ARMY TM 11-5895-1517-34
AIR FORCE TO 31W2-5TYC39-62

TECHINICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR

DIGITAL DATA TRANSFER COMPUTER CP-2107(V)1/G (L-3050V)

THIS PUBLICATION IS NOT AVAILABE THROUGH AG PUBLICATION CHANNELS.

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

15 AUGUST 1994

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

DANGEROUS VOLTAGE
is used in the operation of this equipment.

DEATH ON CONTACT
may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When technicians are aided by operators, they must be warned about dangerous areas. Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been shut off, always ground every part before touching it.

Be careful not to contact high-voltage connections when installing or operating this equipment. Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.

WARNING

Ensure that prime power is off to prevent shock hazard to personnel.

WARNING

EXPLOSIVE GAS

Batteries BT1 through BT4 give off explosive gas (hydrogen and oxygen) when charging. Batteries are charged continuously during normal operation.

a. Make sure battery exhaust vent is open and battery blower is operating.

b. Keep open flames away from battery exhaust vent.

DO NOT TAKE CHANCES

WARNING

COMPRESSED AIR

To be useable for cleaning, the compressed air source must limit nozzle pressure to no more than 29 pounds per square inch gage (PSIG). Compressed air is DANGEROUS and can cause serious bodily harm. It can also cause mechanical damage to the equipment. DO NOT use compressed air to dry parts where cleaning compound has been used. Goggles must be worn at all times while cleaning with compressed air.

LIST OF EFFECTIVE PAGES

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NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

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DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

Washington, DC, 15 August 1994

DIRECT SUPPORT AND GENERAL SUPPOR

MAINTENANCE MANUAL

DIGITAL DATA TRANSFER COMPUTER CP-2107/(V)1/G (L-3050V)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find a mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT, Fort Monmouth, New Jersey 07703-5007.

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, T.O. 00-5-1. Forward direct to prime ALC/MST.

In either case, a reply will be furnished direct to you.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual contains the intermediate direct support and general support maintenance procedures and data for Digital Data Transfer Computer CP- 2107(V)1/G (also known as the L-3050V Central Processor), referred to hereafter in this manual as the central processor (CP). The CP is used in the Central, Message Switching, Automatic AN/TYC- 39(V)6, known as the message switch (MS). This manual contains an introduction, a functional description of the equipment, and maintenance instructions. It also contains a complete listing of reference publications in Appendix A and an expendable supplies and materials list in Appendix B. The Maintenance Allocation Chart (MAC) appears in the message switch Appendix B of Operators and Organizational Maintenance Manual (TM 11-5805-790-12-9/TO 31W2-2TYC39-81-9). Intermediate level repair parts are listed in the Repair Parts and Special Tools List (RPSTL), TM 11-5895-1517-24P. Throughout this manual, where appropriate, references are made to other publications that describe the installation, operation, and maintenance of equipment used in conjunction with the CP.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 25-30 (Consolidated Index of Army Publications and Blank Forms) to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records and Reports

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO 00-35D-54 for unsatisfactory equipment reporting.

b. Reporting of Item and Packaging Discrepancies. Fill out and forward (Reporting of Discrepancy (ROD) (SF 364) as prescribed in:

* AR 735-11-2
* SECNAVINST 4355.18B
* AFR 400-54
* MCO 4430.3J
* DLAR 4140.55

c. Report of Transportation Discrepancies. Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in:

* AR 55-38
* NAVSUPINST 4610.33C
* AFR 75-18
* MCO P4610.19D
* DLAR 4500.15.

1-4. Reporting Equipment Improvement Recommendations (EIR)

If your CP or other message switch equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance.

Army: Put your remarks on an SF 368 (Product Quality Deficiency Report). Mail it to:

Commander
US Army Communications Electronics
Command and Fort Monmouth,
ATTN: AMSEL-LC-ED-CFO
Fort Monmouth, New Jersey 07703-5007.

Air Force: Air Force personnel are encouraged to submit EIRs in accordance with AFR 900-4.

We will send you a reply.

1-5. Administrative Storage

Administrative Storage of equipment issued to and used by military activities will have preventive maintenance checks and services (PMCS) performed in accordance with the PMCS procedures listed in TM 11-5805-790-12-6/TO 31W2-2TYC39- 81-6 before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness. Also, refer to TM 740-90-1 for storage procedures.

1-6. Destruction of Military Electronics Materiel

Electronics materiel shall be destroyed to prevent enemy use only on the order of the commander and in accordance with TM 750-244-2.

Section II. DESCRIPTION AND DATA

1-7. GENERAL DESCRIPTION

The CP-2107(V)1/G computer (L-3050V) (figure 1-1) consists of a control panel assembly, a control panel cable assembly, and a central processor unit (CPU). The MS uses a dual CP configuration. This approach ensures maximum mission reliability and provides off-line maintenance and support capability without the Interruption of message processing and switching.

The CP provides the link between system hardware and software functions. it operates under the control of operational software to perform data comparison, data interpretation, status assessment, table search, and arithmetic operations. The instruction set is suitable for communication processing functions. Messages are processed and forwarded in near real time since the average message execution time is 500 nanoseconds. The CP is based on a high- speed VLSI microcomputer implementation which provides the processing capabilities of the L-3050 (AN/GYK-12) computer used in earlier model message switches, but at five times the speed. Features Include multiple general purpose registers, and independently controlled input/output communications.

The L-3050V comprises the following functional elements:

(a) Central Processor/IO Controller (CPU)
(b) QIOE/PPI (QIOE)
(c) Solid State Memory (SSM)
(d) Terminator (TERM)

For a detailed description of the CP's function within the MS, refer to TM 11-5805-790-12-1/TO 31W2-2TYC39-81-1.

a. Control Panel Assembly. The control panel assembly contains operator controls and indicators used for CP operation and maintenance. The panel is remotely mounted on the front of the shelter's central processor group rack and is connected to the central processor unit chassis by the control panel cable assembly. This cable plugs into a 37 pin D connector on the rear of the control panel and into a 120 contact connector on the central processor unit's input/output (I/O) connector plate mounted on the chassis backplane.

b. Central Processor Unit. The CPU consists of an enclosed card cage assembly with eight circuit card slots, a backplane, an I/O connector panel containing eight signal connectors, associated wiring, and a compliment of five circuit cards. The three open slots are for expansion purposes. (See table 1-1.) The dual CPU chassis are mounted on the left side of the shelter's central processor group rack and are connected to the associated control panel by the control panel cable assembly. Access to the circuit cards is gained by extending the CPG rack and removing the CPU's front panel.

Table 1-1. CPU Circuit Card Assemblies

Location	Card Type
A1	Quad/O EXPDR/PPI
A2	Central Processor Unit
A3	spare
A4	Solid State Memory
A5	Solid State Memory
A6	for memory expansion
A7	for memory expansion
A8	Termination

All signals transmitted from and received by the CPU pass through the card cage assembly I/O connector panel to the backplane. The CPU is powered by a regulated +5-volt dc source applied directly to the CPU card nest backplane.

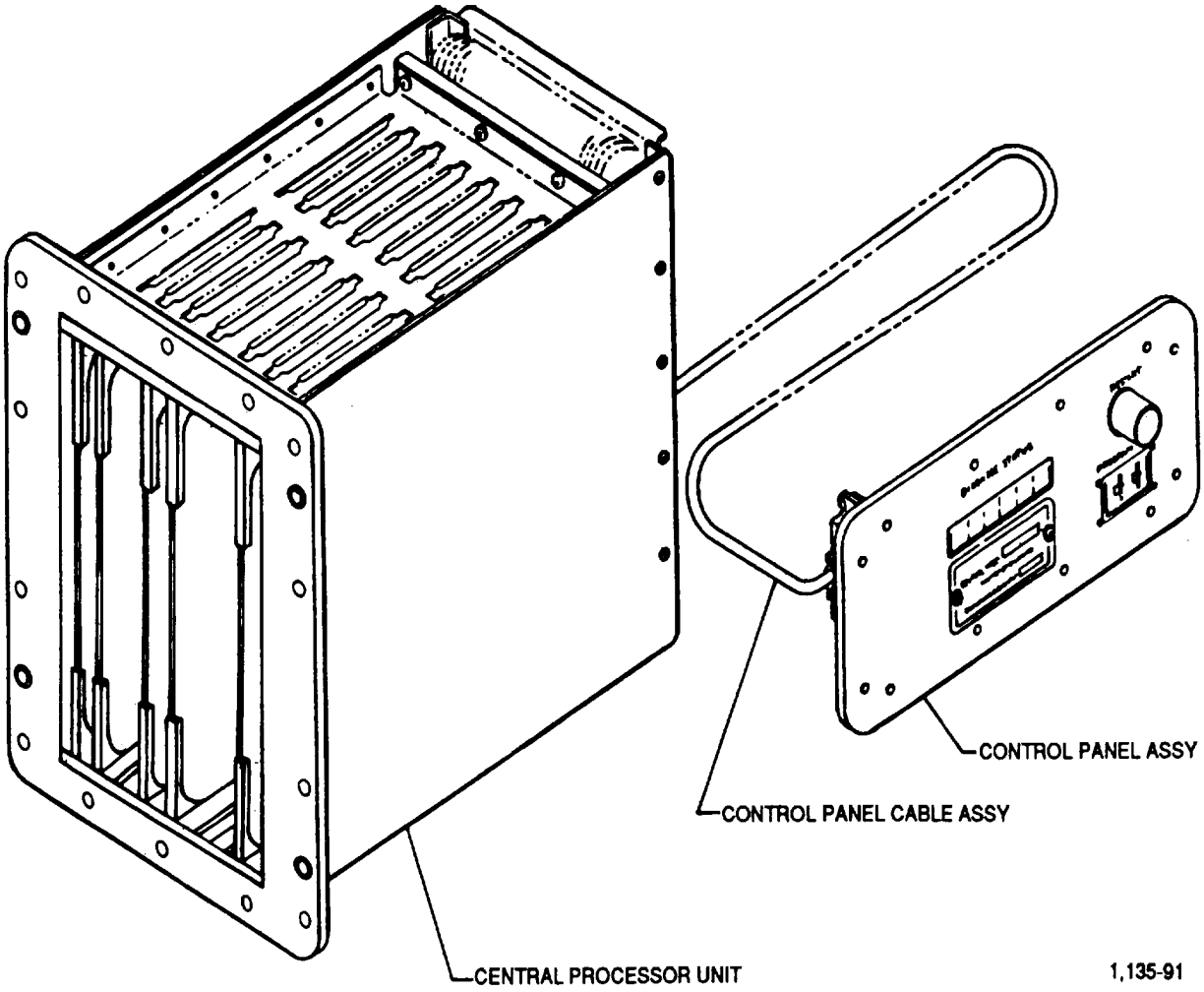

Figure 1-1. CP-2107(V) 1/G Computer (L-3050V)

1-8. TECHNICAL CHARACTERISTICS

The following is a summary list of the CP's technical characteristics.

a. Compatibility. The CP is compatible with a complete array of I/O devices including the following:

(1) Card and paper tape readers and punches
(2) Printers
(3) Tape drives
(4) Disc drives
(5) Video Displays
(6) Remote I/O devices
(7) Special purpose military system equipments and devices

b. Solid State Memory (SSM) Modules.

(1) Each SSM module has a storage capacity of 1,048,576 words (one circuit card). The SSM word length is 33 bits, 32 data bits and one parity bit. CPs are Initially configured with two SSM cards and two expansion slots. Total memory storage capacity (four cards) is 4 megawords, 33 bits wide.
(2) The SSM uses a 25 bit address for addressing up to 16,777,216 words of memory
(3) The bit error rate for the SSM is less than 1 x 10-12
(4) Provision for external battery backup for memory retention
(5) Memory data access cycle time of less than 250 nanoseconds

c. Input/Output Unit.

(1) Single word transfers and block word transfers by byte or words executed asynchronously, independent of program execution. Interleaved data transfer from several peripheral devices.
(2) Memory access protection
(3) Queue table to permit stacking of device interrupts
(4) Automatic parity generation and checking
(5) Multiple real-time clocks for timing control and time of day
(6) Built-in self-test and monitoring

d. Power Requirements.

(1) Voltage: +5V dc nominal (+4.8V dc to +5.4V dc)
(2) Ripple: 200 mV peak-to-peak
(3) Transients: Response/overshoot under all conditions (turn-on and turn-off) is limited to a maximum of +6.5V dc for a duration of 10 ms (max)
(4) Current: 20A maximum at +5V dc with full memory

e. Temperature.

(1) Operating temperature range: -250F to +125°F (-32°C to +52C)
(2) Low temperature starting conditions: -500F (-45°C), fully operational at -25°F (-320C)
(3) High temperature starting conditions: +125°F (+520C)
(4) Storage and transit: -70°F to +160°F (-570C to +71°C)

f. Atmospheric Pressure.

(1) Operating altitude: sea level to 10,000 feet
(2) Storage and transit: sea level to 40,000 feet

g. Relative Humidity.

(1) Operating: 100% up to +86°F (+30°C), 5% up to +125°F (+520C)
(2) Non-operating: 100% up to +86°F (+30°C), 5% up to +1250F (+520C)

CHAPTER 2

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Section I. GENERAL

2-1. Introduction

Maintenance of the CP is performed at Organizational, Direct Support, and Depot Levels. This chapter provides instructions for intermediate direct support maintenance only. Direct support maintenance is performed by those maintenance activities designated to support the using organization and emphasizes corrective maintenance at the equipment site. Direct support maintenance personnel perform corrective maintenance on items that are identified as faulty by organizational maintenance personnel, but are beyond their capability to correct using the maintenance resources authorized at the organizational maintenance level. Direct support maintenance personnel also provide technical assistance to the using organization in all areas that require skills and training that are beyond the capabilities of the organizational maintenance personnel. Direct sup- port maintenance is limited to the activities described below.

a. Visually inspect components for evidence of potential failure conditions such as lack of cleanliness, improper seating of connectors, loose hard- ware or other items, discoloration due to excessive heat, frayed cables or wiring, or bent pins. Correction of observed conditions is to be accomplished by the maintenance level authorized to perform the task.

b. Replace an unserviceable subassembly, module, or assembly, or unit with a like subassembly, module, or assembly, or unit.

c. Verify serviceability and isolate an equipment malfunction by measuring the mechanical or electrical characteristics with established standards. The standards authorized for direct support maintenance include fault detection software, fault isolation software, and technical manuals, including wire, connector, and logic lists.

d. Perform the repairs required to correct a specific failure or unserviceable condition and restore an item to a serviceable condition. This function includes, but is not limited to, soldering, piece part replacement, and cable or harness replacement.

2-2. Voltage Measurements

Voltage, resistance, and continuity measurements are made by direct support maintenance personnel for troubleshooting faults that cannot be resolved or repaired by organizational level personnel. Normally, such faults are traceable to wiring or chassis-mounted components. Generally, signal voltages are at standard TTL logic levels and measurements are made using an oscilloscope. Power supply voltages are measured with a multimeter.

Section II. TOOL AND EQUIPMENT

2-3. Tools and Test Equipment

Tools and test equipment required to perform the maintenance procedures given in this chapter are listed in table 2-1. All tools or test equipment authorized for use at the organizational level are also authorized for use by direct support personnel.

2-4. Repair Parts

Repair parts and accessories authorized for direct support personnel are listed in Repair Parts and Special Tools List (RPSTL) TM 11-5895-1517-24P.

Table 2-1. Tools and Test Equipment

Part Number	Description
TK-101/G	Tool Kit, Electronic Equipment
AN/PSM-45 or AN/PSM-45A	Multimeter
SMA-814891	Supplementary Tool Kit - IL
	Connector Repair Tool Kit:
06-7700-01	Contact Crimping Tool
06-7699-01	Extraction Tool
06-7698-01	Insertion Tool

Section III. TROUBLESHOOTING

2-5. General

This section provides the fault isolation and detailed troubleshooting procedures required to identify and correct a malfunction in the processor. The trouble-shooting procedures are divided into two sections: verification of faults indicated by organizational maintenance and troubleshooting procedures that may be either organizational or direct support.

a. Verification of Organizational Maintenance. Verification of organizational maintenance action is required to determine if the malfunction is correctable using organizational level procedures and, because of incomplete diagnosis, the problem has not been found, or the fault requires direct support troubleshooting procedures to locate it. Perform the following procedure to verify the organizational maintenance actions:

(1) Review the maintenance forms and records for unsatisfactory equipment performance, as prepared by the organizational maintenance personnel, to determine which circuit card assemblies and modules have already been replaced.

(2) Review the reported malfunction with the organizational maintenance personnel. Determine the symptoms, troubleshooting results, and actions taken.

(3) Based on (1) and (2) above, perform such additional corrective maintenance or inspection as may be clearly indicated (e.g., replace cards or modules listed in the operator's and unit maintenance manual for the system in which the CP is installed). Retest if required.

NOTE

If a peripheral fault is indicted by the processor diagnostic program at organizational level and all cards check good, the direct support maintenance should check all other cards associated with the indicated peripheral controller.

b. Troubleshooting Procedures. The operator's and unit maintenance manual for the system in which the CP is installed contains the procedures for running the CP diagnostic programs. Fault isolation flow charts are provided to guide the organizational maintenance personnel through the logical decisions that must be made to correct malfunctions efficiently and quickly.

Section IV. REPAIR

2-6. General

This section provides information required for direct support maintenance of the CP, consisting of connector repair and removal and replacement of major subassemblies. The scope of direct support maintenance is limited by the authorized repair parts, tools, and test equipment. Refer to paragraph 2-3 for tools and test equipment and to RPSTL TM 11-5895- 1517-24P/TO 31W2-2TYC39-64 for repair parts authorized at this level of maintenance.

Direct support personnel are called by the using organization to perform corrective maintenance actions on the CP when the repair task is beyond the skill level, repair authorization, or resources of the organizational level personnel. Direct support personnel are authorized to perform on-site minor repairs to the card cages. This includes, first, any repairs that could be performed by organizational personnel and, second, minor card cage repairs. Wire-wrap repairs cannot be made by direct support personnel; any re- pairs to card cage wiring must be done at depot level maintenance. Replacement of the card cages is done by direct support personnel. Visual aids for removal and replacement procedures are provided in the form of location diagrams and cable diagrams.

2-7. Handling of Electrostatic Discharge (ESD) Sensitive Circuit Card Assemblies

CP circuit card assemblies are sensitive to ESD. An electrostatic charge will damage the circuit card. Observe the following procedures when handling any CP circuit card assembly.

a. Before touching an ESD sensitive circuit card, attach a personnel ground strap to your wrist and connect the other end to equipment or chassis ground.

b. Upon removal of an ESD sensitive circuit card, place it in an ESD protective envelope or package. Avoid touching components, electrical terminals, and circuitry.

c. Do not probe or test an ESD sensitive circuit card.

d. Ground protective packages containing the replacement ESD sensitive circuit card to the equipment chassis before opening the package, to dissipate any accumulated charge on the package.

e. If possible, open the package at the connector end. Remove the ESD sensitive circuit card and install it in the equipment. Avoid touching components, electrical terminals, and circuitry.

f. Perform all other required maintenance actions, such as tightening fasteners and replacing cover, before removing the personnel ground strap.

2-8. Circuit Card Removal and Replacement

Complete instructions for circuit card removal and replacement are contained in the system Operator's and Organizational Maintenance Manual, TM 11 - 5805-790-12-7/TO 31W2-2TYC39-81-7.

2-9. Card Cage Assembly Removal and Replacement

Complete instructions for card cage assembly removal and replacement are contained in the system Operator's and Organizational Maintenance Manual, TM 11-5805-790-12-7/TO 31 W2-2TYC39-81-7.

2-10. Control Panel Repair

Direct support repair of the control panel consists of repair of cable connector (J1) and the removal and replacement of RESTART switch (S1), PROGRAM TEST switch (S2), and cable connector (J1).

The control panel must be removed from the rack before any repair procedures can be accomplished. Complete instructions for control panel removal and replacement are contained in the system Operator's and Organizational Maintenance Manual, TM 11-5805-790-12-7/TO 31W2-2TYC39-81-7.

a. Switch SI Removal. (fig. 2-1)

(1) Tag and unsolder leads from switch S1.

(2) At front of panel, unscrew rubber pushbutton mounting nut from switch.

(3) Remove nut, lockwasher, and switch guard from front of panel.

(4) Remove switch and keyed flat washer from rear of panel.

b. Switch S1 Replacement. (fig. 2-1)

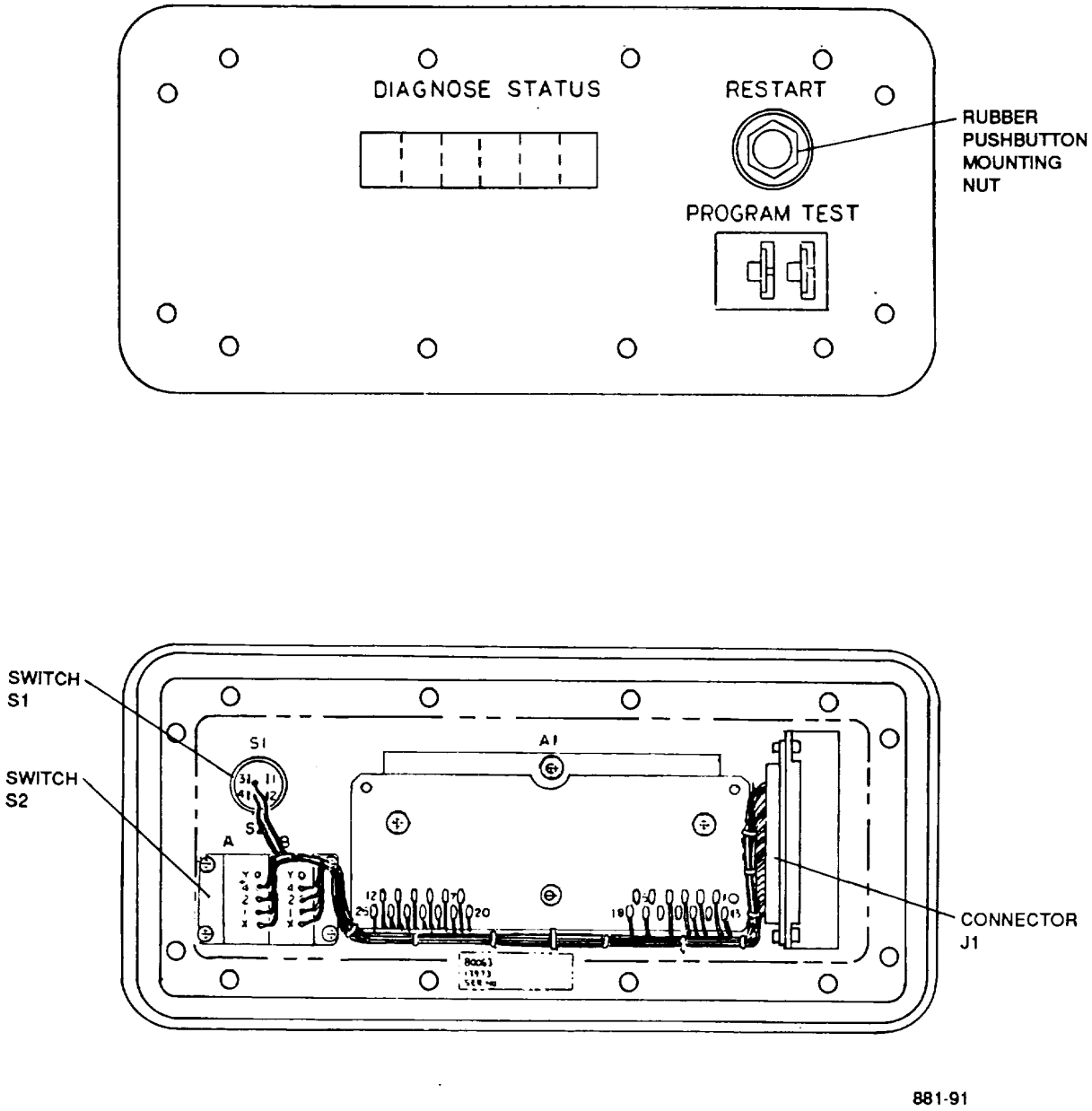

Figure 2-1. CP Control Panel

NOTE

The key of the flat washer fits into an indentation beside the mounting hole on the rear of the panel.

(1) At rear of panel, position switch in mounting hole so that keyed flat washer fits into indentation beside the mounting hole.

(2) At front of panel, install switch guard and lockwasher on switch and secure switch to panel with rubber pushbutton mounting nut.

(3) Solder tagged leads to switch terminals and remove tags.

c. Switch S2 Removal. (fig. 2-1)

CAUTION

Do not cut electrical leads when cutting ties that bundle leads together.

(1) Between S2 and JI, carefully cut the ties that bundle the electrical leads together.

(2) Remove two bolts, two flat washers, two lockwashers, and two nuts securing connector J1 to mounting bracket.

NOTE

Removal of pins from J1 is the same as pin removal from control panel cable connector P2 (para 2-11e).

(3) At connector J1, remove ten electrical leads going to switch S2.

(4) Remove four screws, eight flat washers, four lockwashers, and four nuts securing switch S2 to panel.

(5) Remove switch.

d. Switch S2 Replacement. (fig. 2-1)

NOTE

Replacement of pins in J1 is the same as pin replacement in control panel cable connector P2 (para . 2-11e).

NOTE

Refer to table 2-2 for proper switch S2 to connector J1 wire terminations.

Table 2-2. Control Panel Wiring List

From	To	Signal Name
J1-1 (TP)-	A1-25	+5V0717
J1-2 (TP)'	A1-26	+5V0727
J1-3 (TP)'	A1-12	+5V0747
J1-4		Spare
J1-5 (TP)*	A1-15	PCMD6LR
J1 6(TP)'	S1-4	PMRSWO
J1-7 (TP)°	A1-15	PCMD4LR
J1-8	A1-10	PDAOB1
J1-9	A1-11	PDA1B1
J1-10	A1-24	PDA2B1
J1-11	A1 -22	PDA3B1
J1-12	A1-23	PDA4B1
J1-13	11-9	PDA5B1
J1-14	A1-21	PDA6B1
J1-15	A1-8	PDA7B1
J1-16	A1-7	PDA8B1
J1-17	A1-18	PDA9B1
J1-18	A1-19	PDAAB1
J1-19	A1 -20	PDABB1
J1-20 (TP)'	A1-1	GNDO715
J1-21 (TP)'	A1-2	GND0725
J1-22 (TP)'	A1-13	GND0745
J1-23		Spare
J1-24 (TP)*	A1-3	PCMDGL
J1-25 (TP)'	S1-3	PMRSWOR
J1-26 (TP)'	A1-4	PCMD4L
J1-27		Spare
J1-28		Spare
J1-29	S2-A1	PTSTSWOL
J1 -30	S2-A2	PTSTSW1L
J1-31	S2-A3	PTSTSW2L
J1-32	S2-B1	PTSTSW3L
J1 1-33	S2-B2	PTSTSW4L
J1-34	S2-B3	PTSTSW5L
J1-35	A1 -6	PDAEB1
J1-36	A1-5	PDADB1
J1-37	A1-17	PDACB1
A1-2	S1-3	GND0725
A1-1	S2-AX	GNDO715
A1-13	S2-BX	GND0745

* TP - Twisted Pair as follows:

J1-1 and J1-20	J1-5 and J1-24
J1-2 and Jl-21	J1-6 and J1-25
J1-3 and J1-22	J1-7 and J1-26

(1) Crimp pins to switch electrical leads and Insert into connector J1.

(2) Position switch over mounting holes in panel and secure with four screws, flat washers, and nuts.

(3) Secure connector J1 to mounting bracket with two bolts, two flat washers, two flat washers, and two nuts.

(4) Bundle wires together and secure with ties.

e. *Connector J1 Removal*. (fig. 2-1)

(1) Remove two bolts, four flat washers, two lockwashers, and two nuts securing connector J1 to mounting bracket.

CAUTION

Do not cut electrical leads when cutting ties that bundle leads together.

(2) As necessary, carefully cut the ties that bundle electrical leads together.

NOTE

Removal of pins from J1 is the same as pin removal from control panel cable connector P2 (para 2-11e).

(3) Tag and remove electrical leads from connector J1.

(4) Remove connector.

f. *Connector J1 Replacement*. (fig. 2-1)

NOTE

Replacement of pins In J1 is the same as pin replacement in control panel cable connector P2 (para 2-11e).

NOTE

Refer to table 2-2 for proper connector J1 wire terminations.

(1) Insert tagged leads into replacement connector J1.

(2) Secure connector J1 to mounting bracket with two bolts, two flat washers, two lockwashers, and two nuts.

(3) As needed, bundle wires together and secure with ties.

2-11. Control Panel Interface Cable Repair.

Direct support repair of the control panel interface cable (fig. 2-2) consists of replacing connectors, pins, and wires.

The control panel interface cable must be removed from the CP before any repair procedures can be accomplished. Complete instructions for control panel interface cable removal and replacement are contained in the system Operator's and Organizational Maintenance Manual, TM 11-5805-790-12-7/TO 31W2-2TYC39-81-7.
Table 2-3 lists the replacement parts and tools necessary for cable repair.

Use a multimeter AN/PSM-45A and the cable wiring list (table 2-4) to identify the faulty component, then perform the appropriate repair procedure in this paragraph.

a. *Cable Connector P1 Disassembly*. (fig. 2-3)

(1) Remove knob retaining screw and remove knob.

(2) Remove two screws securing cover and remove cover.

(3) Remove two screws securing cable clamp and remove clamp.

(4) Remove circlip from jack screw.

(5) Remove jack screw and thrust washers from insulator.

(6) Replace connector pins (para 2-1 e) and/or wiring (para 2-1 lf).

b. Cable Connector P1 Reassembly. (fig. 2-3)

(1) Slide thrust washer onto jack screw and insert jack screw through insulator.

(2) Install other thrust washer and circlip on jack screw.

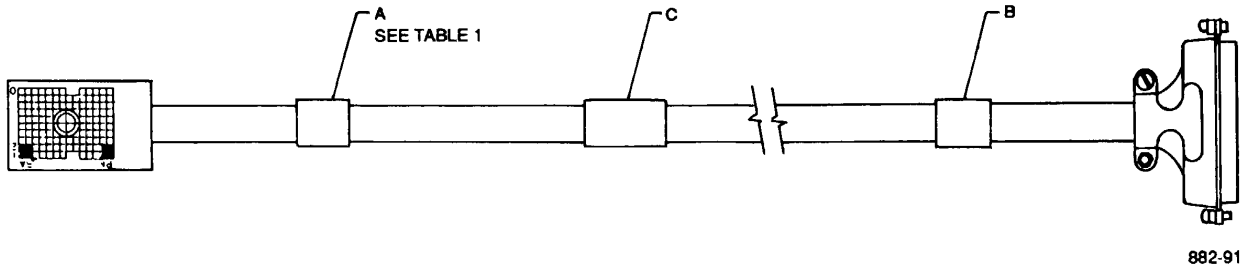

TABLE 1		
IDENTIFICATION MARKING		
A	B	C
P1 (CPU J6)	P2 (CONTPNW1)	80063 ASSY SM-D-823804 13973 ASSY 549713-102 SERIAL NO. XXX

Figure 2-2. Control Panel Interface Cable

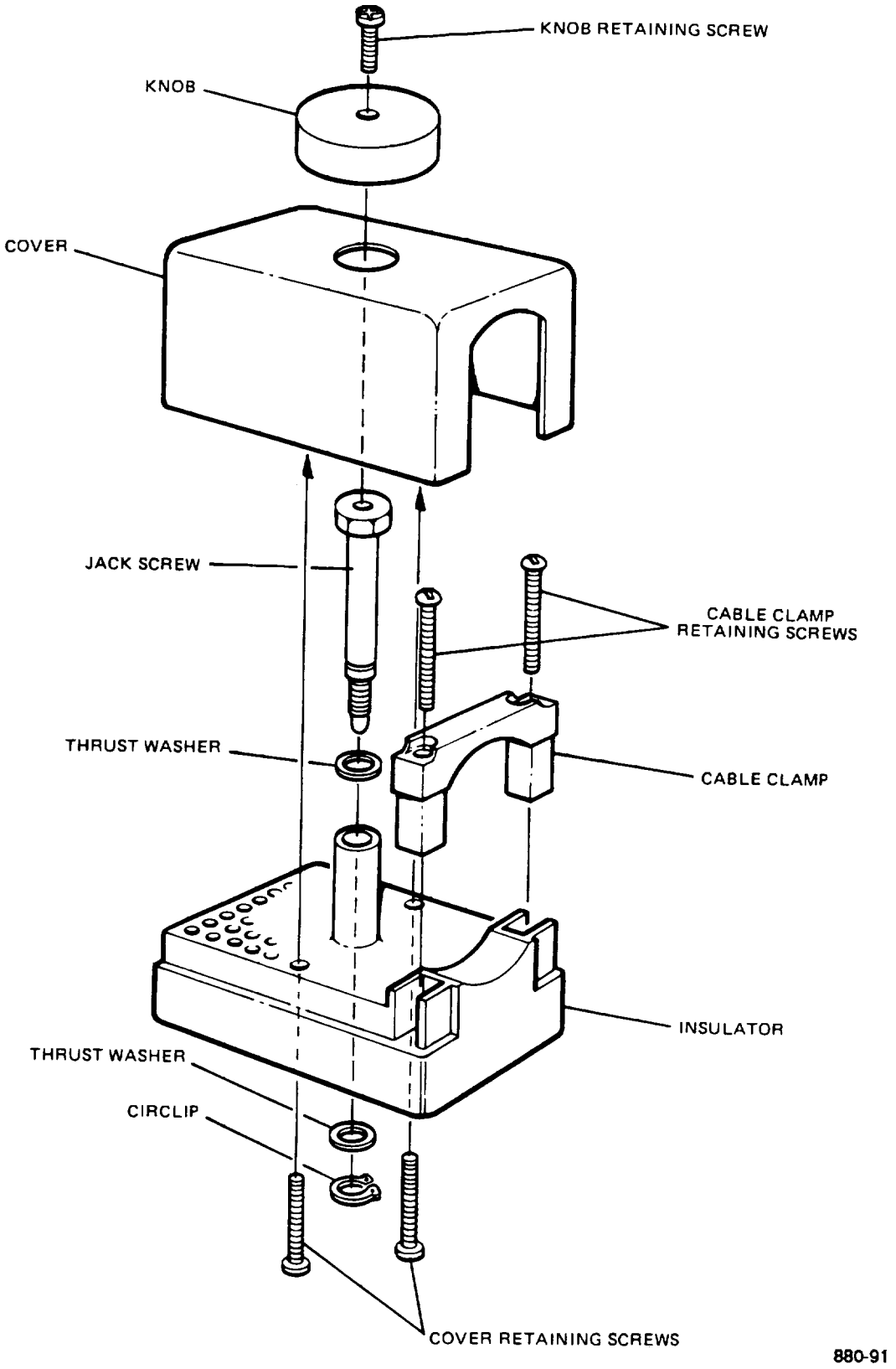

Figure 2-3. Connector P1

Table 2-3. Replacement Part Numbers and Tools For Connectors P1, P2, and J1

Parts			Tools	
Connector	Part Number	Pin	Crimping	Insertion/Extraction
P1	867324-0001	867326-0001	600-0026-00o	600-0027-000
P2	M24308/2-15	M39029/57-354	M81969/12-O1	
J1	M24308/4	M39029/58-360	M81969/12-02	

Table 2-4. Control Panel Interface Cable Wiring List

From	To	Signal Name
P1-A4	P2-1 (TP)*	+5V0717
P1-A5	P2-2 (TP)*	+5V0727
	P2-4	Spare
P1-A6	P2-3 (TP)*	+5V0747
P1-M5	P2-5 (TP)*	PCMDGLR
P1-F2	P2-6 (TP)*	PMRSW0
PI-M3	P2-7 (TP)*	PCMD4LR
P1-C0	P2-8	PDA0B1
P1-C1	P2-9	PDA1B1
P1-C2	P2-1 0	PDA2B1
P1-C3	P2-11	PDA3B1
P1-C4	P2-12	PDA4B1
P1-C5	P2-13	PDA5B1
P1-C6	P2-14	PDA6B1
P1-C7	P2-15	PDA7B1
P1-D0	P2-16	PDA8Bl1
P1-D1	P2-17	PDA9B1
P1-D2	P2-18	PDAAB1
P1-D3	P2-19	PDABB1
P1-B4	P2-20 (TP)*	GNDO715
P1-B5	P2-21 (TP)*	GND0725
P1-B6	P2-22 (TP)*	GNDO745
P1 -L5	P2-24 (TP)*	PCMD6L
P1-F3	P2-2s (TP)*	PMRSWOR
P1 -L3	P2-26 (TP)*	PCMD4L
	P2-27	Spare
	P2-28	Spare
P1-E0	P2-29	PTSTSWOL
P1-E1	P2-30	PTSTSW1 L
P1-E2	P2-31	PTSTSW2L
P1-E3	P2-32	PTSTSW3L
P1-E4	P2-33	PTSTSW4L
P1-E5	P2-34	PTSTSWSL
P1-D6	P2-35	PDAEB1
P1-D5	P2-36	PDADB1
P1-D4	P2-37	PDACB1

*TP = Twisted Pair as follows:

P1-1 and P1-20	P1-5 and P1-24
P1-2 and P1-21	P1-6 and P1-25
P1-3 and P1-22	Pl-7 and P1-26

(3) Position cable clamp over cable and secure to insulator with two screws.

(4) Secure cover to insulator with two screws.

(5) Position knob on jack screw and secure with retaining screw.

(6) Perform continuity check using multimeter ANIPSM-45 or AN/PSM-45A and wiring list (table 2-4).

c. *Cable Connector P2 Disassembly.* (fig. 2-4)

(1) Remove two screws and nylok nuts securing P2 cable clamp.

(2) Retract clip screws to the point where both clips can be slid free of connector housing and remove clips.

(3) Slide connector housing back along cable to provide access to connector contacts.

(4) Replace connector pins (para 2-lie) and/or wiring (para 2-11f).

d. *Cable Connector P2 Reassembly*. (fig. 2-4)

(1) Slide connector housing over connector.

(2) Install clips on edges of connector housing.

(3) Secure cable clamp with two screws and nylok nuts.

(4) Perform continuity check, using multimeter ANIPSM-45 or AN/PSM-45A and wiring list (table 2-4), to verify repair.

e. *Pin Repair (P1 andP2).*

(1) Tag defective pin and remove it by inserting extraction tool on connector side and pushing pin out of connector. Remove pin (still crimped to wire) from cable side of connector.

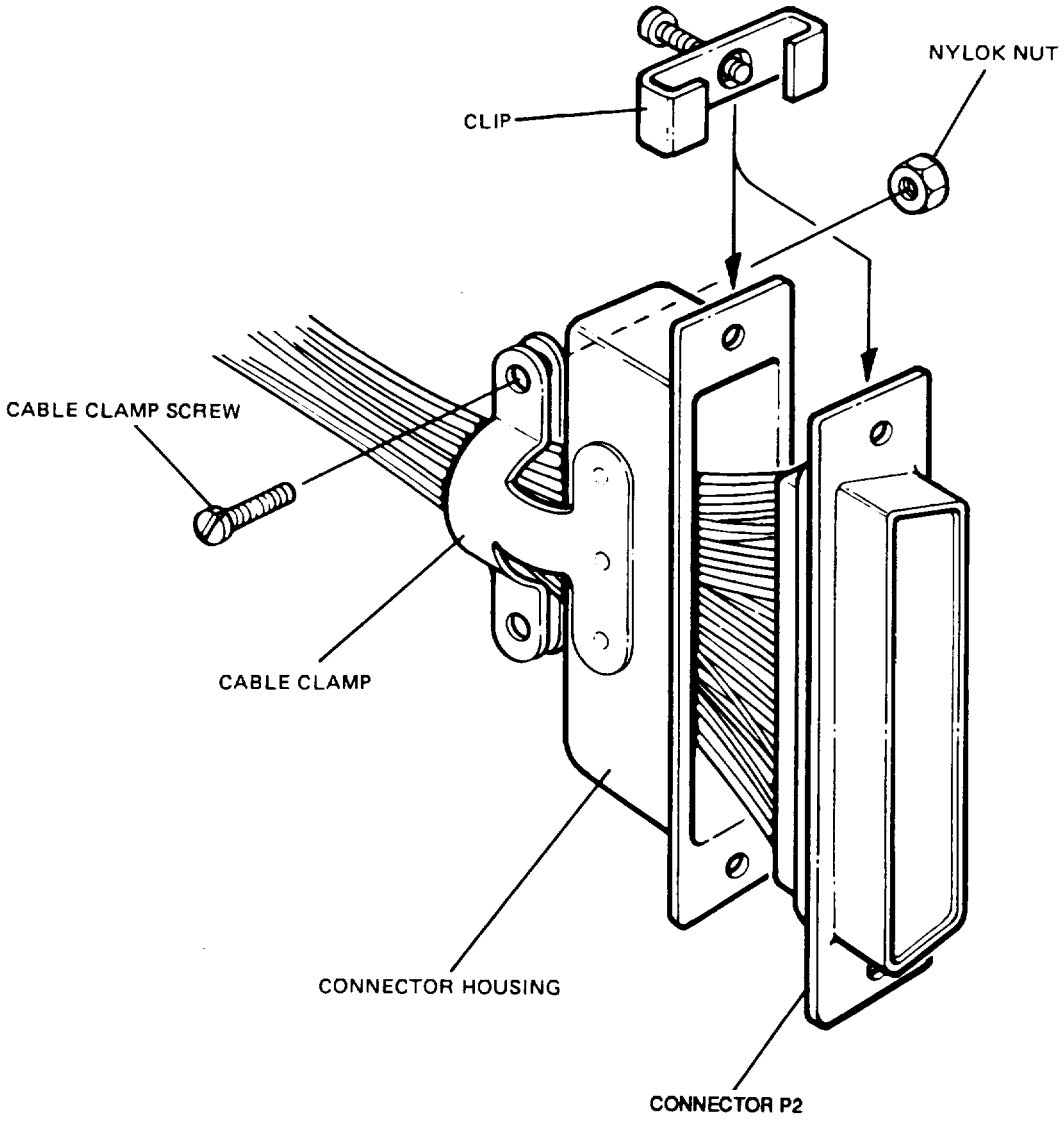

Figure 2-4. Connector P2

(2) Clip pin from wire.

NOTE

Discard and do not reuse pins that have been removed from connector.

NOTE

Do not reuse wire unless there is enough excess length to allow cutting the old pin off and crimping a new pin on. If not, replace wire (para 2-1 f).

(3) Use crimping tool to attach new pin to wire.

CAUTION

Ensure that orientation of new pin is the same as that of all other pins in the same row.

(4) Using insertion tool, insert pin (crimped to wire) into connector from cable side, making sure that pin is oriented the same as all other pins in the row. Gently push the pin into connector until shoulder of tool strikes connector.

(5) Repeat procedure for all other faulty pins.

(6) Perform continuity check, using multimeter AN/PSM-45 or AN/PSM-45A and wiring list (table 2-4), to verify repair.

(7) Reassemble connector P1 (para 2-1 lb.) or P2 (para 2-11d).

f. Cable Wire Replacement.

NOTE

Do not reuse wire unless there is enough excess length to allow cutting the old pin off and crimping a new pin on.

(1) Select replacement wire of proper gauge and cut to length.

(2) Crimp appropriate pins at each end of wire.

(3) Install pins into connectors (para 2-1 e).

(4) Secure replacement wire to harness.

(5) Perform continuity check, using multimeter AN/PSM-45 or AN/PSM-45A and wiring list (table 2-4), to verify repair.

(6) Reassemble connector P1 (para 2-11 lb) and P2 (para 2-11d).

CHAPTER 3

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

There are no direct support maintenance requirements for the central processor.

APPENDIX A

REFERENCES

AFR 66-1	Maintenance Management
AFR 75-18	Reporting of Transportation Discrepancies in Shipments
AFR 400-54	Reporting of Item and Packaging Discrepancies
AFR 900-4	Air Force Suggestion Program
DA Form 2028	Recommended Changes to Publications
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	The Army Maintenance Management System (TAMMS)
MIL-STD-188C	Military Communication System Technical Standards
SF 361	Discrepancy in Shipment Report (DISREP)
SF 364	Report of Discrepancy (ROD)
SF 368	Quality Discrepancy Report (EIR Submission)
TM 11 -5805-790-12-1, -9 TO 31W2-2TYC39-81-1, -9	Operators and Organizational Maintenance Manual: Central, Message Switching, Automatic AN/ITYC-39 A (NSN 5805-01-363-5118)
TM 11-6625-654-14	Operators, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot RPSTL): Multimeter, AN/USM-223 (NSN 6625-00-999-7465)
TM 11-6625-1541-15	Operators, Organizational, Direct Support, General Support, and Depot Maintenance Manual: RMS Voltmeter, AN/USM-224 (NSN 6625-00-727-4706)
TM 11 -6625-2735-14 0969-LP-170-1090 TO 33A1-13-498-1	Operators, Organizational, Direct Support, and General Support Maintenance Manual (Including Depot Maintenance): Oscilloscope, OS-261AJ (NSN 6625-00-127-0079)
TM 11-6625-3052-14 TO 33A1-12-1292-1	Operators, Organizational, and General Support Maintenance Manual for Multimeter, Digital, AN/PSM-45 (NSN 6625-01-139-2512)
TM 11-6625-3052-24P	Operators, Organizational, and General Support Repair Parts and Special Tools list: Multimeter, Digital, AN/PSM-45 (NSN 6625-01-139-2512)

APPENDIX A (Cont.)

REFERENCES

TM 11-6625-3199-14	Operators, Organizational, and General Support Maintenance Manual for Multimeter, Digital, AN/PSM-45A (NSN 6625-01-265-6000)
TM 11-6625-3199-24P-1	Operators, Organizational, and General Support Repair Parts and Special Tools list: Multimeter, Digital AN/PSM-45A (NSN 6625-01-265-6000)
TM 750-244-2	Procedures for Destruction of Army Electronic Materiel to Prevent Enemy Use (Electronics Command)

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