DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL, POWER SUPPLY PP-3514/U

Headquarters, Department of the Army, Washington 25, D.C.

16 September 1964

WARNING

Be careful when working on the inside of the equipment. Disconnect the power cable from the power source. Serious injury or death may result from contact with the 115-volt terminals.

DON'T TAKE CHANCES!

This copy is a reprint which includes current pages from Changes 1 and 2.

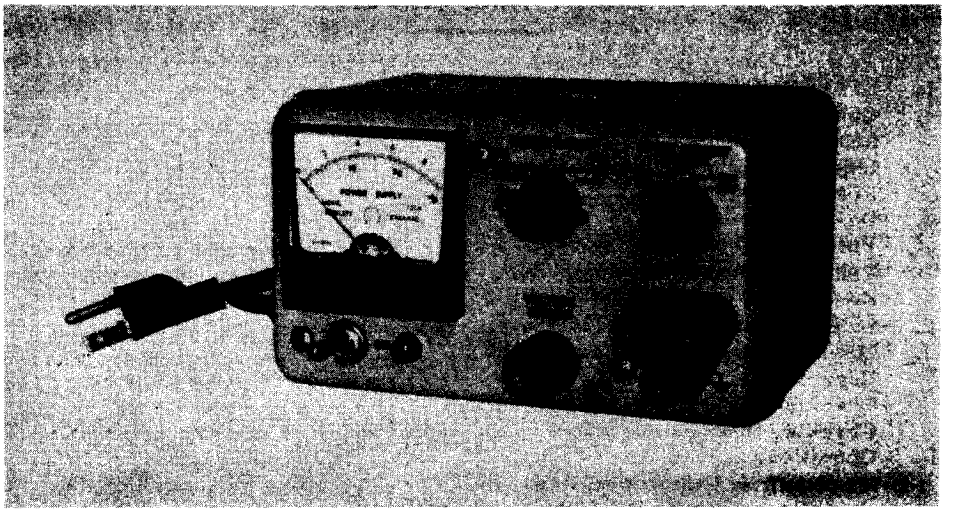

Figure 1. Power Supply PP-3514/U, less technical manuals.

CHANGE
NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *28 June 1967*

Organizational Maintenance Manual
Including Repair Parts List
POWER SUPPLY PP-3514/U

TM 11-6625-617-12, 16 September 1964, is changed as follows:

Title is changed as shown above.

Page 3, paragraph 2. Delete paragraph 2 and substitute:

2. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment. DA Pam 310-4 is a current index of technical manuals, technical bulletins, supply manuals (types 7, 8, and 9), supply bulletins, lubrication orders, and modification work orders available through publication supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publications.

Paragraph 3. Delete subparagraph *c* and substitute:

c. Reporting of Equipment Manual Improvements. Report of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-MR-NMP-AD, Fort Monmouth, N.J. 07703.

Page 20, appendix III. Delete appendix III and substitute:

APPENDIX III
BASIC ISSUE ITEMS

Section I. INTRODUCTION

A3–1. General

This appendix lists items for Power Supply PP–3514/U, the component items comprising it, and the items which accompany it, or are required for installation, operation, or operator's maintenance.

A3–2. Explanation of Columns

An explanation of the columns in section II is given below.

a. Source, Maintenance, and Recoverability Codes Column 1.

(1) *Source code, column 1a.* The selection status and source code, for the listed item is noted here. The source code used is —

Code	*Explanation*
P	Applies to repair parts which are stocked in or supplied from the GSA/DSA, or Army Supply system, and authorized for use at indicated maintenance categories.

(2) *Maintenance code, column 1b.* The lowest category of maintenance authorized to install the listed item is noted here. The maintenance code used is as follows:

Code	*Explanation*
C	Operator/Crew

(3) *Recoverability code, column 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	*Explanation*
R	applies to repair parts and assemblies that are economically repairable at DSU and GSU activities and normally are furnished by supply on an exchange basis.

b. Federal Stock Number, Column 2. The Federal stock number for the item is indicated in this column.

c. Description, Column 3. The Federal item name, a five digit manufacturer's code, and a part number are included in this column.

d. Unit of Issue, Column 4. The unit used as a basis of issue (e.g. ea, pr, ft, yd, etc.) is noted in this column.

e. Quantity Incorporated in Unit Pack, Column 5. Not used.

f. Quantity Incorporated in Unit, Column 6. The total quantity of the item used in the equipment is given in this column.

g. Quantity Authorized, Column 7. The total quantity of an item required to be on hand and necessary for the operation and maintenance of the equipment is given in this column.

h. Illustration, Column 8.

(1) *Figure number, column 8a.* The number of the illustration in which the item is shown is indicated in this column.

(2) *Item or symbol number, column 8b.* The call out number used to reference the item in the illustration appears in this column.

SECTION II. BASIC ISSUE ITEMS LIST

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
										BASIC ISSUE ITEMS LIST						
										POWER SUPPLY PP-3514/U						
P	C	R	6625-445-6933							POWER SUPPLY PP-3514/U: 14493; 721A; (This item is nonexpendable)	ea				1	
										Technical Manual TM 11-6625-617-12P	ea			1		
										Requisition through pinpoint account number if assigned; otherwise through nearest Adjutant General facilities.						
										NOTE: For technicals manuals the quantity indicates the maximum number of copies authorized for packing (or issue) with the equipment. Where a number of these equipments are concontrated in a small area, the quantity on hand may be reduced to practical levels. Excess publications must be returned to publication supply central through AG channels.						
P	C		5920-281-0205							FUSE, CARTRIDGE: 81349; F02GR125B:	ea		1	5	5	F-1
										NOTE: The following fuse is required when the Power Supply is converted from 115 to 230 volt operation.						
P	C		5920-227-9142							FUSE, CARTRIDGE: 75915; 313.250	ea		1	5	5	F-1

Page 21. Add appendix IV after appendix III.

APPENDIX IV
ORGANIZATIONAL REPAIR PARTS

Section I. INTRODUCTION

A4–1. General

This manual contains a list of repair parts required for the performance of organizational maintenance for Power Supply PP–3514/U.

Note. No special tools, test, and support equipment are required for the PP–3514/U.

A4–2. Explanation of Sections

This repair parts list is divided into sections.

a. Prescribed Load Allowance List (PLA), Section II. The PLA is a consolidated listing of repair parts allocated for initial stockage at organizational maintenance. This is a mandatory minimum stockage allowance.

b. Repair Parts for Organizational Maintenance, Section III. Repair parts authorized for organizational maintenance is included in this section.

c. Federal Stock Number Index, Section IV. This is a cross reference index of Federal stock numbers to illustrations by figure and item number.

A4–3. Explanation of Columns

An explanation of the columns in Sections II and III is given below.

a. Source, Maintenance, and Recoverability Codes, Column 1, Section III.

(1) *Source code, column 1a.* The selection status and source for the listed item is noted here. Source code and its explanation is as follows:

Code	*Explanation*
P	—Applies to repair parts that are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.

(2) *Maintenance code, column 1b.* The lowest category of maintenance authorized to install the listed item is noted here.

Code	*Explanation*
C	— Operator/Crew
O	—Organizational Maintenance

(3) *Recoverability code, 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	*Explanation*
R	—Applies to repair parts and assemblies which are economically repairable at DSU and GSU activities and normally are furnished by supply on an exchange basis.

b. Federal Stock Number, Column 1, Section II, Column 2, Section III. The Federal stock number for the item is indicated in this column.

c. Description, Column 2, Section II, Column 3, Section III. The sequence number, Federal item name, a five digit manufacturer's code and a part number are included in this column.

d. Unit of Issue, Column 4, Section III. The unit used as a basis of issue, e.g., ea, pr, ft, yd, etc. is indicated in this column.

e. Quantity Incorporated in Unit Pack, Column 4, Section II; Column 5, Section III. Not used.

f. Quantity Incorporated in Unit, Column 6, Section III. The quantity of repair parts in an assembly is given in this column.

g. Maintenance Allowances, Column 3, Section II; Column 7, Section III.

(1) The allowance columns are divided into subcolumns. Indicated in each subcolumn is the total quantity of items authorized for the number of equipments supported. Items authorized for the number of equipments supported. Items authorized for use as required but not for initial stockage are identified with an asterisk (*) in the allowance column.

(2) The quantitative allowances for organizational category of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the appropriate density column to obtain the total quantity of repair parts authorized.

(3) Subsequent changes to organizational allowances will be limited as follows: No change in the range of items is authorized. If additional items are considered necessary, recommendations should be forwarded to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL–MR–NMP–CD, Fort Monmouth, N.J. 07703, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the USA ECOM National Maintenance Point based upon engineering experience, demand data, or TAERS information.

h. Illustration, Column 8, Section III.

(1) *Figure number, column 8a.* The number of the illustration in which the item is shown is indicated in this column.

(2) *Item or symbol number, column 8b.* The callout number used to reference the item in the illustration appears in this column.

A4–4. Location of Repair Parts

a. When the Federal stock number is unknown, follow the procedures given in (1) through (4) below.

(1) Locate the appropriate appendix of the repair parts list.

(2) If the item or symbol number is available, locate the item by scrutiny of column *8b* of the repair parts list.

(3) If the item, symbol, and figure number is not known, check the description column (column 3) in the repair parts list to locate the part. The parts in this column are arranged in alphabetical order.

(4) Locate the applicable illustration in this manual and note the figure number and item number. Use the repair parts listing and locate the figure number and item number as noted on the illustration.

b. When the Federal stock number is known, use the repair part listing to find the repair part and the figure and item numbers as noted in the Federal stock number index.

A4–5. Federal Supply Codes

This paragraph lists the Federal supply code and the associated manufacturer's name.

Code	*Manufacturer's Name*
14493	Hewlett-Packard Co.
28480	Hewlett-Packard Co.
75915	Littlefuse Inc.
81349	Military Specifications Promulgated by Standardization Div Directorate of Logistic Services DSA

SECTION II. PRESCRIBED LOAD ALLOWANCE LIST

PRESCRIBED LOAD ALLOWANCE

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION	(3) 15—DAY ORG. MAINT. ALLOWANCE (A) 1—5	(B) 6—20	(C) 21—50	(D) 51-100	(4) QTY INC IN UN PK
5355-764-2355	KNOB: 28480; 0370-0026	*	*	*	2	
5355-767-9444	KNOB: 28480; 0370-0077	*	*	2	2	
5920-227-9142	FUSE CARTRIDGE: 75915; 313.250	*	2	3	6	
5920-281-0205	FUSE, CARTRIDGE: 81349; FO2GR125B	*	2	3	6	

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION		(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 15 DAY ORG. MAINT. ALW. (A) 1–5	(B) 6–20	(C) 21–50	(D) 51–100	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER
											POWER SUPPLY PP-3514/U									
P	C	R	6625-445-6933							A001	POWER SUPPLY PP-3514/U: 14493; 721A (This item is nonexpendable)	ea							1	
P	C		5920-281-0205							A077	FUSE CARTRIDGE: 81349; FO2GR125B	ea		1	*	2	3	6	5	F-1
											NOTE: The following fuse is required when the Power Supply is converted from 115 to 230 volt operation.									
P	C		5920-227-9142							A077A	FUSE, CARTRIDGE: 75915; 313.250	ea		1	*	2	3	6	5	F-1
P	O		5355-767-9444							A024	KNOB: 28480; 0370-0077	ea		2	*	*	2	2	2	
P	O		5355-764-2355							A026	KNOB: 28480; 0370-0026	ea		1	*	*	*	2	2	

INDEX — FEDERAL STOCK NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE SYMBOL

STOCK NO.	FIGURE NO.	ITEM NO. REF. SYMBOL	STOCK NO.	FIGURE NO.	ITEM NO. REF. SYMBOL
5920-227-9142	5	F-1			
5920-281-0205	5	F-1			

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

USASA (2)
CNGB (1)
OCC-E (7)
Dir/Trans (1)
CofEngrs (1)
TSG (1)
CofSptS (1)
USAARENBD (2)
USACDCEA (1)
USACDCCBRA (1)
USACDCCEA (1)
USACDCCEA Ft Huachuca (1)
USACDCOA (1)
USACDCQMA (1)
USACDCTA (1)
USACDCADA (1)
USACDCARMA (1)
USACDCAVNA (1)
USACDCARTYA (1)
USACDCSWA (1)
USAMC (5)
USCONARC (5)
ARADCOM (5)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCOMD (2)
USAMICOM (4)
USASTRATCOM (4)
USAESC (70)
MDW (1)
Armies (2)
Corps (2)
USAC (3)
1st Cav Div (5)
Svc Colleges (2)
USASESCS (5)
USAADS (2)
USAAMS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USASTC (2)
WRAMC (1)
Army Pic Cen (2)
USACDCEC (10)
Instl (2) except
  Fort Hancock (4)
  Fort Gordon (10)
  Fort Huachuca (10)
  Fort Carson (25)
  Fort Knox (12)
  WSMR (5)
  APG (5)
Army Dep (2) except
  LBAD (14)
  SAAD (30)
  TOAD (14)
  LEAD (7)
  SHAD (3)
  NAAD (5)
  SVAD (5)
  CHAD (3)
  ATAD (10)
GENDEPS (2)
Sig Sec GENDEPS (5)
Sig Dep (12)
Sig FLDMS (2)
AMS (1)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
Redstone Arsenal (5)
Units org under fol TOE:
  (2 copies each)
  11-57
  11-97
  11-98
  11-117
  11-127
  11-155
  11-157
  11-158
  11-500 (AA-AC)
  11-587
  11-592
  11-597

NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 320-50.

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *19 December 1973*

Changes in force: C 1 and C 2

Operator's and Organizational Maintenance Manual Including Repair Parts List POWER SUPPLY PP-3514/U

TM 11-6625-617-12, 16 September 1964, is changed as follows:

Page 3, paragraph 2. Delete paragraph 2 and substitute:

2. Indexes of Publication

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

Paragraph 3. Delete paragraph 3 and substitute:

3. Forms and Records

a. Reports of Maintenance and Unstaisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP Pub 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP Pub 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine (Corps).

3.1. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-C Fort Monmouth, NJ 07703.

Page 4. After paragraph 6 add:

6.1. Items Comprising an Operable Power Supply PP-3514/U

Power Supply PP-3514/U (FSN 6625-445-6933) comprises the operable end item.

Page 20, appendix III. Delete appendix III in its entirety.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
Active Army:
USASA (2)
CNGB (1)
ACSC-E (2)
Dir of Trans (1)
COE (1)
TSG (1)
USAARENBD (1)
USAMB (10)
AMC (1)
TRADOC (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCO MDS (3)
MICOM (2)
TECOM (2)
USACC (4)
MDW (1)
Armies (2)
Corps (2)
HISA (ECOM) (18)
Svc Colleges (1)
USASESS (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTS (2)
WRAMC (1)
USACDCEC (10)
ATS (1)
Instl (2) except
Ft Gordon (10)
Ft Huachuca (10)
WSMR (1)
Ft Carson (5)
Ft Richardson (ECOM Ofc) (2)
Army Dep (2) except
LBAD (14)
SAAD (30)
TOAD (14)
ATAD (10)
Gen Dep (2)
Sig Sec Gen Dep (2)
Sig Dep (2)
SigFLDMS (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
Units org under fol TOE:
(1 cy each)
11-97
11-98
11-117
11-127
11-158
11-500(AA-AC)
29-134
29-136
NG & *USAR:* None
For explanation of abbreviations used, see AR 310-50.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Power Supply PP-3514/U (fig. 1) and provides instructions for installation, operation, and operator and organizational maintenance. Also, it includes instructions for cleaning and inspection of the equipment. Throughout this manual, Power Supply PP-3514/U is referred to as the power supply.

2. Index of Equipment Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new additions, changes, or additional publications pertaining to the equipment. Department of the Army Pamphlet No. 310-4 is an index of current technical manuals, technical bulletins, supply manuals, supply bulletins, lubrication orders, and modification work orders available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc) and the latest changes to and revisions of each equipment publication.

3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Reports of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71-4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting, by the individual user, of errors, omissions, and recommendations for improving this equipment manual is authorized and encouraged. DA Form 2028 will be used for reporting these improvements. This form may be completed using pencil, pen, or typewriter. DA Form 2028 will be completed in triplicate and forwarded by the individual using the manual. The original and one copy will be forwarded direct to: Commanding General, U. S. Army Electronics Command, ATTN: AMSEL-MR-MP-P, Fort Monmouth, New Jersey 07703. One information copy will be provided to the individual's immediate supervisor (officer, noncommissioned officer, supervisor, etc).

Section II. DESCRIPTION AND DATA

4. Purpose and Use

Power Supply PP-3154/U is a compact, general purpose power supply for test bench use. It supplies a regulated output voltage which is continuously adjustable by a front panel control from 0 to 30 volts direct current (dc) with an output current up to 150 milliamperes. Overload protection is provided by automatically limiting the output current to 25, 50, 100, or 225 milliamperes as selected by a front panel switch. Output voltage and current monitoring is provided by a front panel meter and a meter range switch. The power supply output voltage is supplied at two binding post terminals, on the front panel, which are isolated from the instrument chassis. Either terminal may be connected to external circuits having potentials as high as 400 volts in reference to the powerline ground. The powerline ground is available at a third binding post terminal connected to the instrument chassis. Two or

more power supplies may be series-connected to obtain higher output voltage, or parallel-connected to obtain higher regulated current output.

5. Technical Characteristics

Line-voltage input . . . . . .115 or 230 volts ±10%, 50 to 60 cycles.
Power consumption 16 watts.
Output voltage . . . . 0 to 30 volts dc regulated, continuously adjustable.
Output current. . . .150 milliamperes over entire voltage range at full load conditions.
Noise and ripple . . Less than 150 microvolt rms.
Output impedance. . Less than 0.2 ohm in series with 30 uh.
Overload protection . . . . . 25, 50, 100, 225 milliamperes.
Load regulation . . . Less than 0.3% or 30 millivolts (whichever is greater) from no load to full load.
Line regulation . . . Less than ±0.3% or ±15 millivolts (whichever is greater) for a change from nominal line voltage of ±10%.
Number of transistors. . . . . 4.

6. Description of Power Supply PP-3514/U

The PP-3514/U (fig. 1) is a single unit, alternating current (ac) operated, electronic instrument with permanently attached power cord. No other cables or accessories are furnished. All control knobs and connectors are located on the front panel. The case is constructed of aluminum finished with gray paint and equipped with rubber feet. A built-in panel meter allows either output voltage or current to be monitored. Electronic circuits use solid-state amplifiers and rectifiers entirely. Case dimensions are 4-3/8 inches high by 7 inches wide by 5-1/4 inches deep. Weight is 4 pounds.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

7. Unpacking

a. Packaging Data. When packed for shipment, the PP-3514/U is placed in a carton. A typical shipping carton and its contents are shown in figure 2. The shipping carton contains Power Supply PP-3154/U, the volume is 1,443 cubic inches, the dimensions are 10-1/2 inches by 10-1/2 inches by 13 inches, and the weight is 7 pounds.

b. Removing Contents.

(1) Cut the tape on top of the carton and fold back the flaps.
(2) Remove the upper filler from the carton.
(3) Remove the technical manuals.
(4) Remove the PP-3514/U from the carton.
(5) Remove the wrapping and meter face pad from the PP-3514/U.

8. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (para 3).

b. See that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the basic issue items list (appx III). Report all discrepancies in accordance with TM 38-750.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. If modified, see that any operational instruction changes resulting from the modification have been entered in the equipment manual.

Note: Current MWO's applicable to the equipment are listed in DA Pam 310-4.

9. Checking Fuse

(fig. 5)

Power Supply PP-3514/U is shipped with the fuse installed.

Caution: **Use only fuses of the correct value when replacing a fuse. Overfusing can result in damage to the equipment.**

a. Check the fuse for breakage and proper seating.

b. To reach the fuse:

(1) Remove the case attaching screws at the rear of the equipment.
(2) Pull the chassis out of the case.
(3) The fuse is mounted at the rear of the chassis.

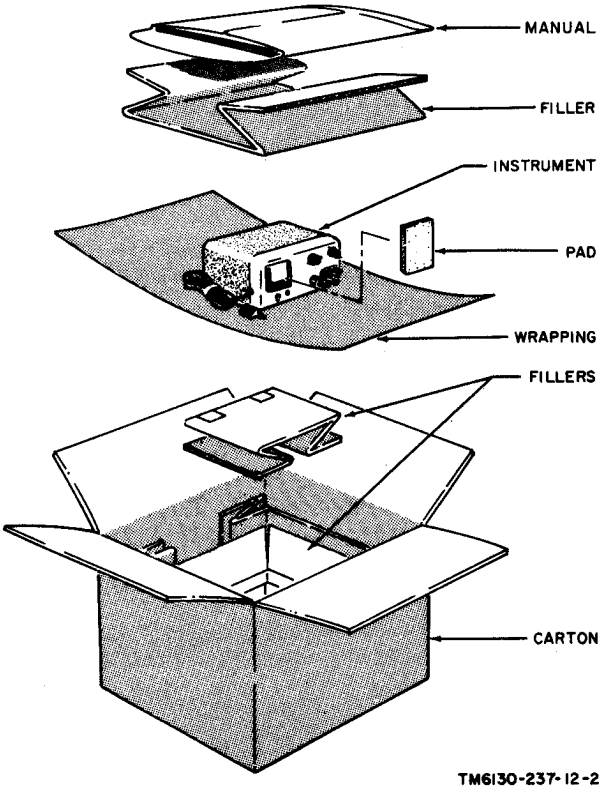

Figure 2. Packaging of Power Supply PP-3514/U.

c. See that a 1/4-ampere 115-volt fuse is installed in the fuseholder.

Note: A 1/8-ampere 230-volt fuse should be used for 230-volt operation. The proper connections for both 115- and 230-volt operation is shown in figure 5.

Section II. OPERATION

10. Damage from Improper Settings

Observe the following precautions when operating the PP-3514/U.

a. When measuring output voltage, start with the METER RANGE switch set to 30 VDC. If the meter reading is below 10, the METER RANGE switch may be set to 10 VDC.

b. When measuring output current, start with the METER RANGE switch set to 300 MA. If the meter reading is below 100, the METER RANGE switch may be set to 100 MA. If the meter reading is below 30, the METER RANGE switch may be set to 30 MA. If the meter reading is below 10, the METER RANGE switch may be set to 10 MA. Take special care when setting the METER RANGE switch to a low current range when the SHORT CIRCUIT CURRENT switch is set to a high valve.

Caution: **Do not subject the output terminals to a voltage source of reverse polarity. To do so will destroy the capacitor connected across the output terminals.**

c. When the METER RANGE switch is in any MA position, insure that no external short circuit occurs.

11. Operating Controls, Indicators, and Terminals

(fig. 3)

Control, indicator, or terminal	Function
Power switch----------	Turns on the power supply.
ON indicator ----------	indicates red when the power switch is at ON.
METER RANGE switch.	Selects the meter function and sensitivity range for monitoring the output voltage or current.
SHORT CIRCUIT CURRENT switch.	Limits the output current to the indicated maximum.
VOLTAGE ADJUST control.	Adjusts the level of the output voltage.
Meter - - - - - - - - - -	Indicates output volts or current as selected by METER RANGE switch.
+ terminal----------	Supplies the positive polarity of the output voltage.
- terminal---------	Supplies the negative polarity of the output voltage.
± terminal---------	Supplies a chassis ground connection which is also the powerline ground.

12. Starting Procedure

Set the front panel controls as follows:

Control	Position
Power switch ----------	**Off.**
METER RANGE switch ---	**30 VDC**
SHORT CIRCUIT CURRENT switch.	**225 MA**
VOLTAGE ADJUST control.	**Fully counterclockwise**

13. Single Unit Operation

Start the equipment as instructed in paragraph 12 and proceed as follows:

a. Connect the power supply to the equipment being supplied power.

b. Set the METER RANGE switch to a position above the output voltage desired, and set the power switch to ON. Allow a 2-minute warmup period for the circuits to stabilize.

c. Rotate the VOLTAGE ADJUST control clockwise until the meter indicates the desired output voltage.

d. Set the SHORT CIRCUIT CURRENT switch to a position above the output current required.

e. When supplying power to an equipment that may be damaged easily by excessive current, connect the equipment to the power supply, set the METER RANGE switch to the range of the required output current, and adjust the VOLTAGE ADJUST control while monitoring the output current to assure that the external circuit is not damaged by excessive current.

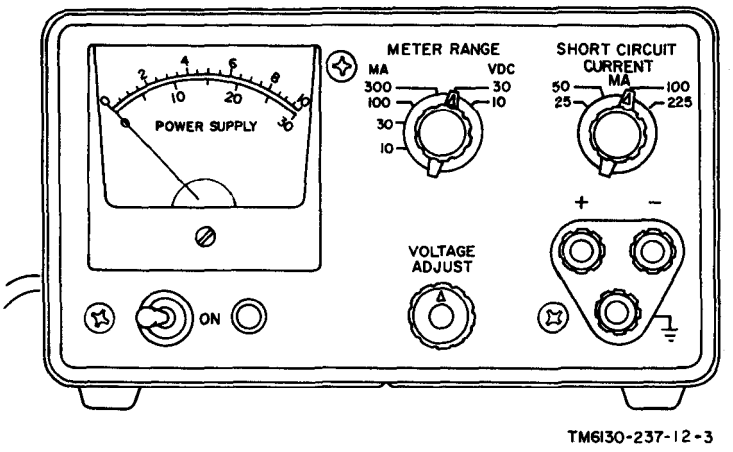

Figure 3. Power Supply PP-3514/U, controls, indicators, and terminals.

14. Series Operation

(B, fig. 4)

When the required output voltage exceeds 30 volts dc, several power supplies may be series-connected to provide the necessary output voltage. Start each power supply as instructed in paragraph 12 and proceed as follows:

a. Connect the power supplies to the equipment being supplied power and set the power switches ON. Allow 2 minutes warmup period for the circuits to stabilize.

b. Rotate the VOLTAGE ADJUST control clockwise on each power supply until the total of the meter indications of all the power supplies equals the required voltage.

c. Set the SHORT CIRCUIT CURRENT switches on all the power supplies to the position just above the required output current.

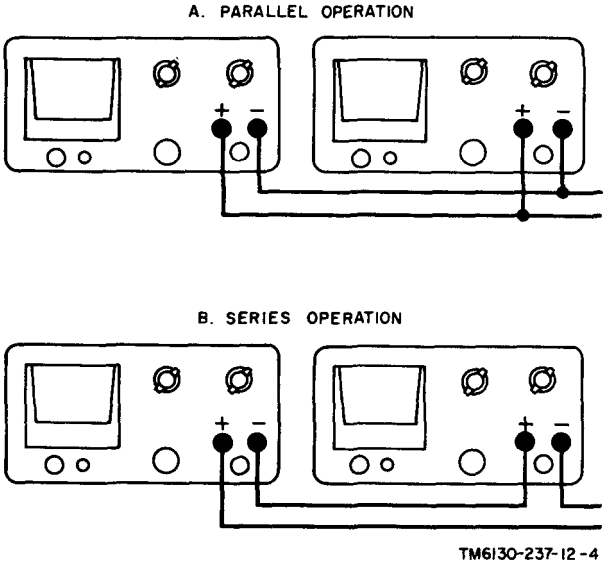

Figure 4. Series or parallel operation of Power Supply PP-3614/U.

15. Parallel Operation

(A, fig. 4)

When the required output current exceeds 150 milliamperes (ma), two power supplies may be parallel-connected to supply the necessary output current. Start each power supply as instructed in paragraph 12 and proceed as follows:

a. Connect the power supplies to the equipment being supplied power. Set each power switch to ON. Allow 2-minutes warmup period for the circuits to stabilize.

b. Set the SHORT CIRCUIT CURRENT switch on the first power supply to 225 MA.

c. Set the SHORT CIRCUIT CURRENT switch on the second power supply to the

position above the remaining output current required.

d. Set the METER RANGE switch to 300 MA.

e. Rotate the VOLTAGE ADJUST controls until the meters total the required output current. If 300 ma is required, adjust only one of the power supplies to a higher output current and leave the other at 150-ma output for regulation purposes.

16. Stopping Procedure

a. Rotate the VOLTAGE ADJUST control fully counterclockwise.

b. Set the power switch to the off position.

c. Disconnect the power supply from the load.

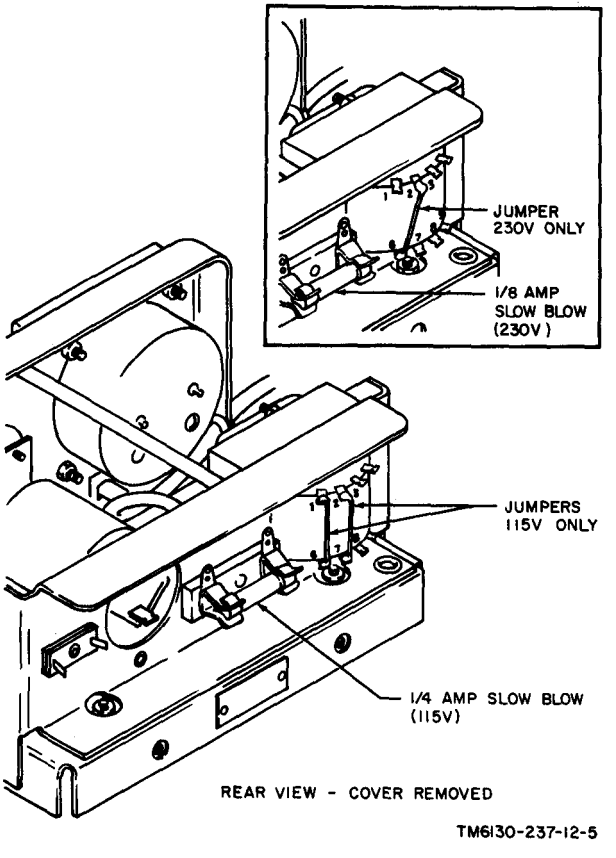

Figure 5. Fuse location and 110-220-volt connections.

CHAPTER 3

MAINTENANCE

17. Scope of Maintenance

The maintenance duties assigned to the operator of Power Supply PP-3514/U are listed below, together with a reference to the paragraphs covering the specific maintenance function. These duties do not require special tools or test equipment.

a. Daily preventive maintenance checks and services (para 20).

b. Weekly preventive maintenance checks and services (para 21).

c. Monthly preventive maintenance checks and services (para 22).

d. Quarterly preventive maintenance checks and services (para 23).

e. Cleaning (para 24).

f. Touchup painting instructions (para 25).

g. Troubleshooting (para 26 and 27).

h. Repairs and adjustments (para 28).

18. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. *Systematic Care.* The procedures given in paragraphs 20 through 25 cover routine systematic care and cleaning essential to proper upkeep of this equipment when it is used separately. When this equipment is used as part of a set or system, follow the procedures established in the *set* or *system* manual.

b. *Preventive Maintenance Checks and Services*. The preventive maintenance checks and services charts (para 20, 21, 22, and 23) outline functions to be performed at specific intervals; however, if the equipment is used as part of a *set* or *system* follow the procedures established in the *set* or *system* manual. For equipments operated separately, these checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the *References* column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by performing the corrective action indicated, higher level maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

19. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of Power Supply PP-3514/U are required daily, weekly, monthly, and quarterly.

a. Paragraph 20 specifies checks and services that must be accomplished daily or under special conditions listed below:

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

(3) At least once each week if the equipment is maintained in standby condition.

b. Paragraphs 21, 22, and 23 specifiy additional checks and services that must be performed on a weekly, monthly, and quarterly basis, respectively.

20. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Completeness----------	See that the equipment is complete----------	Appx III.

Sequence No.	Item	Procedure	Reference
2	Cleanliness----------	Clean the control panel and other exterior surfaces.	Para 24.
3	Meter glass and pointer---	Check the meter glass for cracks. See that meter indicates exact zero and that the pointer is not bent.	Para 28.
4	Controls and connectors--	While making the operating checks (sequence No. 5, 6, and 7), observe that the mechanical action of each knob, switch, and connector is smooth and free of external or internal binding, and that no excessive looseness is apparent. Also, check the meter for sticking or bent pointer.	
5	Preliminary----------	Set the controls as follows: *a*. METER RANGE to 30 VDC. *b*. SHORT CIRCUIT CURRENT to 225 MA. *c*. VOLTAGE ADJUST, fully counterclockwise.	
6	Power switch ------ ---	Set to ON. Note that: *a*. The ON indicator lamp lights. *b*. The meter reads 0 volt.	Para 12.
7	VOLTAGE ADJUST control	Slowly rotate the VOLTAGE ADJUST control clockwise while watching the meter pointer. The pointer must move smoothly upscale to 30 (full scale).	
8	METER RANGE switch---	set to 300 MA. *a*. Momentarily short circuit the output terminals while observing the meter. The pointer must indicate close to 225 on the scale. *b*. Repeat *a* above with SHORT CIRCUIT CURRENT switch set to 100, 50, and 25 MA; and METER RANGE switch to 100 and 30 MA, respectively. Meter must indicate close to the selected short-circuit current.	

21. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Cable----------	Inspect power cable for chafed, cracked, or frayed insulation.	
2	Metal surface ----------	Inspect exposed metal surfaces for scratches, dirt, and corrosion. Clean and touchup paint as required.	Para 25.

22. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Pluckout items --------	Inspect fuse. See that the fuse is not blown or improperly seated.	Para 28.
2	Terminals---------	Inspect terminals for loose connections and cracked or broken insulation.	
3	Wiring and parts-------	Inspect all wiring and parts for any sign of damage, looseness, dirt, discoloration, or overheating. Avoid moving wires and parts from original positions.	
4	Interior---------	Clean interior of chassie and cabinet.	

23. Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Publications - - - - - - - - -	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
2	Modifications - - - - - - - - -	Check DA Pam 310-4 to determine whether new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All ROUTINE MWO's must be scheduled.	TM 38-750 and DA Pam 310-4.

24. Cleaning

Inspect the exterior surfaces of the equipment. The exterior surfaces should be free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean, soft cloth.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame. Provide adequate ventilation.**

b. Remove grease, fungus, and dirt from the case; use a cloth dampened (not wet) with Cleaning Compound (FSN 7930-395-9542).

c. Remove dust or dirt from terminals with a brush.

Caution: **Do not press on meter face (glass) when cleaning the meter may become damaged.**

d. Clean the front panel, meter, and control knobs: use a soft, clean cloth. If necessary, dampen the cloth with water; mild soap may be used for more effective cleaning.

25. Touchup Painting Instructions

Remove rust and corrosion from metal surfaces by lightly sanding with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9-213.

26. General Troubleshooting Information

Troubleshooting this equipment is based on the operational check contained in the daily preventive maintenance checks and services chart. To troubleshoot the equipment, perform all functions starting with sequence number 4 in the daily preventive maintenance checks and services chart (para 20) and proceed through the items until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the sequence number and turn to the corresponding item number in the troubleshooting chart (para 27). Perform the checks and corrective actions indicated in the troubleshooting chart. If the corrective measures indicated do not result in correction of the trouble, higher level maintenance is required. Paragraph 28 (referenced in the chart) contains additional information and step-by-step instructions for performing equipment tests and adjustments to be used during the troubleshooting procedures.

27. Troubleshooting Chart

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
3	Meter does not read zero	Meter out of adjustment - - - - - - - - - -	Adjust meter (para 28).
4	Knob turns loose on shaft	Loose setscrews- - - - - - - - - - - - - -	Tighten setscrews with Allen wrench.
6	*a*. ON indicator does not light.	*a*. Defective fuse - - - - - - - - - - - - - - - -	*a*. Replace fuse (para 28).
	b. Meter does not indicate	*b*. Defective fuse - - - - - - - - - - - - - - - -	*b*. Replace fuse (para 28).

28. Repairs and Adjustments

Caution: **Use only fuses of the correct value. Overfusing can result in damage to the equipment.**

a. Replacement of Fuse (Fig. 5).

(1) Remove the two case attaching screws at the rear of the unit.
(2) Remove the unit from its case.
(3) Remove the fuse from the fuse-holder at the rear of the unit.
(4) Replace the fuse (1/4 ampere for 115-volt ac operation, 0.15 ampere for 230-volt ac operation).
(5) Replace the unit in the case.
(6) Replace the two screws at the rear of the unit.
(7) Make sure that the rubber grommet on the power cord is in the correct position in the case.

b. Adjustment of Meter Pointer.

(1) Turn the adjusting screw on the front of the meter clockwise until the pointer moves down the scale to zero.
(2) If the pointer goes past zero in the downscale direction, continue the clockwise rotation until the pointer moves upscale and then starts downscale again to zero.

CHAPTER 4

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

29. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning original packaging (para 7) will also be helpful.

a. Material Requirements. The following materials are required for packaging Power Supply PP-3514/U. For stock numbers of materials, refer to SB 38-100.

Material	Quantity
Tape, gummed paper	6 ft
Carton, corrugated	1 cubic ft
Cushioning material	1 cubic ft
Paper, padded wrapping	2 sq ft
	1 ft

b. Packaging. Package Power Supply PP-3514/U as outlined below:

(1) Place 4 inches of cushioning material in the bottom of the carton.
(2) Place a small pad of cushioning material on the meter glass. Fold up the power cord and tie it with the cotton twine. Wrap the equipment in padded wrapping paper.
(3) Place the equipment in the center of the carton and place at least 3 inches of cushioning material around and on top of the equipment.
(4) Place the equipment manual in an envelope and place it in the top of the carton.
(5) Seal the carton with gummed paper tape.

30. Authority for Demolition

The demolition procedures given in paragraph 31 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

31. Methods of Destruction

The tactical situation and time available will determine the method to be used when destruction of equipment is ordered.

a. Smash. Use sledges, axes, hammers, crowbars, and any other tools available to smash the equipment.

(1) Use the heaviest tool on hand to smash the connectors, meter, and the knobs.
(2) Remove the unit from the case. With a heavy hammer or bar, smash as many of the exposed parts as possible.

b. Cut. Use axes, handaxes, machetes, and similar tools to cut the wiring and the power cable. Cut the cable in a number of places.

Warning: **Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

c. Burn. Burn the technical manuals first. Pour gasoline on the cut cable and internal wiring and ignite it, or use a flamethrower. Use incendiary grenades to complete the destruction of the unit.

d. Explode. Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired. For quick destruction of the power supply, place an incendiary grenade on top of the unit. Get away from the unit after the grenade is placed.

e. Dispose. Bury or scatter destroyed parts or throw them into a nearby waterway. This is particularly important if a number of parts have not been completely destroyed.

APPENDIX I

REFERENCES

Following is a list of references available to the operator and organizational repairman of Power Supply PP-3514/U:

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 4, 6, 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TM 9-213	Painting Instructions for Field Use.
TM 38-750	Army Equipment Record Procedures.

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance category.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) is listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the categories.

(a) Service. To clean, to preserve, and to replenish lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(f) Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

(g) Align. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) Overhaul. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(j) Rebuild. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all

parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *Operator, organization, direct support, general support, and depot.* The symbol X indicates the category responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Categories higher than those marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *Operator, organization, direct support, general support, and depot.* The dagger (†) indicates the categories normally allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to an including general support are authorized to the organization operating this equipment.

Section II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON O/C	ECHELON O	ECHELON DS	ECHELON GS	ECHELON D	TOOLS REQUIRED	REMARKS
POWER SUPPLY PP-3514/U	service		X				4	Preventive maintenance
	adjust				X		2,3,4	Output voltage & short circuit current
	inspect		X				4	
	test	X						Operational
			X				2,4	Output voltage
					X		1 Thru 7	All tests
	repair				X		4	
			X				4	Fuse knob
	calibrate				X		2,3,4	Short circuit current circuit, meter
	overhaul				X		4	

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	ECHELON					TOOL CODE	REMARKS
	O/C	O	DS	GS	D		
PP-3514/U (Continued)							
AUDIO OSCILLATOR TS-382/U				†	†	1	
MULTIMETER TS-352/U		†		†	†	2	
MULTITESTER ME-26A/U				†	†	3	
TOOL KIT, RADAR & RADIO TK-87/U		†		†	†	4	
TRANSFORMER, VARIABLE CN-16B				†	†	5	
TRANSISTOR TEST SET TS-1836/U				†	†	6	
VOLTMETER, METER ME-30A/U				†	†	7	

APPENDIX III

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation. The list includes tools, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

Columns are as follows:

a. Federal Stock Number. This column lists the 11-digit Federal stock number.

b. Designation by Model. Not used.

c. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

d. Unit of Issue. The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

e. Expendability. Nonexpendable items are indicated by NX. Expendable items are not annotated.

f. Quantity Authorized. Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment.

g. Illustration. The "Figure No." column lists the figure and reference numbers used for identification of the items in the illustration.

Section II. FUNCTIONAL PARTS LIST

FEDERAL STOCK NUMBER	DESIGNATION BY MODEL	DESCRIPTION	UNIT OF ISSUE	EXP	QTY AUTH	ILLUSTRATION	
						FIGURE NO.	ITEM NO
		PP-3514/U					
6625-445-6933		POWER SUPPLY PP-3514/U: Electronic type fullwave rectification; output data: 30 v dc, 150 ma; oper power regt: 115/230 v ac, 50/60 cps, singleph; 7" lg x 5-1/4" d x 4-3/8" h; Hewlett-Packard Part #721A		NX		1	
		ITEMS COMPRISING AN OPERABLE EQUIPMENT					
Order thru AGC		TECHNICAL MANUAL TM11-6625-617-12			2		
		POWER SUPPLY PP-3514/U: (Basic Component)		NX	1	1	
		RUNNING SPARES No Parts Authorized for Stockage at Operator's Level					

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OS Base Comd (2)
LOGCOMD (2)
MDW (1)
Armies (2)
Corps (2)
USA Corps (3)
Instl (2) except Ft Gordon (5)
Ft Hancock (4), Ft Huachuca (10)
Ft Monmouth (63)
Svc Colleges (2)
Br Svc Sch (2)
GENDEP (OS) (2)
Sig Sec, GENDEP (OS) (5)
Sig Dep (OS) (12)
Army Dep (2) except
Lexington, Tobyhanna (12)
Sacramento (28), Ft Worth (8)
Letterkenny (5), Sharpe (3)
Savanna, Navajo (5)
Charleston (3)
USA Tml Comd (1)
USASCC (4)
USAECDA (1)
USACBRCDA (1)
USACECDA (1)
USACECDA (Monmouth Ofc) (1)
USAMSCDA (1)
USAOCDA (1)
USAQMCDA (1)
USATCDA (1)
USAADCDA (1)
USAARMCDA (1)
USAAVNCDA (1)
USAARTYCDA (1)
USASWCDA (1)
USA Elct Mat Agcy (9)
USASA 1st Fld Sta (5)
USARSOUTHCOM Sig Agcy (1)
USATC AD (2)
USATC Armor (2)
USATC Engr (2)
USATC Inf (2)
USASTC (2)
WRAMC (1)
USAERDL (2)
USA Cold Rgn RE Lab (2)
Chicago Proc Dist (1)
11th Air Assault Div (3)
AMS (1)
USAELRDA (White Sands) (13)
Army Tml (1) except Oakland (5)
POE (1)
Sig Fld Maint Shops (3)
WSMR (5)
Units org under fol TOE:
11-16 (2)
11-57 (2)
11-97 (2)
11-98 (2)
11-117 (2)
11-155 (2)
11-157 (2)
11-158 (2)
11-337 (2)
11-500 (AA-AE) (4)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)

NG: State AG (3).
USAR: None.
For explanation of abbreviations used, see AR 320-50.

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