

NAVSHIPS 94169

(Non-Registered)

TECHNICAL MANUAL
for
POWER SUPPLY
PP-3054/UG

TABET MANUFACTURING CO., INC.
Norfolk, Virginia

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS

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From: Chief, Bureau of Ships
To: All Activities concerned with the Installation, Operation,
and Maintenance of the Subject Equipment
.
Subj: Technical Manual for Power Supply PP-3054/UG, NAVSHIPS 94169

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PP-3054/UG
GENERAL INFORMATION



Figure 1-1. Power Supply, PP-3054/UG

SECTION 1 GENERAL INFORMATION

1-1. FUNCTIONAL DESCRIPTION

Power Supply PP-3054/UG is a unit designed to produce 124 volts dc when operated from a 115 or 230 volt ac, 50 or 60 cycle supply. The dc voltage output is regulated and will remain constant within plus or minus 5% with an ac voltage input change of plus or minus 10% and within 10% for the specified ac voltage input change when accompanied by a supply frequency change of plus or minus 5%. The dc voltage output will remain regulated to the same degree with a load varying from 0 to 1.0 ampere.

Power Supply PP-3054/PG is intended to be used as a dc supply for the operation of teletype-writers, radio adapters and associated equipments.

Figure 1-2 shows Power Supply PP-3054/UG used in a typical radio teletype system.

No vacuum tubes are used and the unit requires no operational adjustments.

The circuit comprises a constant voltage power transformer, a bridge silicon rectifier, an inductance-capacitance filter and a dc voltage regulator

consisting of a resistor and Zener diodes. Fuses are provided at the input and output for overload and short circuit protection and a pilot light indicates when the power is on.

1-2. REFERENCE DATA.

- a. Navy Type: Power Supply PP-3054/UG.
Commercial Type: Power Supply TPS-2.
- b. Contract: NObsr-85270.
- c. Contractor: Tabet Manufacturing Co., Inc.
Norfolk 12, Va.
- d. Inspector: Inspector of Naval Material,
Baltimore, Md.
- e. Number of packages: One complete unit per
package.
- f. Cubical Contents: 0.90 cu. ft. uncrated.
- g. Total weight: 59 lbs.
- h. Power Supply: 115/230V, plus or minus 10%,
50 or 60 cycles, single phase.
- i. Output voltage: 124V dc, plus or minus 5%
at 1.0 ampere.

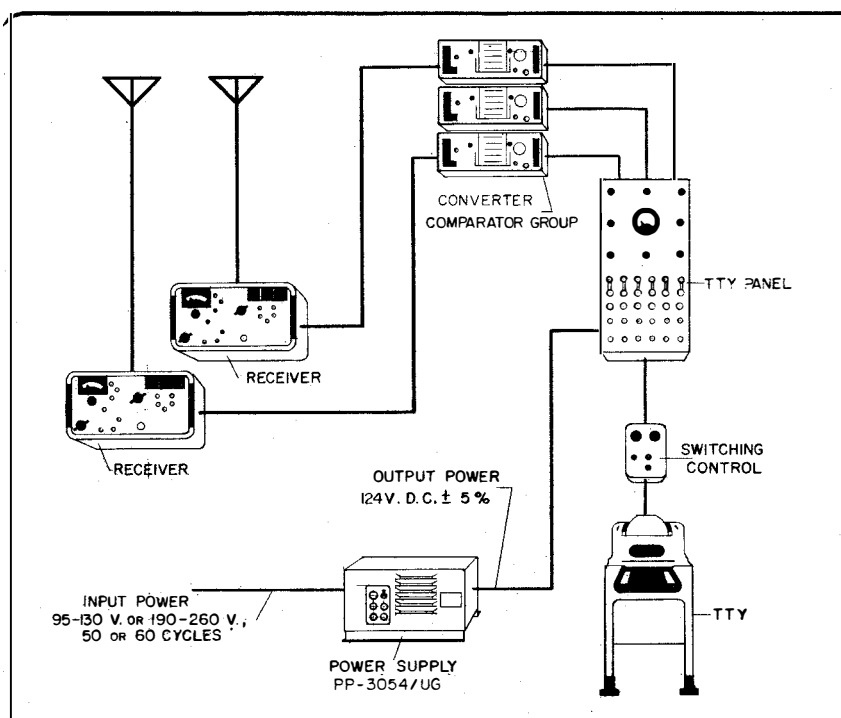


Figure 1-2. Power Supply, PP-3054/UG, System Diagram

SECTION 2 INSTALLATION

2-1. SITE SELECTION.

Power Supply PP-3054/UG may be located on any shelf, table, deck or other horizontal surface. Sufficient clearance should be provided from other equipment and structures to allow adequate ventilation.

Figure 2-1, Power Supply PP3054/UG, Outline Drawing, indicates the overall dimensions. Four 1/4-20 bolts are required to fasten the unit to its foundation.

2-2. POWER REQUIREMENTS.

Power Supply PP-3054/UG operates from 115 or 230 volts, 50 or 60 cycle, single phase supply.

A removable plate is provided on the left side of the cabinet for installing clamps or terminal tubes, to secure the input and output cables to the unit.

2-3. TERMINAL BOARD CONNECTIONS.

Terminal board connections to terminal boards, TB101 and TB201, for operation of Power Supply PP-3054/UG from an ac source of 115 or 230 volts, 50 or 60 cycles, are shown in figures 2-2, 2-3, 2-4 and 2-5 for each respective source of power as listed in table 2-1.

TABLE 2-1 POWER SOURCES

FIGURE	LINE VOLTAGE	LINE FREQUENCY
2-2	115 Volts	60 Cycles
2-3	115 Volts	50 Cycles
2-4	230 Volts	60 Cycles
2-5	230 Volts	50 Cycles

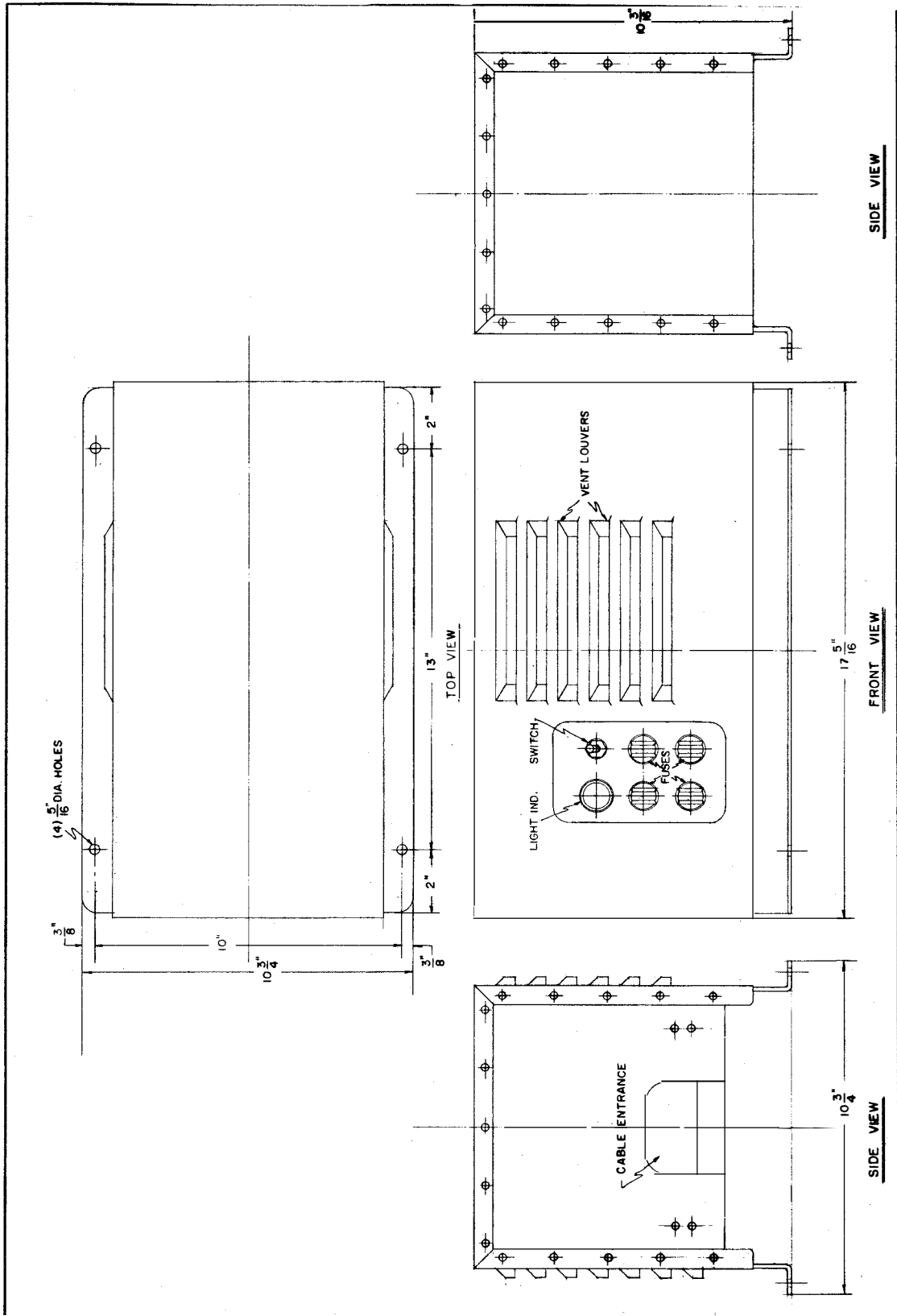


Figure 2-1. Power Supply, PP-3054/UG, Outline Drawing

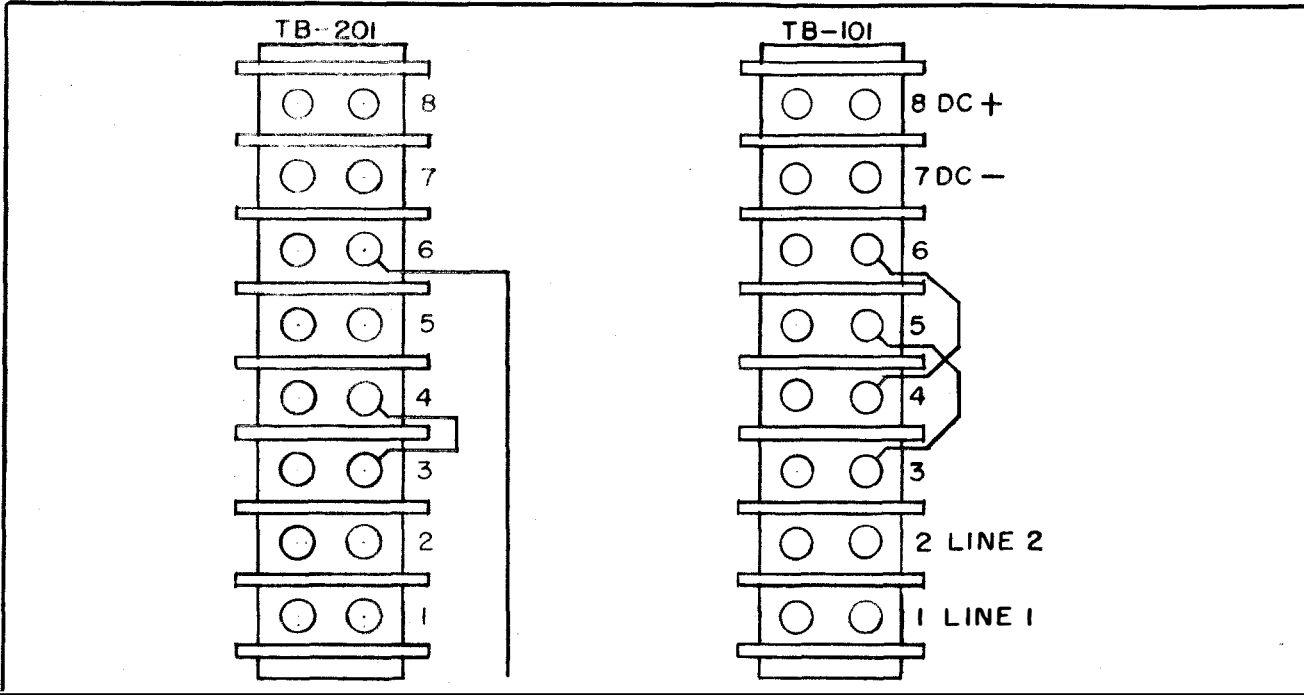


Fig. 2-2 Terminal Board Connections 95—130 Volts, 60 Cycles

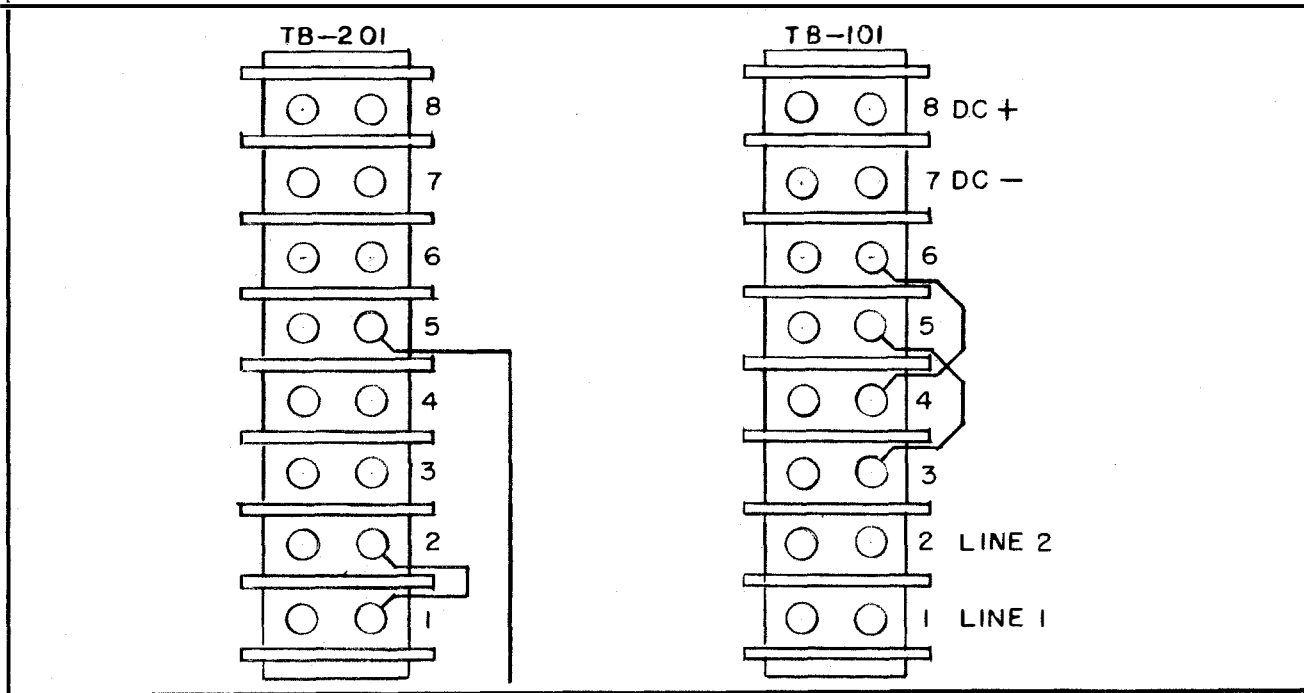


Fig. 2-3 Terminal Board Connections 95—130 Volts, 50 Cycles

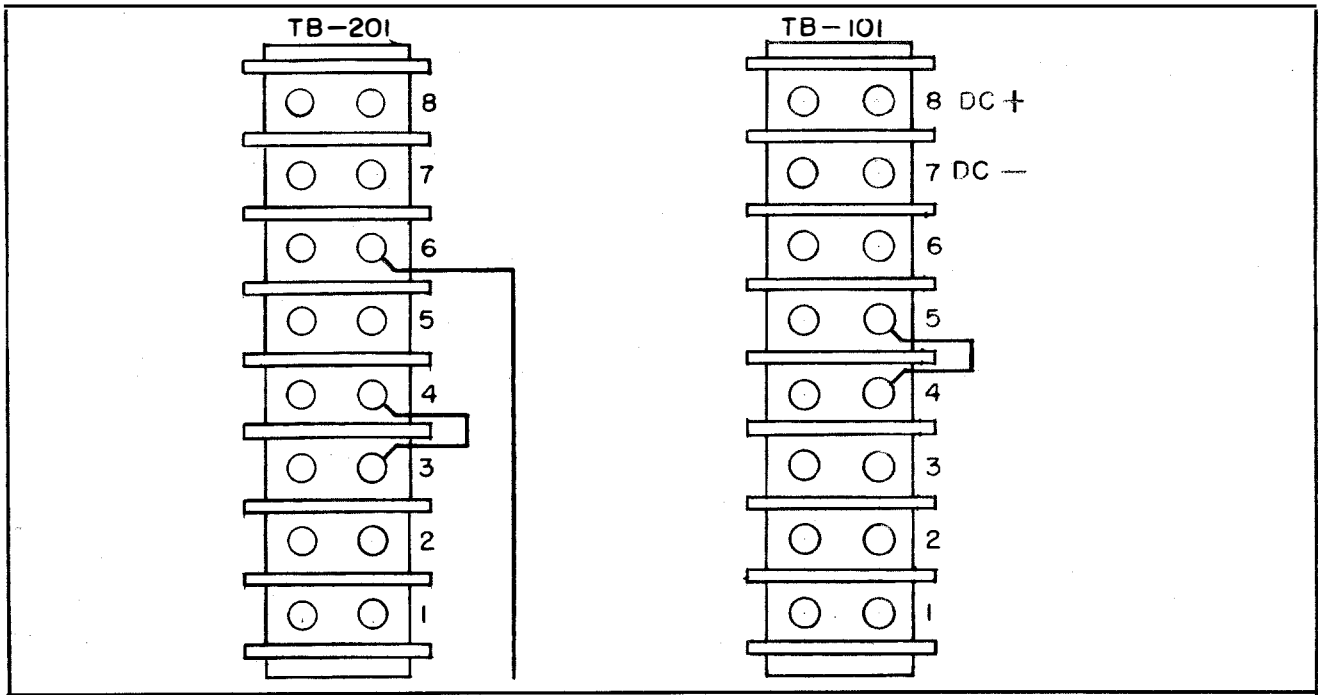


Fig. 2-4 Terminal Board Connections 190—260 Volts, 60 Cycles

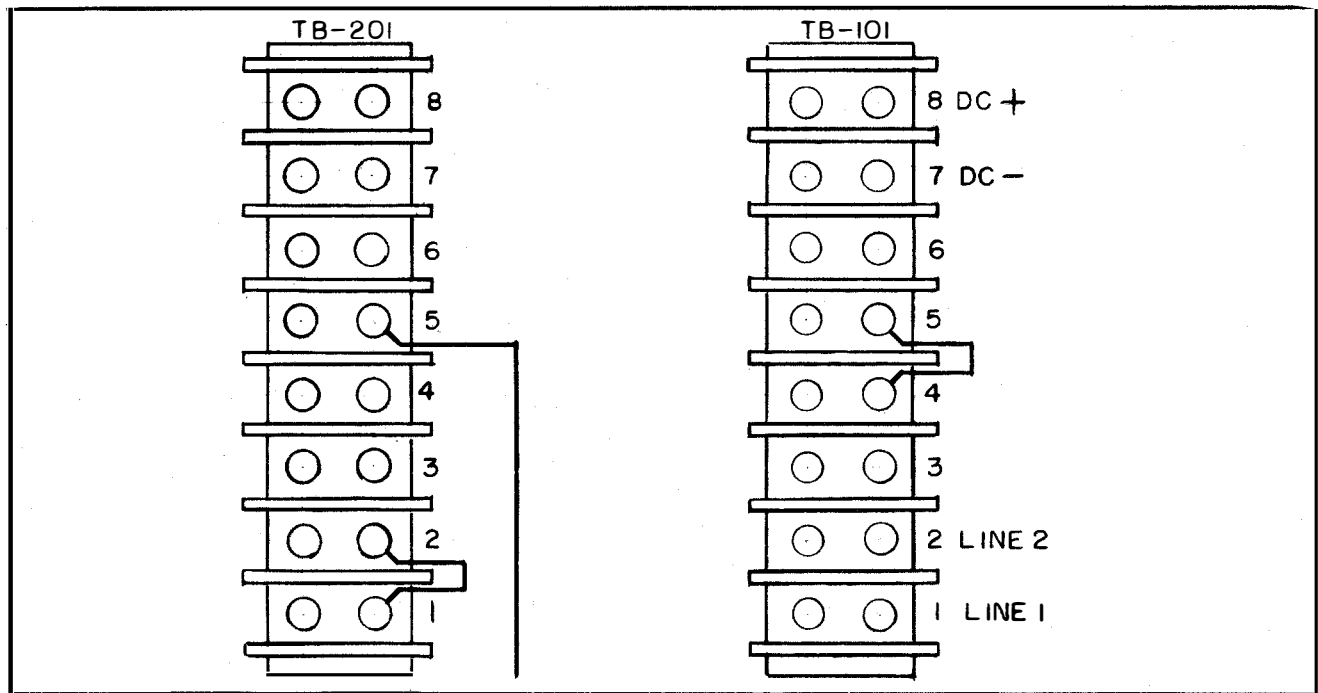


Fig. 2-5 Terminal Board Connections 190—260 Volts, 50 Cycles

SECTION 3 OPERATION

3-1. OPERATING PROCEDURES.

With Power Supply PP-3054/UG properly wired to the ac source and its dc load, it is energized by placing the ac power line switch S-101 in the "on" position. The pilot light I-101 should come on, indicating that ac power is available to the Power

Supply. The dc load should be functioning.

Figure 3-1, Power Supply PP-3054/UG, Front View, shows the location of the power switch, indicator light, line and load fuses.

The Power Supply may be closed down by placing the ac power line switch S-101 to the "off" position. No other operation or special precautions are necessary.

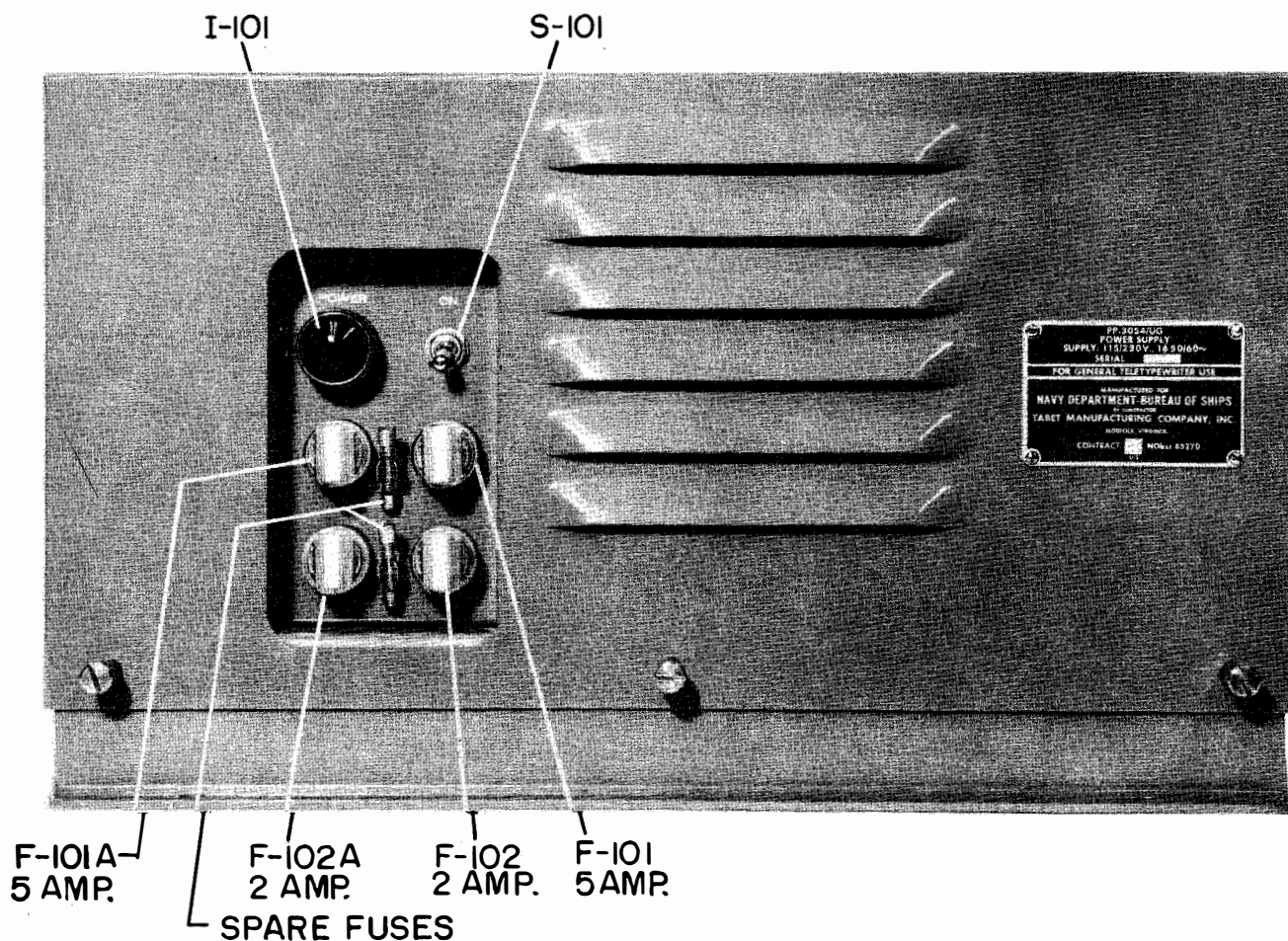


Figure 3-1. Power Supply, PP-3054/UG, Front View

SECTION 4

PRINCIPLES OF OPERATION

4-1. FUNCTIONAL DESCRIPTION

Power Supply PP-3054/UG is designed to operate from a 115 or 230 volt, 50 or 60 cycle, single phase, ac source. The terminals of transformer T-101 are connected to terminal boards TB-101 and TB-201, providing arrangements for connecting the two primary windings in parallel for a 115 volt source and in series for a 230 volt source. Operation from a 50 cycle or 60 cycle power source requires a selection of the appropriate terminals of transformer T-101 for the frequency of the source available. Power terminal board connections shown in figures 2-2, 2-3, 2-4 and 2-5 show the proper connections for power line voltages and frequencies as specified.

The input power is applied through the ac power

line switch S-101, through ac line fuses F-101 and F-101A to the primary of transformer T-101. The secondary of transformer T-101 is connected to a full wave bridge, silicon rectifier CR-102, CR-102A, CR-102B and CR-102C. The output of the silicon rectifiers is connected to the filter, which consists of reactor L-101, capacitors C-101, C-101A, C-101B and C-101C.

DC voltage regulation is provided by a shunt regulator circuit consisting of three series connected, 40 volt, 50 watt Zener diodes CR-101, CR-102A and CR-102B, in conjunction with resistor R-101. The Zener diodes are normally matched sets, however unmatched diodes may be used with only a slight change in the regulated dc voltage.

The dc output is protected from overloading and short circuits by fuses F-102 and F-102A. All fuse holders are of the indicating type, a neon light indicates when its respective fuse is blown.

SECTION 5

TROUBLE SHOOTING

5-1. GENERAL

If dc output voltage is absent make the following checks.

a. Observe power indicating light I-101 for the presence of input power.

b. Check blown fuse indicators for F-101, F-101A, F-102 and F-102A. The neon lights in the knob sections of these fuse holders will glow to indicate a blown fuse. Spare fuses will be found in clip holders, on the control panel, above the indicator light.

c. Check the ac voltage at the input to the bridge silicon rectifier. This should read approximately 175 volts. If an abnormally low voltage is indicated a shorted condition may exist in transformer T-101 or in the filter section.

d. Check the dc voltage across the filter capacitors. This should read approximately 124 volts. If no dc voltage is indicated check capacitors C-101, C-101A, C-101B and C-101C for a possible shorted condition. Defective silicon rectifiers CR-102, CR-102A, CR-102B and CR-103C will also cause the dc voltage to be low or absent.

e. Excessive variations in the dc output voltage from load changes would be caused by defective Zener diodes CR-101, CR-101A and CR-101B.

SECTION 6

REPAIR

6-1. FAILURE REPORT.

FAILURE REPORT

“Report each failure of the equipment, whether caused by a defective part, wear, improper operation, or an external cause. Use ELECTRONIC FAILURE REPORT form DD787. Each pad of the forms includes full instructions for filling out the forms and forwarding them to the Bureau of Ships. However, the importance of providing complete information cannot be emphasized too much. Be sure that you include the model designation and serial number of the equipment (from the equipment identification plate), the type number and serial number of the major unit (from the major unit identification plate), and the type number and reference designation of the particular defective part (from the technical manual). Describe the cause of the failure completely, continuing on the back of the form if necessary. Do not substitute brevity for clarity. And remember—there are two sides to the failure report—

“YOUR SIDE”

“Every FAILURE REPORT is a boost for you:

1. It shows that you are doing your job.

“BUREAU SIDE”

“The Bureau of Ships uses the information to:

1. Evaluate present equipment.

2. It helps make your job easier.
3. It insures available replacements.
4. It gives you a chance to pass your knowledge to every man on the team.
2. Improve future equipment.
3. Order replacements for stock.
4. Prepare field changes.
5. Publish maintenance data.

Always keep a supply of failure report forms on board. You can get them from the nearest District Publications and Printing Office.”

6-2. ADJUSTMENTS.

Power Supply PP-3054/UG does not require any operational adjustments.

6-3. REPAIR.

Figure 6-1 indicates the parts location in Power Supply PP-3054/UG.

Before any part is tested for a suspected defect, it should be disconnected from the circuit.

Circuit continuity and test points may be readily determined from Figure 6-2, schematic diagram and Figure 6-3, wiring diagram.

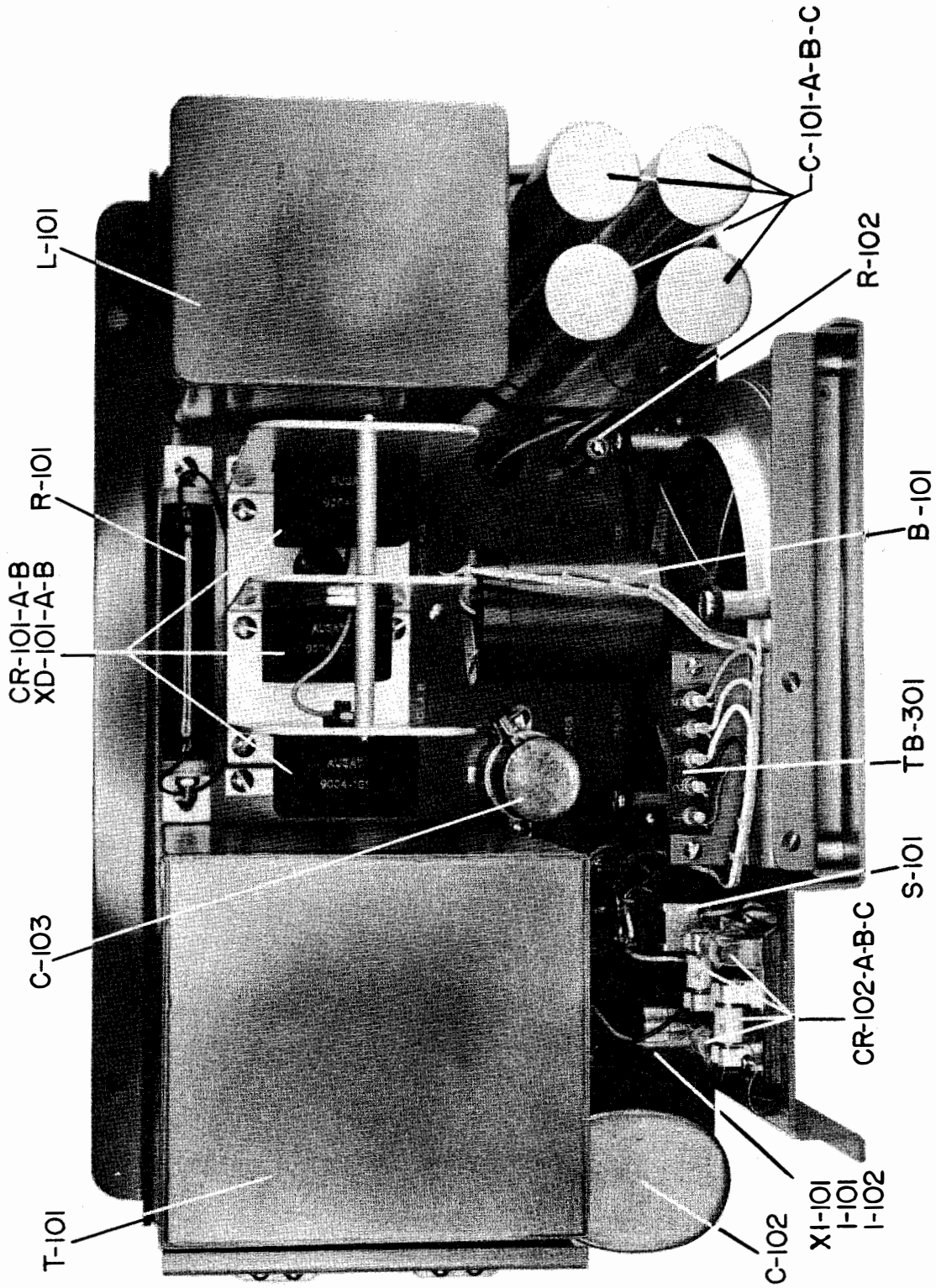
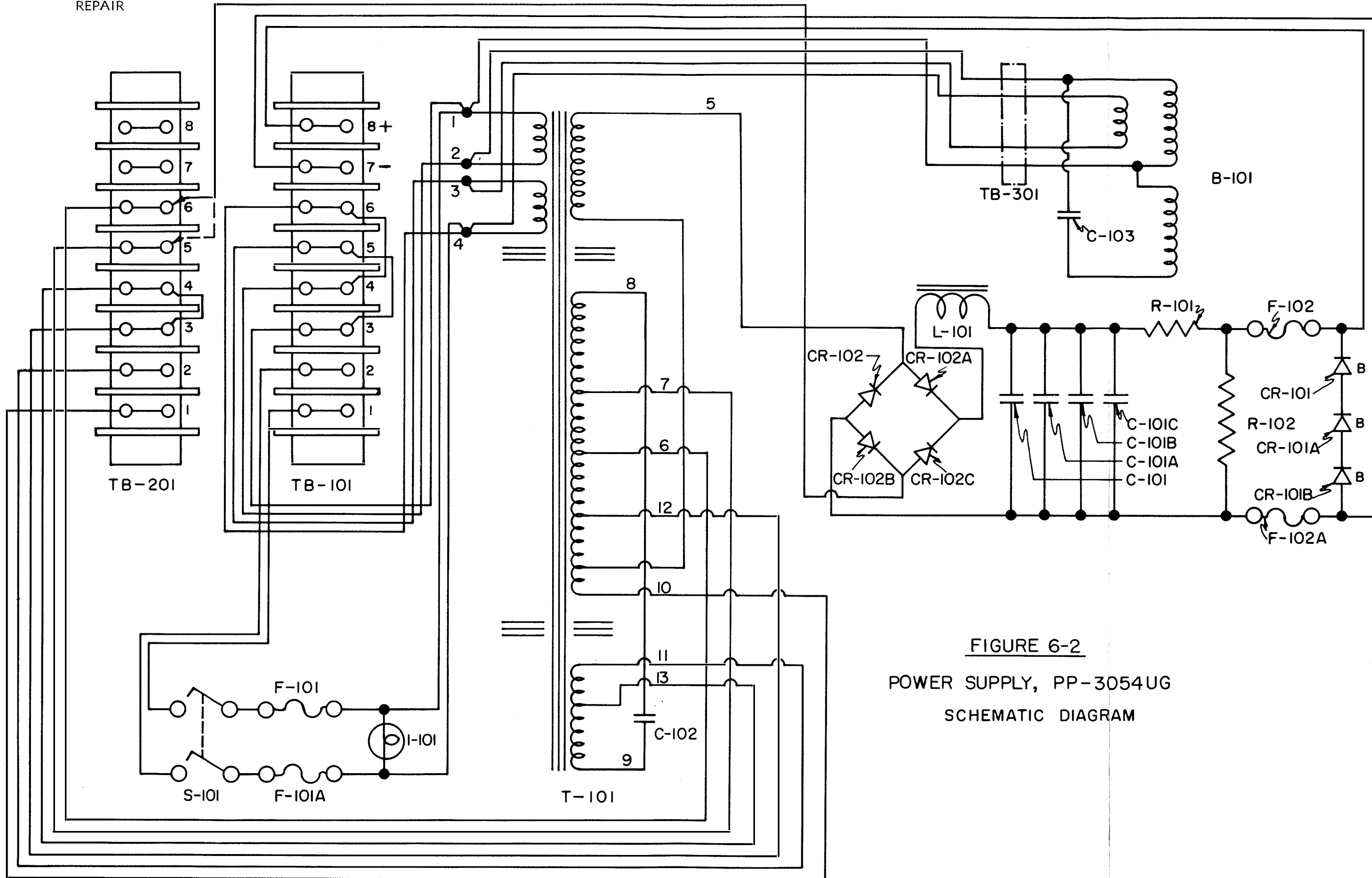


Figure 6-1. Power Supply, PP-3054/UG, Top View

PP-3054/UG
REPAIR

Figure
6-2



ORIGINAL

FIGURE 6-2
POWER SUPPLY, PP-3054UG
SCHEMATIC DIAGRAM

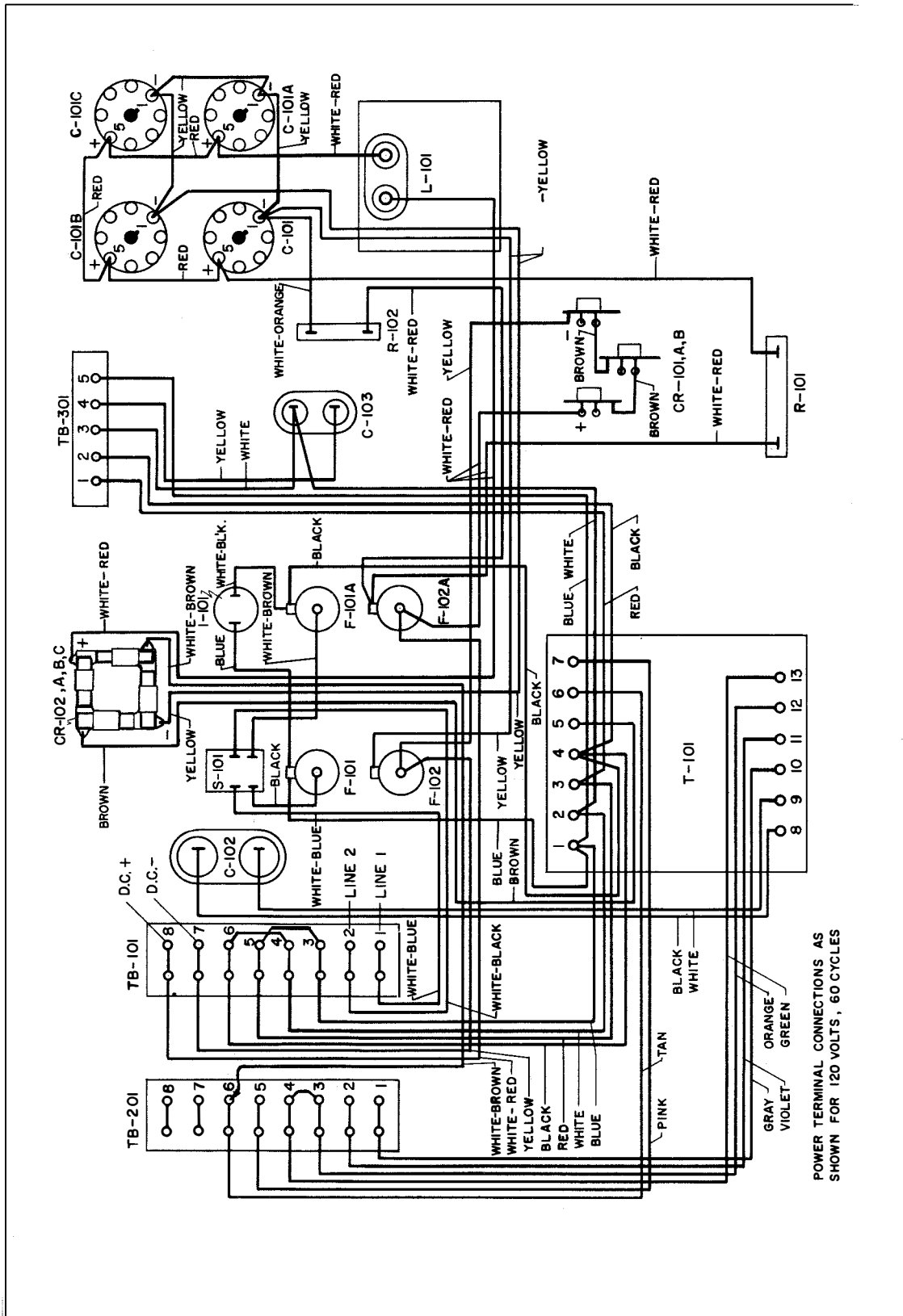


Figure 6-3. Power Supply, PP-3054/UG, Wiring Diagram

SECTION 7

PARTS LIST

7-1. INTRODUCTION.

a. Reference designations, previously referred to as circuit symbols, have been assigned to identify all maintenance parts of the equipment. They are used for marking the equipment, adjacent to the part they identify, and are included on drawings, diagrams, and the parts list.

b. Stock number of parts used in this equipment may be obtained by referring to the Stock Number Identification Table (SNIT) published by E.S.O.

7-2. MAINTENANCE PARTS LIST.

Table 7-1 lists the maintenance parts.

Column 1 lists the reference designation of the various parts in alphabetical and numerical sequence.

Column 2 lists the name and description of the various items.

Column 3 indicates the function of the part in the equipment.

7-3. LIST OF MANUFACTURERS.

Table 7-2 lists Manufacturers of parts used in the equipment. Column 1 indicates the abbreviations used to identify the Manufacturers.

TABLE 7-1 MAINTENANCE PARTS LIST

REFERENCE DESIGNATION	NAME AND DESCRIPTION	FUNCTION
B-101	Axial Fan: 120/240 volts, 50/60 cycles, one phase, 100 CFM, 0 inches SP; Type A1221-37(v); Code 01413	Ventilation
C-101	Capacitor, fixed, dry electrolytic: 150 mfd., 300 V, dc; Mil type CE51C-151N; Code 82376.	Output filter capacitor
C-101A	Same as C-101	Same function
C-101B	Same as C-101	Same function
C-101C	Same as C-101	Same function
C-102	Capacitor, fixed, paper dielectric: 6 mfd. 660V, ac, oil filled; part No. SE8G60501; code 55814.	Part of T-101
C-103	Capacitor, fixed, paper dielectric: 1 mfd., 330V, ac; oil filled; type RR-639A; code 00656.	Part of B-101
CR-101	Zener diode: 40V, 50 watts; tol. plus or minus 5%; type 50M40Z25C5, code 04713.	Regulates dc output voltage
CR-101A	Same as CR-101	Same function
CR-101B	Same as CR-101	Same function
CR-102	Rectifier, silicon: 500V, PIV, 0.5 ampere dc; type 60M; code 84970.	Rectifies regulated ac voltage
CR-102A	Same as CR-102	Same function
CR-102B	Same as CR-102	Same function
CR-102C	Same as CR-102	Same function

TABLE 7-1 MAINTENANCE PARTS LIST

REFERENCE DESIGNATION	NAME AND DESCRIPTION	FUNCTION
F-101	Fuse cartridge: 5 ampere, 250V, type 3AG-5; code 75915.	Line fuse
F-101A	Same as F-101	Same function
F-102	Fuse cartridge: 2 ampere, 250V; type 3AG-2; code 75915.	Load fuse
F-102A	Same as F-102.	Same function
I-101	Lamp: 240 volt; 10 watts; type S-6; Woodhouse Electric Co., Norfolk, Va.	Power indicator
L-101	Reactor, filter: 1.75 henry, 1 ampere dc, 12.5 ohms; MIL type TF4RX-04MP; Cat. No. MG-C-31; code 73386.	Smooths dc current ripples
R-101	Resistor, fixed, wire wound: 25 ohms, 50 watts; type RW35V250; code 80114.	Part of dc voltage regulator
R-102	Resistor, fixed, wire wound: 2500 ohms, 10 watts; type RW29V252; code 80114.	Bleeder
S-101	Switch, toggle, DPST: 15 ampere at 125V, 10 ampere at 250V; type No. ST52K; JBT Instruments, Inc. New Haven, Conn.	AC line switch
T-101	Transformer, power, constant voltage: input voltage 95-130 or 190-260; 50 or 60 cycles, output voltage 200 at 1 ampere, regulation plus or minus 1%; Cat. No. 25206; code 55814.	Power transformer
TB-101	Terminal board: barrier type, 8 terminals; code 75382.	Input-output terminations

TABLE 7-1 MAINTENANCE PARTS LIST

REFERENCE DESIGNATION	NAME AND DESCRIPTION	FUNCTION
TB-201	Same as TB-101.	Same function
XD-101	Heat dissipator: Cat. No. 9006-1G1; code 91506	Used with CR-101, CR-101A, CR-101B
XD-101A	Same as XD-101.	Same function
XD-101B	Same as XD-101.	Same function
XD-101	Light, indicator, with lens; code 72619. Air filter: type 123426; code 00736.	Power indicator Filters air drawn through fan.

TABLE 7-2 LIST OF MANUFACTURERS

CODE	NAME	ADDRESS
00656	Aerovox Corporation	New Bedford, Mass.
00736	Air Maze Corporation	Cleveland, Ohio
01413	Air Marine Motors	Amityville, Long Island, New York
04713	Motorola Semi-Conductor Products, Inc.	Phoenix, Arizona
55814	Sola Electric Co.	Elk Grove, Illinois
72619	Dialight Corporation	Brooklyn, New York
73386	Freed Transformer Co., Inc.	Brooklyn, New York
75382	Kulka Electric Corporation	Mt. Vernon New York
75915	Littel Fuse, Inc.	Les Plains, Illinois
80114	Sprague Electric Company	North Adams, Mass.
82376	Astron, Inc.	East Newark, N.J.
84970	Sarkes Tarzian, Inc.	Bloomington, Ind.
91506	Augat Bros., Inc.	Attleboro, Mass.

NOTES