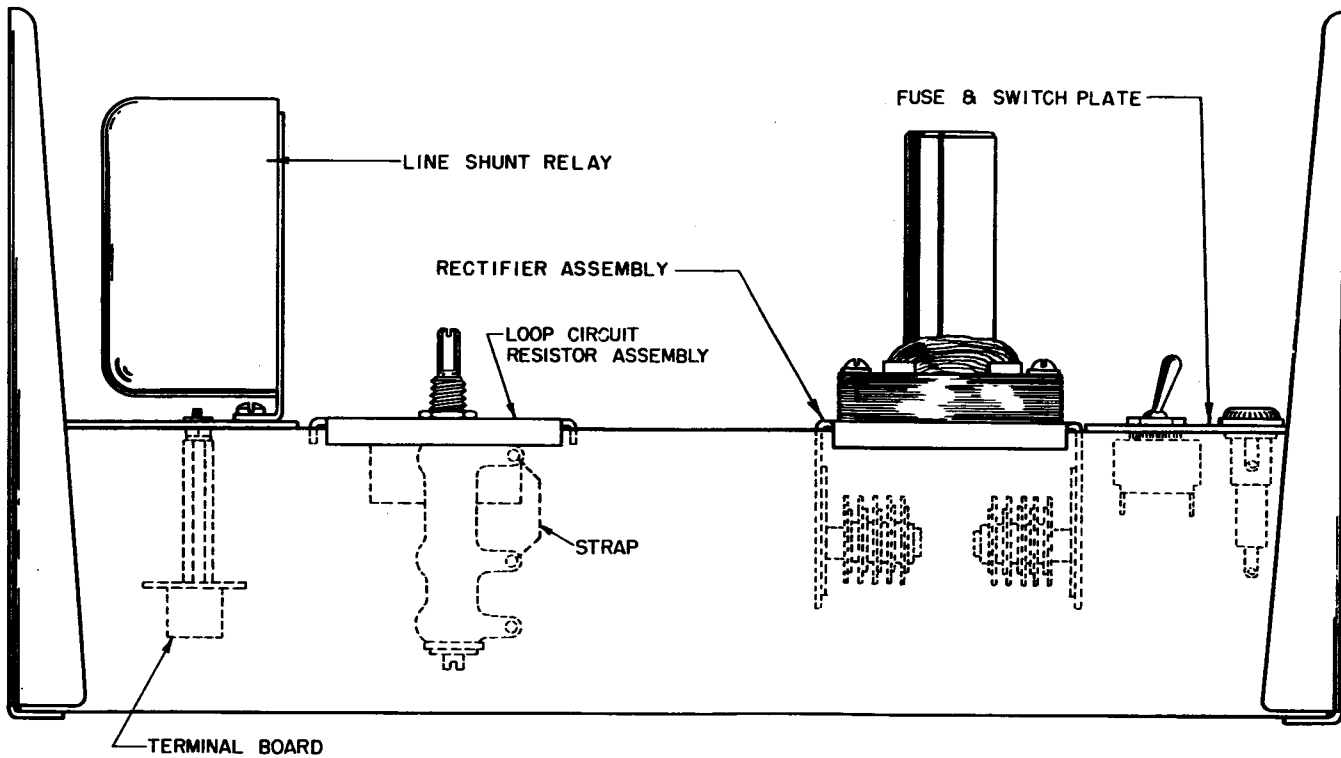


Figure 1-3. Power Distribution Panel with Rectifier and Resistor Assemblies

SECTION 2 THEORY OF OPERATION

1. GENERAL.

This section describes the operating principles and circuit arrangement of the PP-1010/UG RECTIFIER (figures 2-1 and 2-2). The function of the individual rectifier components and the Resistor Assembly are outlined as follows:

a. **POWER TRANSFORMER.**—The power transformer furnishes a center tapped secondary for the full wave connection of the selenium rectifier disks. Isolation of the rectifier output from a direct connection with the AC input is obtained by the use of the transformer.

b. **RECTIFIER.**—Two half wave 100 MA selenium stacks are arranged for full wave connection to the transformer.

c. **FILTER.**—The DC pulsations from the rectifier are smoothed out by the 200 MF electrolytic capacitor.

d. **RESISTOR ASSEMBLY.**—The current limiting resistors R-1201 and R-1202 located on a separate plate provide for the adjustment of the current in the signal line loop circuit to a value of 20 or 60 milliamperes.

2. CIRCUIT ANALYSIS.

Refer to figures 3-1, 3-3, 3-4 and the schematic wiring diagram figure 3-6 for the circuitry and the rectifier cable connections to the power distribution panel. The auxiliary leads (Orange and Blue) shown on the transformer primary of figure 4-7 are used only on the TT-47/UG, TT-48/UG, TT-69/UG and TT-70/UG (SB-154/UG) power distribution panel when continuous rectifier operation is required. Normally these leads are taped at the end and folded in the cable. Figure 3-5, 3-6.

CAUTION

Care should be taken to see that the unused pair of leads (green and white, or orange and blue) are well taped to prevent contact of the live wires.

Refer to figure 2-2 for the associated Resistor Assembly. The 3700 ohm section of R-1202 is normally strapped and fine adjustment for the 60 MA current value is made with the R-1201 rheostat. The additional resistance required in the loop circuit for 20 MA operation is obtained by removing the strap on R-1202 and repositioning the rheostat shaft as needed.

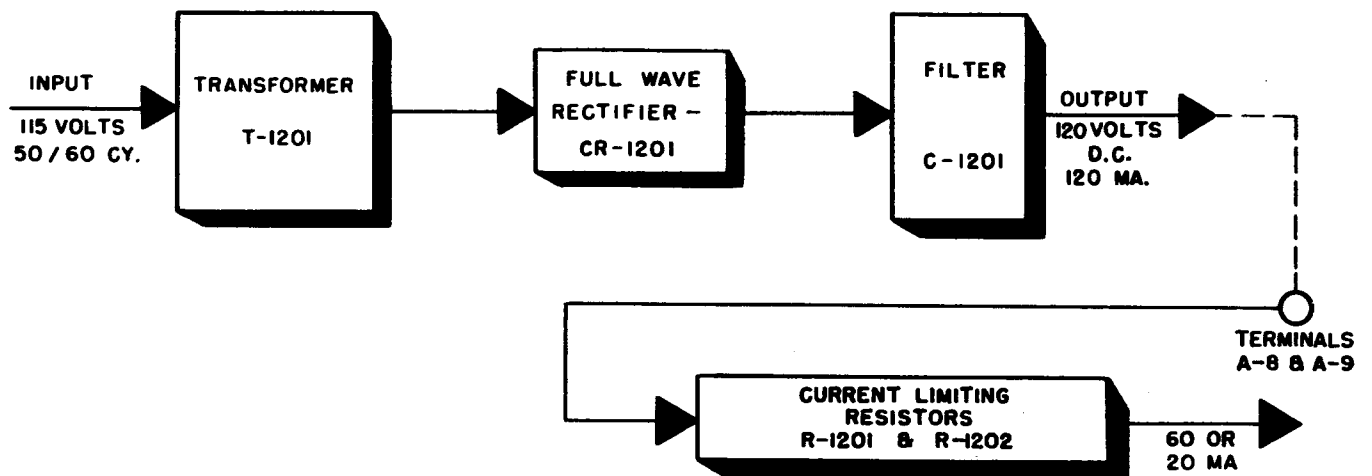


Figure 2-1. Block Diagram

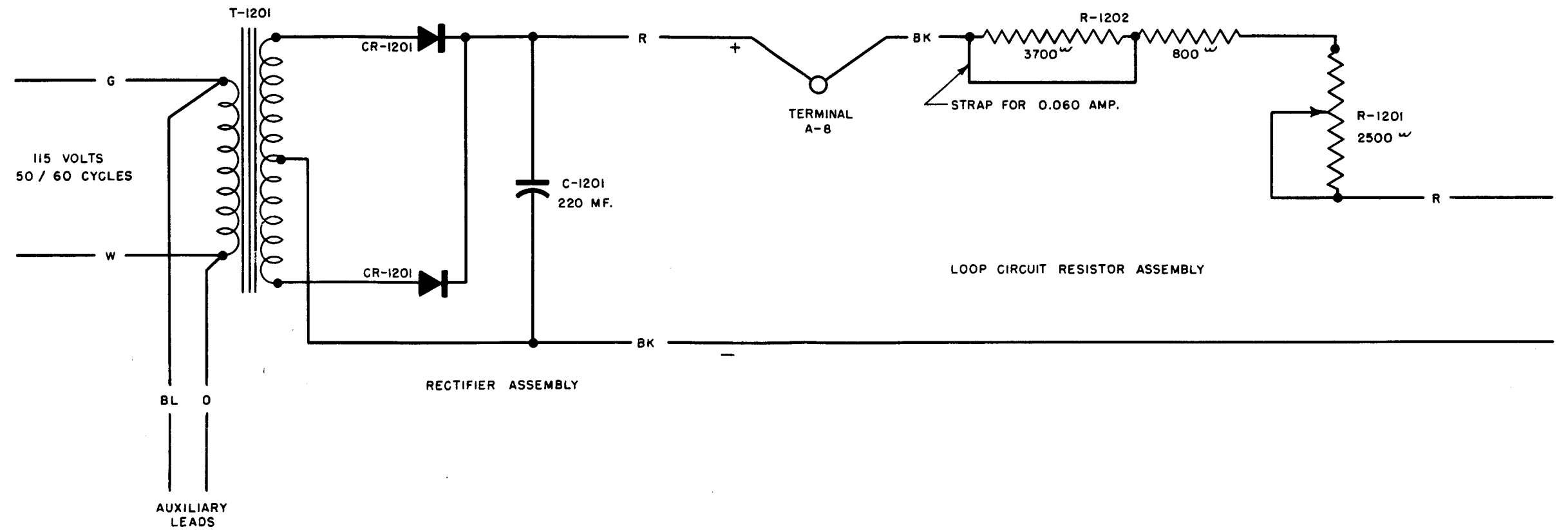


Figure 2-2. Schematic Wiring Diagram, PP-1010/UG
— Rectifier and Resistor Assemblies

SECTION 3 INSTALLATION

1. GENERAL.

The Rectifier Assembly is arranged for mounting adjacent to the fuse plate on the power distribution panel when a source of direct current is needed to operate a Teletypewriter in a local circuit. The rectifier DC output cable is formed toward the left and attached to the terminal board in the power distribution panel of the Teletypewriter.

The associated loop circuit resistor assembly is arranged for mounting adjacent to the line shunt relay. The attached cable is formed to the left for connection to the same terminal board as the rectifier. Complete the connection to the loop circuit as shown in figures 3-1 and 3-2 for TT-47/UG, TT-48/UG, TT-69/UG and TT-70/UG Teletypewriter, figure 3-3 for TT-47A/UG, TT-48A/UG, TT-69A/UG, and TT-70A/UG Teletypewriter and figure 3-4 for the TT-176/UG Teletypewriter.

Refer to Navships Instruction Book 91393, (figure 7-111) for the identification of parts not described in figure 3-1 or Navships 91713, (figure 7-113) for parts not described in figure 3-3.

Certain SB-154/UG power distribution panels may not be equipped with the auxiliary terminal board (similar to TB-1102) figures 3-1 and 3-2. Therefore, the 152126 set of parts and the 152123 cable may be procured to facilitate the connection of the rectifier and resistor assembly in the loop circuit.

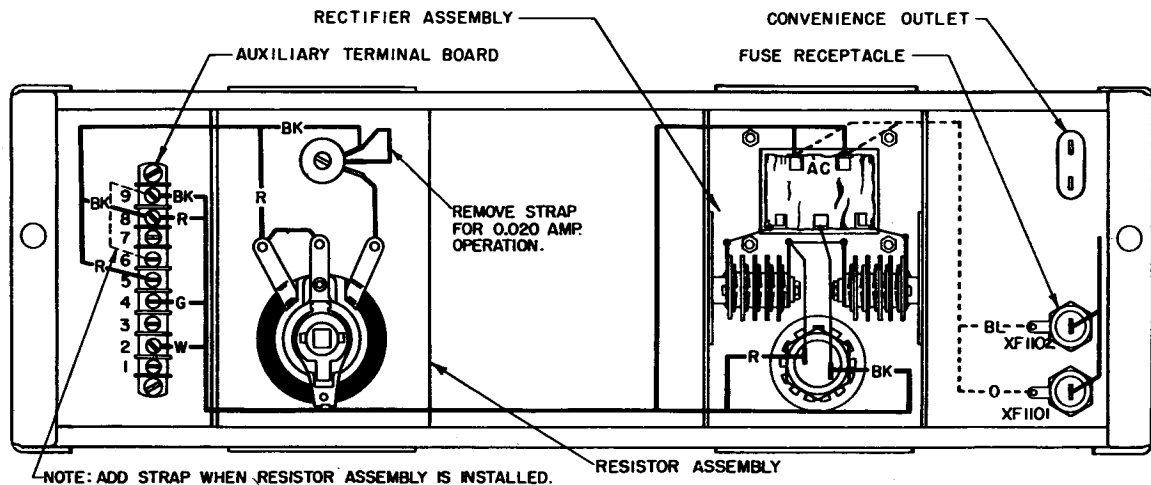
2. INSTALLATION.

a. RECTIFIER AND CABLE ASSEMBLY.—Remove and discard the O-1103 blank plate (figure 7-111) which is mounted next to the fuse receptacle on the power distribution panel. Place the rectifier over the opening so that the transformer is located toward the front and fasten the assembly with the screws and clamps that are furnished.

b. RESISTOR ASSEMBLY.—Remove and discard the O-1102 or the O-1104 blank plate which is mounted next to the line shunt relay on the power distribution panel. Place the resistor assembly over the opening with the rheostat toward the rear. Fasten the assembly to the power distribution panel with the screws and clamps provided.

When the loop circuit resistor assembly is to be installed on the SB-408/UG power distribution panel, remove the R-1201 rheostat and the R-1202 resistor from the A-1203 plate (figure 4-6) and reassemble the components on the plate provided at the extreme left end of the panel, figure 3-4. Make sure that the non-turn device engages the hole in the plate and that the wires are not damaged in transferring the components.

c. AUXILIARY TERMINAL BOARD.—Units that require the addition of the 152126 set of parts, proceed as follows:



**Figure 3-1. Power Distribution Panel, SB-154/UG
with Rectifier and Resistor Assemblies**

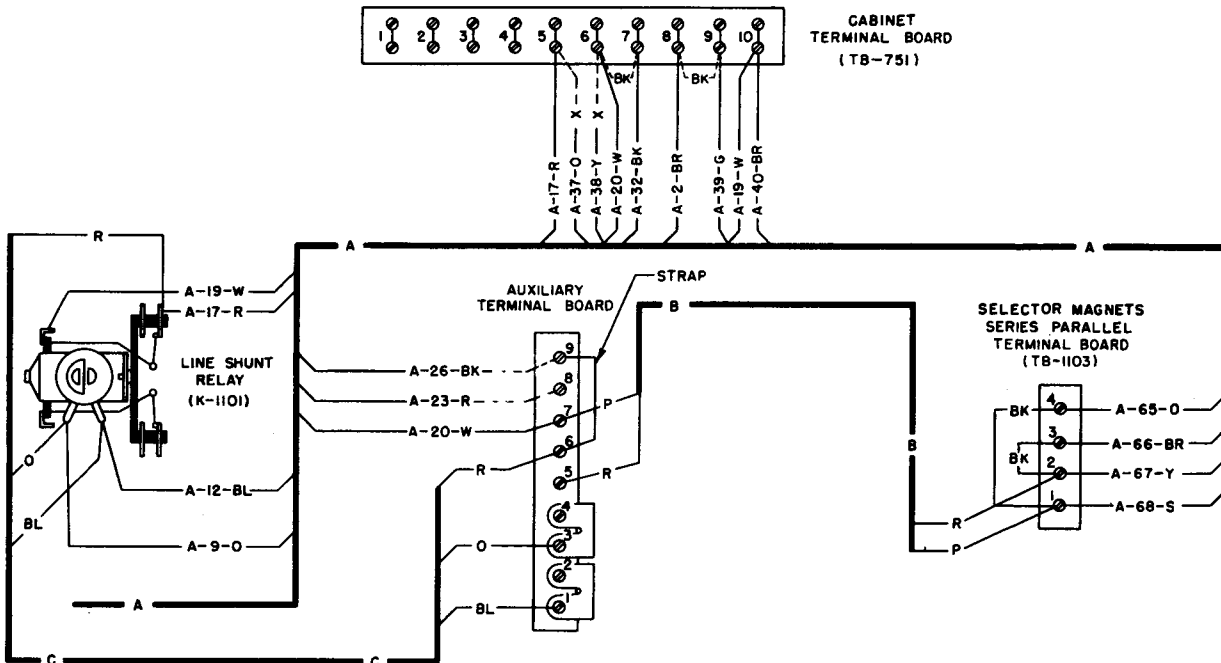


Figure 3-2. Auxiliary Terminal Board Connections

Mount the terminal board on the under side of the plate supporting the line shunt relay in the holes provided and with terminal No. 9 positioned as shown in figure 3-1.

Pull the tinned ends of the attached cable through the hole in the plate and solder to the terminals of the line shunt relay as shown in figure 3-2. The blue lead connects the right terminal of the relay solenoid to No. 1 terminal of the auxiliary terminal board and the orange lead connects the left terminal of the relay solenoid to terminal No. 3 of the auxiliary terminal board. The red lead is soldered to the extreme right

rear terminal of the relay contacts and the opposite end connects with terminal 6 of the auxiliary terminal board.

Remove the orange lead from terminal No. 5 of the cabinet terminal board (TB-751) and tape the end of the lead. Remove the yellow lead from terminal No. 6 of the same board and tape the end of the lead. Untape the loose end of the white wire A-20-W and attach the lead to terminal No. 7 of the auxiliary terminal board.

Connect the 152123 cable between the Selector Magnet Series-Parallel terminal board and the auxiliary terminal board, figure 3-2. Fasten the red lead to terminal No. 2 of the Selector Magnet series-parallel terminal

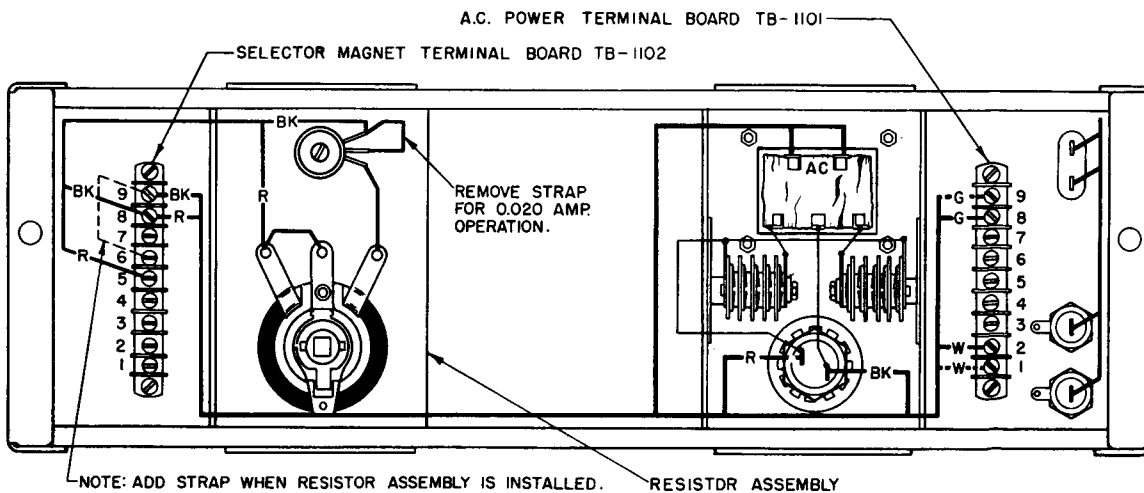


Figure 3-3. Power Distribution Panel, SB-154A/UG with Rectifier and Resistor Assemblies

board TB-1103 and the opposite end of the wire to terminal No. 5 of the auxiliary terminal board. The purple wire connects terminal No. 1 of TB-1103 to terminal No. 7 of the auxiliary terminal board.

3. POWER AND LINE CONNECTIONS.

a. STANDARD OPERATION OF THE RECTIFIER.—This refers to the desired method of connecting the rectifier input on Teletypewriters aboard ship so that the rectifier is energized only when the Teletypewriter power switch is in its ON position.

On the early power distribution panels (SB-154/UG) of TT-47/UG, TT-48/UG, TT-69/UG, and TT-70/UG, the DC output leads and the AC input leads are connected to an auxiliary terminal board (152126 set of parts and the 152123 cable) figure 3-1 and 3-2 (not shown in Navships 91393 but may be procured for terminating the rectifier cable and the resistor assembly cable).

On the TT-47A/UG, TT-48A/UG, TT-69A/UG, and TT-70A/UG equipments, with the AC power terminal board (TB-1101) and the selector magnet terminal board (TB-1102 figure 7-113, Navships 91713), the cable is connected in accordance with figure 3-3. Disregard the orange and blue leads which are taped at the ends and folded in the cable.

b. CONTINUOUS OPERATION OF THE RECTIFIER.—If the direct current is needed to energize the circuit when the Teletypewriter is shut off, the rectifier input is connected to the AC line at a point that is not affected by the power switch.

(1) Continuous operation of the rectifier is accomplished on units not equipped with TB-1101 by extending the orange and blue (auxiliary) leads to connect with the outside terminal of the fuse XF-1101 and XF-1102 respectively.

PROCEDURE

Remove the tape covering the end of the orange and blue leads in the rectifier cable. Solder the blue lead to the side terminal of the fuse receptacle which is nearest the convenience outlet. Solder the orange lead to the side terminal of the other fuse receptacle (refer to figure 3-1) and connect the DC leads to the auxiliary terminal board as shown. Make sure that the green and white leads are disconnected (dead ended) from the Auxiliary terminal board and the end of each lead taped to prevent contact of live wires.

(2) The rectifier connection for continuous operation on the units equipped with the selector magnet terminal board and the AC power terminal board are arranged in accordance with figure 3-3. AC power is provided at terminals No. 1 and No. 9 on the AC terminal board TB-1101 (TT-47A/UG, TT-48A/UG, TT-69A/UG, and TT-70A/UG) to connect the input leads of the rectifier for continuous operation. Disregard the orange and blue leads that are taped in the rectifier cable. Attach the white lead to terminal No. 1 and the green lead to terminal No. 9 on TB-1101.

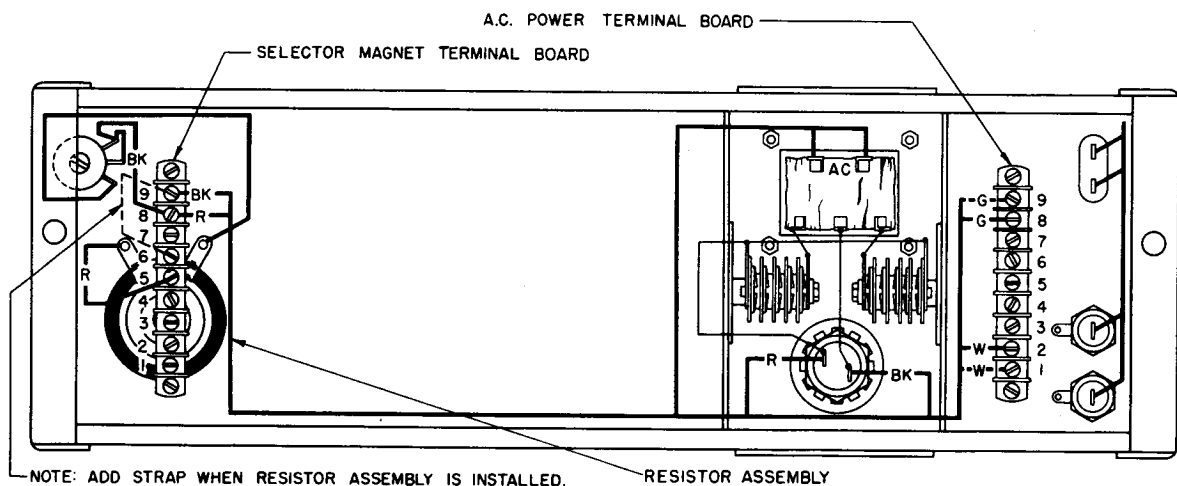


Figure 3-4. Power Distribution Panel, SB-408/UG with Rectifier and Resistor Assemblies

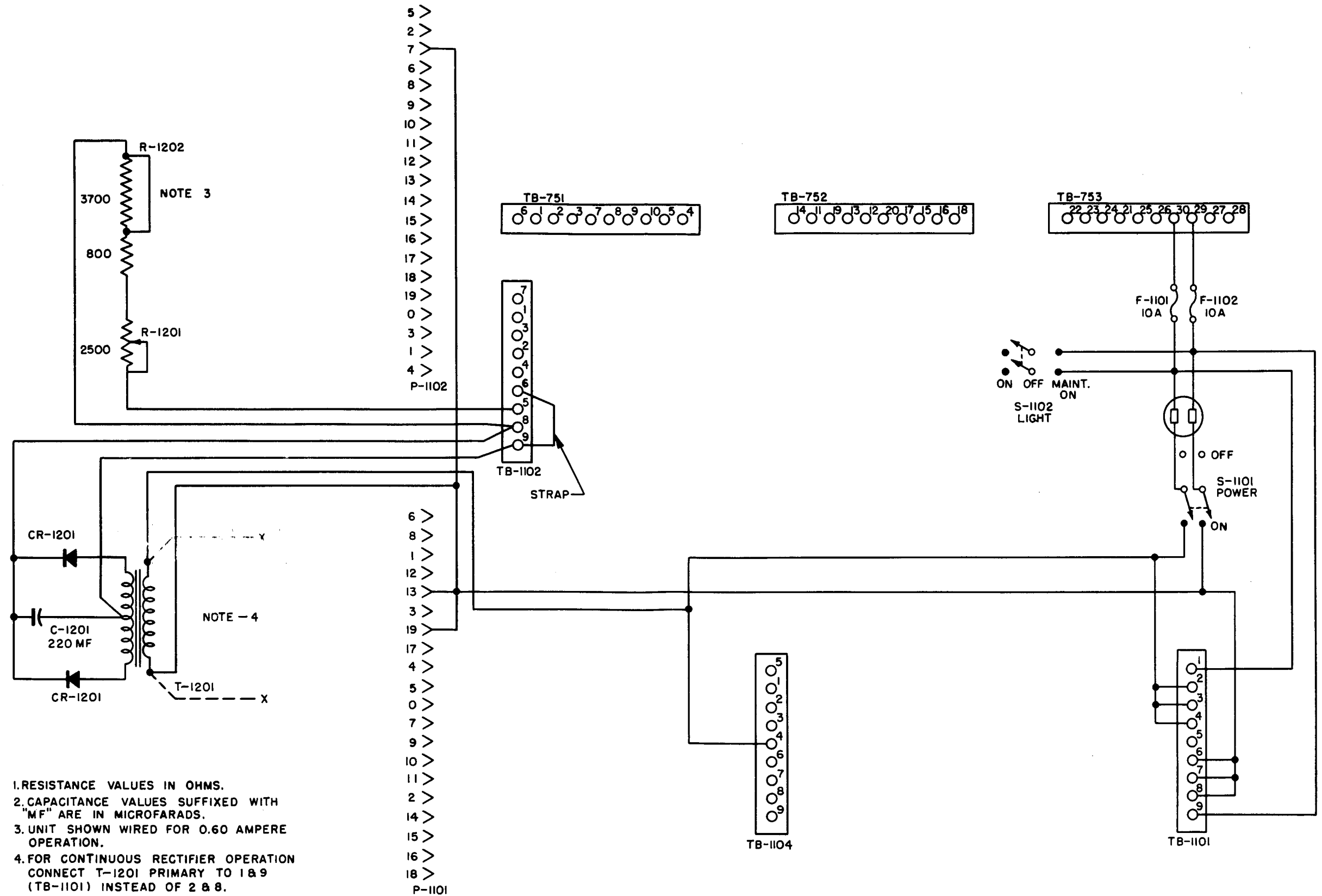


Figure 3-5. Schematic Wiring Diagram, PP-1010/UG
— Rectifier and Resistor Assemblies with
Terminal Board Connections

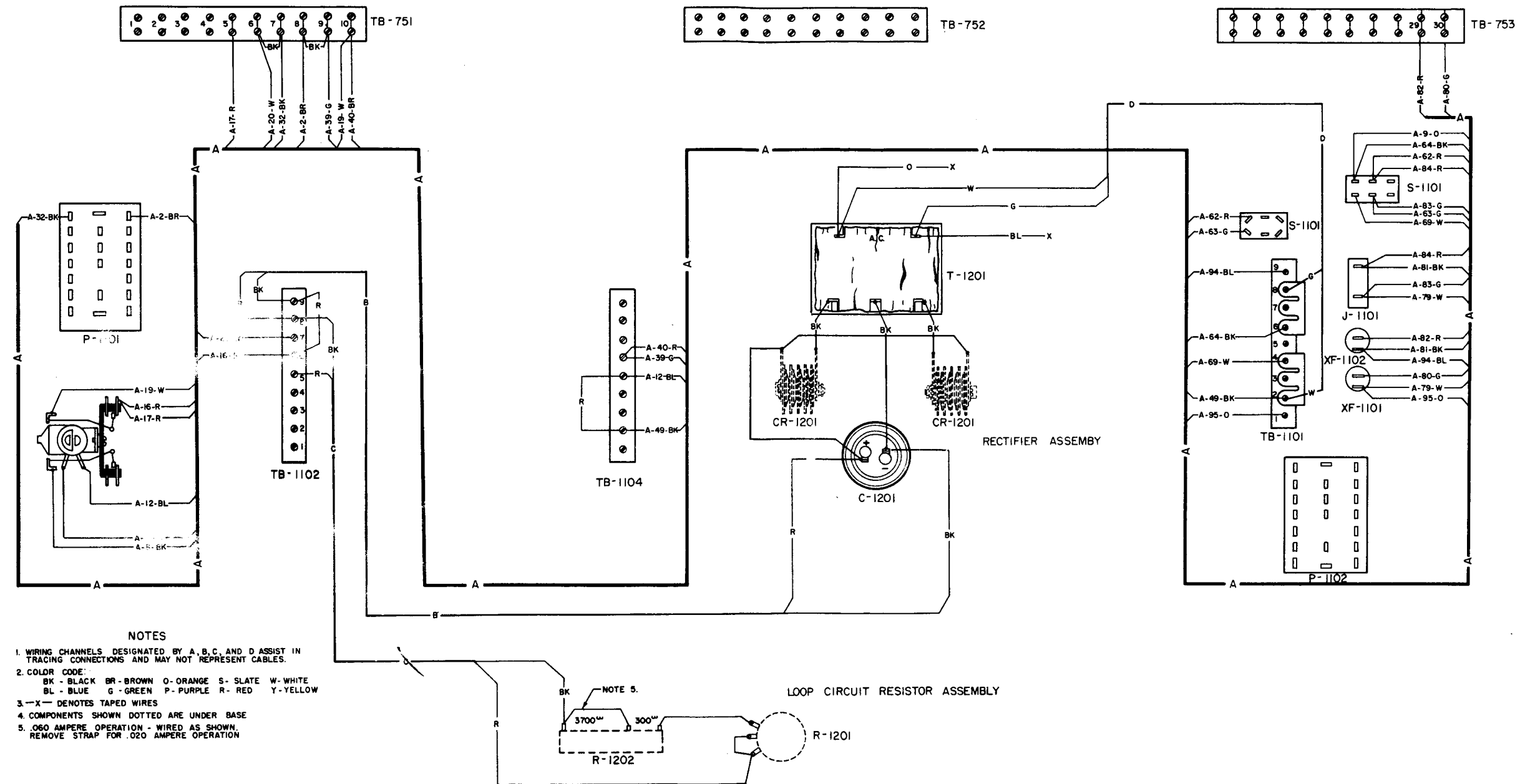


Figure 3-6. Wiring Diagram, PP-1010/UG —
Rectifier and Resistor Assemblies with
Terminal Board Connections

SECTION 4 MAINTENANCE

1. GENERAL.

There is no maintenance required by the operator for this equipment.

2. CORRECTIVE MAINTENANCE.

In general, the components of the rectifier may be replaced by equivalent components without the necessity of further adjustment. Standard test methods and conventional test equipment may be used for checking the components of the unit. The resistance and voltage values may be measured with a multimeter such as the ME-25/U series or the AN/PSM-4 series. Select a suitable range on one of the meters for the forward current check and a lower range for the reverse current check. The second meter may be used to check the input voltage.

To check the final adjustment of the line current (20 or 60 MA) a milliammeter may be connected in series with one of the external leads of the printer loop circuit or the strap across terminal 6 and 7 or 8 and 9 (TB-751 figure 3-5) may temporarily be removed to insert the meter.

CAUTION

Make sure that the correct polarity is observed in connecting the meters and that excessive voltage or current is not applied. The meter terminals may be shunted momentarily to bypass the initial surge during the reverse current test.

a. FRONT AND BACK RESISTANCE TEST OF THE SELENIUM STACK.—Connect three CR-1201 selenium stacks that are known to be good and the selenium stack to be checked in a bridge arrangement as shown in figure 4-1, 4-2, 4-3 and 4-4.

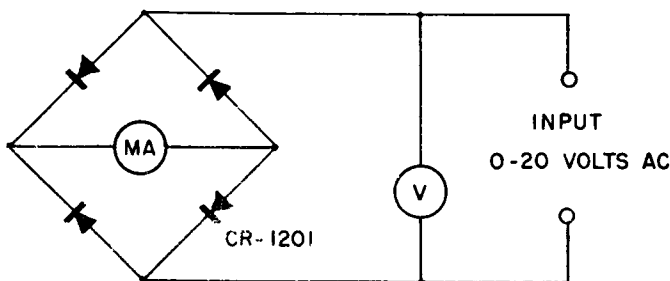


Figure 4-1. Forward Current Test

(1) FORWARD CURRENT. (Figure 4-1.)—Raise the AC input voltage (step down transformer with a variac or 1000 ohm power potentiometer attached to its primary) until a current of 180 MA is obtained. The AC input voltage should not exceed 14.4 volts.

(2) REVERSE CURRENT. (Figure 4-2.)—Apply 270 volts R.M.S. to the input. After 15 seconds, the current should not exceed 30 MA.

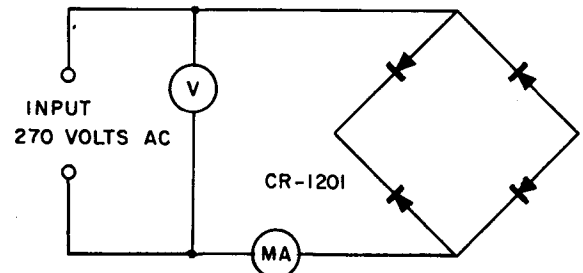


Figure 4-2. Reverse Current Test

b. REPLACING SELENIUM RECTIFIER.—If either rectifier stack is to be replaced, mark the leads before they are unsoldered and then remove the rectifier mounting nuts. Check the connections of the replacement with wiring diagram 4-7.

TABLE 4-1. OUTPUT VOLTAGE

AC-INPUT	DC-OUTPUT (60 MA LOAD)
105 volts	109.8 volts
110 volts	116.0 volts
115 volts	121.5 volts
120 volts	128.0 volts
125 volts	134.5 volts

c. REPLACING CAPACITOR.—Unsolder the leads and remove the mounting nut on the underside of the chassis. Make sure the correct Polarity is observed in connecting the replacement.

d. REPLACING THE TRANSFORMER.—If it is necessary to replace the transformer (T-1201), proceed as follows:

- (1) Unsolder all leads on the transformer termi-

nals. Make sure that all leads are identified so that they may be replaced correctly.

(2) Remove the four mounting nuts and lift the transformer off its plate.

(3) Mount the replacement and wire in accordance with figure 4-7.

e. REPLACING THE RESISTOR.

(1) The ring type rheostat is mounted by its bush-

ing. When the replacement rheostat is installed, make sure that the non-turn device engages the hole in the plate (figure 4-6). Connect the strap and cable in accordance with figure 4-8.

(2) Fixed Resistor Replacement.—Attach the strap across the 3700 ohm section of the resistor for 60 MA application; mount resistor by the screw through the center (figure 4-6). Wire in accordance with figure 4-8.

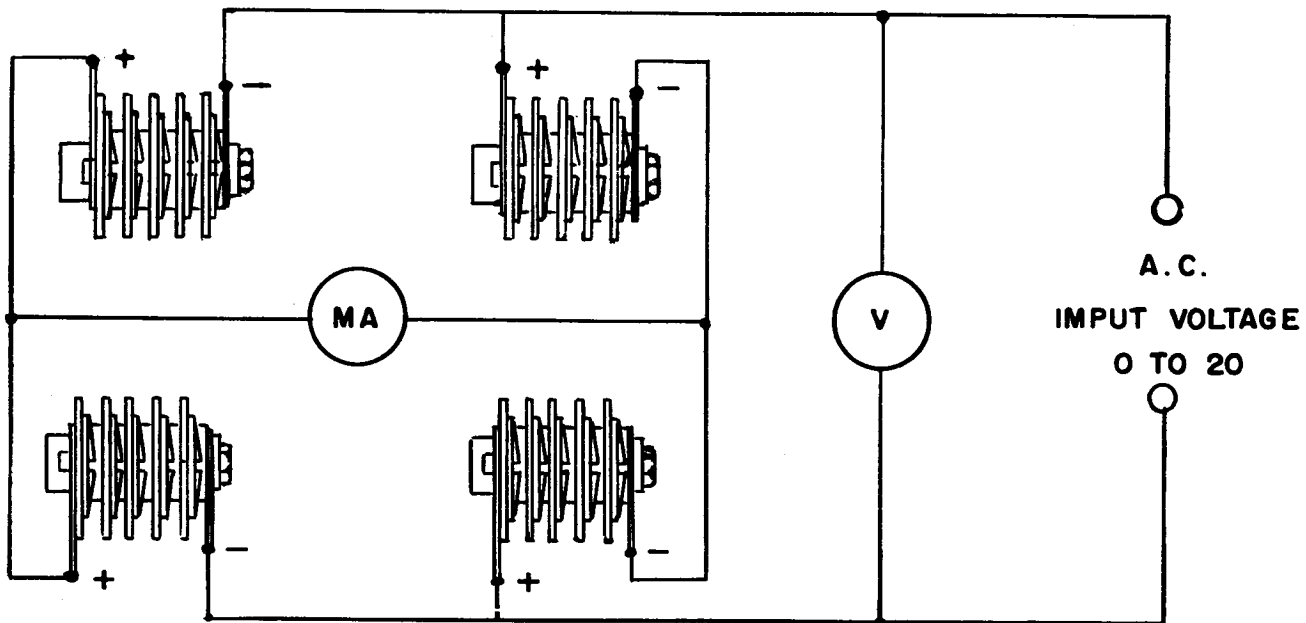


Figure 4-3. Wiring Diagram, Forward Current Test

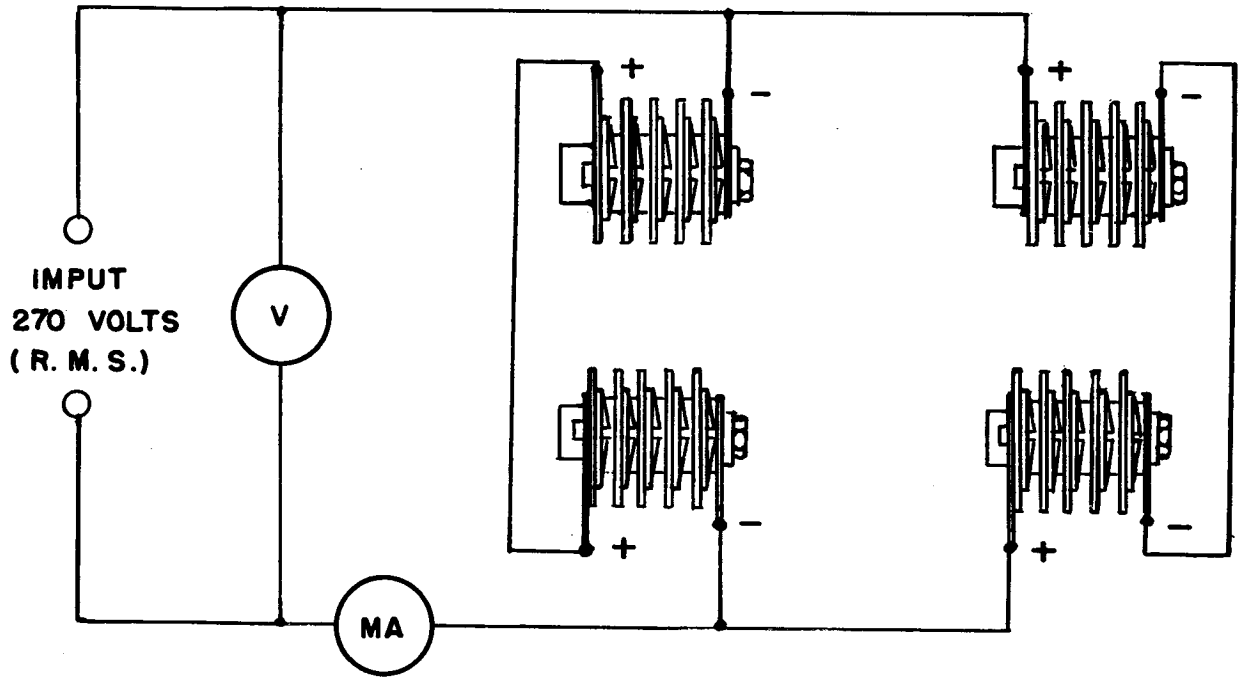


Figure 4-4. Wiring Diagram, Reverse Current Test

TABLE 4-2. VOLTAGE AND RESISTANCE

PP-1010/UG RECTIFIER						
PART	SECTION	FROM	TO	VOLTS	OHMS	REMARKS
T-1201	PRI.	Green	White	—	24.0	—
	SEC.	C. T.	Upper Term.	107 AC	26.7	120 V. Input (No load)
	SEC.	C. T.	Lower Term.	107 AC	26.7	(No load)
C-1201	—	Neg.	Pos.	140 DC	—	(No load)
RESISTOR ASSEMBLY						
R-1202	—	BK	Outer Term.	—	800	3700 ohm Strapped
R-1201	—				2500	Rheostat Slider on Right

TABLE 4-3. WINDING DATA

DESIGNATION SYMBOL	MFR. & MFR'S DESIGNATION	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RESISTANCE IN OHMS	IMPEDANCE RATIO	HIPOT A.C. VOLTS	REMARKS
T-1201	POWER EQUIPMENT CO. T-865 TRANSFORMER		PRI 1 & 2 SEC. 3 & 4 4 & 5 3 & 5	30 30 30	660 586 586 1172	24.4 — — 53.4	— — — —	1500 1500	INPUT 115 VOLTS (NOMINAL) TERMINALS NOT NUMBERED OUTPUT 102-204 VOLTS RESISTANCE VALUE ±5%

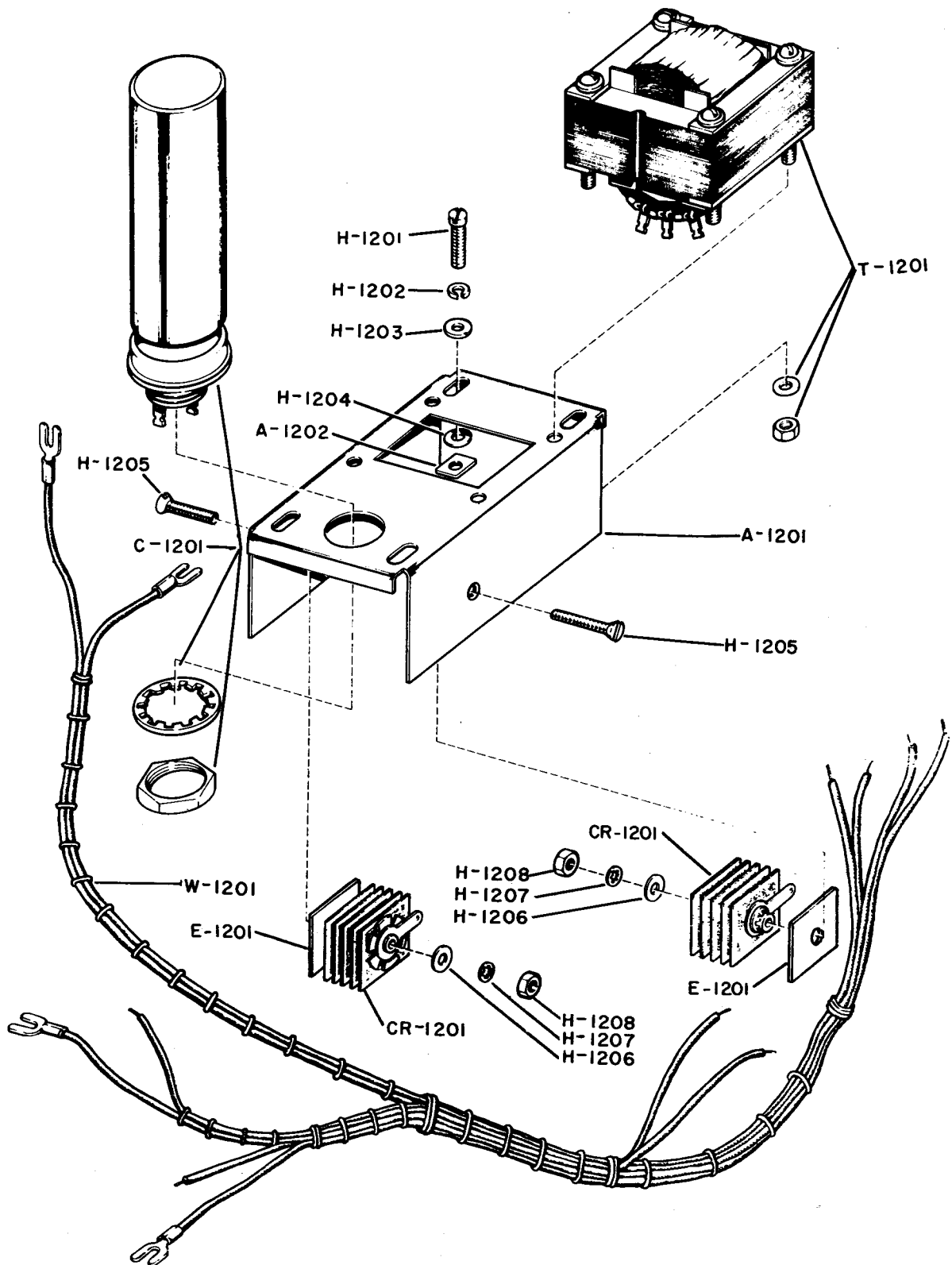


Figure 4-5. Rectifier and Cable Assembly,
Parts Location

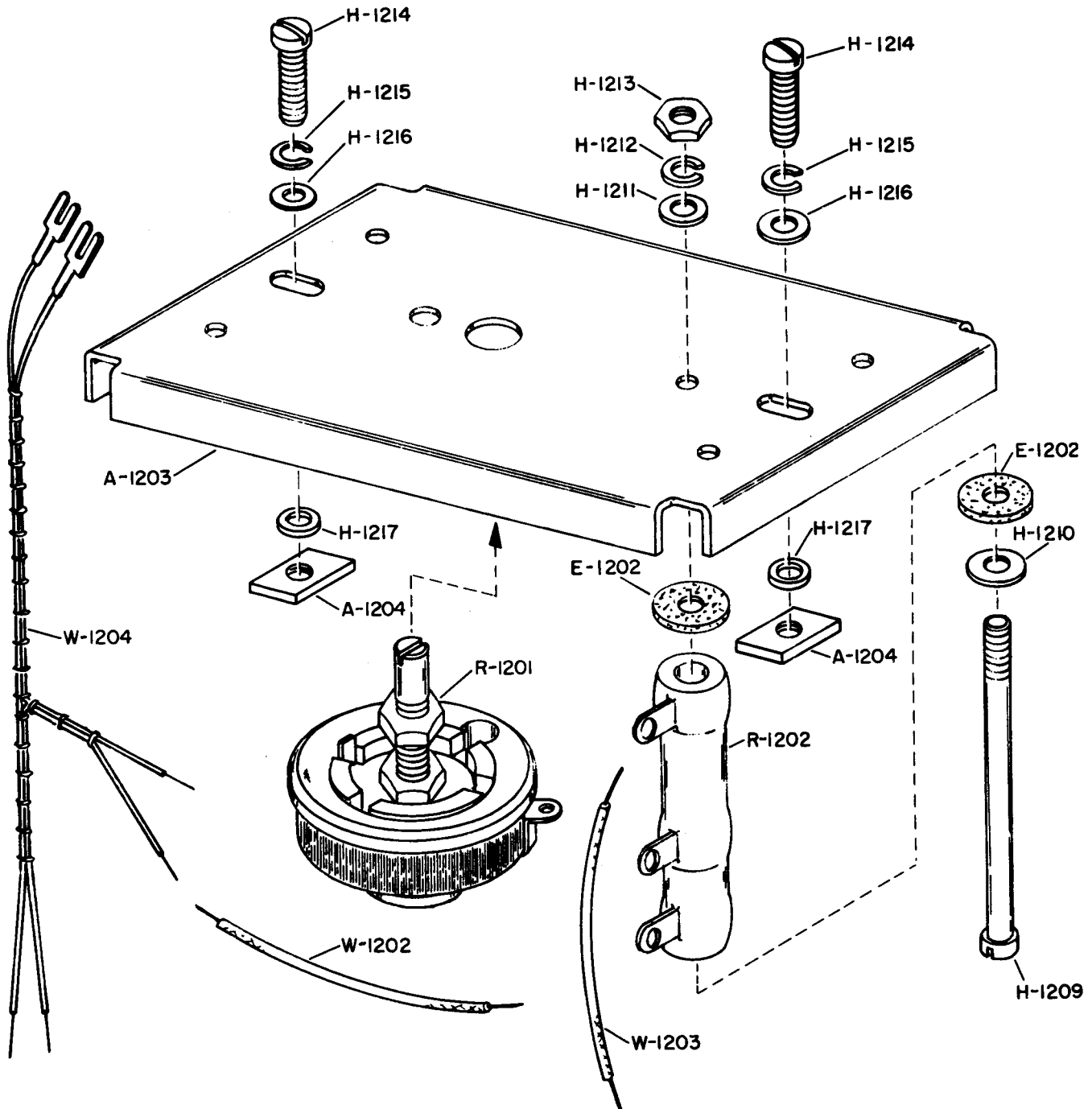


Figure 4-6. Resistor Assembly, Parts Location

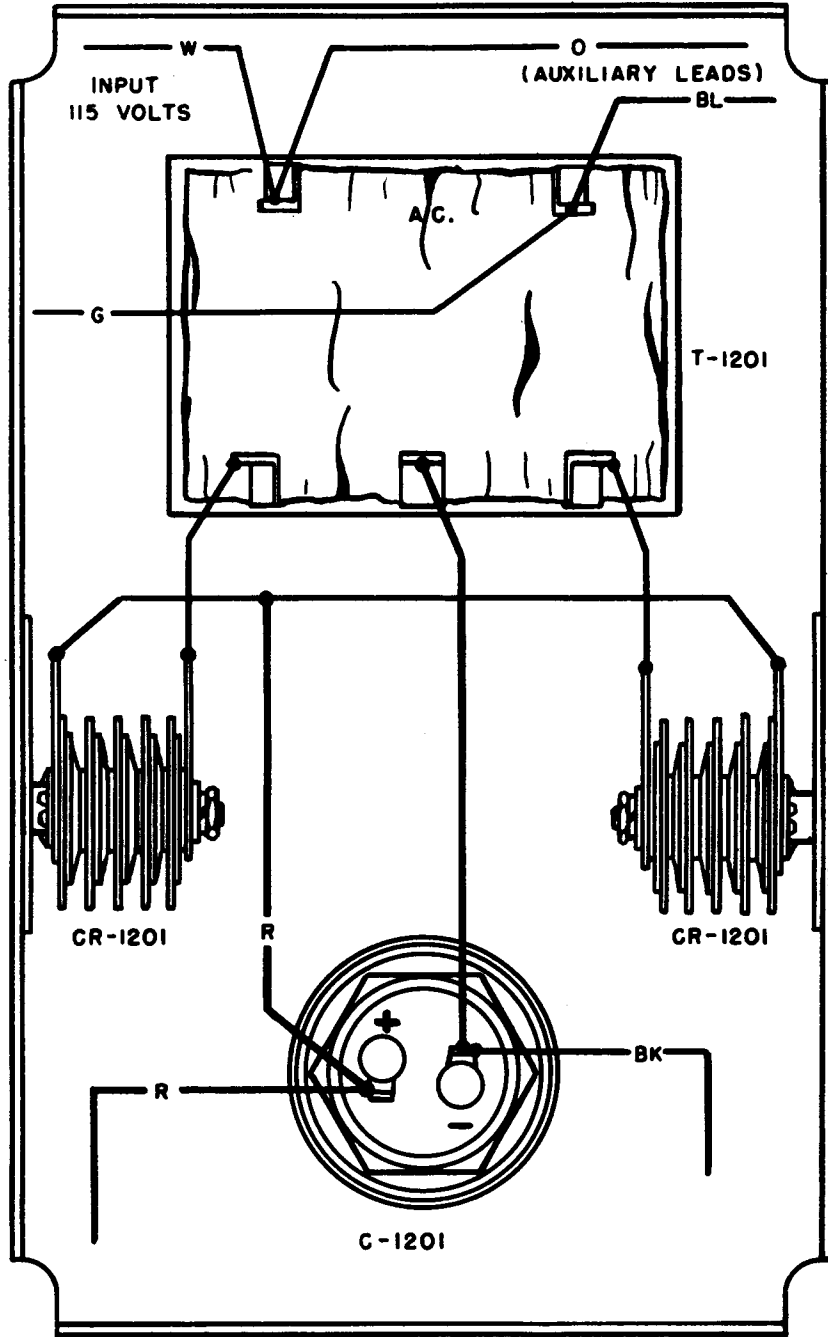


Figure 4-7. Wiring Diagram, Rectifier Assembly

NOTES

1. Color Code

- | | |
|------------|------------|
| BK — Black | O — Orange |
| W — White | G — Green |
| R — Red | BL — Blue |

2. Check Polarity of the replacement stack (CR-1201) before installing.

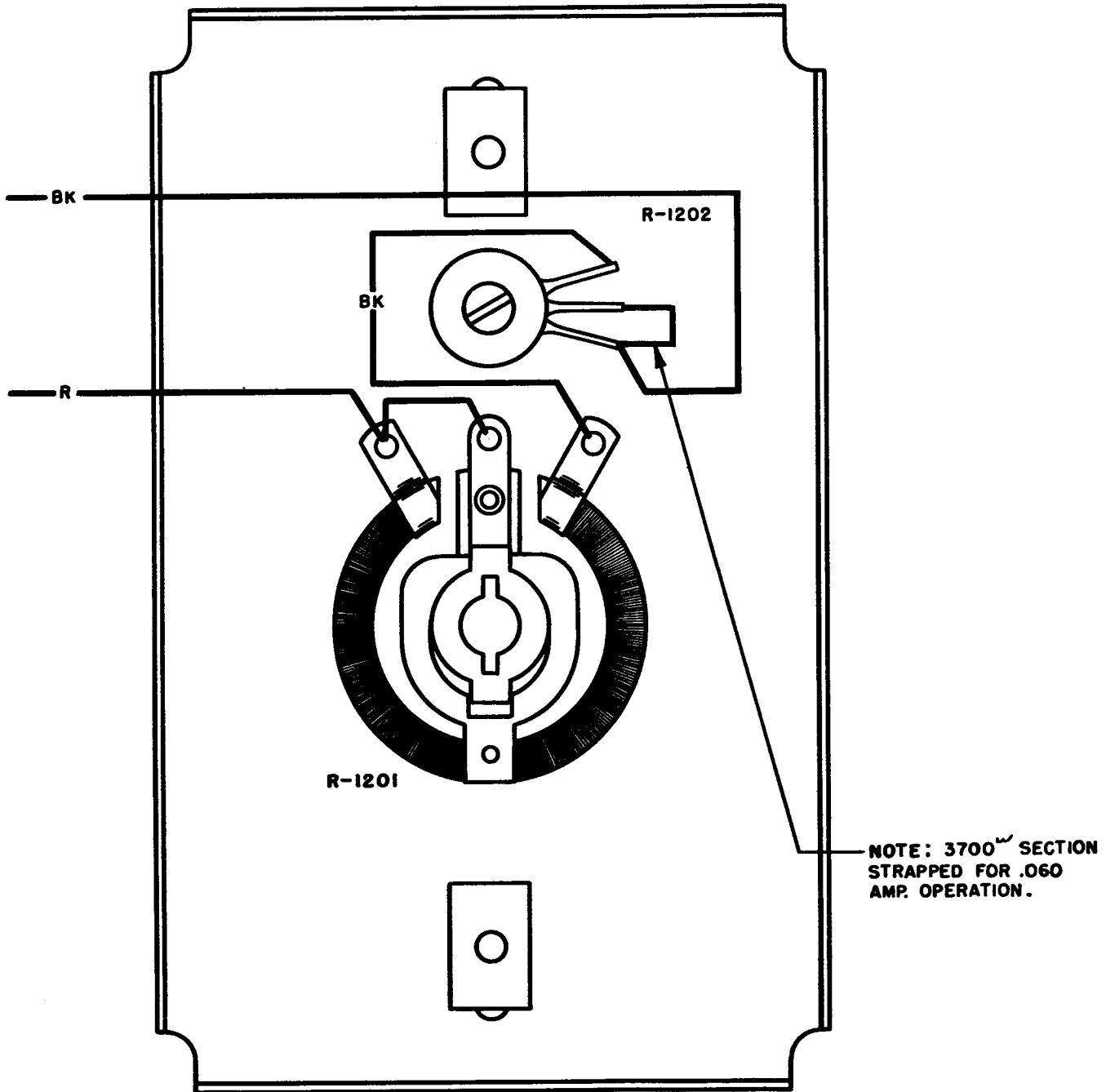


Figure 4-8. Wiring Diagram, Resistor Assembly

**SECTION 5
PARTS LIST**

TABLE 5-1. COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGN.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MANUFAC-TURERS DESIG.	TELETYPE PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.		SPARE PARTS	
								BOX	QUAN.	BOX	QUAN.
A-1201	PLATE, mounting; aluminum, plain anodized; approx 4-3/8" lg x 2-7/8" wd x 1-3/4" h o/a, 0.064" thk material; mts by 4 elongated holes at corners; 4 sides formed, 4 corner cutouts, one sq hole, 2 csk holes, one large and 4 small body holes	Support for Rectifier Assembly		*	CTT 151913	151913	A-1201	1	0	0	0
A-1202	PLATE, clamp; steel, nickel pl; approx 9/16" lg x 3/8" h x 0.095" thk o/s; mts by tapped hole in ctr	Clamps A-1201 to Power Distribution panel		N17-T-350013-733	CTT 151427	151427	A-1202, A-1204	4	0	0	0
A-1203	PLATE, mounting; aluminum, plain anodized; rectangular shape, cutout ea corner, 4 edges formed; approx 4-51/8" lg x 2-3/4" wd x 3/8" h o/s, 0.064" thk material; mts by 2 elongated holes; 7 body holes irregularly located	Supports R-1201 and R-1202			CTT 152975	152975	A-1203	1	0	0	0
A-1204	Same as A-1202	Clamps A-1203 to Power Distribution Panel									
C-1201	CAPACITOR, FIXED, ELECTROLYTIC; one section; 220 mf working voltage, 220 v DC; casing data, aluminum, hermetically sealed; case dimen, 1-3/8" dia, 4-11/32" lg; term data, two, solder lug type, 5/16" h, located on bottom, 7/16" c to c, phenolic ins; method of mfg, mts by threaded base, lock washer and nut	Signal line supply, filter	CEALC221K	N16-C-20490-1061	CSF CBALC 221K	151914	C-1201	1	0	0	0
CR-1201	RECTIFIER, METALLIC; selenium; designed for single phase half-wave circuit, MECA Ref Dwg Group 23; input data, 115 v AC, single phase; output data, 113 v DC, 100 ma, half-wave rectification; over-all dim, 15/16" lg, 1" wd, 1-5/16" h; one 3/16" dia mtg hole through ctr; term data, 2, solder lug type	Signal line supply, rectifier		N17-R-51401-8521	CG GRS5GRH	120195	CR-1201	2	0	0	0
E-1201	INSULATOR, plate; sq shape; grey fibre; 1-5/8" sq; 1/32" thk, 3/16" diam mtg hole	Insulates CR-1201 from A-1201			CAIU IN 159	153108	E-1201	2	0	0	0
E-1202	WASHER, flat; natural color bakelite, PS grade; round, 5/32" ID, 1/2" OD, 1/16" thk	Insulates R-1202 from A-1203 and H-1210		N17-T-350008-377	CTT 75750	75750	E-1202	2	0	0	0
H-1201	SCREW, machine; slot drive; F11 H; steel nickel pl; #6-40; approx 3/4" lg o/a; 5/8" lg threaded portion; head 1/8" thk x 7/32" diam	Holds A-1201 to power distribution panel		N17-T-350013-165	CTT 1179	1179	H-1201, H-1214	6	0	0	0
H-1202	WASHER, lock; steel, round, approx 1/4" OD x 5/32" ID x 1/32" thk o/s; split-ring type	Holds A-1201 to power distribution panel		N17-T-350003-561	CTT 2191	2191	H-1202, H-1212, H-1215	7	0	0	0
H-1203	WASHER, flat; steel, nickel pl; round, approx 5/16" OD x 5/32" ID x 0.028" thk o/a	Holds A-1201 to power distribution panel		N17-T-350003-776	CTT 7002	7002	H-1203, H-1211, H-1216	7	0	0	0

PARTS LISTS

NAVSHIPS 92142
PP-1010/UG

Section 5
H-1204-R-1201

H-1204	WASHER, flat; steel, nickel pl; round, approx 1/4" OD x 5/32" ID x 0.050" thk o/a	Clamping surface for A-1202	N17-T-350009-897	CTT	90789	90789	H-1204, H-1217	6	0	0
H-1205	SCREW, machine; slot drive; FH; steel, nickel pl; #6-32; 1-3/4" lg o/s; threaded portion 1-11/64" lg; head 5/64" lg x 17/64" diam	Holds CR-1201 to A-1201	N17-T-350007-515	CTT	71155	71155	H-1205	2	0	0
H-1206	WASHER, flat; steel, zinc and chromate dip; round, 3/8" OD x 9/64" ID x 0.032" thk	Holds CR-1201 to A-1201	N17-T-350012-636	CTT	125015	125015	H-1206	2	0	0
H-1207	WASHER, lock; steel, zinc and chromate dip; round, approx 9/32" OD x 1/8" ID x 0.018" thk o/s; shakeproof type, straight internal teeth	Holds CR-1201 to A-1201	N17-T-350010-258	CTT	92260	92260	H-1207	2	0	0
H-1208	NUT, PLAIN, HEXAGON; steel, nickel finish; machining, finished, both bearing surfaces chamfered; threaded data, #6-32; dimensions, 5/16" wd across flats, 7/64" h o/a	Holds CR-1201 to A-1201	N17-T-350007-553	CTT	71646	71646	H-1208	2	0	0
H-1209	SCREW, machine; slot drive; flat FH; steel, copper pl; #6-40; approx 2-19/32" lg o/s; threaded portion 3/8" lg; head 5/32" lg x 1/4" diam	Holds R-1202 to A-1203	N17-T-350005-719	CTT	1297	1297	H-1209	1	0	0
H-1210	WASHER, flat; steel; nickel pl; round, approx 7/16" OD x 3/16" ID x 0.050" thk o/a	Holds R-1202 to A-1203	N17-T-350005-622	CTT	3438	3438	H-1210	1	0	0
H-1211	Same as H-1203	Holds R-1202 to A-1203								
H-1212	Same as H-1202	Holds R-1202 to A-1203								
H-1213	NUT, hexagon; steel, nickel pl; #6-40; 3/32" thk o/s; 1/4" wd across flats	Holds R-1202 to A-1203	N17-T-350012-485	CTT	3598	3598	H-1213	1	0	0
H-1214	Same as H-1201	Holds A-1203 to Power Distribution Panel								
H-1215	Same as H-1202	Holds A-1203 to Power Distribution Panel								
H-1216	Same as H-1203	Holds A-1203 to Power Distribution Panel								
H-1217	Same as H-1204	Holds A-1203 to Power Distribution Panel								
R-1201	RESISTOR, VARIABLE; wire-wound element; Resistance and tolerance data, 1 section, 2500 ohms ± 10%; 25 w nom power rating; terminal data, 3 terminals, solder lug type; Housing data, ceramic body, open, dim; Ref Dwg Group 3, 1-9/16 in. dia, 1-3/16 in. deep; single shaft, metal, rd, slotted, dim; Ref Dwg Group 3, 1 in. lg, 1/4 in. dia; contact arm data, insulated, no "off" position; Mounting data as indicated in Ref Dwg Group 3 mounted by bushing, 3/8 in. dia, 32 threads per in., 1/2 in. lg, w/nonturn device located on 1/2 in. radius at 3 o'clock	Current limiting resistor for 20 or 60 ma operation		CAO	25R 2500 ohms	152992	R-1201	1	0	0

* Low failure item - If required requisition from ESO referencing NavShips 900.180A.

ORIGINAL

TABLE 5-1. COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MANUFAC- TURERS		TELETYPE PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL QUANTITY ON HAND	SPARE PARTS	
					W G O	DESIG.				EQUIP. BOX	STOCK BOX
R-1202	RESISTOR, FIXED, WIRE WOUND: body style No. 20, Ref Dwg Group 2; inductive windings; Resistance data, 4500 ohms total resistance \pm 10% tolerance; Power rating, 20 w power dissipation, 300 deg C max continuous operating temp, 40 deg C ambient temp; Tap data, w/fixed taps, 2 fixed taps, 800 ohms, 3700 ohms resistance between fixed taps; body dim., Ref Dwg Group 2, 2 in. lg, 9/16 in. OD; Protective covering data, vitreous enamel coating, humidity resistant; Terminal data, 3, tab type, diam., Ref Dwg Group 2, 7/16 in. lg, 3/16 in. wd; Mounting data, mts by ID, mtg hardware required	Current limiting resistor for 20 or 60 ma operation			CAO	20F 800, 3700, 4500 ohms #211 term	82866	R-1202	1	0	0
T-1201	TRANSFORMER, POWER, STEP-UP: case data, open frame; primary winding data, 115 v, 60 cyc, single ph; secondary winding data, 204 v, CT; 1500 v insulation; air-cooled; impregnated; dim, MECA ref Dwg Group 12, 2-5/8" lg, 2-3/16" wd, 2-3/16" h; term data, 5, solder lug type; 4 mtg holes on 1-3/4" x 2-3/16" mtg centers, MECA Ref Dwg Group 12, mtg hardware furnished; special feature, moisture proof dipped	Furnishes power to line supply rectifier		ML7-T- 77501-5501	CAJU	T865	151916	T-1201	1	0	0
W-1201	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: cable data, 6 cond, cond data, 6, stranded, #18 AWG, plastic ins, laced w/#6 lacing twine, cotton braid covering; dimensional data, length data, approx 1 ft 10 in lg o/a, approx 1 ft 9-3/8" lg excluding terminations; termination data, terminal fittings on first end, 4, terminal, Teletype part/dwg #151626, 2 cond on first end skinned twisted and tinned, all cond on second end skinned, twisted and tinned	Signal line rectifier cable		ML7-T- 350016-585	CTT	151825	151825	W-1201	1	0	0
W-1202	LEAD, ELECTRICAL: Wire data, type identification, JAN spec C-76, conductor details, copper, stranded, no. 18 AWG, insulation details, plastic insulation, cotton braid covered, colored black; 2-1/2 in lg over-all; termination data, ends processed w/o fittings wire stripped of insulation 3/8 in. lg and tinned	Strap for R-1201			CTT	96256BK	96256BK	W-1202, W-1203	2	0	0
W-1203	Same as W-1202	Strap for R-1202									
W-1204	CABLE ASSEMBLY, special purpose: plastic insulated cotton braid covered; 3 cond #24 AWG stranded copper; cond bound w/#6 lacing twine; approx 11-5/8" lg o/a; one end terminated by 2 Teletype #151626 terminals, all other ends skinned, twisted and tinned 3/8" lg; color coded	Connects PP-1010/UG with Power Distribution Panel					152987	W-1203	1	0	0

TABLE 5-2. LIST OF MANUFACTURERS

PREFIX	NAME	ADDRESS
CAIU	Power Equipment Company	5740 Nevada East, Detroit 34, Michigan
CAO	Ward Leonard Electric Co.	6 South Street, Mount Vernon, New York
CG	General Electric Company	1 River Road, Schenectady 5, New York
CSF	Sprague Specialties Company	North Adams, Massachusetts
CTT	Teletype Corporation	1400 Wrightwood Avenue, Chicago 14, Illinois