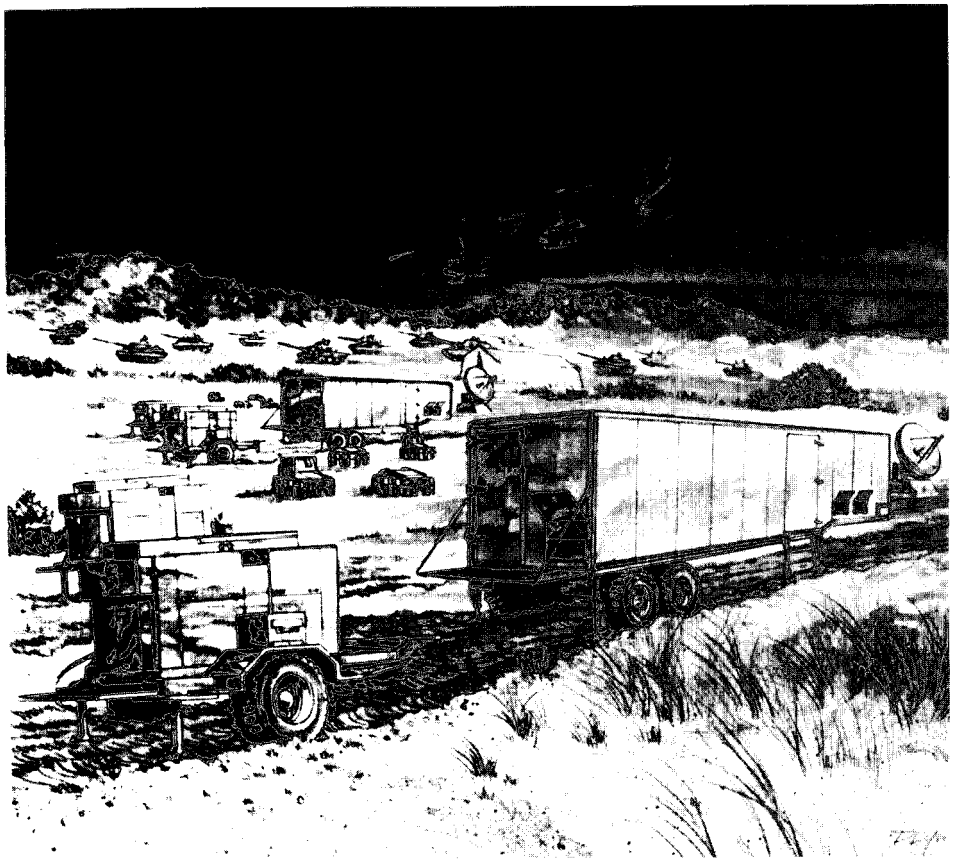
TM 11-7010-205-23-1

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

AUTOMATED DATA PROCESSING

SYSTEM AN/MYQ-4A



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(NSN 7010-01-158-5397)

HEADQUARTERS DEPARTMENT OF THE ARMY

13 MAY 1985

WARNING

HIGH VOLTAGE

is used in the operation of th is equipment.

ELECTROCUTION

may result if personnel tail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby. He/she should be familiar with the operation and hazards of the equipment. He/she should also be competent in giving first aid. When you are helped by operators, you must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take special care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections when installing or operating this equipment.

Whenever possible, keep one hand away from the equi pment to reduce the hazard of current flowing through vital organs of the body.

WARNING

Do not be misled by the term “low voltage”. Voltages as low as 50 volts can cause death.

For artificial respiration, refer to FM 21-11.

WARNING

Remove rings, bracelets, wristwatches, and neck chains before working around electronic equipment. Jewelry can catch on equipment and cause injury, or may short across an electrical circuit and cause severe burns or electrical shock.

FLAMMABLE AGENTS

Isopropyl alcohol is flammable. Keep away from heat and open flames.

Do not operate utility lights when cooling/ventilation units are not in service. Heat buildup may create a fire hazard.

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

DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

IF POSSIBLE , TURN OFF THE ELECTRICAL POWER

IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

SEND FOR HELP AS SOON AS POSSIBLE

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

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 13 May 85

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

AUTOMATED DATA PROCESSING SYSTEM AN/MYQ-4A

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes 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 the back of this manual, direct to: Commander, US Army Communications and Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

This manual tells you how to troubleshoot and maintain Automated Data Processing System AN/MYQ-4A.

LOCATION OF SUBJECTS IN MANUAL

In this manual, paragraphs are numbered in order by chapter. For example, paragraph 2-3 is the third paragraph in chapter 2. Pages are also numbered this way. Using this numbering system, there are three easy ways to locate the information you need in this manual.

- Table of contents
- Alphabetical index
- Index of maintenance procedures

Use the table of contents to quickly find major parts of the manual. If the information you need is not listed in the table of contents, use the alphabetical index at the back of this manual. It lists all subjects covered in the manual and directs you to the subject by paragraph number. When you need a specific maintenance procedure. use the index at the start of chapter 3 or 4. This index lists all the maintenance procedures in the chapter and directs you to each procedure by page number.

MAINTENANCE PROCEDURES

Maintenance procedures in this manual have two features which help you perform them more easily:

- Initial setup boxes
- First-time performance aids

An initial setup box is used at the start of any procedure which requires setup items before you perform it. This box lists items needed to perform the procedure. If the box does not appear at the start of a procedure, no setup items are needed.

If you are using this manual to perform a procedure for the first time, always read through the entire procedure before you start. Always perform the task steps in the order given. This will help assure correct performance. Use the illustrations beside the tasks steps to find the parts of the equipment called out in the steps. Some steps include a reference to another paragraph. Go to that paragraph if you are not sure how the step is done.

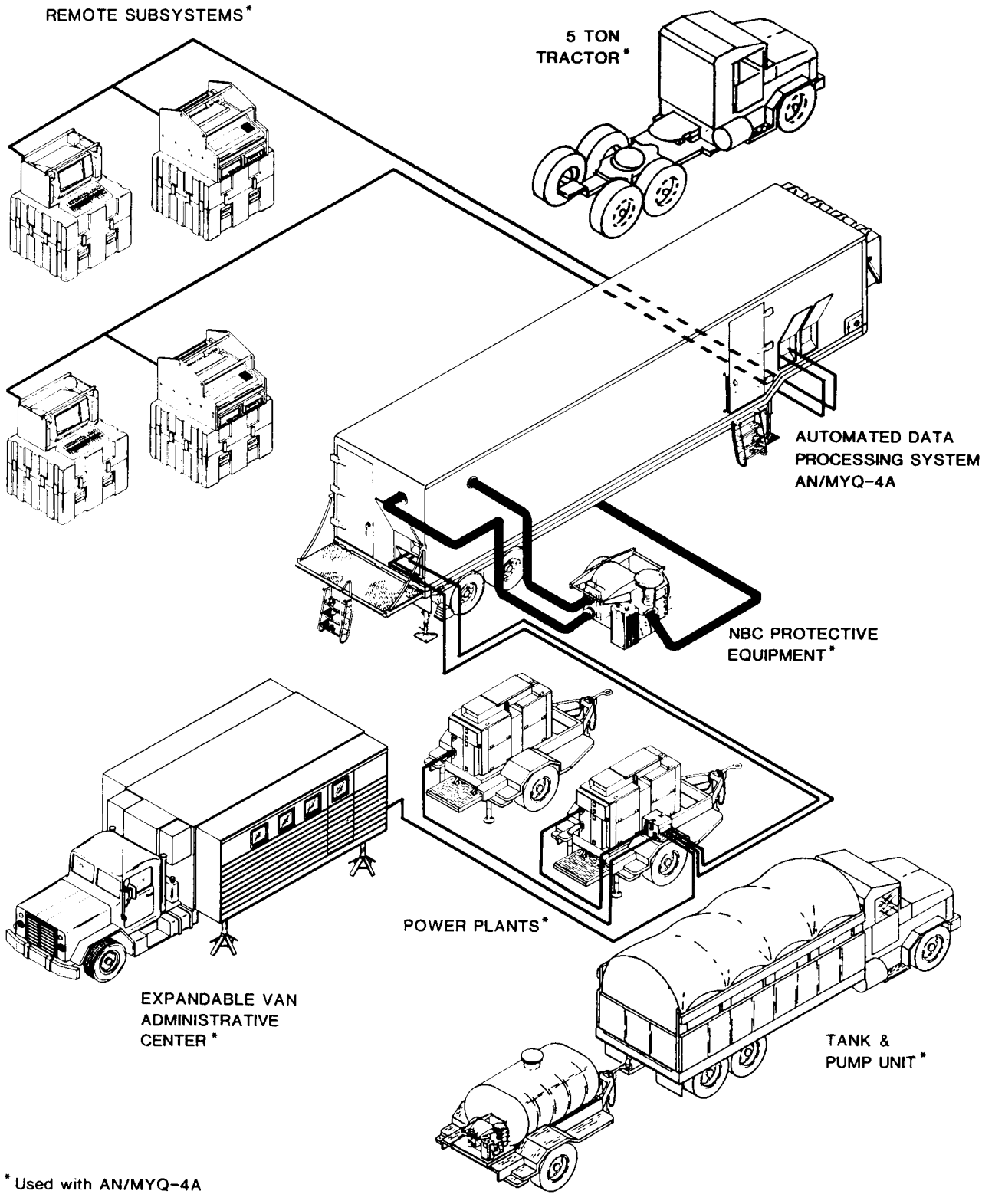


Figure 1-0. Automated Data Processing System DAS3 (D/C)

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

This manual is the organizational and direct support maintenance manual for Automated Data Processing System AN/MYQ-4A (fig. 1-0). In the rest of this manual, the acronym DAS3 (D/C) (Decentralized Automated Service Support System, Division/Corps support) is used as the common name for the AN/MYQ-4A.

DAS3 (D/C) is a mobile, van mounted, self-contained data processing system for tactical division/corps support of Army units. It features four complete subsystems:

- ADP subsystem
- Ac power subsystem
- Environmental subsystem
- Communications subsystem

Preparation for use, preventive maintenance checks and services, troubleshooting, repair, and removal and replacement of equipment for the system are included in this manual. Manuals for maintenance of individual devices within each subsystem are referenced in Appendix A.

1-2. INDEX OF PUBLICATIONS

Refer to the latest issue of DA PAM 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the system.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

1-4. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness. Disassembly and repacking of equipment for limited storage are covered in TM 740-90-1.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your DAS3 (D/C) 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. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at Commander, U. S. Army Communications and Electronics Command, and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

1-7. REFERENCE INFORMATION

Reference information includes the nomenclature cross reference list, list of abbreviations, and an explanation of terms (glossary) used in this manual.

1-8. NOMENCLATURE CROSS REFERENCE LIST

Refer to System Operator's Manual TM 11-7010-205-10-1 for a complete nomenclature cross reference list.

1-9. LIST OF ABBREVIATIONS

A complete list of abbreviations used in this manual is included in the glossary at the back of this manual (Glossary, section I).

1-10. GLOSSARY

A complete glossary of unusual terms is given at the back of this manual (Glossary, section II).

Section II. EQUIPMENT DESCRIPTION AND DATA

1-11. GENERAL

DAS3 (D/C) features van-mounted automated data processing (ADP) equipment supported by air conditioning, heating, and frequency conversion units. This section contains reference information concerning system configuration such as; equipment addressing, cabling and wiring, receptacles, pin numbers, dipswitches, and jumpers for printed wiring boards and backplanes.

It is not necessary for you to acquire a thorough understanding of system operating principles. However, you must know how the system is interconnected and how the parts work and interface with component and end item.

Your duties as a repairer include:

- Troubleshooting and fault isolation
- Repair of system through printed wiring board exchange or assembly/subassembly exchange
- Repair or replacement of wiring

Ž Replacement of minor discrete components
• Operation of test equipment and diagnostic programs

You may be able to identify and isolate a fault by discussing the events leading up to the failure with the system operator. Be alert to the operator's observations, the conditions of failure (on line or off line), and the outward indication of the equipment itself. All these things contribute to solving the problem faster and avoiding down time.

1-12. EQUIPMENT PURPOSE, CAPABILITIES, AND FEATURES

The system is housed in a semitrailer van for complete mobility. The purpose of the system is to process data, assist in record maintenance, and provide division/corps support to field units.

It is capable of processing high-priority requests on a single-entry basis or large transactions as a batch entry. Bulk data transfer at high speeds, over cable, radio, or satellite communications lines are possible through the communications subsystem equipment.

Operational features of the system are listed in System Operator's Manual TM 11-7010-205-10. Some of the maintenance features are:

Ž Console bootstrap procedure automatically initiates a firmware-stored self-testing routine which will tell you if there are any internal problems with system logic operation

• Malfunctions are reported on the system console, on the CPU control panel indicators, and, in some devices, on the board-edge indicator

• Test and verification programs which, when used with the troubleshooting flow charts, will help isolate trouble to the component that needs to be replaced

• Storage facilities for tools, spares, TMDE, and supplies

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

System Operator's Manual, TM 11-7010-205-10-1 gives the location and description of all major components of the system. The system is divided into the following major areas.

- ADP subsystem
- Environmental subsystem
- Ac power subsystem
- Communications subsystem
- Semitrailer van
- Administrative van
- Power plant (auxiliary equipment)

1-14. EQUIPMENT DATA

See System Operator's Manual TM 11-7010-205-10-1.

1-15. SYSTEM CONFIGURATION

It is your responsibility to regularly inspect all cables, wires, electronic, and mechanical interconnections between the components and devices that make up the system. You will also be called upon to repair, replace, and reconnect these items when you perform maintenance. This section includes block diagrams showing subsystem cabling, physical diagrams showing wires, switches, receptacles, light fixtures and equipment, and references to cabling and wiring schematics included in appendix D and FO (fold out) section in the back of this manual.

1-16. AC POWER SUBSYSTEM

The ac power subsystem (fig.1-1) receives three-phase power from either commercial lines or the auxiliary power plant and feeds single phase utility and technical power to the system and three-phase utility power to the air conditioners and nuclear, biological, and chemical protection equipment NBCPE. Power for the air conditioners and NBCPE is connected to one power entrance panel. Power for internal technical and utility circuits is connected to a second power entrance panel. A complete set of cabling and wiring schematics is given in appendix D.

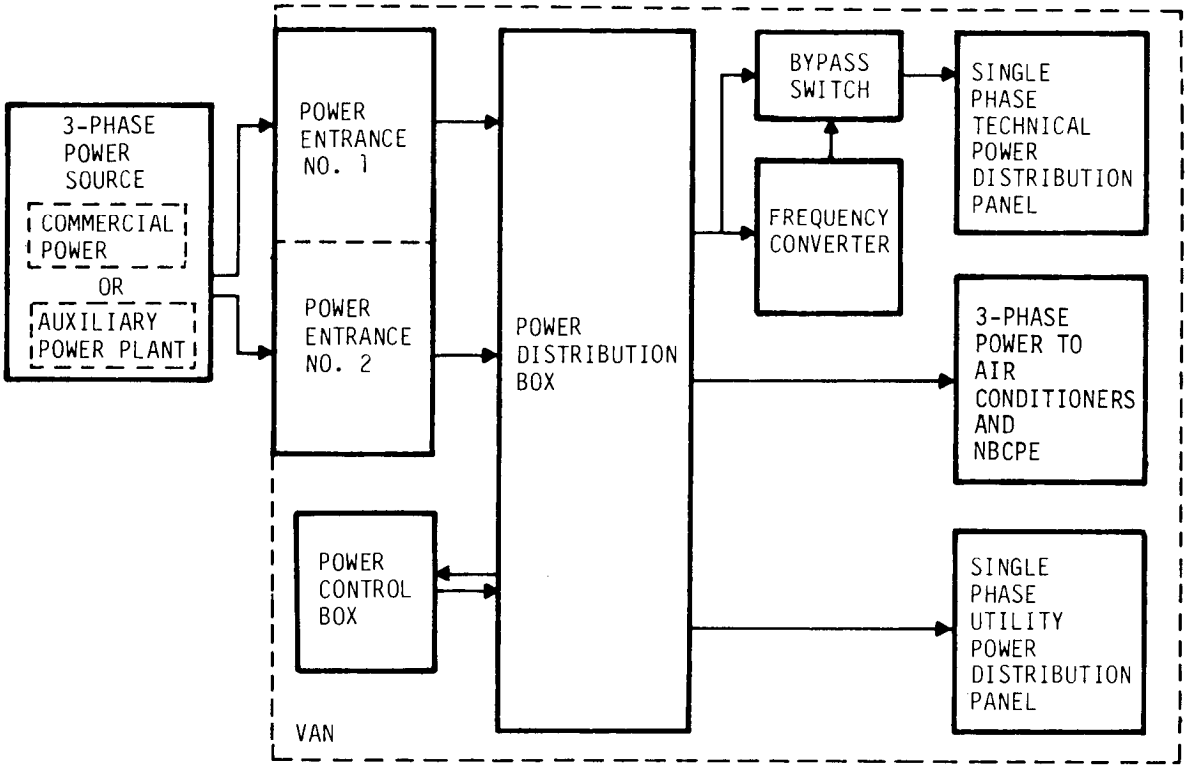


Figure 1-1. Power Distribution Block Diagram

Ac power is run inside the van to convenience outlets for utility devices, and through dedicated circuits for technical power to ADP subsystem equipment. Fig. 1-2, sheet 1 indicates technical and utility power runs and outlets in van roadside locations.

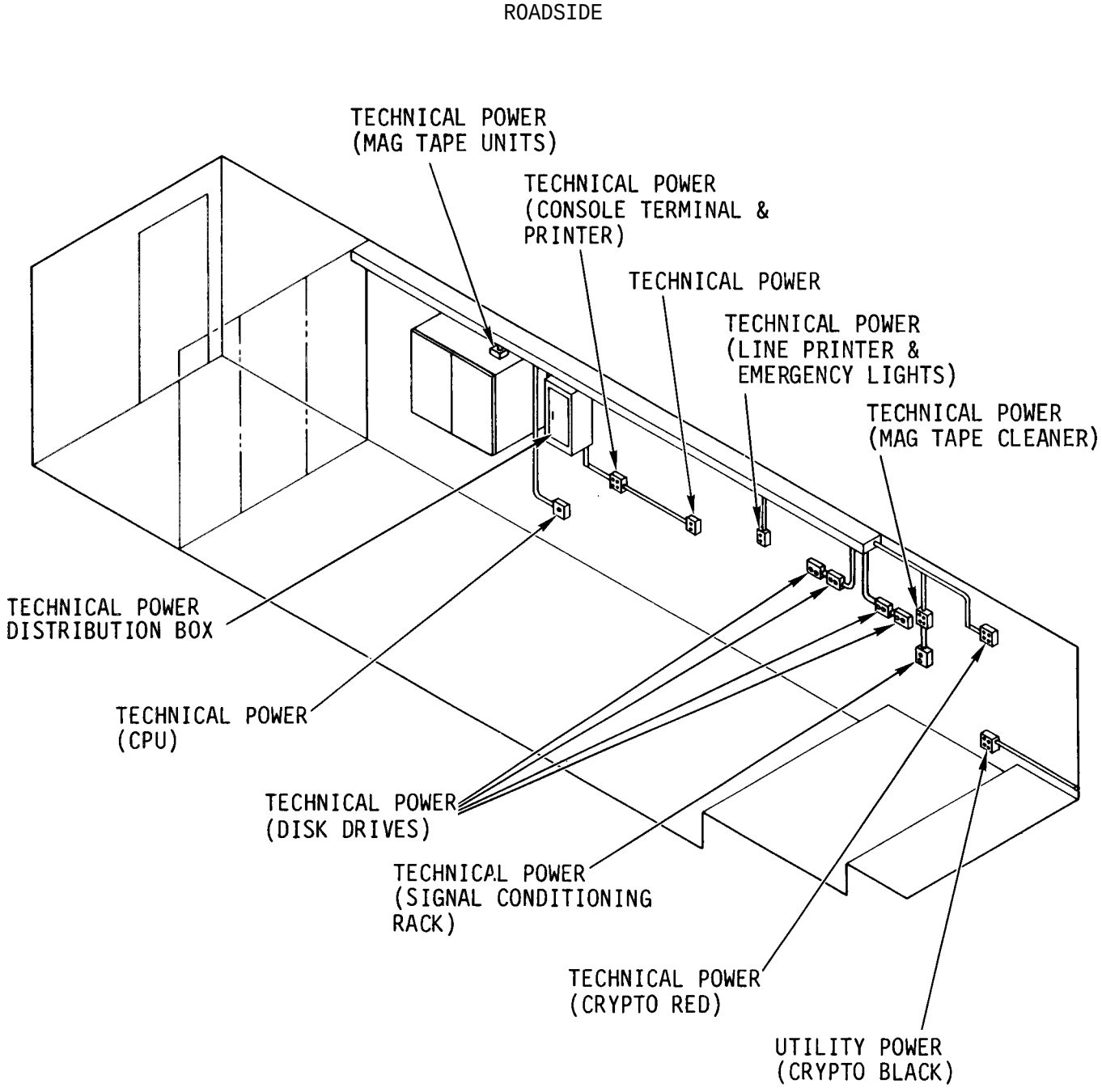


Figure 1-2. Ac Power Runs Inside The Van (1 of 3)

You will also find convenience outlets for utility devices and dedicated circuit runs for technical power on the curbside of the van (fig. 1-2, sheet 2).

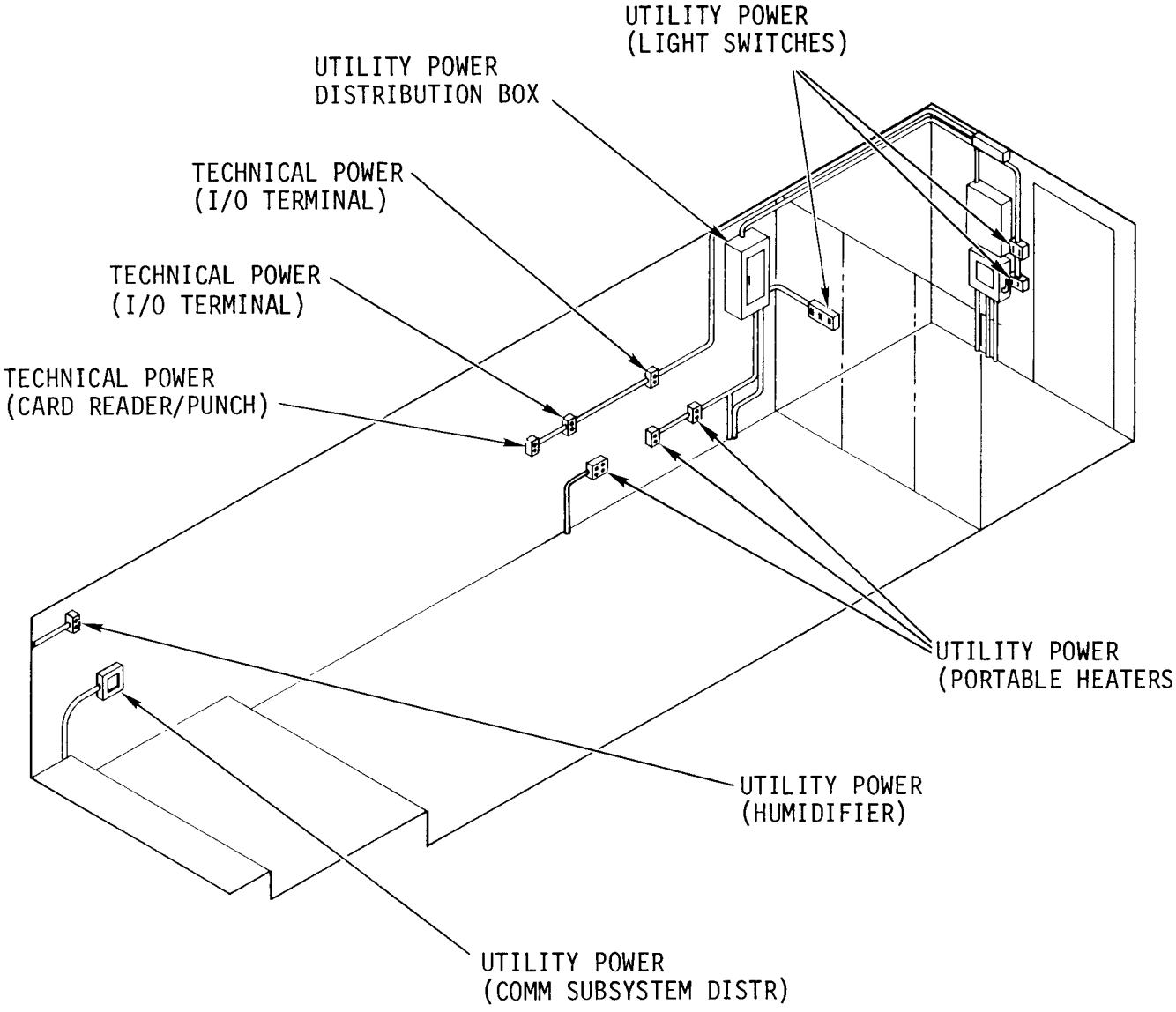


Figure 1-2. Ac Power Runs Inside The Van (2 of 3)

Ac power for incandescent and fluorescent lighting (fig. 1-2, sheet 3) is supplied to overhead conduit runs (above the dropped ceiling).

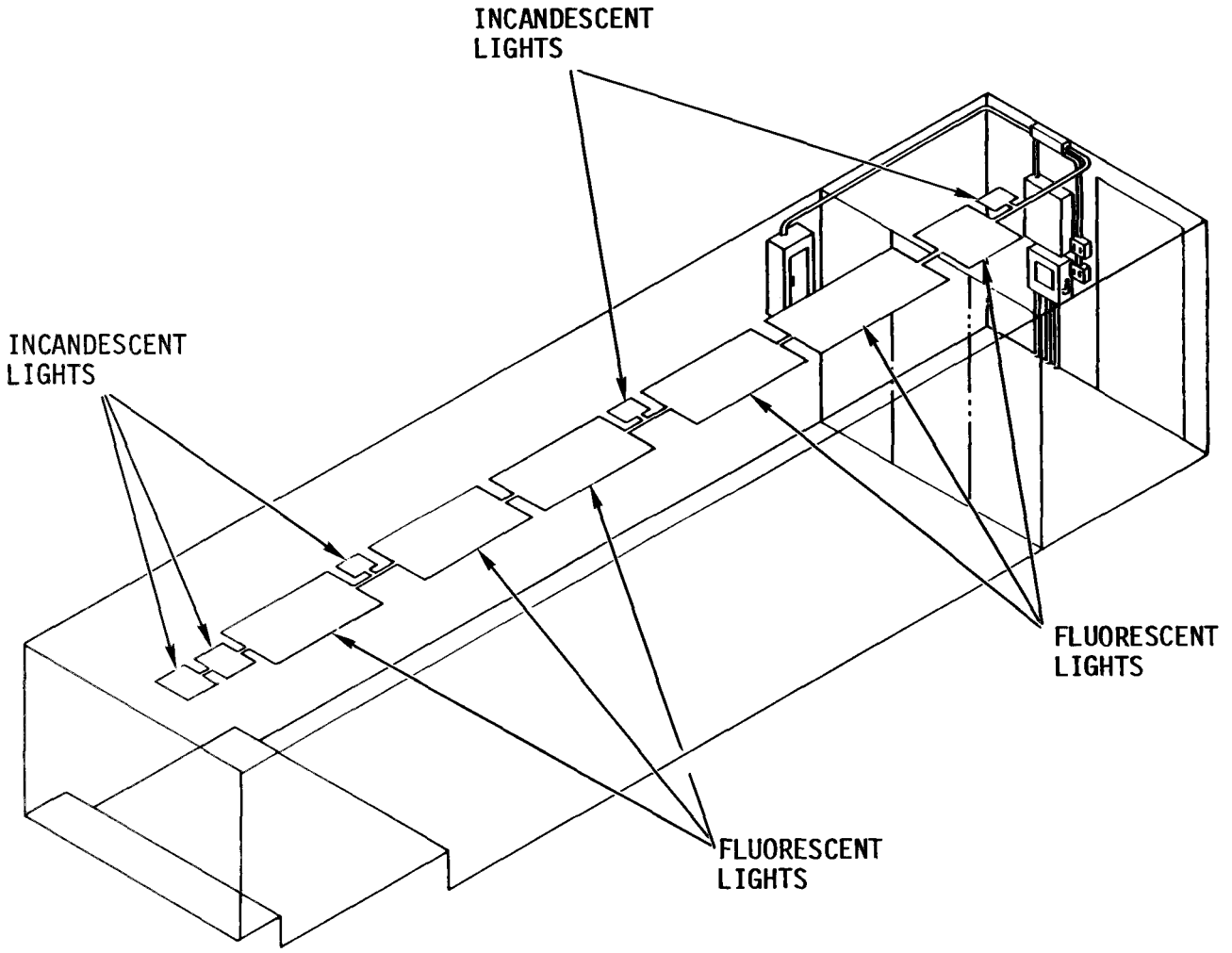


Figure 1-2. Ac Power Runs Inside The Van (3 of 3)

1-17. ENVIRONMENTAL SUBSYSTEM

The normal heating and cooling of the system is accomplished by four air conditioning units (fig. 1-3) mounted at the front of the van. All controls are located in the temperature control panel. Cabling, wiring, connector pin numbers, and a breakdown of the control switches are given in appendix D. Three portable heaters give extra heat during cold weather and when needed for drying out the van and its equipment. A humidifier and its controls adjust humidity inside the van. Provisions have been made for integrating the GFE modular collective nuclear, biological, chemical protection equipment (NBCPE).

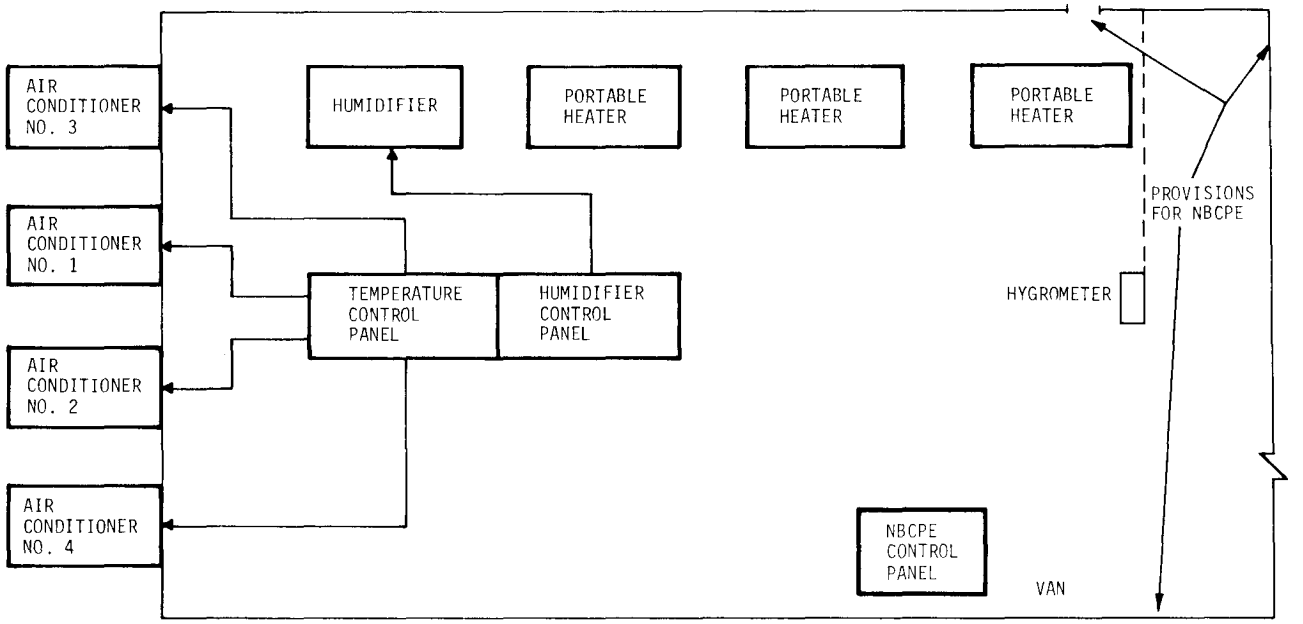


Figure 1-3. Environmental Subsystem

1-18. ADP AND COMMUNICATIONS SUBSYSTEMS

ADP system block diagram (fig. 1-4) illustrates the way each device interconnects with the CPU. Study the directional arrows indicating function and signal flow. A complete breakdown of the CPU components, the device interconnections, and the actual cable designations is given in appendix D. Schematic wiring diagrams for the individual device cabinets are also included in appendix D.

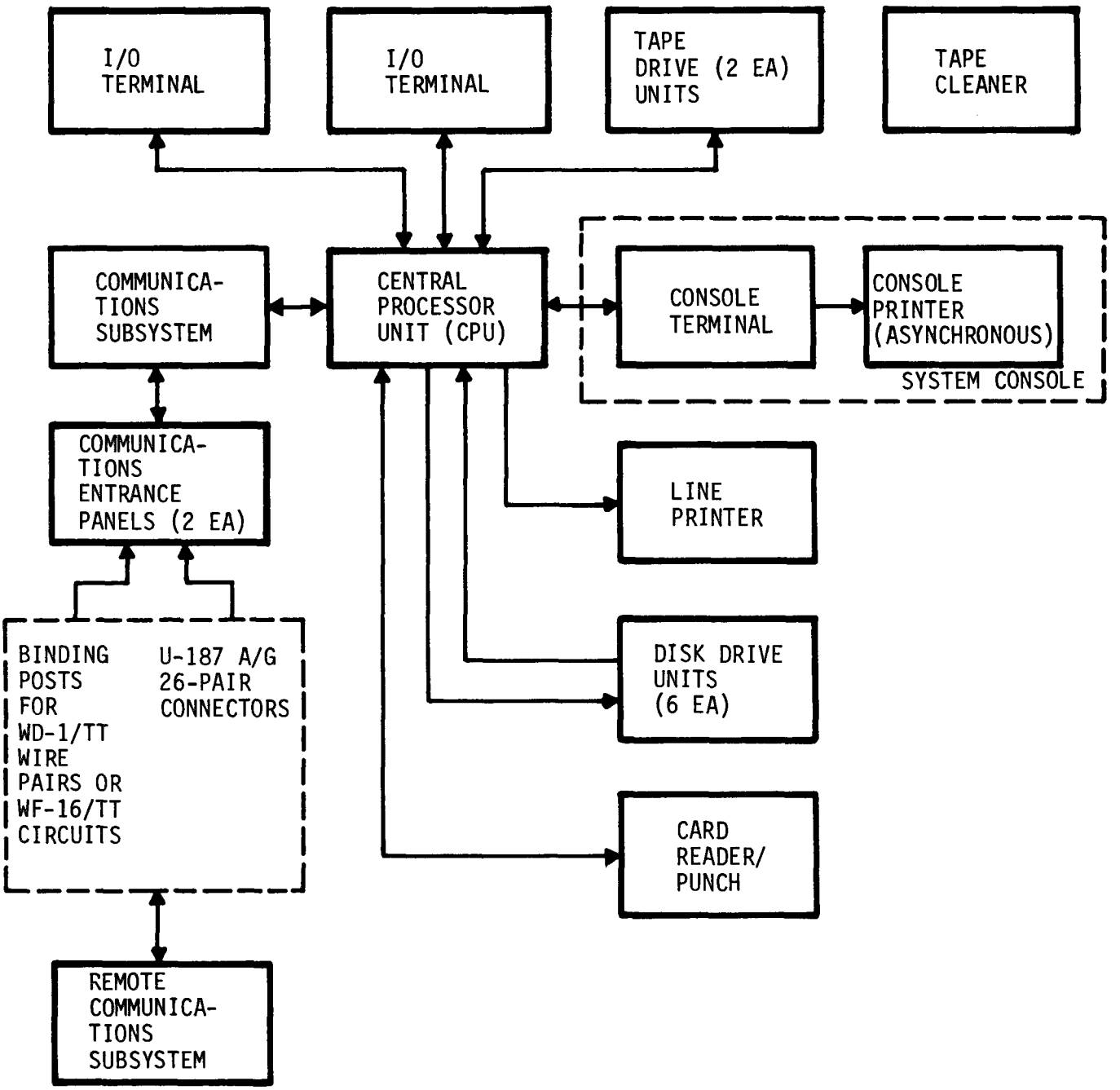


Figure 1-4. ADP and Communications Subsystems

1-19. Central Processor Unit (CPU). The CPU megabus has fifteen slots available for plugging in printed wiring boards, terminators, and air baffles (fig. 1-5).

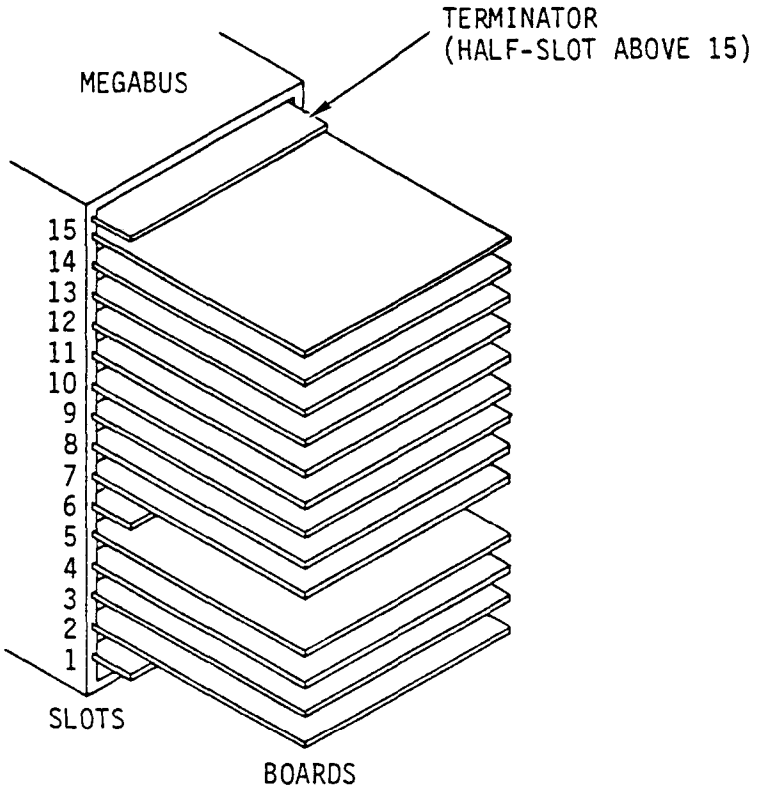


Figure 1-5. CPU Megabus

The slots are in a 10-card and a 5-card chassis mated with a bus-extender cable.

a. CPU Board Configuration. The position of boards in the megabus is very important. Priority of lndividual boards within the chassis (fig. 1-6) is fixed and must be followed. The main memory board always has the highest priority and is inserted below the last communications processor. The CPU memory has a 512K word (1024K bytes) memory.

b. Central Processor (CP) and Memory Management Unit (MMU). The CP with its MMU adapter board must always occupy the top slot used in the meqabus. Each CP and MMU is a matched set. Boards from another system cannot be used-for board swapping.

c. Terminators. Terminators are installed in the connectors of spare slots to complete the bus loop.

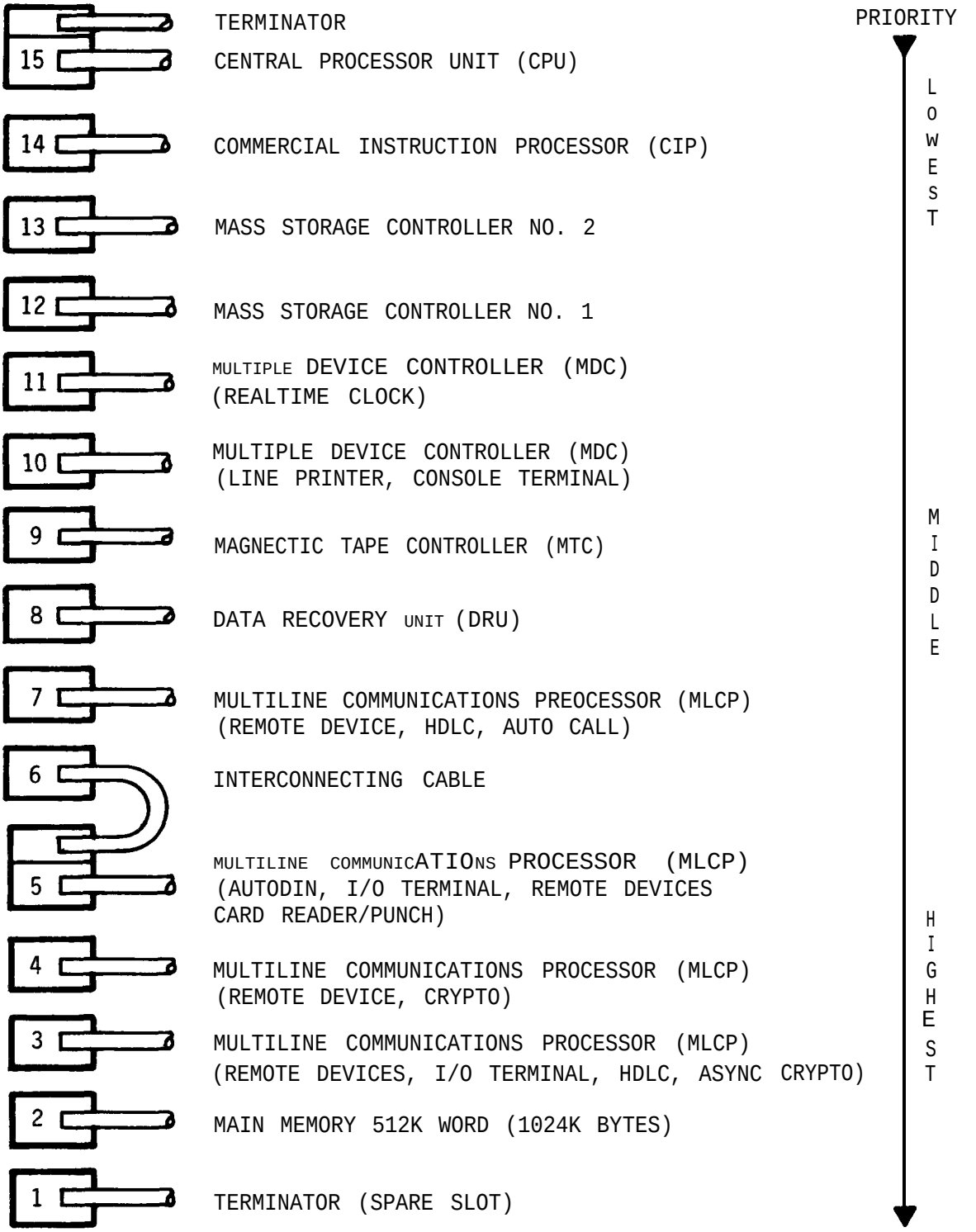


Figure 1-6. CPU Megabus Slot/Board Location

C. Repeater Board. The repeater board (fig. 1-7) is mounted on the door of the CPU cabinet. It is the connection between the central processor (CP) on the megabus and the CPU control panel.

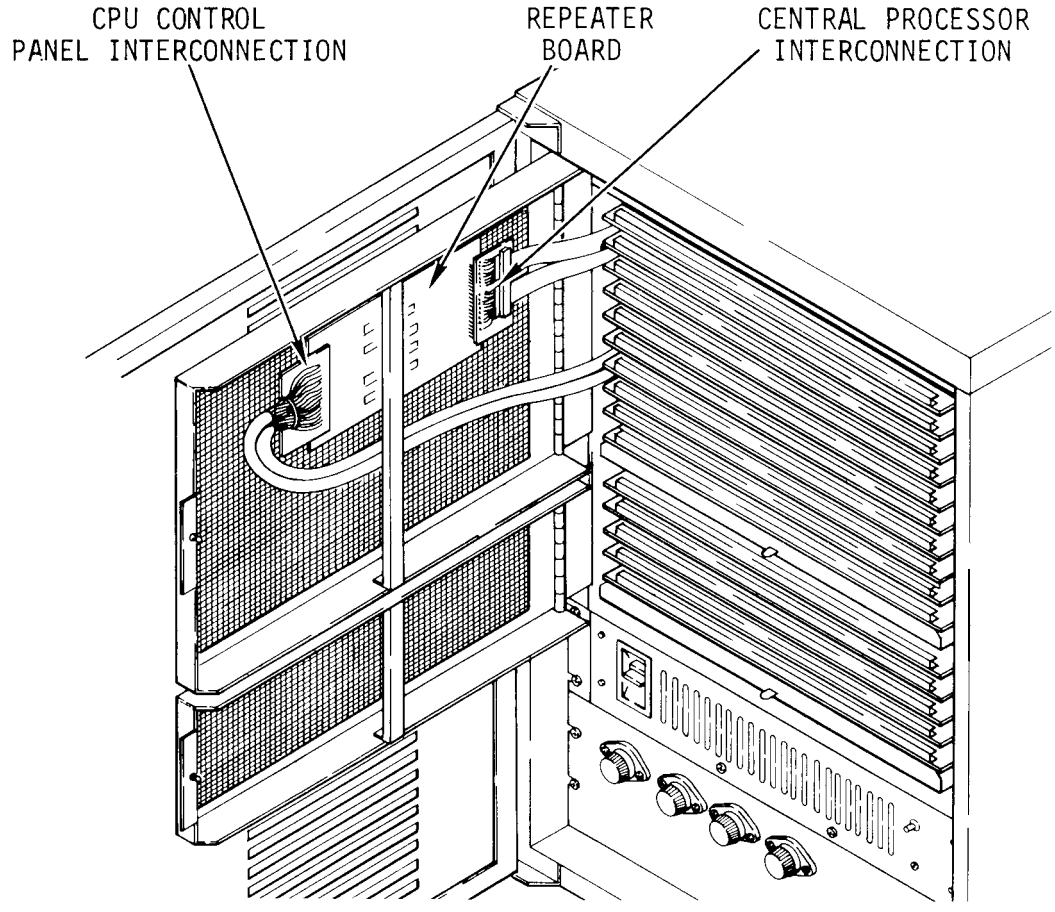


Figure 1-7. CPU Repeater Board

d. CPU Control Panel. The CPU control panel is mounted underneath the magnetic tape drive cabinet. The panel assembly contains a logic board which interconnects with the central processor and repeater boards.

1-20. ADDRESSING EQUIPMENT

The DAS3 (D/C) equipment is completely installed and all CPU addressing dipswitches and/or pin jumpers set in the proper positions at the factory.

You must be familiar with these settings in order to replace a printed wiring board (PWB) during maintenance. The boards occupy specific positions in their respective backplanes.

When a replacement PWB is shipped to you from the supply depot or warehouse, it may or may not have the jumpers installed and the switches set properly. You must make sure the board is addressed before installing it in the backplane. Place the switches and jumpers in exactly the same position they were in on the old PWB and double check it against the diagrams provided in appendix D.

1-21. Address Switches. You will find four types of configuration or address switches on the devices and their PWBS:

- Dipswitches
- Slide switches
- Hexadecimal rotary switches
- Socket (18/Jumper) switches

Dipswitches and slide switches are generally used to select a device or PWB function or option.

Hexadecimal rotary and jumper switches are also used to set various PWB functions but are primarily used to set the bus address in a PWB.

a. Dipswitches. This type assembly (fig. 1-8) consists of from 2 to 10 ON/OFF switches. To set this kind of switch, you use a small jeweler's-type, flat-bladed screwdriver to push down on the function end of a rocker-arm dipswitch. Some switches have a colored strip that comes up flush with the top of the case on the opposite end to indicate that the dipswitch is set. Others are marked O and 1. Remember, you push down the end indicating the desired function or option. You may hear or feel a small click as the switch changes position.

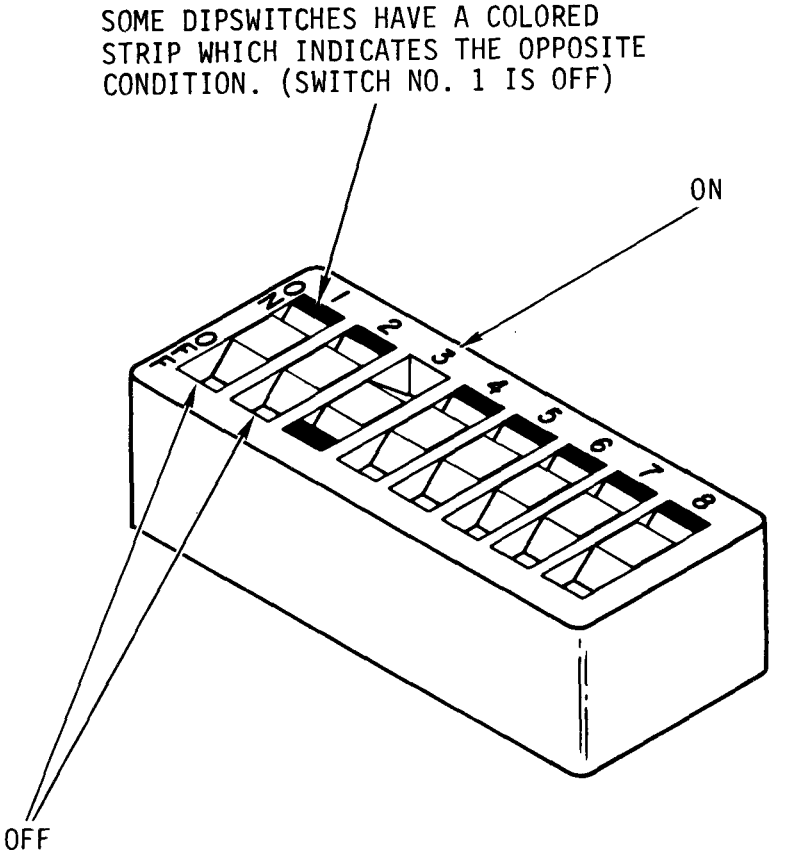


Figure 1-8. Dipswitch Operation

b. Slide Switches. These assemblies (fig. 1-9) are made up of metal or plastic tabbed slides set individually or ganged together in a non-conductive housing.

(1) Typically, the plastic tab switch indicates ON when a dot is visible and OFF when the dot is not visible.

(2) A typical metal tab switch is ON when the tab is at the numbered side of the assembly, and OFF when the tab is at the zero (0) side.

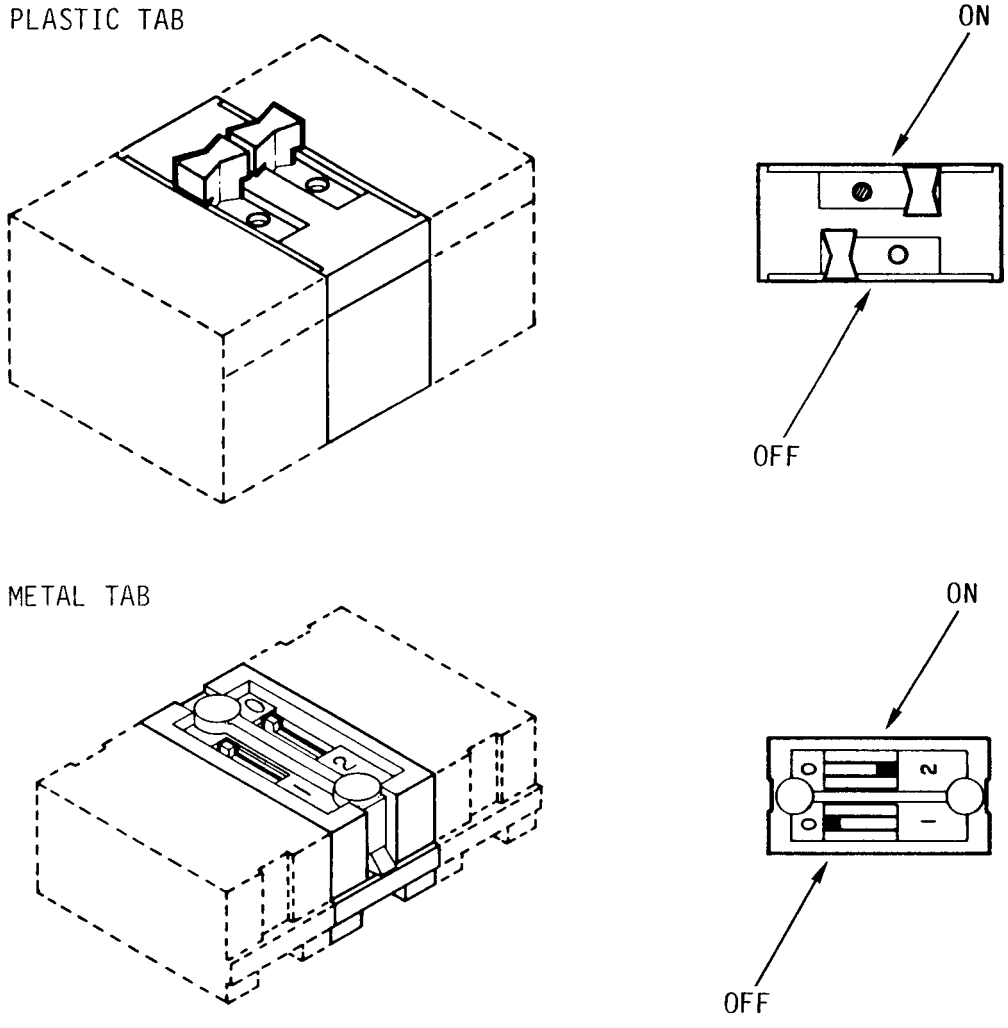


Figure 1-9. Slide Switch Operation

c. Hexadecimal Rotary Switches. The face of a hexadecimal rotary switch has alphanumeric characters and hashmarks circled around an arrow-type-pointer dial (fig. 1-10). The hashmarks between the characters represent the missing values. The dial or selector always rotates clockwise. To select a hexadecimal

value of 5, turn the selector to the right until the pointer lines up with the hashmark between 4 and 6. If you wish to change the setting to E, turn the selector to the right again until the pointer lines up with E.

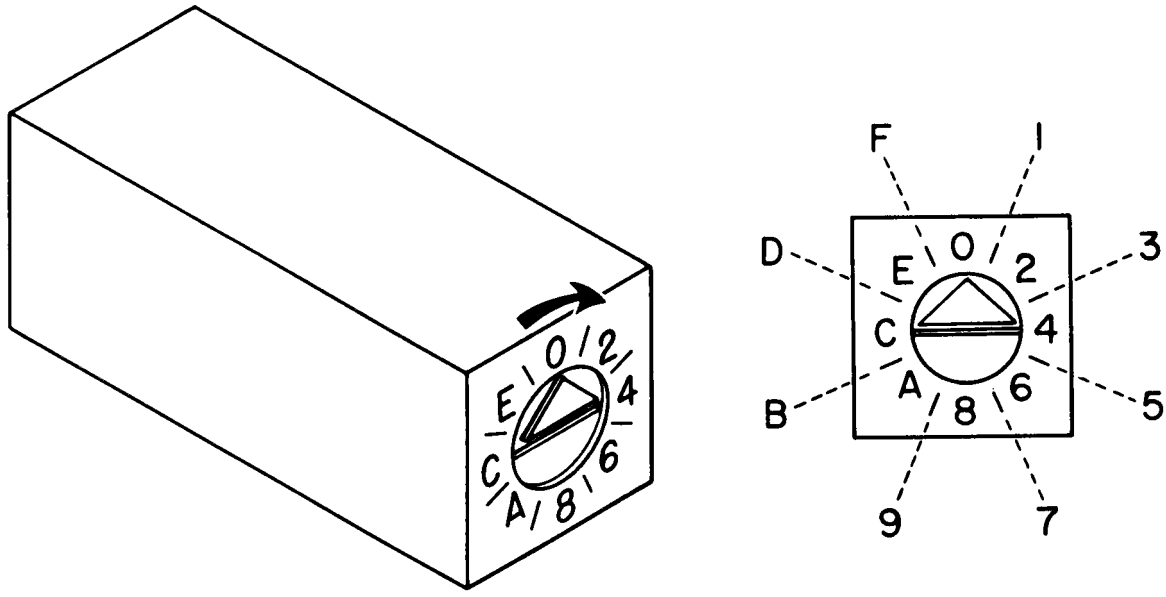


Figure 1-10. Hexadecimal Rotary Switch Operation

1-22. Address Jumpers. The pin or wire jumpers used on the PWBS are also found in three basic types:

- Wire or staple type
- Strap or canister type
- Plug type(s)

These three kinds of jumpers (fig. 1-11) are to be found on the PWBS mounted in the devices that make up the ADP subsystem. The jumpers are installed on the PWBS by pressing them gently but firmly into the holes provided. They are removed by prying them off carefully with a small flat-bladed screwdriver. The address jumpers (plug-type jumpers are sometimes called wiring harnesses) must be put back on a replacement PWB in exactly the same position as the original. Study the PWB and make a sketch of jumper positions before you remove them. Double check your completed work against the settings given in appendix D before YOU reinstall the PWB.

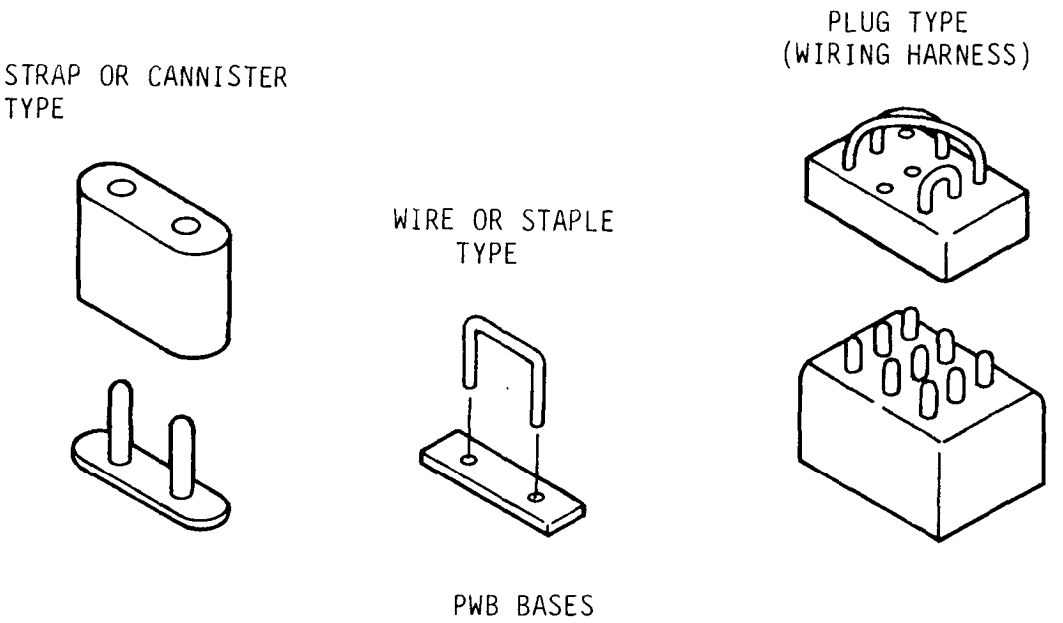


Figure 1-11. Address Jumpers and Wiring Harnesses

1-23. Socket (18/Jumper) Switches. This type switch (fig. 1-12) is used on later configurations of the CPU controller boards and adapter pats. These switches are replacing the earlier model hexadecimal rotary switches. Each switch consists of 16 sockets (eight jumper positions) which are used to set the hexadecimal address specified for that particular PWB. Figure 1-12 illustrates and defines the various jumper positions for each hexadecimal number or character.

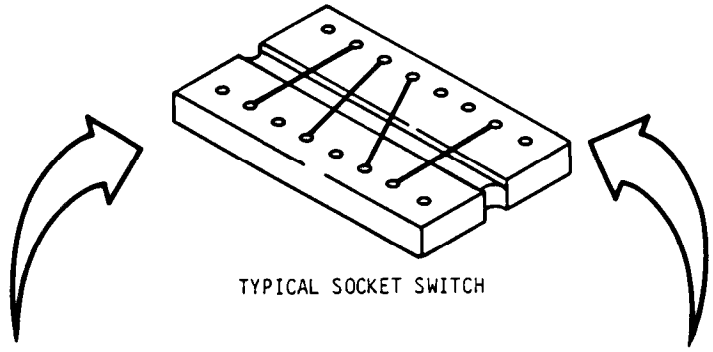
CHART 1

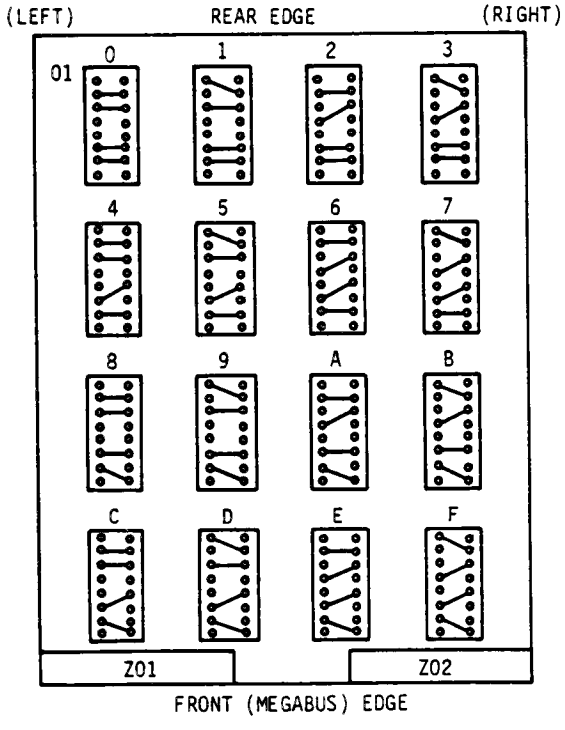
Applies to all boards and board locations except these board/ locations listed on chart #2

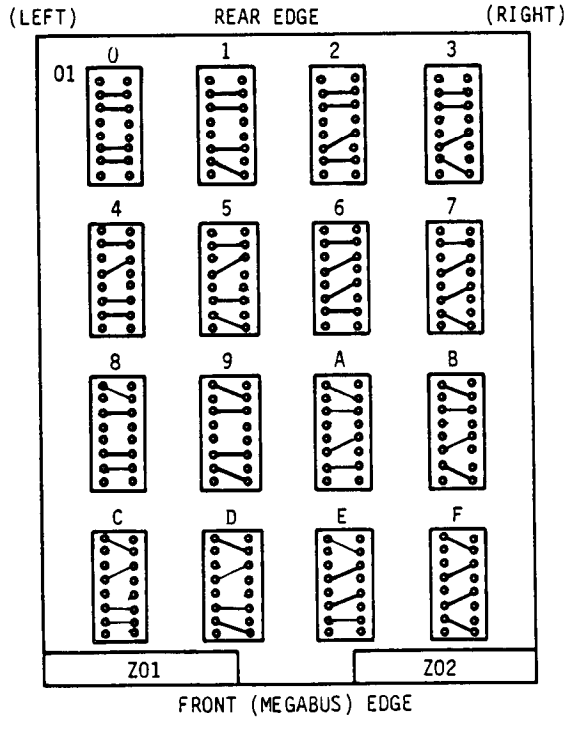
CHART 2

Applies only to:

BD2CSL	Loc	B03
BF4150	Loc	D16
BFM150	Loc	D16
BF4MDC	Loc	C16 & C17
BF4DC1	Loc	C16 & C17







NOTE

For all mother boards and daughter (adapter) boards assume pin 01 of socket to be closest to left rear (non-megabus) edge of board (same orientation as the IC'S). The only exception is the BF415C Lot. P20 on which pin 01 is closest to the right rear edge of board.

Figure 1-12. Socket (18/Jumper) Switch Hexadecimal Jumper Configurations

CHAPTER 2
TECHNICAL PRINCIPLES OF OPERATION

2-1. GENERAL

This chapter describes how DAS3 (D/C) operates as a system. It describes the function of each device in the system, how the signals flow interdependently, and how the support subsystems operate. It also shows the locations of all tools, spares, and support materiel in the van.

2-2. FUNCTIONAL DESCRIPTION

DAS3 (D/C) is a mobile, van mounted, self-contained automated data processing system that provides field support of Army divisions and corps. It is made up of four complete subsystems:

- ADP Subs stem. Accepts input data, processes it, then stores or issues
- Communication Subsystem. Provides the interface signal conditioning, and conversions to telecommunications facilities
- AC Power Subsystem. Furnishes power for all other subsystems, equipment, llghts, and utility outlets
- Environmental Subsystem. Maintains and controls the environment in the van

System operation depends upon a central processor unit (CPU) with individual controllers for each function of the data processing loop plus special adapter packs for communications with peripheral devices, remote users and other CPUs. The flow of signals is managed by the CPU (fig. 2-1).

2-3. SUPPORT EQUIPMENT

The van unit also contains support equipment so that the system can operate independently in the field for extended periods in any kind of weather or environment. The van provides housing, mobility, and storage facilities for the system and working space for operating crew members.

2-4. ADP SUBSYSTEM

All data processing requests are handled by the ADP subsystem. The devices in the subsystem interact to perform this task. The principles of operation for each of these devices are described in exactly the way the device performs its function in the system.

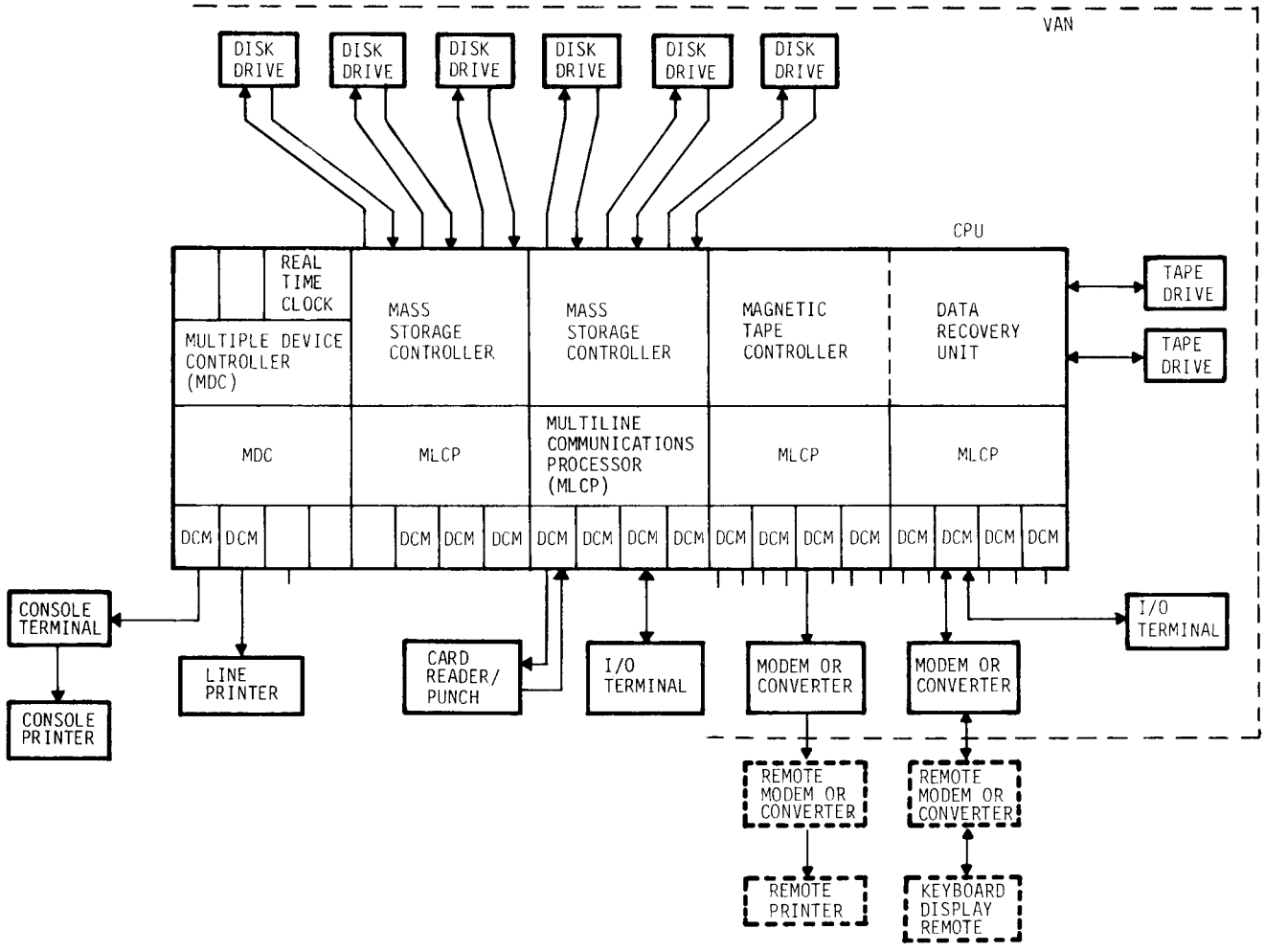


Figure 2-1. Typical Data Processing Signal Flow Block Diagram

a. Card Reader/Punch. The unit (fig. 2-2) features a smart controller which monitors all traffic coming from a host or remote communications subsystem through the CPU and controls the reading and punching of card data, using an interpreting data recorder (IDR).

(1) The smart controller receives card data through RS-232-C interface boards, processes the data, feeds the data to the IDR for punching, and then transmits back to the host CPU for local processing.

(2) The IDR consists of a mechanical device, an electronics cabinet that houses power supplies, printed wiring boards, and communications interfaces. The IDR may be operated off line by keyboard and operator panel to manually punch, read, interpret, verify or reproduce punched cards. On line, the IDR operates only on command from the smart controller.

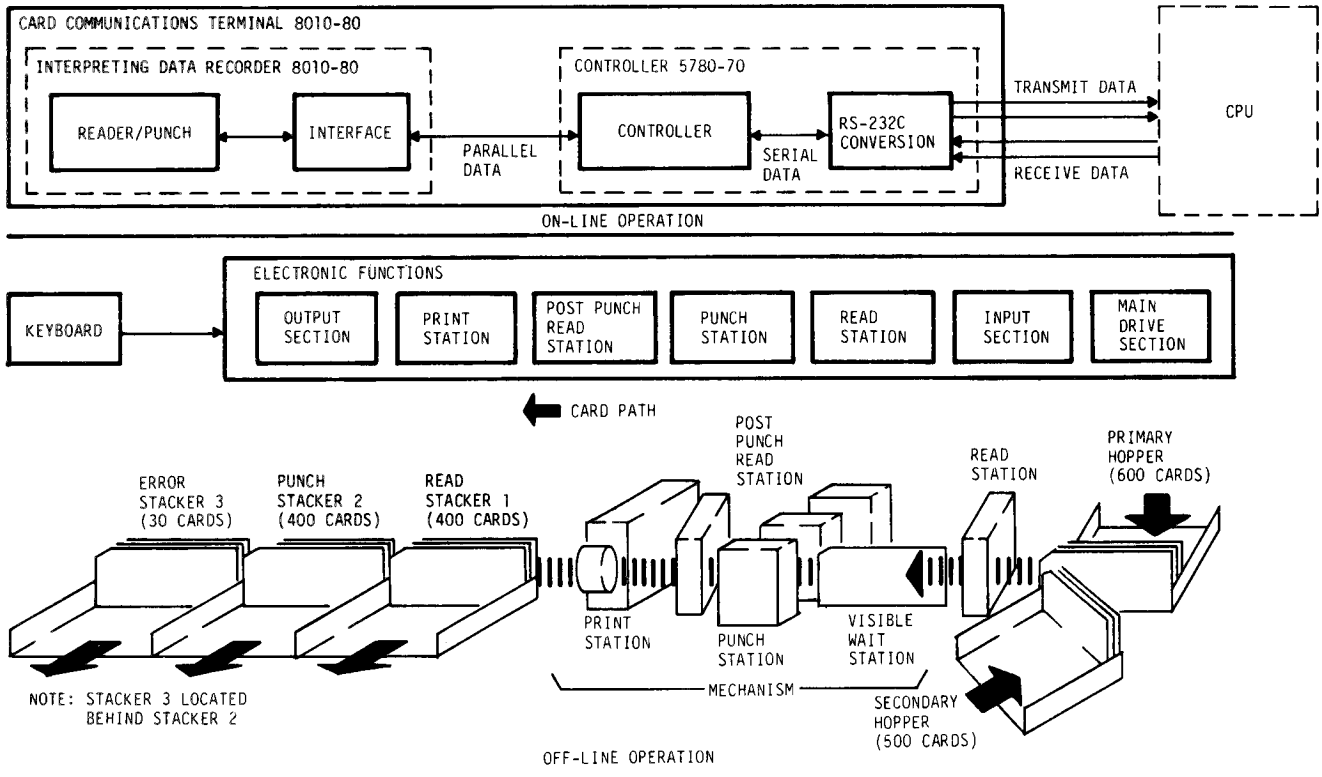


Figure 2-2. Card Reader/Punch Functional Diagram

b. I/0 Terminals. Data brought in for processing in single entry mode can be entered by keyboard at one of the I/0 terminals. This data can be in the form of punched cards, requisition forms, or any other means for introduction of data. The operator can use the I/0 terminal to edit the data or validate the form (fill in blanks, etc.) before transmitting the data to the CPU. The operator keys in the data, which is stored in the buffer until called up. The operator then checks or edits the data and transmits it to the CPU.

(1) In character mode, the terminal transmits ASCII code characters over an asynchronous communications line. The characters are transmitted as soon as the keys are pressed. The character modes are echo and nonecho.

(2) In echo (also called echoplex) mode, the terminal does not react to code sequences from the keyboard. It only transmits. The data is not displayed on the screen until it is verified by the CPU. The display also confirms that the CPU has received the communication.

(3) Nonecho mode produces an immediate reaction to a code character at the terminal. It displays the characters generated from the keyboard of the terminal and the characters generated by the CPU.

(4) Text mode allows you to enter data into terminal memory where it can be stored, displayed and edited prior to transmitting it to the CPU.

(5) Form mode allows generation of forms on the screen. Line graphics can be used to design the forms. A form created at the terminal can be transmitted to the CPU when the terminal is placed on line in the FORM mode.

(6) Remember, when you are checking the operation of an I/0 terminal, its reaction to system operation is totally dependent upon these mode settings. Also, attributes may be built into the system program or individual operation to automatically assign and direct the generation of text, forms, and characters. See TM 11-7025-211-23 for the software/firmware interface functions within the I/0 terminal.

c. Console Terminal. The console terminal and the I/0 terminals are identical devices used for different purposes. The console terminal connects into the CPU and serves as the operating control device for the system. All commands are entered through the keyboard and all system program responses are displayed on the CRT in upper case letters.

(1) There are two operating modes for the console terminal. LOCAL (off line) and remote (on line). The terminal is off line when LOCAL bottom is pressed down into lock position and on line (remote status) when LOCAL button is in the up position. The terminal displays all errors that the system sees.

(2) The console terminal controls the transfer of data during remote device communications. The operator can also test operation of peripheral devices by running the system exerciser program which will report any system faults. You will use the terminal during fault isolation to run T & V programs and view the results.

d. Console Printer. The console printer is slaved to the console terminal and prints out the data displayed on the console terminal screen. The printout is used to check software loading, computer response, and all other operations performed by the console terminal. It also provides a historical record of system transactions and errors.

The CPU consists of a central processor (CP), memory management unit (MMU) commercial instruction processor (CIP), memory unit and equipment controllers, and a full control panel (fig. 2-3). The CIP is an additional hardware processor that operates in parallel with the CP. The CP receives an operating instruction from the software program or the console terminal and determines that DAS3 (D/C) is programmed to handle the transaction. It then sends the operating instruction code, the data description, and data addresses to the CIP via the megabus (backplane). The CIP begins processing the transaction, leaving the CP free to accept another command. If the command is not a program instruction, the CP handles it and proceeds to the next command. If another program instruction comes in before the CIP is finished executing the first one, the CP will wait until the CIP becomes free before sending the signal over the megabus.

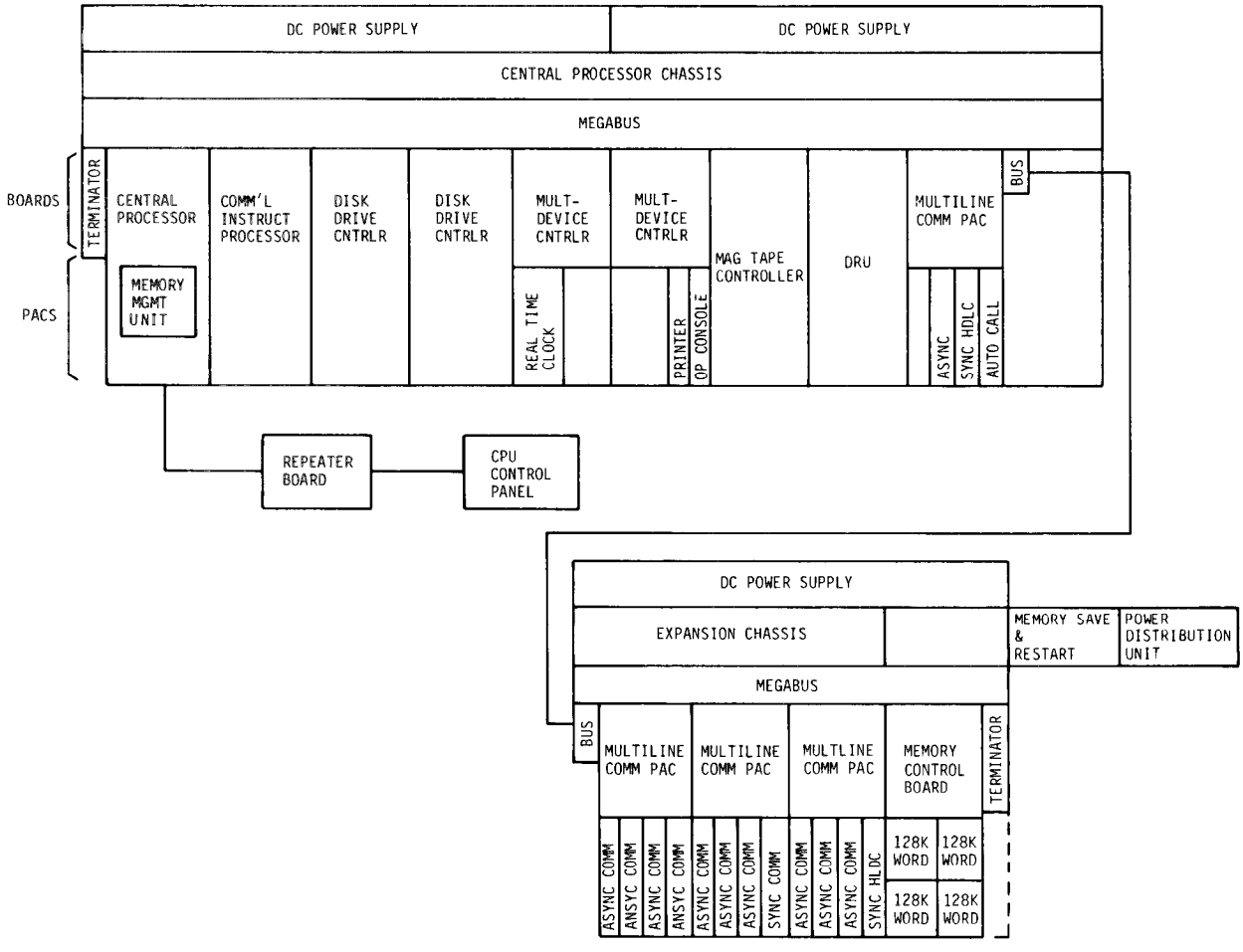


Figure 2-3. CPU Block Diagram

(1) The CP and the memory management unit (MMU) also work together. They provide a series of self tests called quality logic tests (QLTs). QLTs verify all basic data signal flowpaths through the CPU hardware and indicate a GO/NO GO condition on the control panel. QLTs are automatically executed each time the system is booted, each time a master clear is executed on the megabus, and as a response to an initialize command from the software.

(2) In addition to OLTs, the CIP can execute a mini-QLT through a standard CP command to test itself for functional operation without disturbing the contents of the registers or the bits in the status words.

(3) The PWBs in the CPU megabus perform the following functions.

(a) Central Processor Board (CP). The CP performs all address functions, logic, and arithmetic functions.

(b) Commercial Instruction Processor (CIP) .The CIP performs decimal, alphanumeric, data conversion, and edit functions. It obtains instructions from the main memory via the CP.

(c) Main Memory. The main memory consists of a memory controller and memory pats. It has a 512K word capacity. It is used for data storage and for storing control information on address sequencing or data patterns.

(d) Memory Management Unit (MMU). The MMU provides read-write execute, memory protection, and address relocation; it determines if an address is valid and has proper access permission.

(e) Mass Storage Controllers. Firmware and storage module adapter pats mounted on the two mass storage controller boards support six disk drive units. All 1/0 signals between the CPU and the disk drive units are handled by the controllers.

(f) Multiple Device Controllers (MDC). MDCs are used for control and operation of peripheral equipment. Equipment is interfaced by means of device pats mounted on the MDC.

(g) Multiline Communications Processors (MLCP). MLCPs process data to and from communications pats.

(h) Communications Line Adapters. The communication line adapters or communication pats used with the MLCPs contain the logic for data handling, control, and interface between the MLCP and data communication equipment (DCE).

(i) Megabus. The megabus is a 15-slot assembly into which all boards are plugged. It serves as interconnection and message route for all operations.

(j) Magnetic Tape Controller and Data Recovery Unit. This is a two-board unit consisting of a magnetic tape controller (MTC) board with a PE/NRZI adapter connected by ribbon cable to a PE data recovery unit (DRU) board that has three PE clock adapters mounted on it. The DRU connects to the magnetic tape drive units. The MTC decodes commands, transfers data, stores and generates interrupts, and handles signals from megabus to adapters. The DRU is used as a repeater board only. All data and commands to/from the tape drives and CPU feed through signal amplifiers and clocks on the DRU and are not affected by DRU logic. The DRU board only uses the megabus for a voltage supply. The DRU provides eleven QLT fault lights and performs error detection and correction.

f. Memory Save/Auto Restart Unit. This unit provides power during a power failure, to retain the contents in CPU memory for up to two hours. Within that time, the system will automatically restart when powered up and the first instruction is entered. The unit is mounted in the CPU cabinet and plugs into a 120 V ac outlet in the power distribution unit to provide power for backup battery recharge. If the power failure lasts for more than two hours, the MEMORY ON indicator on the front of the unit is turned off and the contents of memory are lost. The RESET button must be pushed to restart the unit again after power is restored.

g. Disk Drive (Mass Storage) Units. Disk drive units are used to store and output system formats, operating programs, test and verification programs, and special supplementary programs. The units interface to the CPU megabus via I/0

signal cables which connect to the mass storage module adapter on a disk controller board (fig. 2-4). The power distribution system is illustrated on schematic wiring diagrams in appendix D. I/0 signals from the controller start and control all disk drive operations except power on. The I/0 cables carry two basic signal types: Tag/Bus In/Bus Out and discrete.

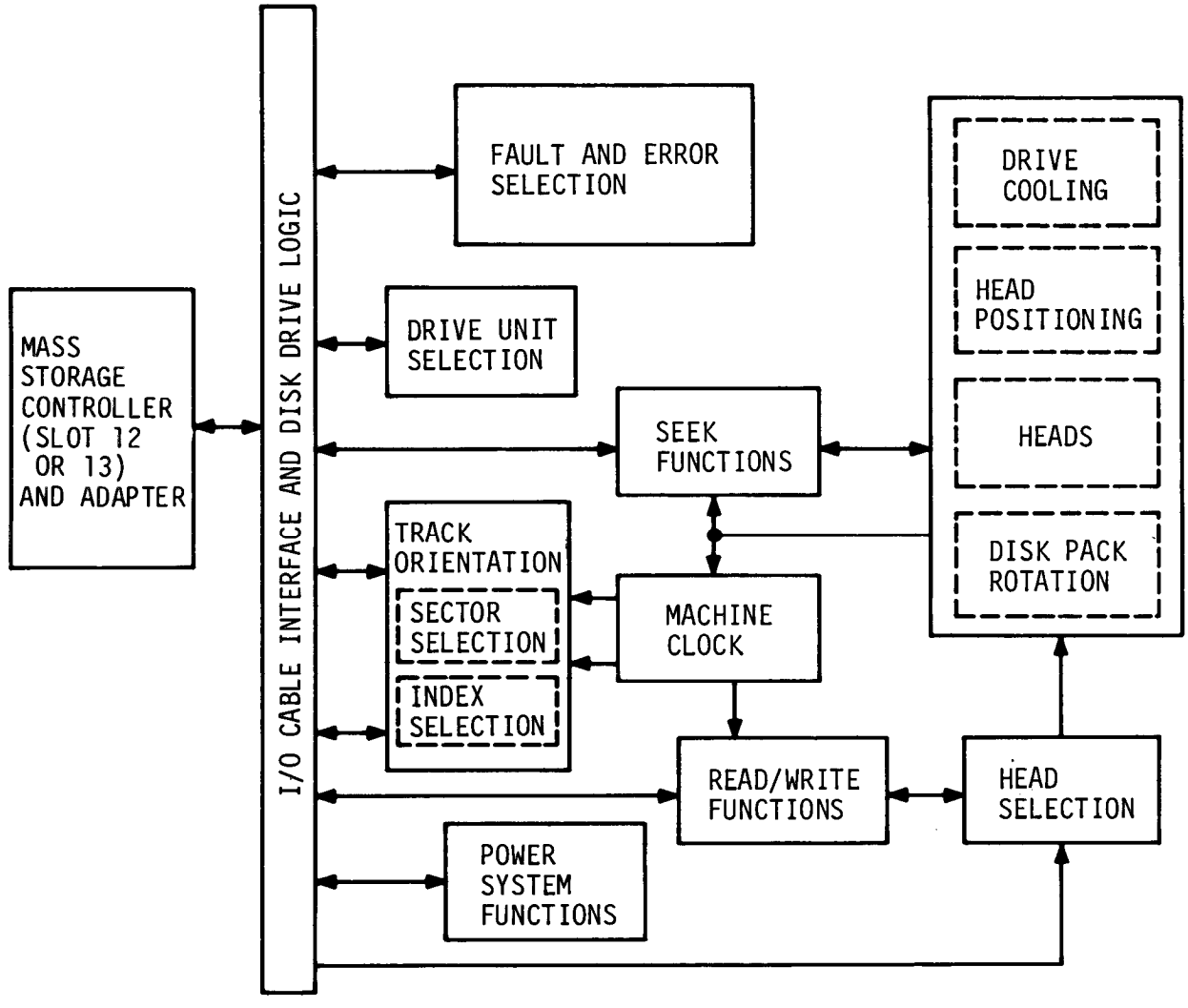


Figure 2-4. Disk Drive Functional Block Diagram

(1) Tag/Bus In/Bus Out Signals. All commands are delivered to the disk drive unit via tag and bus out signal lines. Tag signals identify the operation to be performed and bus out signals modify or clarify that operation. Each time the disk drive unit receives a tag/bus out command, it responds by sending status information back to the controller through the bus in signal lines.

(2) Discrete Signals. Those signal lines carry clock, status, control, and read/write data signals between the disk drive units and the controller.

h. Magnetic Tape Drive Units. The tape drive functions (fig. 2-5) are: read/write data on command; provide control and/or status program data to supplement the system; provide a means of recording and storing data or instructions for spare or historical purposes. Signals are received from and transmitted to the CPU through the PE/NRZI data boards.

(1) PE data board signals are driven directly on the interface signal lines through the magnetic tape controller adapter pats in the CPU.

(2) NRZI data board signals are first buffered (stored) and then strobed out with a read strobe to the appropriate magnetic tape controller adapter pac in the CPU.

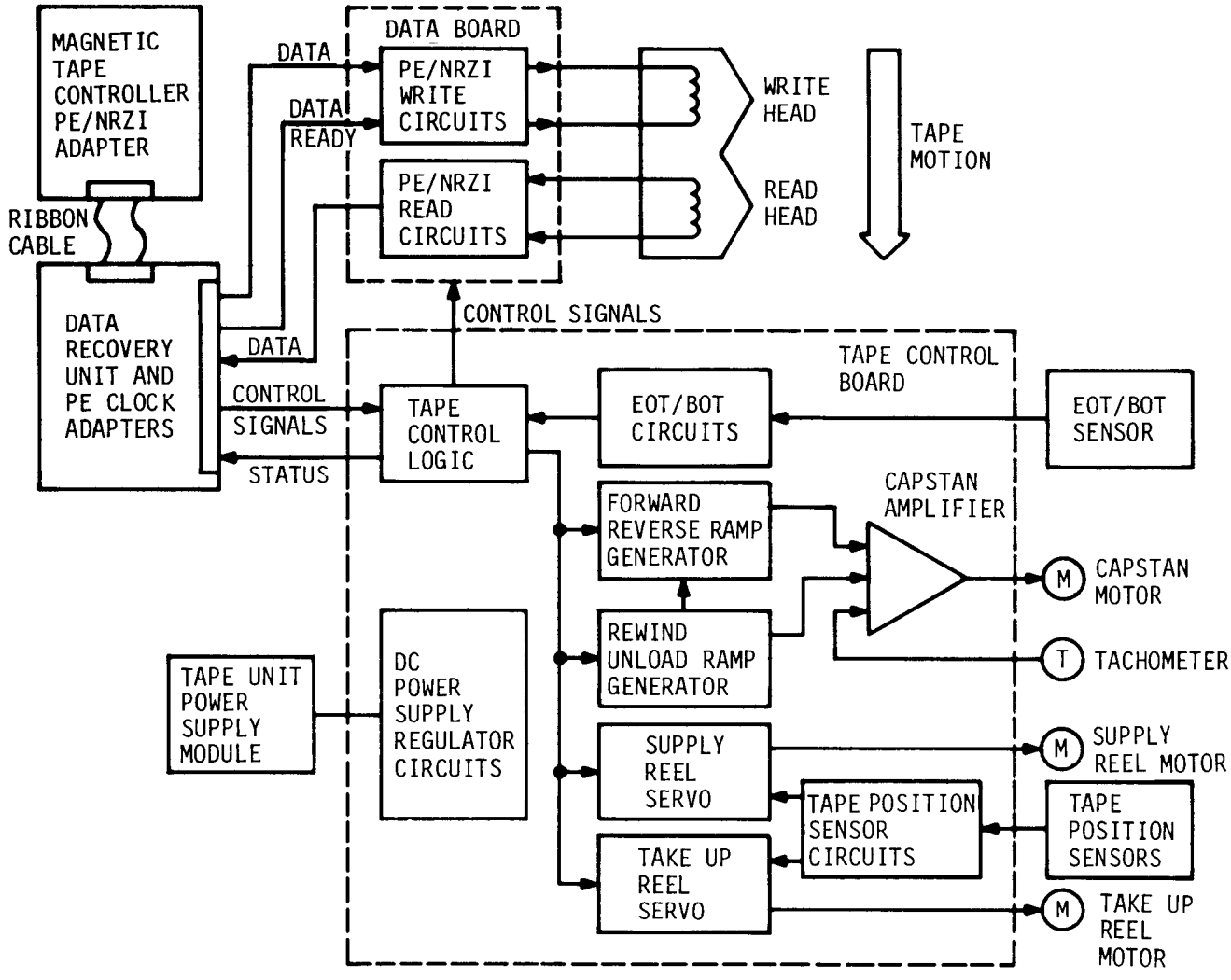


Figure 2-5. Tape Drive Functional Block Diagram

(3) Every magnetic tape should have a BOT and EOT marker firmly attached to the tape (fig. 2-6). These markings should be checked after cleaning or after every tenth use. Replace any marker which is loose or missing.

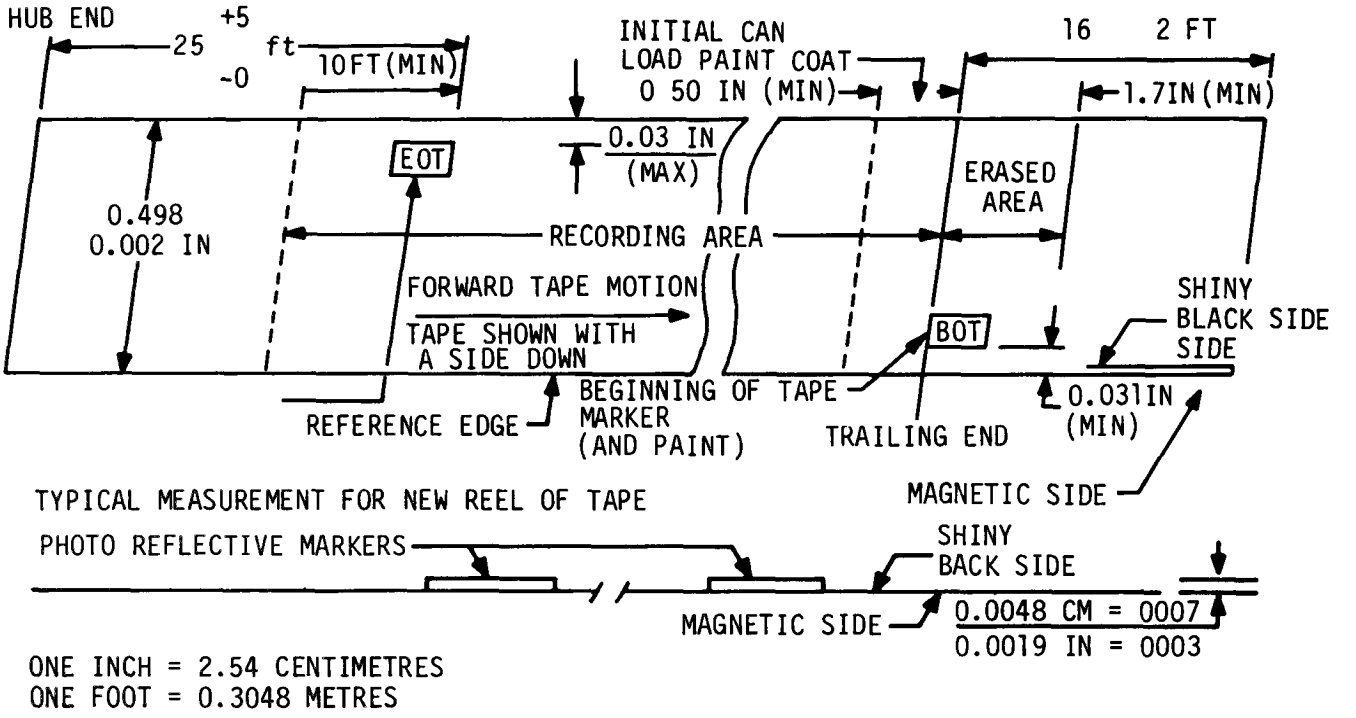


Figure 2-6. Magnetic Tape Layout

(4) During normal operations, the data will be recorded and read in nonreturn-to-zero-inverted (NRZI) format (fig. 2-7), or in phase-encoded (PE) format (fig. 2-8).

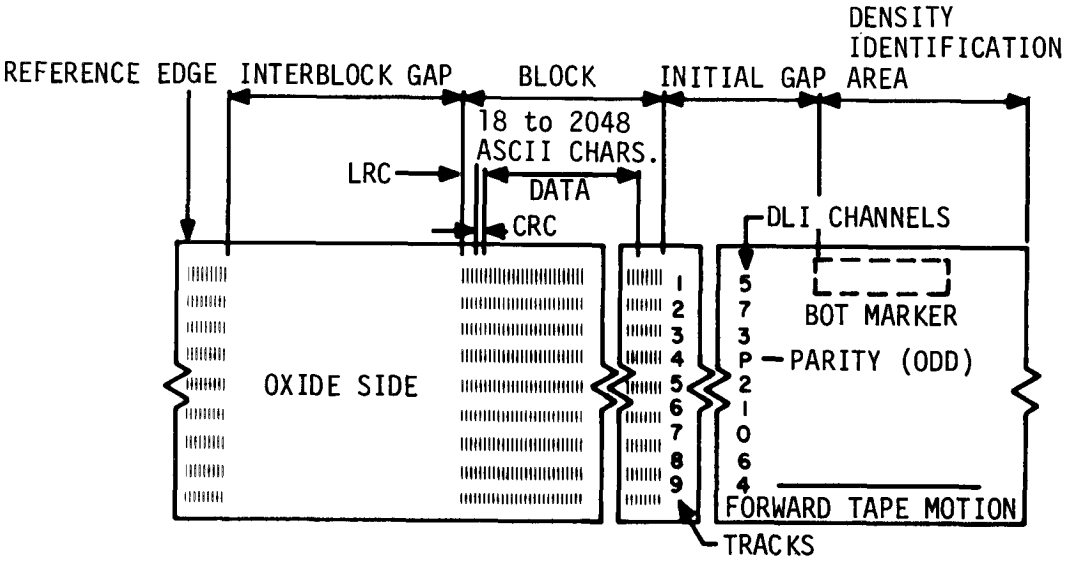


Figure 2-7. NRZI Format

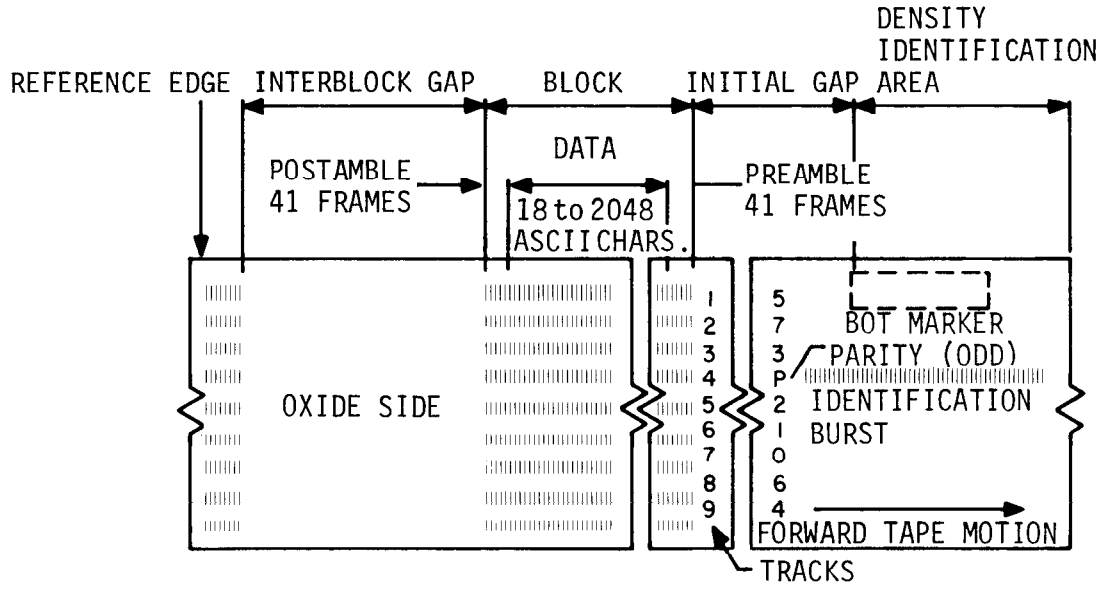


Figure 2-8. PE Recording Format

(5) As you operate the system, errors may be detected and stored in status words 1 and 2. The system will check for cyclic (CRC), longitudinal (LRC) and vertical redundancy, and report the results as odd or even parity. Refer to the troubleshooting flowcharts in chapter 4 when decoding the bits set in status words 1 and 2.

(6) The magnetic tape unit has its own power supply and regulator circuits. Schematic diagrams are included in appendix D in the back of the manual.

(7) The physical operation of the tape drive unit(s) is directed by circuits located on the tape control board. Control signals from the CPU are logically processed and routed to the data boards for use in the read/write operations and to tape drive circuits on the tape control board for the electromechanical operation of tape drive unit(s).

i. Tape Cleaner. The tape cleaner is used to remove dirt from magnetic tape that could cause false or missing data storage or transmittal.

j. Line Printer. The line printer receives processed data from the CPU and stores this data in the buffer memory. A full line of data is stored and then printed. Data transfer takes place during paper movement. During printing, the CPU is signaled that the printer cannot receive new data until the old line is completely printed. When the printer has completed printing the line, a ready signal is sent to the CPU to transfer the next line. The first character of the next line is decoded as a paper feed command and starts paper feed action. This sequence continues until all of the data from the CPU has been printed on the paper.

2-5. AC POWER SUBSYSTEM

The ac power subsystem (fig. 2-9) provides entrance and distribution of ac power for utility and technical consumption. The subsystem contains the following equipment:

- Frequency converter
- Power distribution box
- Power entrance panels
- Power control box
- Bypass switch
- Technical power box
- Utility power box
- Emergency lights
- Technical and utility outlets and switches

a. Frequency Converter. Incoming power passes through a 3-phase circuit breaker, door interlock relay, step down transformer, and a filtered full-wave rectifier circuit. The dc output is fed to six power inverters which are connected in parallel. These change the original incoming ac to a low voltage, and clean the 60 Hz sine wave. This output goes to a step up transformer that brings the voltage back to single phase 115 volts. The output sensing and feedback circuits sample, measure current and voltage, and feed back information to the bias and control logic module. This module regulates and controls the output of the six power inverters. The input circuit breaker acts as an ON-OFF switch, and also as power interrupter in case of an overload or a fault or when the door interlock is activated. The input voltage is reduced to about 12 volts, rectified by the six-diode rectifier, and filtered by a network before going to the power inverters. The power inverter creates a low voltage sine wave which is filtered, amplified, then applied to the output transformer. The combined output voltages of the six power inverter modules are transformed to 115 volts. Electromagnetic interference (EMI) filtering is provided in the secondary of the output transformer (fig. 2-10).

b. Power Control Box. Three-phase power is shunted from the power distribution box through a phase-sequence relay (K1) and a phase-selector switch (S2). K1 energizes normally open contacts to send power to ON/OFF switches (S3 and S4). Pressing the ON pushbutton sends fused power to the van through the main circuit breaker (CB1) in the power distribution box. A key-operated switch (S1) selects the frequency (50 or 60Hz) meter to monitor the input voltage. If K1 detects an incorrect phase sequence or voltage amplitude, the main contactor opens, and van power is shut off. At the same time, normally open contacts close activating an alarm light (DS1) and horn (LS1) to alert van personnel to a power fault occurrence. Schematic diagrams are included in appendix D.

2-6. ENVIRONMENTAL SUBSYSTEM

The environmental subsystem (fig. 2- 11) maintains the internal van environment so that ADP equipment operates properly and personnel are comfortable. This subsystem consists of four air conditioners, a temperature control panel, three portable heaters, humidity control equipment, and provisions for nuclear, biological, chemical protection equipment (NBCPE).

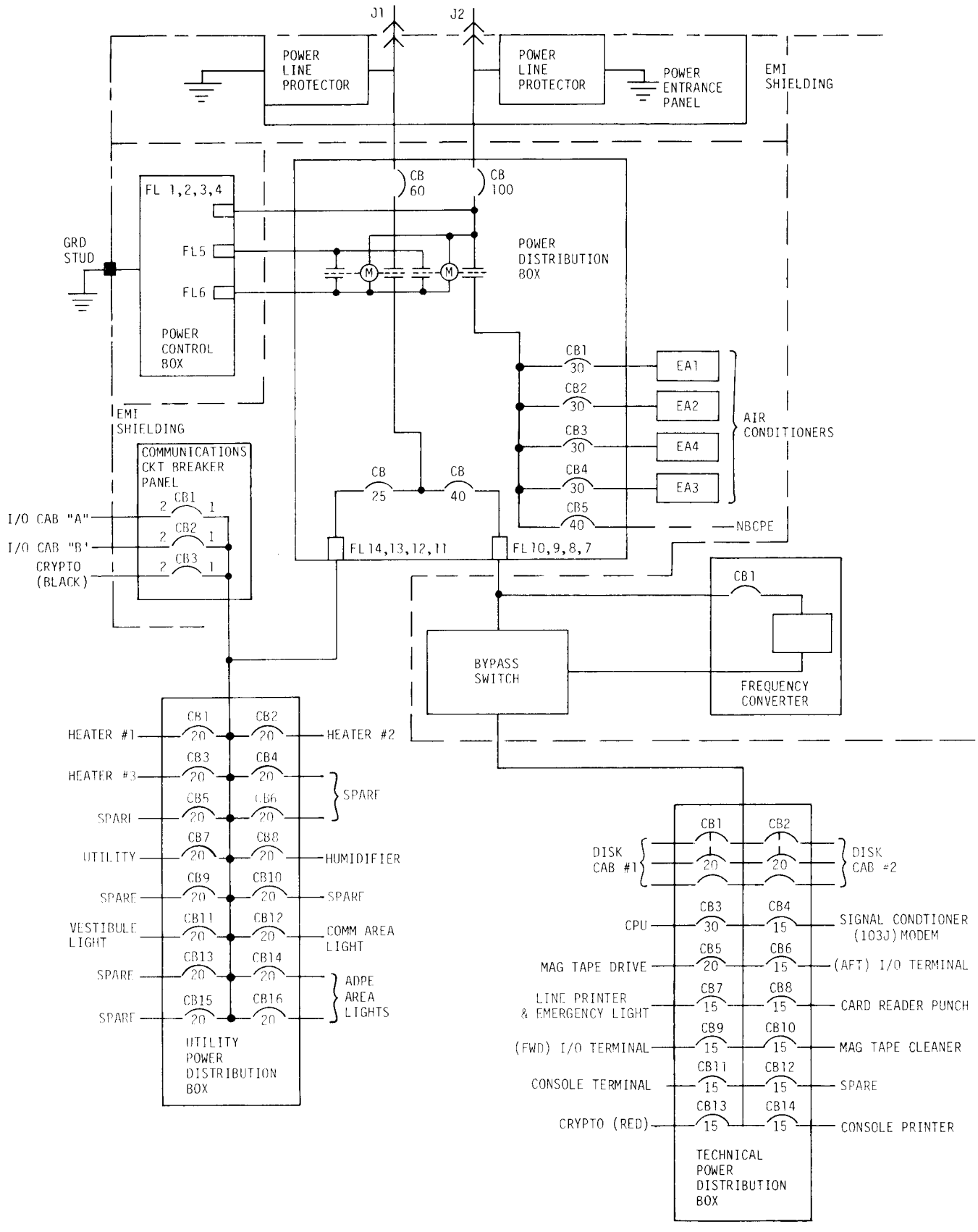


Figure 2-9. Power Distribution Block Diagram

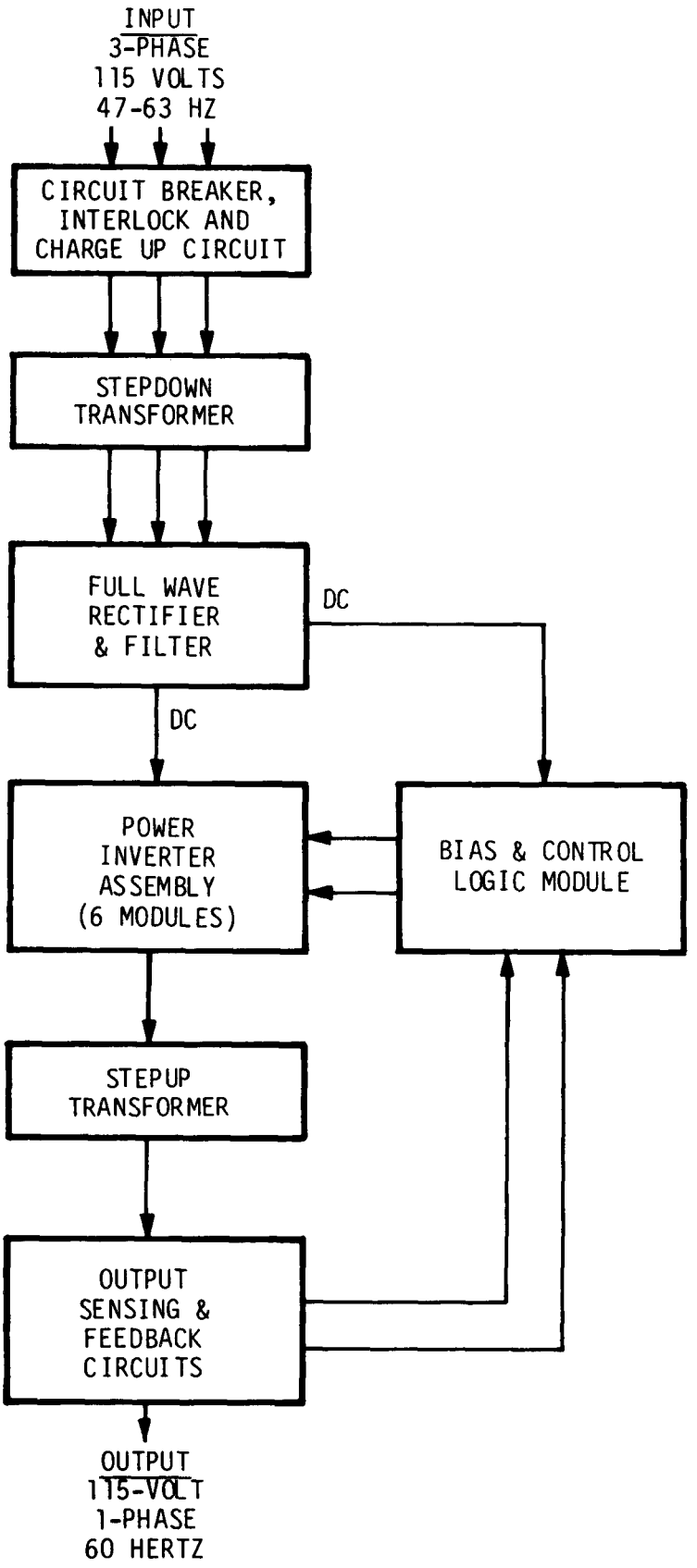


Figure 2-10. Frequency Converter Block Diagram

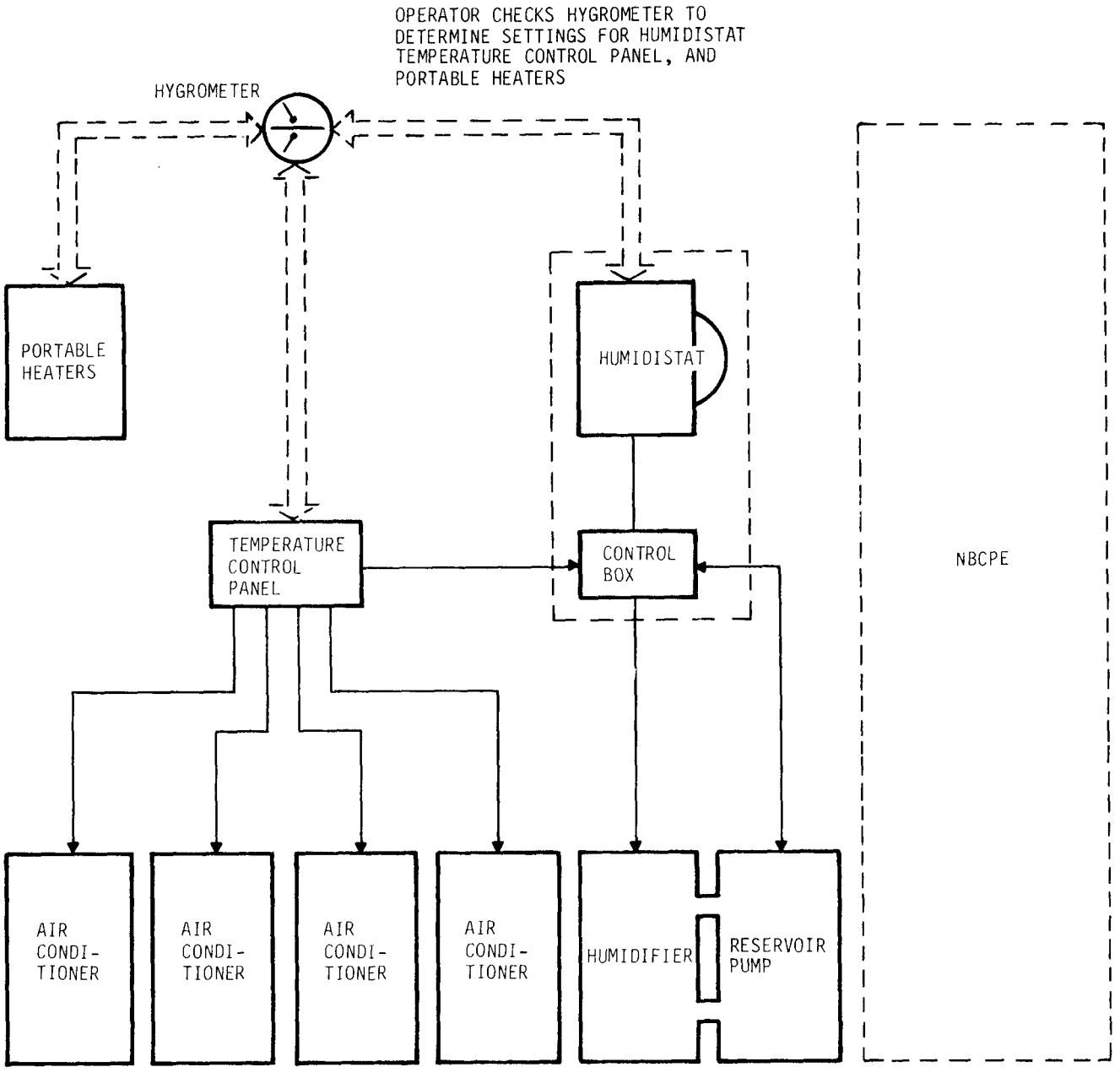


Figure 2-11. Environmental Subsystem Block Diagram

a. Air Conditioners. The air conditioners provide filtered, heated or cooled air. The type and degree of air conditioning provided is controlled by a five-position rotary selector switch, a thermostat, and a fan speed switch located in the temperature control panel. Each unit has an outside air vent that may be opened or closed by a pull-chain to control the intake of outside air. However, the noise hood must be removed (para 3-18) in order to access the pull chain.

(1) Placing the rotary unit-selector switch in HI HEAT position energizes six heating elements. Three of these elements are controlled by the thermostat and three are directly connected. The fan is automatically energized. High or low fan speed may be selected. When air temperature goes over the set point of the thermostat, only the three heating elements controlled by the thermostat are deenergized. The other three are powered as long as the switch is in HI HEAT position.

(2) In LO HEAT position, only the three thermostatically controlled heating elements are energized. When temperature rises above the thermostat set point, these elements are cut off and no heat is generated until the temperature falls below the set point. The fan continues to operate at all times.

(3) In VENTILATE position, only the fan motor operates at selected speed.

(4) In COOL position, the fan is on all the time, and the compressor motor contactor is energized. The contactor supplies power to the compressor through the circuit breaker. After the compressor starts , refrigerant flow is controlled by a thermostat. When temperature rises above thermostat set point, a thermostat contact opens, setting the compressor bypass valve for cooling service. The compressor and fan motor operate continuously. Cooling action is controlled by opening a bypass valve, causing all the refrigerant to flow through the evaporator coil, where cooled air is blown into the van. When temperature falls below set point, the bypass valve is closed and the major part of the compressed refrigerant is bypassed directly back to the input (suction) side of the compressor.

(5) In OFF position, all power is removed from the air conditioner.

b. Humidifier. The van’s humidity level is automatically maintained by a system which includes a humidifier, a control box, a humidistat, a pump tank with a submersible pump, and tubing to carry water between the humidifier and the pump tank (fig. 2-12).

(1) The humidistat is operator-set for the desired relative humidity. It senses the amount of moisture in the air, closes its contacts if there is too little, then reopens them when there is enough. The humidistat is mounted on the control box, which also includes a power ON-OFF toggle switch, a horn, an indicator, and control circuitry.

(2) Power to the humidifier is routed through relay circuits in the air conditioner temperature control panel. Therefore, the humidifier will not power ON if all air conditioners are OFF. To operate the humidifier, the ON-OFF toggle switch on the humidifier control panel must be set to ON and at least one air conditioner powered on (in any mode). If the pump tank has enough water in it and the humidistat is set high enough to close the contacts, the aspirator motor and the water pump will now run.

(3) The pump pumps water to the humidifier tank. The tank gradually fills to the overflow line. Excess water returns to the pump tank where it cools the pump before recirculating.

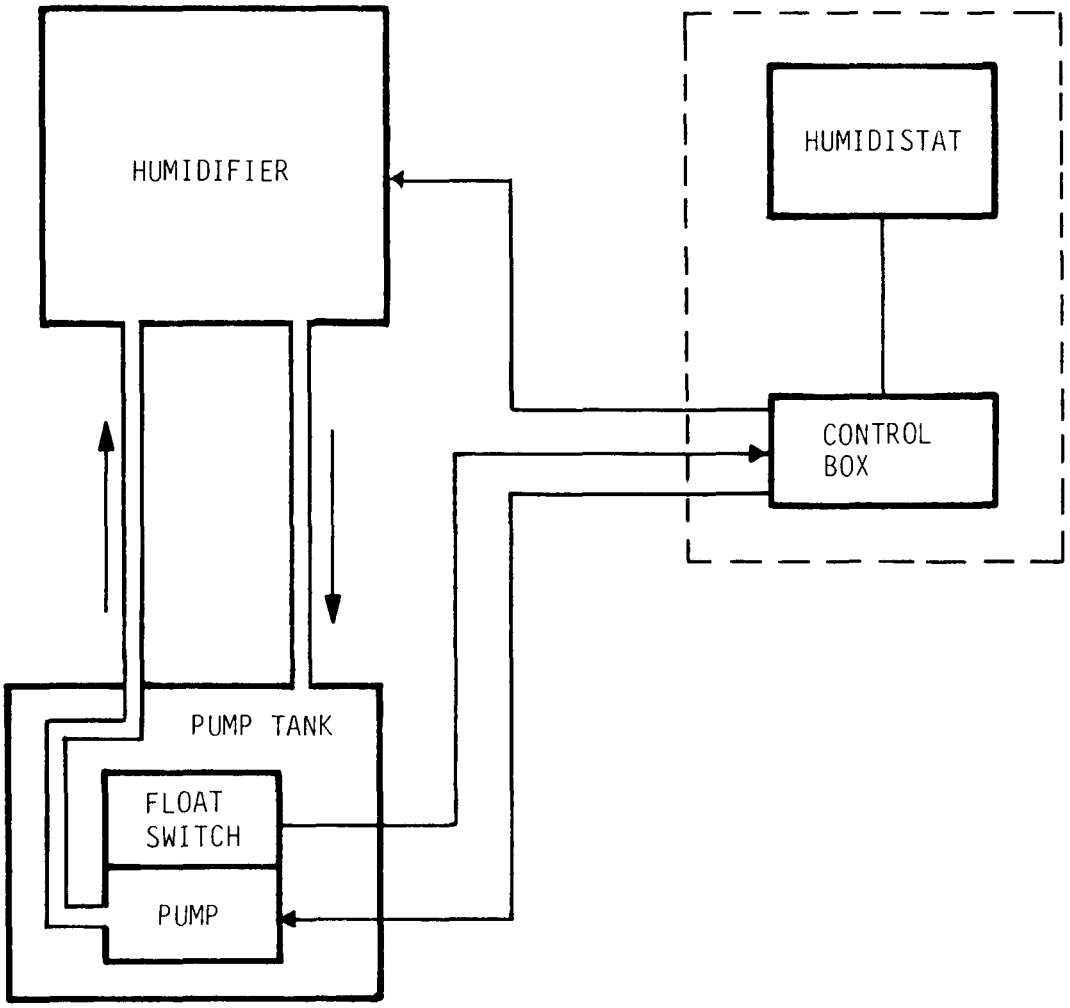


Figure 2-12. Humidifier System

(4) The humidifier (fig 2-13) contains an atomizing unit which draws water from the tank, atomizes it, then blows the droplets through the dome and into the air duct. Air flow through the ducts and van distributes the moisture.

(5) When the pump tank water level gets too low, a low level switch on the pump operates the control box horn and indicator. Water in the humidifier tank drains into the pump tank anytime the pump stops.

c. Hygrometer. The relative humidity in the van is checked on a combination temperature/humidity dial-type hygrometer. Set the humidistat to a higher range if the reading on the hygrometer is below 20%; lower, if the reading is above 30%. If the humidifier is off and the hygrometer reading is above 50%, you will need to operate the air conditioners to bring down the excess humidity in the van.

d. Portable Heaters. Three portable heaters provide 1500 watts each for auxiliary heating. Each heater has a switch (HEAT-OFF-FAN) and a temperature control dial. In HEAT setting, current passes through the heating element. The fan blows heated air out of the unit through louvers. In FAN position, the fan operates, but the heating element is off. The thermostat (temperature control)

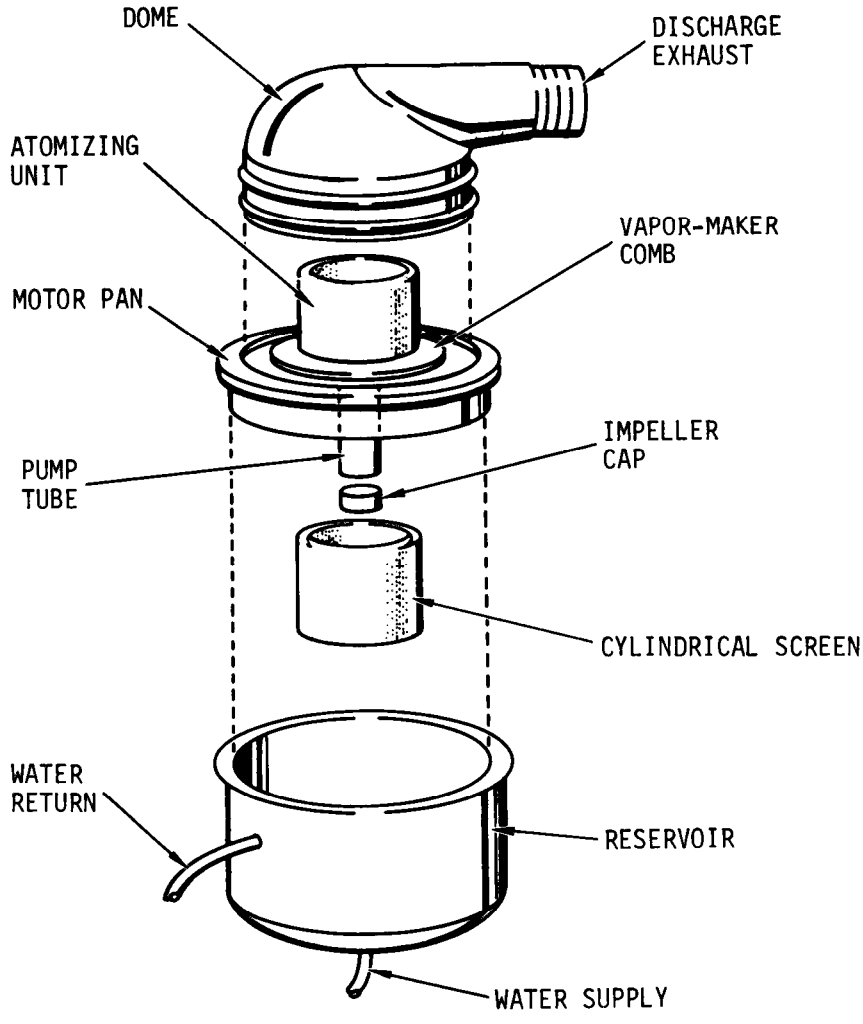


Figure 2-13. Humidifier

cycles the heating element on and off to maintain set temperature. Each heater has a safety overheat cutoff switch which will interrupt power to the heating element if temperature in heating chamber exceeds a specific set level. The fan will continue to operate while heating element is cutoff.

. Nuclear, Biological, and Chemical Protection Equipment (NBCPE). (To be provided)

2-7. COMMUNICATIONS SUBSYSTEM

The communications subsystem (fig. 2-14) allows data processing equipment and personnel in the van to have two-way communication with remote equipment and personnel. Some communications are by voice telephone, but most are by data transfer through the equipment.

Almost all of the equipment for the subsystem is in three cabinets (fig. 2-15). Cabinet A and the crypto cabinet house the devices and circuitry needed for all communications other then those with the remote subsystem. A variety of transmission techniques and protocols, including those required by cryptographic data, can be handled. Cabinet A also has its own entrance panel for connecting external communication lines to the system. All crypto cabinet traffic passes

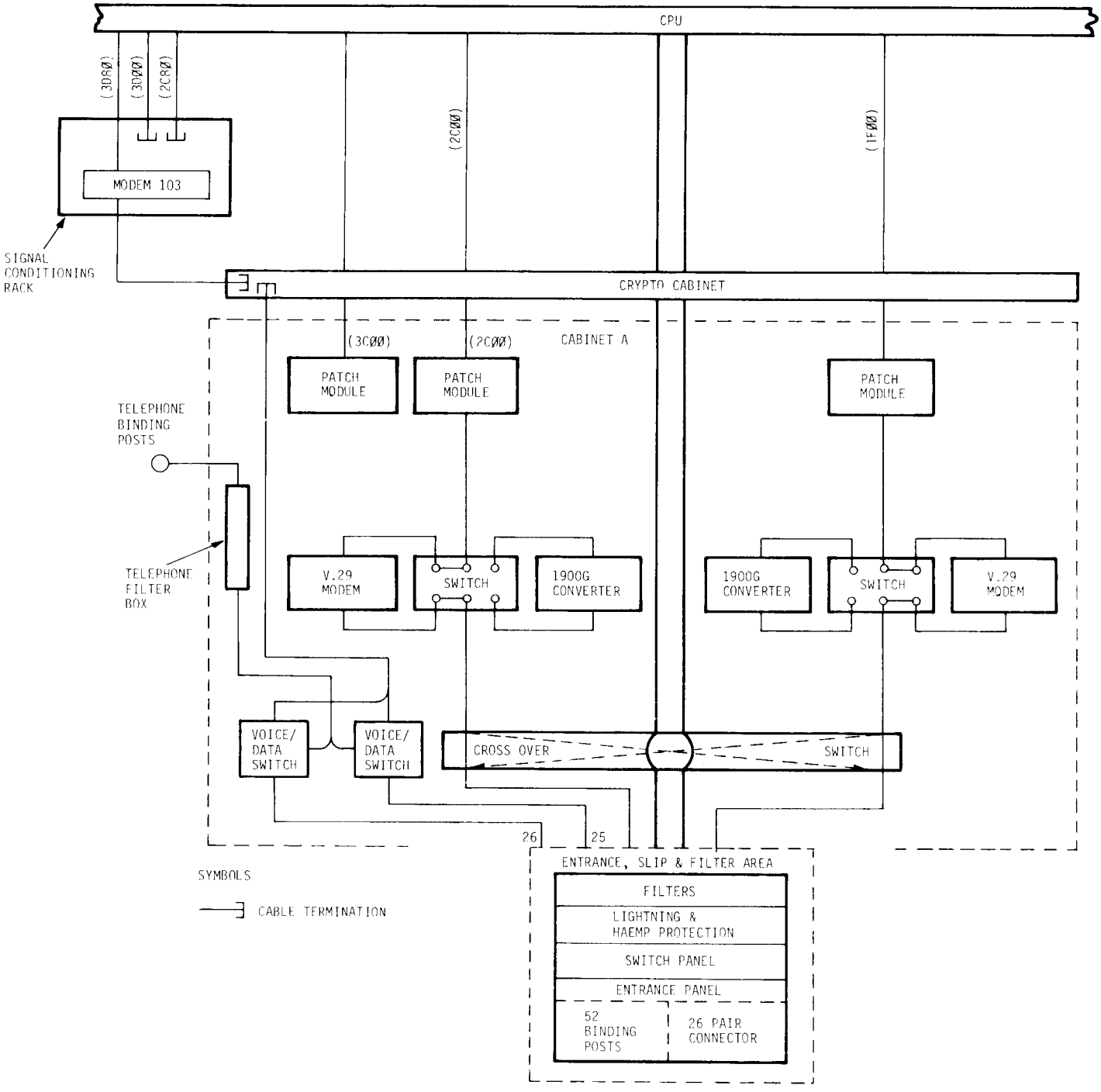


Figure 2-14. Communications Subsystem Block Diagram (1 of 2)

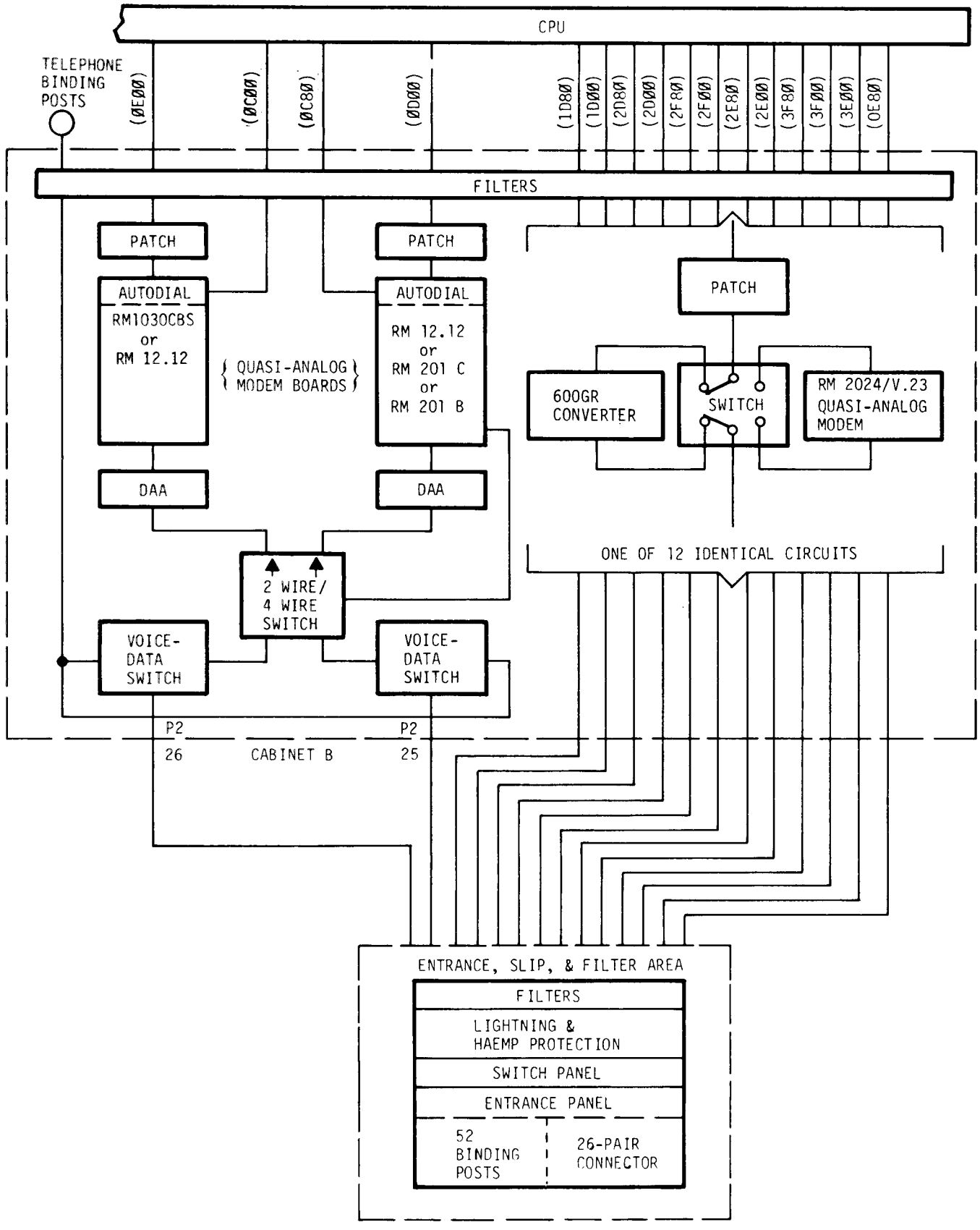


Figure 2-14. Communications Subsystem Block Diagram (2 of 2)

through cabinet A. The crypto cabinet has no direct access of its own to outside circuits. Cabinet B houses devices and circuitry needed to talk with the printers and I/0 terminals that make up the remote subsystem. Cabinet B has its own entrance panel for connecting lines from the remote subsystem equipment. Cabinet B also has data/voice telephone line communication circuits.

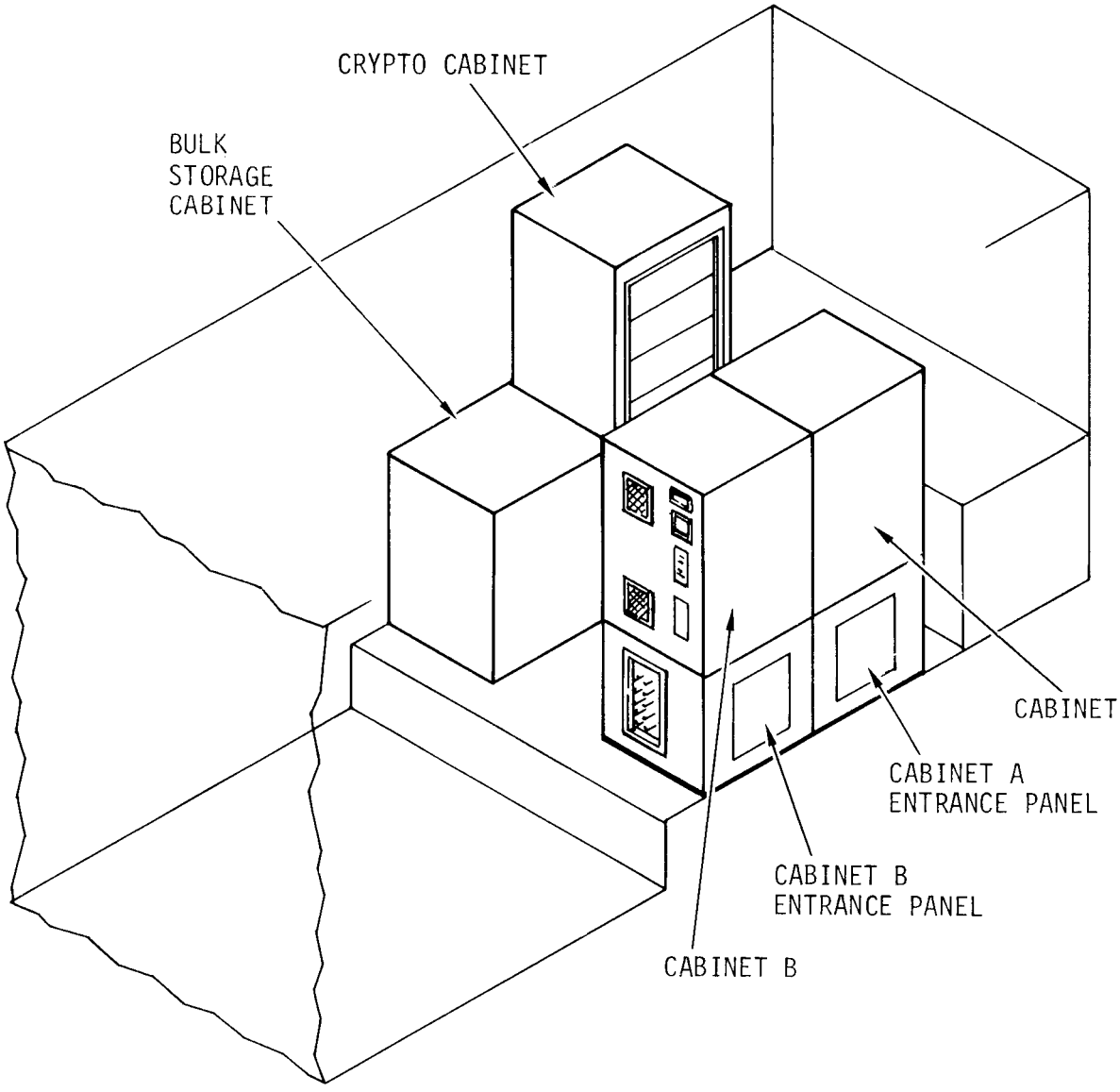


Figure 2-15. Communications Subsystem Cabinets.

The following paragraphs discuss the components in each of these cabinets and the functions of these components in the subsystem.

a. Entrance, SLIP, and Filter Area. The entrance, SLIP, and filter area (fig. 2-16) includes signal line connections, switches, protection devices, and filters. At the entrance panel, lines from external circuits are attached to the binding posts or for more permanent connections, fastened into the connector. Both entrance areas have identical components.

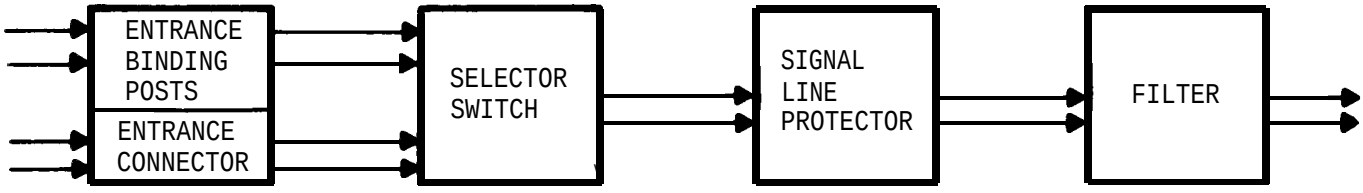


Figure 2-16. Entrance Area Diagram

(1) Toggle switches select lines from either the connector or from the binding posts for connection to the van communication circuits. Four lines (two pairs) from the connector and four lines (two pairs) from the binding posts connect to each switch (fig. 2-17).

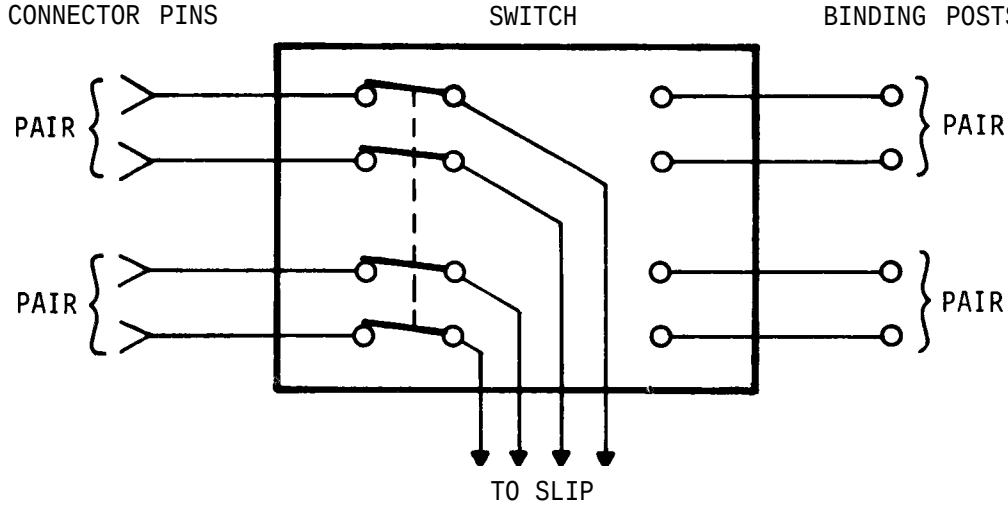


Figure 2-17. Connector/Binding Post Switching

(2) Each signal line protector (SLIP) protects either sixteen or eight lines. The protection is against lightning and other high energy discharges. A spark gap absorbs and drains off the excess energy so that the communications circuits will not see voltages higher than they can handle.

(3) The filter on each line removes unwanted signals (noise) from the transmission. Bandpass filters are used.

b. Cabinet A Signal Processing Equipment. Cabinet A (fig. 2-18) provides the switching networks, patch panels and modems needed to support the dedicated synchronous HDLC or 3780/2780 bulk transfer and asynchronous AUTODIN circuits. These circuits connect with the DCMS on the CPU through the equipment provided in the crypto cabinet.

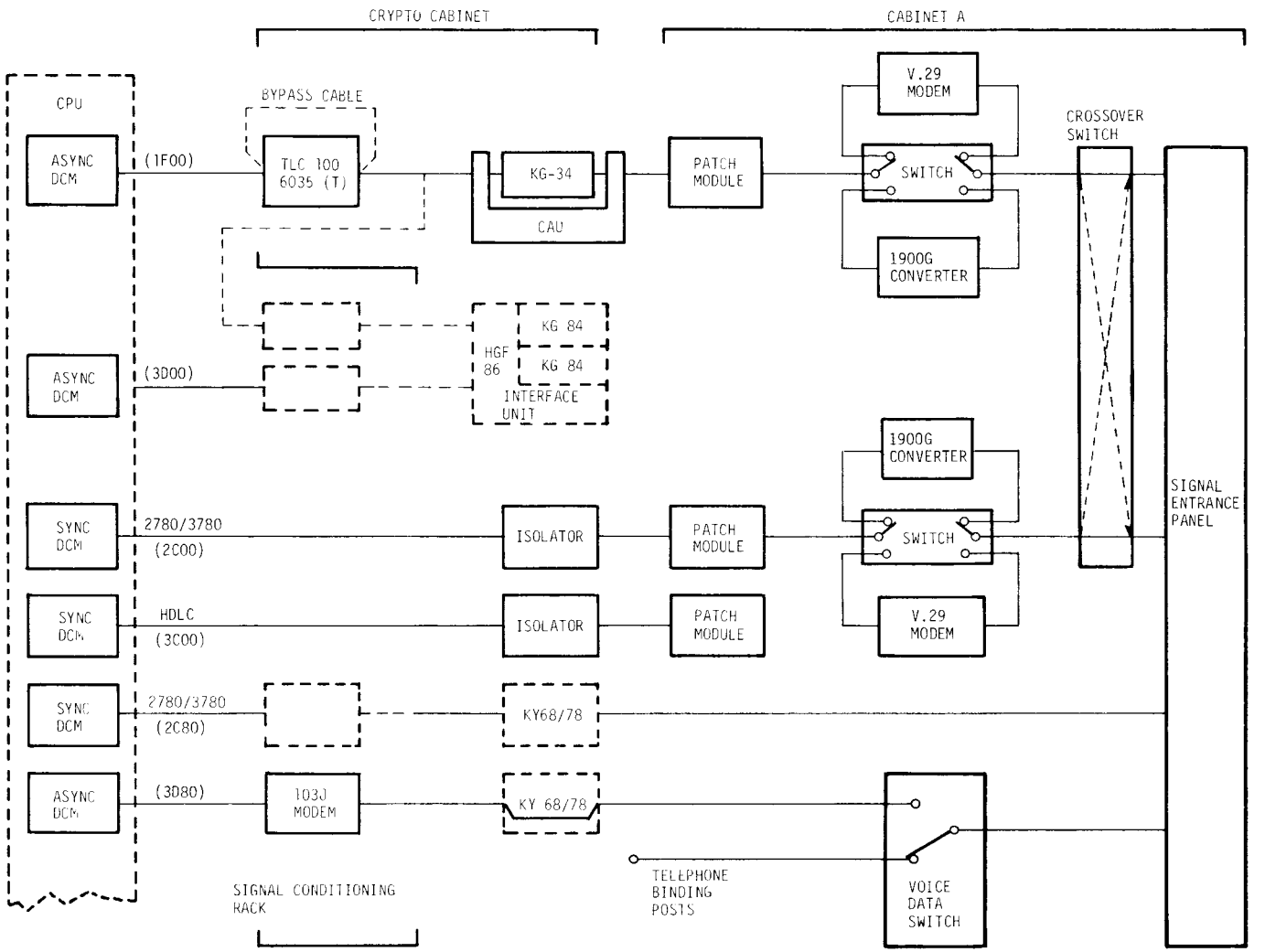


Figure 2-18. Cabinet A and Crypto Cabinet Diagram

(1) All transmitted or received data processed through cabinet A is directed through one or both of the two primary circuits.

(2) The two primary cabinet A circuits (fig. 2-19), are identical. Each has a synchronous high speed modem and an asynchronous dc low-level interface. A switch between the two devices allows the operator to select the mode of operation required. Manual patch modules allow circuit-to-circuit patching, including the bulk data circuit which originates at a patch module. The crossover switch allows cabinet A circuits and the transmission circuits to be interchanged.

(3) The modem-to-interface switches and the patch modules are identical to those in cabinet B. Refer to their descriptions in paragraphs describing cabinet B signal processing equipment.

(4) Cabinet A also has a voice/data device switch. When set in voice position, signals coming into the signal entrance panel are routed to the phone binding posts at the left side of the cabinet. In the data position, the line becomes a data channel and overrides the voice capability.

(5) The V.29 modem is a high-speed type capable of transmitting and receiving serial synchronous data at baud rates of 2400-9600 bps over 4-wire dedicated lines. The V.29 modems are used for direct connection to another DAS3 (D/S), AUTODIN interface, and IBM 2780/3780 interface.

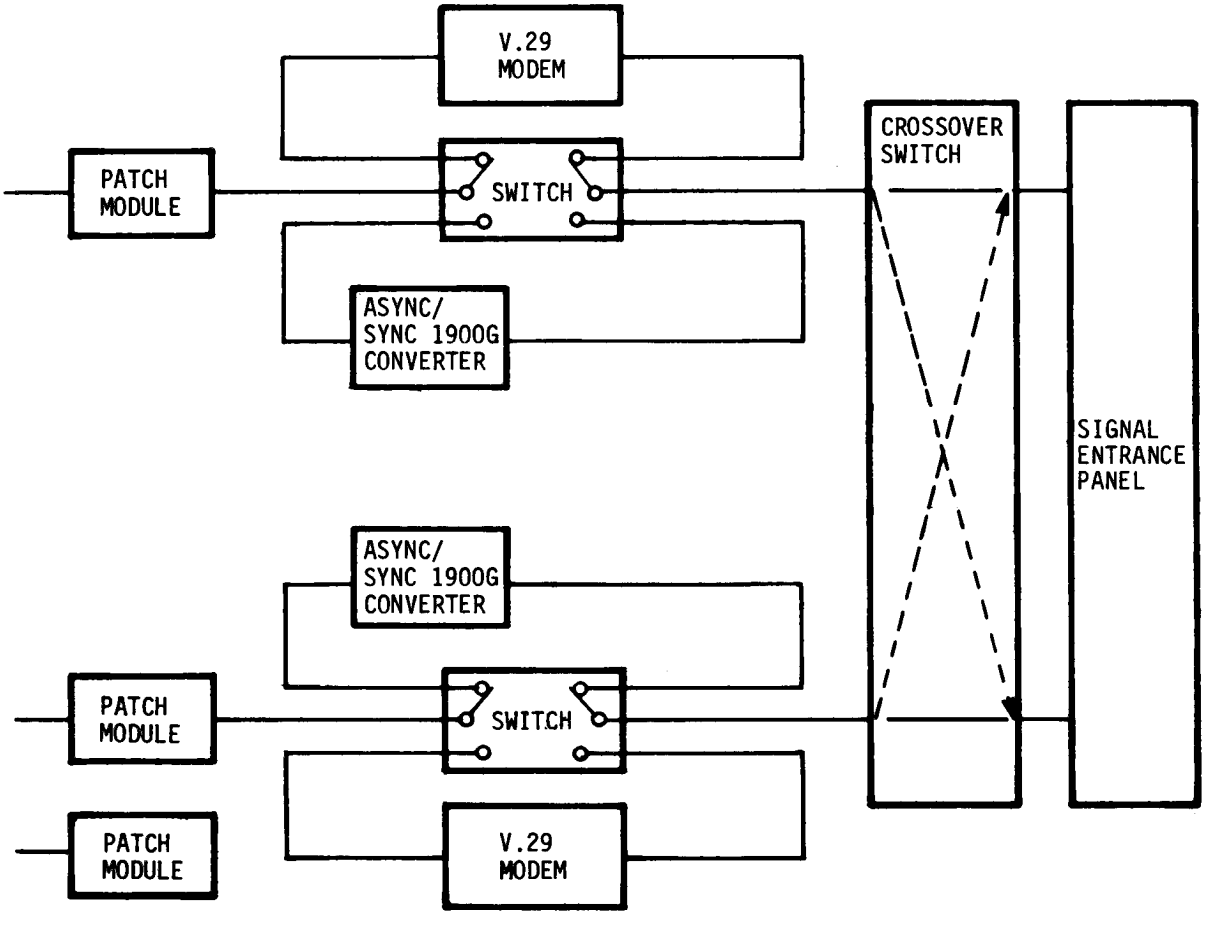


Figure 2-19. Block Diagram, Cabinet A Circuits

(6) The 1900G converter transmits asynchronous data at rates up to 9600 bps up to 2 km in distances. Transmission is four wire full or half duplex. It includes a local loopback test feature to verify its own operation. It also has a remote loopback test feature to check both distant and local modems and the lines between them.

(7) Pairs 25 and 26 from the entrance panel are for four wire voice or data telephone connections. A switch on these pairs connects them to:

- binding posts for use with a four wire telephone
- the 103J modem for four wire data transmission with the CPU

This is not an auto dial circuit.

(8) The 103J modem conditions data transmitted over pairs 25 and 26. The modem is FCC approved direct-connect type. Modulation is phase coherent, frequency shift keyed. Operation is asynchronous at 0-300 bps. The interface is EIA standard RS-232-C.

c. Crypto Cabinet Equipment. Except for those items identified below, it is necessary to use other manuals and documents (see Appendix A) for information on the functions of devices in the crypto cabinet.

(1) The Telecommunication Line Controller (TLC) is an interface module which allows the CPU to communicate with the AUTODIN system. All transmissions between the CPU and AUTODIN must be processed through the TLC. TLC functions include data buffering, validation, flow control, formatting, conversion, and automatic retransmission.

(2) The Crypto Auxiliary Unit (CAU) is an interface module for the cryptographic device with which it is used. The CAU is the communicator for the crypto device. Functions of the CAU include automatic synchronization with external stations; red-to-black isolation and transfer; timing and traffic control. It also provides synchronous to asynchronous conversion.

(3) The isolator assembly is an interface used to eliminate radio frequency propagation of digital signals in order to reduce TEMPEST hazards in ADP application. It effectively eliminates the unauthorized transfer of a signal.

d. Cabinet B Signal Processing Equipment. Cabinet B has the equipment needed for four-wire, full duplex asynchronous communication with the keyboard-displays and printers in the remote subsystem (fig. 2-20). Each of the 12 remote device circuits has a printed circuit board in the quasi-analog modem and a printed circuit board in the 600GR converter. A switch between the two boards allows the operator to select between the two. Manual patch modules allow circuits to be changed from one output channel to another. They are utilized primarily to bypass faults in circuit or equipment.

(1) Cabinet B also includes the common user (dial-up) interface which allows data and voice communications over commercial telephone systems.

(2) Both the 600GR converter and the quasi-analog modem convert incoming signals from the transmission line to the computer and do the opposite for outgoing signals.

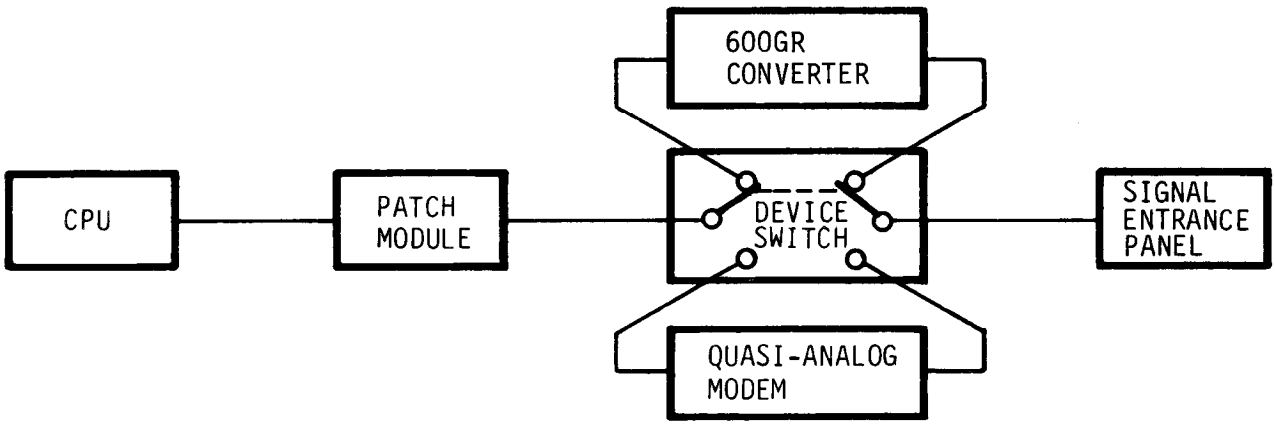


Figure 2-20. Typical Remote Circuit in Cabinet B

(3) The 600GR converter uses a balanced voltage signal transmission technique. Transmission over metallic wire pairs is limited to a distance of two kilometers. The converter is capable of transmitting and receiving data up to 9600 baud in a full duplex, 4-wire mode.

(4) The quasi-analog modem uses a frequency-shift keyed transmission technique. Transmission over direct lines to a remote unit is limited to a distance of ten kilometers. Data rates of 300, 600, and 1200 baud are selectable by switching of jumpers provided on the boards.

(5) The device switch that selects either the modem or the converter for operation, switches data lines on both the DTE and the DCE side of the circuit. In this way, the unused device is isolated from the data path. The switch does not control power to either circuit.

(6) All patch modules in cabinet B are electrically identical. Circuit-to-circuit patches are made with patch cords having plugs on both ends. There is a normal circuit through each patch module that is closed when no patch cord is inserted in the jack. Patch-plug contacts are engaged when the plug is seated in the jack. The through circuit is interrupted before the patch connection is completed. The plug is turned in the jack to lock and unlock the connection.

(7) Each patch module has three jacks - one marked DTE (data terminal equipment), one marked DCE (data communications equipment), and the remaining one marked MONITOR (fig. 2-21). Plugging into the DTE jack makes a connection to the terminal (CPU) local side of the circuit and disconnects the communications equipment (remote) side. Plugging in the DCE jack connects the communications side and disconnects the terminal side. Patches are made between the terminal side (DTE) of one circuit and the communications equipment (DCE) of another circuit. Plugging in the MONITOR jack with a monitoring plug provides a constant visual LED display of carrier detect, receive, or send data signals.

(8) Wire pairs 25 and 26 from the signal entrance panel are used for voice communications and for data transfer over telephone lines (fig. 2-22). These wire pairs can be used as two 2-wire circuits or one 4-wire circuit. Switches direct either or both pairs to data transmission circuitry or to the binding posts. The binding posts are used to connect telephones to the lines for voice communications.

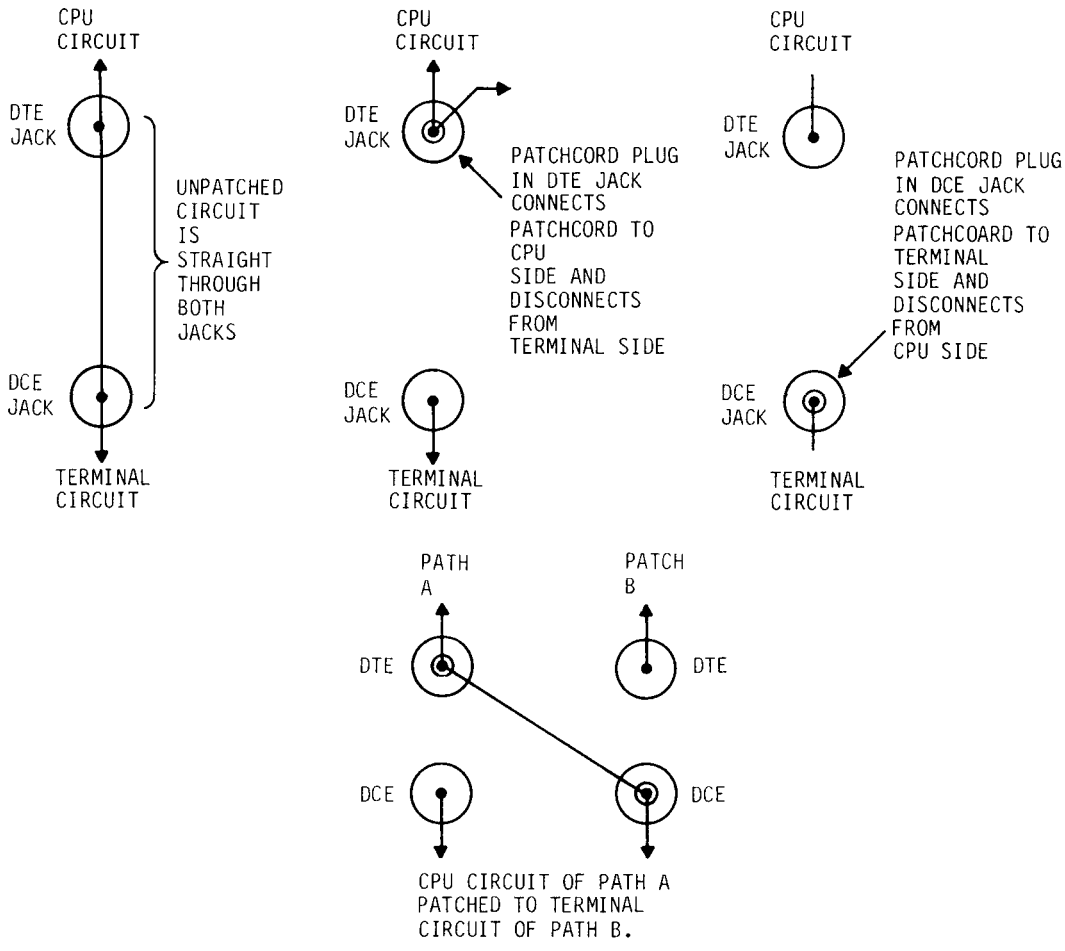


Figure 2-21. Circuit Patching

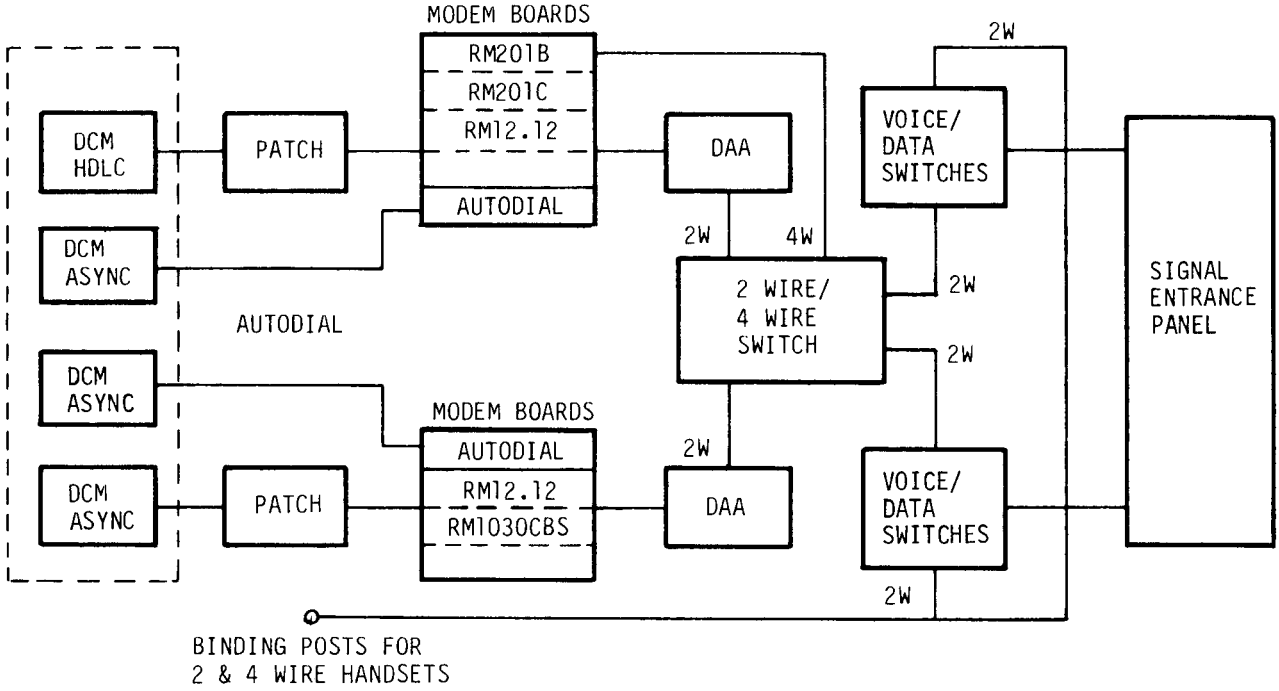


Figure 2-22. Dial-up Block Diagram

(9) In each circuit, a data access arrangement (DAA) protects commercial telephone lines from out-of-tolerance conditions accidentally produced by van equipment. These include high voltages, currents, and signal levels.

(10) The block diagram (fig. 2-22) shows modem boards for different protocols in each auto dial circuit. This shows only the capability of using these different protocols. In practice, the autodial boards are always installed. The modems are installed and removed as required by the protocol of traffic to be processed.

(11) At the CPU, each circuit has a device control module (DCM) to adapt circuit differences to and allow control by the CPU. For one circuit, a synchronous adapter is used; the other uses an asynchronous adapter. The dialer circuits also use asynchronous adapters. A patch module in each circuit allows circuit-to-circuit patches, connecting either circuit to either CPU adapter. The autodial circuits can be used independently and simultaneously.

(12) When the four-wire configuration is set, there is no auto dial function: both the auto dial boards and the DAAs are removed from the circuit.

(13) The auto dial circuit conforms to Bell 801 standards, the dc low level circuit to MIL-STD-188-114, and all other cabinet B interfaces to EIA RS-232-C standards.

2-8. SEMITRAILER VAN UNIT

The van provides shelter and mobility. Air ride suspension allows the equipment to be moved with a minimum of vibration. At emplacement, the van is leveled with built-in jacks so that equipment operation will not be affected by being tilted. Side and rear doors provide entry and exit. The van can be readily prepared for movement by road, sea, or air.

Maintenance checks and services to the van unit are usually handled on a periodic basis. PMCS is included in the operator’s manual for the van inter ior and the DAS3 (D/C) equipment it carries. General maintenance and repair details for brakes, axles, sprinqs, hydraulic system, etc., are covered in TM 9-2330-271 -14. Troubleshooting procedures for the electrical system, suspension, and overall movement preparation of the van unit are also covered.

2-9. Equipment Storage and Spare Parts. Storage facilities are provided to store all supplied spares, TMDE, and support materiel. They include:

- Bulk storage cabinet
- Disk storage cabinet
- Spare parts and tools storage cabinet
- Fluorescent lamp storage rack
- Tape storage racks

The parts, the quantities, and drawer/shelf locations in these storage facilities are shown in appendix D.

2-10. POWER PLANT

The AN/MJQ-12 power plant consists of two trailer mounted 60kW diesel generators. For a detailed description, see TM 5-6115-545-12, -12-1, and -24P. The power

plant is used to supply raw 208 V ac source power to the van when there is no available commercial power. Both 3 phase generators are driven by 6-cylinder, 4-cycle, liquid cooled diesel engines. Each trailer is a two and a half ton, 2-wheel, chassis type. The skid mounted generators are bolted to the trailer chassis. These units are towed to the site, connected together at a switchbox assembly, then cabled to the van power entrance panels (fig. 2-23).

The trailer chassis features air-over-hydraulic brakes, mechanical hand-lever controlled handbrakes, taillight and stoplight assembly, a retractable personnel platform, and landing leg assemblies.

Each unit is equipped with a 55 gallon (200 liters) fuel tank. A 600-gallon auxiliary fuel tank mounted on a cargo trailer provides fuel for prolonged operation on a 24-hour basis.

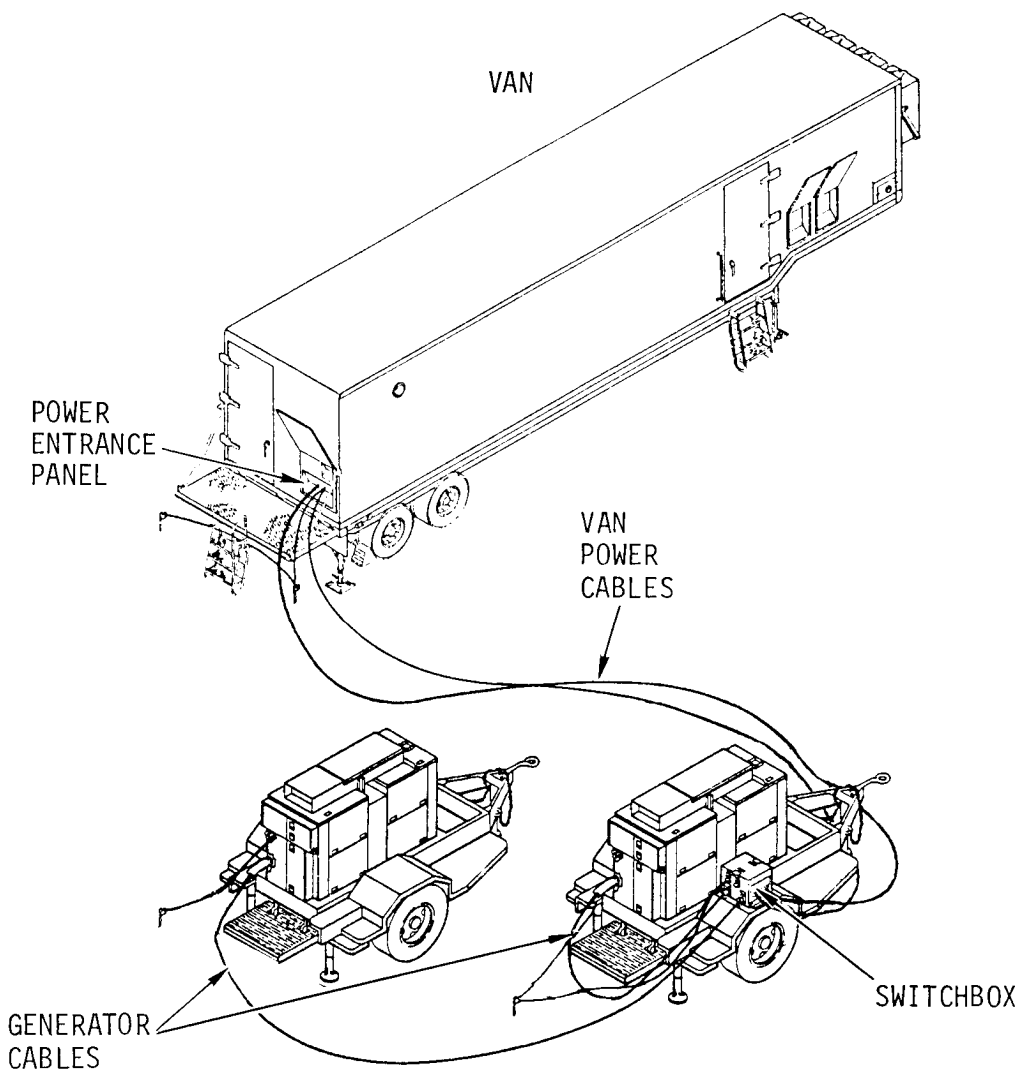


Figure 2-23. Power Plant Diagram

2-11. REMOTE SUBSYSTEM

Some DAS3 (D/C) systems interface with remote subsystems which communicate with the ADPE in the van. These subsystem(s) include the keyboard-display or teleprinter groups.

a. Keyboard-display. All remote keyboard-displays subsystems are electrically similar to the three terminals in the van.

b. Teleprinter. The remote teleprinter is a receive-only device. It includes a 2K line buffer to allow receiving of data at rates up to 9600 baud while printing at speeds up to 150 cps. A 16-key pad allows the operator to enter commands and functions necessary for printer operation. A three digit display shows teleprinter operational and functional status. While printing, the display shows the column number of the next character to be printed.

C. 600G Converter. The 600G converter transmits asynchronous data between the remote devices and the CPU. It operates in a full duplex mode on four wire metallic pairs up to 3 km at data rates up to 9600 bps. It includes a local/remote loopback feature.

d. V.23 Modem. The V.23 A/S modem is a frequency-shift keyed modem for asynchronous operation up to 1200 bps. It is 4-wire full duplex. Features include testing in local, remote, local-self, and remote self-testing modes.

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Index of Organizational Maintenance Procedures

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3-16	Calibrate Temperature Control Dial	3-25
3-17	Calibrate Hygrometer	3-28
3-18	Remove/Replace Air Conditioner Noise Hood	3-30

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

3-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-2. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Refer to TM 11-701O-2O5-23P for special tools, TMDE, and support equipment required by organizational maintenance.

3-3. SPARES AND REPAIR PARTS

There are no spares and repair parts for organizational maintenance.

Section II. SERVICE UPON RECEIPT

3-4. UNPACKING

Upon receipt of new equipment, check packing list and instructions for any precautions or specific unpacking procedures.

3-5. CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage in DD Form 6, Packing Improvement Report.

Check the equipment against the packing slip to see if the shipment is complete, Report all discrepancies in accordance with the instructions of TM 38-750.

Check the equipment to ensure that required Modification Work orders have been applied in accordance with DA PAM 310-7.

3-6. EMPLACEMENT AND PREPARATION FOR USE

Information and instructions for emplacement and preparation for use are contained in the operator's manual, TM 11-7010-205-10.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-7. GENERAL

The following information is for monthly (table 3-2) and semiannual (table 3-3) preventive maintenance checks and services (PMCS).

Routine checks, like equipment inventory, dusting, washing, checking for frayed cables, stowing items not in use, covering unused receptacles, and checking for loose nuts and bolts are not listed as PMCS. They are things that you should do anytime you see they must be done. If you find a routine check like one of those listed, in your PMCS, it was listed because operators reported problems with that item.

3-8. PMCS PROCEDURES

PMCS procedures are done at fixed intervals for the following purposes:

- Make sure that the equipment is operable
- Prevent equipment problems in the future operation
- Identify and resolve minor problems in the equipment before they become major problems
- Scheduled cleaning of the equipment

3-9. ITEM NUMBER COLUMN

The checks/services in the PMCS table are numbered in order of performance. Use this ITEM number when filling out DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

3-10. ITEM TO BE INSPECTED COLUMN

The items listed in this column are based on the major components of DAS3 (D/C) and use common names of these components.

3-11. PROCEDURE COLUMN

This column gives you the check or service procedure which you must perform on the item. Do this at the intervals indicated in the INTERVAL column.

3-12. EQUIPMENT WILL BE REPORTED NOT READY/AVAILABLE IF COLUMN

This column tells you under what conditions the equipment will be unable to perform its primary mission. When you notice this condition during PMCS you must report it on the proper form and tell your supervisor.

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
1	CPU	Check CPU operation as follows: 1. Power on CPU. 2. Run QLT. 3. Run extended QLTs. 4. Power off CPU.	QLTs will not run properly. CHECK indicator remains on
2	Console Terminal	Check console terminal operation as follows: 1. Power on console terminal. 2. Set REMOTE-LOCAL switch to LOCAL . 3. Verify that all operating keyboard characters will print on display unit screen. 4. Power off console terminal.	All keyboard characters not displayed on screen.
3	Tape Drive Condition	Inspect and clean interiors: 1. Power OFF. 2. Remove cover and access cabinet. 3. Using vacuum cleaner with soft bristle brush, vacuum interior and circuit boards.	

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		4. Vacuum blowers in top of cabinet. 5. Close cabinet. 6. Replace cover.	
	Tape Drive Operation	Check operation of tape drive as follows. 1. Power on tape drive. 2. Load scratch tape. 3. Using test light, check capstan speed at strobe disk. NOTE If test light is operating on 60 Hz power, use outer dial on strobe disk. If on 50 Hz, use inner dial.	Capstan speed not correct.
4	Console Printer Condition	Inspect and clean interior: 1. Power OFF. Pull ac power plug from outlet. 2. Remove paper. 3. Remove ribbon cartridge. 4. Remove cover. 5. Using vacuum cleaner with soft bristle brush, vacuum interior and head assembly. Check carriage drive belt as follows: 1. Move carriage along support rails.	

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		2. Check if drive belt moves evenly on motor drive shaft and pulleys.	Drive belt loose or out of alinement.
		3. Check belt for wear.	Belt worn or cut.
		Check print head cable as follows:	
		1. Move carriage along support rails.	
		2. Check if paper board covers are in place over circuit boards.	
		3. Check if print head cable moves freely.	
		Check tractor drive as follows:	
		1. Tractor drive belt for wear.	Belt worn or cut.
		2. Drive gears and pulleys for dirt and wear, clean as required with bristle brush.	
		Check platen drive and intermediate pulleys for dirt and wear. Clean as required with bristle brush.	
		Check that ribbon drive rollers rotate freely and are free of dirt. If necessary clean as follows:	
		WARNING	
		Isopropyl alcohol is flammable. Do not use near high heat or open flame.	
		1. Dampen lint-free cloth with isopropyl alcohol.	

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		2. Wipe rollers and support posts throughly. 3. Replace ribbon cartridge. 4. Replace cover. 5. Install paper. 6. Push ac power plug into outlet.	
	Console Printer Operation	Check operation of console printer as follows: 1. Power on printer. 2. Run self test. 3. Power off printer.	Self test does not run or shows faulty operation.
5	Line Printer	Check operation of line printer as follows: 1. Power on printer. 2. Run self test. 3. Power off printer.	Self test does not run or shows faulty operation.
6	Disk Drive	NOTE Before you perform any of the PMCS, look to see if the READY indicator is lit. If it is, press START switch to cycle down disk drive. Wait one minute before you begin any PMCS. Check pack area and spindle as follows: 1. Slide drawer out. 2. At rear of disk drive set AC POWER switch OFF.	

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		3. Raise pack access cover. CAUTION Do not bump read/write heads with vacuum nozzle. 4. Carefully vacuum entire pack area. 5. Use cotton swab to wipe old lubricant from threads of lockshaft. 6. Dampen lint-free gauze with cleaning solution and wipe spindle. 7. Using swab stick, put thin coat of new grease on threads of lockshaft. 8. Close pack access cover. 9. Raise and remove disk drive cover. 10. Using vacuum cleaner with soft bristle brush, clean logic cage and deck. 11. Raise deck to maintenance position. a. On back of drive, locate bolt and use 3/16 in. hex key, remove bolt and spacer from keeper hole. b. Slide spacer under deck and line up with hole. c. Push bolt through spacer and tighten bolt.	

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		CAUTION Do not lift drive at pack access cover. d. At front of drive, lift deck until support arm is fully extended. e. Loosen knob and pull it out of storage hole. f. Insert knob in locking hole. Tighten knob. 12. Vacuum underside of deck assembly. 13. Vacuum base assembly. 14. Lower deck to normal operating position. a. Loosen knob. Pull it out of locking hole. b. Insert knob in storage hole. Tighten knob. c. With one hand, firmly grasp deck and lift. d. With other hand, grasp arm and push forward towards front of drive, lower deck. 15. Replace disk drive cover. 16. At rear of disk drive set AC POWER switch ON. 17. Push in disk drive drawer.	
7	Quasi-Analog Modem Assembly	Run local self test. (TM 11-7025-212-23)	Self test fails.

Table 3-2. Organizational Preventive Maintenance Checks and Services
Monthly Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
8	Van	Perform checks and services per TM 9-2330-362-14&P (chapter 4, section III).	
9	Power Plant	Perform checks and services per TM 5-6115-595-12&P	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
1	Air Conditioner(s)	Inspect and clean inner air conditioner filters: 1. Power off unit(s). 2. Remove noise hoods (para 3-18) 3. Remove grilles, then remove EMI/RFI filter screen(s). 4. Remove each filter (2 sections). 5. Clean in warm soapy water. Rinse and dry. CAUTION Air flow direction arrow o filter must point toward air conditioner or air flow will be cut. 6. Replace each filter (2 sections) so air flow arrows on filter point toward air conditioner.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		7. Replace EMI/RFI filter screens.	
		8. Replace grilles.	
		9. Replace noise hoods (para 3-18).	
2	Humidifier	Inspect humidifier:	
		1. In tank unit check operation of each float. Both should move freely.	Float(s) damaged or valve corroded and inoperable.
		2. Check all fittings for leaks	Fittings leak.
3	Tape Cleaner	Inspect and clean interior:	
		1. Power OFF. Pull ac power plug from outlet.	
		2. Unbolt tape cleaner from van wall and bulk storage cabinet.	
		3. Remove back cover.	
		4. Using vacuum cleaner with soft bristle brush, clean interior.	
		WARNING Tape cleaner is heavy. Do not attempt to lift it yourself. Get help.	
		5. With your partner, lift tape cleaner to floor and lay on its side.	
		6. Pull off air filter from bottom of tape cleaner.	
		7. Vacuum air filter using soft-bristled, brush type nozzle.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		8. Using vacuum cleaner, clean fan Intake. 9. Clean fan blades. 10. Replace air filter. 11. Replace back cover. 12. Reinstall tape cleaner. 13. Push ac power plug into outlet and power ON.	
4	Disk Drives Absolute Filter	Remove and replace absolute filter as follows: 1. Slide drawer out. 2. At rear of disk drive, set AC POWER switch to OFF. 3. Raise deck to maintenance position. 4. Remove bracket holding filter in place. 5. Slide filter out of slot. 6. Slide in new filter. 7. Insert bracket in slot and position it over filter. 8. Replace bracket screw and washer. 9. Using small strip of masking tape, note date of installation on filter. 10. Lower deck. 11. Replace cover.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		12. Set AC POWER switch to ON. 13. Push in disk drive drawer.	
5	Quasi-Analog Modem Assembly	Inspect and clean modem assembly interior: 1. Power OFF communications cabinet circuit breaker. 2. Open front panel. 3. Power OFF and pull both power supplies out and set aside. 4. Pull all modem boards out and set aside. 5. Using vacuum cleaner with soft bristle brush, clean interior of modem assembly. 6. Clean both power supplies and replace in modem assembly. 7. Carefully vacuum each modem board and replace in modem assembly. 8. Power ON both power supplies. 9. Close front panel. 10. Power ON communications circuit breaker.	
6	Line Printer	Check line printer operation as follows: 1. Power ON printer. 2. Run self test.	Self test will not run.

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		Check hammer bank flight time of hammer modules as follows:	
		1. Inspect self test printout.	
		2. Check if characters are smeared, uneven, incomplete, or missing.	Characters are smeared, uneven, incomplete, or missing,
		Check interlock switches as follows:	
		WARNING Top cover is heavy. Use care when raising.	
		1. Raise top cover.	
		2. Lift hammer bank latch handle.	Code 04 does not appear when hammer bank is opened.
		3. Check if code 04 appears on STATUS indicator.	
		4. Open band cover.	Code 03 does not appear when band cover is opened.
		5. Check if code 03 appears on status indicator.	
		Check that fans are circulating cooling air as follows:	
		1. Lift off paper guide shield.	
		2. Check that hammer bank blower fan hub is turning.	Hammer bank fan is not operating.
		3. Check that paper puller fan blade is turning.	Paper puller fan is not operating.
		4. Place hand on logic cage fan shroud. Check for vibration of fan motor.	Logic cage fan is not operating.

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		Check paper puller drive belts for cracks or cuts.	Drive belts cracked or cut.
		Check forms compressor as follows:	
		1. Remove paper.	
		2. Power OFF printer.	
		3. Pull ac power plug from outlet.	
		4. Check forms compressor on front of hammer bank mask for cracks or breaks.	Forms compressor is cracked or broken.
		Check for groove in surface of edge guide bearings.	Groove is worn into surface of bearing.
		Check character band tracking as follows:	
		1. Mark each edge guide bearing with a felt pen.	
		2. Rotate either character band pulley and check that both edge guide bearings move freely.	Edge guide bearings do not move freely.
		Using belt tension gauge, check belt tension of paper feed drive belt. It should show 12 + 1 oz. at 3/16 inch deflection.	Belt tension is greater or less than 12 + 1 oz. at 3/16 inch deflection.
		Check transducer gap as follows:	
		1. Make sure character band is in normal operating position.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		2. Using feeler gauge, check for a gap between transducer and the timing marks on the band of 0.005 + 0.002 in. (0.127 ± 0.051 mm).	Transducer gap not within tolerance.
		Check ribbon mask for cracks or cuts.	Ribbon mask cracked or cut.
		Check ribbon drive belt as follows:	
		1. Rotate band drive pulley.	
		2. Check ribbon drive belt for cracks or cuts.	Ribbon drive belt is cracked or cut.
		Clean interior of printer as follows:	
		1. Lift off paper guide shield.	
		2. Vacuum around paper feed assembly, paper puller assembly, and area around base support.	
		WARNING Isopropyl alcohol is flammable. Keep away from high heat or open flame.	
		3. Dampen and clean, lint-free cloth with isopropyl alcohol, and wipe ribbon dust and paper lint from all surface areas.	
		4. Lower band cover.	
		5. Press down on latch handle until hammer bank is locked into position.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		WARNING Top cover is heavy. Use care when lowering. 6. Lower top cover. 7. Push ac power plug into outlet. 8. Install paper. 9. Run self test.	
7	Console Terminal	Inspect and clean interior: 1. Power OFF. Pull ac power plug from outlet. 2. Remove display unit cover. WARNING Hazardous voltages are present within the terminal. To avoid electrical shock, disconnect power before performing maintenance. WARNING Use care when handling or working around cathode ray tube (CRT). Hazardous voltages may be present on CRT even with power OFF also damage to the CRT could cause an implosion resulting in possible severe injury from flying glass.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		3. Using vacuum cleaner with soft bristle brush, carefully vacuum chassis and logic board. 4. Replace display unit cover. 5. Push ac power plug into outlet.	
8	CPU	Inspect and clean interior: 1. Power OFF at control panel. 2. Pull out CPU. 3. Open CPU door. Power OFF memory save and PDU. 4. Open both grilles. 5. Using vacuum cleaner with soft bristle brush, vacuum metal surfaces, wiring and components. 6. At rear of CPU, pull off panel and vacuum metal surfaces. Inspect and clean power supply fans: 1. Power ON. 2. Check operation of all power supply fans. 3. Power OFF. 4. Remove fan guards from each power supply fan. 5. Check for dust buildup on fan blades. If none, skip step 6.	Any fan not operating.

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		WARNING Isopropyl alcohol is flammable. Keep away from heat and open flame. 6. Wipe residue from fan blades with clean lint-free cloth dampend with isopropyl alcohol. 7. Replace fan guards. 8. Replace rear panel. 9. Close grilles. 10. Close door and push in CPU.	
9	1/0 Terminals	Inspect and clean interior: 1. Power OFF. Pull ac power plug from outlet. 2. Remove display unit cover. WARNING Hazardous voltages are present within the terminal. To avoid electrical shock, disconnect power before performing maintenance.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		WARNING Use care when handling or working around cathode ray tube (CRT). Hazardous voltages may be present on CRT even with power OFF also, damage to the CRT could cause an implosion resulting in possible severe injury from flying glass. 3. Using vacuum cleaner with soft bristle brush, carefully vacuum chassis. 4. Replace display unit covers. 5. Push ac power plug into outlet.	
10	Card Reader/ Punch	Inspect and clean deck: 1. Power OFF. Pull ac power plug from outlet. 2. Raise deck to maintenance position.	
		3. Check belts, pulleys and shafts for dirt buildup, wear and improper belt tracking.	Belt worn or cut.
		4. Check for frayed wires, loose connections. 5. Using vacuum cleaner with soft bristle brush,, vacuum chassis and deck areas.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		Inspect and clean electronics cabinet: 1. Remove pedestal cover. 2. Pull out logic cage. 3. Using vacuum cleaner with soft bristle brush, vacuum inside of electronics cabinet and back of logic cage. 4. Push in logic cage. 5. Access and clean smart controller logic cage. 6. Replace pedestal cover. Check belt tensions to following specifications:	

Belt	Tension
Main drive	11 oz for 1/16 in. to 3/32 in. deflection
Read roller timing	21 oz for 1/8 in. deflection
Camshaft timing	12 oz for 1/16 in. to 3/32 in. deflection
Post punch advance index	16 oz for 1/16 in. to 3/32 in. deflection
Printer drive	3.1 oz for 5/64 in. to 7/64 in. deflection

		7. Lower deck and top cover. 8. Push device back in place. 9. Push ac power plug into outlet.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
11	Communications Equipment	Inspect communications and crypto cabinets as follows: a. Check cabinet doors and equipment panels for signs of binding or wear to hinges. b. Check that all rack mountings are securely fastened. c. Insure that all cable connectors are firmly seated with their mating connector or outlet. d. Check operation of all panel switches for signs of wear or binding. e. After power has been applied and equipment energized, inspect all illumination and indicator lamps for defects or breakage.	
12	Curbside Door	Check operation of curbside door.	Safety latch jams or door will not open.
13	Frequency Converter	Inspect and clean interior: WARNING All ADP equipment must be powered off and technical power cut at circuit breaker in power distribution box before beginning this procedure. Electrocution may result if this procedure is performed with power on. 1. Open frequency converter door.	

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		2. Remove all power modules and logic module. 3. Using vacuum cleaner with soft bristle brush, vacuum interior of cabinet. 4. If dusty, vacuum surface of each module and replace in cabinet. 5. Inspect wiring for loose or damaged connectors. 6. Close frequency converter door and tighten latches.	Connectors damaged.
14	Door Seals and RFI Shielding	Check RFI shielding for corrosion or rips.	RFI shielding cut or corroded.
15	Van	Perform checks and services per TM 9-2330-362-14&P (chapter 4, section III).	
16	Ground Rods and Straps	Inspect ground rods, straps and connections: 1. Check soil for extreme dry condition. If too dry, refer to TC 11-6 for alternate grounding techniques. 2. Check connections from rod to rod and to van. ● If corroded, remove Clean corrosion and replace ● If loose, tighten	Ground strap cut or lug broken off.

Table 3-3. Organizational Preventive Maintenance Checks and Services
Semiannual Schedule -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
17	Power Cables	WARNING Electrocution may result if this procedure is done with power on from source to van. 1. Power off van. 2. Cut power at source. 3. Lift and visually check cable for cuts in insulation or damaged connectors. 4. Make sure all connections are tight.	 Any wire in cable exposed through cut insulation. Connector cracked or damaged.
18	Power Plant	Perform checks and services per TM 5-6115-594-14&P	

Section IV. TROUBLESHOOTING

3-13. GENERAL

There is no troubleshooting at the organizational maintenance level.

Section V. MAINTENANCE PROCEDURES

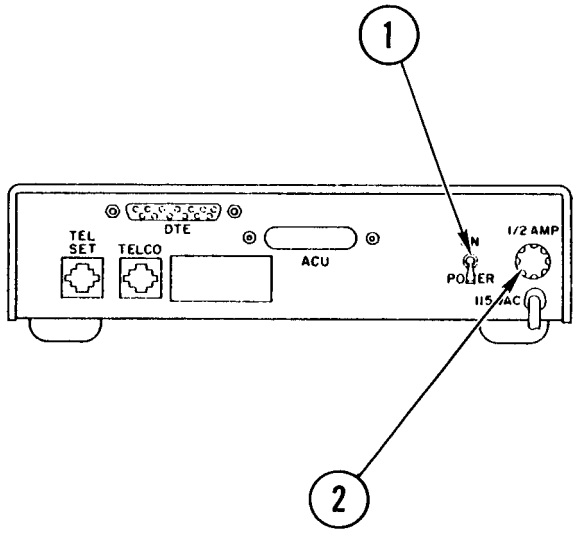
3-14. GENERAL

Maintenance at the organizational level consists of preventive maintenance checking, cleaning and servicing of DAS3 (D/C) equipment. PMCS procedures are done monthly and semiannually. However, some maintenance must be done on an unscheduled basis. Procedures for unscheduled maintenance are included here.

3-15. REMOVE/REPLACE 103J MODEM FUSE

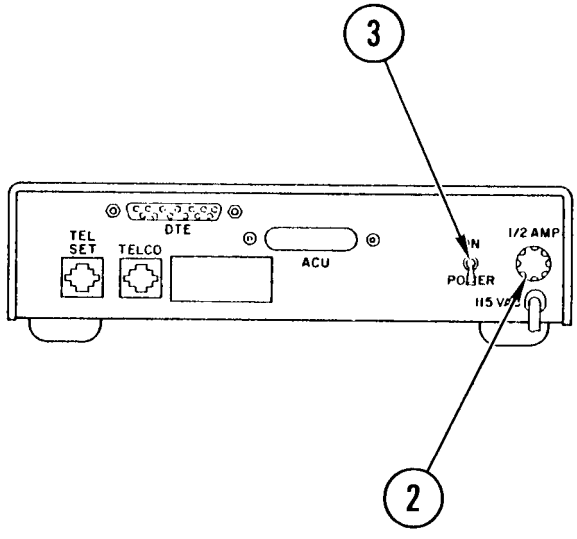
INITIAL SETUP

Common Tools	Materials/Spare Parts
● Tool kit	● Fuse (.5 amp)



Remove

1. At rear of modem power OFF.
2. Push in fuse cap, turn as indicated and pull out.
3. Remove fuse from cap.



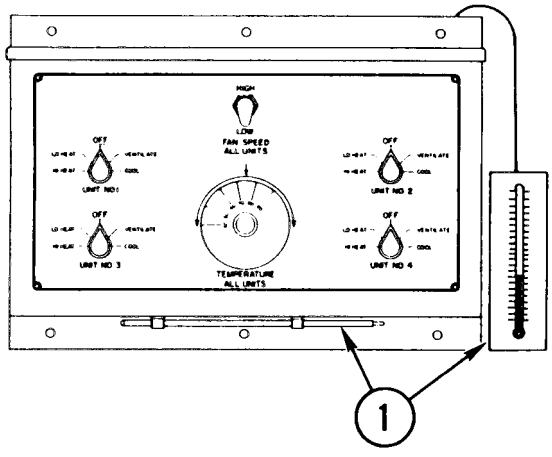
Replace

1. Place fuse in cap.
2. Install fuse cap, push in and turn to lock cap in place.
3. Power ON modem.

3-16. CALIBRATE TEMPERATURE CONTROL DIAL

INITIAL SETUP

Common Tools	Materials/Spare parts
● Accurate thermometer	● Paper
● Tool kit	● Pencil or pen



NOTE

Calibration is best performed when air around temperature control panel is at 75°F (24°C), but may be done at any point between 65°F (18°C) and 85°F (30°C). The air conditioners may be off or on.

1. Hang accurate thermometer near temperature sensor probe. Wait until temperature reading is steady (about 5 minutes).

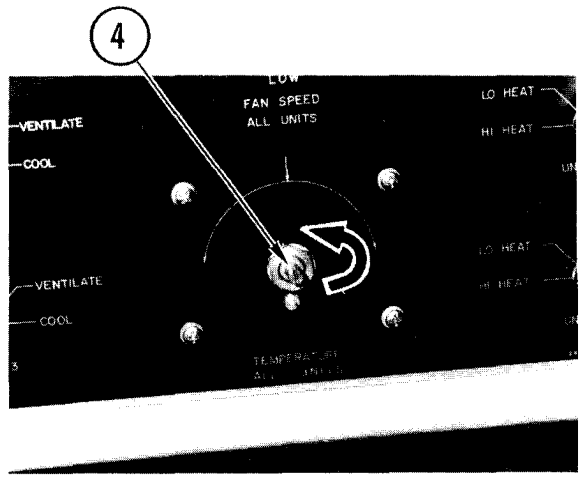
2. Using a hex key wrench, loosen two set screws at bottom and right-hand side of knob and remove temperature control dial.

NOTE

If necessary, reduce surrounding noise so that you can hear microswitch clicks inside the temperature control panel.

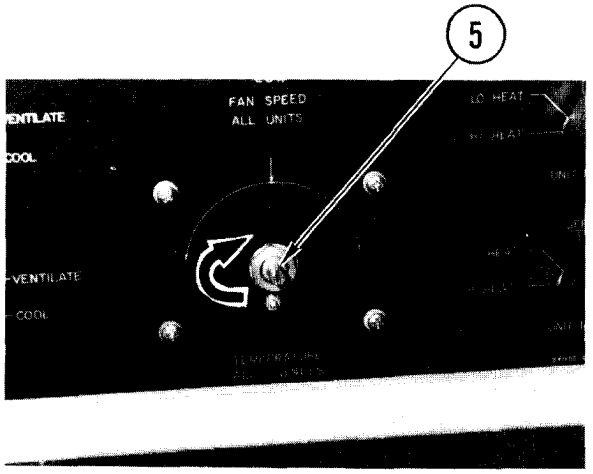
3. Place your ear close to the temperature control panel. Listen for the click of microswitches opening.

3-16. CALIBRATE TEMPERATURE CONTROL DIAL (CONT)



4. Use a flat tip screwdriver to slowly turn temperature control shaft about one-half turn to the left. The microswitch should click open.

   - When all four microswitches have clicked, go to step 5
   - If you do not hear four distinct clicks, replace temperature control switch and repeat steps 1 thru 4



5. Now turn temperature control shaft to the <u>right</u> until you hear the click of the microswitch closing.

   - When all four microswitches have clicked, go to step 6
   - If you do not hear four distinct clicks, tell your supervisor maintenance is required
   - If you are not sure, repeat steps 4 and 5

NOTE

The final switch setting will be found in the center of the microswitches.

6. Turn temperature control shaft back to the left until you hear all four clicks (switch openings).

7. Turn temperature control shaft to the <u>right</u> until you hear two clicks and stop.

3-16. CALIBRATE TEMPERATURE CONTROL DIAL (CONT)

CAUTION

Make sure stop screw on rear of temperature dial does not touch the control panel face.

8. Install temperature control dial on shaft.

9. Read the temperature on your accurate thermometer. Turn the temperature control dial pointer to the setting that matches the thermometer reading. Tighten both set screws.

10. If air conditioner was powered OFF, power unit back ON.

11. Note setting of control dial. Wait 20 to 30 minutes and recheck the setting against your accurate thermometer reading. They should match. If they do not, loosen set screws and repeat steps 8 thru 11.

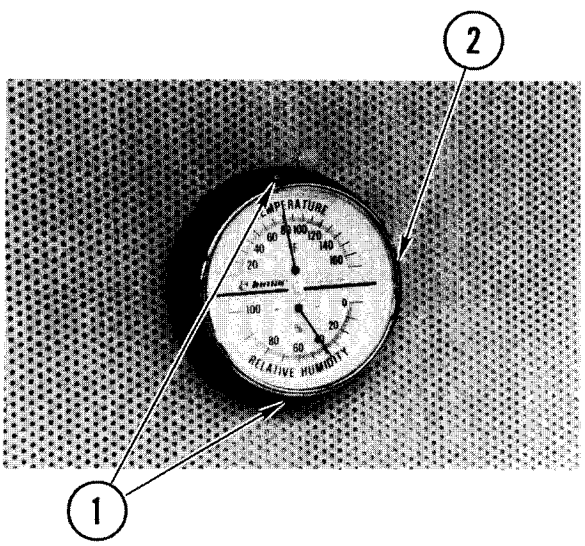
12. Remove thermometer.

3-17. CALIBRATE HYGROMETER

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare parts
- Strip of cloth 24 inches long X 12 inches wide



NOTE

Shock, rough handling during transport, or use of hygrometer over long periods of time in widely varying ranges of relative humidity may cause the measuring element to alter. It can sometimes be regenerated by exposing the element to saturated humidity.

CAUTION

Support the hygrometer with your free hand so that it does not fall when the last screw is removed.

1. Remove screws holding hygrometer to van bulkhead. Remove hygrometer,

2. If a known-good source of relative humidity measurement is available, the hygrometer may be calibrated by inserting a thin-bladed screwdriver into the access slot on the right-hand side of the case and turning the screw. If hygrometer reads correctly now, go to step 4.

3. If hygrometer does not read correctly, or if no alternate source of measurement is available, do the following:

   a. Wet strip of cloth thoroughly with water and wring out enough so that water does not drip.

   b. Fold cloth over several times lengthwise and wrap around slotted portion of the hygrometer case so that the dial remains visible.

3-17. CALIBRATE HYGROMETER (CONT)

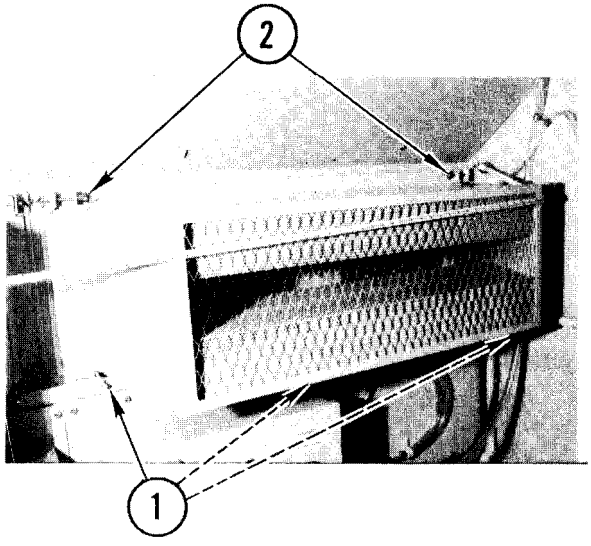
c. Wait 30 to 45 minutes and check relative humidity reading. it should now read 95%. If it does not, insert thin-bladed screwdriver into access slot on right-hand side of case and adjust until pointer reads 95%.

d. Unwrap cloth and let hygrometer stand for another 30 minutes. It should now show the actual relative humidity in the van.

e. If you have reason to suspect that the reading is still inaccurate, replace the hygrometer.

4. Position hygrometer on van bulkhead, insert screws and tighten.

3-18. REMOVE/REPLACE AIR CONDITIONER NOISE HOOD

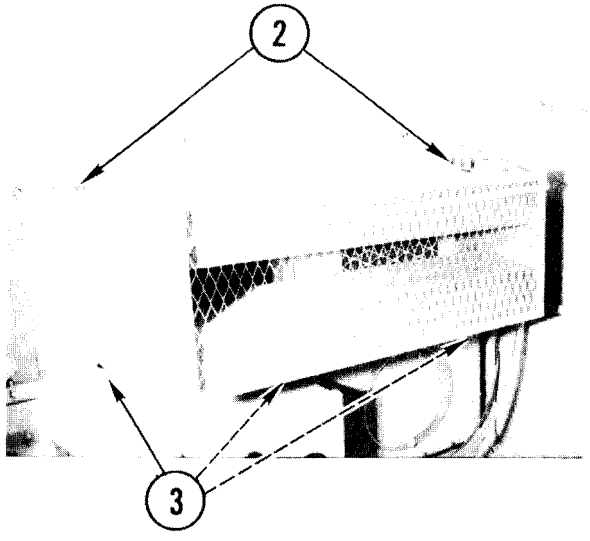


NOTE

There are two noise hoods installed in each van. Use this procedure to remove/replace either one.

Remove

1. Loosen three tension screws.
2. Pull and release two pin fasteners at top of hood.
3. Lift hood from mounting track.



Replace

1. Set bottom edge of hood in mounting track.
2. Position hood in position and secure with two push pin fasteners at top of hood.
3. Tighten three tension screws.

CHAPTER4
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

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Section 1. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Refer to TM-11-701O-2O5-23P for a complete listing and description of special tools, TMDE, and support equipment required by direct support maintenance.

4-3. SPARES AND REPAIR PARTS

Refer to TM-11-701O-2O5-23P for a complete listing and description of spares and repair parts required for direct support maintenance of this equipment.

Section II. TROUBLESHOOTING

4-4. GENERAL

This section contains tabular troubleshooting procedures together with associated software error tables to help you to isolate and correct a fault or failure in a major assembly, subassembly, and/or cable(s) in the system. These procedures isolate failure symptoms to the level shown in figure 4-1. The troubleshooting procedures are divided into the following major subsystem groups:

- AC power subsystem
- Environmental subsystem
- ADP subsystem
- Communications subsystem

Troubleshooting for the semitrailer van is found in TM 9-2330-362-14&P.

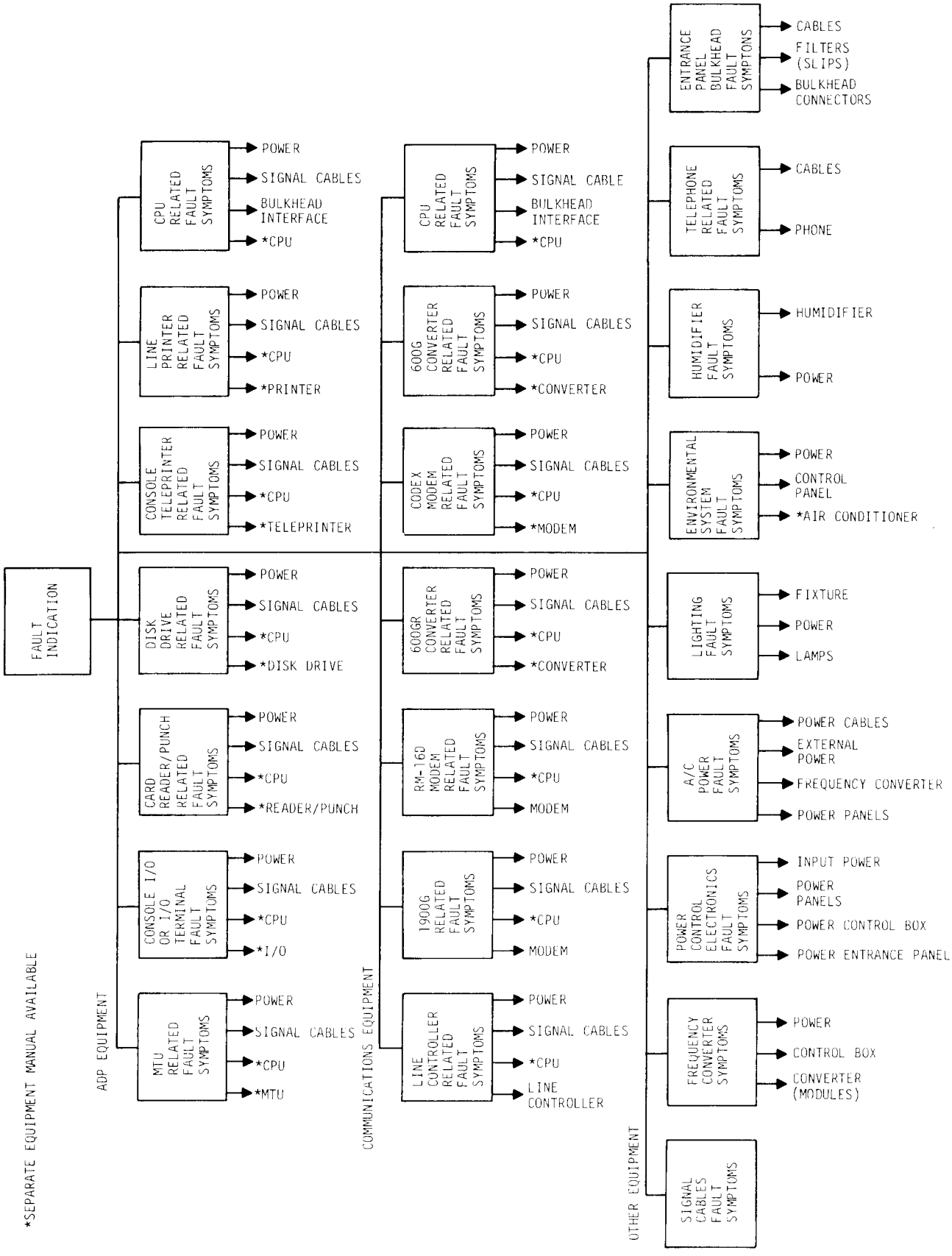


Figure 4-1. DAS3 D/C System Fault Isolation Tree

4-5. TROUBLESHOOTING PHASES

The most effective way to troubleshoot a fault in the system is to follow a routine which guides you through the five phases of troubleshooting (fig. 4-2). By following this routine you assure accurate use of fault isolation and repair procedures. You also improve your troubleshooting skills.

Each of the five phases in the troubleshooting routine is designed to accomplish a specific goal.

a. Fault Discovery. Usually, the operators or supervisor will notice faulty performance first. They must report the fault on the proper form so you have the facts you need for the next phase.

b. Failure Confirmation. If the trouble was reported by the operator, you must ask him/her:

- What happened? What is the exact nature of the symptom
- What were you doing when the failure occurred? What program was running
- What operating procedures were you following? Were they done correctly
- Did anything unusual happen just before you discovered the symptom
- Has this symptom happened before? If so, check the logbook to see what was done to fix it
- What action did you take

Whether reported by the operator or found during maintenance, you must confirm that a program fault is present. Try to duplicate the symptom by operating the equipment. Re-run the same program. If the symptom happened before, try to correct the fault the same way. If the suspected device has PWBs or cable connectors, reseat all PWBs and check all connections before troubleshooting.

Troubleshooting Entry. If you cannot accurately identify the symptom at this point, go to the SYSTEM CHECKOUT/SYMPTOM INDEX (table 4-5). It will help you to accurately identify the symptom and lead you to the appropriate troubleshooting table.

d. Trouble Isolation. Do the step-by-step isolation procedures in the troubleshooting tables to isolate and correct the cause of the failure. If the fault is an unusual one and you are unable to find and correct it using the tables, use alternative troubleshooting techniques (para 4-9).

e. After Maintenance. When you have found the cause of the trouble and performed the indicated maintenance, you must confirm that the problem is fixed. Perform the after-maintenance check (table 4-10). If it passes, you have corrected the problem. If it doesn't pass, use alternative troubleshooting to try to correct the fault and perform the checkout again.

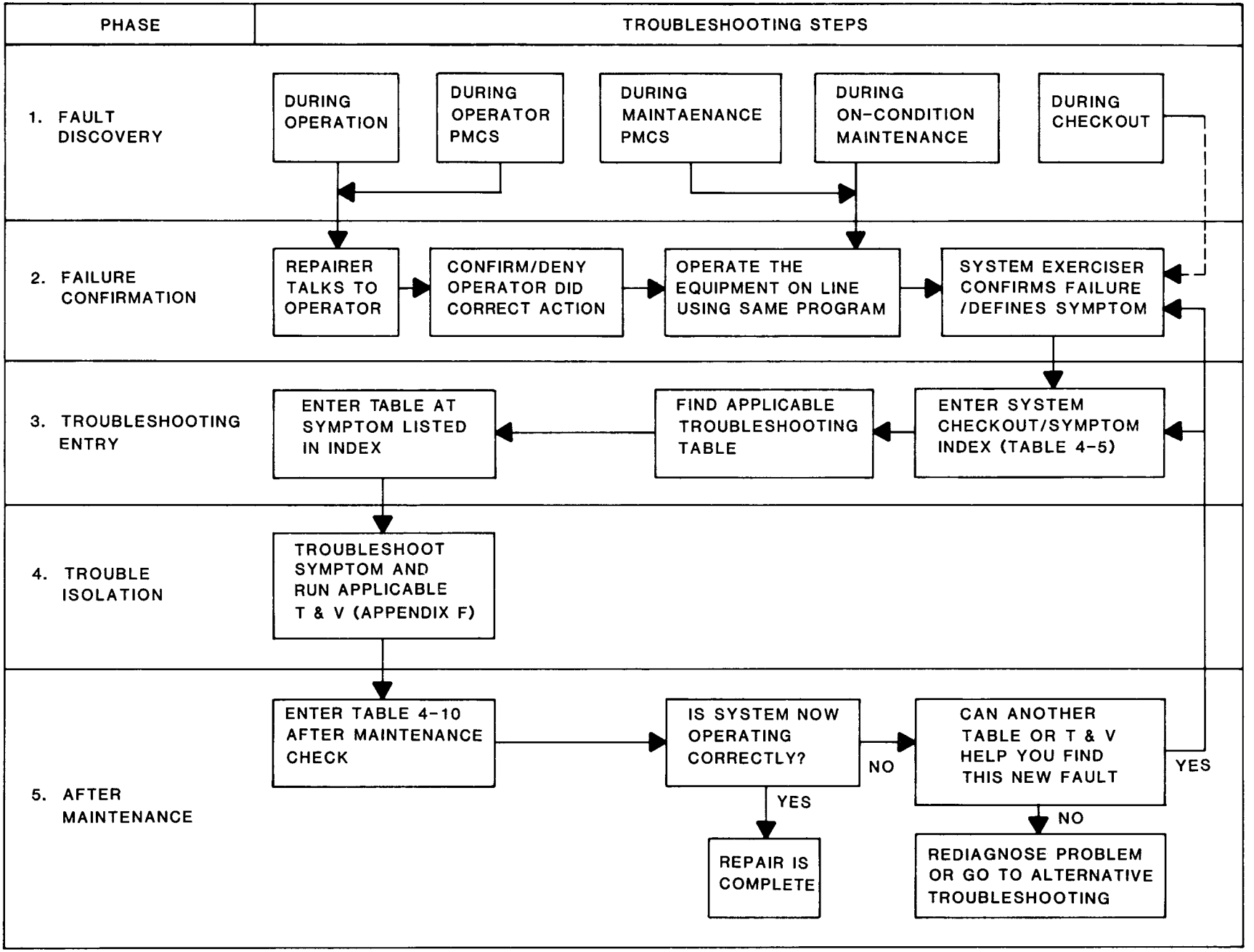


Figure 4-2. Troubleshooting Phases

4-6. INTERPRETING ERROR MESSAGES

Error messages are reported by the software. They may appear when you are running application programs or running the System Exerciser. They may also appear when you are running T & Vs.

Tables 4-1 through 4-4 list and define the majority of error messages which are reported by the software.

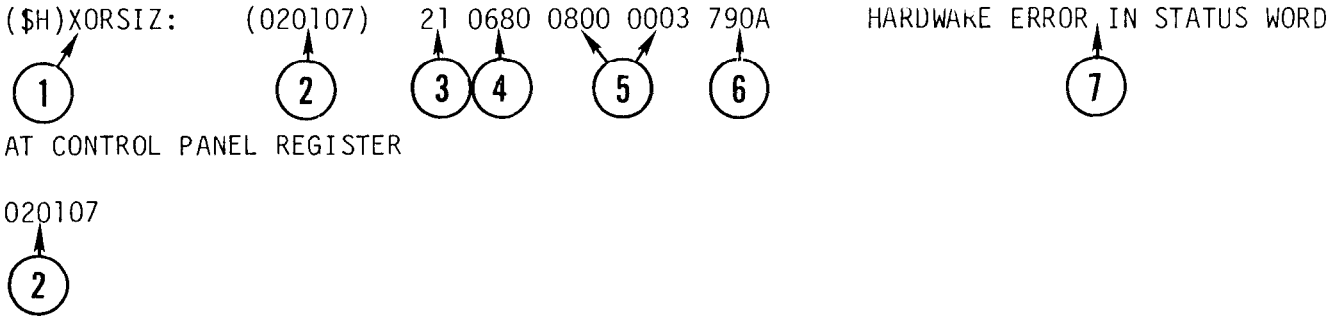
Error messages can appear on the screen of one of the terminals or on the register of the CPU control panel in the form of a six character error code. On the console terminal, the code usually will appear with some text explaining the nature of the report or error. The error code consists of a two character prefix which identifies the portion of the software reporting the error and a four character hexadecimal code which, when translated, tells you what software detected the error and what part of the software detecting the error was responsible for it. Regardless of where the error code appears, it will usually indicate software/ hardware error or a human error (physical 1/0 message). When you get an error message (fig. 4-3) you can recover using the procedures given in the message tables (tables 4-1 thru 4-4). Sometimes the error message points to a possible hardware fault, and you will be called into check it out.

a. Software/Hardware Errors. Figure 4-3 is a typical software/hardware error message as it would appear on your console terminal , or as it would appear on the control panel register.

b. Breaking Down the Error Code. In the event no text is available to alert you to he immediate cause of an error, what follows will show you how to translate the error code.

(1) The first two characters of the six character error code identify the software which reported the error (table 4-1). The next four characters are a hexadecimal code. The first two characters of the hexadecimal code identify the software that detected the error, and the last two refer to that area within the software that pinpointed the error. For the example, in figure 4-3, the 02 indicates the system, the 01 indicates equipment, and the 07 indicates logical communication. Table 4-1 lists the possible software error code identifiers and their locations in the system.

(2) The hexadecimal code, which comprises the last four characters of the error code indicates the software/hardware responsible for the error. The XX represents the error message identifiers (table 4-1).



(1) Reporting Component - Indicates the software routine detecting the fault. In this example it is the system exerciser.

(2) Software Error Code - Tells you which component of software was affected by the error. In error code 020107, the 02 represents the code for the software component reporting the error (table 4-1 gives a complete list of software reporting codes). The last four characters are a hexadecimal code that represents one of nine hardware based faults (table 4-2).

(3) Task Level Number - Interrupt level of the software component reporting the error.

(4) Hardware Channel - Gives the channel number of the faulty equipment when a hardware error is indicated. In this example, it is a disk drive on channel 0680.

(5) Software Status Word - Consists of either one or two hexadecimal codes which further pinpoint an error within the hardware/software. When two hexadecimal codes show up, it indicates a disk drive caused error. When one hexadecimal code appears it usually means a tape drive or printer caused error.

(6) Sector Number - Indicates disk pack sector number where error is occurring. This code appears only when a disk pack has a bad sector.

(7) Text Message - In this example the text message confirms that a hardware fault is present.

Figure 4-3. Typical System Message Reporting Hardware Error

Table 4-1. Software (XX) Error Message Identifiers

NOTE

The XX codes are the first two characters of the software error code. This table can also be used to define YY codes which are the middle two characters in the error code. The XX codes tell you which software component reported the error; the YY codes tell you which software component detected the error.

XX Code	Component
01	Physical I/0
02	File System
03	Trap Handler
04	Clock Manager
05	Semaphore Functions
06	Memory Manager
07	Logical Communications
08	Executive
OB	CLM Communications
OC	Message and Presentation Services
10	Assembler
11*	Linker
12	Utility Programs
13	Configuration Load Manager
16	Loader
17	System Commands
19	Editor
1F	On Line T & Vs
21	Patch
22	File Transmission Facility (FTF)
23	Macro Processor

* Code 11 is used for all codes/components not listed in this table.

Table 4-1. Software (XX) Error Message Identifiers -- Continued

XX Code	Component
26	COBOL Compiler
27	COBOL Object-Time Routines
28	RPG Compiler
29	RPG Object Program Routines
2C	Data Entry Facility-I
2D	HASP File Transmission
2E	2780/3780 File Transmission
2F	3270 File Transmission
31	Sort and Merge
33	Remote Batch Facility
34	Multi-line Communications Processor Dump (DUMCP)
38	Call/Cancel Errors
39	Login/Listener
3B	Error Logging
3D, 3E, 3F	Display Processing
40	Transaction Control Language Processor (TCLP)
41	Transaction Control Language (TCL)
	Compiler
43	BASIC Interpreter, Interpreter/Compiler and Run-Time
4A	Checkpoint and Restart
4B, 4C	Data Entry Facility-II
54	Logical HDLC
55	Node Control
56	Remote Concentration Facility
99, 16	Initialization Halt
	Operator Interface Manager
	Multi-User Debugger & SD DEBUG
A0-7F	Reserved for System Software Use
80-EE	User-defined
FO-FF	Reserved for System Software Use

Table 4-2. Software Error Codes Indicating Hardware Faults

NOTE

Since the YYZZ portion of the software error code can designate only nine hardware based faults, they are already translated in this table. If it is necessary to translate other software error codes not found in this table, go to table 4-3.

CODE	Message Indicated
XXO1O7	Hardware error. Use status word code to define. See table 4-1.
XXO1OA	Controller failure. Check connectors, cables etc.
XXO1OB	Hardware error. Check modem, comm lines etc.
XX023E	Disk write error.
XX0311	Memory or megabus failure. Run T & V.
XX0318	Memory or megabus failure. Run T & V.
X083F	1/0 error in disk drive.
XX1607	Disk drive error.
XX171E	Disk drive error.

Table 4-3. Hexadecimal Code Conversion

Hex Character	Binary Equivalent	Hex Character	Binary Equivalent
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

A Status Word code is always given in hexadecimal form. The sample given in figure 4-3 is 0800. You must first convert this to binary. If You convert each of the four characters, the result will be:

(0)	(8)	(0)	(0)
0000	1000	0000	0000

With the sixteen-character binary code you c 0an use the status bit chart below to find the “significant” bit.

Status bit: 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Binary code: 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0

In this case “4” is the only significant bit because it is the only bit showing “1” in binary code.

Once you have translated the hexadecimal code to binary and used it to find significant bits, you go to table 4-4 to define the meanings of the bits. Find "4" under Bit Position on this table and read across to disk drive (Remember 0680 on the error message told you this is a disk drive fault.) Under disk drive you see “read error” meaning disk drive 0680 is making errors when it reads data. This could be a bad read head or a bad board. Your troubleshooting tables will help you isolate this fault and determine the repair needed to correct it.

Table 4-4 . Status Word Bit Position Matrix

Bit Position	Card Reader/Punch	Printer	Disk Drive	Magnetic Tape	Terminals
0	-				
1	-			Rewinding	Read error
2	Data service rate error	-	Over/under-run	Retryable error	Data service rate error
3	Invalid ASCII code	End of form	Write protect error	Write protect error	-
4	Punch echo or read registration	-	Read error	-	Communications control block (CCB) service error
5	Light/dark check	-	Illegal seek	-	
6	Card jam		Missed data synchronization	BOT	Long record
7	-		Unsuccessful search	EOT	Poll failure
8	-		Missed clock pulse	Long record	NAK limit reached
9	-		Successful retry	Nonretryable error	Excessive checksum/parity errors
10	-				Nonzero residual

Table 4-4. Status Word Bit Position Matrix -- Continued

Bit Position	Card Reader/Punch	Printer	Disk Drive	Magnetic Tape	Terminals
11	-			Operation check	Phone hand-up
12	-			High density	-
13	-				Uncorrectable page overflow
14	-				Busy received
15	Fatal error	Fatal error	Fatal Error	Fatal error	Fatal error: bus parity or memory error

NOTE: - signifies a bit is not set

Table 4-5. System Checkout/Sympton Index

FAULT SYMPTOM NOTICED DURING FAILURE/RESTART	PROBABLE CAUSE	TABLE ENTRY
No lights lit on power entrance panel	External power not connected	Table 4-6. Symptom 3b
Van will not power ON	External power not getting to power control box	Table 4-6. Symptom 3b
Van powers ON but fluorescent lights will not light	Temperature in van too low	Table 4-6. Symptom 2
Input voltages and/or frequency out of tolerance	Improper voltage/ frequency from power line or power plant	Table 4-6. Symptom 1b
Fault warning light and/or horn comes on when power is applied at power control box	Contactor K1 on phase sequence relay cannot close	Table 4-6. Symptoms 6, 7
One or more air conditioners do not operate properly	Incoming power not in phase.	Table 4-6. Symptom 1a
	Circuit breaker or EMI filter open	Table 4-6. Symptom 8

Table 4-5. System Checkout/Symptom Index

FAULT SYMPTOM NOTICED DURING FAILURE/RESTART	PROBABLE CAUSE	TABLE ENTRY
No power at utility receptacles	Circuit breaker(s) or EMI filter(s) open	Table 4-6. Sympton 10
No technical power at tech power box	Bypass switch OFF or circuit breaker open in power distribution box or frequency converter not operating	Table 4-6. Symptoms 11 thru 15
Frequency converter power module LEDs dim or not lit	Power not distributed evenly	Table 4-6. Symptom 16
Frequency converter does not operate	No input power, over load trip or circuit breaker open	Table 4-6. Symptoms 10 thru 15
Temperature in the van too high or low	Air conditioning unit(s)	Table 4-7. Symptom 3
Data processing errors are occurring that are not found in software/hardware checks	Static electricity. Humidifier not working.	Table 4-7. Symptom 8
Erratic operation. Shorts suspected inside equipment	Humidistat set too high. Condensate on boards or contacts	Table 4-7. Symptom 9
Humidifier does not operate	Power failure or humidistat too low	Table 4-7. Symptoms 10, 11
Unable to condition disk packs because of excess ice or condensation forming	Environmental subsystem not balanced with outside/van conditions	Table 4-7. Symptom 14
Memory on indicator does not light when CPU is powered up and RESET button pushed	Memory save/autorestart circuit breaker not on	Table 4-8. Symptom 3c
DC ON indicator does not light	Power failure	Table 4-8. Symptom 6
LOAD, CHECK, and READY indicators do not light up when LOAD button is pressed	Faulty control panel	Table 4-8. Symptom 8b
EO or DO registers do not come up when selected	Frozen control panel	Table 4-8. Symptom 7
EO or DO register comes up but does not read 00000	QLT failure	Table 4-8. Symptom 8a

Table 4-5. System Checkout/Symptom Index -- Continued

FAULT SYMPTOM NOTICED DURING FAILURE/RESTART	PROBABLE CAUSE	TABLE ENTRY
Check indicator stays ON	Errors indicate controller or adapter board failure	Table 4-8. Symptom 8
System not ready to BOOT	Controller QLT failure	Table 4-8. Symptom 8
System will not BOOT	CPU control panel failure	Table 4-8. Symptom 9
System BOOTS but won't run program	Software error or software reporting a hardware problem	Table 4-8. Symptom 11
CHECK and TRAFFIC indicators stay ON after system is BOOTED and EXECUTE is pressed	CP or memory board failure	Table 4-8. Symptom 8c
B4 register does not register FFFFF when called up	Firmware segment of BOOTLOAD on CP board has failed	Table 4-8. Symptom 8a
TRAFFIC indicator stays lit	CPU/control panel repeater board failure	Table 4-8. Symptom 8c
Contents of register EO constantly changing	CPU control panel failure or repeater board failure	Table 4-8. Symptom 8c
Visual inspection or system exerciser indicates peripheral device failure	A device has failed to cycle up, come on line, or perform its function	Table 4-8. Symptom 12
Data error occurs during program run	A device has failed to produce data correctly	Table 4-8. Symptoms 12 or 13
Unscheduled/undefined halt has occurred during the run of a new program	Software failure or interfacing hardware has caused program to fail	Table 4-8. Symptom 13a
Unscheduled/undefined halt occurred during program run of a program that has been successfully run before	Operator entry error, program access error, or hardware failure	Table 4-8. Symptom 13b
T & V pack refuses to load	Disk drive adapter failure or incorrect I.D. input to register D2	Table 4-8. Symptom 10c

Table 4-5. System Checkout/Symptom Index -- Continued

FAULT SYMPTOM NOTICED DURING FAILURE/RESTART	PROBABLE CAUSE	FLOWCHART OR TABLE ENTRY
T & V program heading did not come up on console terminal when code name was keyed in	Operator error or hardware failure	Table 4-8. Symptom 17
Terminal screen blank	Device not receiving or power failure	Table 4-8. Symptom 11b, 12
No carrier signal or wrong LED indication at modem	Defective modem	Table 4-9. Symptom 8
System not processing request from remote communications device	Modem defective or MLCP not handling interface.	Table 4-9. Symptom 2
Remote unit requesting access to system not receiving hookup or reply	Modem defective, switches not set properly or input connection defective	Table 4-9. Symptoms 1 thru 5
System receiving communications but a high level of interference is present	Defective filters or line protectors	Table 4-9. Symptom 6
Communications subsystem not receiving power	All circuit breakers not in ON position	Table 4-9. Symptom 10
System unable to establish communications in chosen mode	Signal flow path not set up properly	Table 4-9. Symptom 8
Carrier signal present but communications data link not made	Operator error or hardware failure	Table 4-9. Symptom 8
Remote channel inoperative	CPU MLCP failure, cabling or modem	Table 4-9. Symptoms 2 and 5
Carrier present at modem but remote channel not operational	MLCP failure or cabling	Table 4-9. Symptom 5
Auto dial inoperative	MLCP failure, modem or filters defective	Table 4-9. Symptom 7
Telephone communication between vans inoperative	MLCP failure modem, slip, or filter defective	Table 4-9. Symptom 7
Power indicator on modem flashing or out	Power supply failure	Table 4-9. Symptom 9

4-7. USE OF TROUBLESHOOTING TABLES

When the CHECKOUT/SYMPTOM INDEX directs you to a troubleshooting table, always read through the entire table before you start following the directions on the table. This will help you understand the nature of the fault and make it easier to correct.

a. Follow one step at a time. Even if you suspect multiple problems, troubleshoot only one problem at a time. When you've solved that problem, move on to the next.

b. Read each step carefully. Before doing a task, be sure you understand what the instructions mean.

c. Do exactly what each step tells you. Do not take shortcuts. They usually cost you more time.

d. Make a note of where you are at each step. This will help you return to the proper place after doing a test.

e. Never skip a step. Following each step in order is the surest, most efficient way to solve the problem. . It keeps you from getting lost and from causing problems by overlooking a necessary step.

f. Write down all test results. You will need these results for later decisions. If you're uncertain about a procedure, you can recheck your notes and retrace your steps.

g. Don't get stuck on only one corrective action. If one doesn't work, recheck your notes and retrace your steps. Determine how and why you got to where you are. Recheck each step to see if you could have made an error in choosing the symptom/probable cause.

4-8. REFERENCE TO A MAINTENANCE PROCEDURE

As you follow the directions on the troubleshooting tables, you will be led to a maintenance procedure which can correct the fault. The reference will be to a paragraph in section IV or to a specific TM for a device. Do all the steps unless the reference tells you to do only some of the steps. Then do only the steps called for in the reference.

4-9. ALTERNATIVE TROUBLESHOOTING TECHNIQUES

When a failure has a unique symptom not covered in the CHECKOUT/SYMPTOM INDEX or when the failure is not corrected by using the troubleshooting tables, you must try alternative troubleshooting techniques.

- Review chapter 2 and make sure you understand how the equipment functions
- Use the support diagrams in appendix D to check out the circuits for the fault area

- Check the system logbook to see if this fault has occurred in the past and how it was corrected
- If possible, talk to other repairers. They may be able to help you solve the problem and correct the fault

4-10. AFTER MAINTENANCE CHECK

Whether you use a troubleshooting table or an alternate troubleshooting technique to correct a fault, you must always check your work after maintenance.

a. If the device has a self-test capability, run the self test to assure device readiness.

b. If the device can check operation by a single task, such as the card reader/punch punching a fully laced card (see TM 11-7040-200-23), go through the procedure.

c. Run the T & V (Appendix F) associated with the device (always run T & V, even if device passes self test) to confirm that system is operating properly.

NOTE

If repair involved board swapping, try the suspected faulty board in the device again to make sure it really is faulty. Sometimes dirty contacts or loose connections make it appear that a board is faulty.

You must confirm that the problem is fixed. Perform the system-checkout-after-maintenance (table 4-10). If it passes, you have corrected the problem. If not, go back to the SYSTEM CHECKOUT/SYMPTOM INDEX again and try to determine if another fault is causing the problem to continue. Discuss the problem again with the operator and your supervisor. Perhaps a symptom was overlooked. Tell your supervisor that the repair will take longer to fix. Have the operator run the system exerciser again if necessary.

4-11. TROUBLESHOOTING PROCEDURES

The system troubleshooting tables guide you through a step-by-step trouble isolation procedure for each symptom you may identify. The tables are made up of symptoms, probable causes, and suggested corrective actions. Individual device troubleshooting flowcharts or tables are in their respective device manuals:

Console Printer (See TM 11-7025-233-23)
Disk Drive (See TM 11-7025-208-23)
Keyboard-Display (See TM 11-7025-211-23)
Tape Cleaner (See TM 11-7035-203-23)
Tape Drive (See TM 11-7025-209-23)
Line Printer (See TM 11-7025-232-23)
Isolator (See TM 11-7010-206-23)
V.29 Modem (See TM 11-7025-234-23)
Converter (See TM 11-7010-200-23)
Card Reader/Punch (See TM 11-7040-200-23)

4-12. AC POWER SUBSYSTEM TROUBLESHOOTING

The power control box has monitoring and self-test devices to warn of trouble and help you isolate problems in the ac power subsystem. The purpose of these devices is explained below. Their use in troubleshooting is detailed in table 4-6.

- Frequency meter - monitors 50 Hz or 60 Hz power, as selected by frequency selector switch
- Voltmeter - monitors 120 volts ac, one phase at a time as selected by phase selector switch
- Phase Sequence Relay with Warning Horn and Light - automatically tests for the following conditions:

  Phase sequence of incoming power is A-B-C

  Voltage of each phase is 120 volts or higher

  Fuses F1, F2 and F3 in control and monitor box are good

  If one or more of these conditions are not satisfied, the relay cannot close. This causes the following actions:

  Fault warning horn sounds

  Fault warning light comes on

  Main contactor K1 of relay is prevented from closing. Even if POWER ON button is pressed, ac power cannot be applied to power distribution box.

Start your troubleshooting by looking up the SYMPTOM that has appeared in your system. The PROBABLE CAUSE of that symptom s listed in the next column in the most likely order of occurrence. Then, take the CORRECTIVE ACTION in the last column.

Table 4-6. AC Power Subsystem Troubleshooting

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Fault indicator light comes on and horn sounds when POWER ON button is pushed.	a. Incoming power not in A-B-C phase sequence.	a. Turn off power, connect power cable for correct phase.
	b. Incoming voltage from power plant too low.	b. Set power plant voltage to correct setting for 50 Hz or 60 Hz operation. (See TM 5-6115-465-12.)
	c. Fuse F1, F2, or F3 open.	c. Check fuses, replace if open.

Table 4-6. AC Power Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
2. Fluorescent lights will not come on.	a. Air temperature below O°F, van not warmed up.	a. Turn on incandescent lamps until van is warmed. Turn off when fluorescent come on. WARNING Dispose of defective lamps carefully. Do not break lamp. Internal powder is toxic.
	b. Defective fluorescent 1 amp	b. If ends of tube are dark, replace lamps.
	c. Defective ballast	c. Replace ballast (para 4-85).
3. No voltage or frequency readings on power control box.	a. Main circuit breakers CB60 and CB1OO not closed or defective. (Twelve power line protector lights on.)	a. Close breakers. If still no power, measure phase voltages in and out of CB60 and CB1OO. If no output voltage on one or more phases, replace breaker(para 1-107). If no input voltages, disconnect power from van, and check continuity of wiring from power entrance panel to CB60 and CB1OO input. Replace defective wiring.
	b. External power not connected properly (twelve power line protector lights off).	b. Inspect input power cables and switches. Replace as required.
4. No voltage reading on any phase on power control box, but 12 power line protector lights on and frequency meter reading okay.	Voltmeter defective	Put known good voltmeter in parallel with meter. If substitute meter readings okay, replace meter in box (para 4-87).
5. No voltage reading on A phase in power	a. Fuse F1 open.	a. Check fuse, replace if open (para 4-87).

Table 4-6. AC Power Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
5. (Continued)	b. Resistor R1 open.	b. Open CB1OO. Measure for continuity and ohm value of R1. Replace R1 if open or resistance value not 150 ± 10 ohms.
6. Contactor K1 cannot be heard to close when POWER ON button is pushed. NOTE Contactor K1 operates on voltage potential between phases A and C.	a. Power not available, see item 3, above.	a. Make sure power cables are connected properly, power is on and main breaker is closed.
	b. Fuse F3 or F5 open.	b. Check fuses. If one is open, find and fix cause for blown fuse, then replace fuse (para 4-87).
	c. Switch S4 defective.	co Open CB1OO. Measure continuity through S4. If open, replace switch (para 4-87).
	d. Contactor K1 is defective.	d. Open CB1OO to remove power. Measure for continuity across coil of contactor. If open, replace contactor (para 4-87).
7. Contactor K1 will not hold when POWER ON button is pushed then released.	a. Fuse F4 open.	a. Check fuse. If open, fix cause then replace fuse (para 4-87).
	b. Switch S4 defective.	b. Open CB1OO. Measure resistance through S4. If resistance is more than 2 ohms, replace switch (para 4-87).
	c. One of two sets of holding contacts on K1 open.	c. Hold POWER ON button down. Quickly check voltage across suspected contacts. If voltage reading occurs, contacts not closing; replace K1 (para 4-87).
8. One air conditioner will not operate.	a. Circuit breaker CB1, CB2, CB3 or CB4 in power distribution box is defective.	a. Measure phase voltages in and out of suspected breaker. If no output voltage on one or more phase conductors, replace

Table 4-6. AC Power Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8. (Continued)		a. (Continued) breaker. If no input voltage, check output voltage at CB1OO. If no output voltage, replace CB1OO. If output voltage at CB1OO but no input voltage at CB1, 2, 3 or 4, shut down power at CB1OO and measure continuity of wiring between CB1OO output and air conditioner circuit breaker input. Replace defective wire(s).
	b. One or more EMI filters open.	b. Measure voltage in and out of suspected filter. (Check continuity through filter on neutral conductor.) If no output voltage (or no continuity), replace filter (para 4-88).
9. INPUT POWER light on frequency converter will not come on.	a. Circuit breaker CB1 open.	a. Close breaker if open.
	b. Circuit breaker CB1 defective.	b. Measure phase voltages in and out of breaker. If no output voltage on one or more phase conductors, replace breaker (para 4-91).
	c. Circuit breaker CB40 in power distribution box open.	c. Close breaker if open.
	d. Circuit breaker CB40 defective.	d. Measure phase voltages in and out of CB40. If no output on one or more phases, replace breaker (para 4-107).
	e. One or more EMI filters (FL7, FL8, FL9 or FL1O) open.	e. Measure voltage in and out of suspected filter. (Check continuity through filter on neutral conductor.) If no output

Table 4-6. AC Power Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
9. (Continued)		e. (Continued) voltage (or no output continuity), replace filter (para 4-88).
10. Utility power receptacles all dead.	a. Circuit breakers CB60 and CB25 power distribution box open.	a. Close breakers if open.
	b. Circuit breaker CB60 defective.	b. Measure phase voltages in and out of CB60. If no output voltage on one or more phases, replace breaker (para 4-107). If no output voltdge at CB60, replace CB60. If output voltage at CB60, check continuity of wiring between CB60 and CB25. Replace defective wire(s).
	c. Circuit breaker CB25 defective.	c. Check output voltage at CB25. If no output on one or more phases, replace CB25.
	d. One or more EMI filters (FL11, FL12, FL13, or FL14 defective.)	d. Measure voltage in and out out of suspected filter. (Check continuity through filter on neutral conductor.) If no voltage output (or no continuity), replace filter (para 4-88).
11. No frequency converter output.	a. No input power.	a. Apply input power.
	b. CB1 tripped.	b. Reset CB1. If trip is repeated, check for fault in input circuitry.
	c. Overcurrent trip (indicator lit).	c. Check load; if load is proper, replace logic module (para 4-95). Push reset.
	d. Overtemperature trip (indicator lit).	d. Unit will restart when temperature falls.

Table 4-6. AC Power Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
11. (Continued)	e. Failed power inverter module(s).	e. Failure of more than two power inverter modules may cause loss of output. • Check for fuse lights and replace blown fuses. If fuse opens again, replace power inverter module(s) (para 4-97) • Sudden failure of all power inverters may be result of failed logic module
	f. Failed logic module.	f. Replace logic module (para 4-95).
	g. Open resistor R1 or R2 in frequency converter.	g. Check resistance. Replace resistor if faulty.
	h. Failed output transformer T2.	h. Check for open windings. Replace T2 (para 4-102).
12. Low frequency converter output voltage.	a. Low input voltage.	a. Operate only from the specified voltage.
	b. Failed contactor K1.	b. Replace K1 (para 4-93).
	c. Failed power module.	c. See procedure under “No output” (item 11).
	d. Failed logic module.	d. Replace logic module (para 4-95).
	e. Shorted capacitor C1.	e. Replace Cl (para 4-100).
13. Repeated frequency converter overtemperature trips.	a. Air inlet filter dirty.	a. Replace filter (see TM 11-7010-203-10).
	b. Excessive ambient temperature.	b. Reduce temperature in van.
	c. Failed bl ower(s).	c. Replace failed blower(s) (para 4-90).
	d. Electric load is too great.	d. Reduce load.

Table 4-6. AC Power Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
13. (Continued)	e. Air outlet blocked.	e. Remove blockage.
14. Frequency converter input-power circuit breaker trips and repeats.	a. Shorted winding in transformer T1.	a. Replace T1 (para 4-103).
	Ab. Shorted rectifier (CR1 through CR6).	b. Replace failed rectifier (para 4-104).
	c. Failed start-up contactor K1.	c. Replace K1 (para 4-93).
15. Frequency converter has no output current reading on meter.	Failed current transformer T3.	Check for open windings. Replace T3 if necessary (para 4-98).
16. Frequency converter power module LEDs dim or not lit with a nominal load of 62 amps	a. Bad fuse.	a. Check fuses. Replace if open (para 4-96).
	b. Failed power module.	b. See lle for corrective action.
	c. Failed logic module.	c. Check output voltage, check load. If load is OK, replace logic module (para 4-95).

4-13. ENVIRONMENTAL SUBSYSTEM TROUBLESHOOTING

Table 4-7 contains the troubleshooting information that will help you isolate and correct faults that can occur in the environmental subsystem. Start your

Troubleshooting by looking up the SYMPTOM that has appeared in your system. The PROBABLE CAUSE of that symptom is listed in the next column in the most likely order of occurrence. Then, take the CORRECTIVE ACTION in the last column.

This information treats the four air conditioners and the temperature control panel as a subsystem. Most faults that can occur in the air conditioners are not considered. If a fault occurs within one of the air conditioners, do troubleshooting as described in TM 5-4120-360-14.

Table 4-7. Environmental Subsystem Troubleshooting

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. Fan speed will not switch from LOW to HIGH for any air conditioner.	FAN SPEED switch S1 faulty (fig. FO-4).	Replace switch S1 (para 4-41).
2. Fan speed will not switch from LOW to HIGH for only one air conditioner.	a. Faulty relay in affected air conditioner (see TM 5-4120-360-14).	a. Replace air conditioner with known good unit (para 4-56).
	b. Open contacts in FAN SPEED switch S1 (fig. FO-4).	b. Turn off power and check for continuity through S1. If open, replace switch (para 4-41).
	c. Open wire in Temperature Control Panel EA5 (fig. FO-4).	c. Turn off power and unplug J7-1, J7-2, J7-3 or J7-7 as applicable. Check for continuity from affected J7-X pin via SIA, SIB, SIC or SID and S2 and S8 as applicable.
3. Temperature in van varies more than 10 degrees from dial setting.	a. Air conditioners not turned on in correct sequence.	a. Reset air conditioner operating controls.
	b. Faulty microswitches in switch S6 (fig. FO-4).	b. Turn off power. Check for continuity through switch contacts as temperature control dial is rotated. If open, replace switch.
	c. Dust or dirt accumulated around temperature sensing probe.	c. Vacuum debris away from probe. Wipe clean with alcohol and soft, clean cloth.
	d. Air conditioner air inlet filters clogged.	d. Remove and clean filters.
	e. Fresh air vents full open (too much outside air).	e. Close vents.
4. One air conditioner runs but does not provide cooling or heating or is noisy.	a. Faulty air conditioner. (See TM 5-4120-360-14).	a. Replace air conditioner with known good unit (para 4-56).

Table 4-7. Environmental Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
4. (Continued)	b. Air conditioner cover closed and unit overheats.	b. Open outside cover and allow unit to cool.
5. One or more air conditioners will not run.	a. Applicable circuit breaker CB1, CB2, CB3 or CB4 in Power Distribution box not closed.	a. Check breakers for open or tripped setting. Reset as required.
	b. Faulty circuit breaker in Power Distribution box.	b. Replace breaker (para 4-107).
6. No air conditioner will run.	a. Circuit breakers CB1, CB2, CB3 and CB4 not closed during van emplacement.	a. Check and close breakers (para 4-107).
	b. Circuit breaker CB1OO in power distribution box open.	b. Close circuit breaker.
	c. Circuit breaker CB1OO defective.	c. Measure phase voltages in and out of CB1OO. If no output voltage on one or more phases, replace breaker (para 4-107).
	d. One phase of the power line is open.	d. Troubleshoot the AC power subsystem (para 4-12).
7. Air in van is stale and/or odors noticeable.	a. Fresh air vents on operating air conditioners closed.	a. Open vents.
	b. Personnel smoking in van.	b. Prohibit smoking in van.
	c. Odors drawn in from outside.	c. Close fresh air vents as much as possible. Correct outside conditions if possible.
	d. Food consumed or stored in van.	d. Prohibit food in van.

Table 4-7. Environmental Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8. Air in van is very dry and static electricity causes data processing errors.	a. Humidifier water tank empty.	a. Fill water tank with distilled water (see symptom 12).
	b. Pump not running, lights and horn off.	b. Check fuses, then EA6 circuit.
	c. Humidifier not working.	c. Repair humidifier (see symptoms 10 through 13).
	d. Air conditioner outside air vents too far open in extremely dry climate.	d. Close air vents to minimum allowable for fresh air entry.
	e. Doors open too much in extremely dry climate.	e. Keep doors closed as much as possible.
9. Air in van is damp and condensation forms on cool surfaces.	a. Humidistat set too high for temperature in van.	a. Put humidistat on lower setting to keep humidity about 40 percent to 50 percent.
	b. Air temperature in van too cold for good operation of ADP equipment.	b. Raise temperature in van to about 70°F.
	c. Air conditioner outside air vents too far open in extremely damp climate.	c. Close air vents to minimum allowable for fresh air entry.
10. Humdifier will not operate.	a. Circuit breaker CB8 in Utility Power Panel open.	a. Check and close CB8.
	b. Circuit breaker CB8 defective.	b. Check power in and out of closed CB. If open, replace breaker (para 4-81).
	c. System switch is off or defective.	c. Replace switch in ON position. Check switch.
	d. Humidistat set too low.	d. Check humidistat setting; raise to higher value than relative humidity in van.

Table 4-7. Environmental Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
10. (Continued)	e. Faulty humidistat.	e. Raise and lower humidity setting; listen for c lick as control passes val ue of van humidity. If no click, replace humidi stat (para 4-44).
11. Humidifier operates but does not produce water vapor.	a. Humidifier clogged.	a. Clean humidifier.
	b. Relative humidity in van already near vapor saturation level.	b. Humidistat setting too hiqh. Additional humidity not needed.
	c. Pump float valve stuck closed.	c. Repair or replace humidifier float assembl Y (para 4-46).
12. Humidifier and tank runs out of water in 6 hours or less.	a. Fresh air vents on operating air conditioners set wide open in very dry weather conditions.	a. Close air vents, then crack open one bead on chain, or more if weathe r and van conditions permi t.
	b. Rear or side door left open excessively during very dry weather conditions.	b. Establish control to keep doors closed as much as possible. Keep FAN SPEED switch on LOW if feasible.
	c. Van air temperature too high.	c. Lower temperature dial setting. Keep van below 80°F if possible.
13. Humidifier becomes clogged frequently.	Water supply contains too many minerals.	Drain water tank. Drain and clean humidifier. Refill tank with distilled water.
14. Condensation or ice forms on disk packs stored near floor of van.	a. Temperature in van too low for good operation of ADP equipment.	a. Raise temperature in van to about 70°F.
	b. Extremely cold outside temperature prevents keeping lower portion of van above 60°F.	b. Store disk packs at higher level in cabinet. Keep doors open to allow warmer air circulation around disk packs.

Table 4-7. Environmental Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
14. (Continued)	c. Humidity level too high.	c. Do one or more of the following: ● Use lower humidistat setting ● Operate van at higher temperature ● Run air conditioner(s) to remove humidity if temperature is too high

4-14. ADP SUBSYSTEM TROUBLESHOOTING

Table 4-8 contains the troubleshooting information that will help you isolate and correct faults that can occur in the ADP subsystem. The majority of the major assemblies in the ADP subsystem have some form of self-test capability, either on line or off line, together with fault and/or diagnostic status indicators which signify what operation or functional subassembly is faulty. These indicators or status displays can be very useful in isolating or correcting a fault within the system. Their purpose and use are detailed throughout the procedural steps in table 4-8.

Start your troubleshooting by looking up the SYMPTOM that has appeared in your system. The PROBABLE CAUSE of that symptom is listed in the next column in the most likely order of occurrence. Then, take the CORRECTIVE ACTION in the last column.

Table 4-8. ADP Subsystem Troubleshooting

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. ADP subsystem won't power on	Bypass switch not in FREQUENCY CONVERTER ON or BYPASS ON position.	Set bypass switch to FREQUENCY CONVERTER ON or BYPASS ON position.
2. Peripheral device won't power on.	a. Tech power box circuit breaker(s) not set to ON position.	a. Set breaker(s) to ON position and retry power ON sequence.
	b. Device not powered ON or not set up for on-line operation.	b. Make sure device is powered ON. Place device on line.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
2. (Continued)	c. Device has PDU with circuit breaker not ON.	c. Power ON PDU circuit breaker and repeat start sequence.
3. CPU won't power ON.	a. CPU control panel power switch not set to ON.	a. Set switch to ON position.
	b. Circuit breaker at bottom of CPU cabinet not set to ON position.	b. Set breaker to ON position and power on CPU.
	c. Memory save unit circuit breaker at bottom of CPU cabinet not set to ON position.	c. Check "memory ON" indicator. If not lit, set circuit breaker to ON position, press RESET button and power ON CPU.
	d. PDU fuse burnt out.	d. Check all fuses. Replace bad ones. If fuses blow again, replace PDU (see TM 11-7021-200-23).
	e. Failure in one of the CPU power supplies.	e. Replace power supply (TM 11-7021-200-23).
	f. Failure in memory save unit.	f. Check memory save power supply output. Rep1ace faulty unit.
4. Breakers and switches all ON, all fuses are OK, but CPU won't power ON.	No 120 V ac getting to PDU.	Check AC input with voltmeter. If PDU is not getting 120 V ac, check the power cord for damage or a broken plug. If cord or plug is damaged, replace it. If plug is not seated, plug it in. If AC power is still not available, troubleshoot AC power subsystem (table 4-7).
5. Power supplies in PDU are OK but CPU won't power ON.	No voltage between power supply and backplane or voltage is faulty.	a. Check voltage: (1) Power OFF CPU. (2) Set CPU circuit breaker in tech power box to OFF position.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
5. (Continued)		(3) Remove boards from five-slot section of backplane that is powered by the supply that appears to be causing problem. (4) Power ON tech power box breaker and CPU. (5) Using voltmeter, measure +5, +12, -12, and +18 dc voltages on backplane (see Appendix D). (6) Power OFF CPU and tech power box breaker. Check continuity of wires and backplane connections. (7) Replace bad card cage (backplane), wires or connectors (TM 11-7021-200-23).
6. CPU control panel switch is set to ON but DC ON indicator not lit.	Power supply failure.	Go back to step 3 and troubleshoot again. If CPU is powered ON and DC ON indicator still not lit, replace control panel.
7. CPU control panel locked up (frozen). NOTE Control panel is locked up or frozen when the register contents cannot be called up by pressing the proper buttons.	a. Panel locked.	a. Turn panel key to the right to unlock panel.
	b. System awaiting operator action.	b. Enter correct I.D., command or data.
	c. Panel locked in CHANGE mode.	c. Press STOP, CLEAR, LOAD and EXECUTE QLTs should run.
	d. QLT failure in CPU.	d. Power OFF CPU and tech power box breaker. Do the following steps in order: (1) Remove all boards from backplane except CP board and move terminator up.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
7. (Continued)		(2) Power back ON. (3) Press STOP, CLEAR, and SELECT. (4) Try to select various registers. If YOU can't get more than one register, or if EO or DO registers, do not register 00000, replace CP board (see TM 11-7021-200-23) and do checkout after maintenance (Table 4-l0). (5) Power OFF. Re-install controllers one at a time, starting with the memory. NOTE Each time a board is re-installed, the lower boards and the terminator must be moved up to create a continuous backplane. (6) Run QLTs and check to see if panel is un-frozen now. If board is faulty, QLTs will fail and panel will freeze up. NOTE A CHECK indicator lit continuously after the register clears indicates more than one controller is faulty.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
7. (Continued)		(7) Replace faulty controller/adapter and do system checkout after maintenance (Table 4-10).
8. CPU QLTs won't pass.	a. Operator error occurred during key-in of QLT sequence.	a. Press SELECT, then enter E and O on hexpad keys. Register should display EO 00000. If it doesn't, go back to step 7 and troubleshoot for frozen control panel. If it does, press STOP, CLEAR, LOAD and EXECUTE. The TRAFFIC, RUN, READY and CHECK indicators should light up. After a period of a minute or so, the registers should clear and read: ● EO 00002 ● B4 FFFFF ● D1 00400 The TRAFFIC and CHECK indicators will go out. If they do not and control panel is not frozen, retry the sequence. If the CHECK indicator will not go out, go to step 8b.
	b. Faulty CPU control panel.	b. Press LOAD button. LOAD, CHECK, and READY indicators should light up. If any do not light, replace CPU control panel.
	c. Faulty CPU control panel or repeater board.	c. If TRAFFIC indicator stays ON, check all connections between CPU control panel and CP board. (1) Power OFF CPU.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8. (Continued)		(2) Using ohmmeter, check continuity of connectors and wires between control panel and repeater board and between repeater board and CP. Check all pins and connections for bent or dirty contacts. Replace any bad cables or connectors. (3) Reseat all connectors, power ON and press EXECUTE. • If TRAFFIC and CHECK indicators do not go OFF, try to change the contents of a register. If you cannot, replace control panel. If problem still persists, replace the repeater board
	d. PDU fuse burnt out	d. Check all fuses. Replace bad ones. If fuses blow again, replace PDU (see TM 11-7021-200-23).
	e. Bad connections, bent pins, broken or dirty contacts, board(s) not seated properly or in wrong slot.	e. Power OFF CPU. Set CPU breaker in tech power box to OFF position before opening CPU cage door: (1) Reseat all boards. (2) Check and reseat all cable connectors.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8. (Continued)		(3) Check position of all boards in backplane. Boards must be in the proper slots with no spaces between. Top and bottom of cage must contain a terminator/air baffle.
		(4) Power back ON. Press CLEAR, LOAD and ExeCUTE ● If QLTs pass and registers read as indicated in step 8a, you are ready to boot system ● If QLTs still do not pass, re-diagnose the problem by matching the BO or EO register error reading with those listed in the CPU halt conditions table
		(5) Replace faulty board(s) in CPU and run QLTs (TM 11-7021-200-23). Do system checkout after maintenance (table 4-10).
9. System will not boot	a. Wrong control panel indication.	a. Check all CPU control panel indicators: ● READ or WRITE indicator lit denotes system waiting for operator to input data or command. Enter proper data or command and press RUN and EXECUTE

REGISTER	HALT CONDITION	PROBABLE FAULT
BOOFF80	Instruction set timed out	CP board
B0OO044 6000049 BOOO08F BOOOO03	Memory failed to acknowledge CP on bus request	Memory adapter board
6000007 BOOO03F	Memory management unit failure	MMU adaptor on CP board
BOOO097	Memory acknowledged CPU bus request but CP has failed	CP board
BOOO093	External interrupt on megabus	Go to step 7d

NOTE

An EO register reading of 000A2, OOOBA, 000CO or 000D2, will always indicate a memory fault. Any other EO register reading (except EO 00002) will be related to the software bootload circuits on the CP board.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
9. (Continued)		● EO register contents indicators constantly changing and READY and RUN indicators not lit. Replace CPU control panel
	b. Input media such as disk drive pack, diskette or tape not loaded, stabilized, or cycled up properly.	b. Correct program loading procedure and try to boot the system. If reboot fails, switch to another input media until the fault is isolated. Replace software or go to device TM to troubleshoot loading device. If problems persist, go to steps 10 or 12.
10. Program will not load	a. Loading device channel address is different than the address in register D1.	a. On CPU control panel hex pad, input correct channel address into register D1. Boot system.
	b. CPU does not recognize device I.D. Load indicator stays lit.	b. Input correct I.D. number into register D2.
	c. CPU register D2 does not receive input, still reads D2 00000 after attempt to load program.	c. Check address switch positions on applicable controller. Input device not able to input to correct I.D.
		● If register D2 content matches device I.D., check 07 register for status. If D7 reads D708000, which indicates a software loading problem, go to step 11
		● If register D2 does not match device I.D., or 07 does not read D708000, problem is in input device. Go to step 12 or TM for device

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
11. Program loads but does not run correctly	a. CP board malfunctioning	a. Observe the error code and message on console terminal: ● If error code indicates software problem, go to step 13 • If error code indicates hardware problem, go to step 12
	b. Console terminal not displaying correct data (screen is blank, no cursor, or wrong data) and console printer printing out garbled text.	b. Halt program run, set console terminal and console printer off line, and run self tests. ● If self-test fails, go go to device TM and troubleshoot ● If devices pass self-tests, load and run T& Vs: KCMX3 and CPFX1
	c. I/0 terminal has cursor visible but no display.	c. Go to step 12.
	d. Tape, punch cards, or printing paper not moving at scheduled times or intervals.	d. Software instruction malfunction or a peripheral device failure. Go to step 12, then step 13.
12. Peripheral device fails to come “on line”, or system exerciser has indicated a specific device failure.	a. Device not powered ON.	a. Check power ON switch, individual power supply circuit breaker, and tech power box circuit breaker. Make sure power is reaching device and that power indicator is lit. Power ON and do system checkout after maintenance (table 4-10).

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
12. (Continued)	b. Device not in READY or RUN mode, or "cycled up".	b. Prepare device for operation using start up and check out procedures given in TM 11-7010-205-10. Perform any off-line self-test applicable to device. ● If device comes on line, restart system and do system checkout (table 4-10) ● If device fails to come on line, continue troubleshooting
	c. Device stalled for lack of operator attention.	c. Check device(s) for items such as: ● End of tape ● Hopper empty ● Stacker full ● Out of paper ● Card jam or misfeed ● Wrong media loaded ● Program not loaded (tape, disk pack or diskette) ● Drive not cycled up Perform required function, re-enable device and restart system. If device still fails, continue troubleshooting.
	d. Loose connections, faulty cables.	d. Inspect all cables for damage, bent pins or dirty contacts. Perform continuity check, using ohmmeter, if you suspect a faulty cable or connector. Make sure all connectors are seated and locked. Try to restart. If device fails to come on line, continue troubleshooting.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
12. (Continued)		NOTE If T & Vs indicate that the device has failed, go to device manual and continue troubleshooting.
	e. Interface board not functioning properly.	e. Run T & Vs in the following order: (1) Device (2) Device adapter pac (3) Device controller board (4) Main memory board (5) CP board Install new board where last (highest level) T & V reported failure and rerun all T & Vs that failed. If all T & Vs pass on first run, review your operating procedures, try to rerun the program, and re-evaluate the fault symptoms or error codes.
13. Program has come to an unscheduled halt.	a. Software malfunction or software reporting hardware problems.	a. Interpret error or status code or message: (1) If problem is related to one of following: ● Command processor ● Editor ● Assembler ● Utilities ● Patch program ● Debugger ● Configuration load manager

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
13. (Continued)		Review the operating procedures to determine if software or run procedure has been modified since last successful run. Restart the program using correct run procedure. If the same halt does not occur, operator error caused the problem. Notify operator and supervisor about using correct procedure. If the same halt does occur, tell supervisor that a known good software program is needed. Obtain a good program and restart the run. Go to table 4-10 and do system checkout after maintenance.
		(2) If error or status code indicates software is reporting a hardware problem: ● Go to step 12 for peripheral device failure troubleshooting ● Go to table 4-10 and do system checkout after maintenance
	b. Central processor reacting to random error bits which can cause intermittent data errors during program run (the program may or may not come to an unscheduled halt.	b. Check data output on console terminal CRT or printout: ● If errors occurred during the course of the program run, re-enter the program at a clean point and restart. If

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
13. (Continued)		same data errors halt program again, the operating pack probably needs to be reformatted. Tell supervisor you need a known-good program. Rerun program using good disk pack or tape. Do system check-out after maintenance (table 4-10) ● If program went out of sequence just before halt occurred, recheck program language format and restart. If same halt occurs, recheck program operating instructions for correct file name or I.D. Re-start using correct operating procedure. If program halts again, compare revision numbers of software and hardware to make sure they are compatible. Recheck error or status code on terminal and go back to step 13a ● If you cannot correct the problem, go to alternative trouble-shooting (para 4-9)
	c. Error or status code indicates a problem in CP board or memory.	c. Run T & Vs; CMMX1, CPSX1, and CPFX1. If program is handled through the com-mercial instruction pro-cessor, run CPFX3 also. Replace board(s) if T & Vs fail. Now rerun T & Vs in reverse order (low to high). If T & Vs pass, repair is complete. If not, go to alternative troubleshooting (para 4-9).

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
14. RESET indicator on tape drive lit to indicate tape drive went off line during processing.	MDC or DRU and adapter boards are faulty	(1) Install a WRITE PERMIT ring in a work tape and load tape. (2) Run T & Vs in following order: CMMX1 CPFX1 MTUX3 (3) If memory or WDT T & Vs do not pass, replace the board indicated and rerun the T & Vs in reverse order. If T & Vs pass, repair is complete. Put tape drive back on line and continue processing. (4) Run T & V MTUX3 until an error display appears on the console terminal. Use the error display and status word chart to interpret the meaning of the errors. Refer to program major and minor labels listing given in appendix F. (5) If the status words indicate that QLT for mag tape controller has failed, replace the board(s) using the QLT chart shown. Rerun all T & Vs. If they pass, repair is complete. Put tape drive back on line and continue processing. If T & Vs do not pass after all boards have been replaced, do alternative troubleshooting (para 4-9) and go to TM for device.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
14. (Continued)		(6) If the status words indicate other than QLT failure, go to appendix F and use major/minor error listings to determine the course of troubleshooting indicated by the T & V report.
15. Disk drive goes off line. CHECK indicator lit, won't restart.	Unknown	(1) Look at physical I/0 message reported on the console terminal. If the error code indicates a disk drive failure, load and run T & V MSUX2 on another drive channel. (2) Problem will be given a primary probable cause to go with the minor error label; DEV (device), CONT (controller), SYS (system), ADAP (adapter). (3) Run T & Vs for: (1) Device (2) Adapter (3) Controller If T & Vs fail, replace bad board or repair device (see TM for device) at highest level of failure. If T & Vs pass, go to next step. (4) Replace transmitter/receiver board(s) in slots BO1 and B02 of logic cage one at a time with a known-good one from another drive. Rerun T & V MSUX2. If T & V passes, install a new board and return the one you swapped back to the original drive.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
15. (Continued)		(5) If replacing a transmitter/receiver board does not solve problem and MSUX2 fails, disconnect the I/0 cable, install turnaround connector on the disk drive end and run T & V MSUX2 to test cable. If cable checks out, go to TM for device and continue troubleshooting. If cable is faulty, repair or install new cable and place drive back in service. Do system checkout after maintenance (table 4-10) or go to DD-TS-26 in TM 11-7025-208-23.
16. Disk drive unit down .	Hardware failure	(1) Load and run T & V SMDX2. (2) Look for an error message to appear on console terminal screen. Interpret the error code portion of the message. (3) Use the code to enter the SMDX2 error dictionary (appendix F). This table will identify the code and suggest types of corrective action. (4) Make suggested repairs or replacements, and rerun T & V SMDX2. (5) If T & V passes, repair is complete. Do system checkout after maintenance (table 4-10). (6) If T & V fails, go to TM 11-7025-208-23 and continue troubleshooting.

Table 4-8. ADP Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
17. T & V program heading did not come up on console terminal when code name keyed in.	a. Operator error	a. Reboot T & V pack, wait for hardcore test to run, find C? on screen, and type in code. Press RETURN.
	b. Hardware failure	b. Press STOP button on CPU control panel. Rerun QLTs. If QLTs pass, check D1 register contents. Channel number loaded in D1 must match device. If disk drive still cannot input correct I.D., switch T & V pack to another drive. If this fails, do alternative trouble-shooting (para 4-9).

4-15. COMMUNICATIONS SUBSYSTEM TROUBLESHOOTING

Table 4-9 contains the troubleshooting information that will help you isolate and correct faults that can occur in the communication subsystem. Start your troubleshootinq by looking up the SYMPTOM that has appeared in your system. The PROBABLE cause-of that symptom is listed in the next column in the most likely order of occurrence. Then, take the CORRECTIVE ACTION in the last column.

Table 4-9. Communication Subsystem Troubleshooting

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1. No signal input at entrance binding posts or connectors.	a. No signal on land lines.	a. Use oscilloscope to determine presence of signal. If no signal is present notify remote terminal operator. Check both terminal switches for correct baud rate and parity setting. If signal is present, continue trouble-shooting.

Table 4-9. Communication Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1 (Continued)	b. Defective input connection.	b. Check input signal line connections. If 26 pin connector is used, make sure it is seated properly. Replace defective connector (para 4-75).
	c. Corroded or wrong connection at signal entrance panel.	c. Inspect visually. If binding post connection is corroded or dirty, clean it and make new connection. If wires are connected to wrong posts, correct wiring (see appendix D, for panel A and B entrance panel connections).
	d. Switches at signal entrance panel not set properly.	d. Set switches in accordance with input.
	e. Defective selector switch, line filter, line protector (slip), device switch, or cabling.	e. Using an oscilloscope or multimeter check for presence of signal or continuity from entrance panel connection back through selector switch, line protector (Slip), line filter, and device switch to modem rack (FO-6 thru FO-8). Repair or replace defective unit(s) or cabling as necessary.
2. Unable to send or receive on an asynchronous modem line.	Defective modem board or remote terminal.	1. Determine which remote channel is inoperative. 2. At modem perform remote self test. Transmitter and receiver LEDs should be lit or flicker if loopback test passes, go to step 5. If loopback test does not pass, continue with troubleshooting.

Table 4-9. Communication Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
2 (Continued)		3. At entrance, panel binding post, disconnect 4-wire connection from remote terminal (see appendix D for channel connections). 4. Connect a jumper between transmit A and receive A binding posts. 5. Connect another jumper between transmit B and receive B binding posts. 6. Set channel selector switch in cabinet B to BINDING POST position, 7. Run T & V DCMXl, internal mode (appendix F). 8. If T & V passes, problem is in 4-wire field cable to remote subsystem or at remote subsystem. Contact remote operator and have he or she check 4-wire connections and moderm switch positions. If T & V does not pass, go to step 3.
3. DCMXl remote loop back test at bulkhead binding post fails for a remote asynchronous channel.	Defective modem	1. Substitute modem board of defective channel with a modem board from a known good unused channel (TM ll-7025-212-23 or-para 4-67). 2. Rerun DCMXI. If T & V passes, moderm board is defective. Replace modem board (TM 11-7025-212-23. or para 4-61.

Table 4-9. Communication Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
3 (Continued)		3. If T & V does not pass, set device switch to other modem group i.e., CONVERTER TO MODEM or MODEM TO CONVERTER. 4. Rerun T & V, if T & V now passes, problem is in device-switch, cabling to modem, or modem chassis. Using ohmmeter, check continuity of connections from device switch to modem chassis. Replace defective device switch or cabling if defective. If device switch and cabling check out, replace defective modem unit (para 4-65 or 4-66). If T & V still does not pass, go to step 4.
4. Remote channel fails to operate on either asynchronous modem line.	Faulty patch panel, filter, converter, slip, or cabling	1. Using patch panel, select a known operating channel and patch its DTE to DCE of inoperative channel. 2. Run T & V DCMX1. If T & V passes, remote loop from patch panel through modem, filter, and slip is functioning. Go to step 5. 3. If T & V still does not pass, check continuity through patch panel, converter, filters, slips, and entrance panel connection (FO-6, FO-7, FO-8, and fig. D-41). Replace defective component as directed in applicable procedure.

Table 4-9. Communication Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
5. Signal present from modems to CPU bulkhead but remote channel inoperative.	Defective cabling, MLCP board.	1. Disconnect cable at CPU bulkhead and install loopback connector B40038l8. 2. Run T & V DCMXl, cable mode. 3. If T & V passes, check cabling between CPU bulkhead and cabinet B. 4. If T & V fails, replace MLCP board (TM 11-7021-200-23) .
6. High level of interference	a. Defective input connection	a. Check input signal connections. If 26 pin connector is used, check that connector is properly seated. If binding post connection, check that connection(s) is not corroded or dirty. Clean and reconnect.
	b. Defective line protector (slip).	b. Replace line protector (para 4-78).
	c. Defective line filter.	c. Replace line filter (para 4-77).
	d. Defective line switch.	d. Replace line switch (para 4-76).
7. Asynchronous Auto-dial channel OEOO inoperative.	s. Defective MLCP board or defective cabling.	l. Disconnect cable OEOO at CPU bulkhead and install loopback connector B40038l8. 2. Run T & V DCXMl, mode “A” cable loop. 3. If T & V fails, check cables and connectors at bulkhead, replace cable(s) if defective para (4-112). Replace MLCP if defective (see TM 11-7021-200-23).

Table 4-9. Communication Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
7 (Continued)		4. If T & V passes, continue troubleshooting.
	b. Defective filter, modem board, autodial board, patch module, data coupler, switch, or cabling.	l. At red patch panel, patch DTE of line 2 to DCE of 1 line 1. 2. Insert an asynchronous modem board in slot l3 of quasi-analog modem. 3. Set telephone switches to 4-wire modem and data mode. 4. At entrance panel binding posts, connect a jumper from transmit 25A to receive 26A. 5. Connect another jumper from transmit 25B to receive 26B. 6. Set channel selector switch in cabinet B to BINDING POST position. 7. From console change baud rate to l200. 8. Run T & V DCMXl, internal mode. 9. If T & V passes, problem is in auto call adapter of CPU, cabling from CPU, filter, patch panel, auto dial board or DAA. l0. If T & V fails, using ohmmeter, check continuity from modem thru telephone switches, filter, SLP and channel switch to bulkhead terminals (refer to Appendix D). Replace defective component utilizing procedures in chapter 4, section III.

Table 4-9. Communication Subsystem Troubleshooting -- Continued

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8. Signal is being interrupted between CPU and signal entrance panel.	Faulty modem, patch panel, converter, or wiring.	Perform modem self-test (loopback). Transmitter and receiver LEDs should be lit If loopback test passes, measure signal at binding posts or switches using oscilloscope. Switch patch cable to another signal flow path to see if patch panel is faulty. Repair or replace any faulty item.
9. Power indicator on modem flashing or out.	Power supply failure.	Troubleshoot power supply using MA-TS-02 in TM 11-7025-212-23.
l0. Subsystem not receiving power.	a. Breaker for tech power box not in ON position.	a. Set CB40 to ON.
	b. Breaker for utility power box not in ON position.	b. Set CB25 to ON.
	c. Main breaker in power distribution box not in ON position.	c. Set CB60 to ON.
	d. Communications breakers in PA6 next to cabinet A not in ON position.	d. Set all three breakers to ON.

Table 4-10. System Checkout After Maintenance

STEP	CHECKOUT PROCEDURE	CONDITION	ACTION	GO TO
1.	Have CPU and all peripheral devices been powered on and placed on line?	Yes		Step 2
		No		Table 4-8, Step 1
2.	Did CPU QLTs pass?	Yes		Step 3
		No	Run QLTs again	Table 4-8, Step 8

Table 4-10. System Checkout After Maintenance -- Continued

STEP	CHECKOUT PROCEDURE	CONDITION	ACTION	GO TO
3.	Did you replace CP board, memory pat, or watch dog timer board to repair the fault?	Yes	Run T & Vs in following order: (1) CPSX1 (2) CMMX1 (3) CPFX1	Step 4
		No	Run T & Vs in following order: (1) Device (if any) (2) Device controller (3) CMMX1 (4) CPSX1	Step 4
4.	Did any T & V fail to load?	Yes		Table 4-9, Steps 9 and 10
		No		Step 5
5.	Did all T & Vs make at least one error-free pass?	Yes	Repair is complete	
		No	Replace board at highest level of T & V failure or repair device and rerun T & Vs from lowest level to highest failure	Step 6
6.	Did all T & Vs make at least one error-free pass?	Yes	Repair is complete	
		No	Replace board(s) at next highest level of failure	Step 7
7.	Have all controller boards that might have caused the problem been replaced?	Yes	Rerun all T & Vs. If they pass, repair is complete. If they do not, do alternative troubleshooting.	Step 8
		No		Step 3 - or - rediagnose the problem and go to symptom checkout index (table 4-5)

Table 4-10. System Checkout After Maintenance

STEP	CHECKOUT PROCEDURE	CONDITION	ACTION	GO TO
8.	Have MLCPS and DCMS been tested by running T & VS?	Yes		Step 9
		No	Run T & Vs: • MLCX1 • DCMX1 • DCMX2	
9.	Are I/0 terminal switches set to proper baud rate and parity to support the data link?	Yes	Check with remote subsystem operator to make sure settings are the same on both terminals.	Step 10
		No	Use tables to make proper switch settings	
10.	I/0 terminals set in proper mode to call up status line?	Yes		Step 11
		No	Place configuration switch S4 in proper position. • If S3-2 is set to the UP position, S4-4 must be UP	
11.	Have I/0 terminals been tested for ability to establish data link?	Yes		Checkout is complete
		No	Run T & V VIPX8	

Section III. MAINTENANCE PROCEDURES

4-16. GENERAL

This section contains the inspection, removal, installation, and service procedures for all system level maintenance tasks. The majority of these maintenance tasks are required to fix a malfunction or a failure which was isolated during troubleshooting. While troubleshooting in the ADP and Communications subsystems, you may be instructed to run various Test and Verification (T & V) procedures. These procedures are referenced in the troubleshooting by their individual titles and are found in appendix F of this manual.

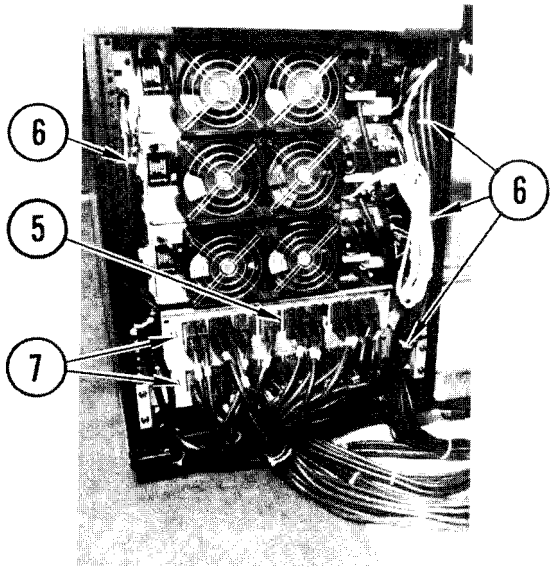
4-17. MAINTENANCE PROCEDURES

Before you start a corrective maintenance procedure, you should gather all the items or help listed in the initial setup box for that procedure. Read the procedure carefully and do only what each step tells you to do. Some steps are followed by a reference. Use the reference any time you are not sure what you must do for that step. Always do the steps in the order they are given unless the procedure requires decision steps. When decision steps are involved, go in the order indicated by the decision.

4-18. REMOVE/REPLACE CPU

INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required	Support Equipment
• Tool kit • TORX offset driver	• Plastic bag • Tags • Pen or pencil Tie wraps • 4x6x26 inch board (2 ea)	• Two	• Dolly or hand truck



Remove

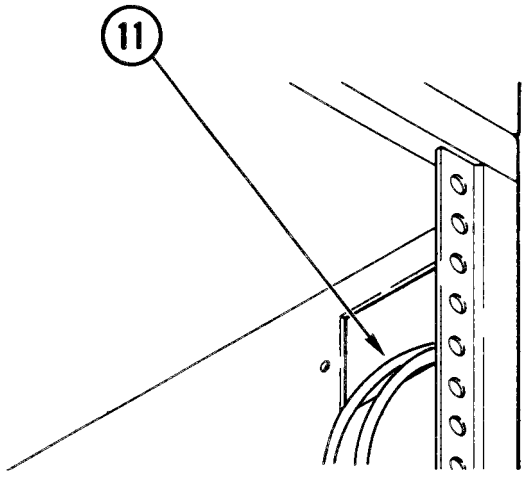
1. Power off CPU.
2. Pull ac power plug from technical power outlet.
3. Remove rail pins and pull CPU out to end of track.
4. Remove hack and side panels.
5. Tag and disconnect cables from bulkheads.
6. Cut tie wraps holding cables to both sides of CPU.
7. Remove bulkheads and set aside.

WARNING

CPU weighs about 370 lb (about 170 kg). Do not attempt to lift or remove it without first reducinq its weight by removing heav y components (steps 8-10).

8. Remove power distributi on unit (TM 11-7021-200-23).
9. Remove memory save and auto restart unit (TM 11-7021-200-23).
10. Remove three power supplies (TM 11-7021-200-23) .

4-18. REMOVE/REPLACE CPU (CONT)



11. At upper right rear corner, find two black power cables coming throuqh rectangular hole. You must remove their ac power connectors before you can feed them out through the hole:

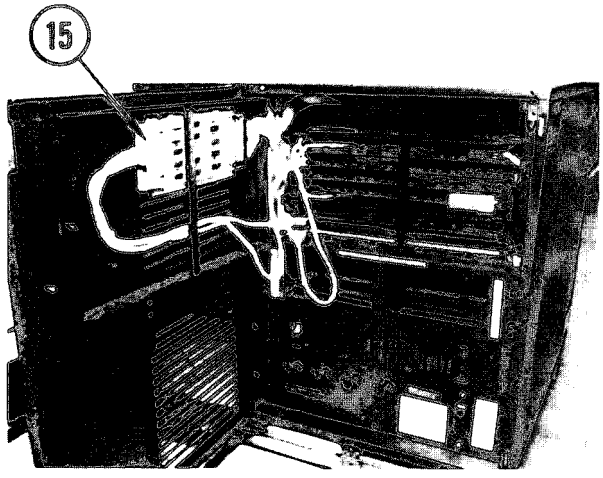
    a. Loosen three face screws.

    b. Note which wire goes to which prong in connector.

    c. Loosen three screws and remove wire from connector.

    d. Retain connectors and hardware for reinstallation.

12. Feed power cables out through hole.

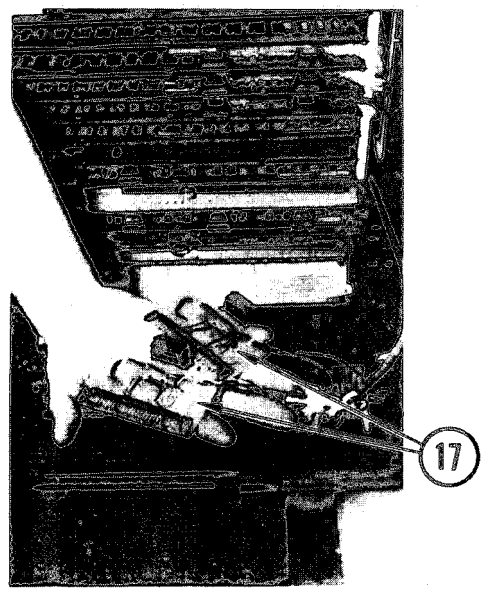


13. Replace bulkhead.

14. Open front door of CPU and open top grill.

15. Unplug paddleboard connector from front connector of repeater board and carefully fish paddleboard through the CPU. Make sure no pins are bent or wires broken during removal.

16. Remove nut and free all green and yellow ground wires from each side of 10 card chassis.



17. Remove port connectors form disk drive controller boards and place on a working surface. Carefully fish connectors through the CPU. Make sure no pins are bent or wires broken during removal.

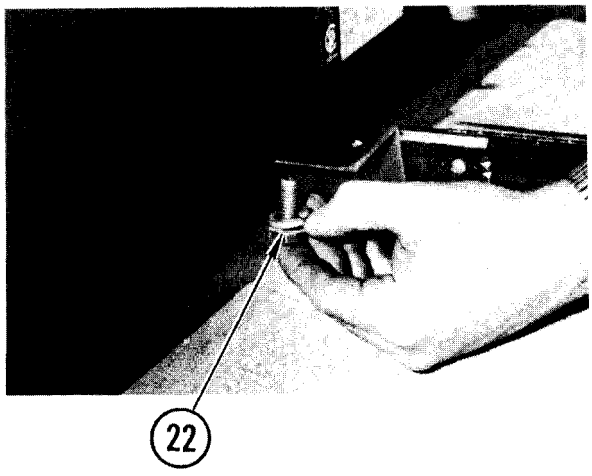
18. Note its position, then carefully pull gray communication cable through CPU.

19. Feed ground wires out through CPU.

20. close grill and front door of CPU.

4-18. REMOVE/REPLACE CPU (CONT)

21. Remove ground lead from ground stud in CPU.



22. Remove two bolts securing CPU to one slide and store in marked plastic bag.

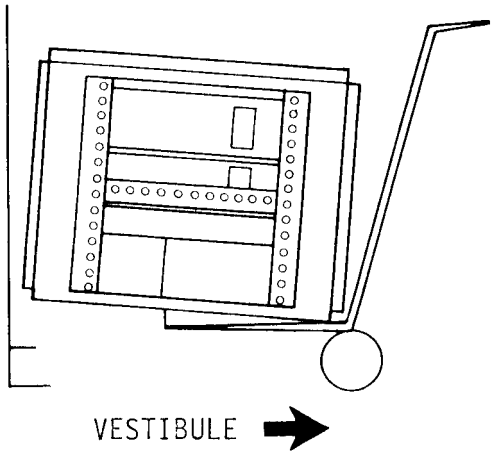
23. Line up 4x6 board to slide it under CPU in place of slide. Push slide back to wall while sliding board under CPU.

24. Repeat steps 22-23 for other slide.

25. Bring in hydraulic hand truck or dolly and place under CPU.

NOTE

If using hand truck, you must mount CPU lengthwise on truck to get it through vestibule door. It will not fit through sideways.



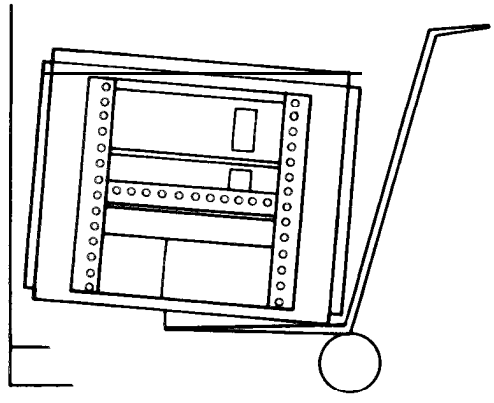
26. Remove CPU from van.

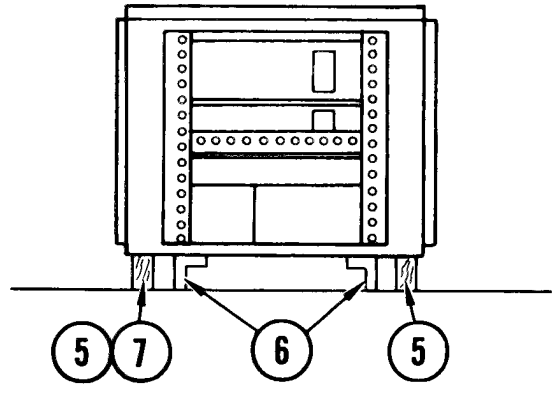
NOTE

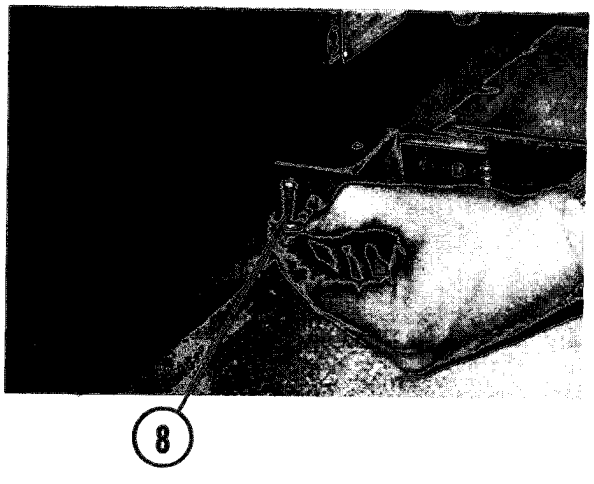
If CPU is to be shipped to another location for maintenance, reinstall power supplies, power distribution unit and memory save auto restart unit.

27. Install bulkhead, back panel and side panels.

4-18. REMOVE/REPLACE CPU (CONT)







Replace

WARNING

CPU weighs about 370 lb (about 170 kg). Do not try to lift or replace it without first reducing its weight by removing heavy components.

1. Remove power supplies, power distribution unit, and memory save auto restart unit (Remove steps 8-10).
2. With partner, lift CPU onto rear platform and into vestibule.
3. Put CPU on hand truck or dolly so the back of unit faces vestibule door.
4. Bring CPU into van. Position CPU so that front door faces vestibule and mounting holes in bottom will aline with slides.
5. Lift one end of CPU at a time and put a set of boards under each end and remove dolly (or hand truck).
6. Extend rails under CPU.
7. Lift one end of CPU at a time and remove one set of boards.
8. Attach CPU to slides using bolts as shown. Attach roadside bolts first, but do not tighten.

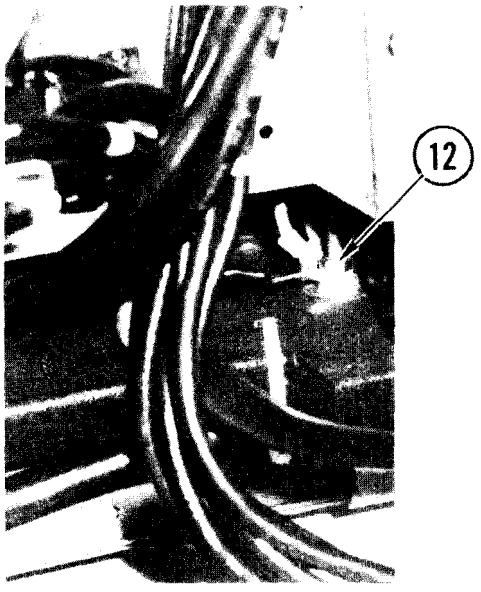
NOTE

On left side use outer holes of slide. On right side use inner slide holes.

9. After both bolts are attached to slide, remove board from other end of CPU.

4-18. REMOVE/REPLACE CPU (CONT)

10. Attach other two bolts. When all four bolts are started, tighten them.



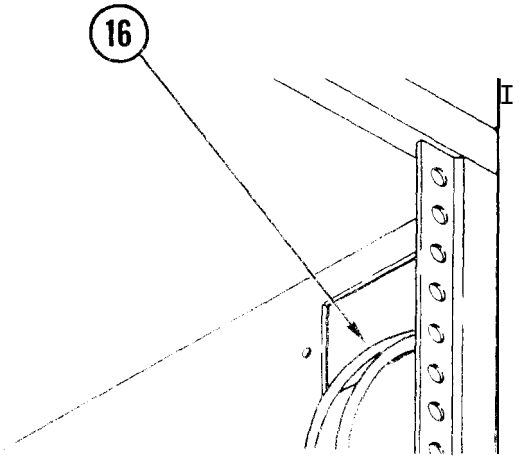
11. Remove four screws and set bulkhead to one side.

12. Connect ground lead to stud in CPU.

13. Replace three power supplies (TM 11-7010-200-23) .

14. Replace memory save and auto restart unit (TM 11-7010-200-23).

15. Replace power distribution unit (TM 11-7010-200-23) .



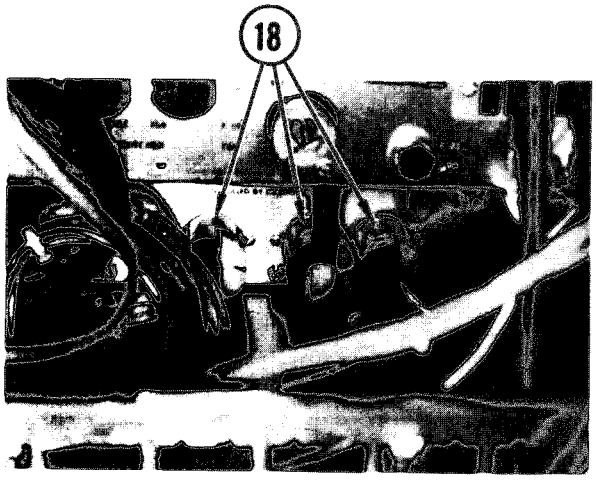
16. Feed cables from tape drive cabinet through rectangular hole in CPU cabinet.

4-18. REMOVE/REPLACE CPU (CONT)

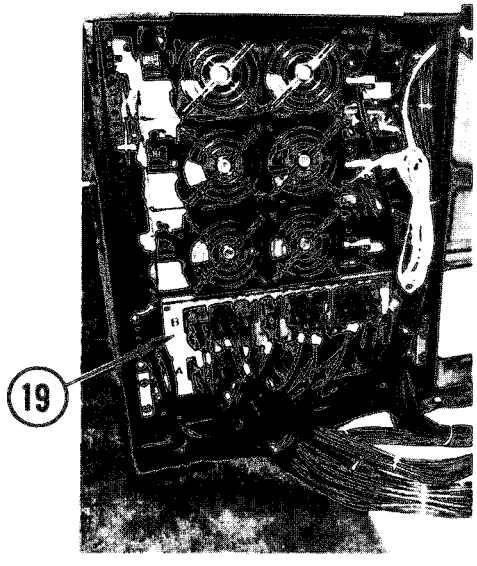
17. Install ac power connectors which you retained during CPU removal:

    a. Using your notes, attach wires to prongs and ground screw.

    b. Mount face over connector and install three screws.



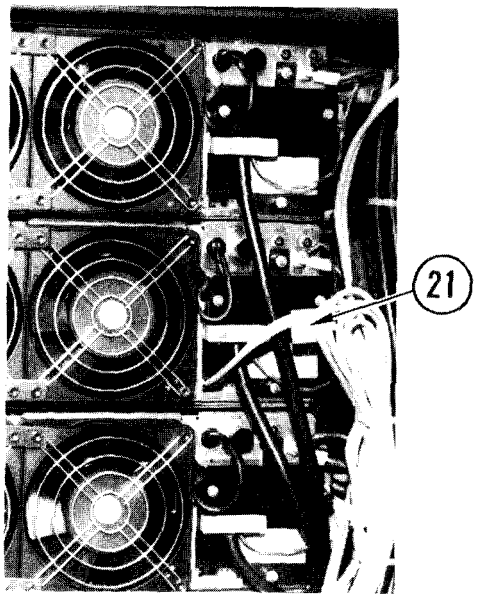
18. Plug ac power plugs and control panel cable into PDU.



l9. Connect all interface cables to bulkhead.

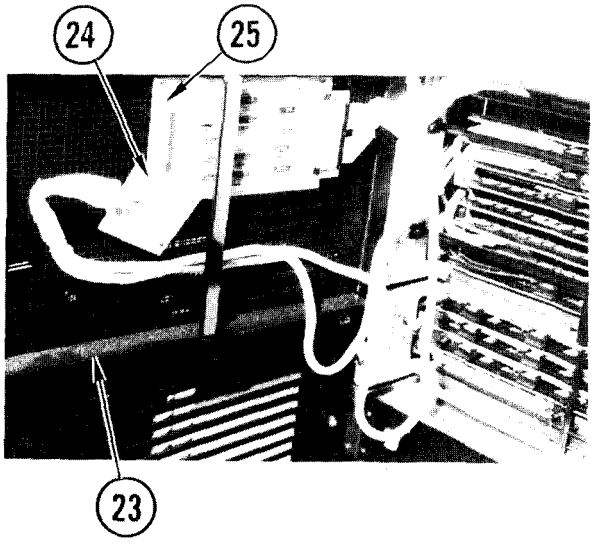
20. Install bulkhead.

4-18. REMOVE/REPLACE CPU (CONT)



21. Connect double orange cable from control panel to CPU as shown. Fasten it to side of CPU with tie wraps.

22. Find the two cables from the control panel (connected to a paddleboard connector).



23. Open front door of CPU and open top grill.

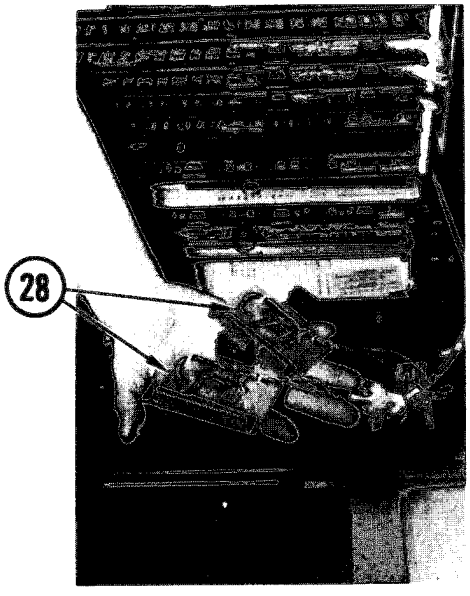
24. Carefully fish the paddleboard connector through the side of the CPU, next to the power supplies. Make sure no pins are bent or wires broken.

25. Connect paddleboard to front connector of repeater board.

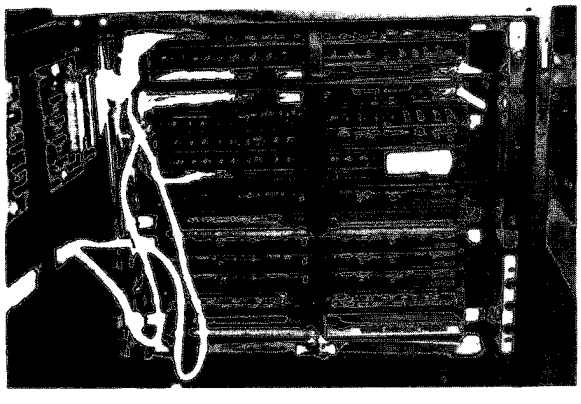
26. Using your note, carefully fish gray communications cable and connectors through the CPU. Make sure no pins are bent or wires broken during installation.

27. Fish green and yellow ground wires through CPU on each side of chassis. Remove nut and fasten wires to respective sides of 10 card chassis.

4-18. REMOVE/REPLACE CPU (CONT)



28. Using your notes, connect connectors to ports on disk drive controller.



29. Fasten cables to sides of CPU with tie wraps.

30. Plug ac power cable connector into technical power outlet.

31. At CPU, replace back and side panels. Close front door and slide CPU in under tape drive cabinet. Put pins in slide rails.

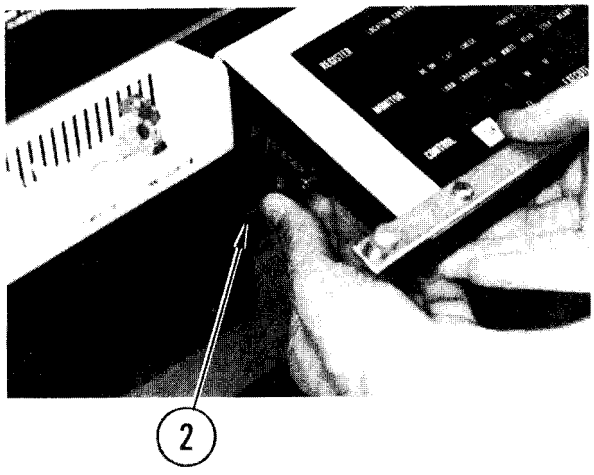
4-19. REMOVE/REPLACE CPU CONTROL PANEL

INITIAL SETUP

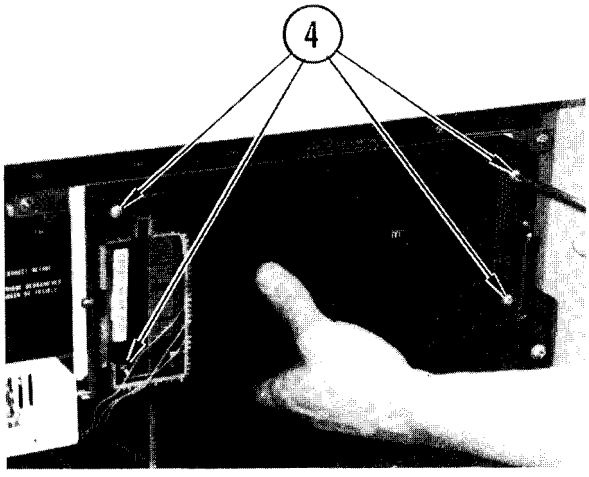
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pencil or pen

Remove

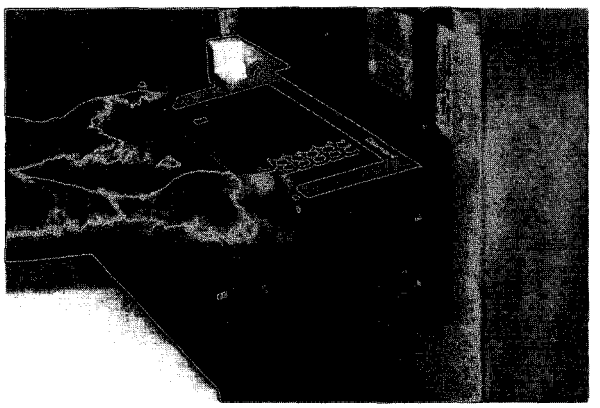


1. Power off CPU.
2. Free pins holding control panel in place.
3. Tilt up panel.

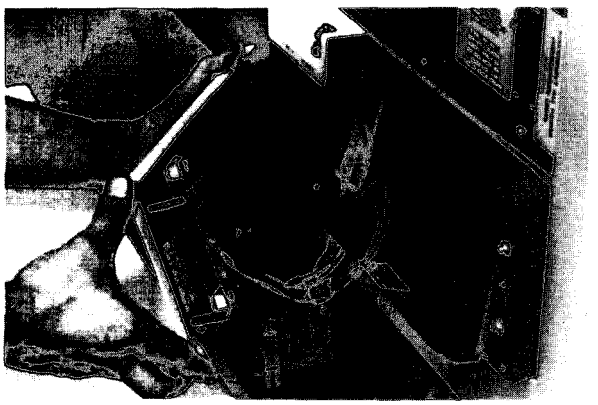


4. Remove screws.

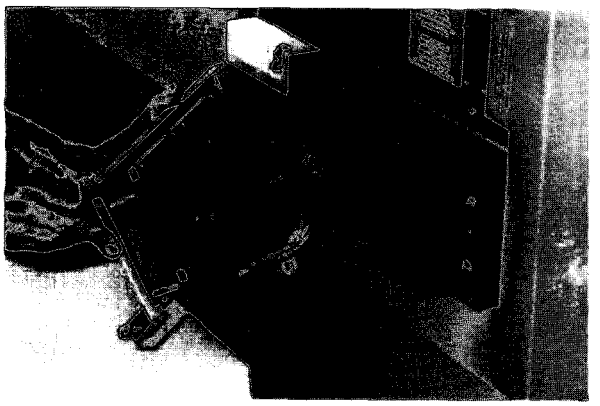
4-19. REMOVE/REPLACE CPU CONTROL PANEL (CONT)



5. Hold Panel. Tilt down.



6. Pull panel free of housing.



7. Pull off back cover.

4-19. REM0VE/REPLACE CPU CONTROL PANEL (CONT)

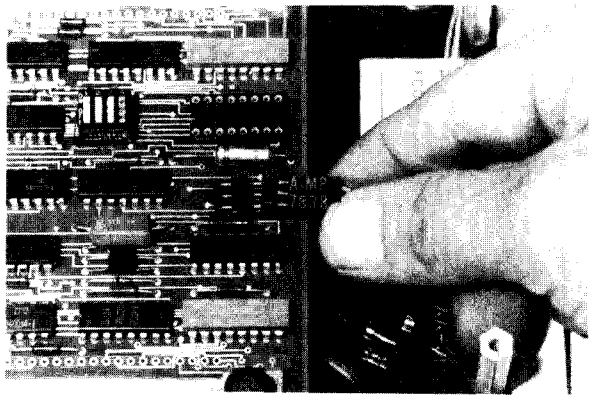
CAUTION

Wires on connectors break easily. Handle with care.

8. Use your scratch paper to note positions of ribbon cable connectors.

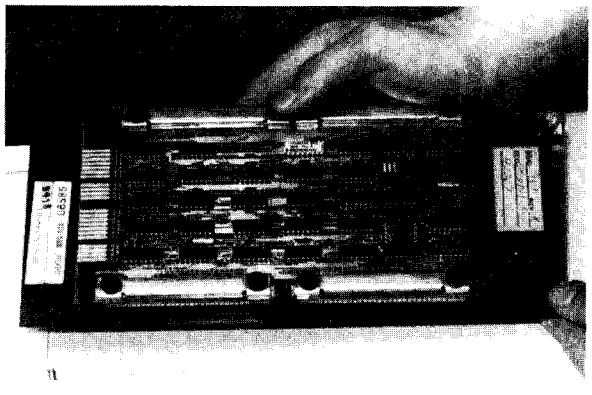
NOTE

Some control panels have an extra ribbon cable (red connector into PWB, large black connector on face plate). Do not remove. This cable assembly applicable to DAS3.



9. Pull off ribbon cable connectors from inside tape drive.

10. Unplug power connector (orange wires).

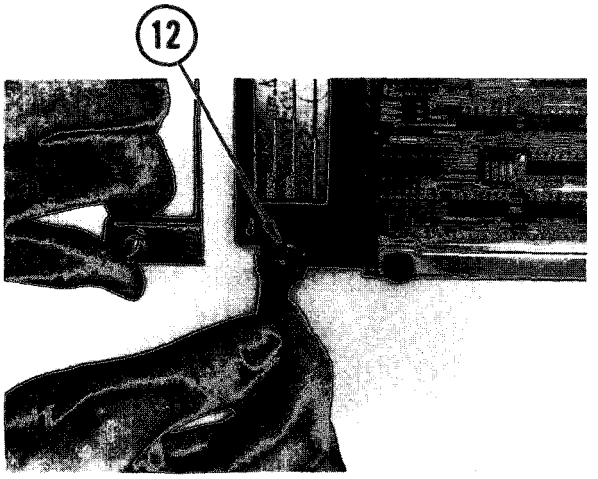


11. Lay panel on flat surface as shown so you can remove parts.

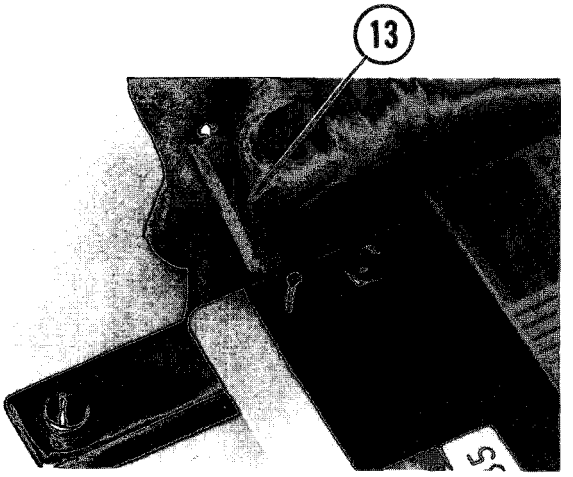
NOTE

In steps 12 to 15, you remove small parts that hold panel together. They are easily lost. When you remove them, keep them near their original locations.

4-19. REMOVE/REPLACE CPU CONTROL PANEL (CONT)



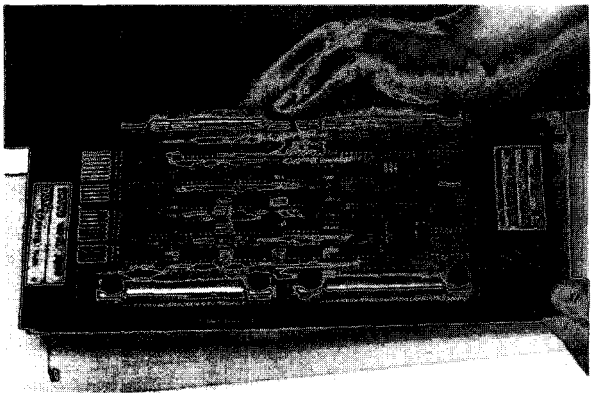
12. Remove nut and washer at two places. Set bar aside.



13. Remove threaded spacers and washers at corners of mounting plate.

NOTE

In some installations there are only three threaded spacers and washers.



14. Lift panel off of facing.

4-19. REMOVE/REPLACE CPU CONTROL PANEL (CONT)

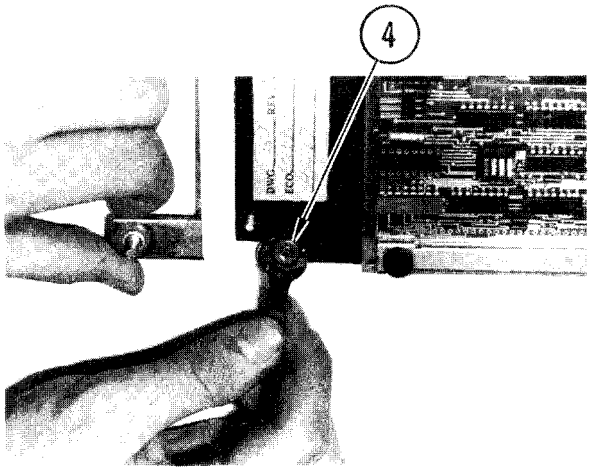
Replace

1. Put new panel on facing.

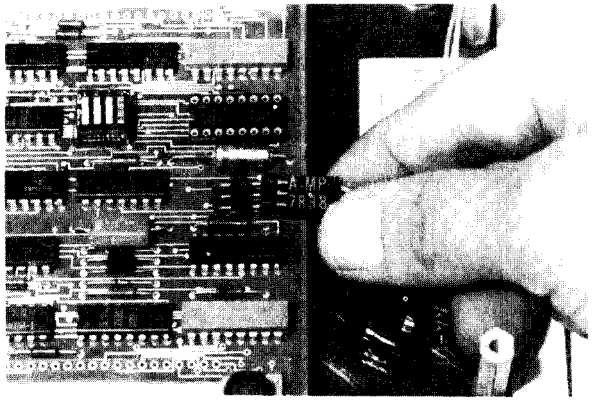
NOTE

Install washers with shoulder down.

2. Replace washers and threaded spacers.
3. Line up bar, facing, and panel.

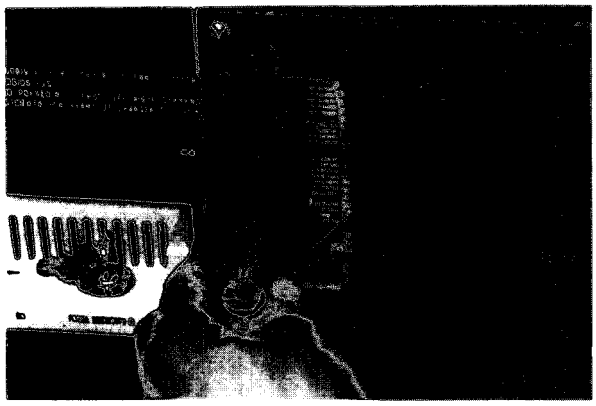


4. Replace washer and nut (two places).

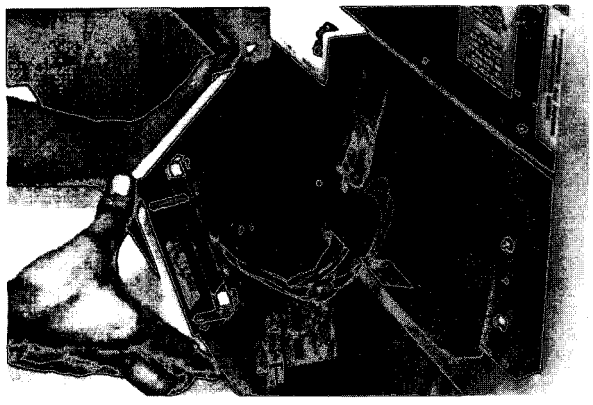


5. Push on power connector (either side of connector may be up).

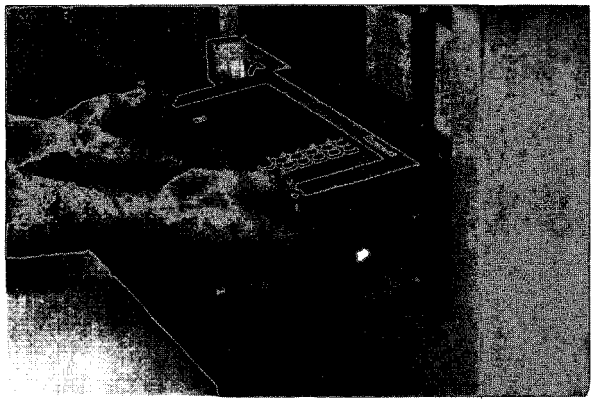
4-19. REMOVE/REPLACE CPU CONTROL PANEL (CONT)



6. Using your notes, plug in ribbon cable connectors.

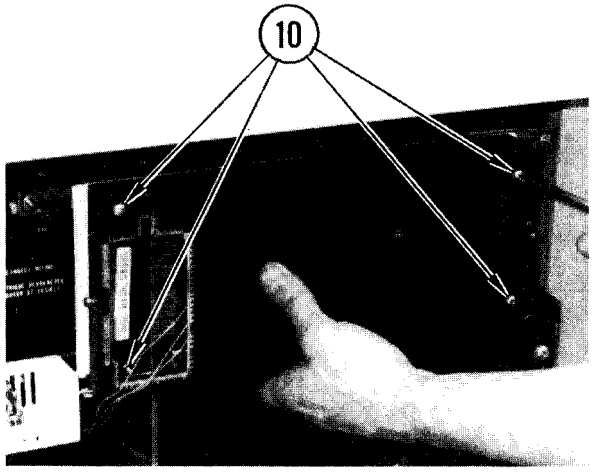


7. Replace back cover.



8. Put panel back in housing.

4-19. REMOVE/REPLACE CPU CONTROL PANEL (CONT)



9. Tilt panel up.
10. Replace screws and washers. Tighten screws.

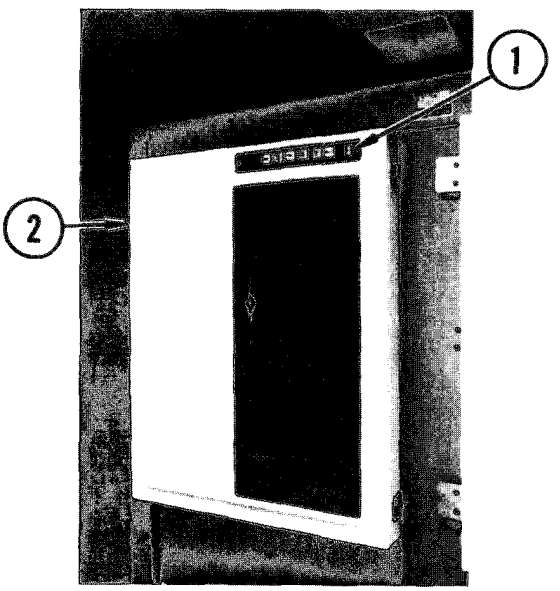
11. Tilt panel down.
12. Lock pins in place.

4-20. REMOVE/REPLACE TAPE DRIVE

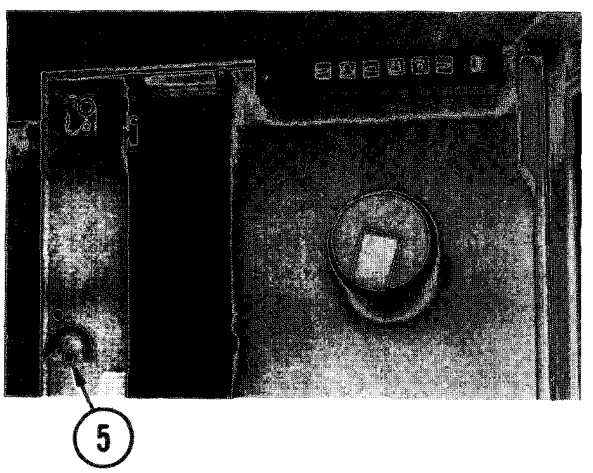
INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required	Support Equipment
• Tool kit	• Tie wraps • Padding • Tags • Pen or pencil	• Two	• Hand truck

Remove

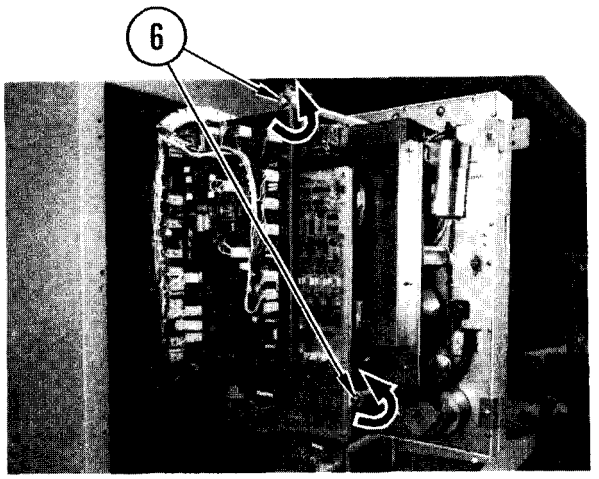


1. Power OFF tape drive and set CBO1 to OFF on tape drive PDU.
2. Open tape drive cover.
3. Remove cover.
   a. Locate spring-loaded pin at top of inside front cover.
   b. Pull down on pin and remove cover.

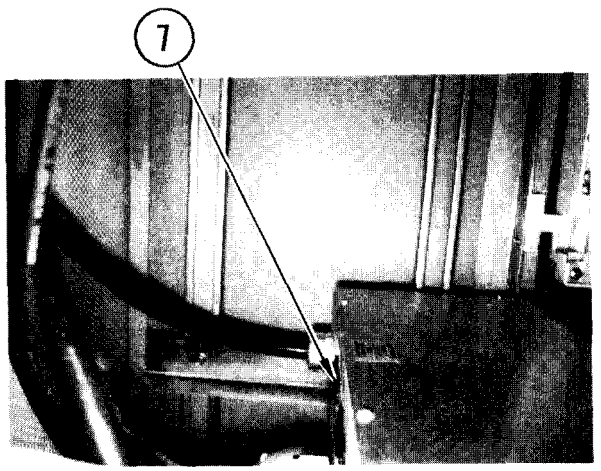


4. If tape is loaded, remove tape.
5. Insert flat-tip screwdriver in latch hole. Turn as shown. Pull open cabinet.

4-20. REMOVE/REPLACE TAPE DRIVE (CONT)



6. Turn latches as shown. Pull open boards.



7. Pull tape drive ac power plug from PDU. Pull cord outside cabinet.

NOTE

Loosen screws on bottom connectors before removing cables on control and data boards.

8. Tag and remove multiconductor cable from top and bottom of data and control boards.

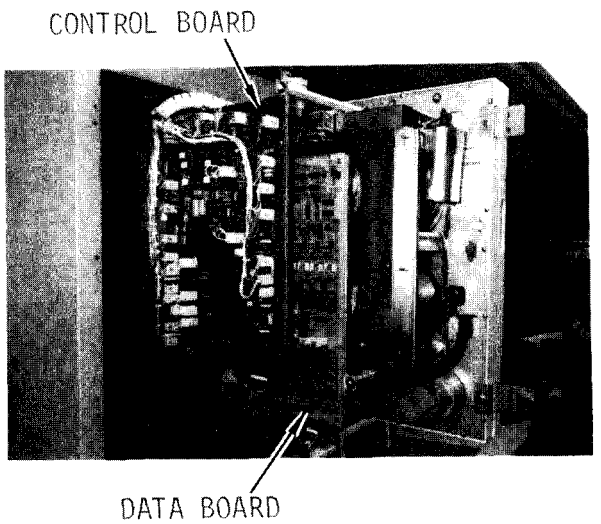
- If you are removing the cable on the left-hand tape drive, remove:

PWB	Cable Connectors
Control bd.	J101, J102
Data bd.	J201, J202, J301, J302

- If you are removing the cables on the right-hand tape drive, remove:

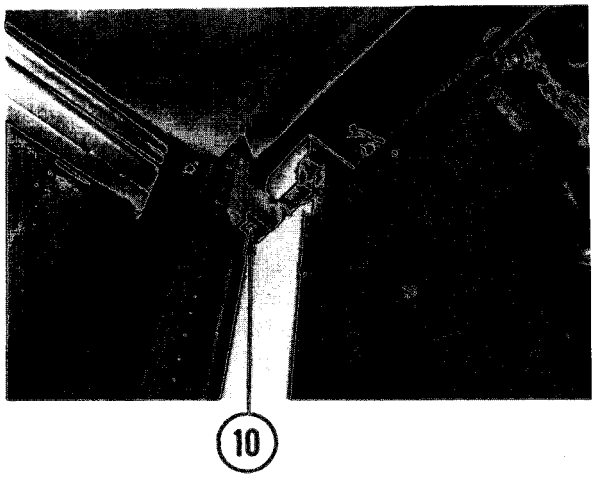
PWB	Cable Connectors
Control bd.	J101
Data bd.	J202, J302

(If present, remove and store terminator boards)



4-20. REMOVE/REPLACE TAPE DRIVE (CONT)

9. Cut tie wraps to free cables. Push cables inside tape drive cabinet.



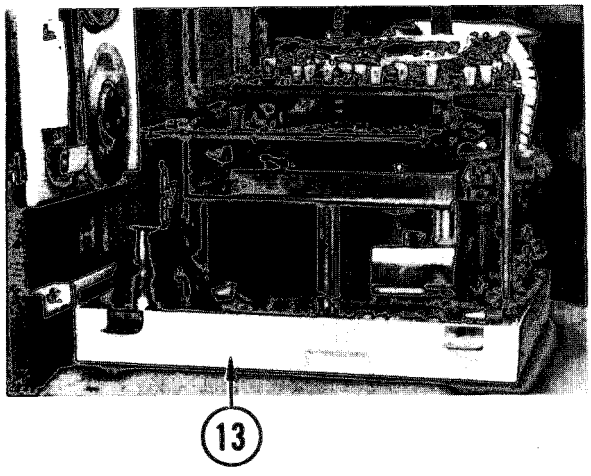
10. Lean inside cabinet space. Remove screw. Pull off block.

11. Move hand truck next to tape drive. Put padding on hand truck.

WARNING

Tape drive weighs over 100 lb. Do not attempt to lift without help.

12. Hold one side of tape drive. Tell your partner to hold other side. Lift tape drive up and off hinge pins.



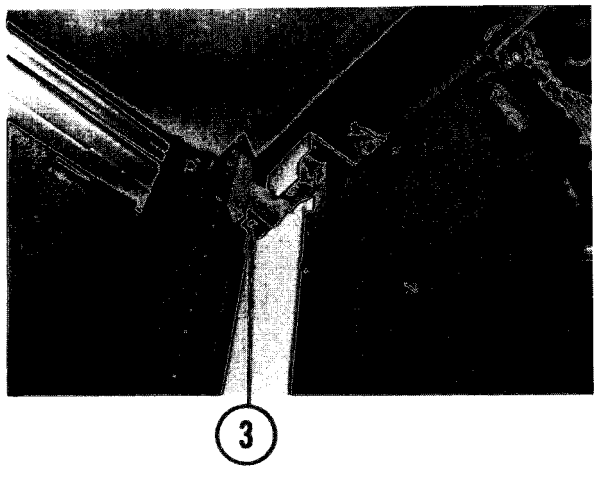
13. Lay tape drive face down on padding on hand truck as shown.

14. Remove tape drive from van.

Replace

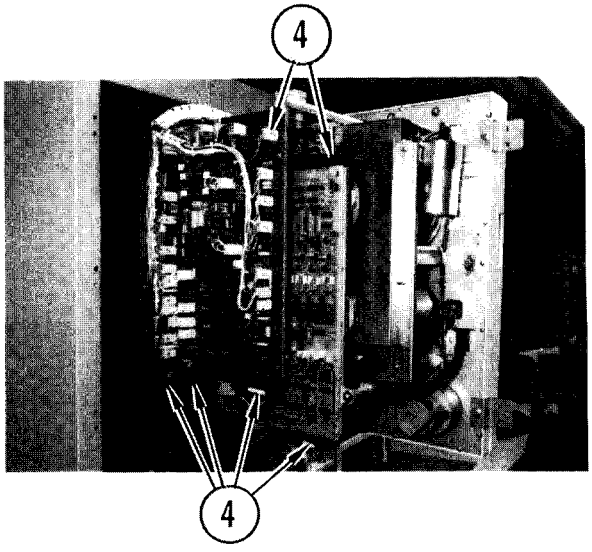
1. Using padded hand truck, bring tape drive into van beside tape drive cabinet.

2. Hold one side of tape drive. Tell you partner to hold other side. Lift tape drive onto hinge pins.



3. Lean inside cabinet. Push on block. Replace screw.

4-20. REMOVE/REPLACE TAPE DRIVE (CONT)



4. Pull cables out of cabinet and replace:

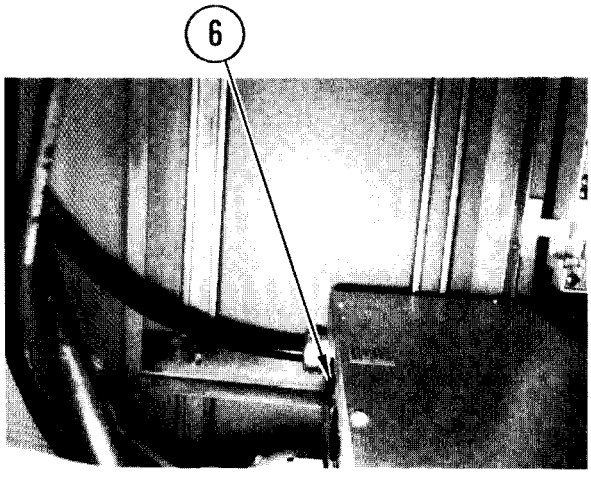
   - If you are replacing the cable on the left-hand tape drive, replace:

PWB	Cable Connectors
Control bd.	J101, J102
Data bd.	J201, J202, J301; J302

   - If you are replacing the cables on the right-hand tape drive, replace:

PWB	Cable Connectors
Control bd.	J101
Data bd.	J202, J302

   (If removed, get terminator boards from storage and install on data board)



5. Replace tie wraps on cables.

6. Route tape drive power cord into cabinet and push plug into PDU outlet.

7. Close tape drive.

   a. Insert flat-tip screwdriver in latch hole.

   b. Turn clockwise until tight.

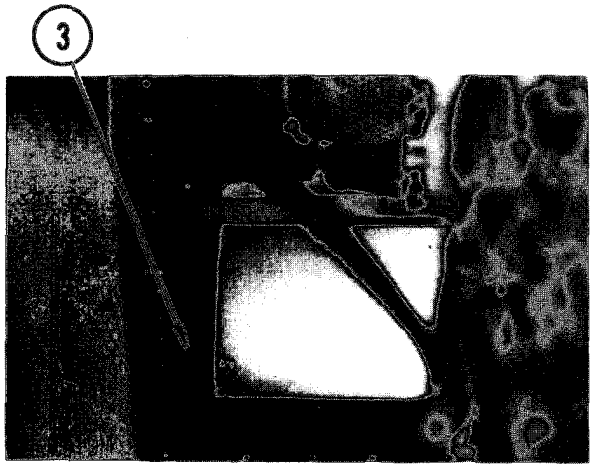
8. Replace cover.

4-21. REMOVE/REPLACE TAPE DRIVE PDU

INITIAL SETUP

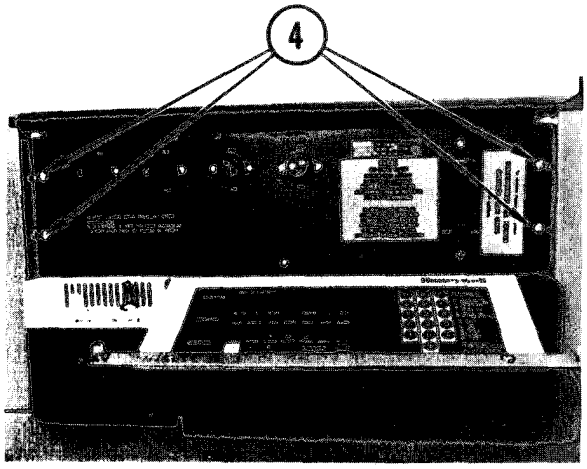
Common Tools
• Tool kit

Materials/Spare Parts
• Tie wraps



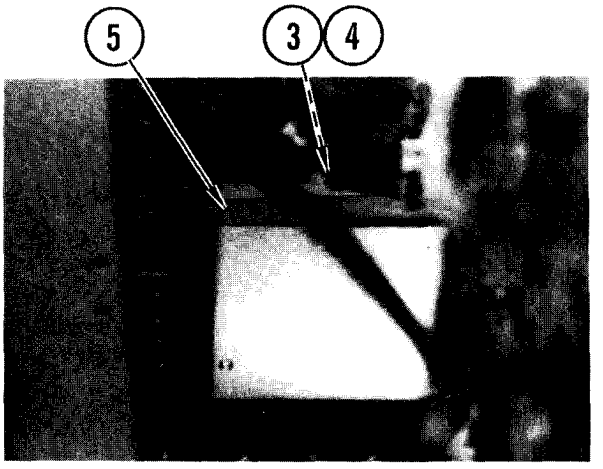
Remove

1. At tech power box, set circuit breaker CB5 OFF.
2. Open tape drive cabinet (para 4-20, steps 1-5).
3. Loosen hold-down screws at sides of bracket until bracket can be lifted high enough to slide out PDU.



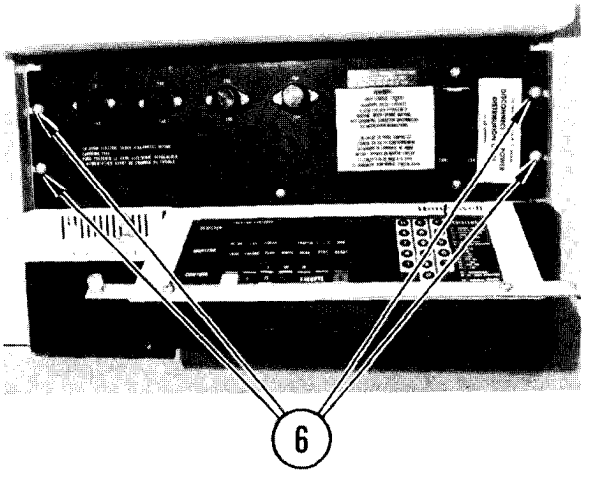
4. Remove four screws from front cover plate.
5. Pull PDU out of tape drive cabinet.
6. Disconnect plugs from rear of PDU.
7. Reach into cabinet and disconnect power cord from receptacle.
8. Close tape drive cabinet.

4-21. REMOVE/REPLACE TAPE DRIVE PDU (CONT)



Replace

1. At tech power box, set CB5 OFF.
2. Open tape drive cabinet (para 4-20, steps 1-5).
3. At rear of PDU, reconnect all plugs from CPU and tape drive unit.
4. Reach into cabinet and plug power cord into receptacle.
5. Slide PDU into tape drive cabinet. Lift hold-down bracket up high enough to maneuver PDU under bracket.



6. Insert and tighten four screws in cover plate of PDU.
7. Tighten hold-down bracket screws.
8. Close tape drive.
   a. Insert flat-tip screwdriver in latch hole.
   b. Turn clockwise until tight.
9. Replace cover.
10. Power ON CB5 at tech power box.
11. Power ON tape drive unit.

4-22. REMOVE/REPLACE TAPE DRIVE CABINET FAN

INITIAL SETUP

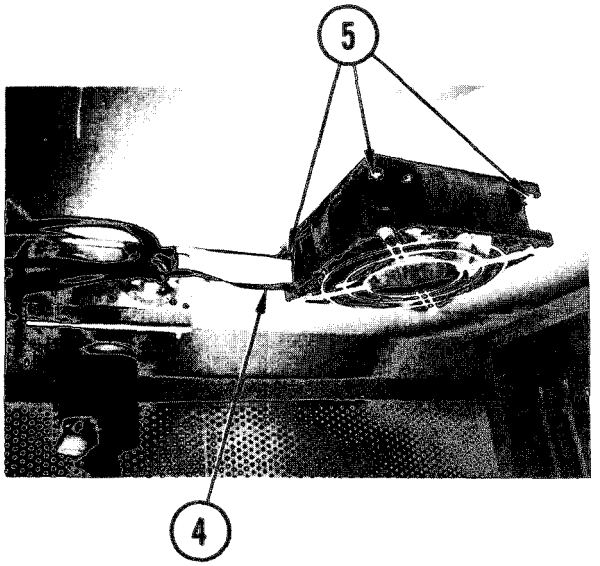
Common Tools	Materials/Spare Parts
• Tool kit	• Electrical tape

WARNING

Electrocution may result if this task is done with power on.

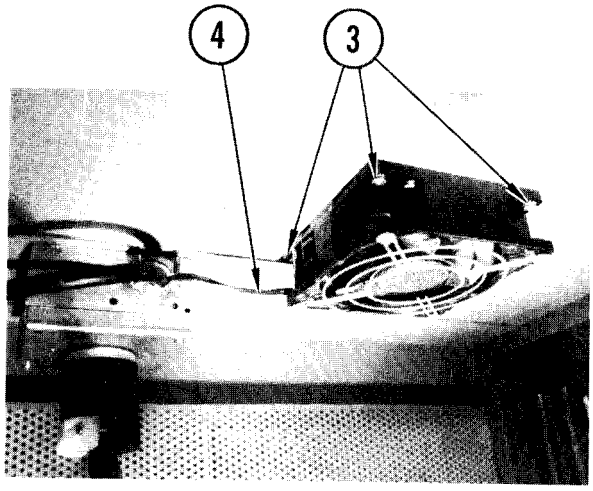
Remove

1. At tech power box, set tape drive circuit breaker CB5 to OFF. Place tape over breaker to indicate a repair is in progress.
2. Power OFF tape drive PDU.
3. Open tape drive cabinet (para 4-20, steps 1-5).



4. Disconnect power cord from rear of fan unit in top of cabinet.
5. Remove four nuts, washers, and bolts connecting fan and grill to top of cabinet.
6. Remove fan and close cabinet.

4-22. REMOVE/REPLACE TAPE DRIVE CABINET FAN (CONT)



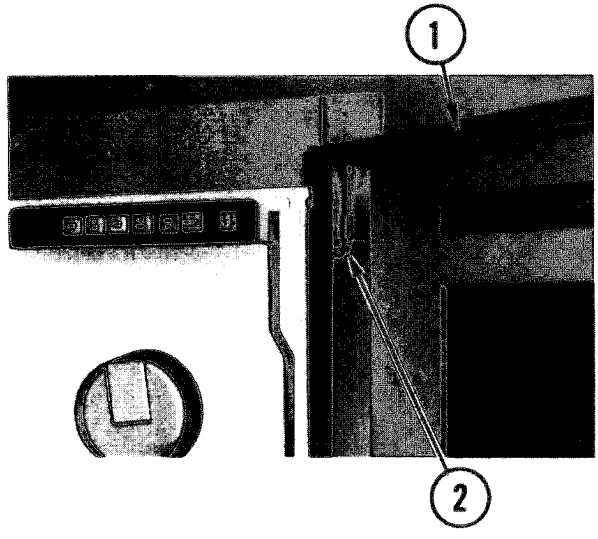
Replace

1. Open tape drive cabinet.
2. Aline fan with holes in top of tape drive cabinet.
3. Install four corner bolts, washers, and nuts through fan, grill, and top of cabinet. Tighten nuts.
4. Connect power cord to rear of fan unit.
5. Close tape drive.
   a. Insert flat-tip screwdriver in latch hole.
   b. Turn clockwise until tight.
6. Replace cover.
7. At tech power box, remove tape from circuit breaker and set breaker to ON.
8. Power ON tape drive PDU.

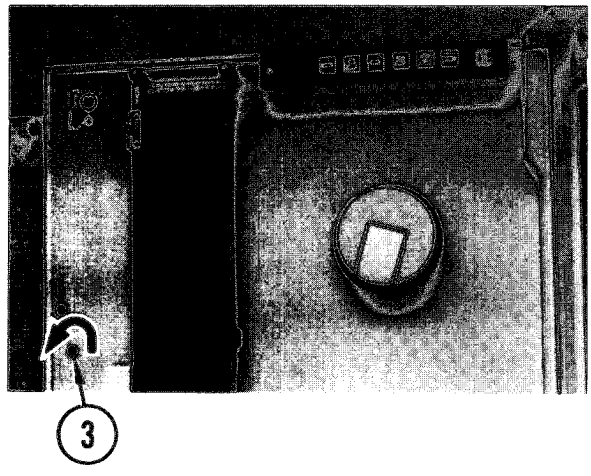
4-23. ADJUST TAPE DRIVE FLUX GATE

INITIAL SETUP

Common Tools	Test Measurement and Diagnostic Equipment	Supplies
• Tool kit	•Oscilloscope • SMUPAC	• Scratch tape

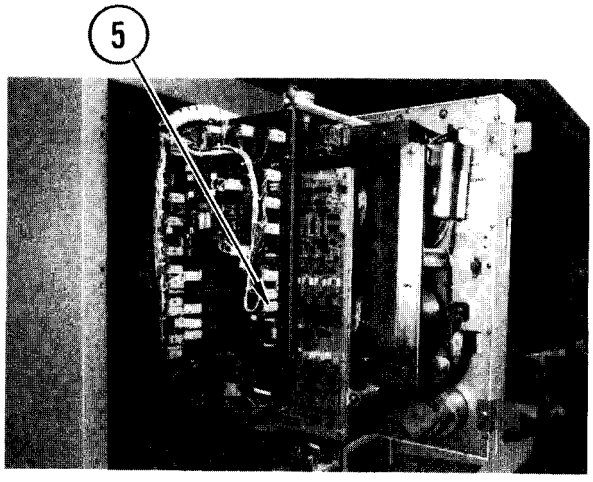


1. Open tape drive cover.
2. Remove cover.
   a. Locate spring-loaded pin at top of inside front cover.
   b. Pull down on pin and remove cover.



3. Insert flat-tip screwdriver in latch hole. Turn as shown. Pull cabinet part way open.
4. Load scratch tape with write permit ring.

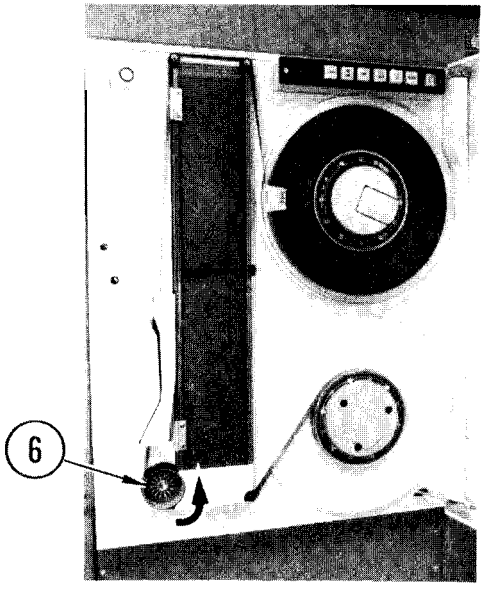
4-23. ADJUST TAPE DRIVE FLUX GATE (CONT)



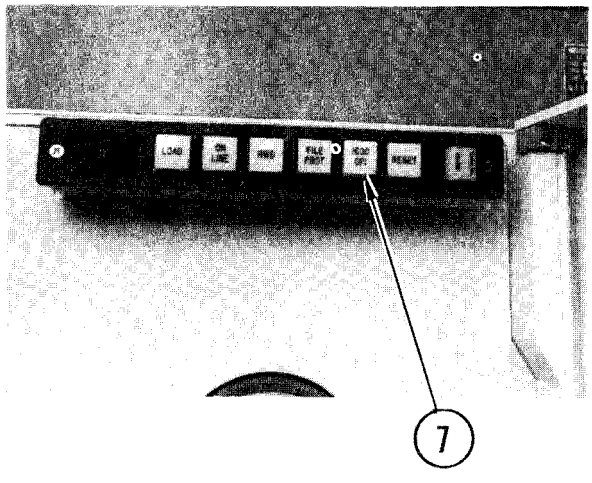
NOTE

Step 5 must be done with power on. Otherwise tape will not load properly to make flux adjustment.

5. Disconnect P1 from control board. Close tape drive (swing unit in, do not lock or replace cover).



6. Turn capstan by hand in direction shown until BOT marker moves onto takeup reel.



7. Make sure 1600 CPI indicator is off . If not, press l600 CPI button.

8. Set up oscilloscope:

   - Mode: ALTERNATE
   - Channel 1: 0.2 volts per centimeter
   - Channel 2: 0.2 volts per centimeter
   - Trigger channel 1 negative
   - TIME/DIV: 20 µsecs

9. Load T & V MTUX3 (appendix F).

10. When you see HELP (Y OR N)?: enter N and press return.

4-23. ADJUST TAPE DRIVE FLUX GATE (CONT)

11. When you see MODE (A, Q, OR "CONTROL H" FOR HELP)?: enter P and press RETURN .

12. When you see ERROR CONTROL (A, C, H OR R)?: enter C and press RETURN.

13. When you see TRACE (Y OR N)?: enter N and press RETURN.

14. When you see PRINT I/0 HISTORY (Y OR N)?: enter N and press RETURN。

15. When you see SUPPRESS ERROR REPORTS (Y OR N)?: enter Y and press RETURN.

16. When you see PRINT READ ERROR RATES (Y OR N)?: enter Y and press RETURN.

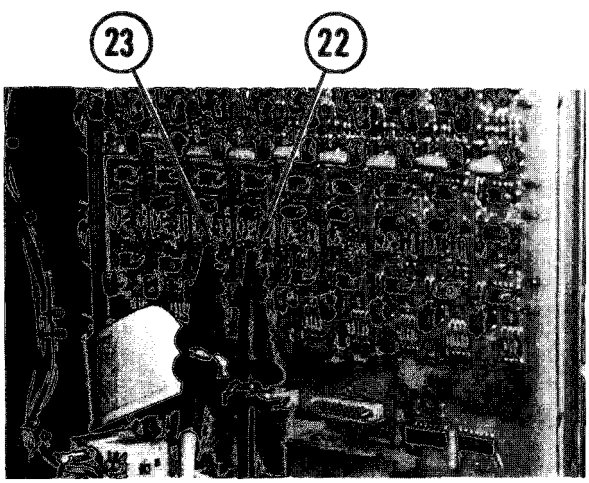
17. When you see MODE (A, Q OR "CONTROL H" FOR HELP)?: enter D and press RETURN.

18. When you see CHANNEL (1600 1680)?: enter appropriate drive channel and press RETURN.

19. When you see WARNING! THIS MODE WILL WRITE ON THE TAPE, OK TO WRITE ON TAPE (Y OR N)?: enter Y and press RETURN .

20. When you see RANGE, DATA (12-800 HEX, 00-FF)?: enter 800,FF.

21. When you see LINKS (UP TO 20)?: enter FW and press RETURN.



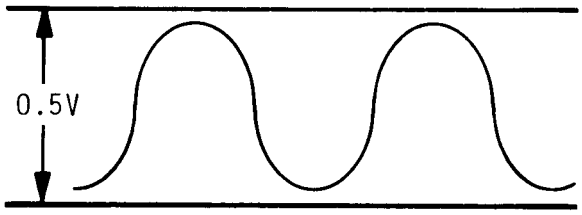
NOTE

RESET indicator should now blink continuously. This indicates all ones are being written on both channels. You are now ready to check amplitude.

22. Attach channel 1 probe to TP601 on NRZI board.

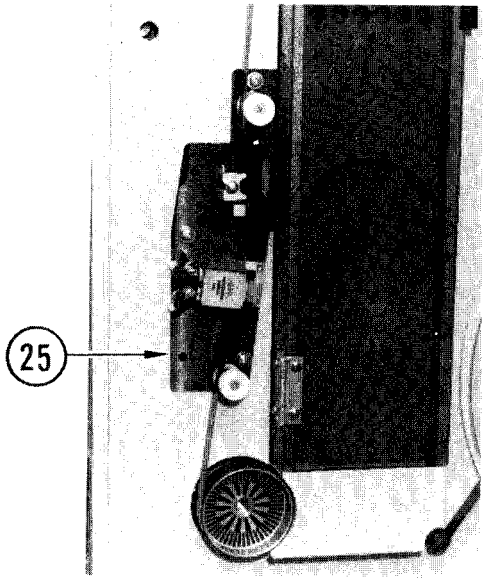
23. Attach channel 2 probe to TP701 on NRZI board.

4-23. ADJUST TAPE DRIVE FLUX GATE (CONT)

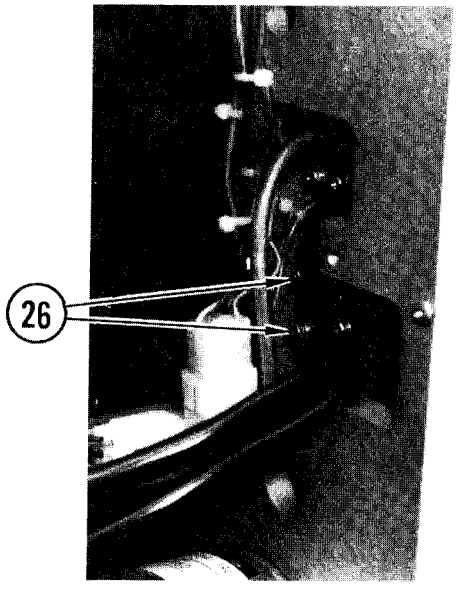


24. Amplitude for each signal should be less than 0.5 volts.

- If yes, go to step 32
- If not, go to step 25

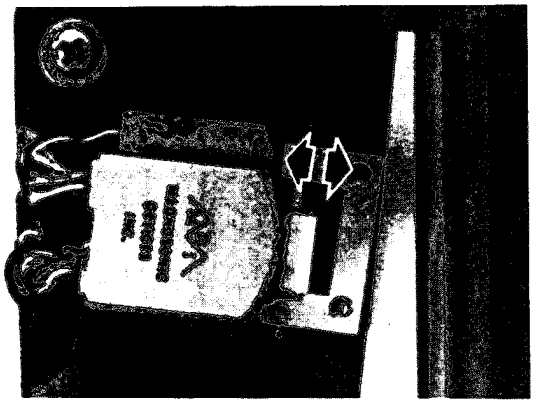


25. Remove head covers as shown.



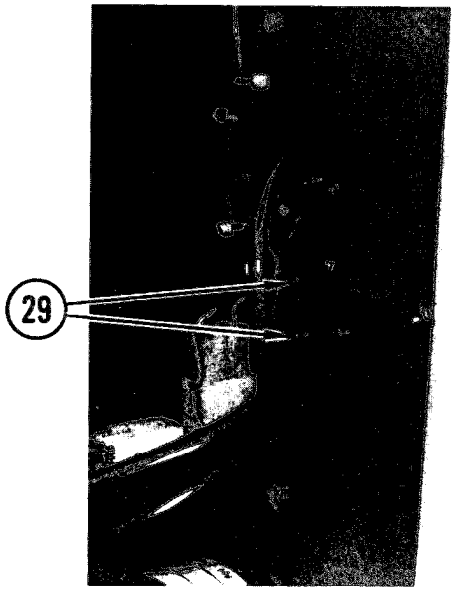
26. Loosen two flux gate screws.

4-23. ADJUST TAPE DRIVE FLUX GATE (CONT)

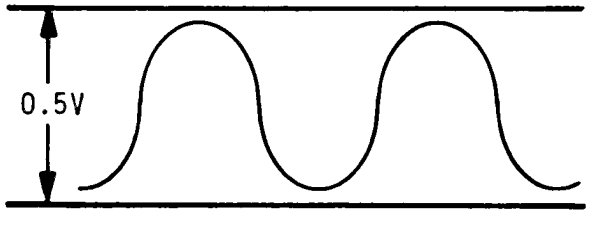


27. Move flux gate as shown by arrow.

28. While moving gate, display channels one at a time. When amplitude is within limits for both channels, hold gate in place.



29. While holding flux gate in place, tighten two flux gate screws.



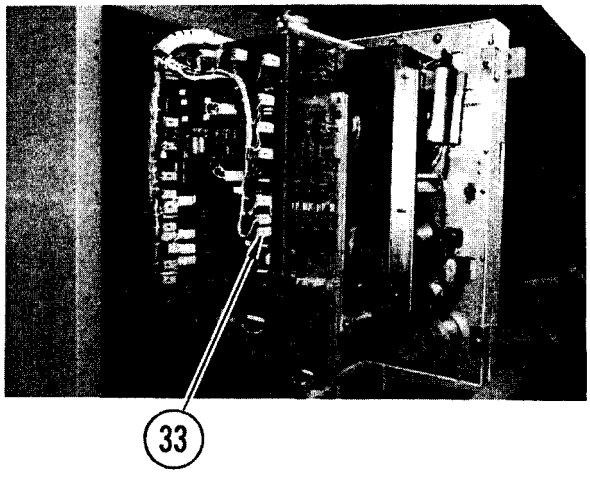
30. Display channels 1 and 2.

- If amplitude is within limits shown for both channels, go to step 31
- If amplitude is not within limits, go back to step 26

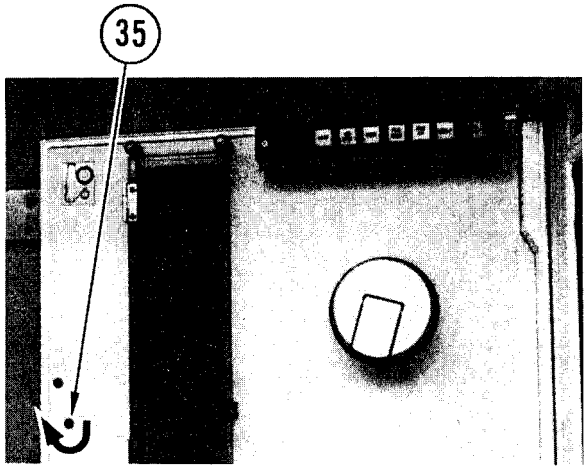
31. Replace head covers and disconnect scope probes.

32. Power OFF tape drive. Power off CBO1 at PDU.

4-23. ADJUST TAPE DRIVE FLUX GATE (CONT)



33. Connect P1 to control board.



34. Close tape drive.

35. Insert screwdriver in latch hole. Turn as shown until latch closes.

36. Unload scratch tape.

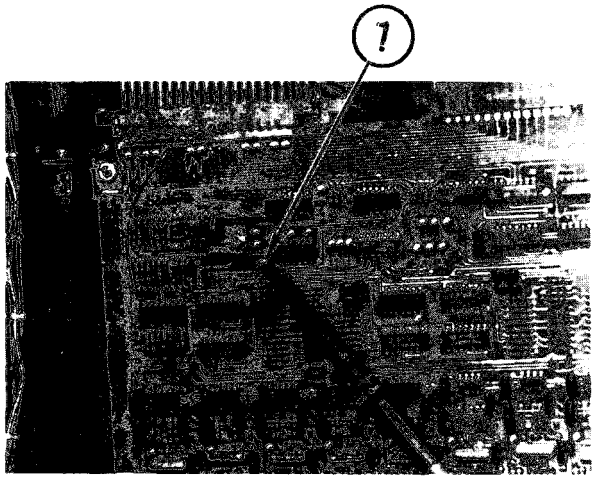
37. Replace cover.

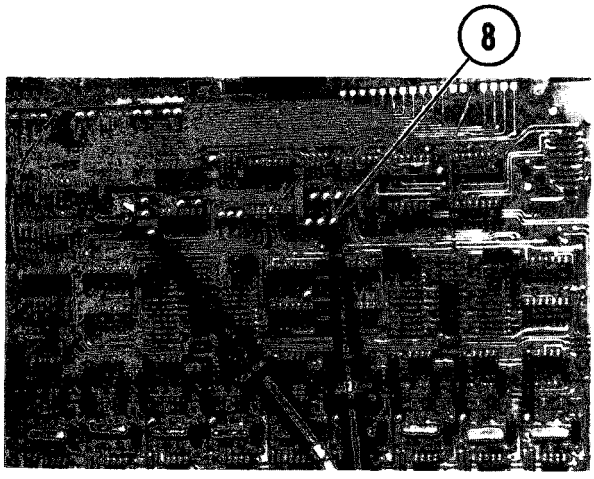
4-24. ADJUST WRITE HEAD DESKEW

INITIAL SETUP

Common Tools	Materials/Spare Parts	TMDE
• Tool kit	• Pen or pencil • Paper	• Oscilloscope • Azimuth skew tape •Scratch tape • SMUPACK

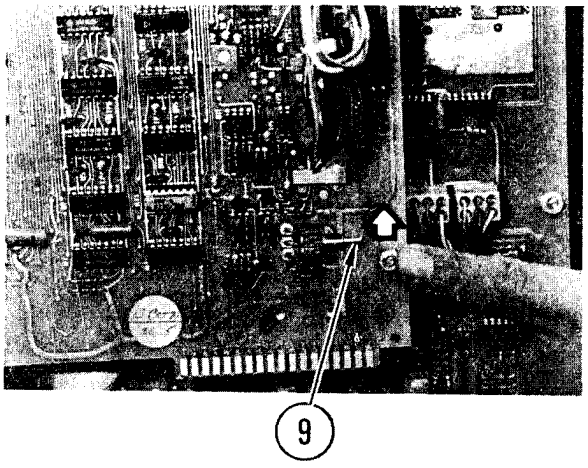
1. Open tape drive door.
2. Load skew tape.
3. Press RESET to set drive off line.
4. Make sure FILE PROT is lit and 1600 CPI is not lit.
5. Access tape drive (para 4-23, steps 1-3).
6. Set up oscilloscope.
   - Channel 1: 2 volts per centimeter
   - Channel 2: 2 volts per centimeter
   - Trigger positive
   - TIME/DIV: 2 µsec/channel
7. On NRZI board, attach channel 1 to TP5.



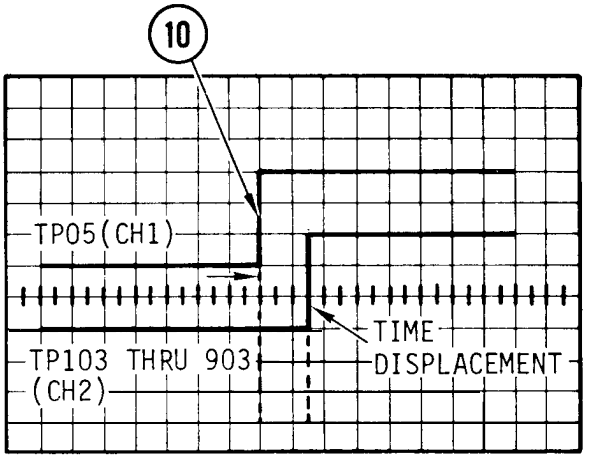


8. Attach channel 2 probe to TP103.

4-24. ADJUST WRITE HEAD DESKEW (CONT)



9. On control board, set SW1 to FWD.



10. Observe scope. On scratch paper, record time displacement between channels 1 and 2.

11. Attach channel 2 probe to TP's 203 thru 903 and record displacement times for each.

12. All time displacement should be less then 3.3 microseconds.

    • If yes, go to step 13

    • If no, adjust read head skew (TM 11-7025-209-23), then repeat write head deskew checks until all displacements are less than 3.3 microseconds

CAUTION

Do not use high speed rewind for skew tape, damage to tape will result.

13. Using switch SW1, rewind skew tape.

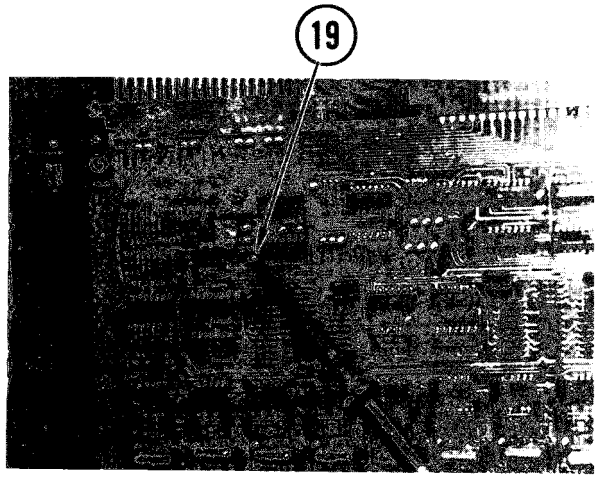
14. Unload skew tape.

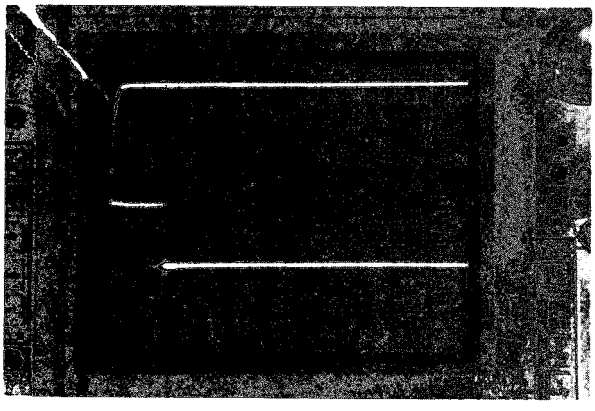
15. Load scratch tape with write-permit ring installed.

16. Place tape drive online.

17. Make sure FILE PROT is not lit.

4-24. ADJUST WRITE HEAD DESKEW (CONT)





18. Run T & V MTUX3 (appendix F).

    a. When you see HELP (Y OR N)?: enter N and press RETURN.

    b. When you see MODE (A, Q OR "CONTROL H" FOR HELP)?: ENTER D and press RETURN.

    c. When you see CHANNEL (1600 1680)?: enter appropriate drive channel and press RETURN.

    d. When you see WARNING! THIS MODE WILL WRITE ON THE TAPE, OK TO WRITE ON TAPE (Y OR N)?: Y enter Y and press RETURN.

    e. When you see RANGE, DATA (12-800 HEX, 00-FF)?: enter 800,FF.

    f. When you see LINKS (UP TO 20)?: enter FW and press RETURN.

NOTE

RESET indicator on tape drive should now blink continuously. This indicates all-ones are being written in all channels.

19. Make sure channel 1 is still attached to TP 5.

20. Using your notes from steps 9 and 10, find which TP had greatest time displacement.

21. Attach channel 2 to that TP.

22. Observe scope. Measure time displacement. Time displacement for TP should be same as readout from step 9 or 10.

    • If yes, go to step 24

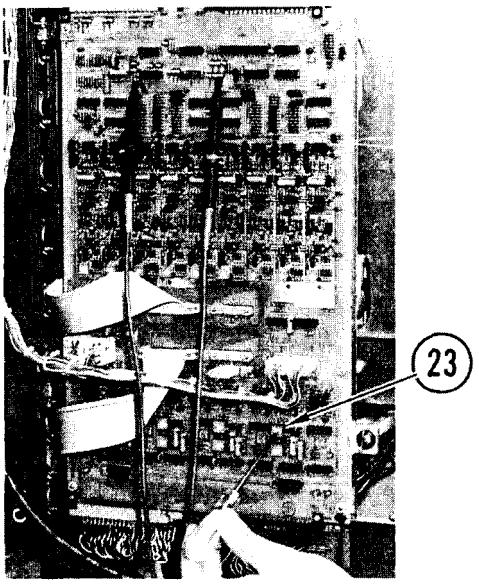
    • If no, go to step 23

4-24. ADJUST WRITE HEAD DESKEW (CONT)

NOTE

Use this chart to make adjustments.

POT	adjusts	TP
R102		103
R202		203
R302		303
R402		403
R502		503
R602		603
R702		703
R802		803
R902		903



23. Adjust pot for associated TP. While adjusting, observe scope. stop adjustment when time displacement equals readout from step 9 or 10.

24. Using figures from step 9 and 10 measure time displacement for TPs 103 thru 903. Work from highest displacement TP to lowest displacement TP. Displacement for all TPs should equal readouts from step 9 and 10.

    • If they do, go to step 25

    • If any do not, go back to step 6

25. Disconnect probes.

26. On CPU control panel, press S (stop).

27. Unload scratch tape.

    • If part of adjustment sequence go on to next adjustment task

    • If not, close tape drive cabinet and door

4-25. REMOVE/REPLACE CONSOLE PRINTER

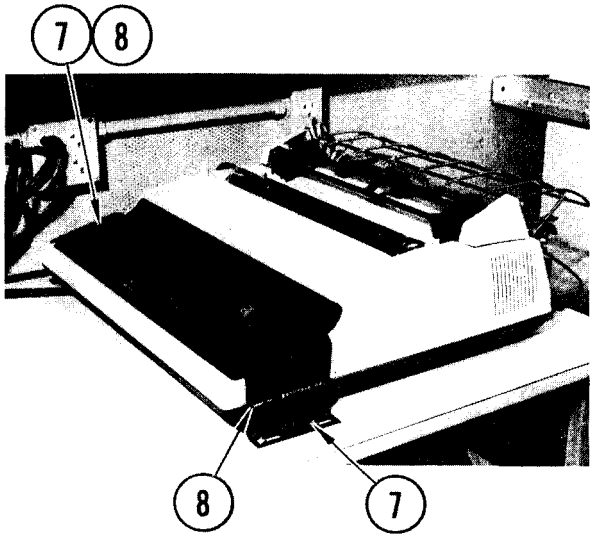
INITIAL SETUP

Common Tools
- Tool kit

Remove

1. Power OFF. Remove paper.
2. Remove nut and washer from ground strap. Remove ground strap from printer.
3. Pull ac power plug from outlet and remove power cord from printer.
4. Loosen screws on communications cable and remove cable from printer.
5. Remove three mounting screws together with flatwashers and lockwashers which secure rear mounting clip assemblies.
6. Remove three mounting clip assemblies.

4-25. REMOVE/REPLACE CONSOLE PRINTER (CONT)



7. Remove four mounting screws, lockwashers, flatwashers, and nuts which secure right and left mounting brackets to counter top.

8. Remove two mounting brackets.

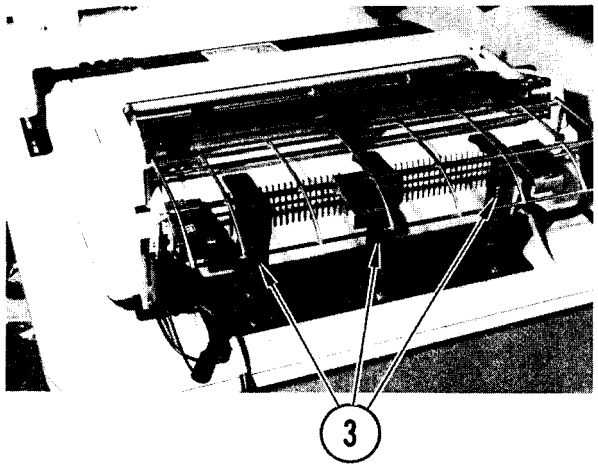
9. Prepare console printer for movement (TM 11-7010-205-10).

Replace

1. Prepare console printer for operation (TM 11-7010-205-10).

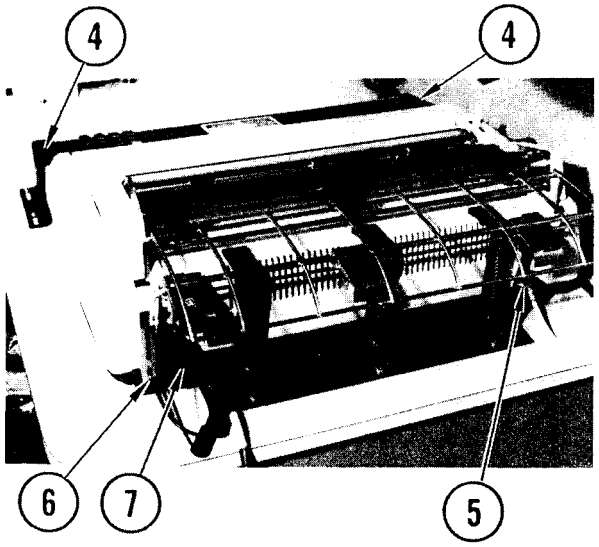
NOTE

Route ground strap underneath printer when you do step 2. This will allow easy connection later.



2. Position console printer on counter so that rear of printer is aligned with mounting angle.

3. Replace three mounting clips and secure in position with three screws, lockwashers, and flatwashers.



4. Replace left and right mounting brackets in position and secure with four screws, lockwashers, and nuts.

5. Push ac power plug into chassis outlet. Push other end into tech power outlet.

6. Plug communications cable. into connector and tighten screws.

7. Attach ground strap to stud and secure with nut and washer.

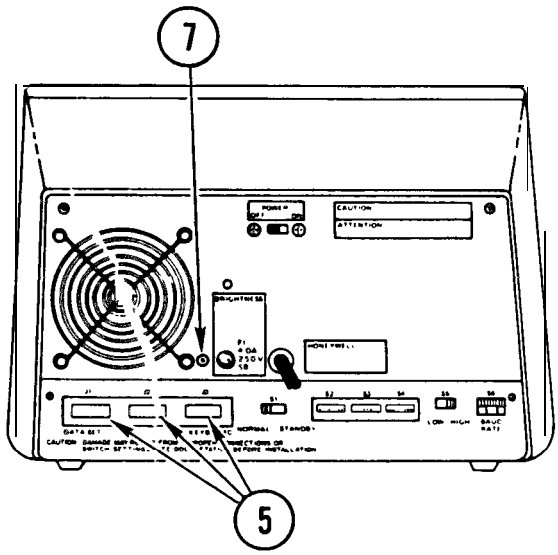
8. Install paper. Power on.

4-26. REMOVE/REPLACE CONSOLE TERMINAL OR I/O TERMINAL

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Plastic bag
- Tags
- Pen or pencil



Remove

1. Power OFF.
2. Pull ac power plug from outlet.
3. Remove six terminal mounting screws together with lockwashers and flatwashers from underneath table and place in parts storage bag.

NOTE

Do not remove keyboard tie down hardware. Loosen ribbon cable by removing wrap.

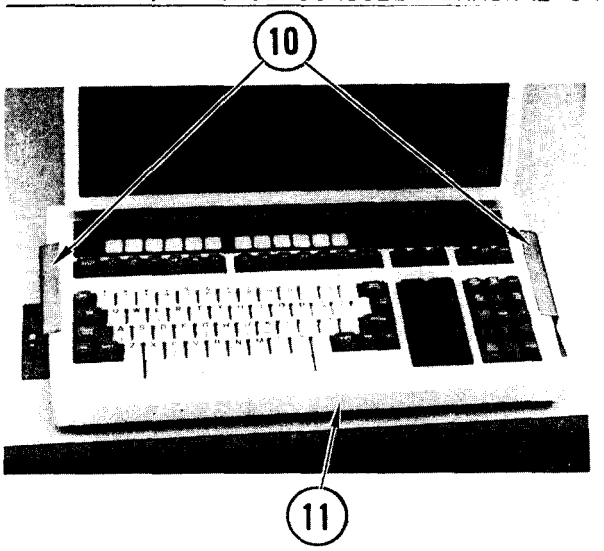
4. Lift and turn terminal so you can access cables at rear.

NOTE

Only the console terminal has a cable connected to J2. This is for the console printer.

5. Tag cables.
6. Loosen connector screws. Remove cables.
7. Remove screw and disconnect ground strap.
8. Remove terminal.
9. Remove six flatwashers from over mounting holes on table top.

4-26. REMOVE/REPLACE CONSOLE TERMINAL OR I/0 TERMINAL (CONT)



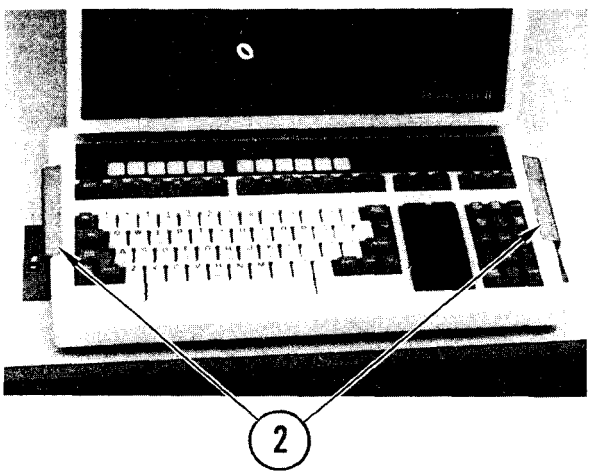
10. Remove two mounting screws together with flatwashers, lockwashers and nuts which secure left and right keyboard bracket assemblies. Stow parts in storage bag.
11. Remove terminal keyboard.
12. Mark and stow storage bag.

Replace

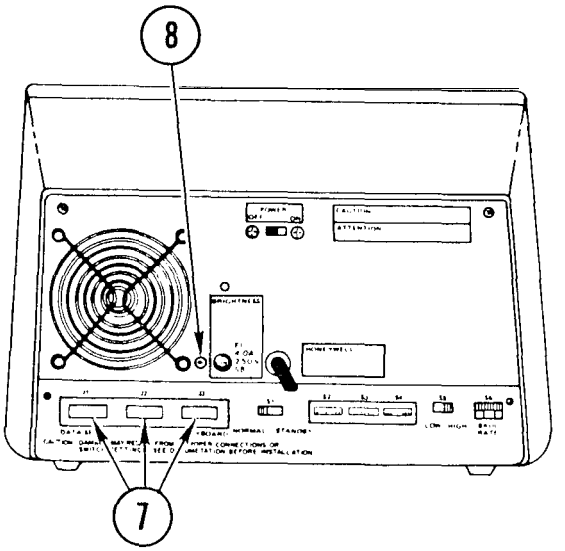
NOTE

Before you install terminal, check rear panel switch settings. See Appendix D for correct settings.

1. Place terminal keyboard in position between mounting holes in table top.



2. Get keyboard bracket assemblies from parts bag in storage and position the two bracket assemblies n position over the two mount ing hol
3. Secure brackets in position with two screws, flatwashers, lockwas hers and nuts.
4. Get terminal tie down parts from parts bag.
5. Position flatwashers over six terminal mounting holes on to table.
6. Place terminal in position making certain that keyboard cable is dressed properly up terminal.

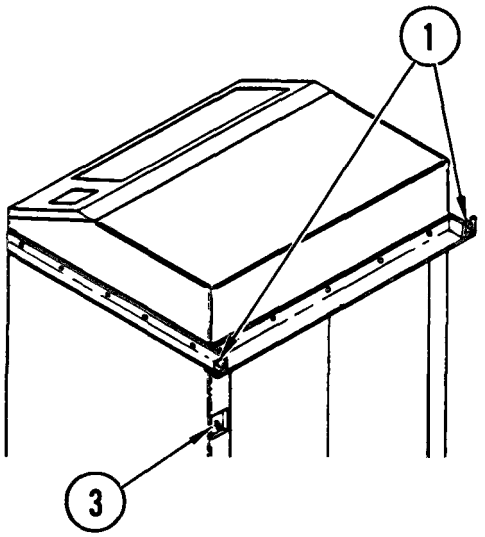


7. Using tags as reference, connect cables to rear of terminal. Tighten connector screws.
8. Connect ground strap.
9. Line up holes in terminal base with flatwashers and holes in table.
10. Replace screws, lockwashers, and flatwashers on each side of base.
11. Push ac power plug into tech power outlet.

4-27. REMOVE/REPLACE LINE PRINTER

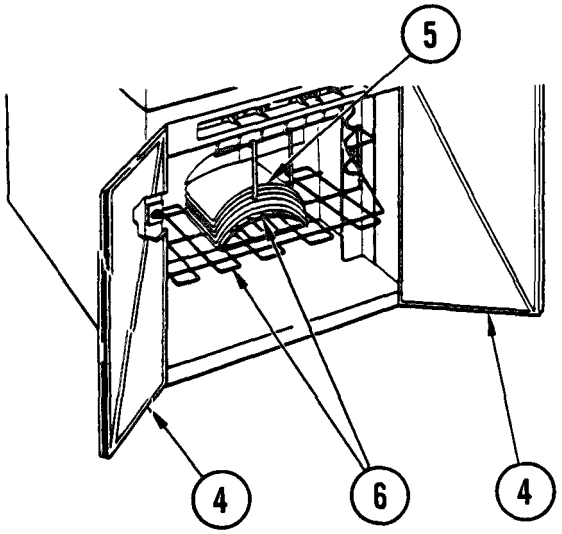
INITIAL SETUP

Common Tools	Materials/Spare parts	Personnel Required
• Tool kit • Hex key wrench set-decimal • Decimal socket set	• Plastic bag • Tie wraps	• Two



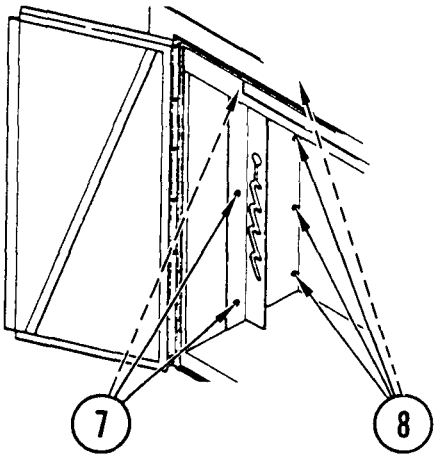
Remove

1. If not already removed, remove two screws together with lockwashers and flatwa shers s ecuring right and left mounti ng angl es to van wall.
2. Pull line pri nter away from wal l.
3. Power OFF.



4. Open rear doors of printer.
5. Remove paper.
6. Remove paper stacker and paper shelf.

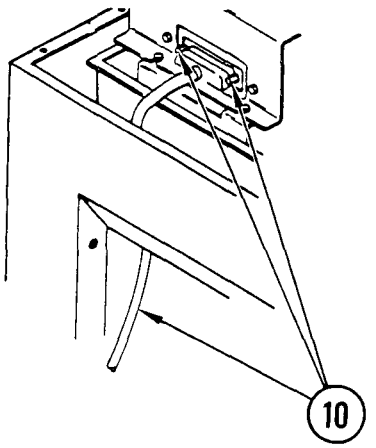
4-27. REMOVE/REPLACE LINE PRINTER (CONT)



7. Remove three screws from paper shelf mounting rail. Remove rail.

8. Remove four mounting screws from side panel. Remove panel.

9. Loosen mounting screws and lift printer top cover.



10. Squeeze spring clips or remove mounting screws and carefully three communications cable down and out printer.

11. Replace side panel and secure position with four mounting screws

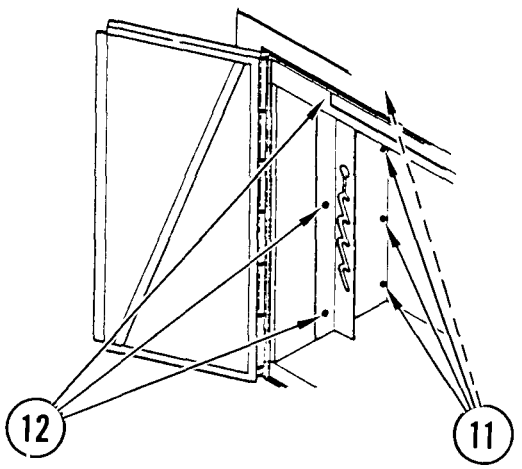
12. Replace paper shelf mounting rail and secure with three mounting screws.

13. Replace paper shelf and stacker.

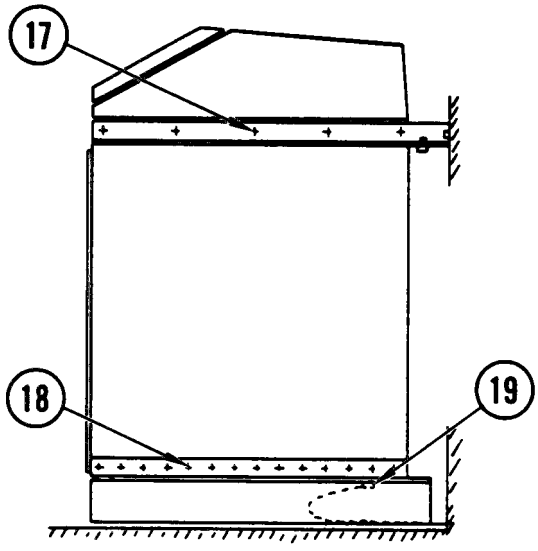
14. Close rear doors.

15. Close top cover and tighten two mounting screws.

16. Prepare line printer for movement (TM 11-7010-205-10-1), but do not install screws in wall bracket or locking pins in tracks.



4-27. REMOVE/REPLACE LINE PRINTER (CONT)



17. Remove mounting screws together with lockwashers and flatwashers and remove left, right, and rear mounting angles from sides and rear of printer. Stow in van pending replacement.
18. Remove mounting screws together with lockwashers and flatwashers securing printer to right and left slide assemblies, and store all mounting hardware in marked plastic bag.
19. Remove mounting bolt under rear of printer and remove grounding strap with one bolt.

NOTE

Wheels are mounted on bottom of printer. When removed from rails, the printer can be rolled out of the van without a dolly or hand truck.

20. With partner, lift printer off runners and onto floor.
21. Remove the left rail used for the line printer, and remove vestibule door and side of door frame (para 4-115).
22. Remove line printer from van.

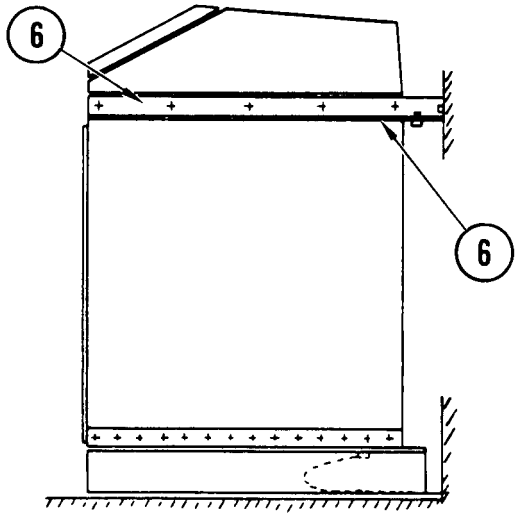
Replace

NOTE

Use hardware retained during removal.

1. Install the left rail for the line printer, roll line printer into van and position it in front of rails.
2. Get marked plastic parts bag from storage.
   - If printer is a replacement unit, mounting hardware and brackets are packed with it
   - If printer is original unit the mounting hardware and brackets are stored in the van
3. With your partner, raise line printer and slide rails under line printer. At the same time, have partner position slides so that mounting holes are alined with corresponding holes on printer frame.

4-27. REMOVE/REPLACE LINE PRINTER (CONT)



4. Attach line printer to left and right slide assemblies with mounting screws together with lockwashers and flatwashers. Do not tighten any mounting screws until all screws have been inserted in position, then tighten all screws securely.

5. Attach grounding strap to right rear caster and secure in position with mounting bolt.

6. Replace right, left, and rear mounting angles to sides and rear of printer. Secure in position with mounting screws, lockwashers, and flatwashers.

7. Open rear doors of printer, then repeat steps 6-9 of removal procedure to access ac harness duct.

8. Reconnect communications cable, then close up ac harness duct Remove, steps 11-15.

9. Prepare printer for operation (TM 11-7010-205-10-1) .

10. Slide line printer against wall.

11. Install locking pins.

12. Install screws, lockwashers, and flatwashers holding line printer to wall.

13. Replace vestibule door and side of door frame (para 4-115).

4-28. REMOVE/REPLACE DISK DRIVE

INITIAL SETUP

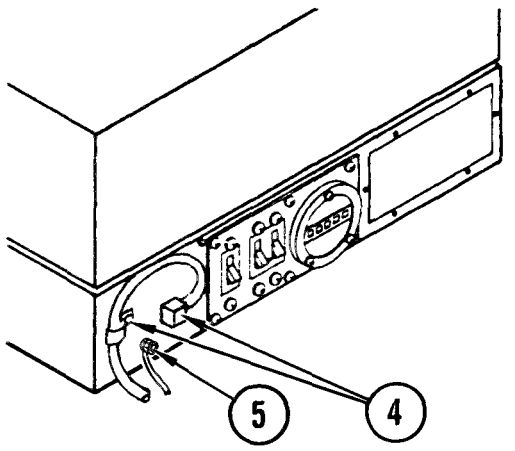
Common Tools	Personnel Required	Support Equipment
• Tool kit • Flashlight	• Two	• Hydraulic hand truck

WARNING

Electrocution may result if this procedure is done with power ON to disk drive. Cut power before you begin this procedure.

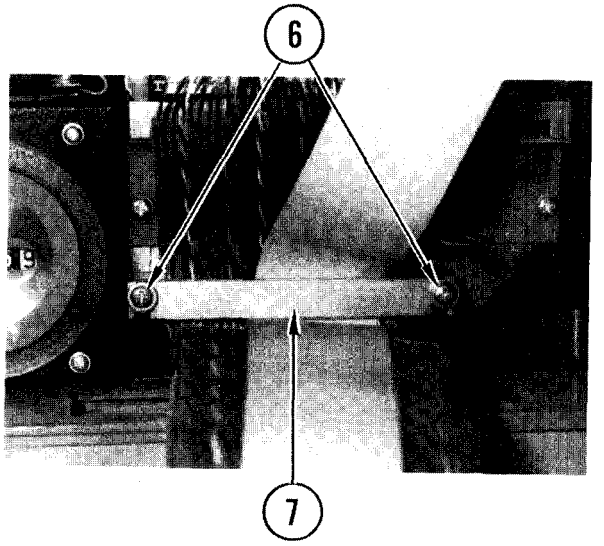
Remove

1. At tech power box, set CB1 and CB2 to OFF.
2. Pull out drawer of disk drive to be removed.
3. Prepare disk drive for movement (TM 11-7010-205-10-1). Do not close cover or secure disk drive drawer in cabinet.



4. Remove screw holding cable clamp on power cord Disconnect power cord plug.
5. Remove nut and lockwasher. Disconnect ground strap.

4-28. REMOVE/REPLACE DISK DRIVE (CONT)

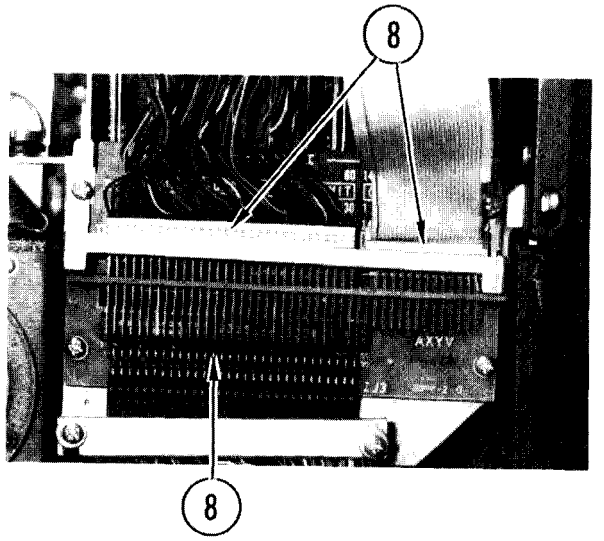


NOTE

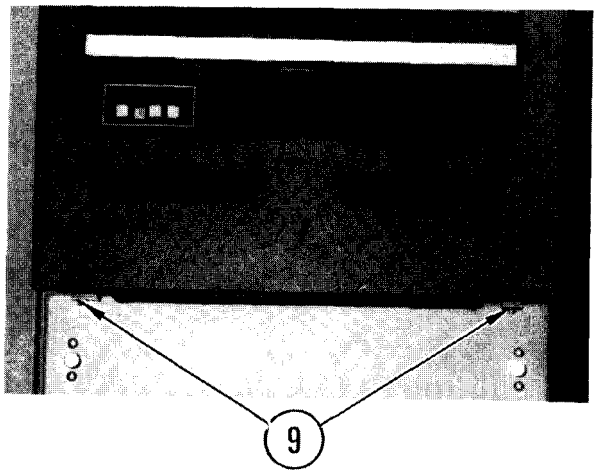
Some disk drives have a round shielded multi-conductor type cable instead of a ribbon cable. These drives also have a different mounting bracket to hold the round cable in place.

6. Loosen screws securing cable bracket at rear of disk drive.

7. Remove bracket.

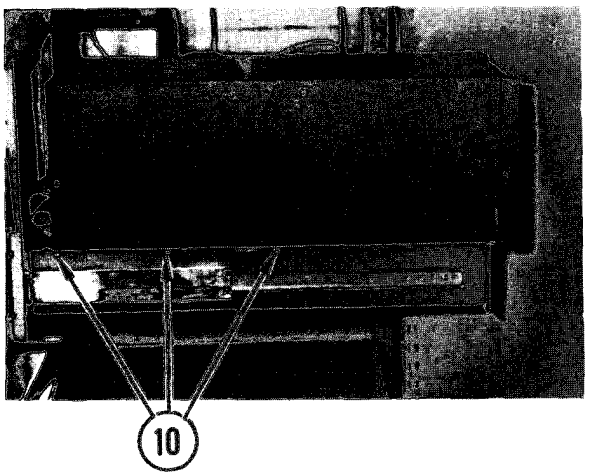


8. Note position and disconnect cables. Close cover.



9. At front of disk drive, remove screws shown.

4-28. REMOVE/REPLACE DISK DRIVE (CONT)



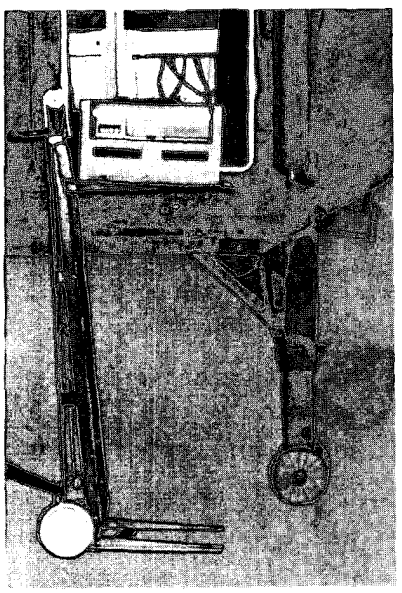
10. Remove screws on both sides of drive.

WARNING

Disk drive weighs approximately 200 lb. Do not attempt to lift or move unit without help.

11. With your partner, lift drive off drawer support. Place on floor.

12. Open side door of van.



13. Slide drive onto hand truck platform as shown.

14. At top of disk drive cabinet, remove cover to access inside of cabinet.

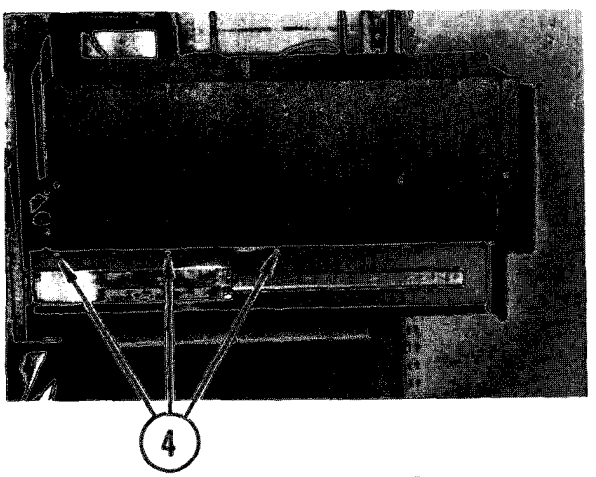
15. Inside disk drive cabinet, unplug power cord for disk drive YOU removed. Cut tie wraps and remove power cord. Ship power cord with disk drive.

Replace

1. Open side door of van.

WARNING

Disk drive weighs approximately 200 lb. Do not attempt to lift or move unit without help.

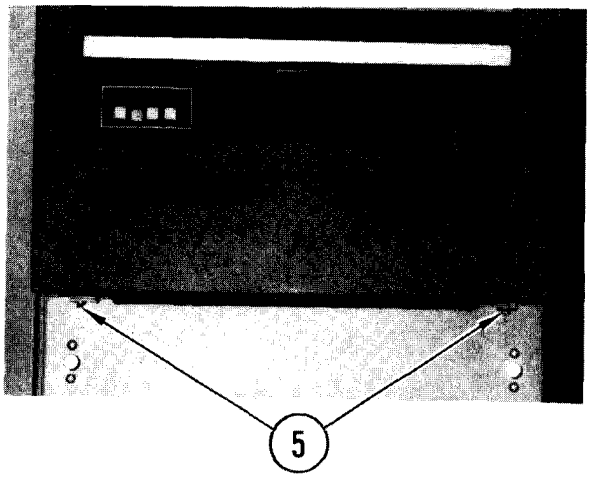


2. With your partner, slide drive onto van floor from hand truck platform.

3. With your partner, lift drive onto drawer support.

4. Replace bolts on both sides of assembly.

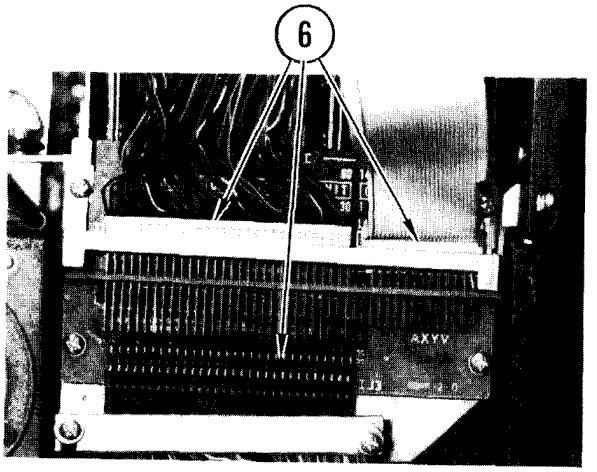
4-28. REMOVE/REPLACE DISK DRIVE (CONT)



5. Replace screws at front corners.

NOTE

Some disk drives have a round shielded multi-conductor type cable instead of a ribbon cable. These drives also have a different mounting bracket to hold the round cable in place.



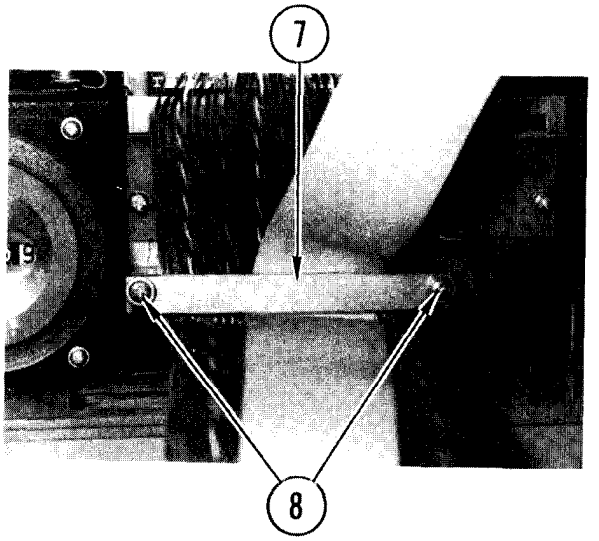
6. Open disk drive cover and connect cables.

7. Place bracket around ribbon cable.

8. Tighten screws to secure bracket.

9. Inside drive cabinet, plug in ac power cord and install tie wraps as needed.

10. At top of disk drive cabinet, replace cover and tighten four screws.



11. Use nut and lockwasher to attach grounding strap to stud on back of drive.

12. Prepare disk drive for operation (TM 11-7010-205-10-1).

13. Set circuit breakers on rear of drive to ON.

14. Close drawer.

15. At tech power box, set CB1 and CB2 to ON.

4-29. REMOVE/REPLACE DISK DRIVE CABINET FAN

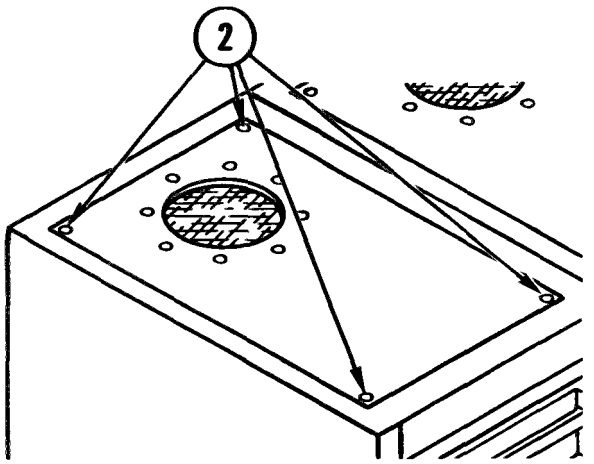
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Electrical tape

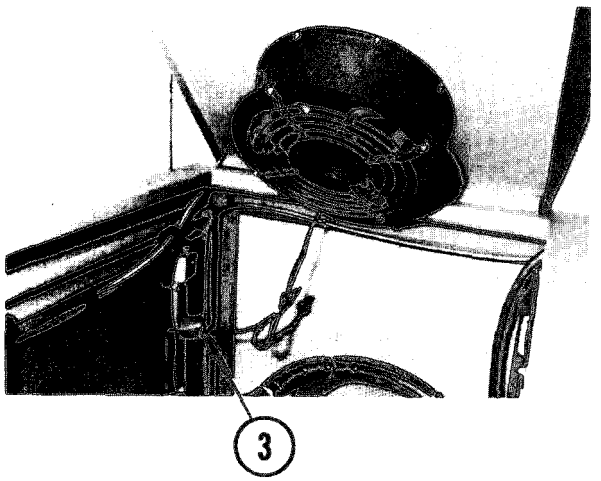
WARNING

Electrocution may result if this task is attempted with power on.

Remove

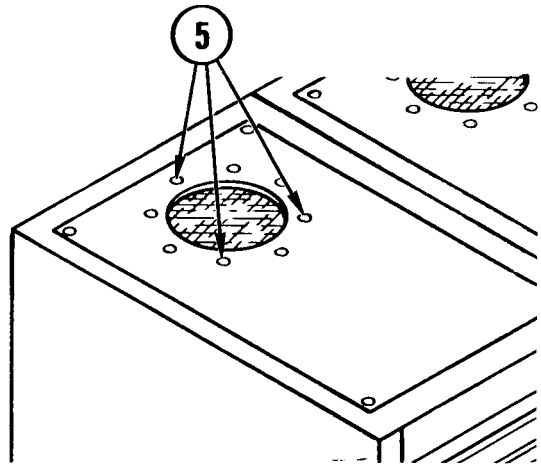


1. In technical power box, set circuit breakers CB1 and CB2 to OFF. Place tape over breakers to indicate that a repair is in progress.
2. On top of disk drive cabinet, remove screws from cover.

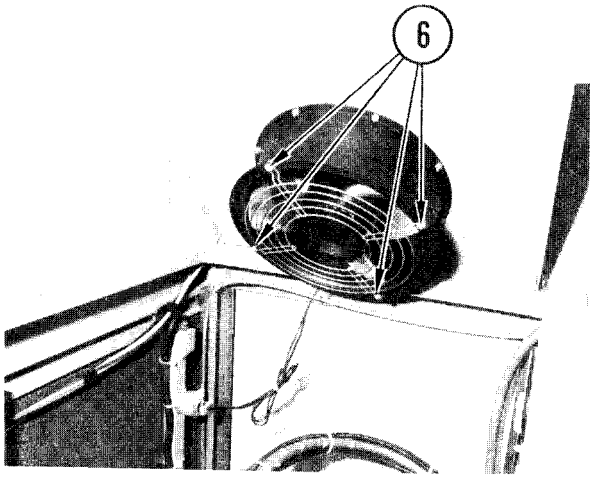


3. Lift top cover up and unplug fan assembly from outlet.
4. Lift off cover and fan assembly. Place in a convenient working position.

4-29. REMOVE/REPLACE DISK DRIVE CABINET FAN (CONT)



5. Remove eight screws, lockwashers, and nuts holding fan assembly to cover.



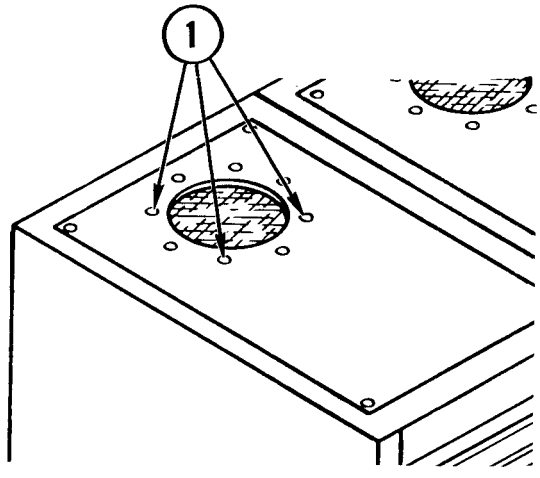
6. Remove four screws, nuts, and washers holding fan to housing grill.

7. Remove grill and set aside.

Replace

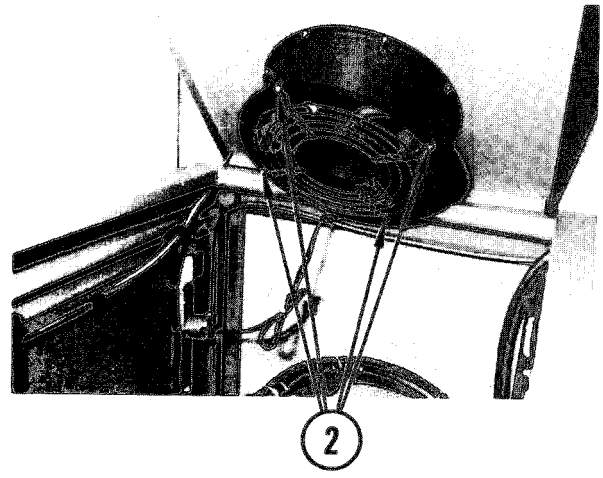
NOTE

Make sure directional arrow on fan points toward cover.



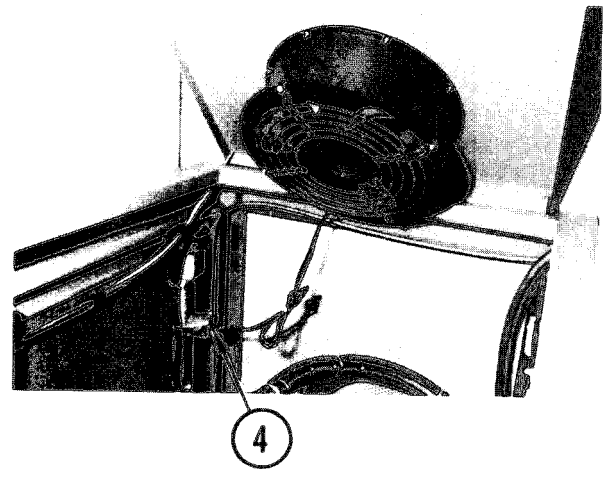
1. Aline fan assembly base with holes in disk drive cover. Install and tighten eight screws, nuts, and lockwashers.

4-29. REMOVE/REPLACE DISK DRIVE CABINET FAN (CONT)



2. Place grill on fan assembly. Insert and tighten four screws, nuts, and washers.

3. Replace cover and fan assembly on top of disk drive unit (keep top tilted up).



4. Plug fan power cable into receptacle.

5. Lower disk drive cover into place. Insert and tighten four corner screws.

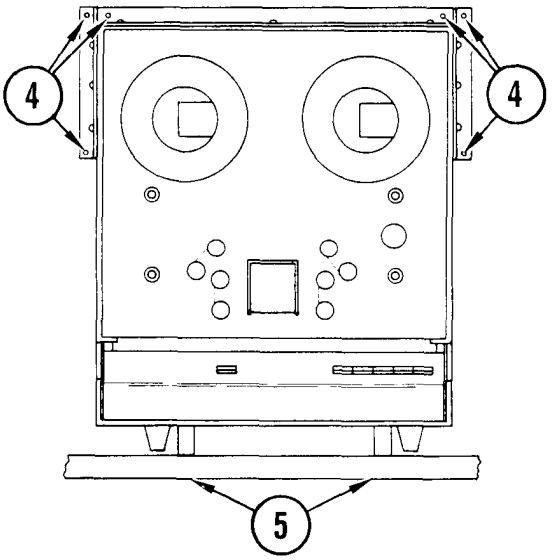
6. At tech power box, set circuit breakers CB1 and CB2 ON.

4-30. REMOVE/REPLACE TAPE CLEANER

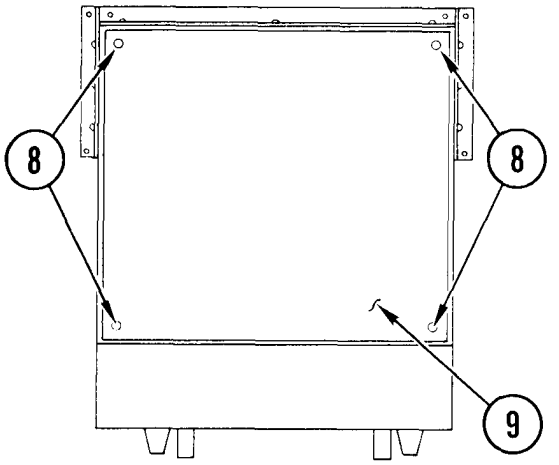
INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required
•Tool kit	• Small plastic bag • Tags • Pen or pencil • Large plastic bag	• Two

Remove

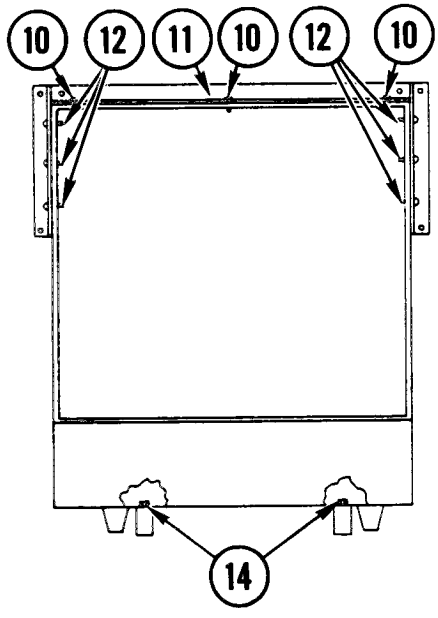


1. If plastic cover is on tape cleaner, pull off.
2. Power OFF. Pull ac power plug from outlet.
3. Remove takeup reel.
4. Remove six screws, lockwashers, and flatwashers holding tape cleaner to
5. Remove four screws, lockwashers, and flatwashers from under cabinet top. Place in plastic bag.
6. Move tape cleaner away from wall.
7. Turn tape cleaner around so back panel is facing you.



8. Remove four screws and flat plasti c washers holding back panel. Set aside.
9. Lift out back panel and set it asi de

4-30. REMOVE/REPLACE TAPE CLEANER



10. Remove three bolts, nuts, lockwashers and flat washers holding top angle bracket.

11. Remove bracket and put bolts, washers and nuts in holes. Do not tighten.

12. Remove three bolts, nuts, lockwashers and flat washers holding each side angle bracket.

13. Remove each bracket and put bolts, washers and nuts in bracket holes. Do not tighten. Retain brackets for re-installation.

14. Inside base of tape cleaner, remove two hex head screws, lockwashers and flat washers holding each tiedown bar to bottom of tape cleaner.

15. Put screws and washers in plastic bag.

16. Put back panel on tape cleaner and fasten it with four screws and flat plastic washers.

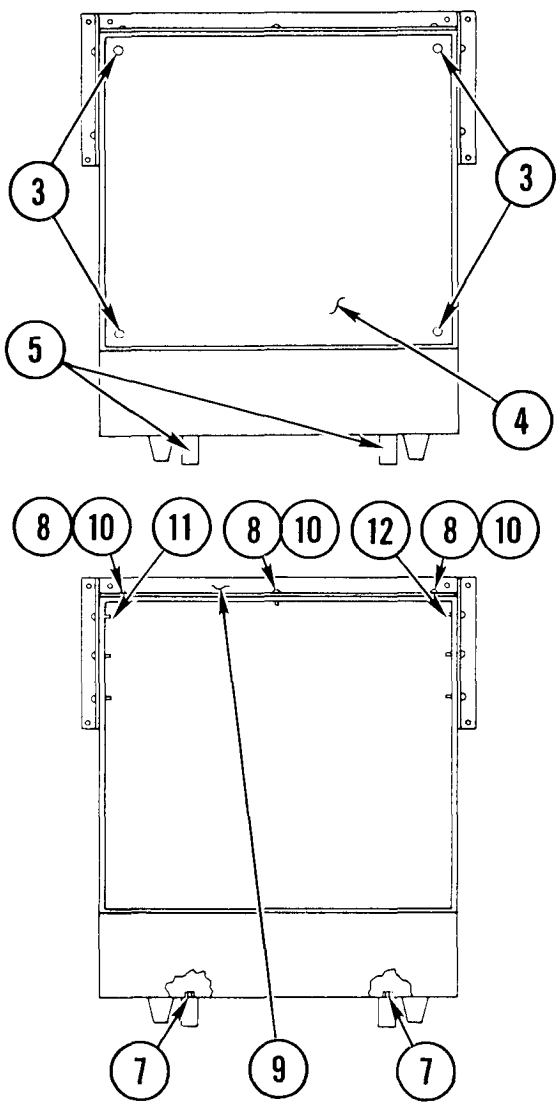
17. Cover tape cleaner with large plastic bag.

WARNING

Tape cleaner is heavy. Do not attempt to lift without help.

18. With your partner, carry tape cleaner out of van.

4-30. REMOVE/REPLACE TAPE CLEANER (CONT)



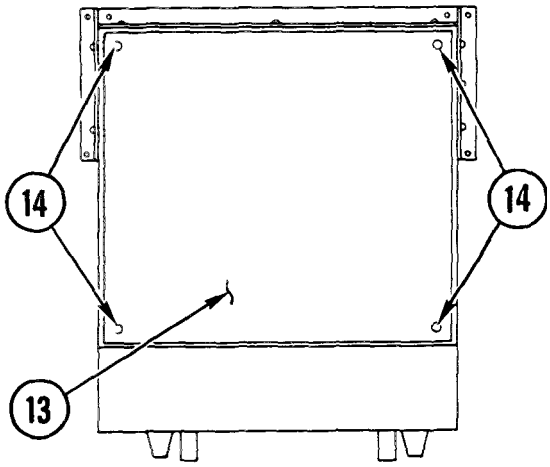
Replace

WARNING

Tape cleaner is heavy. Do not attempt to lift without help.

1. With partner, carry tape cleaner into van.
2. If present, remove plastic cover. Place tape cleaner on bulk storage cabinet on top of tie down bars with back facing out.
3. Remove four screws and flat plastic washers holding back panel. Set aside.
4. Lift out back panel and set it aside.
5. Position tie-down bars under tape cleaner so that two holes in each bar line up with holes in bottom of tape cleaner.
6. Get tiedown hardware from storage.
7. Install two hex head screws, flat washers and lockwashers in each tiedown bar. Tighten.
8. Remove three screws, flat washers, lockwashers and nuts from top angle bracket.
9. Position top angle bracket on top of tape cleaner so that vertical flat containing two holes will be against wall of van when tape cleaner is turned around.
10. Fasten bracket to tape cleaner with three bolts, flat washers, lockwashers and nuts.
11. Fasten left side angle bracket to tape cleaner with three bolts, flat washers, Iockwashers and nuts.
12. Fasten right side angle bracket to tape cleaner with three bolts, flat washers, lockwashers and nuts.

4-30. REMOVE/REPLACE TAPE CLEANER (CONT)



13. Put back panel in position on tape cleaner.

14. Put in four screws and flat plastic washers.

WARNING

Tape cleaner is heavy. Do not attempt to lift it without help.

15. With partner, turn tape cleaner around.

16. Move tape cleaner toward wall until holes in tape cleaner base line up with holes in cabinet top.

17. Install four screws, lockwashers, and flatwashers under cabinet top.

18. Install six screws, lockwashers, and flatwashers to hold tape cleaner to wall.

19. Push ac power plug into outlet.

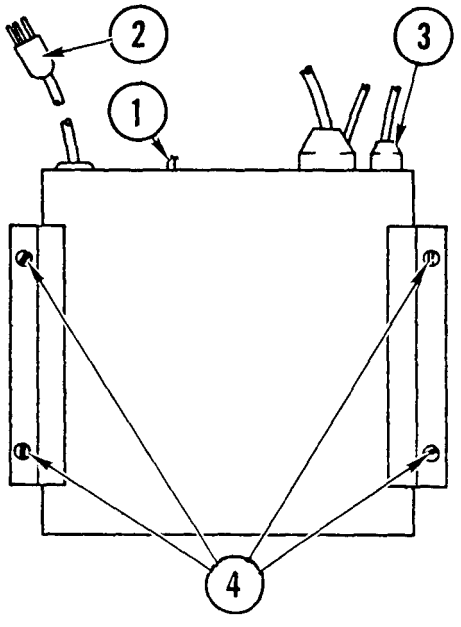
20. Adjust running time and tension. (See TM 11 -7035 -203-23.)

21. Cover with plastic dust cover.

4-31. REMOVE/REPLACE 103J MODEM

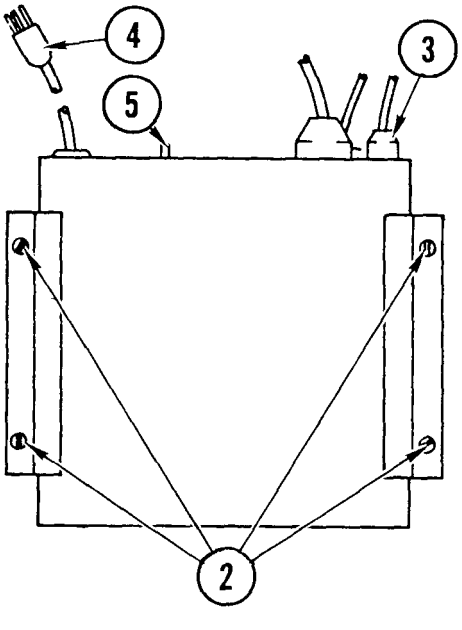
INITIAL SETUP

Common Tools
• Tool kit



Remove

1. Power OFF modem.
2. Unplug power cord from outlet.
3. Unplug connectors from back of modem.
4. Loosen screws on holddown brackets.
5. Slide modem out of brackets.



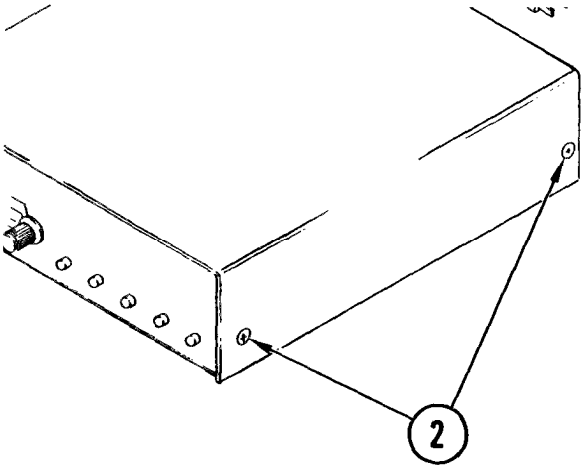
Replace

1. Slide modem under holddown brackets.
2. Tighten holddown bracket screws.
3. Plug connectors into back of modem.
4. Plug power cord into outlet.
5. Power ON modem.

4-32. ACCESS/CLOSE UP 103J MODEM FOR MAINTENANCE

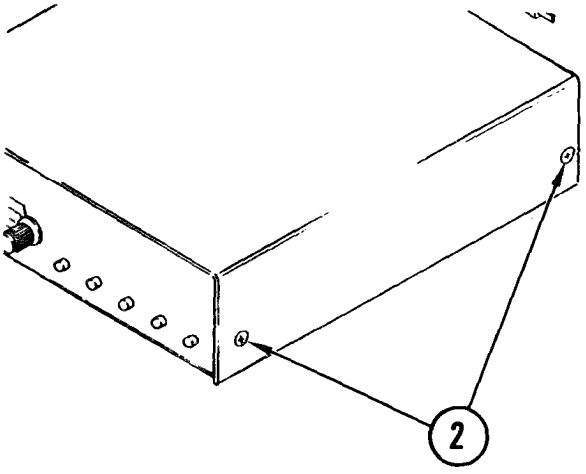
INITIAL SETUP

Common Tools
• Tool kit



Access

1. Remove 103J modem from bulk storage cabinet (para 4-31).
2. Remove two screws and lockwashers on each side of modem cover and lift off cover.



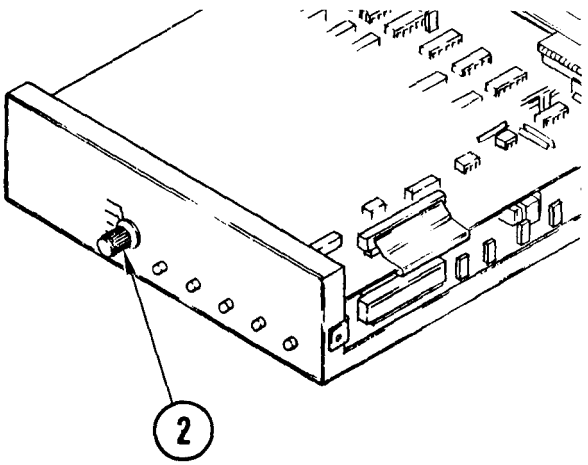
Close Up

1. Replace modem cover in position.
2. Install and tighten two screws and lockwashers on each side of modem cover.
3. Replace 103J modem in bulk storaqe cabinet (para 4-31)

4-33. REMOVE/REPLACE 103J MODEM CIRCUIT BOARDS

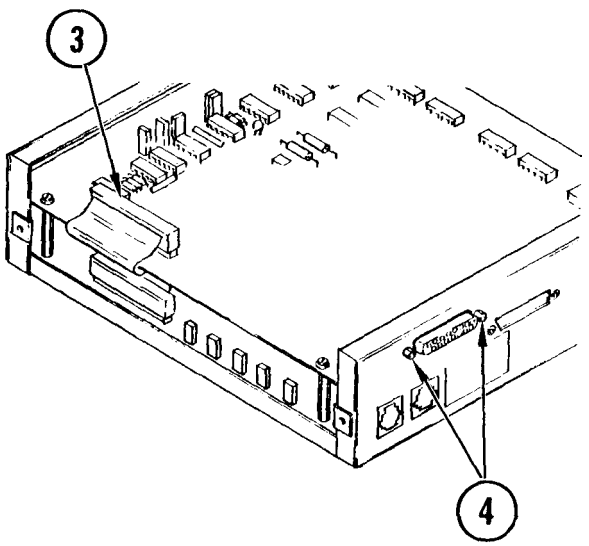
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access modem circuit boards (para 4-32) .
2. Set pointer on rotary test switch to LOCAL. Loosen two setscrews on rotary switch knob and remove.



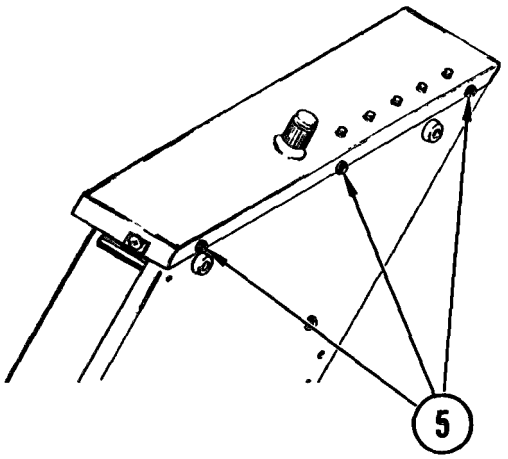
3. Disconnect cable assembly from top circuit board.

NOTE

Cable assembly has color orientation strip on right hand side.

4. Remove mounting stud on each side of connector.

4-33. REMOVE/REPLACE 103J MODEM CIRCUIT BOARDS (CONT)

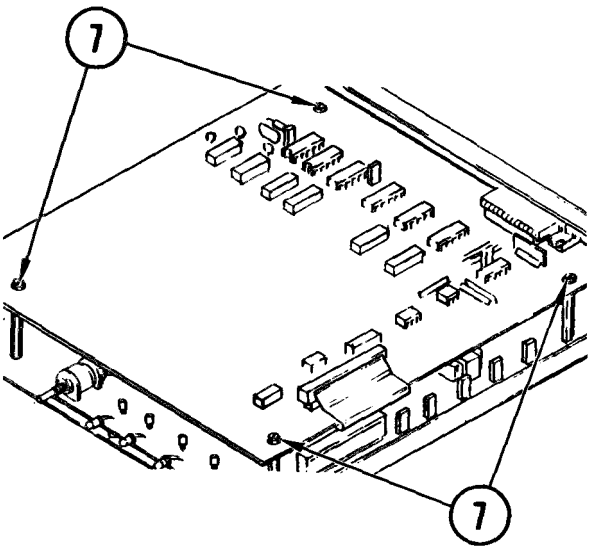


5. Remove three mounting screws and lockwashers from bottom of modem front panel assembly.

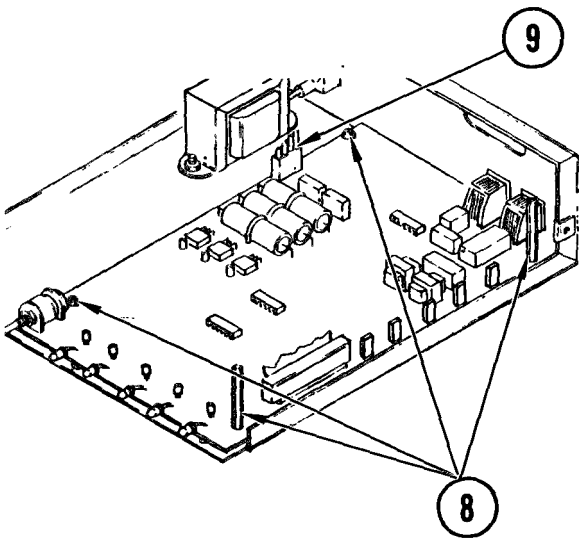
CAUTION

Use care when removing front panel not to damage circuit board LEDs.

6. Remove front panel.



7. Remove four screws and washers securing top circuit board to base assembly. Remove circuit board.

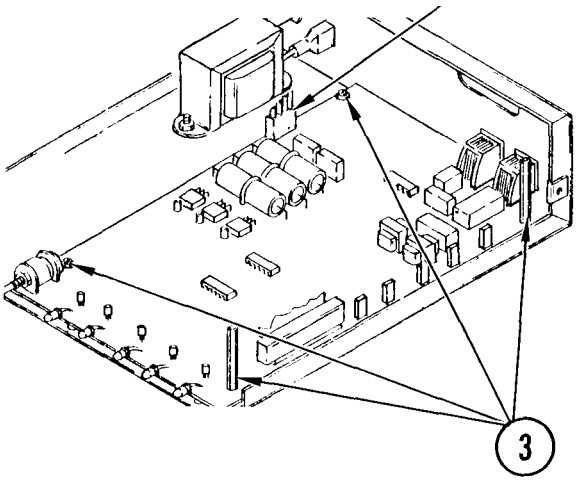


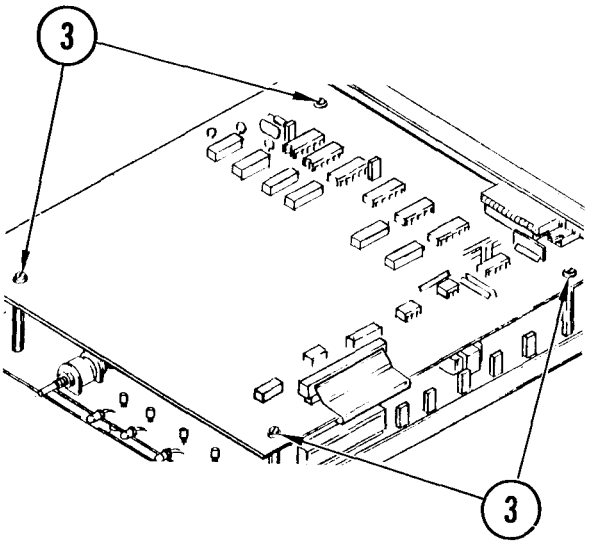
8. Remove two screws and two standoffs securing interface board to base assembly.

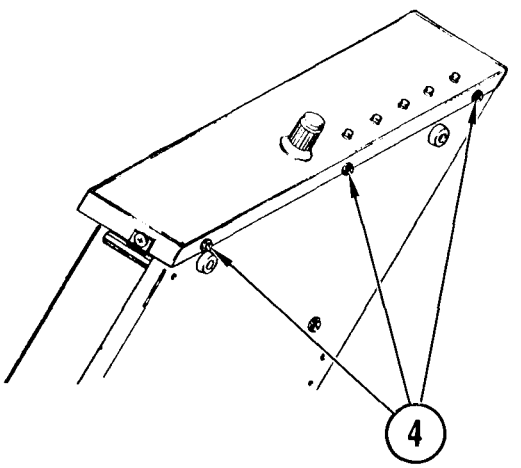
9. Disconnect transformer plug and interface cable.

10. Remove interface circuit board.

4-33. REMOVE/REPLACE 103J MODEM CIRCUIT BOARDS (CONT)







Replace

1. Connect jumpers as shown in Appendix D. Place interface circuit board in position on base assembly and secure in position with two mounting screws and standoffs.

2. Connect transformer plug and interface cable to interface circuit board.

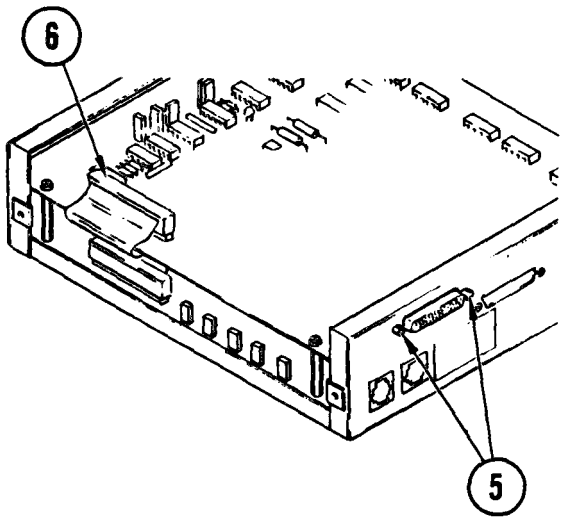
3. Install four screws and washers securing top circuit board to base assembly.

CAUTION

Use care when replacing front panel not to damage circuit board LEDs.

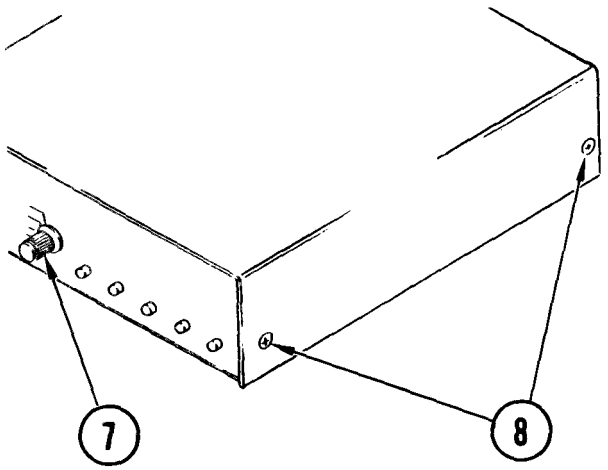
4. Install front panel in position and tighten three mounting screws and lockwashers.

4-33. REM0VE/REPLACE 103J MODEM CIRCUIT BOARDS (CONT)



5. Replace two mounting studs securing connector.

6. Connect cable assembly to top circuit board, observing color orientation.



7. Slide knob onto rotary switch. Set pointer at LOCAL. Tighten setscrews.

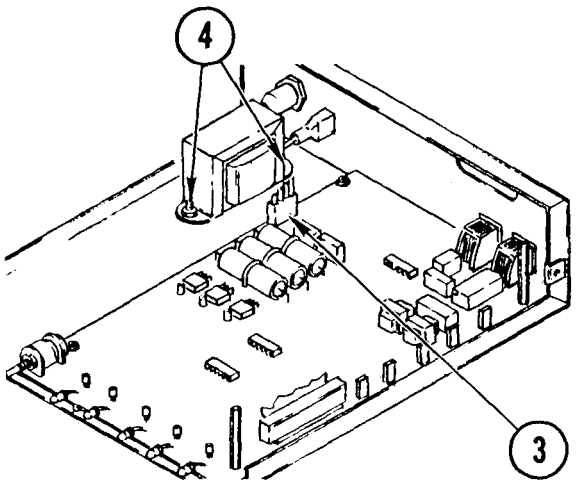
8. Install and tighten two screws and lockwashers on each side of modem cover.

9. Replace 103J modem in bulk storage cabinet (para 4-31).

4-34. REMOVE/REPLACE 103J MODEM TRANSFORMER

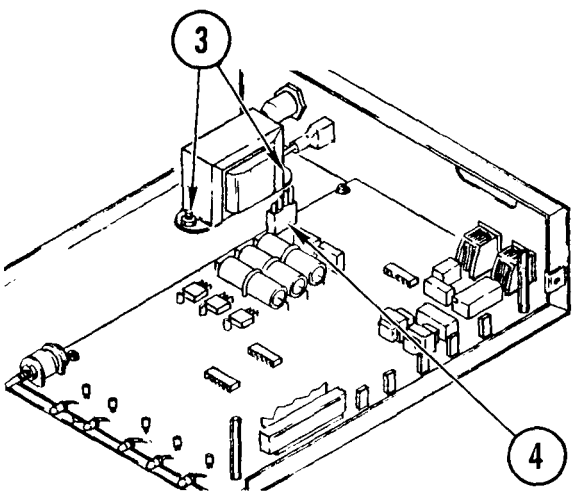
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access modem transformer (para 4-32).
2. Remove top circuit board (para 4-33, Remove, steps 2-7).
3. Disconnect transformer plug from interface circuit board.
4. Remove two mounting screws, lockwashers, and nuts securing transformer to base.
5. Unsolder or cut and disconnect power lead and wire connected to power switch.



Replace

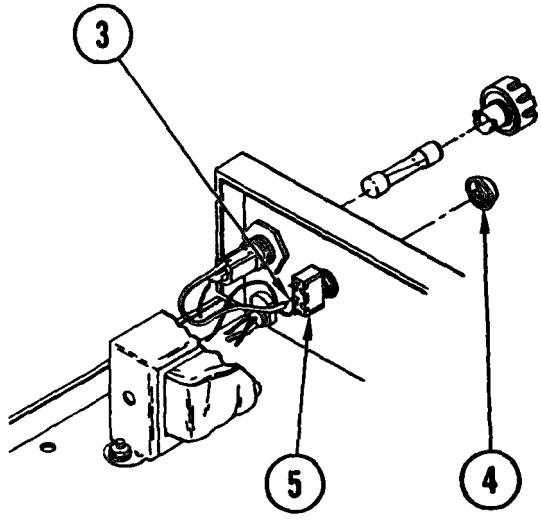
1. Place transformer in position on base assembly.
2. Connect power wire and lead to power switch and solder in position.
3. Install two mounting screws, lockwashers, and nuts securing transformer to base assembly.
4. Connect transformer plug to interface circuit board with green wire toward rear of case.
5. Replace top circuit board (para 4-33 Replace, steps 3-7).
6. Close up modem (para 4-32, Close Up, steps 1-3).

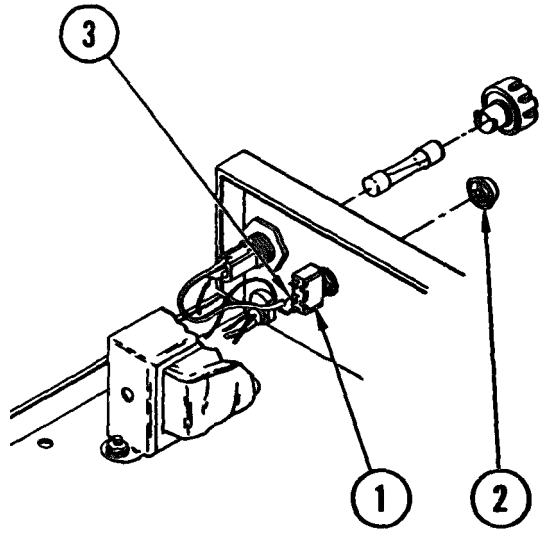
4-35. REMOVE/REPLACE 103J MODEM POWER SWITCH

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil





Remove

1. Access modem power switch (para 4-32) .
2. Remove top circuit board (para 4-33, Remove, steps 2-7).
3. Tag and unsolder switch wires connected to fuse and transformer.
4. Remove switch retaining ring.
5. Remove switch from rear panel.

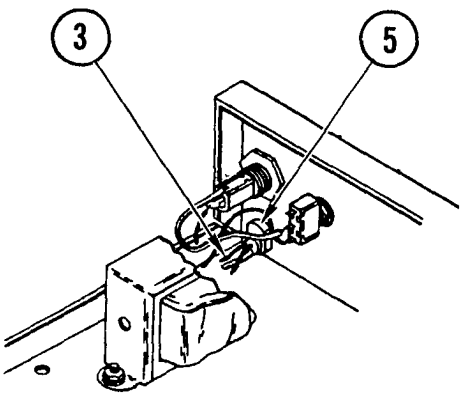
Replace

1. Install switch into rear panel.
2. Place retaining ring on switch and tighten.
3. Solder, fuse and transformer leads to switch.
4. Replace top circuit board (para 4-33, Replace, steps 3-7).
5. Close up modem (para 4-32, Close Up, steps 1-3).

4-36. REMOVE/REPLACE 103J MODEM POWER CORD

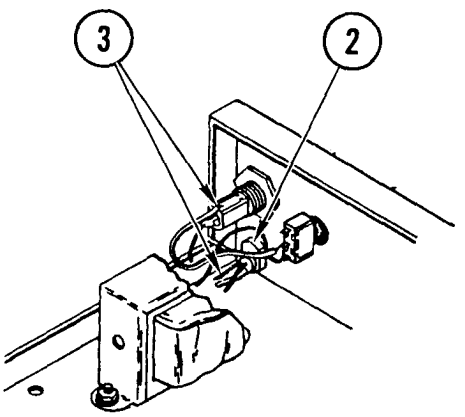
INITIAL SETUP

Common Tools
• Tool kit



Remove

1. Access modem power cord (para 4-32).
2. Remove top circuit board (para 4-33, Remove steps 2).
3. Cut green wire and wire to transformer.
4. Remove fuse and unsolder transformer wire attached to fuse holder.
5. Remove strain relief for power cord at rear panel.
6. Remove power cord from modem.



Replace

1. Insert power cord through hole in rear panel.
2. Replace strain reli ef securing cord at rear panel.
3. Connect wire leads of power cord to fuse holder. Solder into position. Replace fuse.
4. Solder green wire lead of power cord to grounding terminal on base assembly.
5. Replace top circuit board (para 4-33, Replace, steps 3-7).
6. Close up modem (para 4-32).

4-37. REMOVE/REPLACE ISOLATOR ASSEMBLY

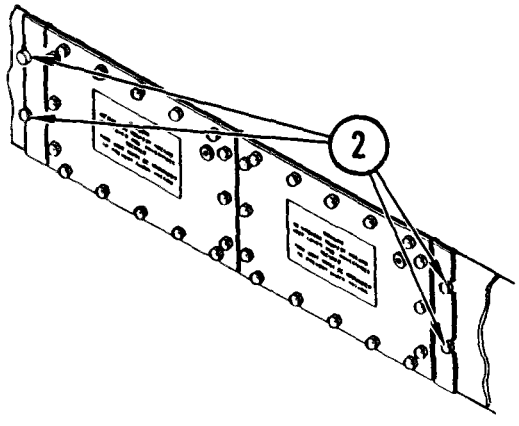
INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Paper
- Pen or pencil

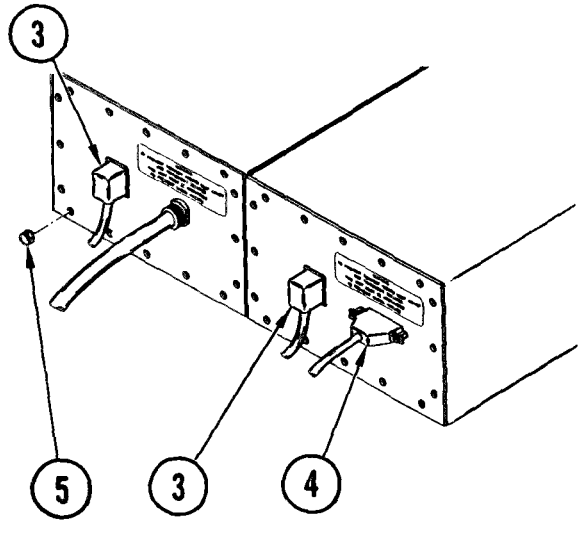
NOTE

There are two isolators in the crypto cabinet. Use these procedures to remove and replace either one.



Remove

1. Power OFF crypto cabinet circuit breaker.
2. Remove panel mounting screws, washers and lockwashers.



3. At back of isolator to be removed, unplug two power cords.

CAUTION

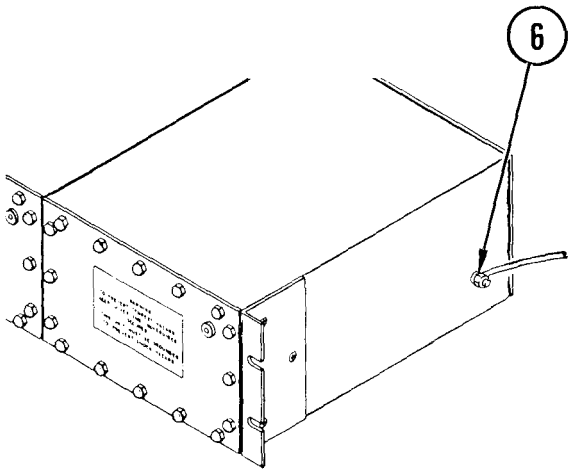
Use care in removal of rear covers as the power and signal wires are connected between cover connectors and terminal strips in the assembly.

4. Unplug connector.
5. Remove nuts from left rear cover.

CAUTION

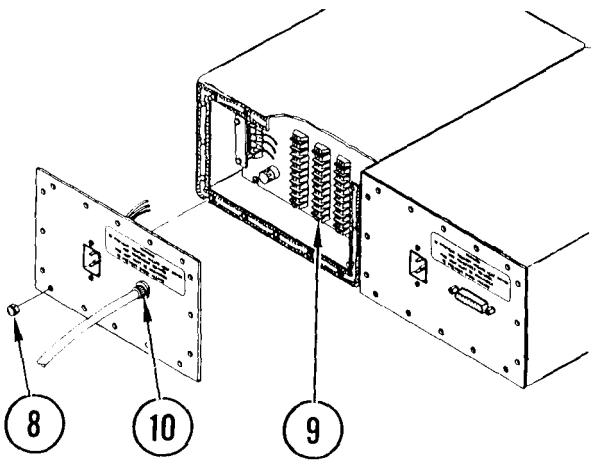
Avoid damaging EMI gasket under rear cover.

4-37. REMOVE/REPLACE ISOLATOR ASSEMBLY (CONT)



6. Remove bolt, washer, nut, and ground strap; move ground strap aside.

7. Pull isolator assembly from front of cabinet.



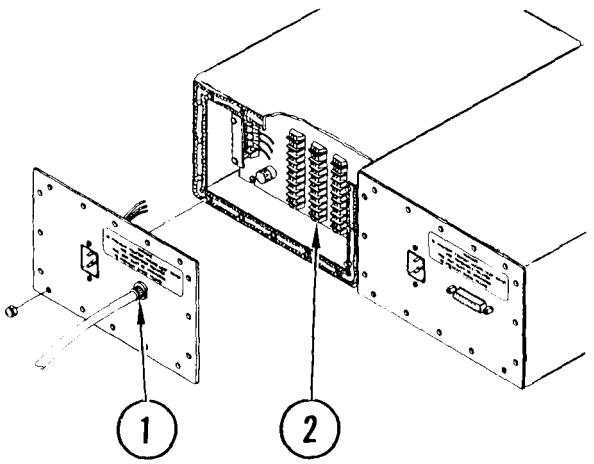
8. Take cover off of studs.

9. Tag and remove conduit wires and ground strap from terminals.

10. Disconnect conduit cable from rear panel and feed wires through hole in panel.

11. Reinstall rear cover.

Replace

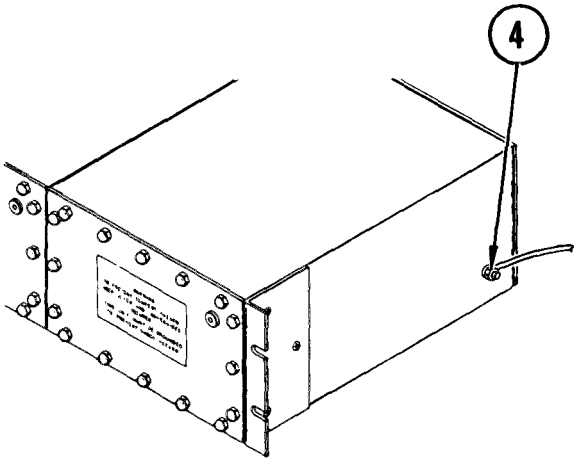


1. Remove left rear cover and feed conduit wiring through access hole in rear panel, then reconnect conduit cable.

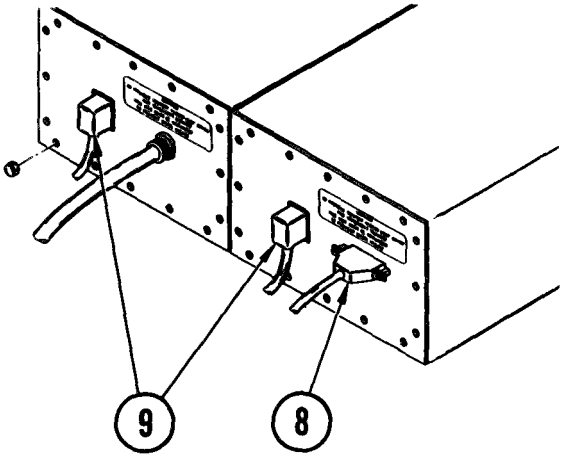
2. While holding isolator assembly, connect wires to terminals.

3. Slide isolator into crypto cabinet.

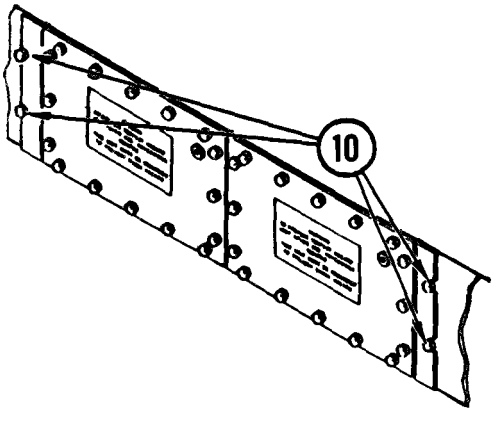
4-37. REMOVE/REPLACE ISOLATOR ASSEMBLY (CONT)



4. Replace ground strap and secure with bolt, nut, and washer.
5. Move isolator for best access to rear terminal boards.
6. Place rear cover on studs.
7. Install nuts on all cover studs.



8. Replace connector and secure with attached mounting screws.
9. Replace two ac power plugs.



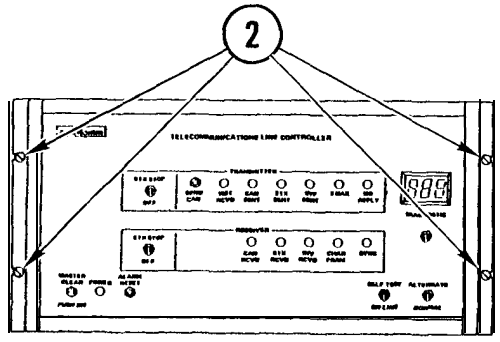
10. Install front panel mounting screws.
11. Power ON crypto cabinet circuit breaker.

4-38. REMOVE/REPLACE TELECOMMUNICATION LINE CONTROLLER

INITIAL SETUP

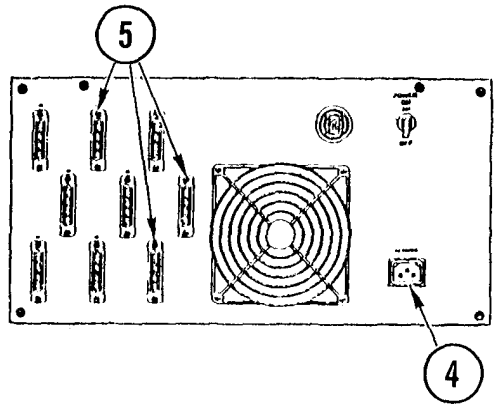
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil



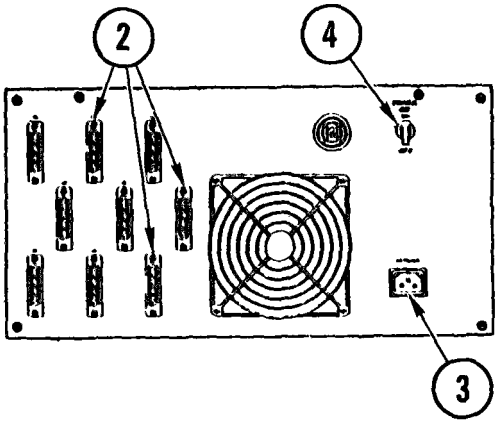
Remove

1. Power OFF crypto cabinet circuit breaker.
2. Remove TLC rack mounting screws.



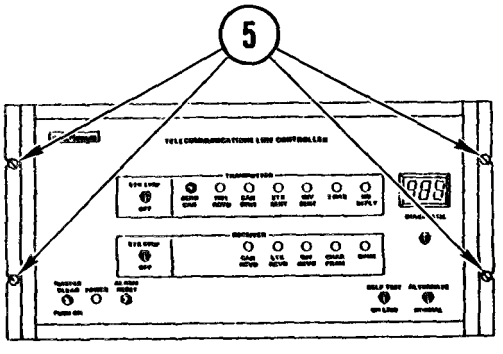
3. Move TLC for better access to connections on back.
4. Unplug power cord from back of TLC.
5. Tag and unplug connectors.

4-38. REMOVE/REPLACE TELECOMMUNICATION LINE CONTROLLER (CONT)



Replace

1. Place TLC in rack.
2. Plug connectors into back of TLC.
3. Plug power cord into back of TLC.
4. Set POWER switch to ON.



5. Install mounting screws.
6. Power ON crypto cabinet circuit breaker.

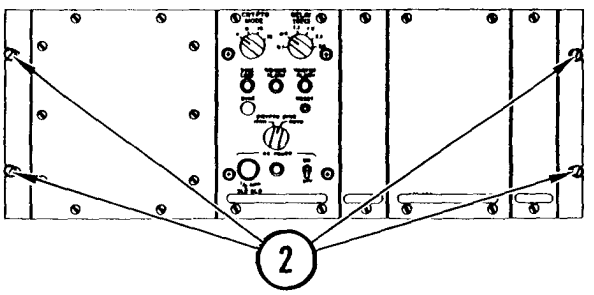
4-39. REMOVE/REPLACE CRYPTO AUXILIARY UNIT

INITIAL SETUP

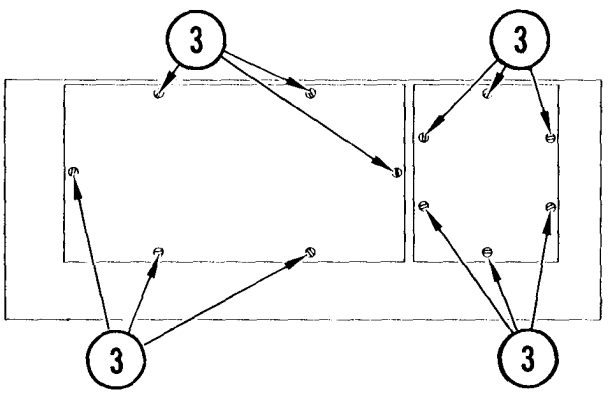
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pen or pencil

Remove



1. Power OFF crypto cabinet circuit breaker.
2. Remove mounting screws.



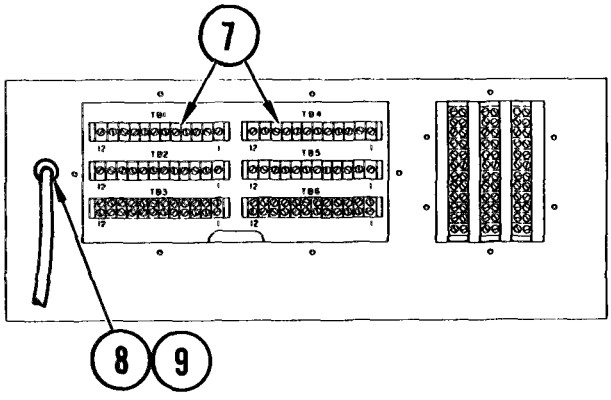
3. At rear of CAU, remove all screws from covers.

CAUTION

Avoid damaging EMI gaskets under rear covers.

4. Remove covers.
5. Move CAU as much as conduit and space allow to get better access to terminal boards.
6. Make a drawing showing terminal boards and wire number to each connection.

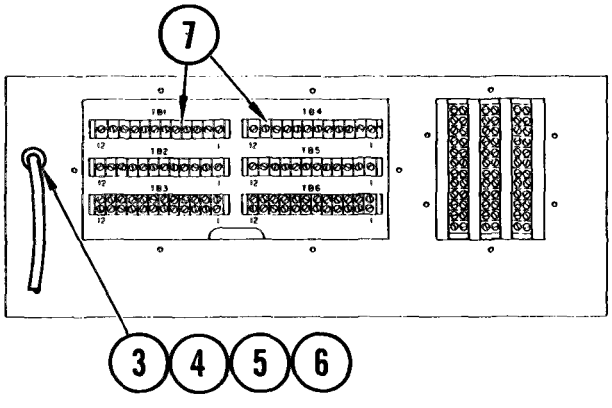
4-39. REMOVE/REPLACE CRYPTO AUXILIARY UNIT (CONT)



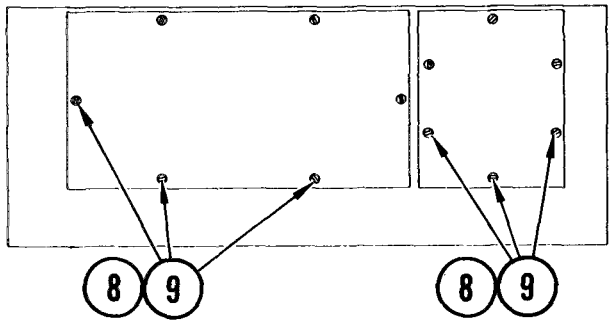
7. Remove wires from all terminals.
8. Inside rear flange, remove nut and washers from conduit connector.
9. Carefully pull connector and wires from rear flange.
10. Pull CAU from front of cabinet.

Replace

1. Slide CAU into crypto cabinet.
2. Move CAU for best access to rear terminal boards.



3. Feed wires through conduit hole in CAU rear flange.
4. Feed wires through conduit washers and nut that mount inside flange.
5. Seat conduit connector in hole.
6. Screw inside nut onto conduit connector.
7. Following drawing made during removal, connect all wires to terminal boards.



8. Position rear covers over mounting holes.
9. Install mounting screws and tighten cover studs.
10. Install front panel mounting screws.
11. Power ON crypto cabinet circuit breaker.
12. Power ON CAU front panel.

4-40. REMOVE/REPLACE TEMPERATURE CONTROL PANEL

INITIAL SETUP

Common Tools
- Tool Kit

Materials/Spare Parts
- Safety wire
- Tags
- Pen or pencil

WARNING

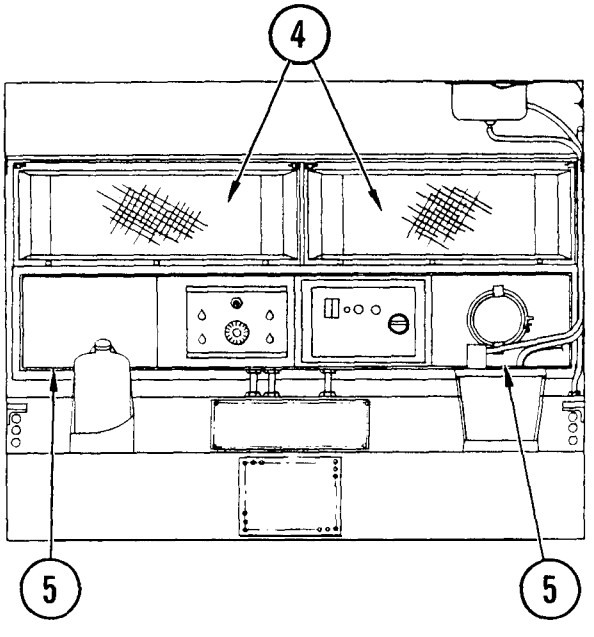
Electrocution may result if this procedure is attempted with power on.

Remove

1. In temperature control panel power OFF air conditioners.
2. Set four air conditioner circuit breakers to OFF at power distribution box.

WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lamps are OFF when all air conditioners are OFF.



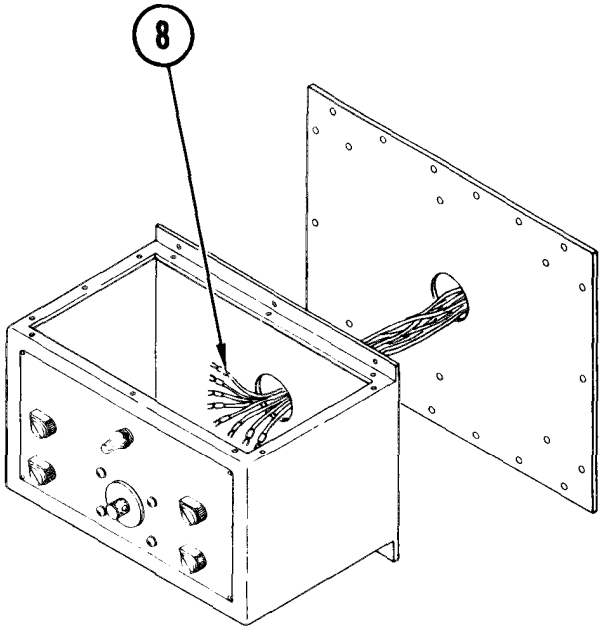
3. Switch OFF all incandescent lights.
4. If installed, remove noise hoods (para 3-18).
5. Loosen captive screws securing left and right bulkhead panel covers to bulkhead. Remove covers.

WARNING

Hazardous voltages can exist on filter terminals at back of humidifier control box. Make sure power is OFF and filters are discharged.

6. Power OFF humidifier circuit breaker.

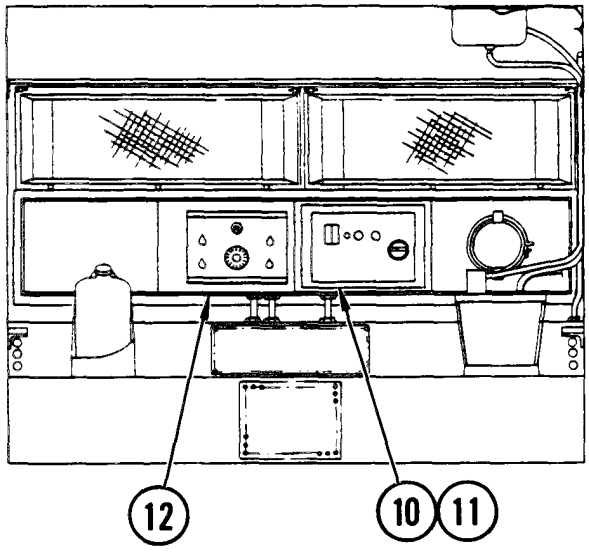
4-40. REMOVE/REPLACE TEMPERATURE CONTROL PANEL (CONT)



7. Remove 12 screws and washers in temperature control panel cover. Lift off cover.

8. Tag and disconnect eight wires inside temperature control panel.

9. Replace cover. Replace and tighten 12 screws and washers.



10. Loosen captive screws securing bulkhead panel cover and humidifier control box to bulkhead.

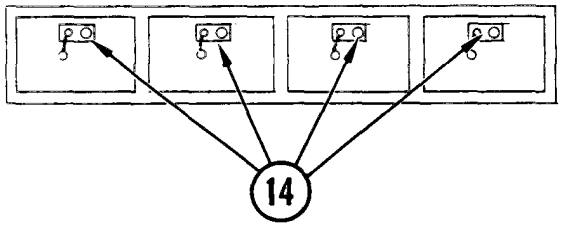
11. Carefully lower panel and control box to floor.

12. Remove all screws holding bulkhead panel cover and control panel.

CAUTION

Do not bump or damage sensor. It is located at bottom (toward front) of control panel.

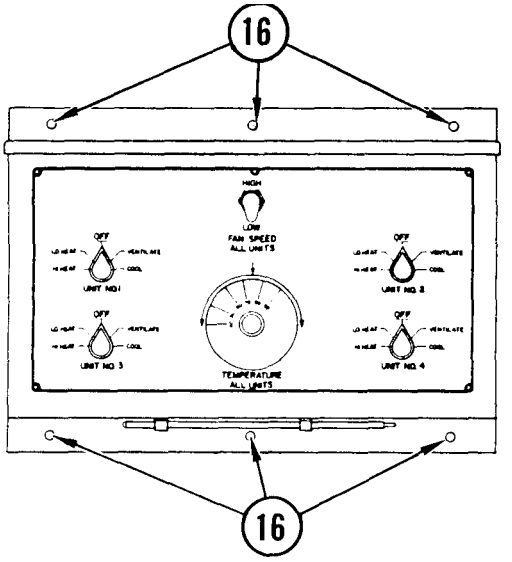
13. Carefully lower cover and control panel to floor and lay it on its side.



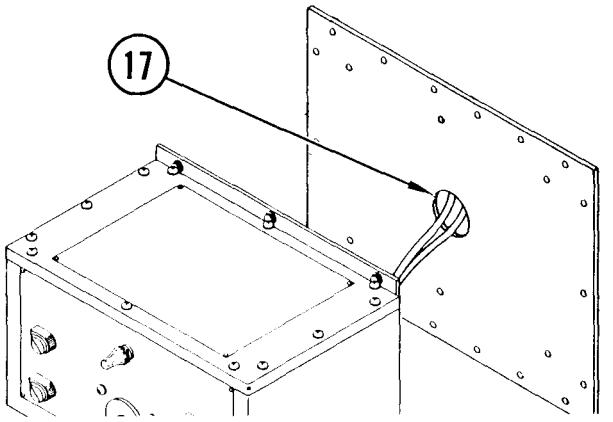
14. Cut and pull off safety wire on each connector.

15. Tag and disconnect connectors to P7 cables from each air conditioner unit.

4-40. REMOVE/REPLACE TEMPERATURE CONTROL PANEL (CONT)



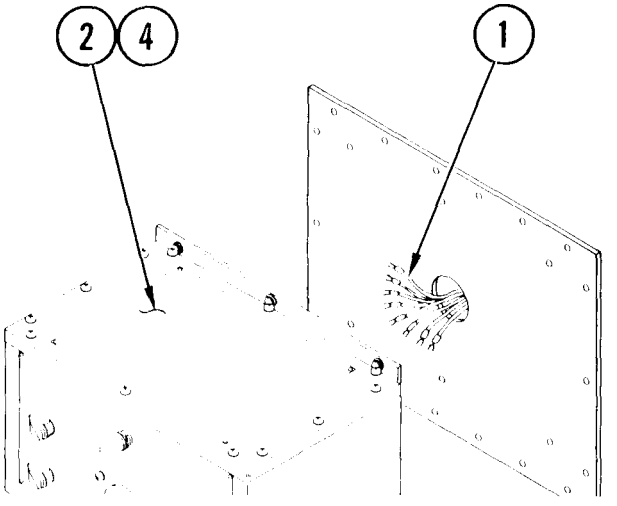
16. Remove six bolts holdinG control panel. Set control panel aside.



17. Pull cables removed in step 15 through hole.

18. Pull eight loose wires out of control panel and let hang from hole.

19. Remove temperature control panel.



Replace

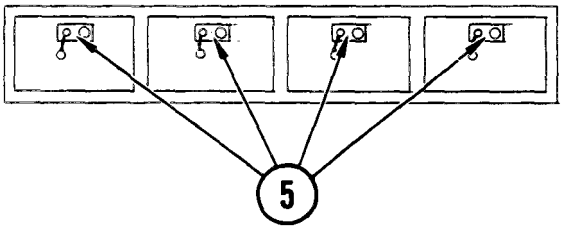
1. Push control panel cables through hole in panel.

2. Remove screws and washers. Lift off cover.

3. Thread eight loose wires into control panel and connect to terminal blocks inside panel.

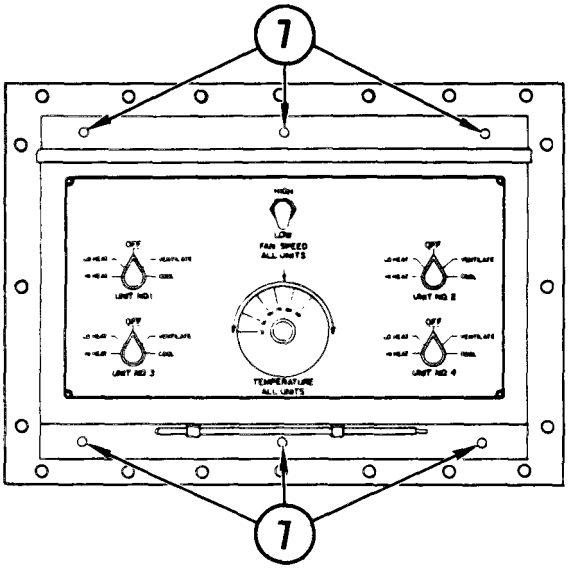
4. Replace cover. Install and tighten screws and washers.

4-40. REMOVE/REPLACE TEMPERATURE CONTROL PANEL (CONT)



5. Push cable into jack on each air conditioner unit.

6. To secure cable to plug, twist safety wire around cable and jack.



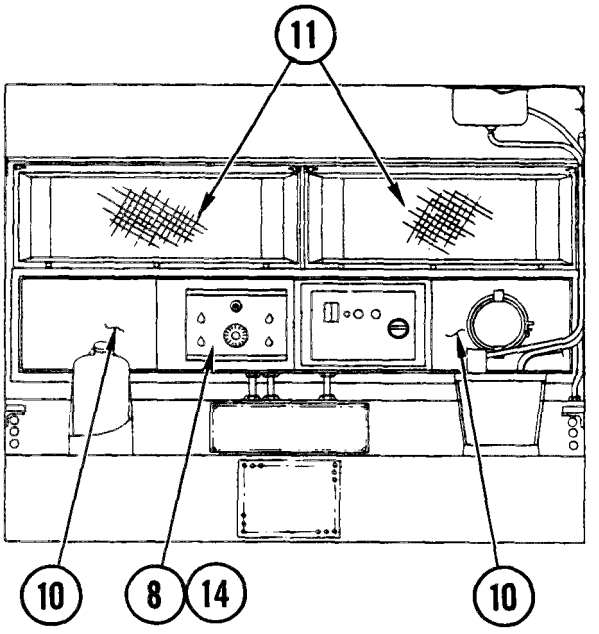
CAUTION

Do not bump or damage sensor. It is located at bottom (toward front) of panel.

7. Place control panel on bulkhead panel cover. Replace and tighten bolts, lockwashers, and nuts.

8. Lift panel with control panel into position. Secure to bulkhead with captive screws.

9. Replace bulkhead panel cover and humidifier control box. Secure in position with captive screws.



10. Replace and secure left and right side bulkhead panel covers.

11. If removed, replace noise hoods (para 3-18).

12. At power distribution box in vestibule, set four air conditioner circuit breakers to ON.

13. At utility power box power ON humidifier circuit breaker.

14. At temperature control panel, power ON and test all four air conditioners.

4-41. REMOVE/REPLACE TEMPERATURE CONTROL PANEL TOGGLE SWITCH

INITIAL SETUP

Common Tools
- Tool Kit

Materials/Spare Parts
- Paper
- Pencil or pen

WARNING

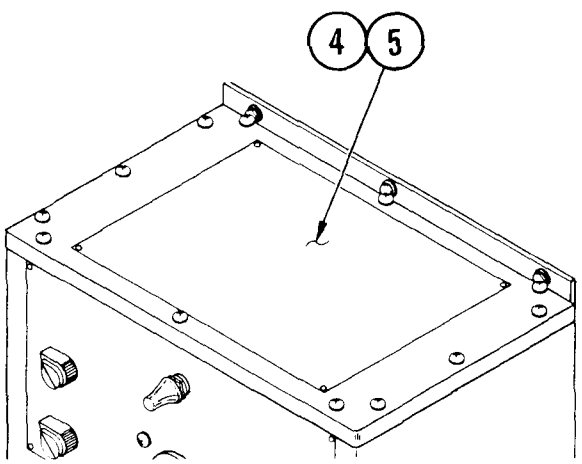
Electrocution may result if this procedure is attempted with power ON.

Remove

1. At temperature control panel, power OFF air conditioners.
2. Set four air conditioner circuit breakers OFF at power distribution box.

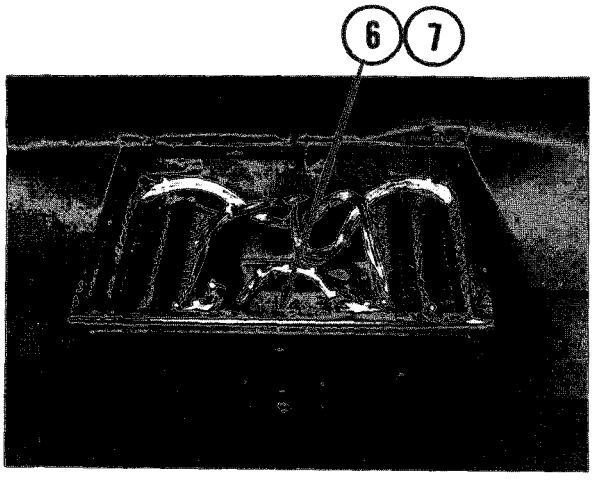
WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lights are OFF when all air conditioners are OFF.



3. Switch OFF all incandescent lights.
4. Remove 12 screws from air conditioner control box cover.
5. Lift off cover and set aside.

4-41. REMOVE/REPLACE TEMPERATURE CONTROL PANEL TOGGLE SWITCH (CONT)

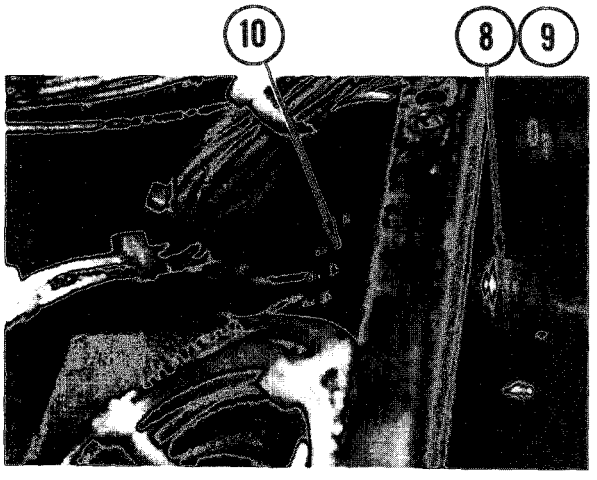


6. Note positions of wire connectors on toggle switch.

7. Remove wire connectors.

CAUTION

Work carefully when removing knobs and rubber switch guard.



8. On front of control panel, locate toggle switch. Loosen rubber switch guard locknut and remove. Do not lose mesh packing.

9. Remove switch locknut and washer.

10. Remove toggle switch and inside washer.

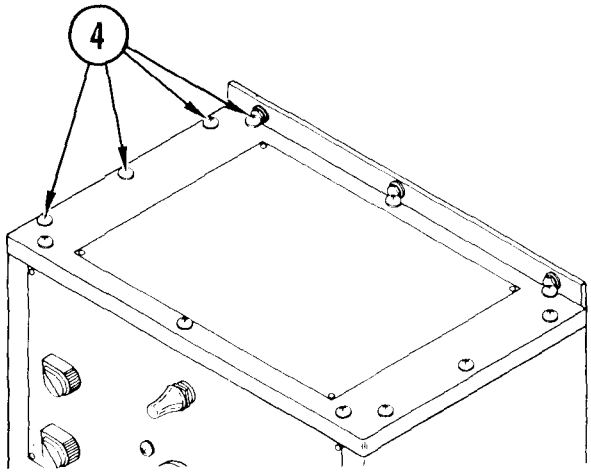
Replace

1. Using your notes as a guide, replace wire connectors on toggle switch.

2. Install tab washer on switch with tab facing switch. Locate hole in front of panel, set toggle switch into position and tighten 1/2-inch locknut on threaded shaft.

3. Install switch guard on toggle switch handle and carefully tighten locknut.

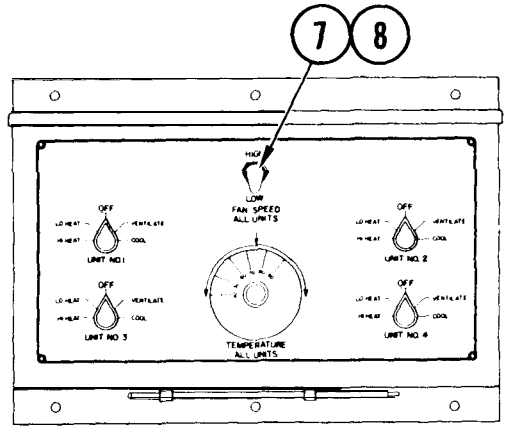
4-41. REMOVE/REPLACE TEMPERATURE CONTROL PANEL TOGGLE SWITCF (CONT)



4. Replace temperature control panel cover. Install 12 screws.

5. Set four air conditioner circuit breakers ON at power distribution box .

6. On temperature control panel, power ON air conditioners.



7. Set toggle switch on LOW and test.

8. Set toggle switch on HIGH and test.

4-42. REMOVE/REPLACE TEMPERATURE CONTROL PANEL ROTARY SWITCHES

INITIAL SETUP

Common Tools
• Tool kit

Materials/Spare Parts
• Paper
• Pen or pencil
• Tie wraps

WARNING

Electrocution may result if this procedure is attempted with power ON.

Remove

NOTE

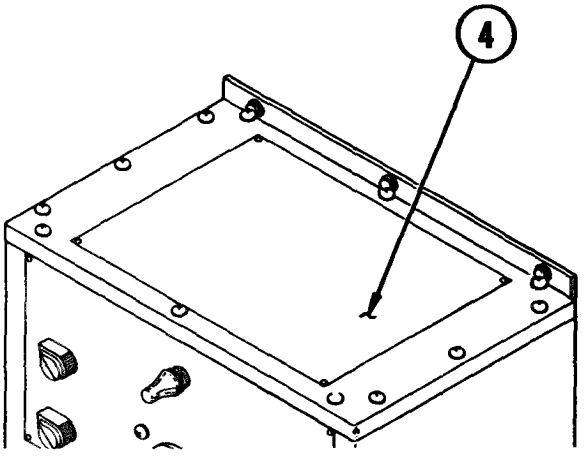
There are four rotary switches. Use this procedure to remove/replace any one of them.

1. On temperature control panel power OFF air conditioners.
2. Set four air conditioner circuit breakers to off at power distribution box. Set humidifier circuit breaker OFF at utility power box.

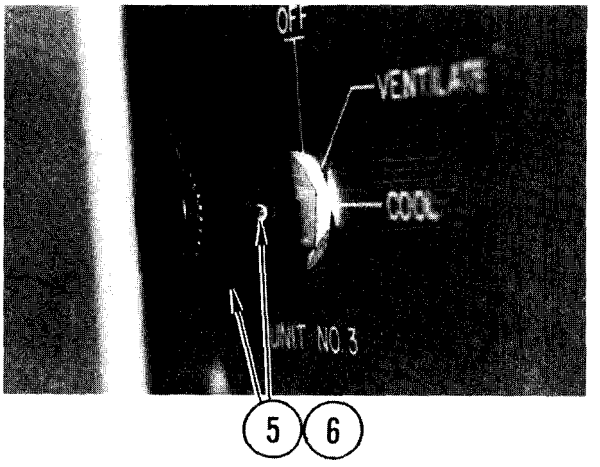
WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lights are OFF when all air conditioners are OFF.

3. Switch off all incandescent lights.
4. Remove 12 screws from cover. Lift off cover and set aside.

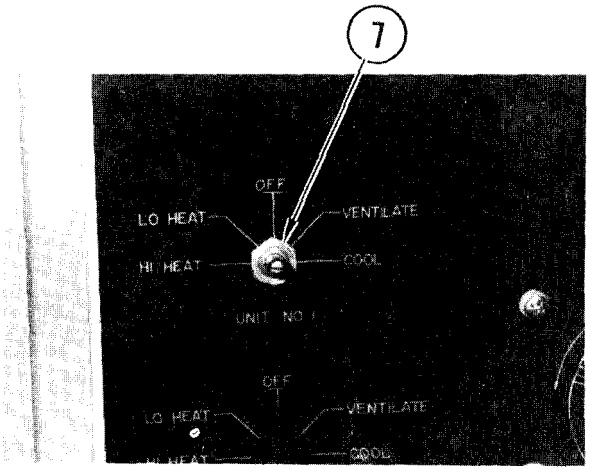


4-42. REMOVE/REPLACE TEMPERATURE CONTROL PANEL ROTARY SWTICHES (CONT)



5. Find switch on front of temperature control panel. Loosen two set screws in 3-o'clock and 6-o'clock positions on rotary switch knob.

6. Pull off knob.

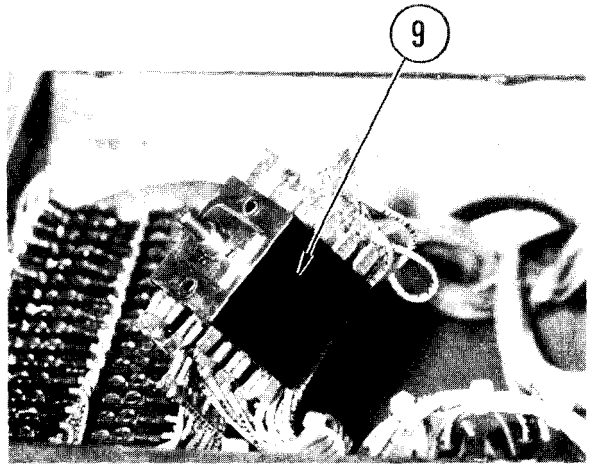


7. Remove two locknuts from threaded shaft.

WARNING

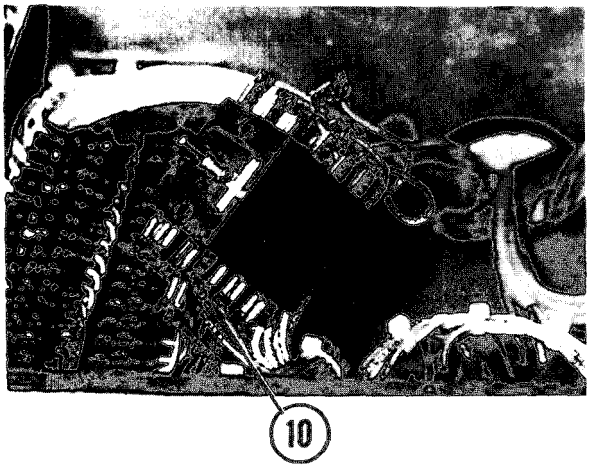
The rotary switches and terminal blocks can contain dangerous voltage from the filters in the humidifier control box, even after the power is cut OFF.

8. Open humidifier control box. Check and discharge filters.



9. Remove rotary switch from control panel.

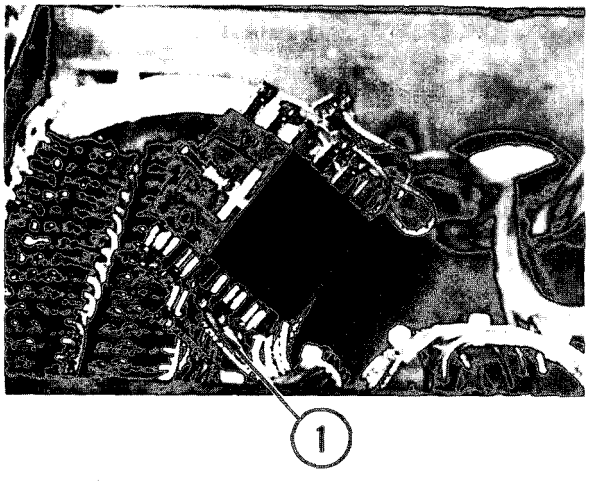
4-42. REMOVE/REPLACE TEMPERATURE CONTROL PANEL ROTARY SWITCHES (CONT)



10. Using your scratch paper, note positions of wire connectors on rotary switch.

11. Remove tie wraps on wires.

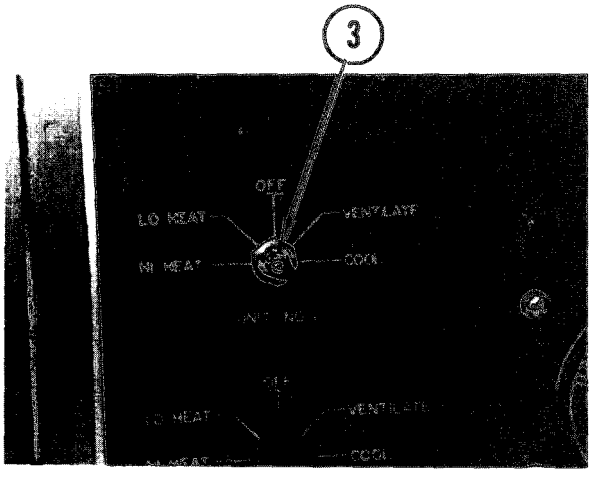
12. Remove wire connectors.



Replace

1. Using your notes, replace all wires on rotary switch.

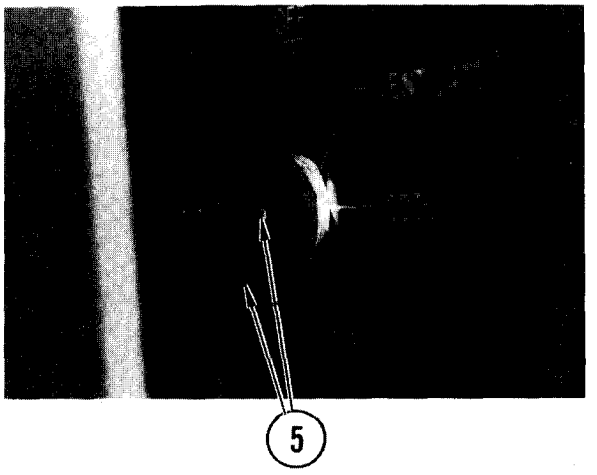
2. Replace tie wraps.



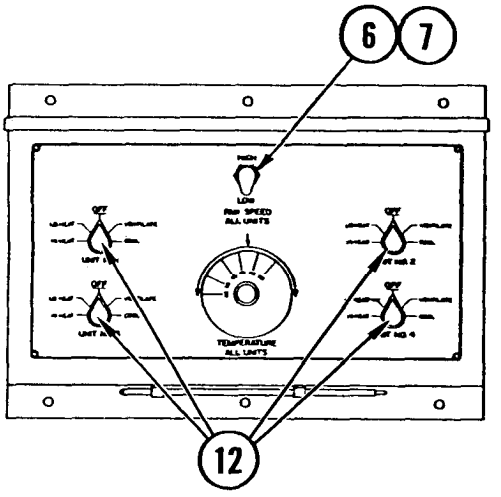
3. Install rotary switch into control panel.

4. Install two locknuts on threaded shaft and tighten.

4-42. REMOVE/REPLACE TEMPERATURE CONTROL PANEL ROTARY SWITCHES (CONT)



5. Install knob on switch and tighten two set screws.



6. Replace control panel cover.

7. Replace and tighten 12 screws on cover.

8. Set rotary switch to COOL/VENTILATE and test.

9. Set rotary switch to LO HEAT/HI HEAT and test.

10. Set four air conditioner circuit breakers ON at power distribution box.

11. At utility power box, set humidifier circuit breaker ON.

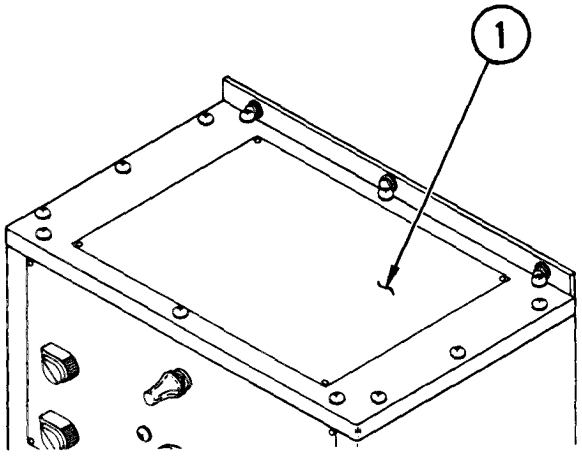
12. At temperature control panel, power ON four air conditioners.

4-43. REMOVE/REPLACE TEMPERATURE CONTROL PANEL THERMOSTAT

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pencil or pen



WARNING

Electrocution may result if this procedure is attempted with power ON.

Remove

1. On temperature control panel power OFF air conditioners.
2. Set four air conditioner circuit breakers to off at power distribution box. Set humidifier circuit breaker OFF at utility power box.

WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lights are OFF when all air conditioners are OFF.

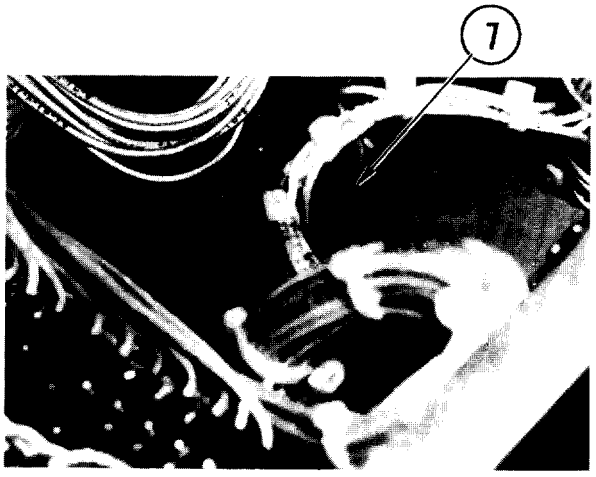
3. Switch off all incandescent lights.
4. Remove air conditioner noise hood above temperature control panel (para 3-18, Remove).
5. Remove 12 screws from air conditioner control box cover. Lift cover and set aside.

WARNING

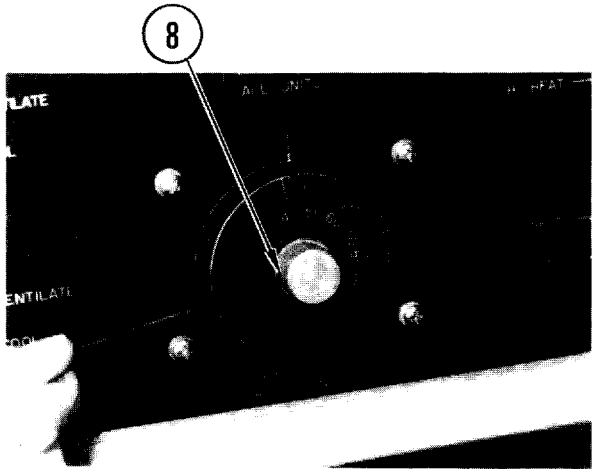
The rotary switches and terminal blocks can contain dangerous voltage from the filters in the humidifier control box, even after power is cut off .

6. Open humidifier control box. Check and discharge filters.

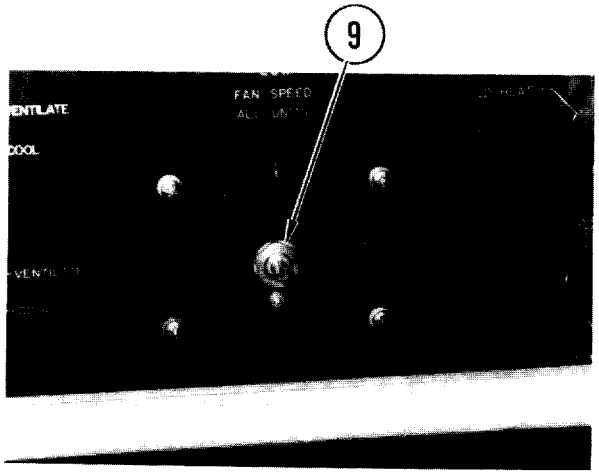
4-43. REMOVE/REPLACE TEMPERATURE CONTROL PANEL THERMOSTAT (CONT)



7. Tag and disconnect wire connectors on thermostat switch.

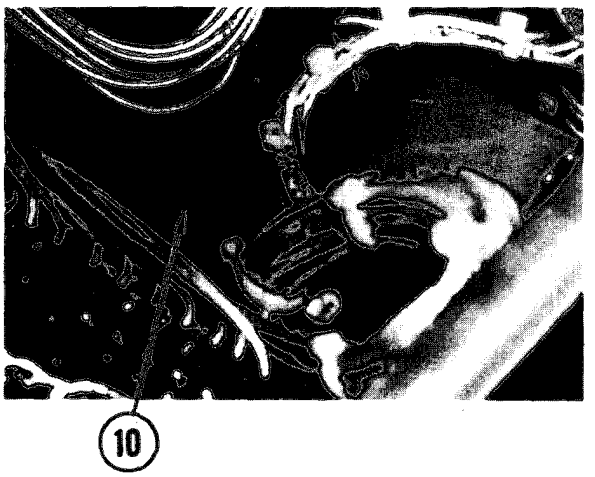


8. On front of control panel, loosen set screw in temperature control dial. Remove dial.



9. Remove locknut holding switch shaft.

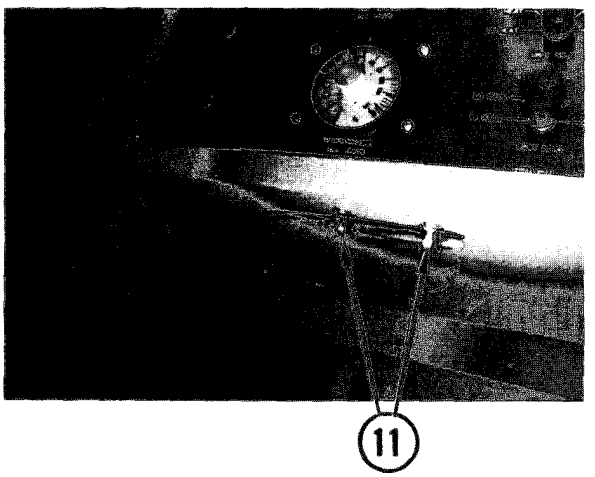
4-43. REMOVE/REPLACE TEMPERATURE CONTROL PANEL THERMOSTAT (CONT)



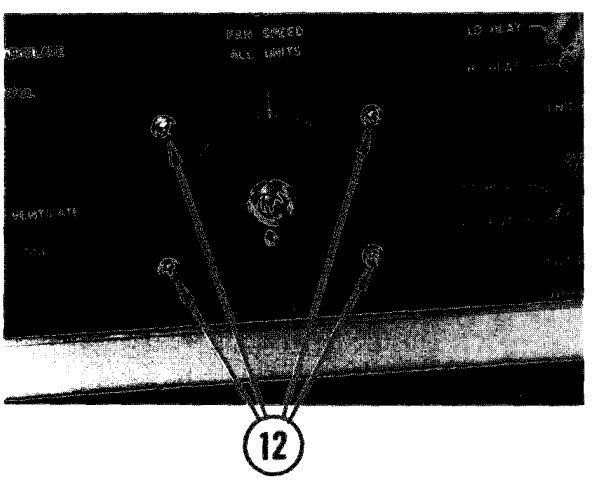
10. Disconnect strain relief fittings.

CAUTION

Copper tubing is hollow. Do not crimp or bend at harsh angle.



11. At bottom of control panel, remove two clamps holding sensor. Push sensor bulb with copper tubing up through hole in panel. Save spacers for reinstallation.



12. On front of control panel, remove four screws holding thermostat switch to panel.

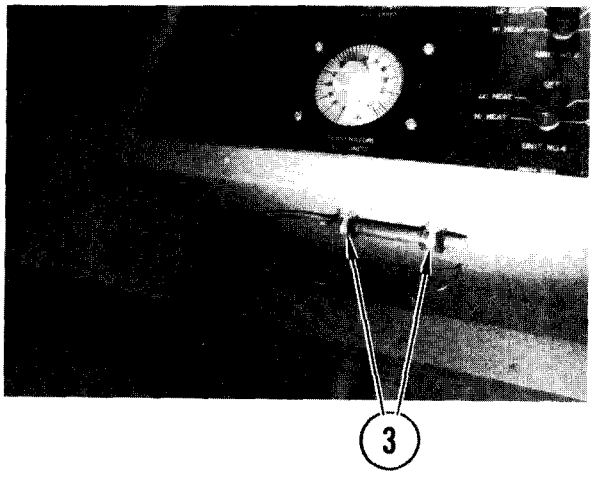
13. Lift entire unit up and out of temperature control panel.

Replace

1. Position thermostat switch into hole in front of control panel. Maneuver sensor bulb down through hole in bottom.

2. Install and tighten four screws through front of panel.

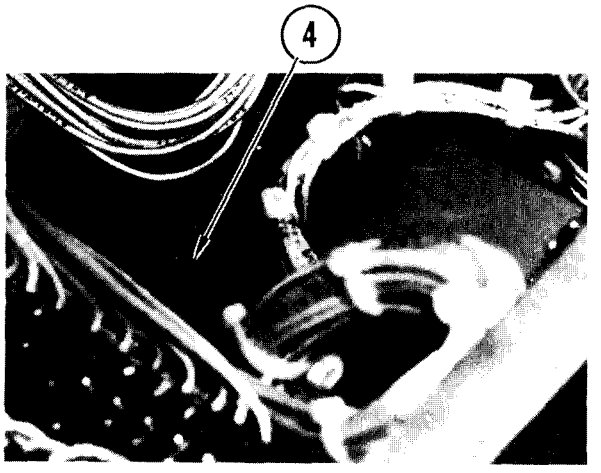
4-43. REMOVE/REPLACE TEMPERATURE CONTROL PANEL THERMOSTAT (CONT)



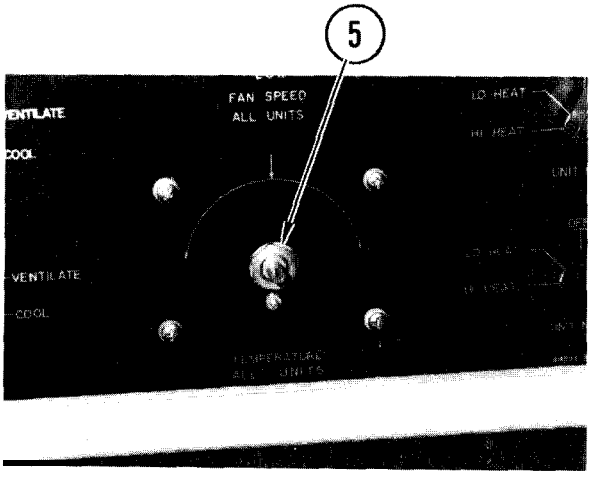
CAUTION

Copper tubing is hollow. Do not crimp or bend at harsh angle.

3. Push sensor bulb with copper tubing through hole on bottom of control panel. Tighten clamps.



4. Attach two spacers on either side of smaller spacers, with ring toward smaller spacers. Reconnect strain relief fittings.



5. Replace and tighten locknut and temperature control dial on switch shaft.

4-43. REMOVE/REPLACE TEMPERATURE CONTROL PANEL THERMOSTAT (CONT)

6. Using your notes, reconnect all wires on rear of switch.

7. Replace control panel cover.

8. Replace noise head and tighten cover screws.

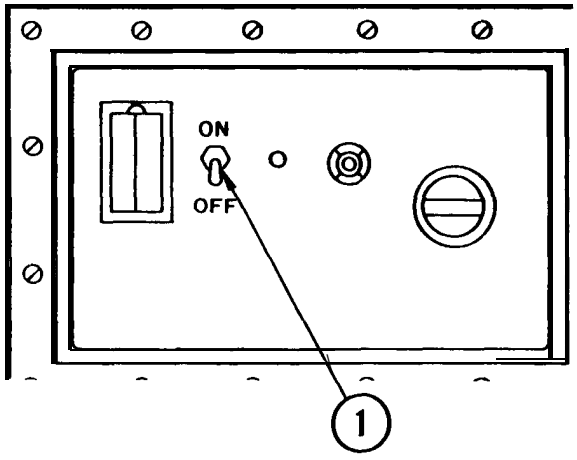
9. Calibrate temperature control dial (para 3-16).

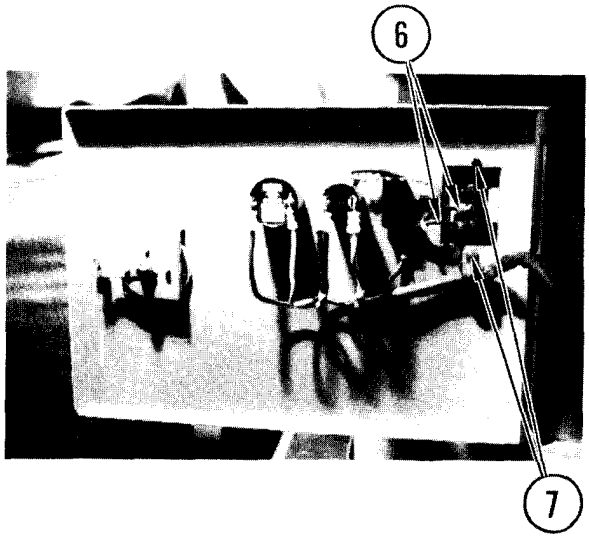
4-44. REMOVE/REPLACE HUMIDISTAT

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil





WARNING

Electrocution may result if this procedure is attempted with power ON.

Remove

1. Power OFF humidifier control box.
2. At utility power box, set humidifier circuit breaker to OFF.
3. At the temperature control panel, power OFF all air conditioners.

WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lights are OFF when all air conditioners are OFF.

4. Power OFF all air conditioner circuit breakers at the power distribution box. Switch off all incandescent lights.

WARNING

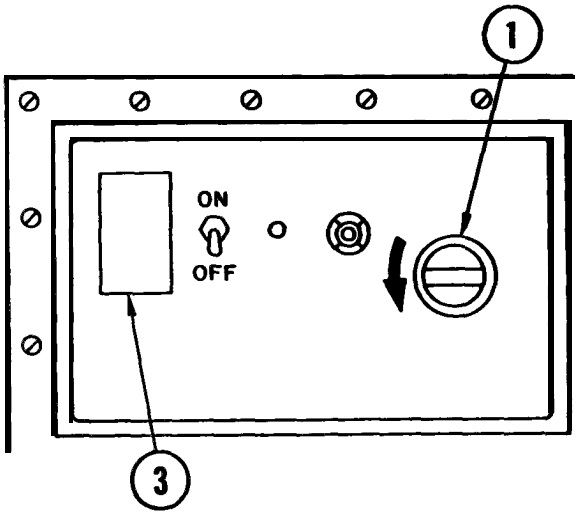
Hazardous voltages can exist on filter terminals within humidifier control box. Make sure power is OFF and filters discharged before performing maintenance.

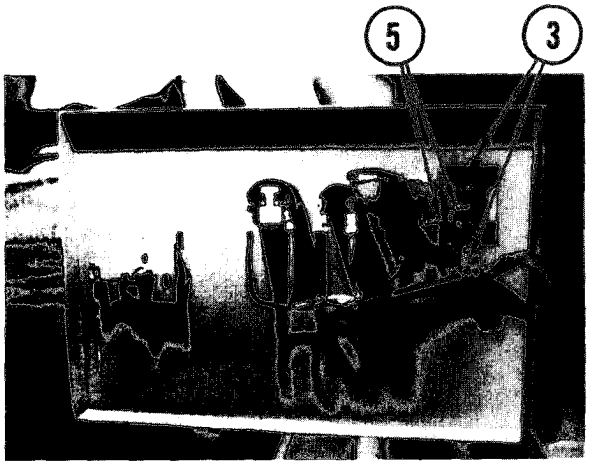
5. Open humidifier control box door.
6. Tag and disconnect two leads attached to humidistat terminals.
7. Loosen and remove two mounting nuts and washers.

4-44. REMOVE/REPLACE HUMIDISTAT (CONT)

8. Remove humidistat from front of control box.

9. If replacement humidistat is not available, close and latch control box door.





Replace

1. If closed, open humidifier control box door.

NOTE

To prepare humidistat for mounting, loosen screw on bottom of humidistat cover. Remove cover, then separate humidistat from mounting bracket.

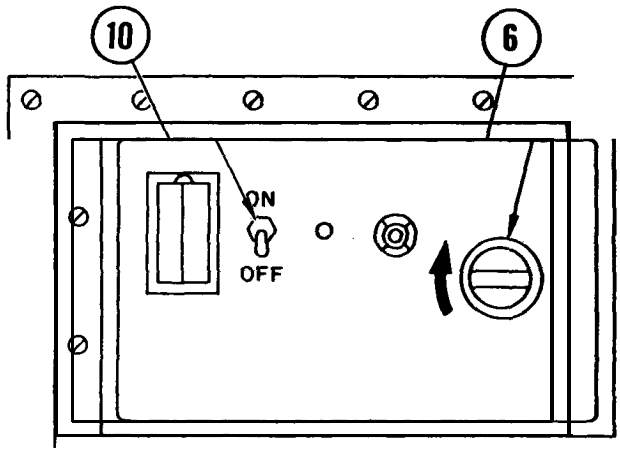
2. Mount humidistat bracket in position on front cover with mounting screws through holes in cover.

3. Replace and tighten two screws, mounting nuts and washers.

4. Attach humidistat to mounting bracket. Install humidistat cover and tighten screw at bottom of cover.

5. Referring to tags, connect two wires to humidistat terminals.

4-44. REMOVE/REPLACE HUMIDISTAT (CONT)

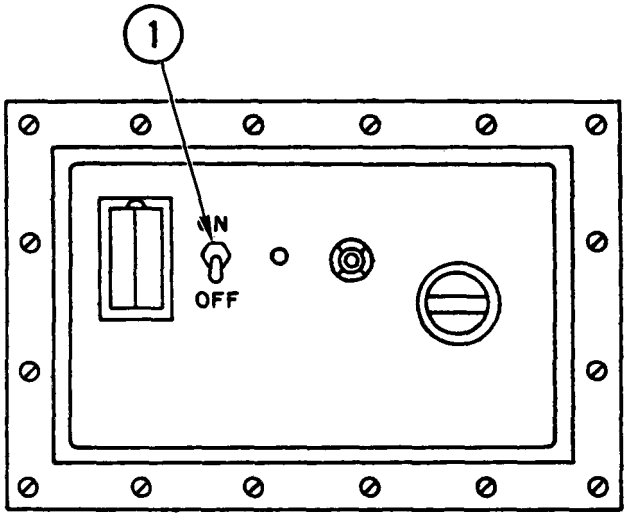


6. Close and latch control box cover.
7. Set all air conditioner circuit breakers ON at power distribution box .
8. Set humidifier circuit breaker ON at utility power box.
9. At temperature control panel, power ON all air conditioners.
10. Power ON panel toggle switch.

4-45. REMOVE/REPLACE HUMIDIFIER

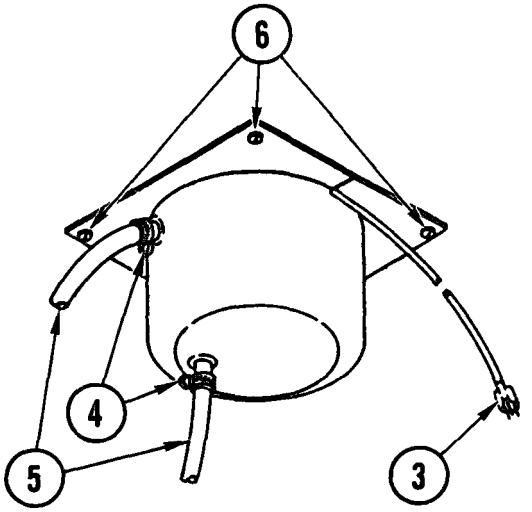
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil



Remove

1. Power OFF humidifier control panel.
2. At utility power box, set humidifier circuit breaker to OFF. Place piece of tape over breaker switch to indicate maintenance is underway.



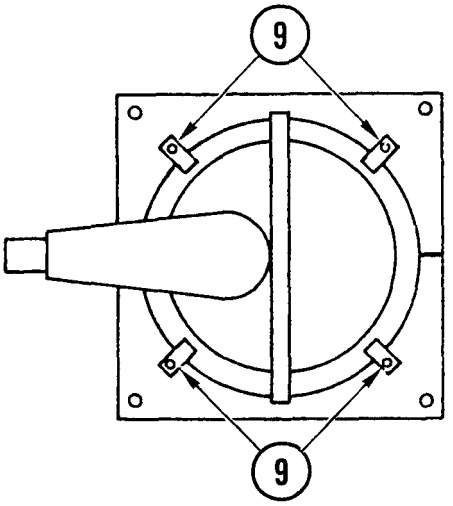
3. Unplug power cord.

NOTE

As soon as humidifier is powered OFF, any water in the reservoir will drain back into the pump tank. Allow at least one minute for humidifier to completely drain before you do step 4.

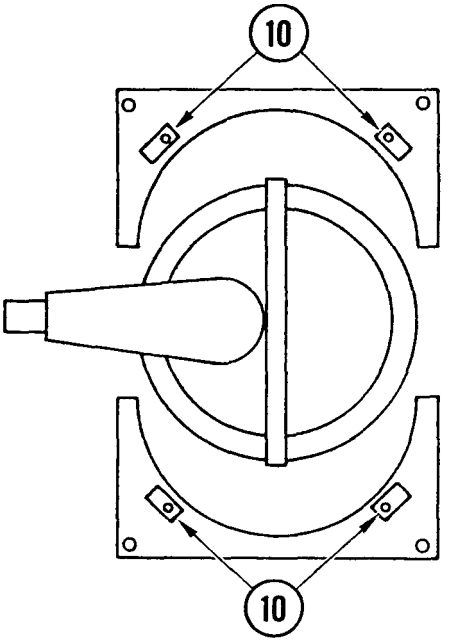
4. Loosen both hose clamps on humidifier reservoir.
5. Tag and remove hoses.
6. While supporting humidifier, remove mounting screws.
7. Lower humidifier from plenum, tilting to get spout through hole.

4-45. REMOVE/REPLACE HUMIDIFIER (CONT)



8. Place humidifier on a work surface.

9. Loosen screws on locking tabs.

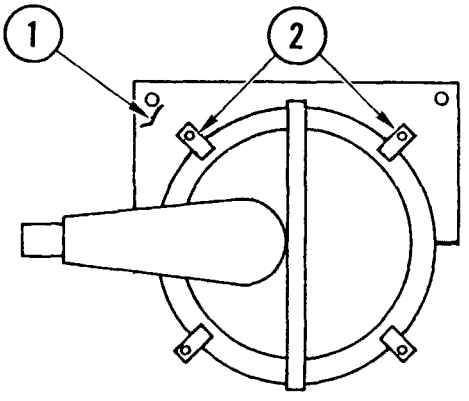


10. Turn locking tabs and remove mounting plate halves.

Replace

NOTE

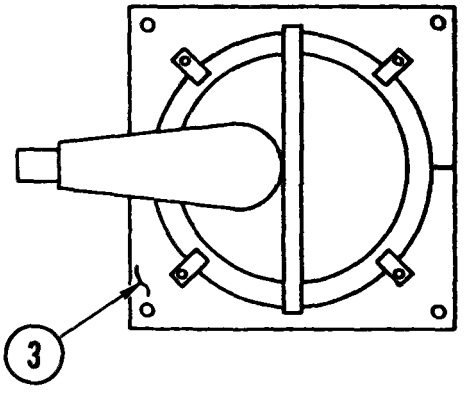
At assembly, be sure to aline humidifier nozzle and mounting plate joints.



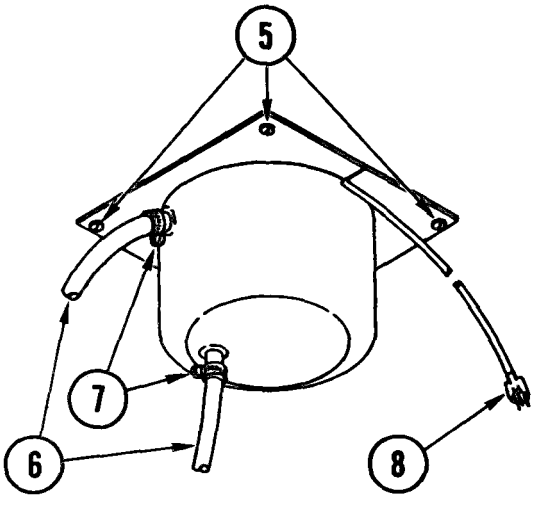
1. Place one mounting plate half in position.

2. Set tabs over humidifier and tighten screws.

4-45. REMOVE/REPLACE HUMIDIFIER (CONT)



3. Install other mounting plate half, making sure power cord is seated.



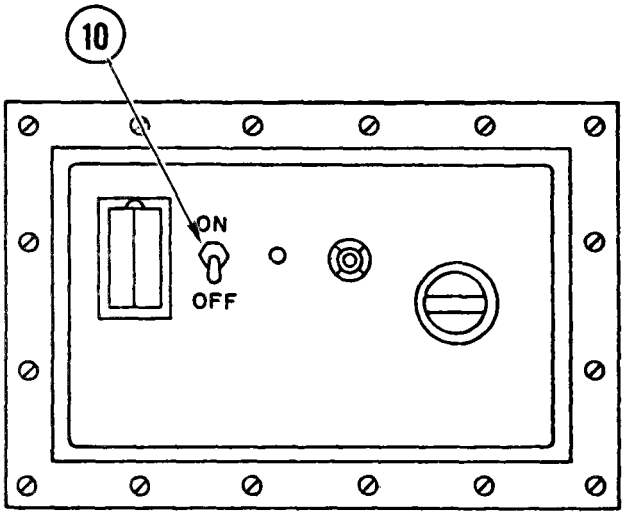
4. Place humidifier dome in plenum with nozzle pointing to rear of van.

5. While supporting humidifier, install mounting screws.

6. Push hoses onto fittings. Supply hose goes to bottom fitting; return hose to top fitting.

7. Tighten hose clamps.

8. Plug in power cord (para 4-46, Replace, step 15).



9. Power ON humidifier circuit breaker at utility power box.

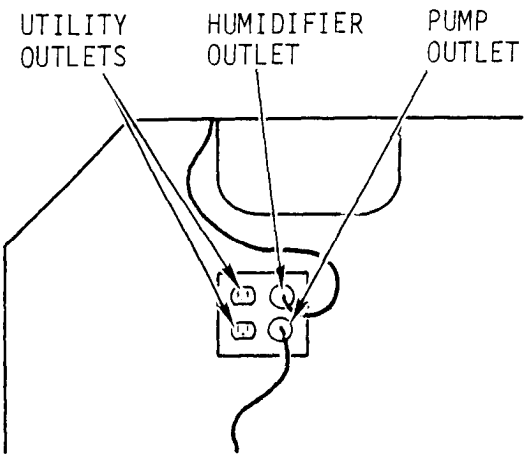
10. Power ON humidifier control panel.

4-46. REMOVE/REPLACE HUMIDIFIER PUMP TANK OR FLOAT ASSEMBLY

INITIAL SETUP

Common Too' s
- Tool kit

Personnel Required
- Two

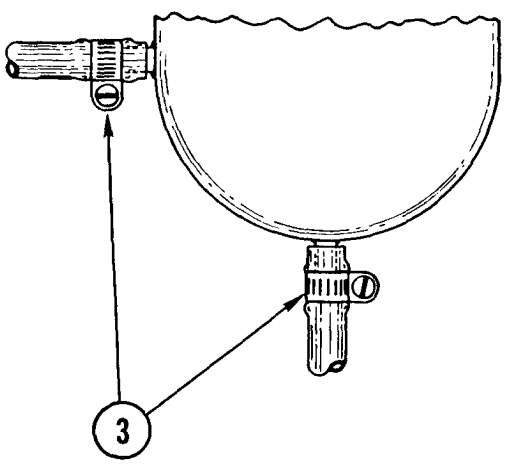


Remove

1. Ensure at least one air conditioner is ON.
2. Turn power OFF humidifer control and unplug humidifier and pump power cords.

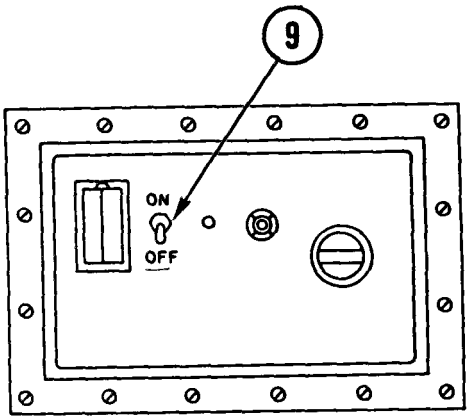
NOTE

As soon as humidifier is powered OFF, any water in the reservoir will drain completely into the pump tank. Allow at least one minute for humidifier to completely drain before you do step 3.



3. Loosen hose clamp and pull hose from bottom of humidifier reservoir.
4. Open jerry can and insert end of hose into can. If necessary, remove wall clamps to extend hose to can.
5. Plug in humidifier pump power cord. Turn power ON.
6. When pump tank is nearly empty, unplug pump. (Some water will remain in tank.)
7. Push hose back onto bottom of humidifier reservoir, and tighten hose clamp. If removed, replace wall clamps on hose.
8. Close and stow jerry can.

4-46. REMOVE/REPLACE HUMIDIFIER PUMP TANK OR FLOAT ASSEMBLY (CONT)

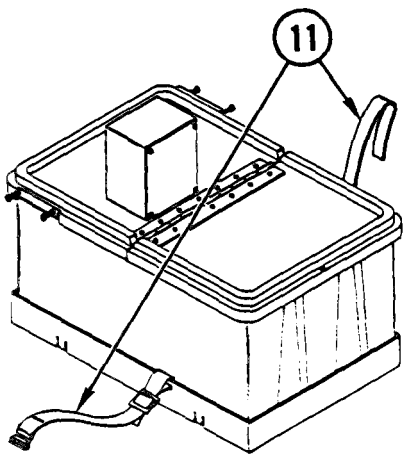


NOTE

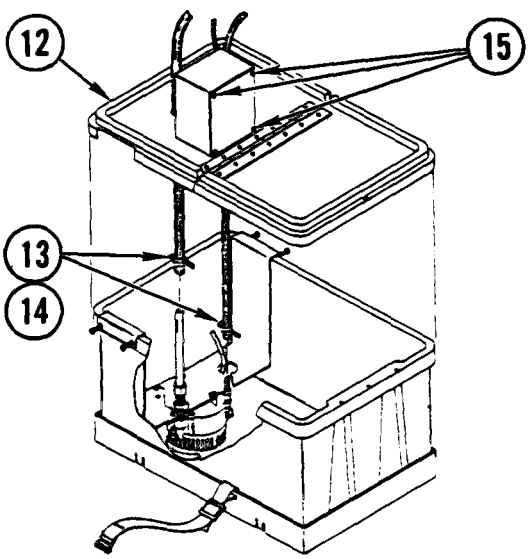
To remove float assembly, do steps 9-18. To remove humidifier pump tank, do steps 9-23.

9. Power OFF.

10. Power OFF humidifier circuit breaker at utility power box.



11. Loosen and remove tank tiedown strap.



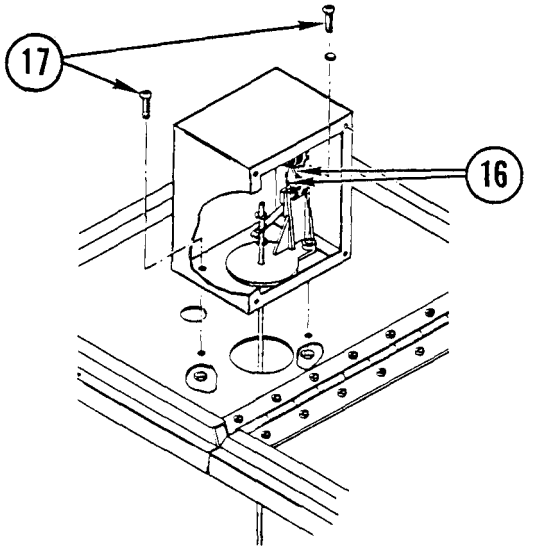
12. Carefully lift tank lid upward until lips at rear of lid can be separated from tank unit.

13. Loosen two hose clamps and remove two sections of hose tubing from pump assembly.

14. Remove hose clamps and pull each section of hose through holes in lid.

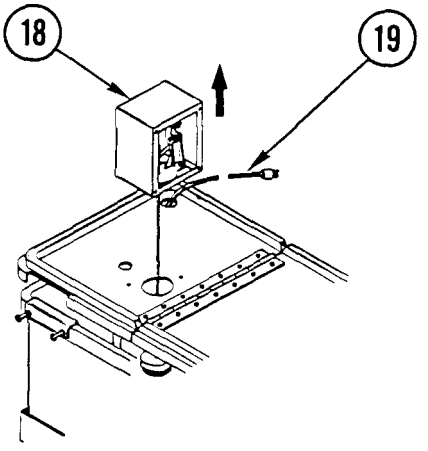
15. Remove four screws and lift off access cover of switch housing.

4-46. REMOVE/REPLACE HUMIDIFIER PUMP TANK OR FLOAT ASSEMBLY (CONT)



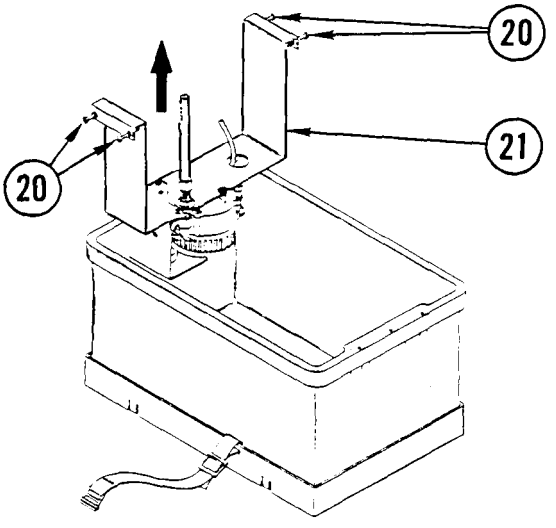
16. Tag and unsolder two leads attached to float switch assembly.

17. Loosen and remove two switch housing screws together with lockwashers, flatwashers, and nuts.



18. Lift housing aside, then lift float switch assembly from lid assembly taking care not to bend flat rod.

19. Cut tie wraps and feed power cord through access hole in lid, then remove lid.



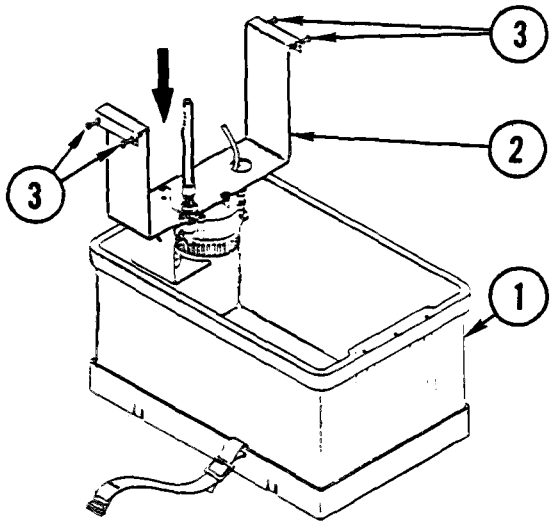
20. On both sides of tank, loosen pump mounting bracket screws. Remove support brackets.

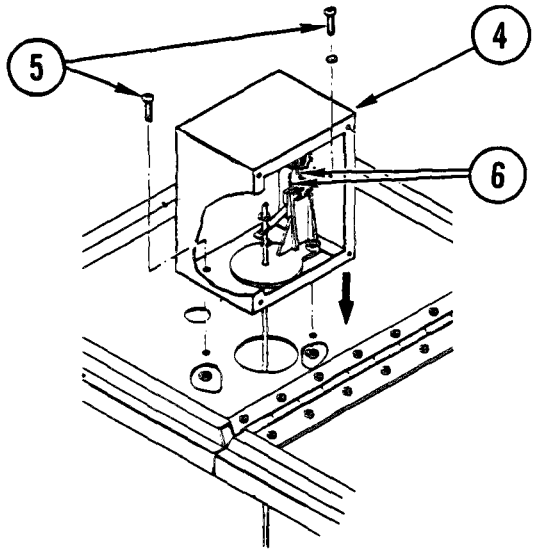
21. Lift pump assembly out of tank.

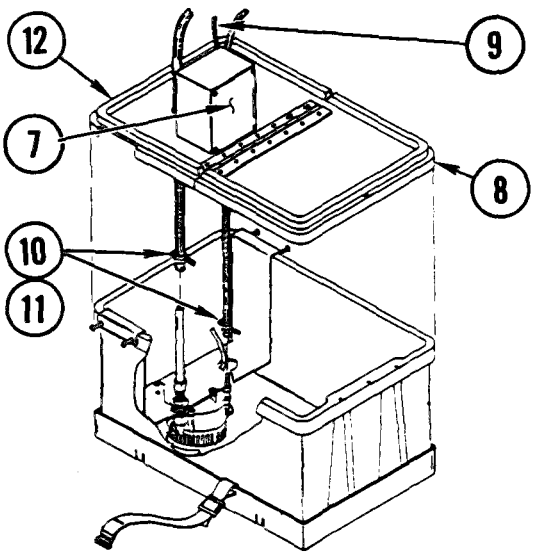
22. Carefully place pump assembly on floor of van.

23. Remove tank.

4-46. REM0VE/REPLACE HUMIDIFIER PUMP TANK OR FLOAT ASSEMBLY (CONT)







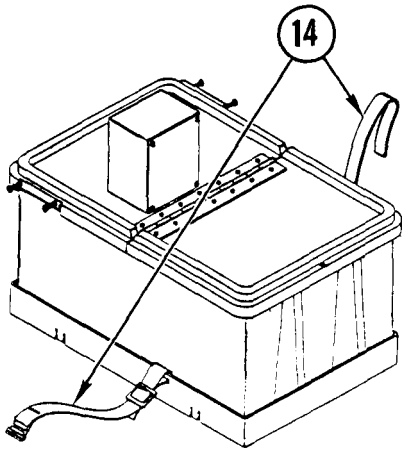
Replace

NOTE

To replace float assembly, do steps 4-6 and 11-13. To replace tank assembly do steps 1-17.

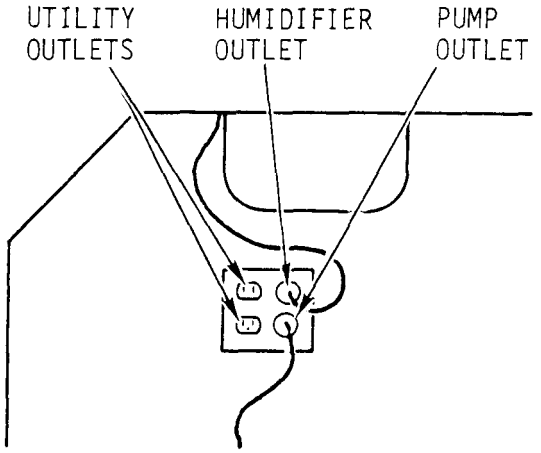
1. Place tank assembly in position in mounting bracket.
2. Lift and position pump assembly and support bracket in tank assembly.
3. On both sides of tank, tighten pump mounting bracket screws.
4. Replace float switch assembly and switch housing in position on lid, taking care not to bend float rod.
5. Replace and tighten two switch housing mounting screws together with lockwashers, flatwashers, and nuts.
6. Referring to tags, replace and solder two leads to float switch assembly.
7. Install switch housing access cover. Replace four screws.
8. Place lid in position over tank assembly.
9. Feed power cord up through hole in support bracket, then through hole in lid.
10. Feed two sections of hose through holes in top of lid, then through holes in brackets.
11. Place hose cl amps on hoses, then position and secure hoses with clamps.
12. Lower and eng age rear section of lid to tank assembly, lower lid onto tank assembly taking care not to bend float rod.

4-46. REMOVE/REPLACE HUMIDIFIER PUMP TANK OR FLOAT ASSEMBLY (CONT)



13. Fill tank with distilled water.

14. Install and tighten tiedown strap.



15. Plug in humidifier and pump power cords.

16. Power ON humidifier circuit breaker.

17. Power ON humidifier control panel.

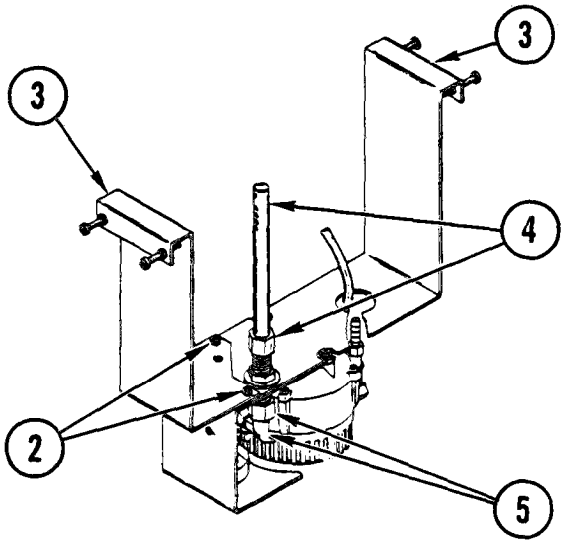
18. Power ON all air conditioner units.

4-47. REMOVE/REPLACE HUMIDIFIER PUMP

INITIAL SETUP

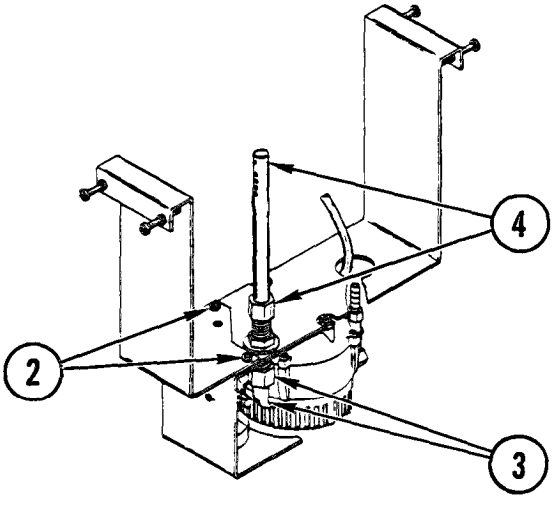
Common Tools
• Tool kit

Materials/Spare Parts
• Cord (10 feet)



Remove

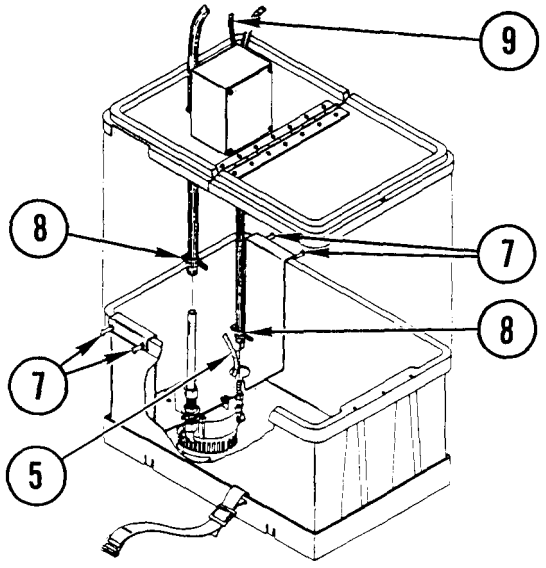
1. Remove humidifier tank lid and float switch assembly (para 4-46, Remove steps 1-13 and 19-21).
2. Remove two mounting screws together with lockwashers, flatwashers, and nut securing two support brackets to pump assembly.
3. Remove smaller support bracket.
4. Loosen and remove compression ring and nut and remove return tube.
5. Remove mounting nut then remove bulkhead union and pump cooling elbow. Lift off larger support bracket.
6. Remove pump assembly.



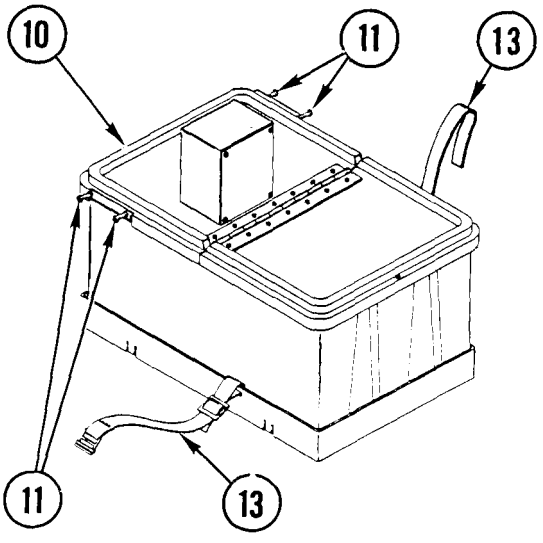
Replace

1. Fit pump to brackets.
2. Install two screws, washers, and nuts to hold pump to brackets.
3. Replace bulkhead union and elbow. Open end of elbow must face pump. Secure in position with mounting nut.
4. Replace return tube and secure in position with compression nut.

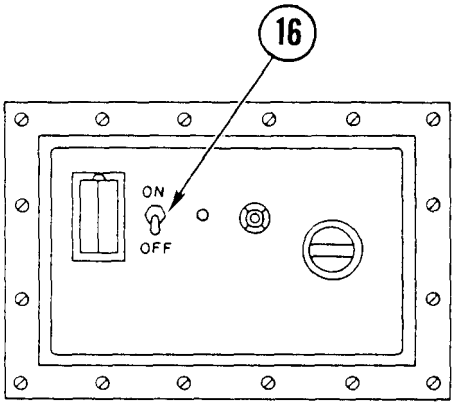
4-47. REMOVE/REPLACE HUMIDIFIER PUMP (CONT)



5. Feed power cord through hole in bracket.
6. Replace humidifier tank lid and float switch assembly (para 4-46, Replace, steps 2, 3, and 7-18).
7. Replace pump assembly in position on tank assembly.
8. Replace input and return hoses, and secure in position with hose clamps.
9. Feed power cord through hole in lid.



10. Fit lid to rear of pump tank and lower lid in position, taking care not to bend float rod.
11. Place support bracket in position. Tighten pump mounting bracket screws.
12. Fill tank with distilled water.
13. Install and tighten tank tiedown strap.

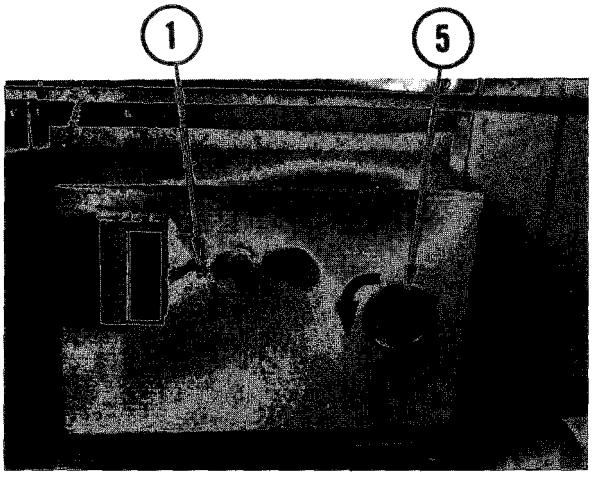


14. Plug in humidifier and pump power cords.
15. Power ON humidifier circuit breaker.
16. Power ON humidifier.
17. Power ON all air conditioner units.

4-48. ACCESS/CLOSE UP HUMIDIFIER CONTROL BOX

INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Electrical tape



WARNING

Electrocution may result if procedure is done with power on.

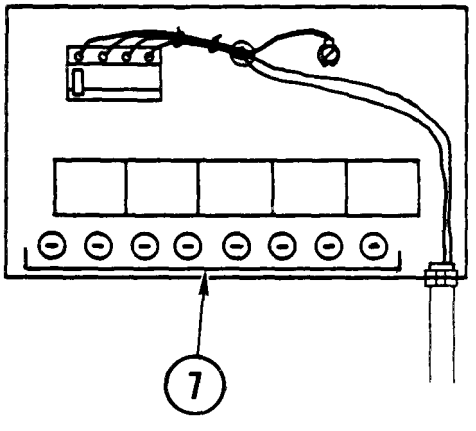
Access

1. At temperature control panel, power OFF all air conditioners.

WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lights are OFF when all air conditioners are OFF.

2. Power OFF humidifier.
3. At power distribution box, set all four air conditioner circuit breakers OFF. Switch off all incandescent lights.
4. At utility power box, set humidifier circuit breaker OFF. Place a strip of tape over circuit breaker to indicate a repair is in progress.



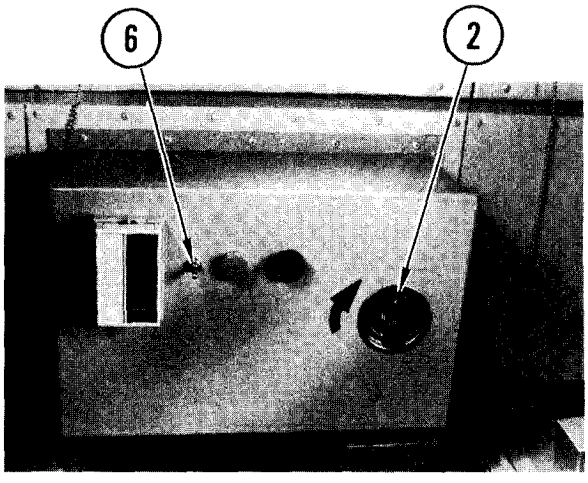
5. Turn latch handle as shown.
6. Open cover.

WARNING

Filters in humidifier control box may contain dangerous voltage even after control box is powered OFF. Make sure filters are fully discharged before working on control box.

7. Discharge filters.

4-48. ACCESS/CLOSE UP HUMIDIFIER CONTROL BOX (CONT)



Close Up

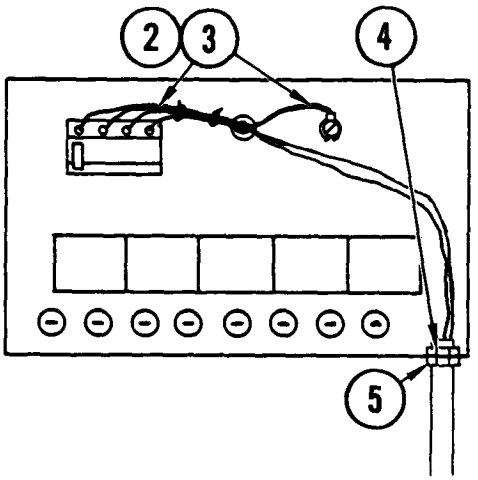
1. Close door.
2. Turn latch handle as shown.
3. At utility power box remove tape and set humidifier circuit breaker ON.
4. At power distribution box, set all four air conditioner circuit breakers ON.
5. At temperature control panel power ON air conditioners as required.
6. At humidifier control box power ON humidifier.

4-49. REMOVE/REPLACE HUMIDIFIER CONTROL BOX

INITIAL SETUP

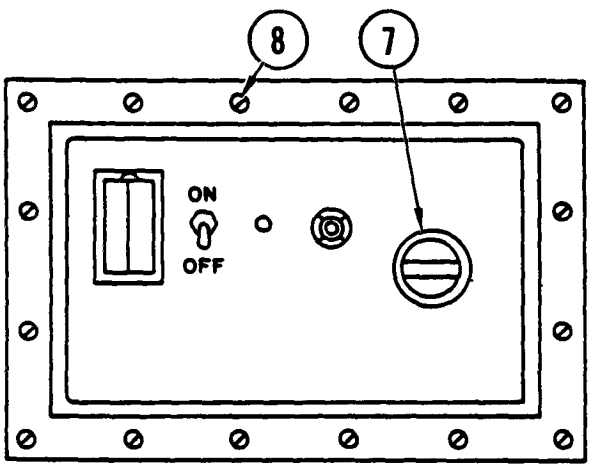
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Tags
- Pen or pencil



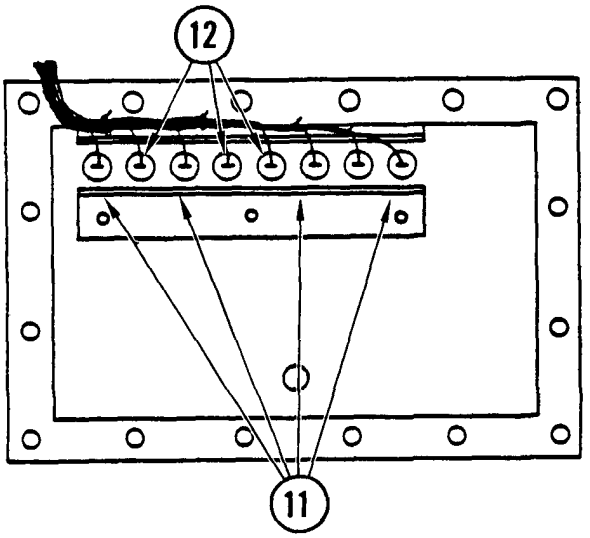
Remove

1. Access humidifier control box (para 4-48).
2. Make a drawing showing connections for wires that come through hole in bottom of box only.
3. Disconnect wires.
4. Make sure locknut is tight.
5. Loosen ring nut.
6. Carefully pull wires out of box.



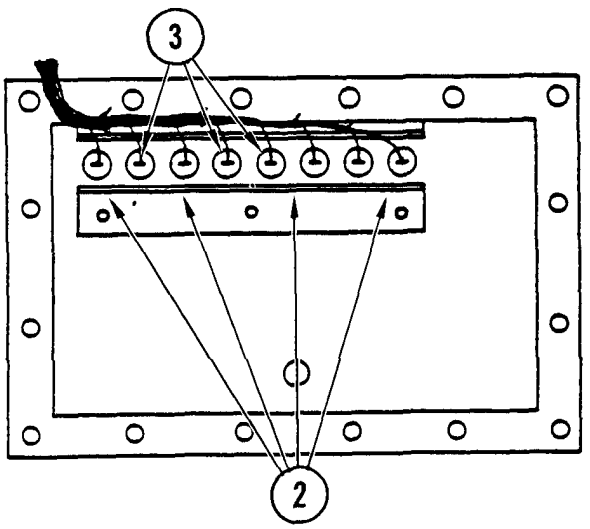
7. Close humidifier control box door.
8. Loosen all quick-release, captive mounting screws.
9. Carefully pull box from bulkhead.
10. Turn box face down.

4-49. REMOVE/REPLACE HUMIDIFIER CONTROL BOX (CONT)

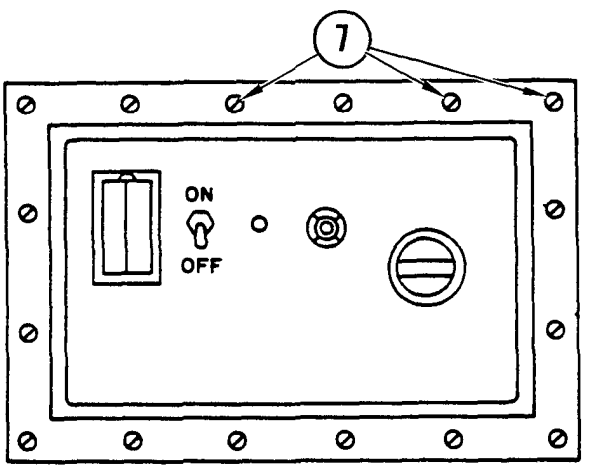


11. Remove eight mounting screws and lift off filter protective cover.
12. Tag and remove wires from filters.
13. Replace protective cover and secure in position with eight mounting screws.
14. Remove control box.

Replace

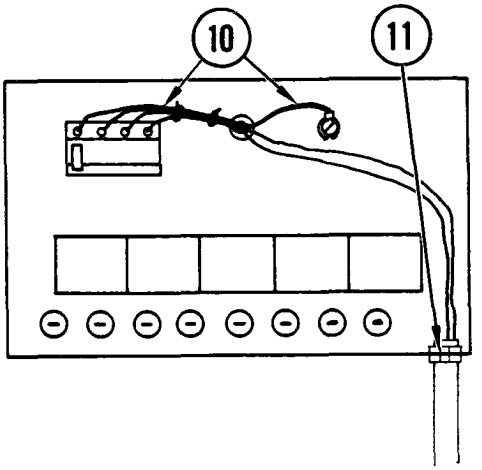


1. Place control box face down in front of hole in bulkhead.
2. Remove eight mounting screws and lift off filter protective cover.
3. Following tags, connect wires to filters.
4. Replace protective cover and secure in position with eight mounting screws.



5. Place box at hole in bulkhead.
6. Push mounting screws into holes.
7. Turn and lock mounting screws.
8. Open control box door.

4-49. REMOVE/REPLACE HUMIDIFIER CONTROL BOX (CONT)



9. Carefully thread wires up through channel opening and into box.

10. Follow drawing made at removal, connect wires inside box.

11. Tighten ring nut.

12. Close up humidifier control box (para 4-48).

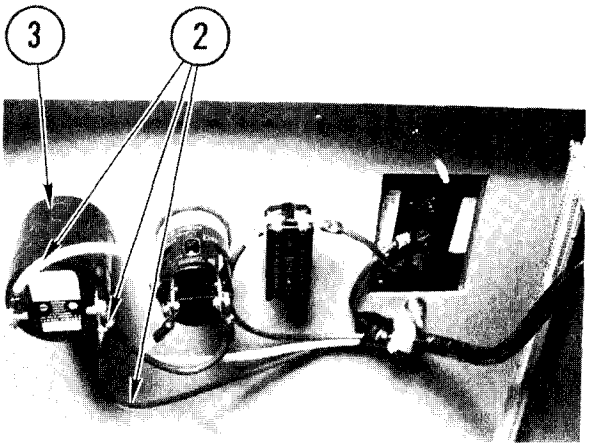
4-50. REMOVE/REPLACE HUMIDIFIER CONTROL BOX SOUND ALARM

INITIAL SETUP

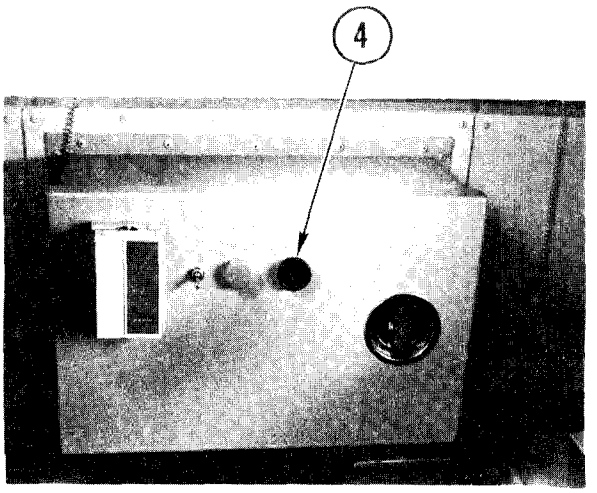
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil

Remove

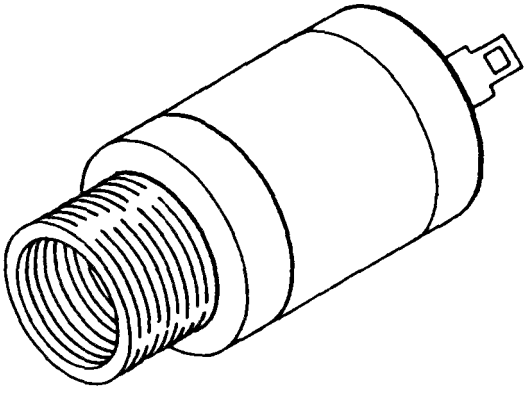


1. Access humidifier control box (para 4-48).
2. Tag wires, loosen screws and pull off wires.
3. Hold sound alarm with one hand.

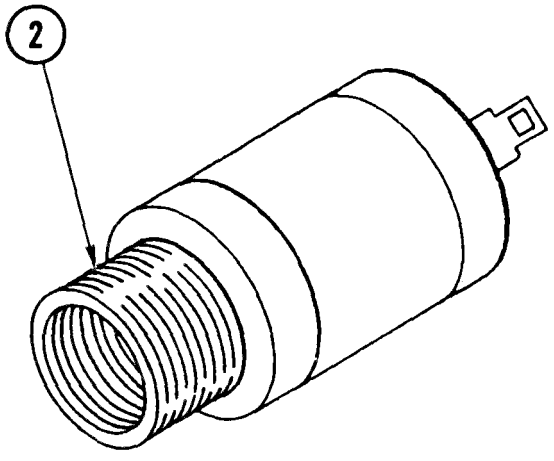


4. With other hand unscrew and remove grill from front of cover.

4-50. REMOVE/REPLACE HUMIDIFIER CONTROL BOX SOUND ALARM (CONT)



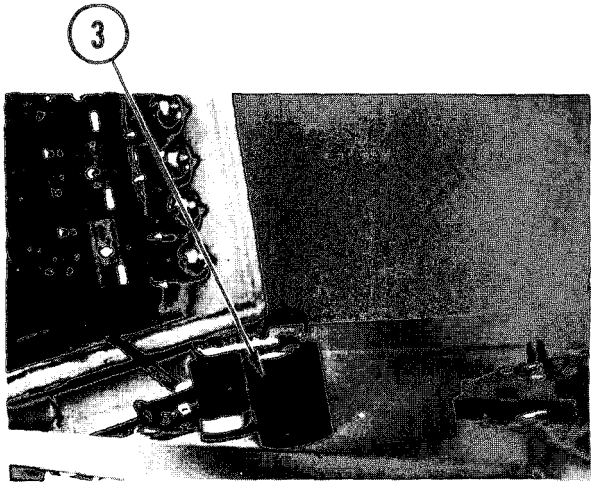
5. Pull out sound alarm unit.



Replace

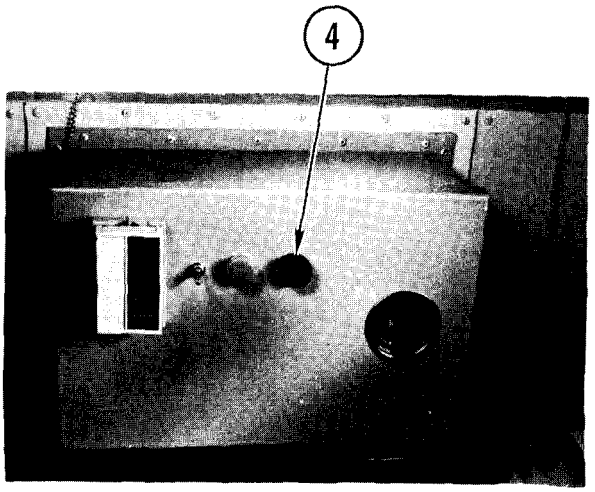
1. Open cover.

2. Insert shaft of sound alarm unit through hole in cover.

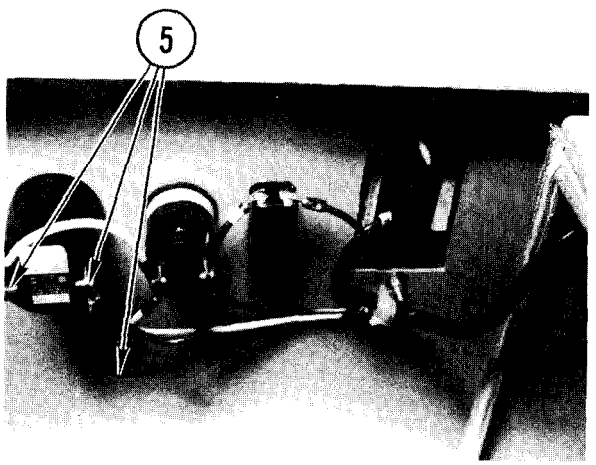


3. On inside cover, hold sound alarm with one hand.

4-50. REMOVE/REPLACE HUMIDIFIER CONTROL BOX SOUND ALARM (CONT)



4. On front of cover, screw grille on sound alarm shaft with other hand, and tighten.



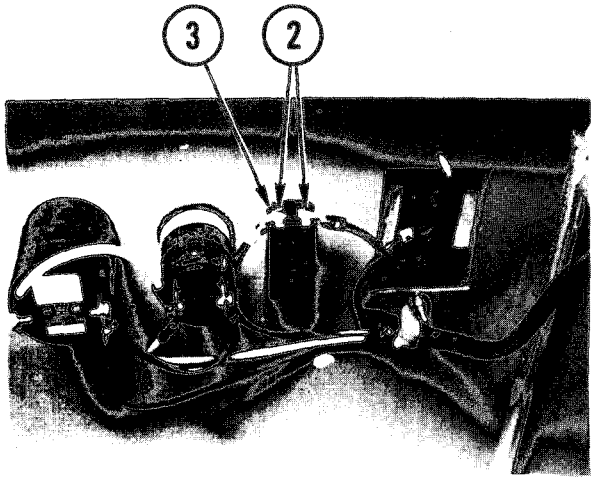
5. Referring to tags, connect wires and tighten screws.

6. Close up humidifier control box (para 4-48).

4-51. REMOVE/REPLACE HUMIDIFIER CONTROL BOX SWITCH

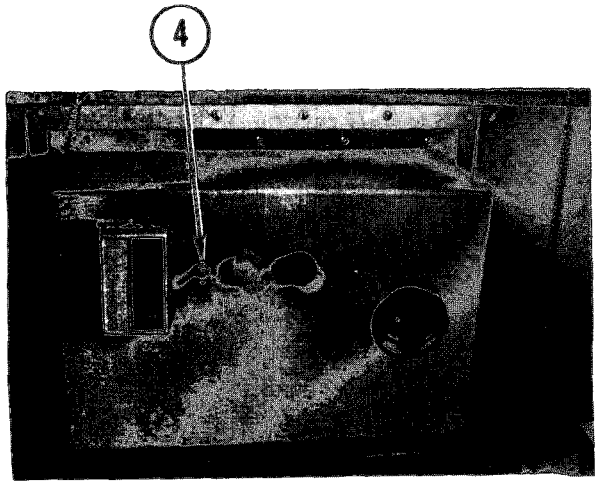
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil



Remove

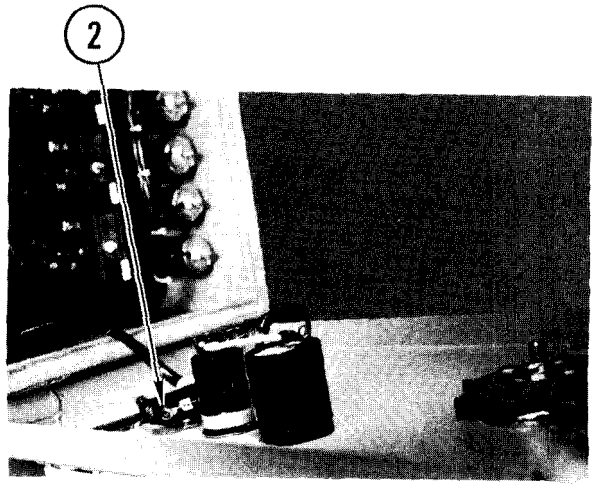
1. Access humidifier control box (para 4-48).
2. Tag wires, loosen screws and pull off wires.
3. Hold switch unit with one hand.



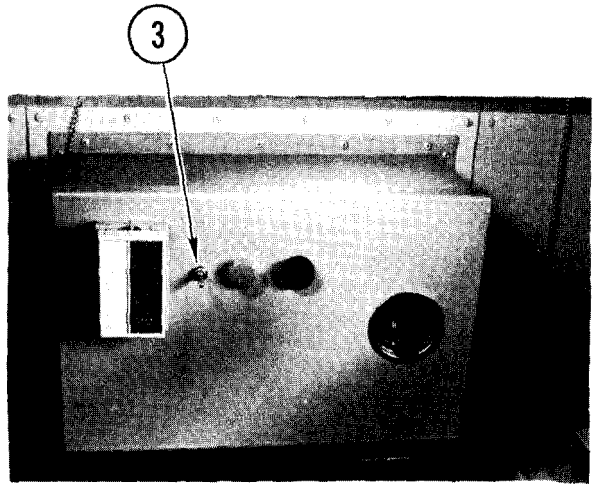
4. With other hand, remove locknut.
5. Pull out switch unit from inside cover.

4-51. REMOVE/REPLACE HUMIDIFIER CONTROL BOX SWITCH (CONT)

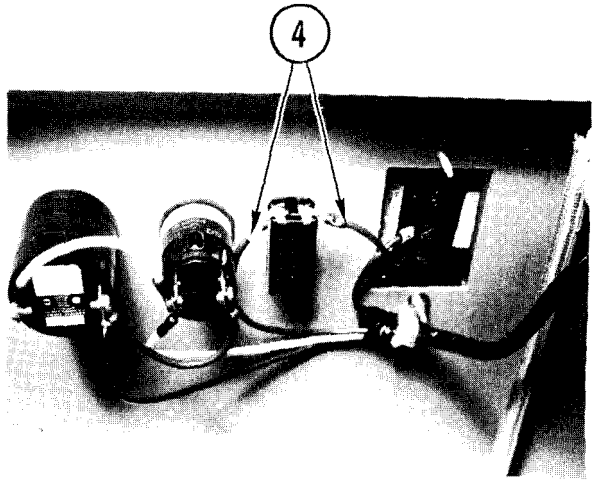
Replace



1. Push switch unit through hole in cover.
2. Hold switch unit with one hand.



3. With other hand replace and tighten locknut.

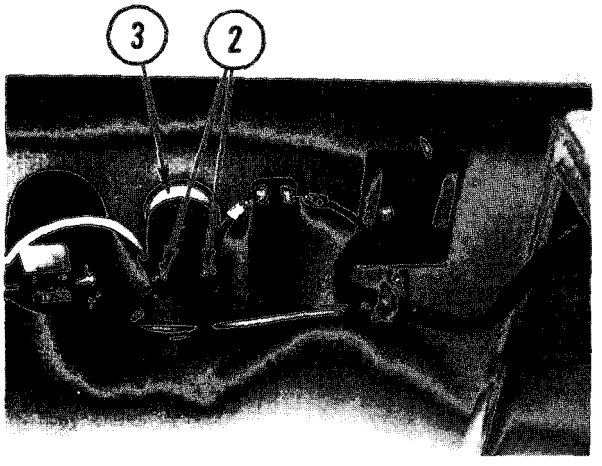


4. Referring to tags, push on wires and tighten screws.
5. Close up humidifier control box (para 4-48).

4-52. REMOVE/REPLACE HUMIDIFIER CONTROL BOX INDICATOR

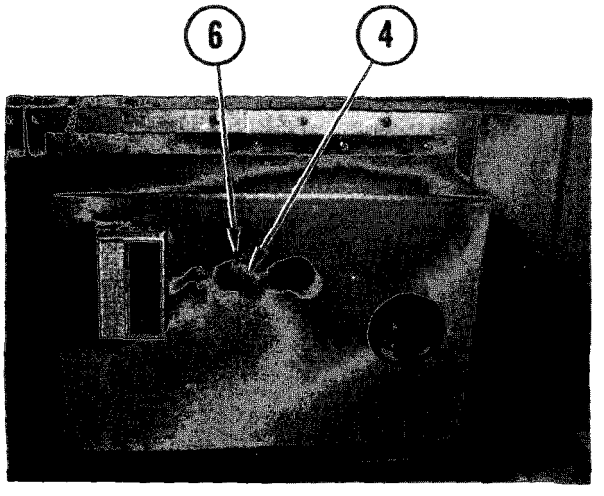
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil



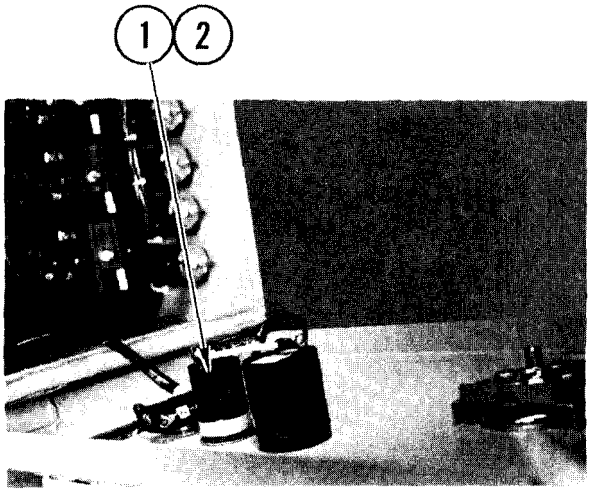
Remove

1. Access humidifier control box (para 4-48) .
2. Tag wires, loosen screws and pull off wires.
3. Hold indicator unit with one hand.



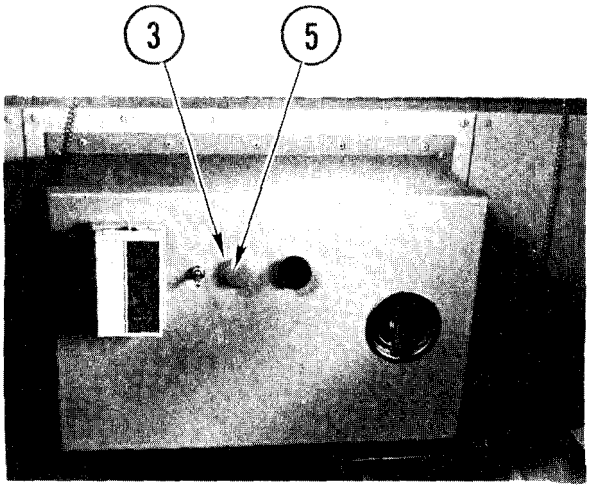
4. With other hand, unscrew and remove red lamp lens cover.
5. If necessary, unscrew and pull out lamp.
6. Remove locknut.
7. Pull out indicator unit.

4-52. REMOVE/REPLACE HUMIDIFIER CONTROL BOX INDICATOR (CONT)

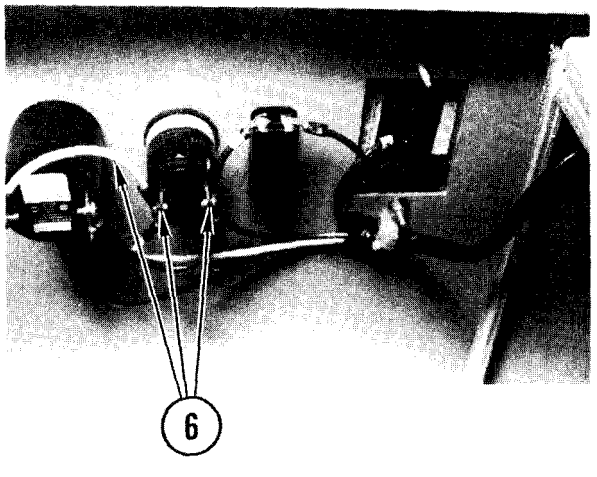


Replace

1. Push indicator unit through hole in cover.
2. Hold indicator unit with one hand.



3. With other hand replace and tighten locknut on indicator unit shaft.
4. If necessary, insert lamp into socket and tighten.
5. Replace and tighten red lamp lens cover.



6. On inside of control box attach wires, then tighten screws.
7. Close up humidifier control box (para 4-48).

4-53. REMOVE/REPLACE HUMIDIFIER CONTROL BOX RELAY

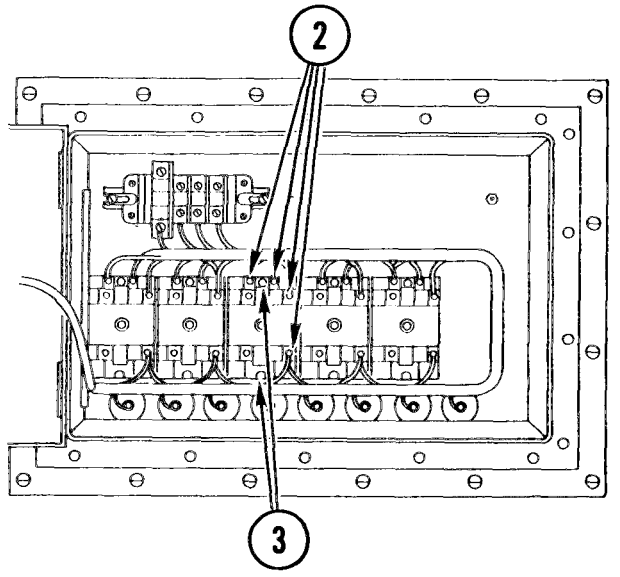
INITIAL SETUP

Common Tools
- Tool kit.

Materials/Spare Parts
- Tags
- Pen or pencil

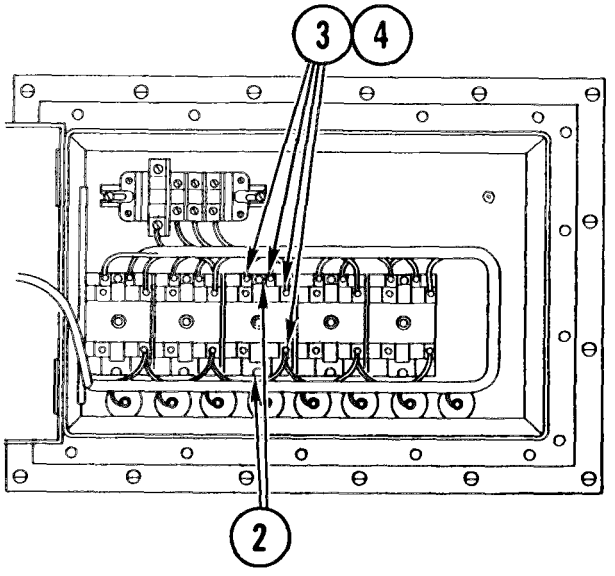
NOTE

There are five relays in the humidifier control box. Use this procedure to remove/replace any of them.



Remove

1. Access humidifier control box (para 4-48) .
2. Tag wires, loosen four screws and washers and pull off wires.
3. Loosen two screws.
4. Pull relay up and out.



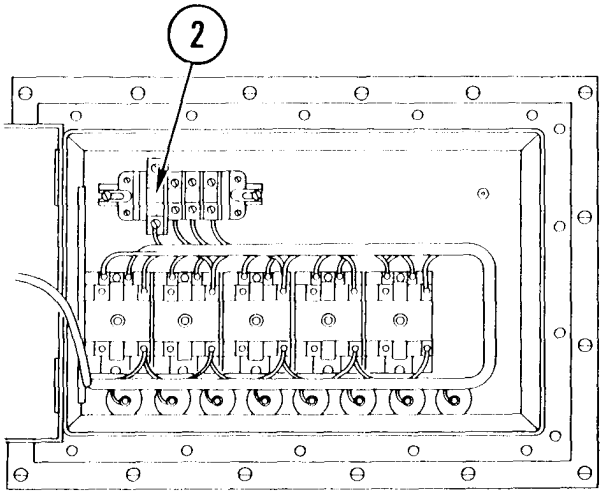
Replace

1. Slide relay into position on mounts.
2. Tighten two screws.
3. Referring to tags, attach wires.
4. Tighten four screws and washers.
5. Close up humidifier control box (para 4-48).

4-54. REMOVE/REPLACE HUMIDIFIER CONTROL BOX FUSE

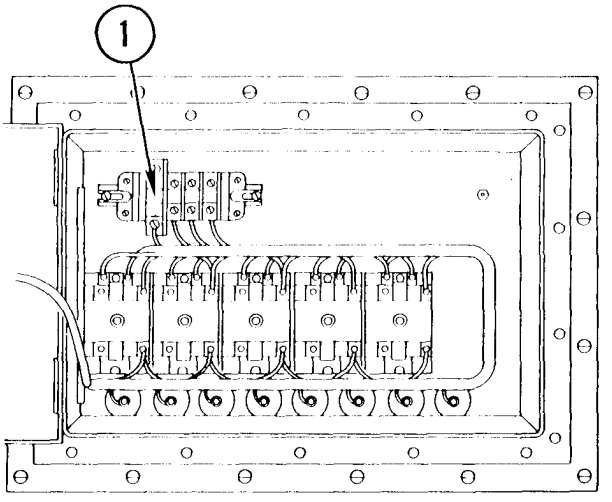
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Fuse



Remove

1. Access humidifier control box (para 4-48).
2. Reach in and pry out fuse.



Replace

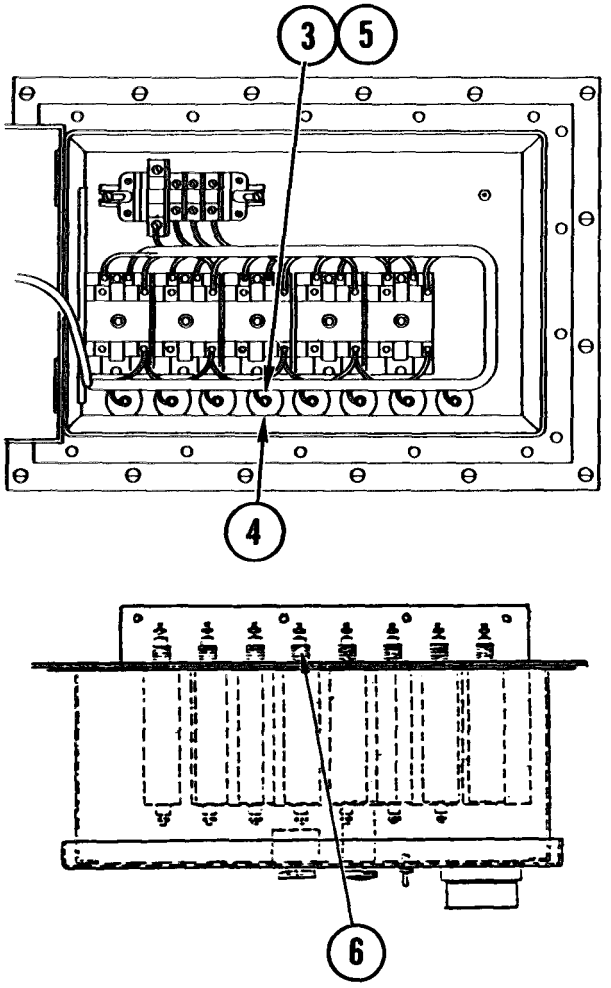
1. Push fuse into place in mounting clamps.
2. Close up humidifier control box (para 4-48).

4-55. REMOVE/REPLACE HUMIDIFIER CONTROL BOX FILTER

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil



WARNING

Hazardous voltages can exist on filter terminals within the humidifier control box. Make sure power is off and filters discharged before removing.

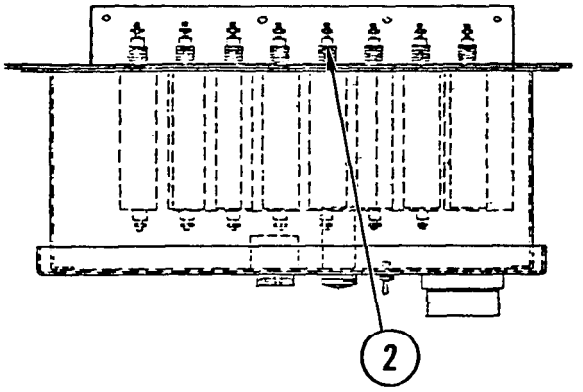
Remove

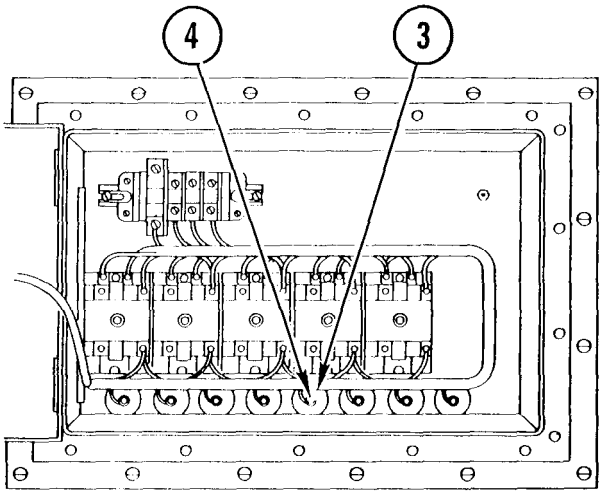
NOTE

There are eight filters in the humidifier control box. Use this procedure to remove/replace any of them.

1. Remove humidifier control box (para 4-49, Remove, steps 1-12).
2. Locate defective filter(s).
3. Tag wire(s).
4. Remove nut(s) and washer(s).
5. Pull off wire(s).
6. Remove locknut from rear of filter outside control box.
7. Pull out filter.

4-55. REMOVE/REPLACE HUMIDIFIER CONTROL BOX FILTER (CONT)





Replace

1. Insert filter through hole in rear of control panel.
2. Replace and tighten nut and washers.
3. Push on wire(s).
4. Replace and tighten nut(s) and washer(s).
5. Replace humidifier control box (para 4-49, Replace, steps 3-12).

4-56. REMOVE/REPLACE AIR CONDITIONER

INITIAL SETUP			
Common Tools	Materials/Spare Parts	Personnel Required	Support Equipment
• Tool kit	• Adhesive	• Three	• Hoist, crane, or block and tackle
• Putty knife	• Contact cement		• Folding ladder
• Socket set	• Sealant adhesive (RTV103)		

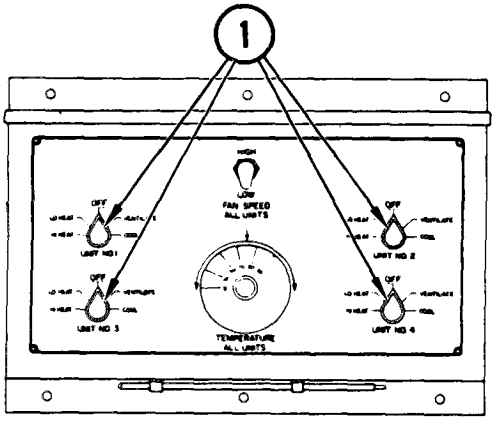
Remove

WARNING

Do not attempt to remove an air conditioner without aid of adequate hoisting or lifting equipment. Each air conditioner weighs 260 lb. Removal of air conditioner without adequate support equipment is dangerous.

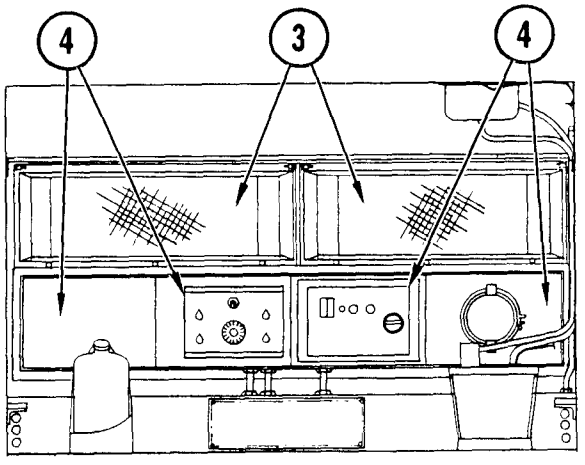
WARNING

Incandescent lights may start a fire if left ON when all air conditioners are powered OFF. Make sure incandescent lights are OFF when all air conditioners are OFF.



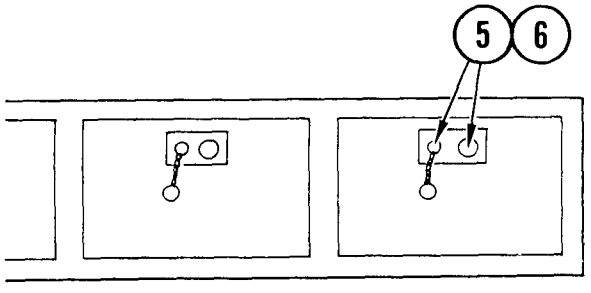
1. On temperature control hex, set four air conditioner switches to OFF.
2. At power distribution box, set air conditioner circuit breakers CB1, CB2, CB3, and CB4 to OFF.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)



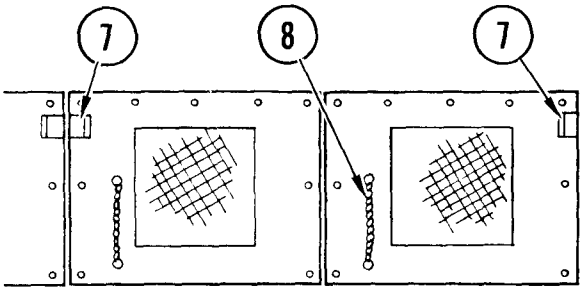
3. Remove noise hood(s) (para 3-18, Remove).

4. Remove access panel for air conditioner you are about to take off.



5. Cut safety wire around power and control connectors.

6. Disconnect power cable at connector P1/J1 and control cable at connector P7/J7.

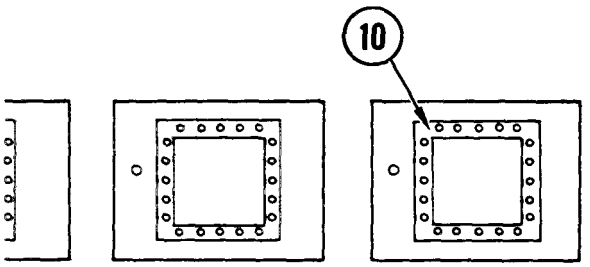


7. Remove two screws, noise hood mounting bracket, and spacer for air conditioner you are removing.

8. Remove screws and flatwashers holding ac filter grill for air conditioner you are about to take off. Feed pull chain through hole as you remove grill.

9. Disconnect beaded pull chain that leads to air conditioner vent door. Let chain hang or remove and set aside.

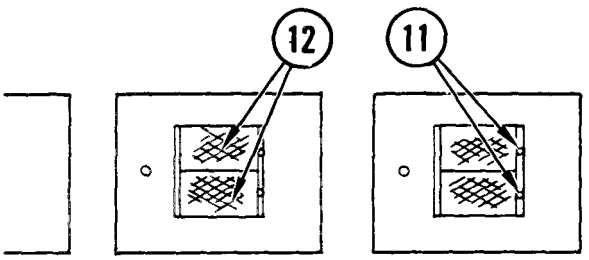
4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)



10. Using a screwdriver, remove screws holding EMI filter screen in opening. Remove screen and set aside.

CAUTION

If all air conditioners are to be turned off for an extended period, turn off internal fluorescent lights as ballasts will overheat.



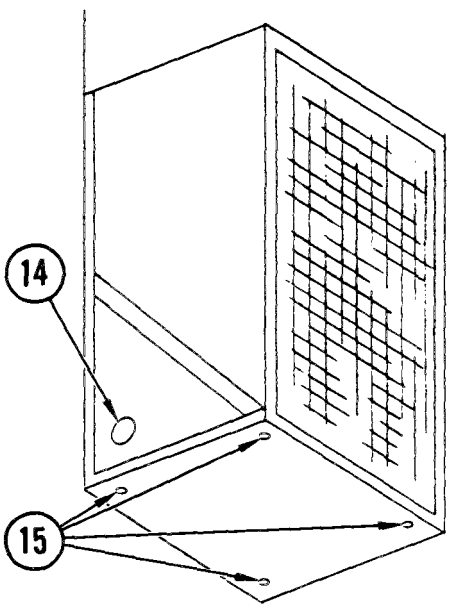
11. Using a small flat blade screwdriver, turn hold-down zip fasteners on filter bracket. (Turn fastener 90° to loosen.)

12. Remove filters and set aside.

13. Outside van, use folding ladder to reach air conditioner.

WARNING

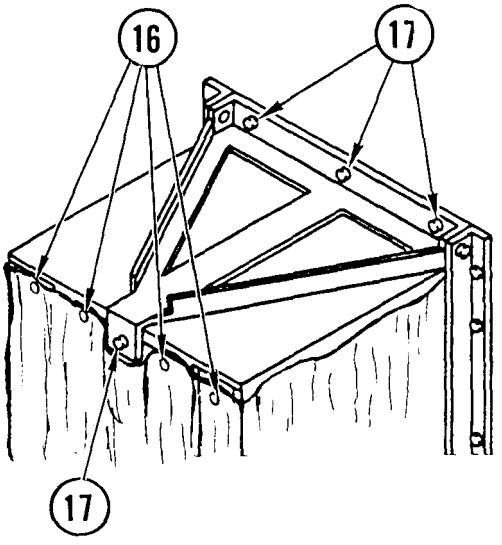
Van must be level before air conditioner is freed from bracket and frame. Air conditioner could fall if tilted outward, causing injury to personnel.



14. Remove small cover over circuit breaker located at lower rear section of air conditioner.

15. Remove four bolts and washers that secure bottom of air conditioner to support frame.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)

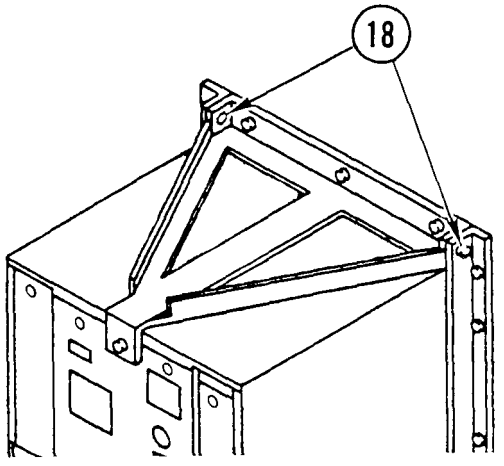


16. Remove four screws at top front of outer cover to access front bracket bolt.

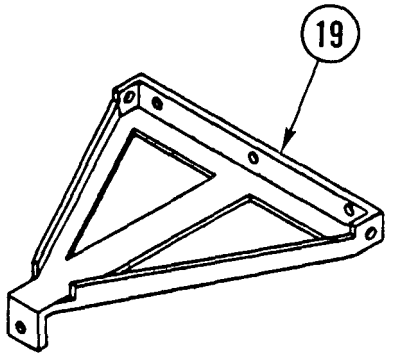
17. Using folding ladder, climb up to top of air conditioner and remove three bolts securing bracket to van and one bolt securing bracket to air conditioner.

NOTE

In some installations a spacer is installed between air conditioner and front of bracket. Save for replacement.

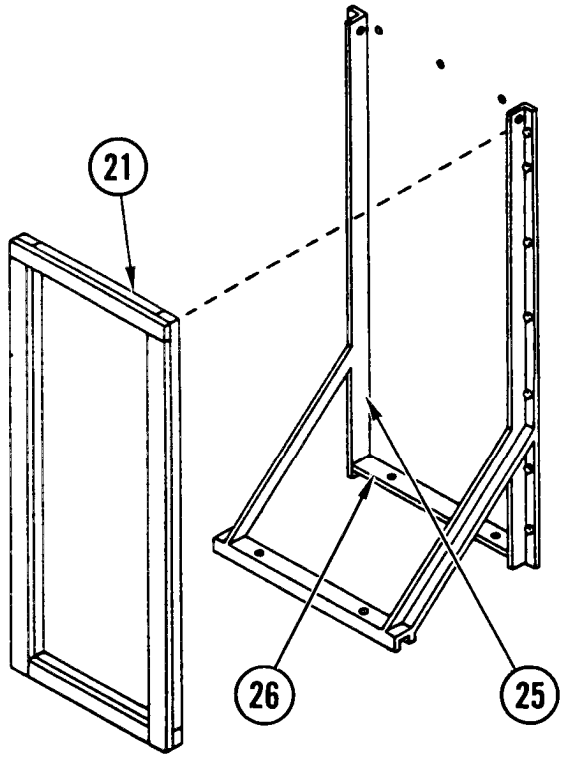


18. Remove two bolts that secure top bracket to upper ends of side rails.



19. Remove bracket and save for reinstallation.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)



WARNING

Each air conditioner weighs 260 lb. Stand clear of unit while lifting from support and lowering to ground.

CAUTION

Get help to guide unit out of its support assembly during removal. Don't let unit swing or tilt while it is being lifted off support assembly.

20. Remove air conditioner from supporting frame. Reinstall circuit breaker cover.

21. Check gasket for the following conditions:
    - If gasket is torn, cracked, or dry rotted, go to step 22
    - If gasket is OK, go to step 26

22. Using a putty knife, loosen contact cement between gasket and front of van. Remove existing a/c van gasket.

23. Check van surface. It should be smooth and clean for new gasket.

24. If van surface is not clean and smooth, scrape off remaining contact cement.

25. Apply contact cement to van surface and set hard gasket surface in place against van.

NOTE

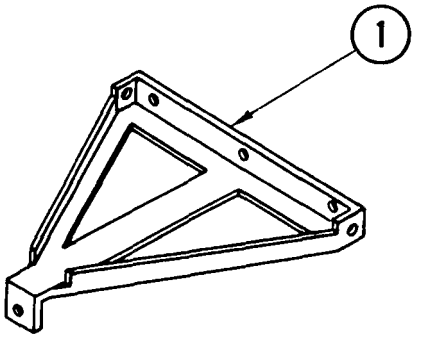
If a replacement air conditioner is not available, follow steps 26 thru 28; otherwise, go to Replace step 1.

26. Remove three bolts. Lift off bottom frame support.. Retain support.

27. Inside van, remove a cover plate from storage.

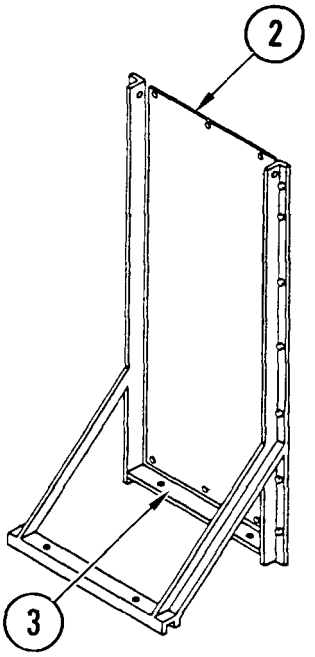
28. Place cover plate over opening left by removed air conditioner, and secure with 10 bolts.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)



Replace

1. Get top bracket for air conditioner.

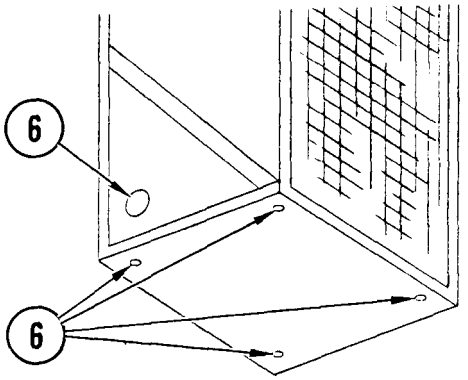


2. If cover plate is installed over opening in front of van, remove cover and stow in rack beside frequency converter (see Remove, step 26).

WARNING

Do not attempt to replace an air conditioner without aid of adequate hoisting or lifting equipment. Each air conditioner weighs 260 lb. Removal of air conditioner without adequate support equipment is dangerous.

3. If previously removed, install bottom frame support. Remove circuit breaker cover from air conditioner. Set air conditioner into position on support assembly.

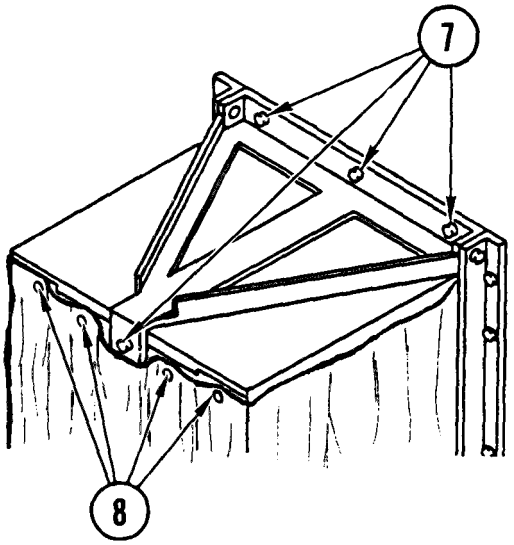


4. Attach thin wire to beaded chain inside new air conditioner and fish line through 1/2-inch hole while sliding air conditioner into place.

5. Position unit so that it fits against gasket and lines up with mounting holes.

6. Insert and tighten four bolts that secure bottom of air conditioner to support, then replace cover over circuit breaker.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)

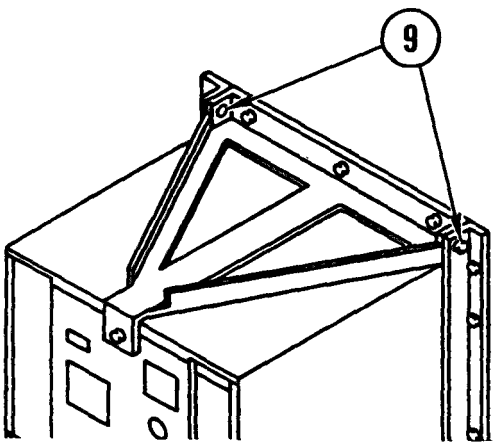


7. Set support bracket on air conditioner.

NOTE

If spacer was installed on original installation replace under front of mounting bracket.

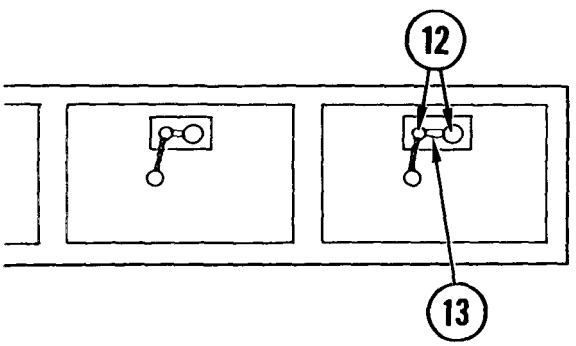
8. Insert and tighten three bolts securing bracket to van and one bolt securing bracket to air conditioner.



9. Insert and tighten four screws at top front of outer cover.

10. Insert and tighten two bolts and nuts securing top bracket to vertical rails of support.

11. Tighten all bolts and nuts.



12. Inside van, connect power cable P1 to J1 and control cable P7 to J7.

NOTE

Make sure cables clear panel. Do not crimp cables with panel.

13. Replace safety wire on cables.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)

14. Replace access panel(s) in position and secure with screws and flatwashers.

15. At power distribution box, set circuit breakers CBl, CB2, CB3, and CB4 to ON.

16. At temperature control panel, power on air conditioner just replaced.

17. Check that:

    • Compressor works in COOL Mode

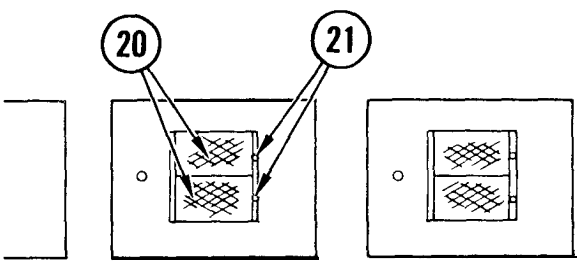
    • Fan works in LO and HI

    • Heat works in LO HEAT and HI HEAT

18. If air conditioner functions, go to step 19.

    • If compressor, fan, or heat does not work, refer to trouble-shooting table 4-8

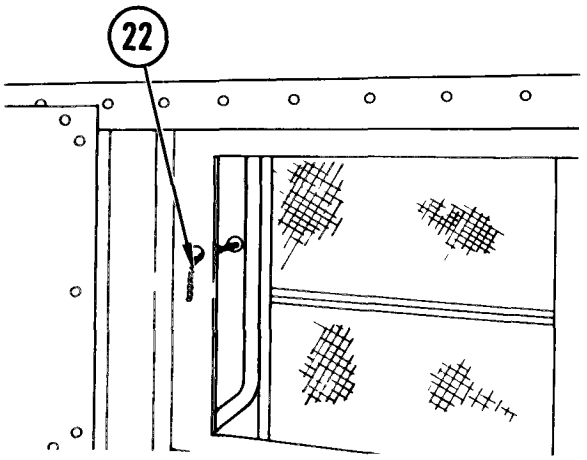
19. At temperature control panel, power OFF air conditioner.



20. Slide filters into place with air flow arrows pointing inward.

21. Replace inner filter bracket, push in hold-down bolts and turn 90° to lock.

4-56. REMOVE/REPLACE AIR CONDITIONER (CONT)



22. Fish beaded pull chain through hole adjacent to screen and attach to ac filter grill from which it was disconnected. Check to see if chain operates vent door as required.

23. Position EMI screen as shown. Replace screws, securing EMI filter, and tighten screws.

24. Replace ac filter grill and secure in position with screws and flatwashers.

25. Replace noise hood mounting bracket with spacer on filter grill. Install two screws.

26. Replace noise hood, (para 3-18, Replace).

27. Turn ON air conditioners as needed.

4-57. REMOVE/REPLACE l900G CONVERTER

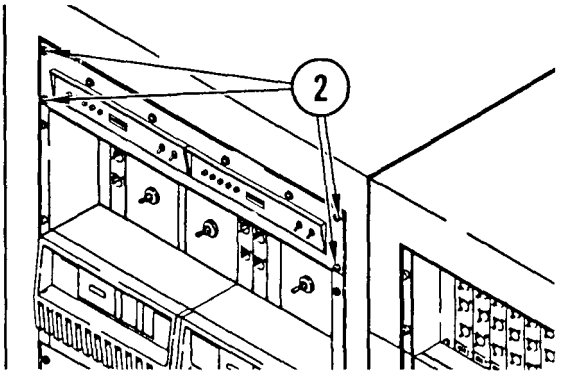
INITIAL SETUP

Common Tool s
• Tool kit

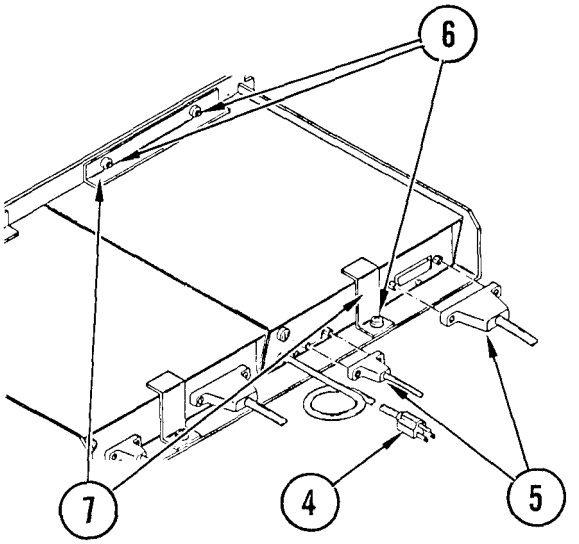
NOTE

Use these procedures to remove and replace either interface mounted in cabinet 'A'.

Remove

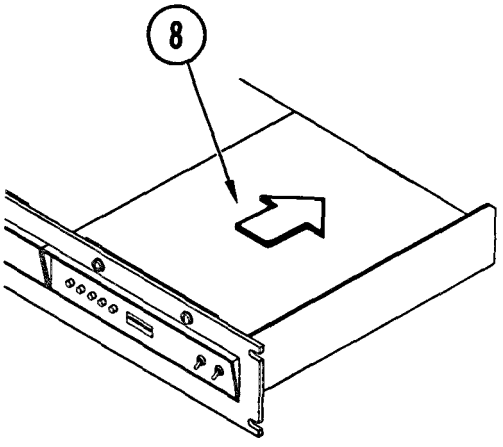


1. Open cabinet A door.
2. Remove converter panel mounting screws.
3. Pull converter shelf from rack.

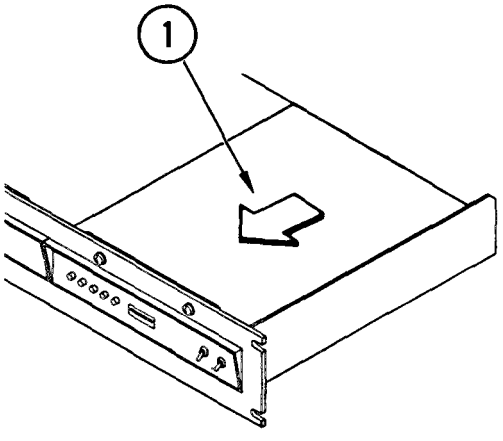


4. Cut tie wraps, and unplug power cord from outlet inside cabinet.
5. Unplug two cable connectors from back of converter.
6. Loosen and remove mounting screws, lockwashers and flatwashers on both holddown brackets.
7. Remove brackets.

4-57. REMOVE/REPLACE l9OOG CONVERTER (CONT)

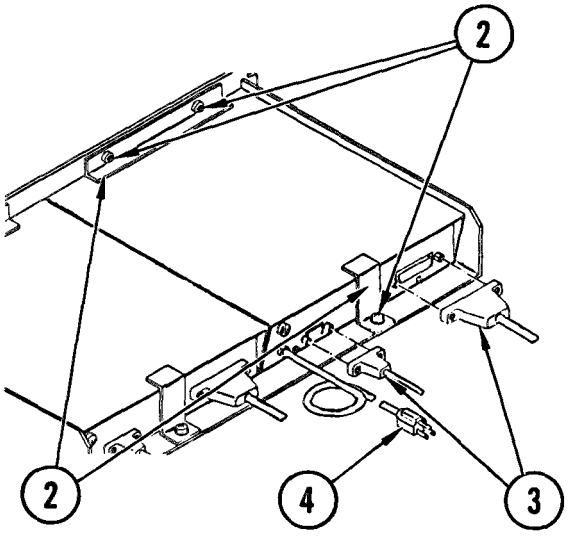


8. Slide converter from shelf.



Replace

1. Place converter on rear of shelf, slide forward into position with front through panel cutout.

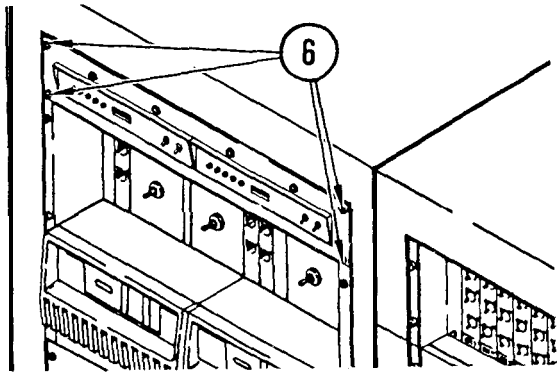


2. Place holddown brackets in position and secure with mounting screws, lockwashers and flatwashers.

3. Plug cable connectors into back of converter.

4. Plug power cord into cabinet outlet.

4-57. REMOVE/REPLACE l9OOG CONVERTER (CONT)



5. Slide converter shelf into rack.

6. Install converter panel mounting screws.

7. Make sure that converter dipswitch is configured properly for system operation (Appendix D).

8. Close cabinet ‘A’ door.

4-58. REMOVE/REPLACE V.29 MODEM ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit

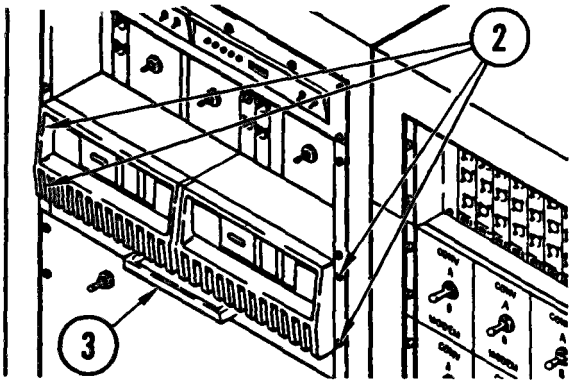
Materials/Spare Parts
- Tags
- Pen or pencil

NOTE

Use these procedures to remove or replace either V.29 modem assembly.

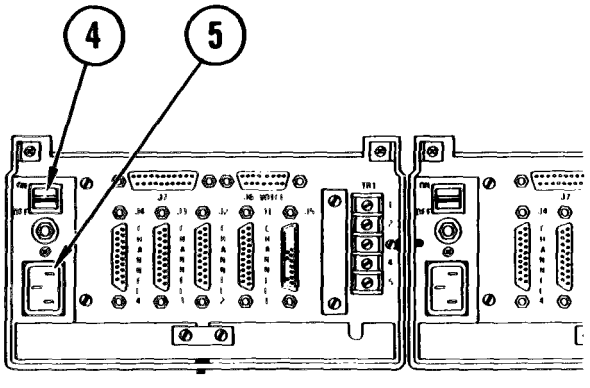
Remove

1. Open cabinet A door.



2. Remove panel screws, washers, and lockwashers.

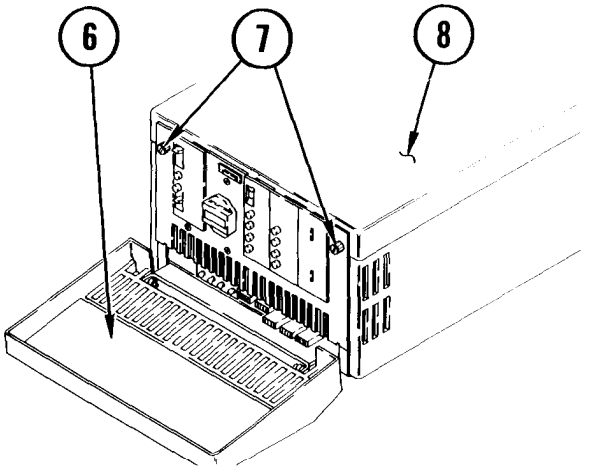
3. Pull slide-mounted base by its handle until it latches.



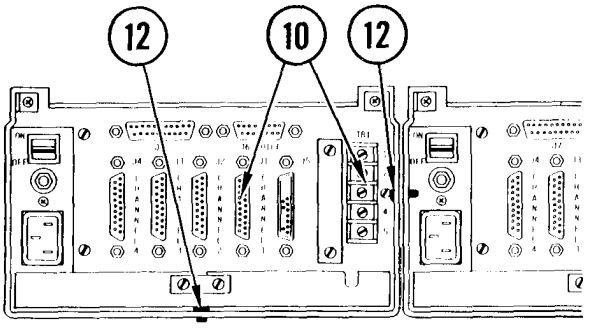
At rear panel, power OFF modem to be replaced. Cut tie wraps and remove ac power cord from outlet.

Pull out ac power plug connected to modem.

4-58. REMOVE/REPLACE V.29 MODEM ASSEMBLY (CONT)



6. Lower front panel cover.
7. Loosen two captive screws located at upper corners of front panel.
8. Slide cover assembly toward rear of modem until top cover disengages from rear channel.
9. Lift off cover, and lay on adjacent modem.

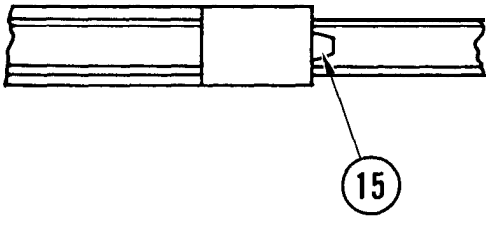


10. Tag each cable and terminal lead to identify modem connector or terminal each connects to.
11. Remove all cables and terminal leads.
12. Remove two mounting screws, lockwashers, flatwashers, and nuts connecting modem to mounting shelf and adjoining modem. Retain hardware.

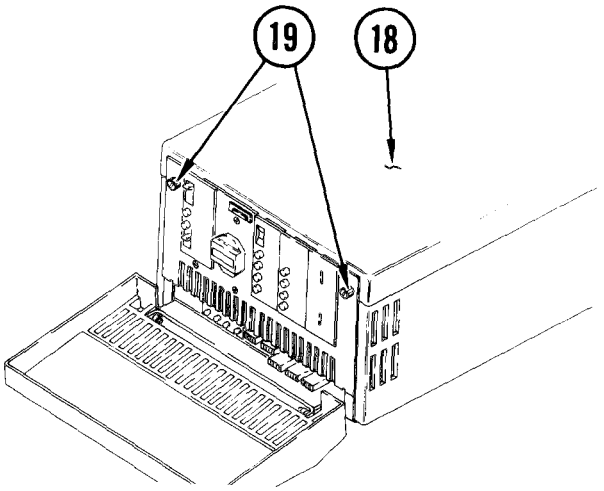
NOTE

Adjacent board may have to be removed.

13. Remove mounting screw, lockwasher, washer, and nut securing modem to side of mounting shelf. Retain hardware.
14. Lift modem from mounting shelf.
15. Press slide latch on both sides and close drawer.
16. Replace panel screws.



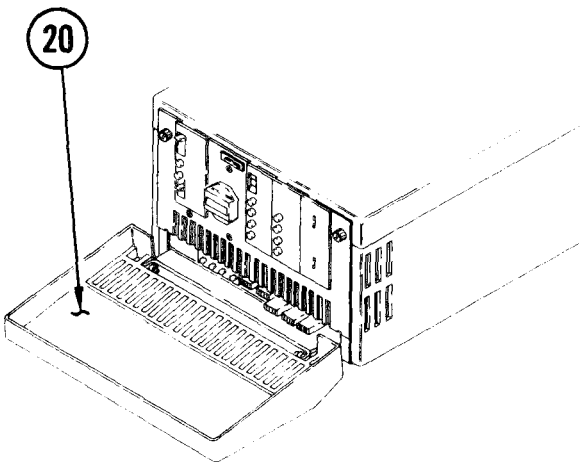
4-58. REMOVE/REPLACE V.29 MODEM ASSEMBLY (CONT)



17. Place cover in position on rear of modem.

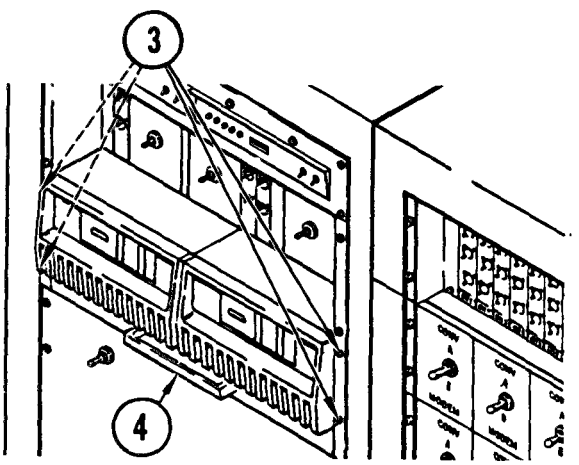
18. Slide cover assembly towards front of modem until rear portion of top cover engages rear channel.

19. Close top cover and secure in position with two captive screws located on front panel.



20. Close front panel cover.

Replace



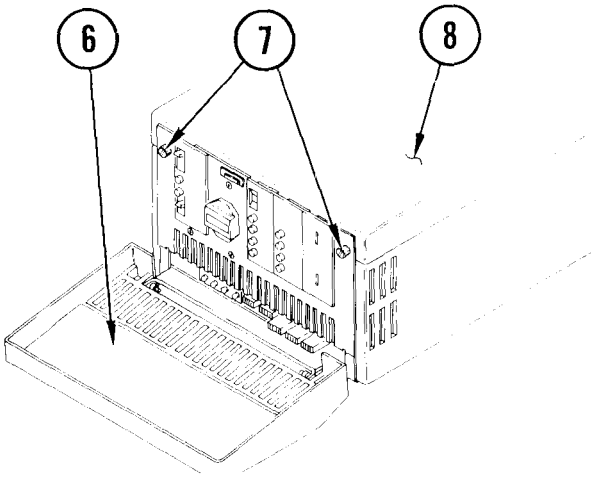
1. On new modem, strap boards and set switches as required for the system (see Appendix D).

2. Open cabinet A door.

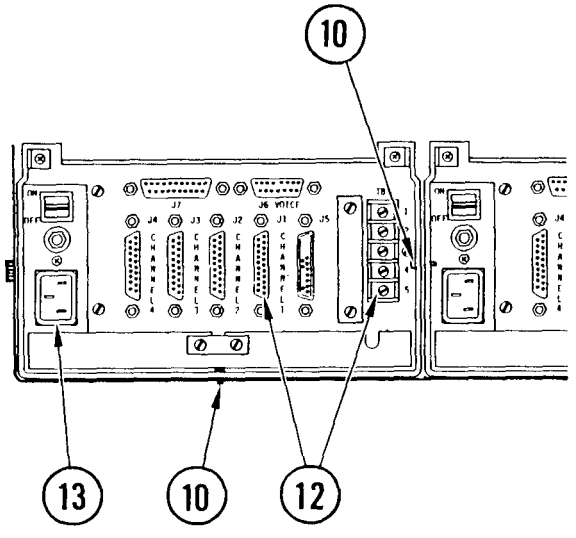
3. Remove panel screws.

4. Pull slide-mounted base by its handle until it latches.

4-58. REMOVE/REPLACE V.29 MODEM ASSEMBLY (CONT)



5. Place modem on mounting shelf with feet in holes.
6. Lower front panel cover.
7. Loosen two captive screws located at upper corners of front panel.
8. Slide cover assembly toward rear of modem until top cover disengages from rear channel.
9. Lift off cover, and lay on adjacent modem.

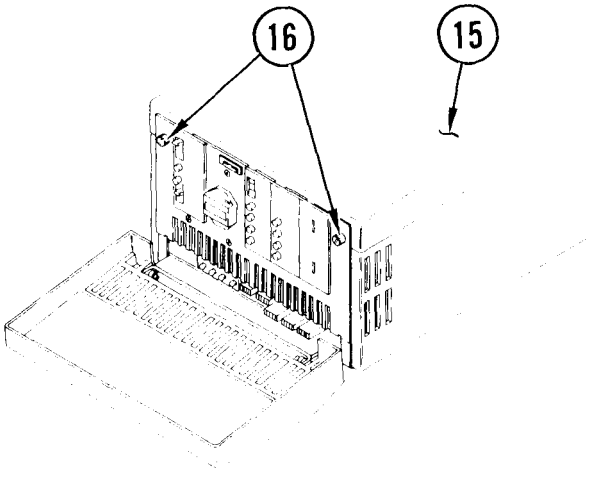


10. Replace and tighten two mounting screws together with lockwashers, flatwashers and nuts securing modem to mounting shel f and adjoining modem.

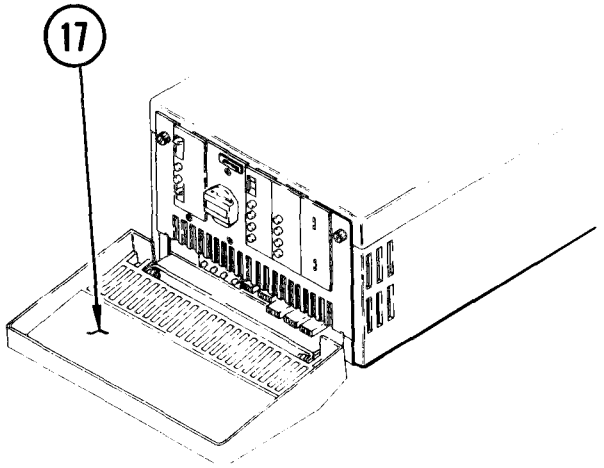
NOTE

Adjacent card may have to be removed.

11. Replace and tighten mounting screw, lockwasher, washer, and nut securing modem to side of mounting shelf.
12. Using tags made during removal, connect cable and wire terminal leads.
13. Connect ac power plug to modem, then cabinet power receptacle. Replace tie wrap.
14. Place cover in position on rear of modem.
15. Slide cover assembly towards front of modem until rear portion of top cover engages rear channel.
16. Close top cover and secure in position with two captive screws located on front panel.



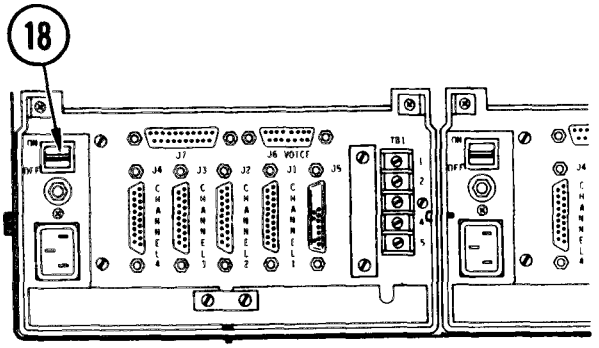
4-58. REMOVE/REPLACE V.29 MODEM ASSEMBLY (CONT)



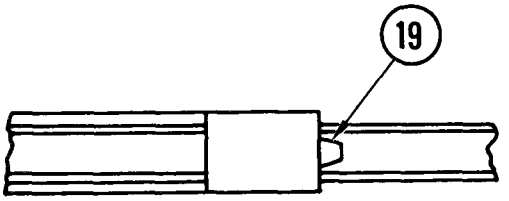
17. Close front panel cover.

NOTE

In some installations the V.29 modem is rack mounted. See your system manual for replacement instructions.



18. At rear panel, power ON modem.



19. Press slide latch on both sides and close drawer.

20. Replace panel screws.

21. Close cabinet door.

4-59. REMOVE/REPLACE PATCH MODULE

INITIAL SETUP

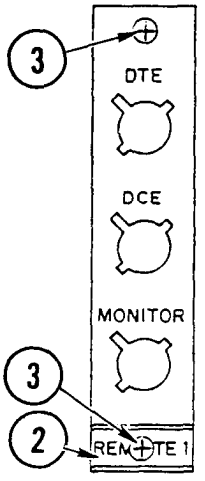
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Label
- Pen or pencil

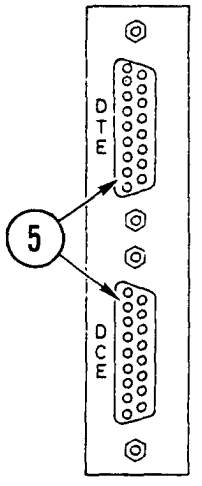
NOTE

Use these procedures to remove and replace any patch module.

Remove



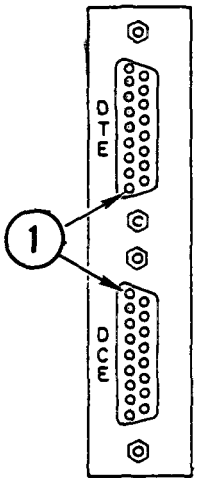
1. Power OFF cabinet and open door.
2. At the patch module remove label over bottom screw.
3. Remove both screws.
4. Slide module from frame.



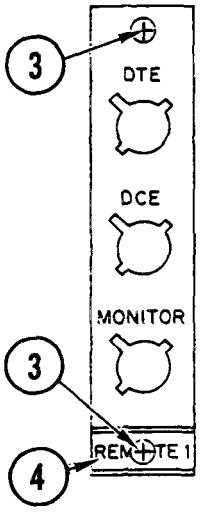
5. Tag and unplug both connectors from back of module.

4-59. REMOVE/REPLACE PATCH MODULE (CONT)

Replace



1. Plug both connectors into back of module.



2. Slide module into frame.
3. Install mounting screws.
4. Make new label and place over bottom screw.
5. Power ON cabinet.
6. Close cabinet door.

4-60. REMOVE/REPLACE MODEM SELECTOR SWITCH

INITIAL SETUP

Common Tool s
- Tool kit

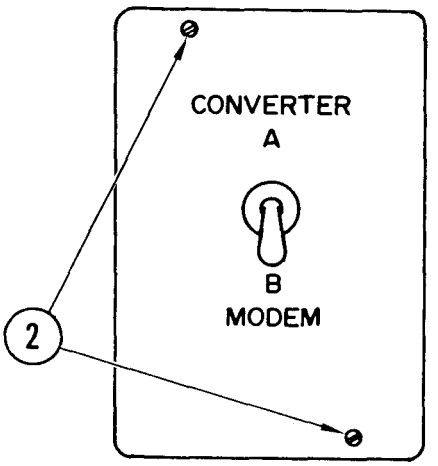
Materials/Spare Parts
- Tags
- Pen or pencil

NOTE

Use these procedures to remove any modem selector switch.

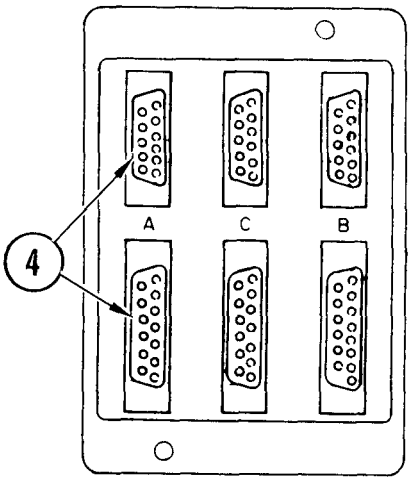
Remove

1. Open cabinet door.



2. Unscrew both capti ve mount ing screws.

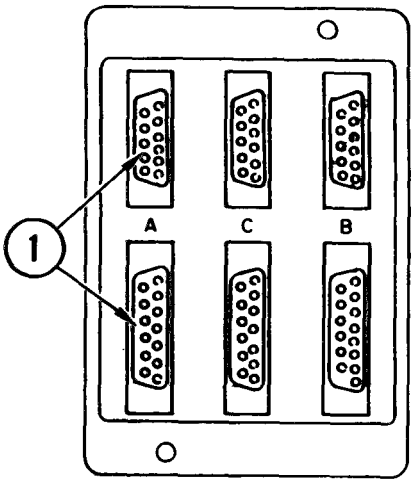
3. Slide switch from frame.



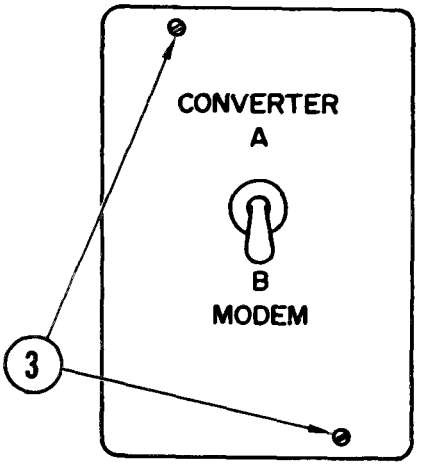
4. Tag and unplug connectors from back of switch.

4-60. REMOVE/REPLACE MODEM SELECTOR SWITCH (CONT)

Replace



1. Plug connectors into back of switch.
2. Slide switch into frame.



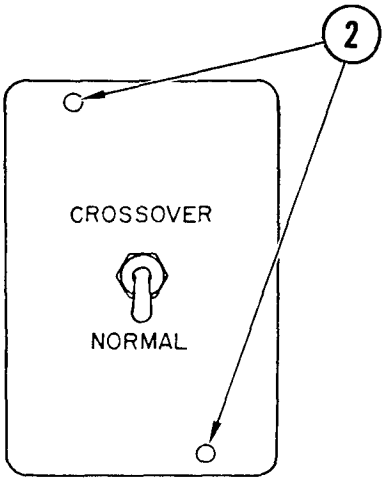
3. Screw mounting screws into frame.
4. Close cabinet door.

4-61. REMOVE/REPLACE MODEM CROSSOVER SWITCH

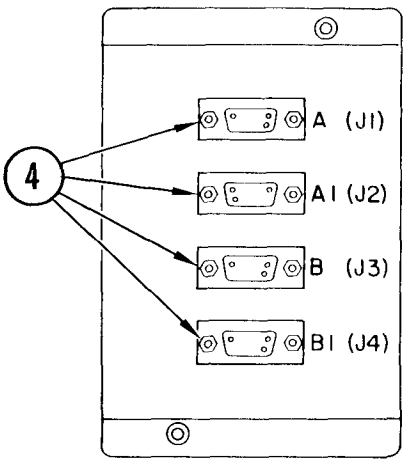
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil

Remove



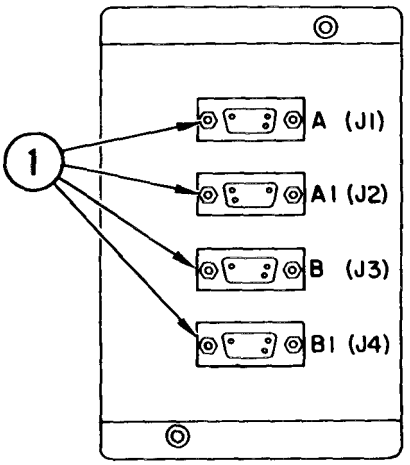
1. Open cabinet A door.
2. Unscrew both captive mounting screws.
3. Slide switch from frame.



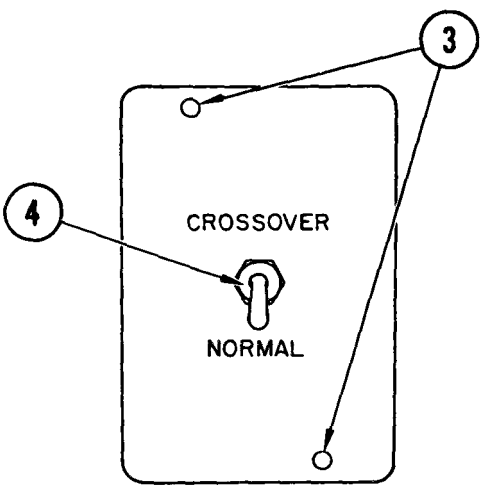
4. Tag and remove connectors from back of switch.

4-61. REMOVE/REPLACE MODEM CROSSOVER SWITCH (CONT)

Replace



1. Replace connectors to terminals on back of switch.

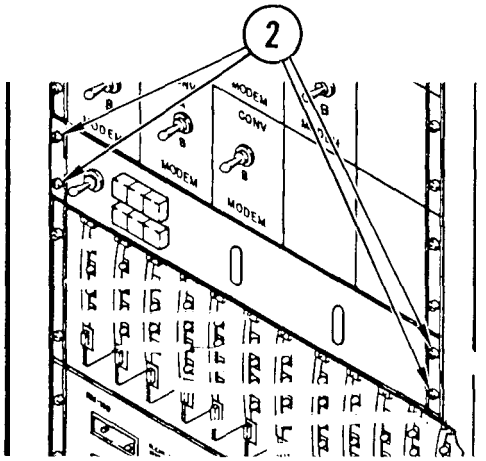


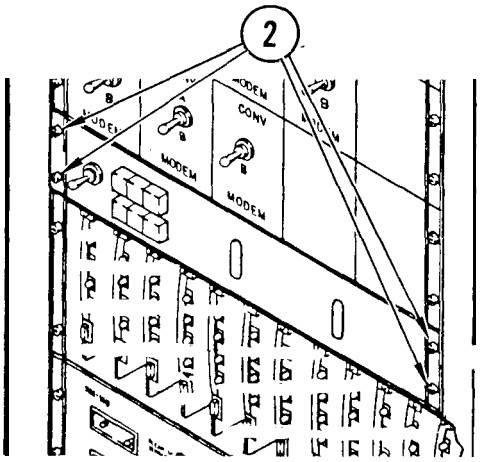
2. Slide switch into frame.
3. Screw mounting screws into frame.
4. Set switch to desired position.
5. Close cabinet door.

4-62. ACCESS/CLOSE UP VOICE DATA SWITCH PANEL

INITIAL SETUP

Common Tools
• Tool kit





WARNING

Electrocution may result if procedure is done with power on.

Access

1. Power OFF communications circuit breaker and open cabinet B door.
2. Remove panel mounting screws.
3. Pull panel from rack and allow it to hang in front of cabinet.

Close Up

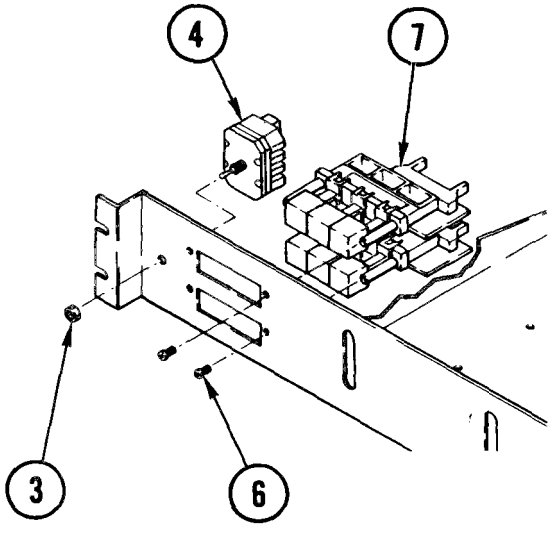
1. Place panel in position in rack.
2. Install panel mounting screws.
3. Close cabinet door.
4. Power ON communications circuit breaker.

4-63. REMOVE/REPLACE CABINET TELEPHONE SELECTOR SWITCHES

INITIAL SETUP

Common Tools
• Tool kit

Materials/Spare Parts
• Paper
• Pen or pencil



WARNING

Electrocution may result if task is done with power on.

Remove

1. Access voice data switch panel (para 4-62, Remove, steps 1-3).

NOTE

To remove toggle switch, do steps 2 thru 4. To remove either set of voice/data pushbutton switches, use steps 5 thru 7.

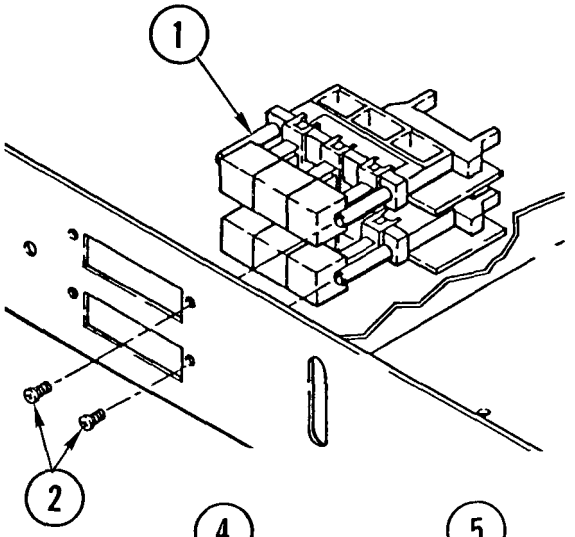
2. Tag and remove wires from switch.
3. Remove panel nut and washer.
4. Pull switch from panel.
5. Unplug connector behind switch.
6. Remove switch mounting screws from panel.
7. Remove switch.

4-63. REMOVE/REPLACE CABINET B TELEPHONE SELECTOR SWITCHES (CONT)

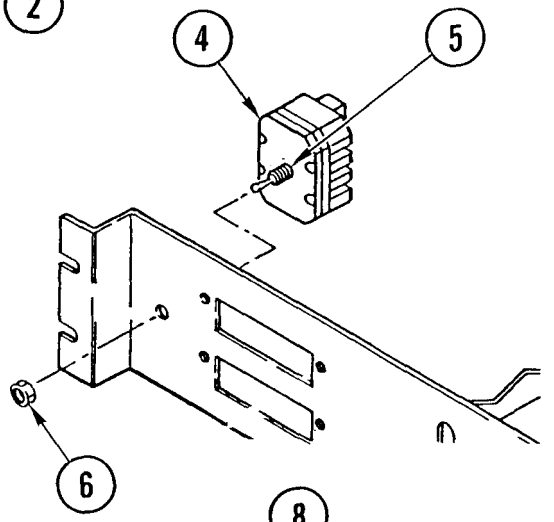
Replace

NOTE

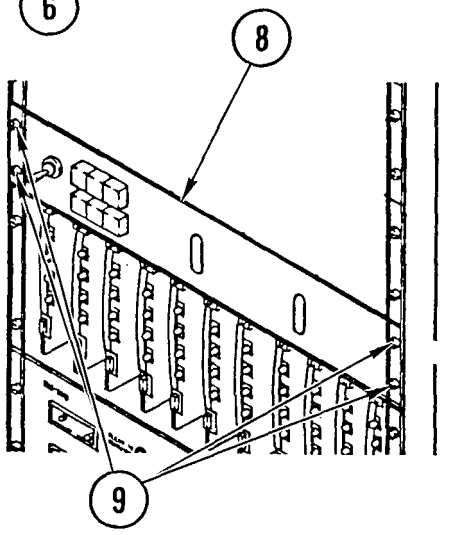
To replace voice/data pushbutton switches, do steps 1 thru 3, then steps 8 thru 11. To replace toggle switch, start at step 4.



1. Place switch against panel.
2. Install switch mounting screws.
3. Join cable connectors.



4. Insert switch bushing in hole from rear of panel.
5. Set tab in small panel hole.
6. Install washer and panel nut.
7. Connect wires to switch.



8. Place switch panel in rack.
9. Install panel mounting screws.
10. Power ON circuit breaker.
11. Close cabinet door.

4-64. REMOVE/REPLACE DATA ACCESS ADAPTER (DAA) OR POWER TRANSFORMER

INITIAL SETUP

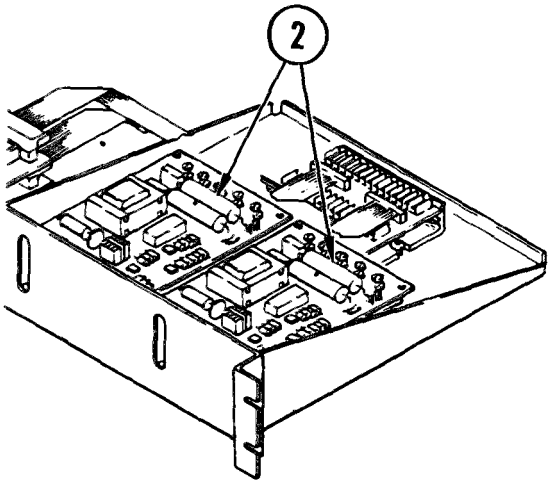
Common Tools
• Tool kit

Materials/Spare Parts
• Paper
• Pen or pencil

Remove

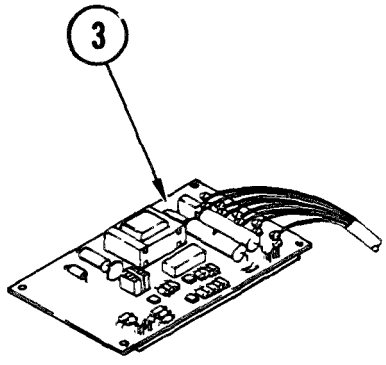
NOTE

There are two data access adapters used in communications cabinet B, use steps 1 thru 8 to remove either one. To remove associated power transformer, use steps 1, 9 and 10.



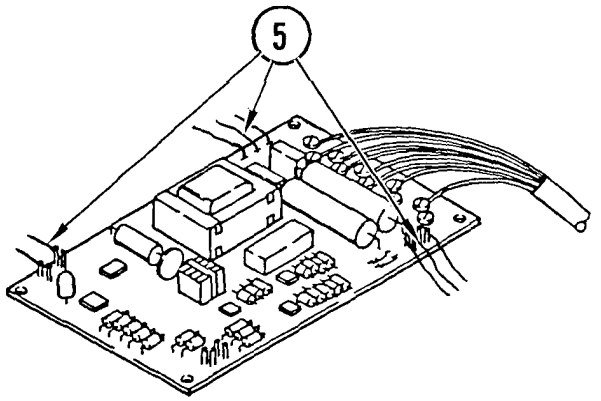
1. Access voice data switch panel (para 4-62, Remove, steps 1-3).

2. Find DAA to be removed.



3. Pull snap-in circuit board from case.

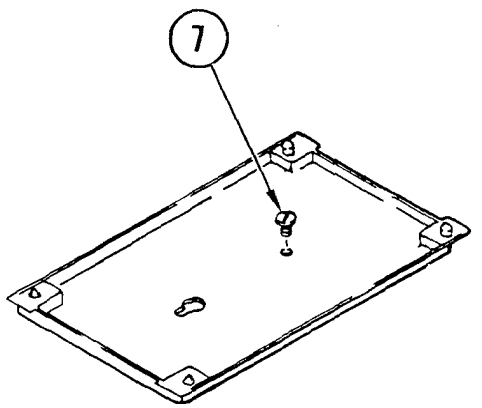
4-64. REMOVE/REPLACE DATA ACCESS ADAPTER (DAA) OR POWER TRANSFORMER (CONT)



4. Remove circuit boards, with leads attached, from cabinet. (Cable is long enough to allow changing connections outside cabinet.)

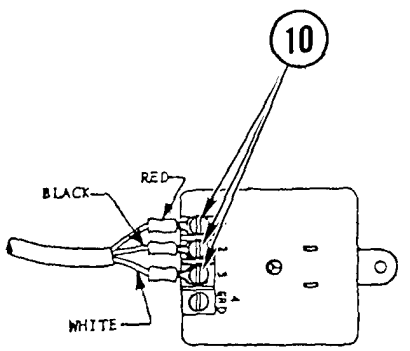
5. Make a drawing of wire connections to terminals of board.

6. Remove wires from circuit board terminals.



7. On underside of data switch panel, remove two screws from back of DAA case.

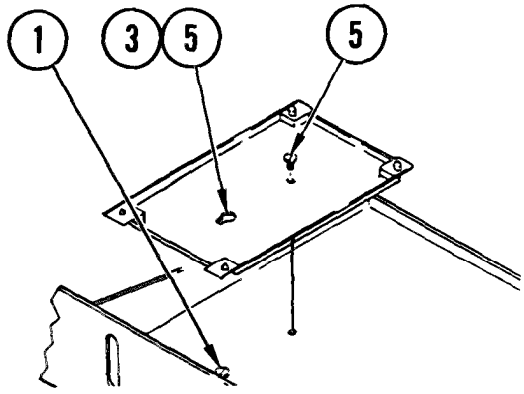
8. Pull case from mounting tray. (It is held by two adhesive strips).

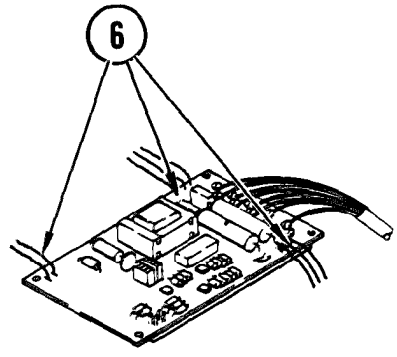


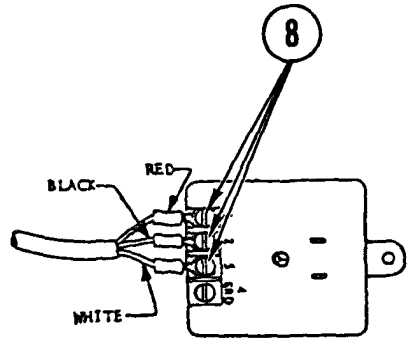
9. Unplug transformer from cabinet B power strip.

10. Disconnect three cable leads at transformer terminals and remove transformer.

4-64. REMOVE/REPLACE DATA ACCESS ADAPTER (DAA) OR POWER TRANSFORMER (CONT)







Replace

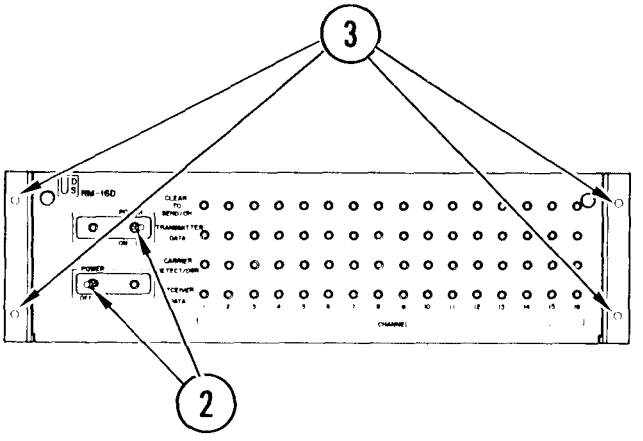
To replace data access adapter, use steps 1 thru 7, and 10. To replace power transformer, use steps 8 thru 10.

1. Start the case mounting slot screw, but do not tighten.
2. Remove paper from adhesive mounting strips on back of DAA cases.
3. Place case on mounting screw and slide screw head into slot.
4. Press case against mounting plate.
5. Install other mounting screw and tighten screws.
6. Following drawing made during removal, connect wires to circuit card.
7. Place circuit card in case and snap it in.
8. Connect cable leads to transformer terminals.
9. Plug transformer into cabinet B power strip.
10. Replace voice data switch panel (para 4-62, Replace, steps 1-4).

4-65. REMOVE/REPLACE QUASI-ANALOG MODEM

INITIAL SETUP

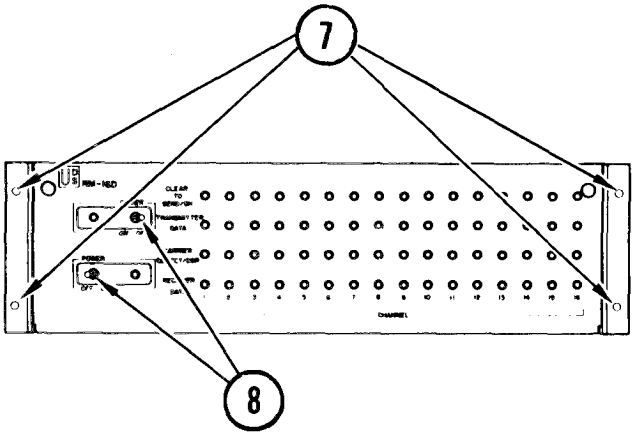
Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil



Remove

1. Open B cabinet door.
2. Power OFF modem at toggle switches and power OFF communications cabinet circuit breaker.
3. Remove four screws holding quasi-analog modem to cabinet rack.
4. Pull modem from cabinet.
5. Cut tie wrap, and pull ac power plug from cabinet power outlet.
6. Tag each cable to identify the modem connector to which it belongs.
7. Disconnect all cables from modem.
8. Remove modem
9. Replace mounting screws in cabinet rack.
10. Close cabinet door.

4-65. REMOVE/REPLACE QUASI-ANALOG MODEM (CONT)



Replace

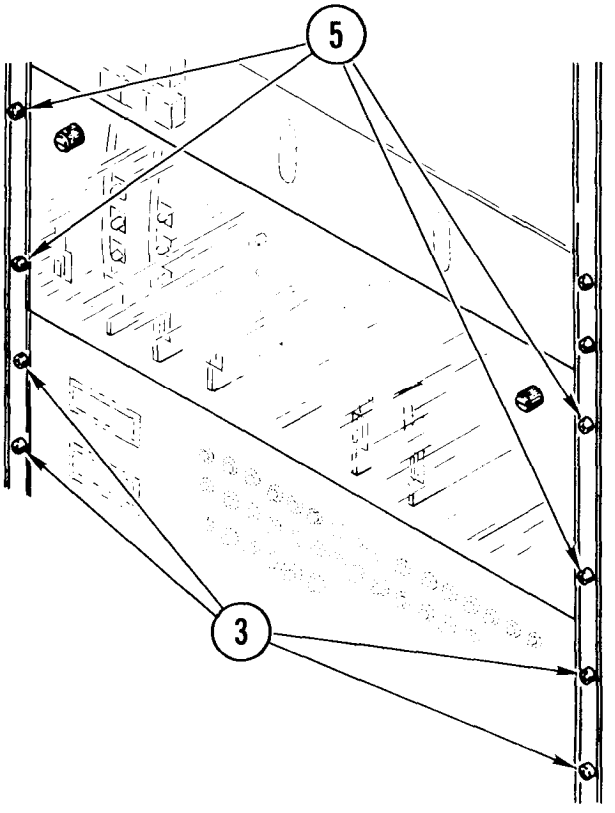
1. Open B cabinet door.
2. Place modem in front of cabinet.
3. Using tags made during removal, plug in all cables.
4. Push in ac power plug into cabinet power outlet, and replace tie wrap.
5. Remove modem mounting screws from cabinet rack.
6. Place modem in cabinet.
7. Replace mounting screws.
8. Power ON communications circuit breaker and power ON modem at toggle switches.
9. Close cabinet door.

4-66. REMOVE/REPLACE 6OOGR CONVERTER

INITIAL SETUP

Common Tools
- Tool kit

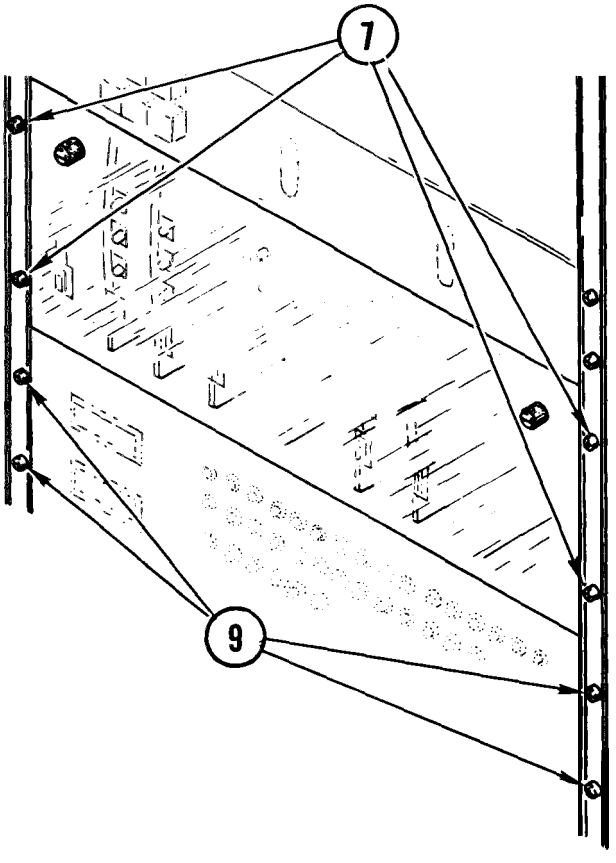
Materials/Spare Parts
- Tags
- Pen or pencil
- Tie wraps



Remove

1. Open B cabinet door.
2. Power OFF communications cabinet circuit breaker.
3. Remove four screws holding quasi-analog modem to cabinet rack.
4. Pull quasi-analoq modem out of cabinet approximately halfway.
5. Remove four screws holding converter to cabinet rack.
6. Pull converter away from cabinet so you can access cables and place on quasi-analog modem.
7. Remove tie wraps and pull ac power plug from cabinet power outlet.
8. Tag each cable to identify the connector in which it belongs.
9. Disconnect all cables from connector panel.
10. Remove converter.
11. Replace mounting screws in cabinet rack.
12. Close cabinet door.

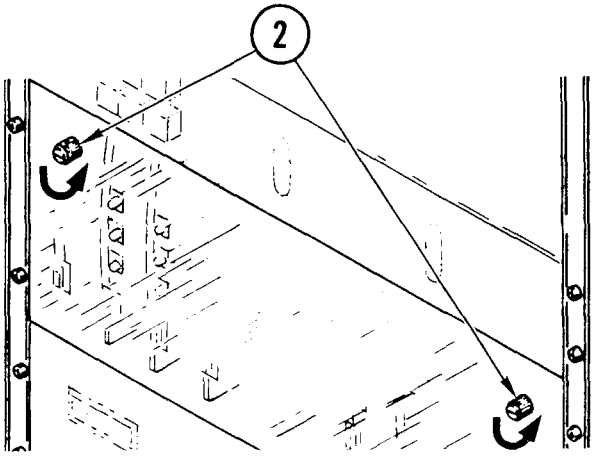
4-66. REMOVE/REPLACE 6OOGR CONVERTER (CONT)



Replace

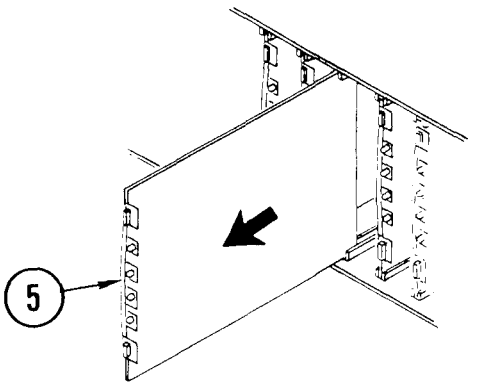
1. Open B cabinet door.
2. Place converter on quas i-analog modem.
3. Push in ac power plug into cabinet power outlet. Replace tie wraps.
4. Using tags made during removal, plug in all cables.
5. Remove mounting screws from cabinet rack.
6. Replace converter in cabinet.
7. Replace mounting screws.
8. Repace quasi-analog modem in cabinet.
9. Replace mounting screws.
10. Power ON communications cabinet circuit breaker.
11. Close cabinet door.

4-67. REMOVE/REPLACE 600GR CONVERTER BOARD



Remove

1. Open cabinet B door.
2. Loosen knurled locking screws as shown.
3. Pull hinged panel open from top.
4. Find board to be removed.

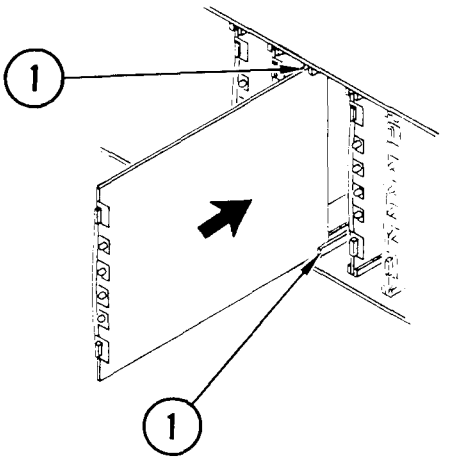


5. Grasp plastic handle.
6. Slide board from rack.

Replace

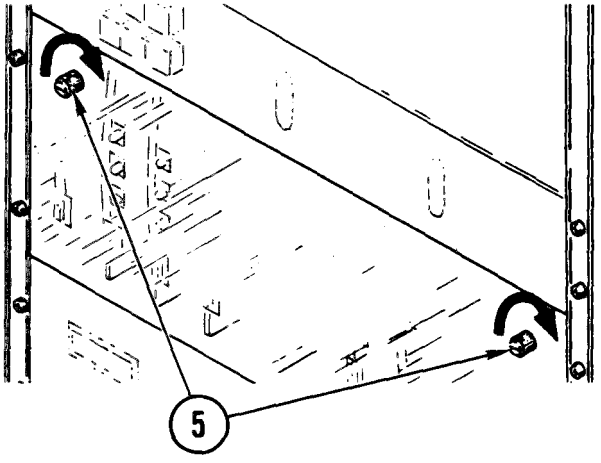
NOTE

Make sure that converter dipswitch is configured properly for system operation (Appendix D).



1. Start back end of board into upper and lower card slots.
2. Slide board into modem rack.
3. Press board firmly so that connector is fully seated in backplane.

4-67. REMOVE/REPLACE 600GR CONVERTER BOARD (CONT)



4. Close hinged panel.
5. Turn knurled locking screws as shown.
6. Close cabinet B door.

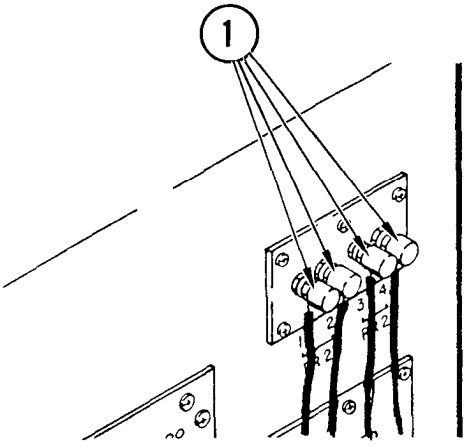
4-68. REMOVE/REPLACE TELEPHONE FILTER ASSEMBLY

INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil

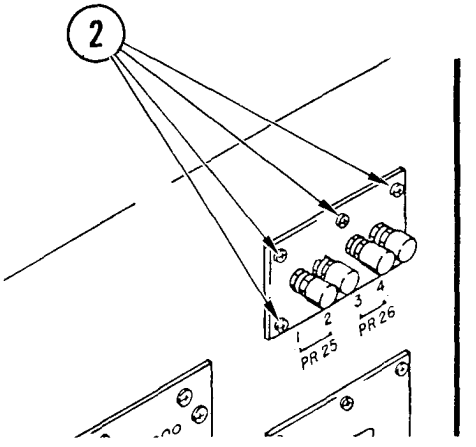
NOTE

There are two telephone filter assemblies, one located in cabinet A and the other in cabinet B. Use this procedure to remove either filter.



Remove

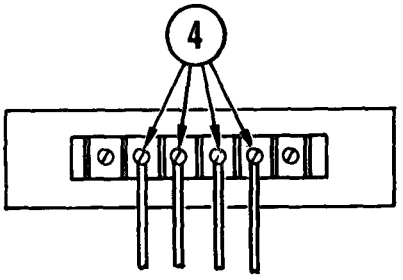
1. Outside cabinet, remove wires from telephone binding posts.



2. Remove six mounting screws and washers attaching filter panel to side of cabinet.

3. Pull panel from mounting slot and allow it to hang at side of cabinet.

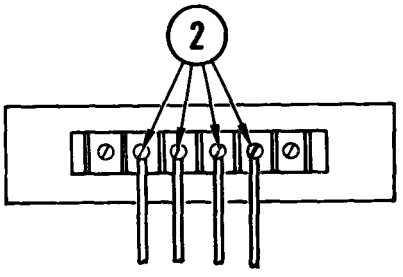
4-68. REMOVE/REPLACE TELEPHONE FILTER ASSEMBLY (CONT)



4. Tag and remove wires from terminal end of filter.

5. Remove filter assembly.

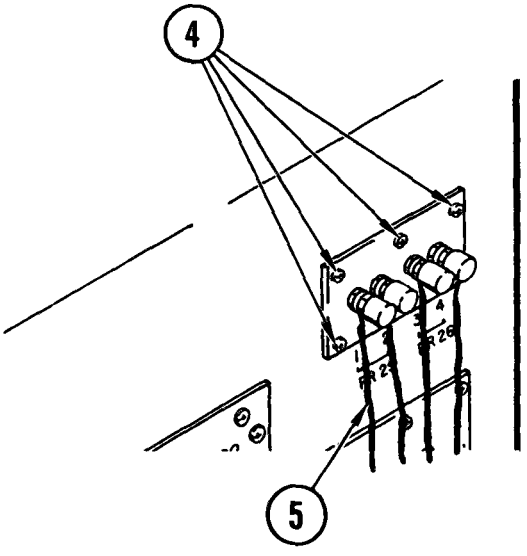
Replace



1. Check RFI gasket on filter mounting surface to be sure it is not folded or damaged.

2. While holding filter in place at side of cabinet, connect tagged wires to filter terminals.

3. Place filter assembly in position through mounting slot in side of cabinet.



4. While holding filter in position in cabinet mounting slot, install mounting screws and washers.

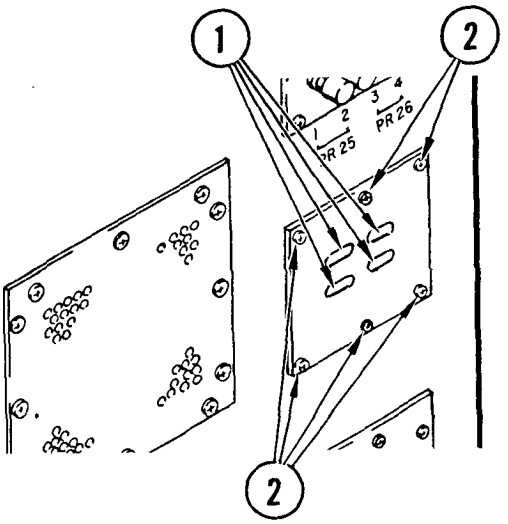
5. Reconnect telephone lines, if needed.

4-69. REMOVE/REPLACE B2 SIGNAL LINE FILTER ASSEMBLY

INITIAL SETUP

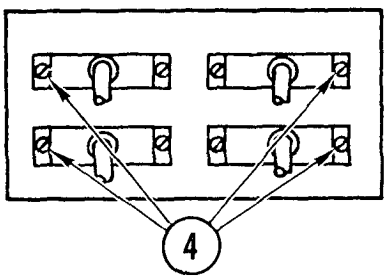
Common Tools
• Tool kit

Materials/Spare Parts
• Tags
• Pen or pencil



Remove

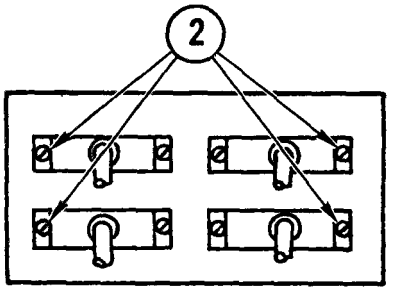
1. Outside B cabinet, tag and remove connectors.
2. Remove mounting screws and washers.
3. Remove line filter assembly from mounting slot and allow it to hang from side of cabinet.



4. Tag and remove connectors from end of filter.
5. Remove line filter.

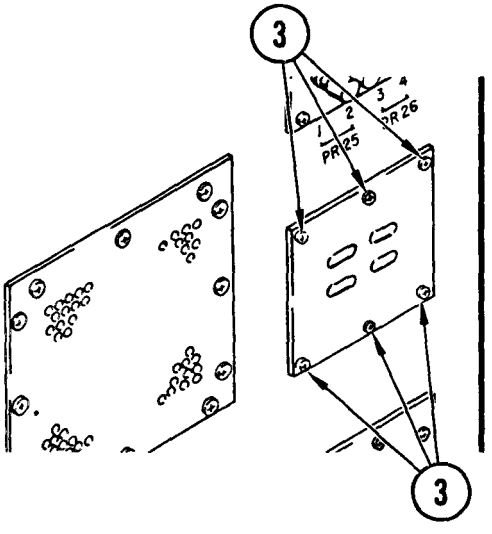
4-69. REMOVE/REPLACE B2 SIGNAL LINE FILTER ASSEMBLY (CONT)

Replace

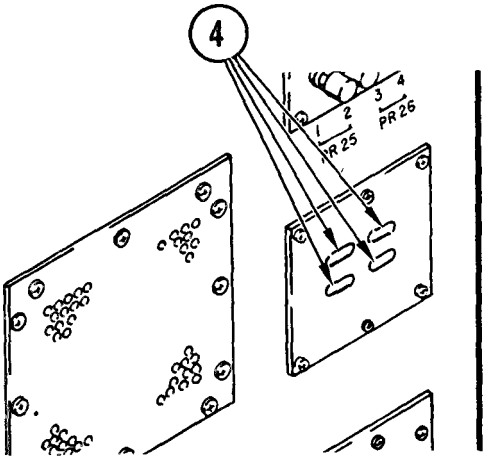


1. Check RFI gasket on filter mounting surface to he sure it is not folded or damaged.

   While holding filter near mounting slot at side of cabinet, install tagged connectors.



3. Place filter in position through mounting slot in side of cabinet, install mounting screws and washers.



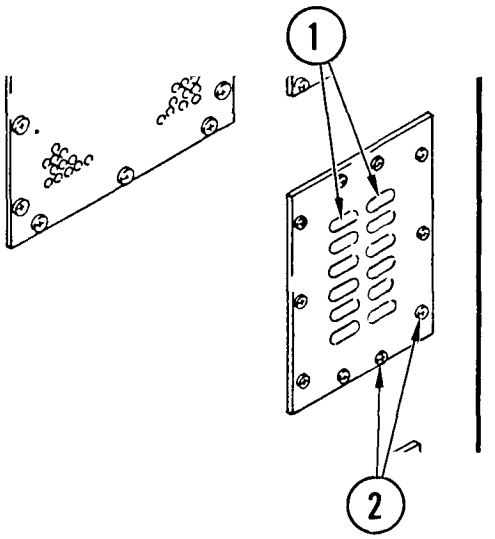
4. Install tagged connectors.

4-70. REMOVE/REPLACE B1 SIGNAL LINE FILTER ASSEMBLY

INITIAL SETUP

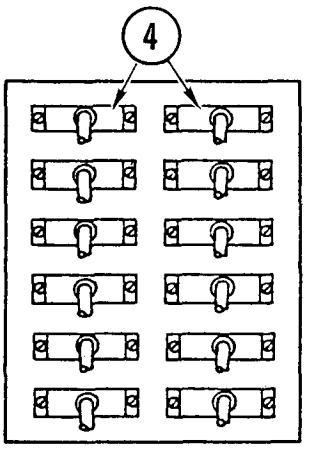
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil



Remove

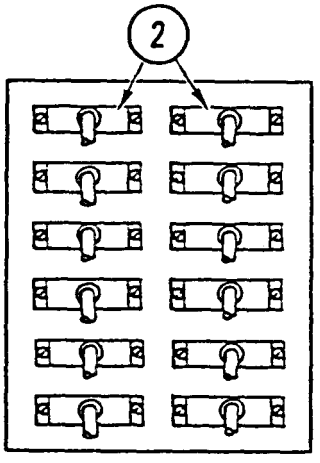
1. Outside B cabinet, tag and remove connectors.
2. Remove mounting screws and washers attaching line filter to side of cabinet.
3. Remove line filter from mounting slot and allow it to hang from side of cabinet.



4. Tag and remove connectors attached to inside of line filter.
5. Remove line filter.

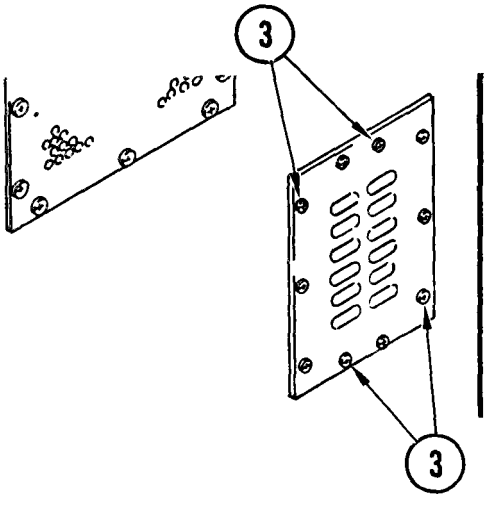
4-70. REMOVE/REPLACE Bl SIGNAL LINE FILTER ASSEMBLY (CONT)

Replace

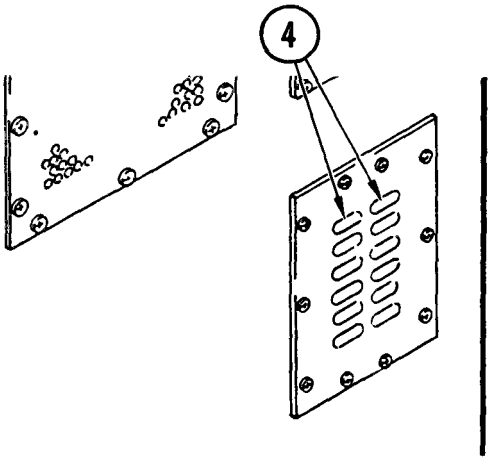


1. Check RFI gasket on filter mounting surface to be sure it is not folded or damaged.

2. While holding filter near mounting slot at side of cabinet, install tagged connectors.



3. Place filter in position through mounting slot in side of cabinet, install mounting screws and washers.



4. Install tagged connectors.

4-71. REMOVE/REPLACE CABINET A AND B POWER LINE FILTER

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil

WARNING

Electrocution may result if task is done with power on.

Remove

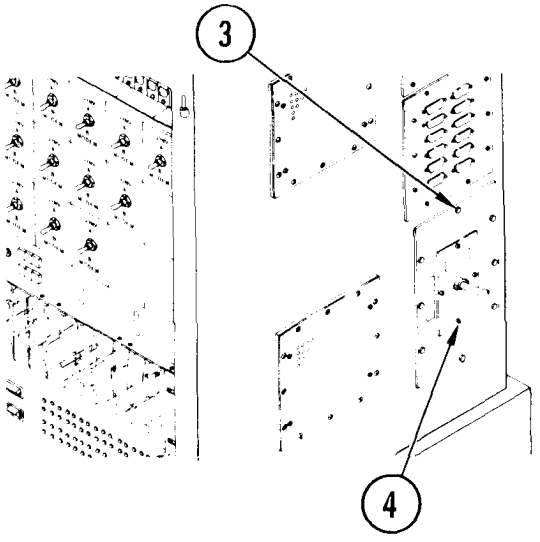
NOTE

There are two power line filter assemblies, one located in cabinet A and the other in cabinet B. Use this procedure to remove either line filter assembly.

1. Power OFF communications circuit breaker.

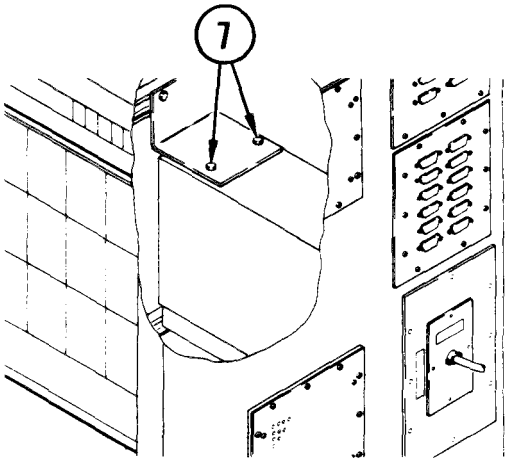
WARNING

Hazardous voltages can exist on filter terminals within the filter housing. Make sure that power is OFF and that filters are discharged before performing any maintenance.



2. Find power line filter in side of cabinet.
3. Remove eight mounting screws and washers attaching filter assembly to side of cabinet.
4. Remove four screws and washers securing cable mounting plate to filter assembly. Pull plate aside.
5. Tag and remove wires from both filter terminals and ground wire from case.

4-71. REMOVE/REPLACE CABINET A AND B POWER LINE FILTER (CONT)



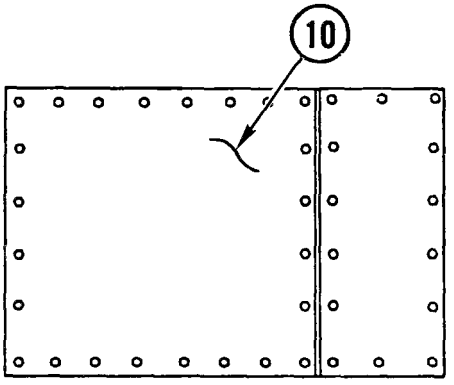
6. Remove B1 signal line filter assembly (para 4-70, Remove, steps 1-3).

7. Remove two mounting bolts securing power line filter box to cabinet.

CAUTION

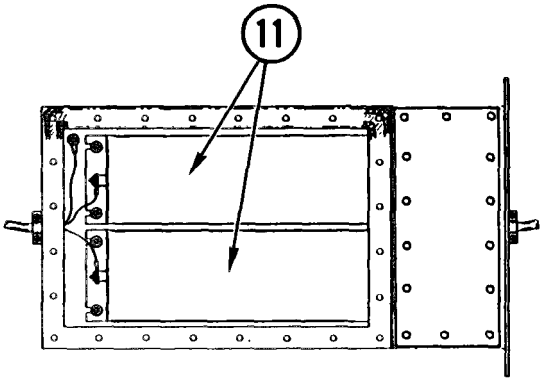
Use care when removing filter assembly, unit is heavy and may cause injury if dropped.

8. Carefully remove line filter from mounting slot and place on flat surface at side of cabinet.



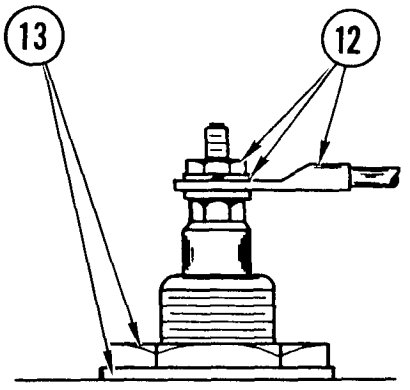
9. Remove all screws from cover.

10. Remove cover.



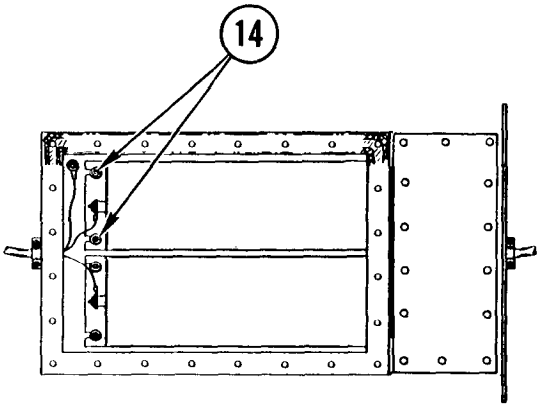
11. Find filter to be replaced.

4-71. REMOVE/REPLACE CABINET A AND B POWER LINE FILTER (CONT)



12. At rear of filter, remove nut, washer, and wire lug from terminal.

13. Loosen and remove filter mounting nut and washer.



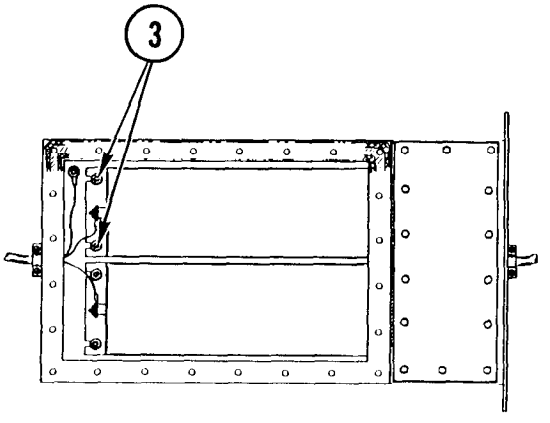
14. Remove two mounting nuts and washers securing filter studs on bottom of filter housing.

15. Lift filter free of studs and slide forward until rear terminal clears mounting hole at rear of housing.

16. Lift filter assembly from housing.

NOTE

Check that EMI gasket is in place around mounting opening.



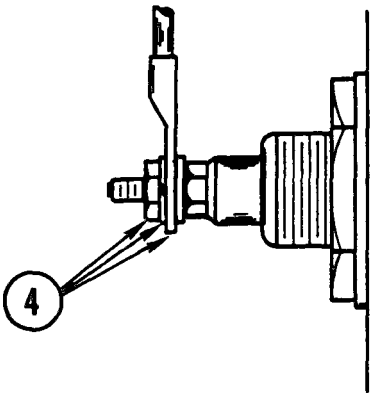
Replace

1. Place filter in housing with mounting terminal in hole and mounting ears over studs at bottom of housing.

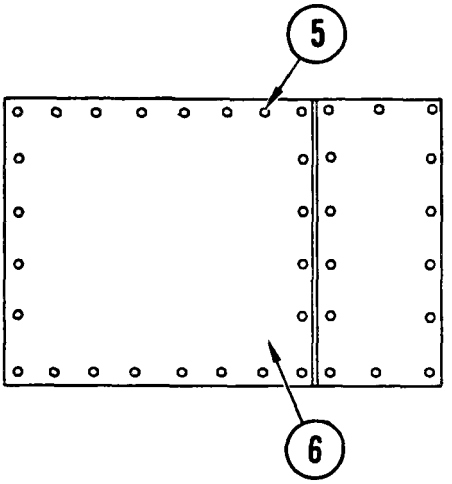
2. Replace flat spacer and mounting nut securing filter terminal to housing wall.

3. Replace two mounting nuts and washers on studs at bottom of housing.

4-71. REMOVE/REPLACE CABINET A AND B POWER LINE FILTER (CONT)



4. Install wire lug, washer, and hexnut. Hold hex on filter while tightening nut.

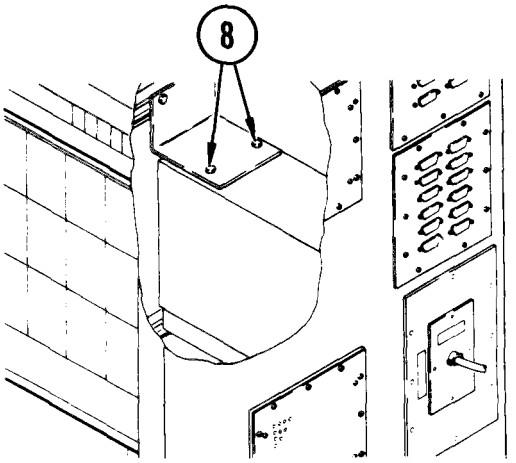


5. Check RFI gasket on filter housing to be sure it is not damaged.

6. Position cover and install all screws.

CAUTION

Filter assembly is heavy, use care when replacing as injury may result if dropped.

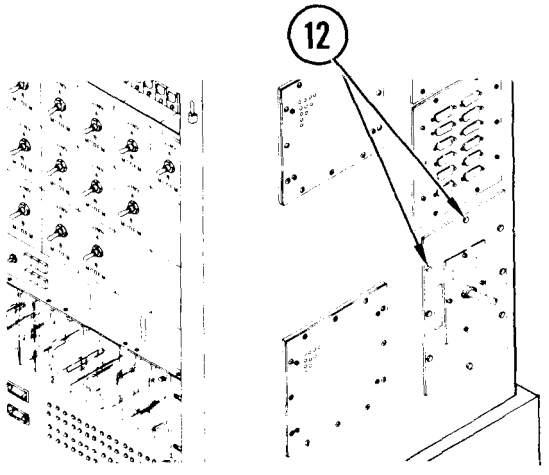


7. Carefully lift and position filter assembly in mounting slot on side of cabinet.

8. Replace two mounting bolts securing power line filter box to cabinet.

9. Replace Bl signal line filter assembly (para 4-70, Replace, steps 1-3).

4-71. REMOVE/REPLACE CABINET A AND B POWER LINE FILTER (CONT)



10. Replace wires on both filter terminals and connect ground wire to case.

11. Install cable mounting plate on filter assembly and secure in place with four screws and washers.

12. Hold filter assembly in position and install mounting screws and washers.

13. Power ON communications circuit breaker.

4-72. REMOVE/REPLACE CABINET A TELEPHONE SELECTOR SWITCH

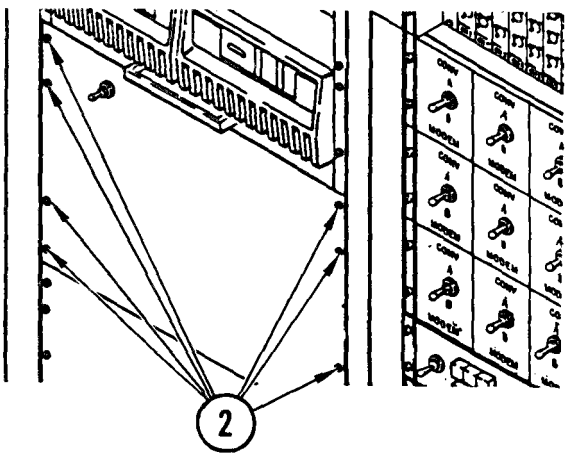
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	•Tags • Pen or pencil

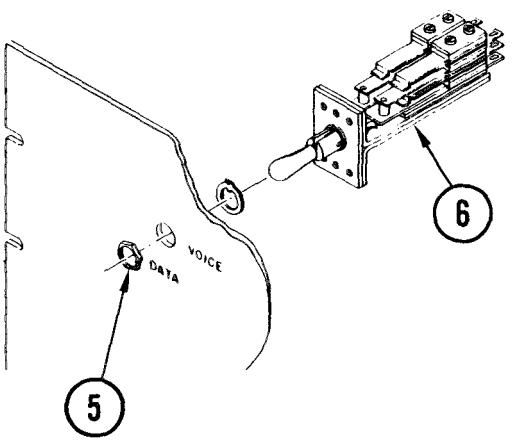
WARNING

Electrocution may result if task is performed with power on.

Remove

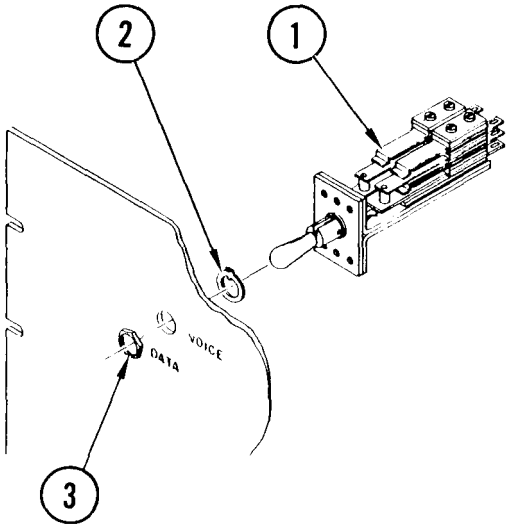


1. Power OFF communicat ions circuit breaker and open cabinet door.
2. Remove panel mounting screws, washers, and lockwashers.
3. Pull panel from rack.
4. Tag and remove wires from switch.



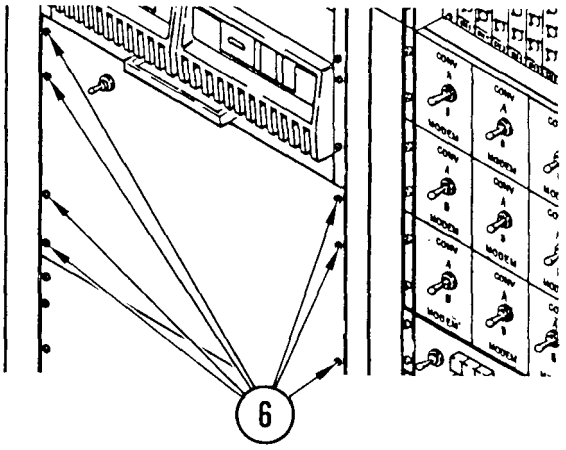
5. Remove panel nut and washer.
6. Pull switch from panel.

4-72. REMOVE/REPLACE CABINET A TELEPHONE SELECTOR SWITCH (CONT)



Replace

1. Insert switch bushing in hole from rear of panel.
2. Set alinement tab in small panel hole.
3. Install washer and panel nut.
4. Connect wires to switch.



5. Place switch panel in rack.
6. Install panel mounting screws, washers, and lockwashers.
7. Power ON circuit breaker.
8. Close cabinet door.

4-73. REMOVE/REPLACE COOLING FAN OR AIR FILTER

INITIAL SETUP

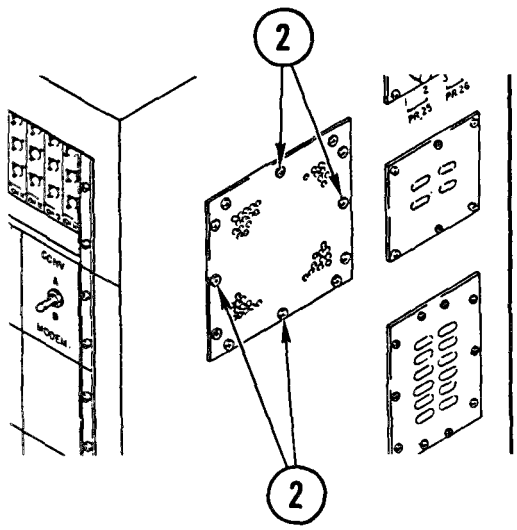
Common Tools
- Tool kit

Materials/Spare Parts
- Tie wraps
- Air filter

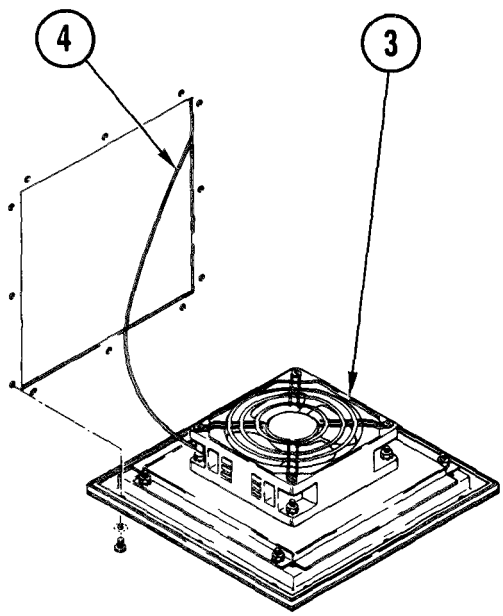
Remove

NOTE

There is a cooling fan and air filter located at the side of each A and B cabinet, use this procedure to replace either fan or filter. To remove a fan use steps 1 thru 6. To remove a filter use steps 7 thru l0.

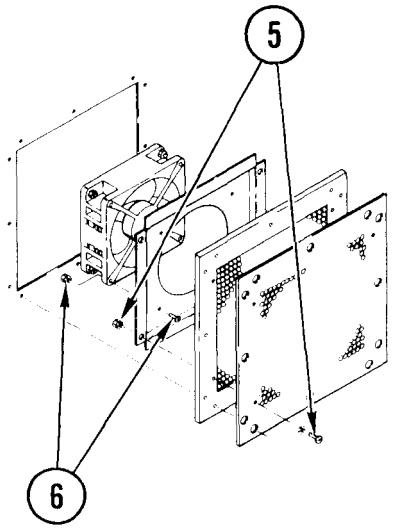


1. Power OFF communications circuit breaker.
2. Remove mounting screws and washers securing fan mounting plate to side of cabinet.



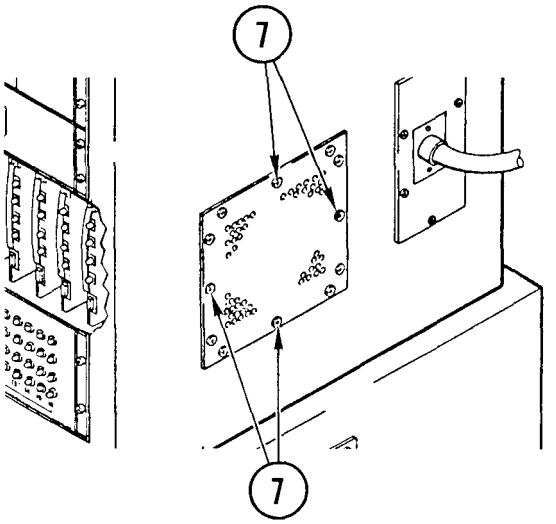
3. Remove fan and fan mounting plate from mounting slot and allow it to hang from side of cabinet.
4. Remove tie wraps from fan power cord and unplug cord from power strip.

4-73. REMOVE/REPLACE COOLING FAN OR AIR FILTER (CONT)

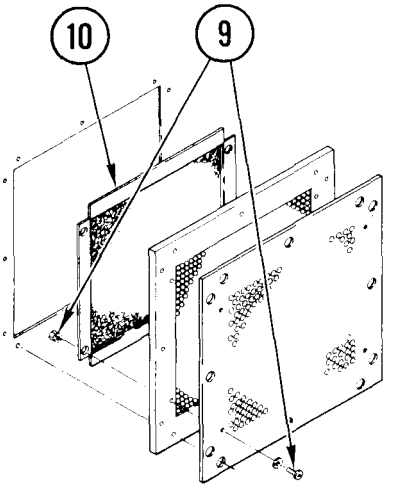


5. Remove four mounting screws, lock-washers and nuts and remove fan and mounting bracket from filter panel.

6. Remove four mounting screws, lock-washers, and nuts and remove fan from mounting bracket. Save bracket pending replacement.



7. Remove mounting screws and washers securing air filter mounting plate to side of cabinet.

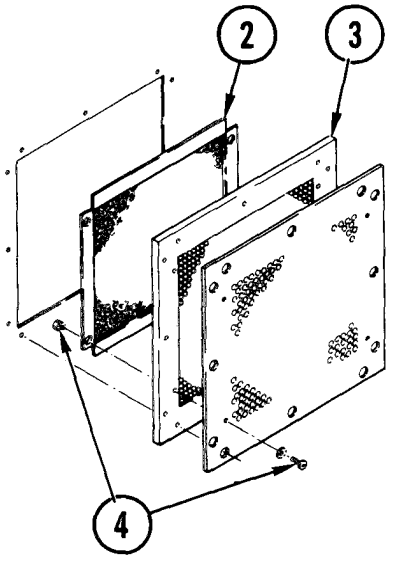


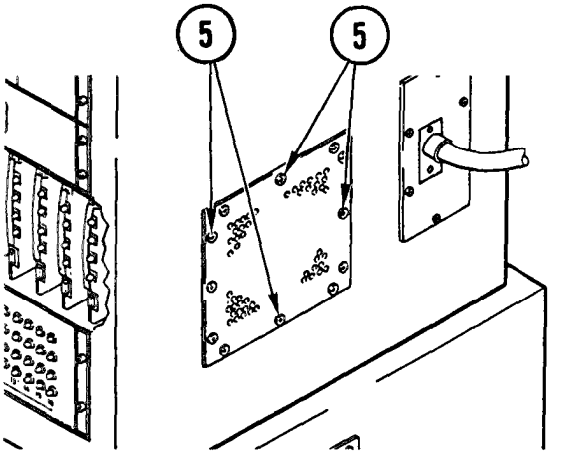
8. Remove filter and mounting plate from mounting slot.

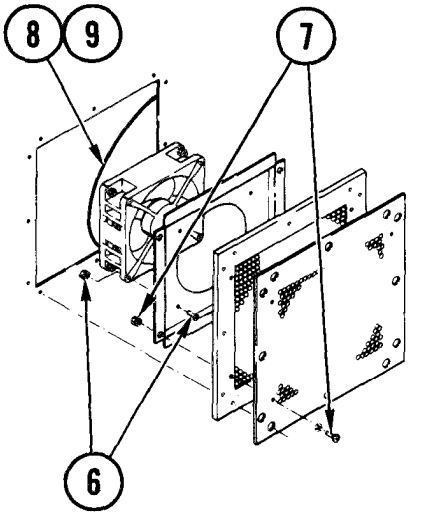
9. Remove mounting screws, washers, and nuts holding filter standoff cover to mounting plate.

10. Remove filter.

4-73. REMOVE/REPLACE COOLING FAN OR AIR FILTER (CONT)



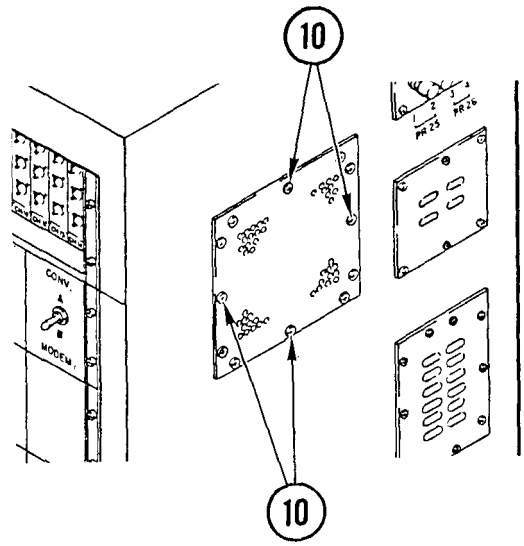




Replace

1. When replacing filter do steps 2 thru 5, then skip to 11 When replacing fan, begin at step 6.
2. Place filter in position on mounting plate.
3. Replace filter standoff cover in position over filter so that mounting holes are alined with holes in mounting plate.
4. Install and tighten filter mounting screws, washers, and nuts.
5. Replace filter and mounting plate in position in mounting slot on side of cabinet and secure in position with mounting screws and washers.
6. Place fan on mounting bracket with directional arrow toward filter, and secure in position with four screws, lockwashers, and nuts.
7. Place fan and bracket in position on filter panel and secure in position with four screws together with lock-washers and nuts.
8. Plug in fan power cord into cabinet power strip.
9. Replace tie wraps securing plug to power strip.

4-73. REMOVE/REPLACE COOLING FAN OR AIR FILTER (CONT)



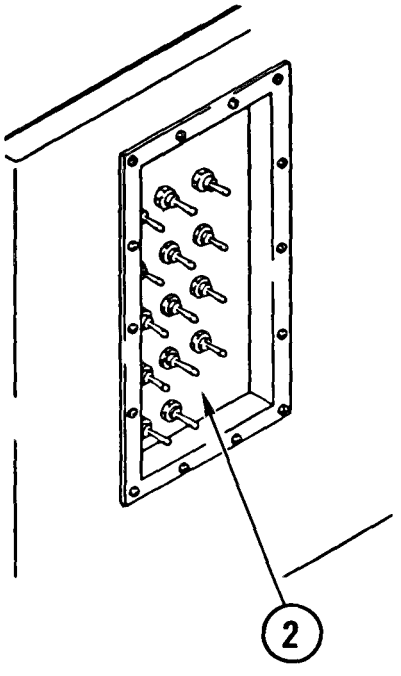
10. Replace fan and fan mounting plate in position in mounting slot on side of cabinet and secure in position with mounting screws and washers.

11. Power ON communications circuit breaker.

4-74. REMOVE/REPLACE/REPAIR SIGNAL ENTRANCE PANEL TERMINAL BOARD

INITIAL SETUP

Common Tools	Materials/Spare Parts	Support Equipment
• Tool kit	• Tags • Paper • Pen or pencil • Sealant	• Ladder



WARNING

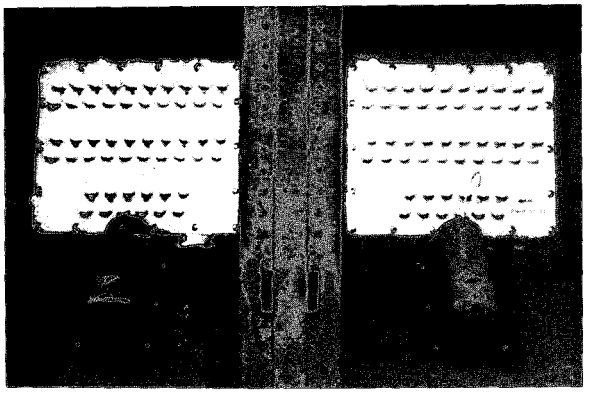
Hazardous voltages can exist on filter terminals within the cabinet. Use extreme care when removing signal entrance panel.

NOTE

Use this procedure to replace the terminal board in either signal entrance panel. To replace a binding post, go to Repair.

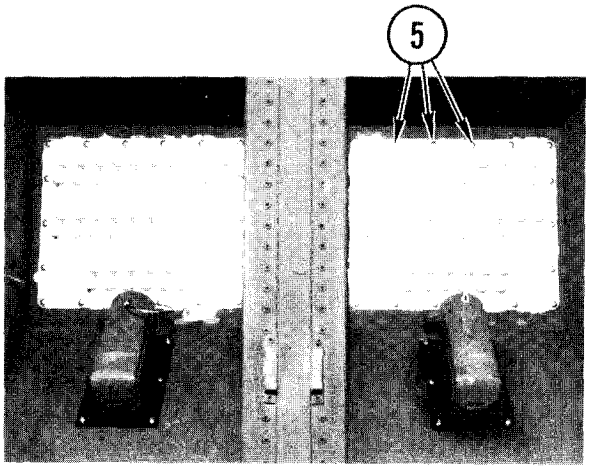
Remove

1. Power OFF communications cabinet circuit breaker.
2. Inside van, set all toggle switches for panel to be removed to CONNECTOR position.



3. Outside van, lift and latch signal entrance door.
4. Tag and disconnect all signal lines from terminal board.

4-74. REMOVE/REPLACE/REPAIR SIGNAL ENTRANCE PANEL TERMINAL BOARD (CONT)



5. Remove all screws holding terminal board to entrance panel.

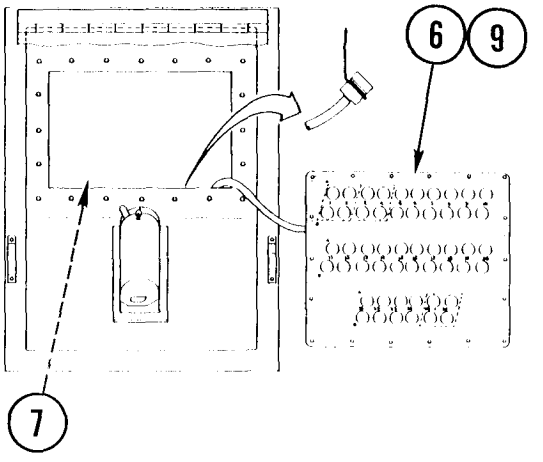
6. Pry terminal board loose from flange, and move terminal board aside. Do not pull wires.

7. Reach through panel opening and disconnect panel board connector.

8. Remove ground wire.

9. Remove terminal board and cable.

10. Scrape sealant from flange and terminal board.

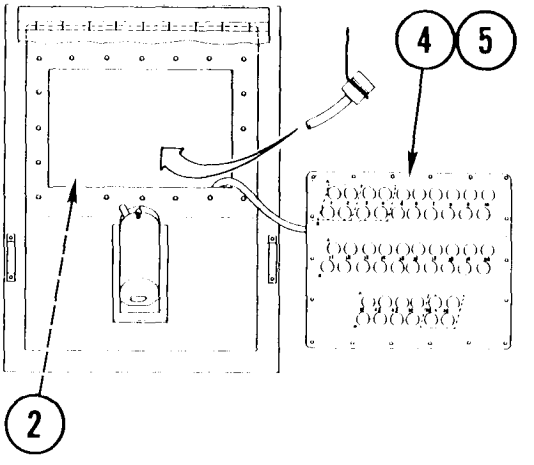


Replace

1. At signal entrance panel, pass cable through signal entrance opening.

2. Reach inside van and connect cable and ground wire.

3. Apply a light bead of sealant around surface of flange. Avoid getting sealant in screw holes.



4. Position terminal board on entrance panel .

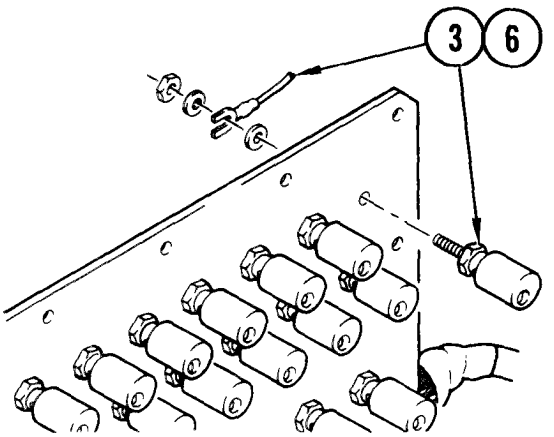
5. Install mounting screws.

6. Reconnect all signal lines to terminals.

7. Power ON communications cabinet circuit breaker.

8. Inside van, set toggle switches to BINDING POST or CONNECTOR as desired, and test new connections.

4-74. REMOVE/REPLACE/REPAIR SIGNAL ENTRANCE PANEL TERMINAL BOARD (CONT)



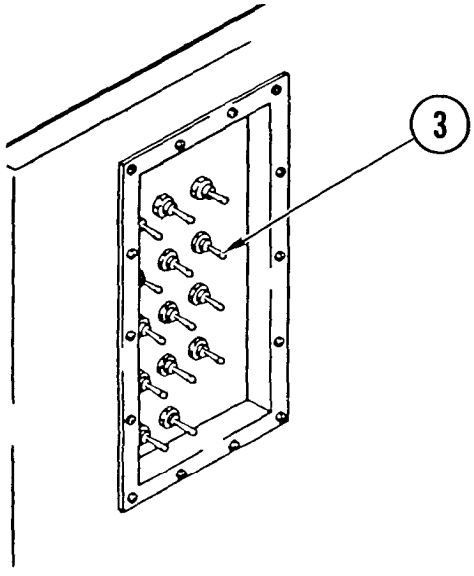
Repair

1. Remove terminal board with defective binding post (Remove, steps 1-3, 5, 6 and 10).
2. Remove signal wire from binding post to be replaced.
3. Remove nut, lockwasher, wire lug, and washer from binding post.
4. Remove binding post from terminal board.
5. Insert new binding post in terminal board.
6. Replace nut, lockwasher, wire lug, and washer on binding post.
7. Connect signal wire to binding post.
8. Replace terminal board (Replace, steps 3-5 and 7, 8).

4-75. REMOVE/REPLACE SIGNAL CONNECTOR ASSEMBLY

INITIAL SETUP

Common Tools	Materials/Spare Parts	Support Equipment
• Tool kit	• Paper • Pen or pencil	• Ladder



WARNING

Hazardous voltages can exist on filter terminals within the cabinet. Use extreme care when removing signal connector assembly.

NOTE

These procedures apply to the terminal board in either signal entrance panel.

Remove

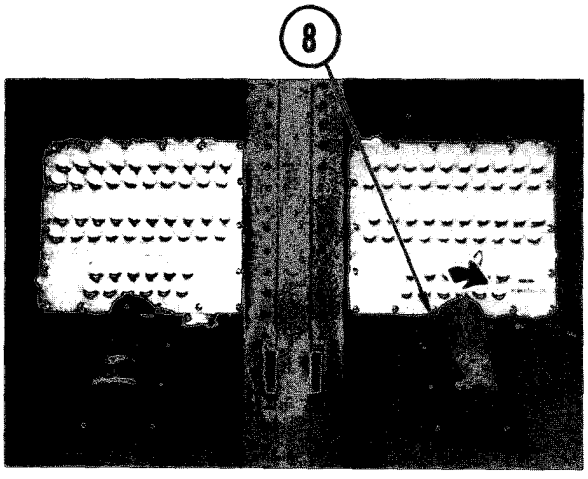
1. Power OFF cabinet circuit breaker.
2. Inside van, set all toggle switches for connector to be removed to BINDING POST position.

NOTE

If a signal line connector is connected to signal connector assembly, disregard steps 3 thru 6 and proceed with step 7.

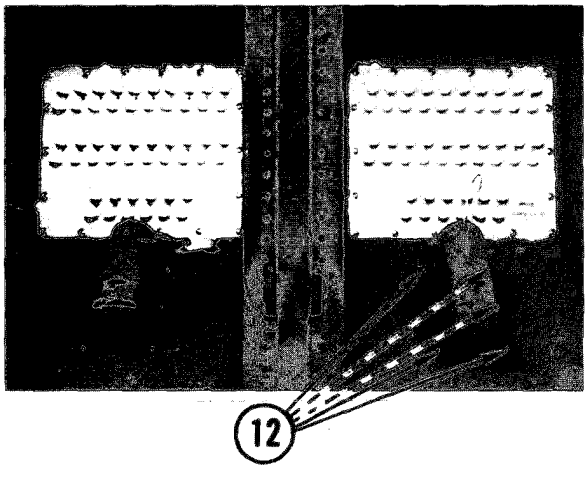
3. Remove mounting screws and washers from toggle switch panel.
4. Lift switch panel aside.
5. Locate signal connector assembly and remove nut and washer from ground cable and move cable aside.
6. Remove connector from signal connector assembly.

4-75. REMOVE/REPLACE SIGNAL CONNECTOR ASSEMBLY (CONT)



7. Outside van, 1 ift and latch signal entrance door.

8. At top end of connector, turn locking ring to your right until it releases.



9. Remove dust cover on cable assembly.

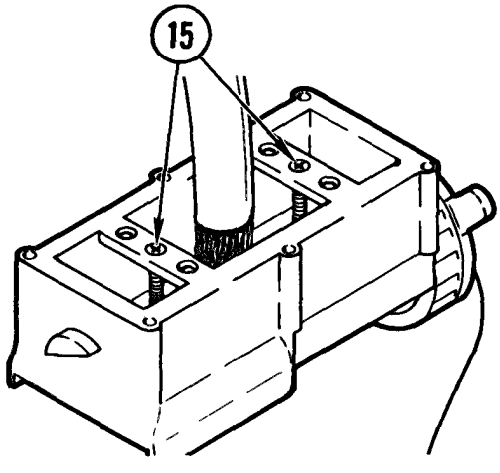
10. Let cover hang by retaining cable.

11. If connected, unplug signal line connector and set aside.

12. Remove screws and washers holding connector mounting plate to signal entrance panel.

13. Pry connector plate loose from entrance panel, and lift connector and plate from panel.

14. Scrape sealant from connector plate and entrance panel.

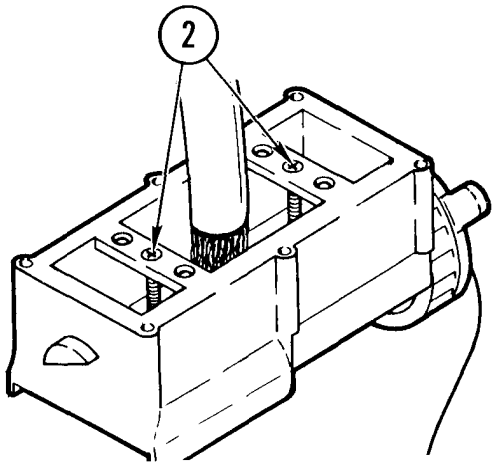


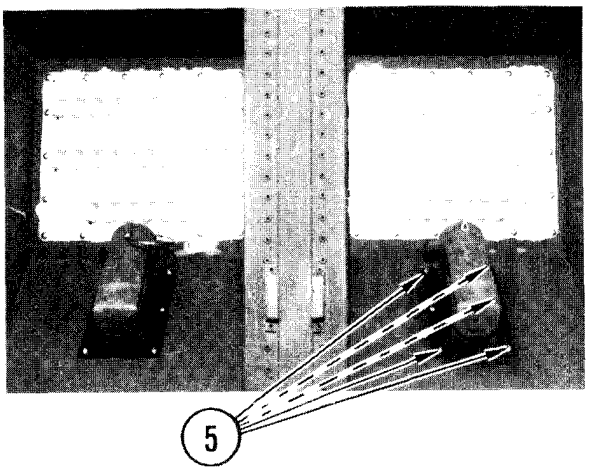
15. Remove screws from bottom of signal connector assembly and work connector board out of housing to expose wire lugs.

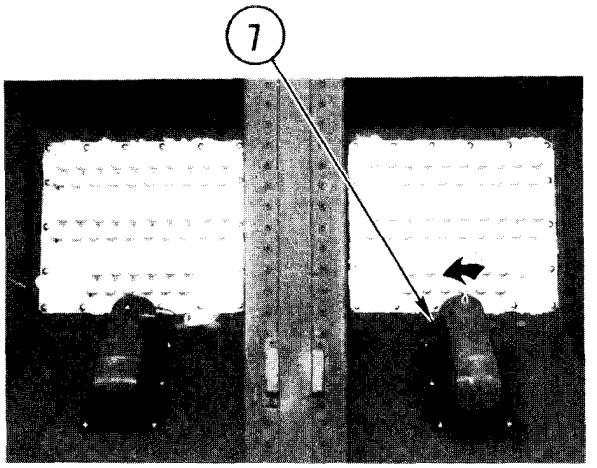
16. Same numbers appear on top and bottom of connector. Before tagging and removing wires, note color and terminal numbers.

17. Tag and unsolder wires from lugs and remove.

4-75. REMOVE/REPLACE SIGNAL CONNECTOR ASSEMBLY (CONT)







Replace

1. Using your notes, solder wires on terminal lugs on signal connector assembly.
2. Replace connector assembly inside housing and tighten screws in bottom of housing.
3. Apply a light bead of sealant around signal entrance panel. Avoid getting sealant in screw holes.
4. Place signal connector assembly housing and connector plate in position on entrance panel opening.
5. Replace and tighten mounting screws and washers.

NOTE

If van was connected to remote terminal reconnect field wire connector and proceed with step 7.

6. Replace dust cover on housing.
7. Rotate locking ring to your left as illustrated until it locks cover down securely.
8. Inside van, replace connector on signal connector assembly.
9. Replace ground cable and secure in place with nut and washer.
10. Replace toggle switch panel and secure in place with screws and washers.
11. Power ON cabinet circuit breaker.
12. Set toggle switches to BINDING POST or CONNECTOR, as desired, and test new connections.

4-76. REMOVE/REPLACE SWITCH PLATE TOGGLE SWITCH

INITIAL SETUP

Common Tools
- Tool kit

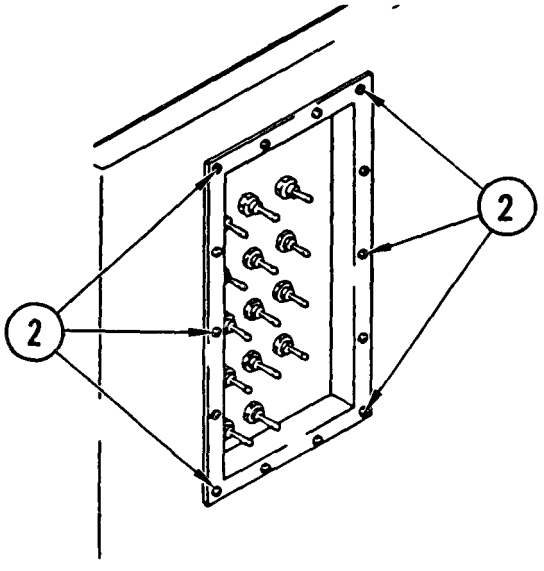
Materials/Spare Parts
- Paper
- Pen or pencil

WARNING

Hazardous voltages can exist on filter terminals within the cabinet. Use extreme care when removing switch panel.

NOTE

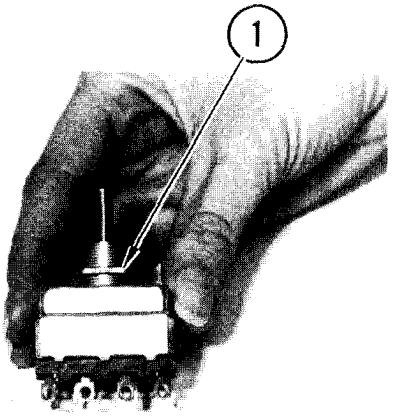
Follow these steps to remove/replace any of the toggle switches on either cabinet A or cabinet B entrance line switching panels.



Remove

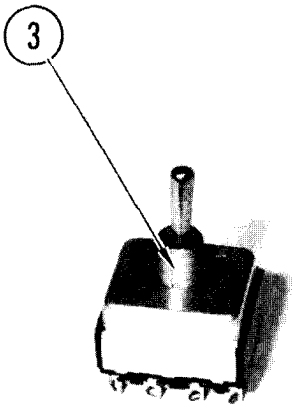
1. Power OFF cabinet circuit breaker.
2. Remove mounting screws and washers from toggle switch panel.
3. Lift switch panel aside to access wires on bottom of switch. Use your scratch paper to make note of wire positions and color codes.
4. Using flat tip screwdriver, loosen screws on bottom of switch. Pull out wires.
5. On top of switch plate, remove nut and washer for switch you are removing.
6. Remove switch from panel.

4-76. REMOVE/REPLACE SWITCH PLATE TOGGLE SWITCH (CONT)



Replace

1. Position backing nut 3/4 way down threaded bushing on switch.
2. Find keyway on switch.

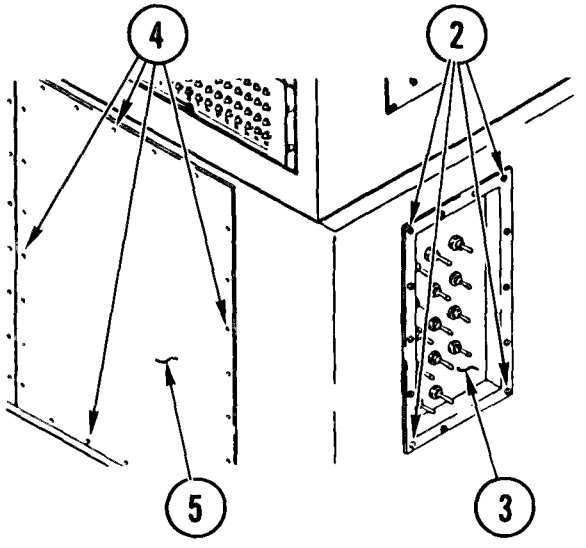


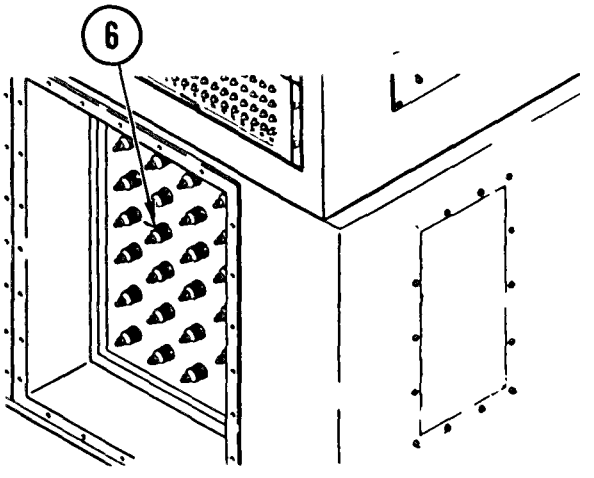
3. Line up keyway with key in switch panel and insert threaded shaft.
4. Install washer and nut. Tighten nut.
5. Using your notes, match wire leads with points on switch, push on all leads and tighten screws.
6. Set switch plate on signal entrance panel. Line up holes in panel with holes in enclosure.
7. Install mounting screws and washers.
8. Power ON cabinet circuit breaker.
9. Check operation of switch.

4-77. REMOVE/REPLACE SIGNAL PROTECTION PANEL FILTER

INITIAL SETUP

Common Tools
• Tool kit





WARNING

Hazardous voltages can exist on filter terminals within the cabinet. Use extreme care when removing signal protection panels.

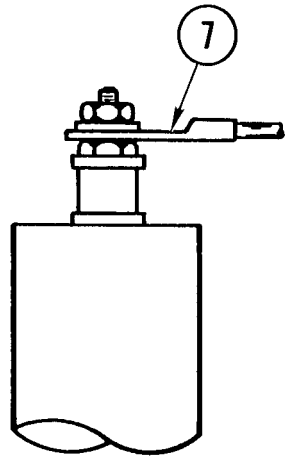
NOTE

Signal protection filter panels are in both cabinet A and cabinet B. Use these procedures for removing and replacing a filter on the panel in either cabinet.

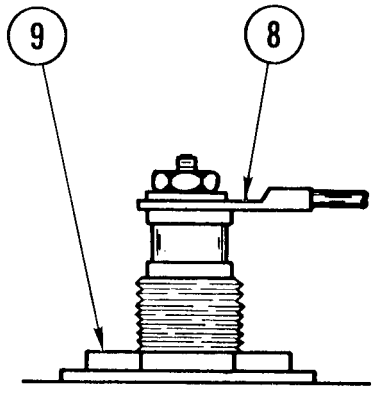
Remove

1. Power OFF communications circuit breakers on wall next to cabinet A.
2. Remove mounting screws and washers from toggle switch panel.
3. Lift panel from cabinet and lay aside.
4. Remove mounting screws and washers from front panel.
5. Remove panel.
6. Find filter to be replaced.

4-77. REMOVE/REPLACE SIGNAL PROTECTION PANEL FILTER (CONT)



7. Reach through switch panel hole and remove nut, washer, and lead from rear of filter.

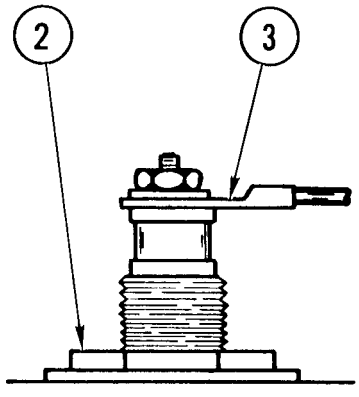


8. At front of cabinet, remove nut, washer, and lead from front of filter.

9. While holding filter body from back of panel, remove nut and washer from front of panel.

10. Remove filter.

Replace

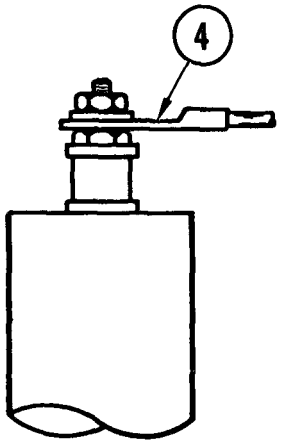


1. Reach through switch panel hole and put filter mounting bushing through panel hole.

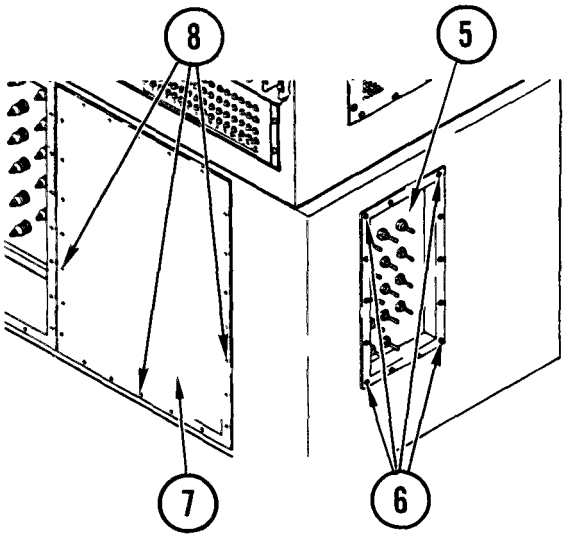
2. While holding filter from rear, install washer and mounting nut on front.

3. Connect wire to outside (front) terminal, and replace nut and washer.

4-77. REMOVE/REPLACE SIGNAL PROTECTION PANEL FILTER (CONT)



4. Connect wire to inside (rear) terminal, and replace nut and washer.



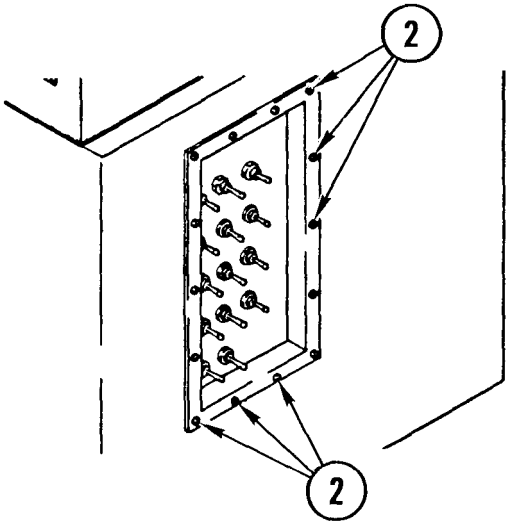
5. Place toggle switch panel on cabinet.
6. Install mounting screws and washers.
7. Put front panel in place.
8. Install mounting screws and washers.
9. Power ON cabinet circuit breakers.

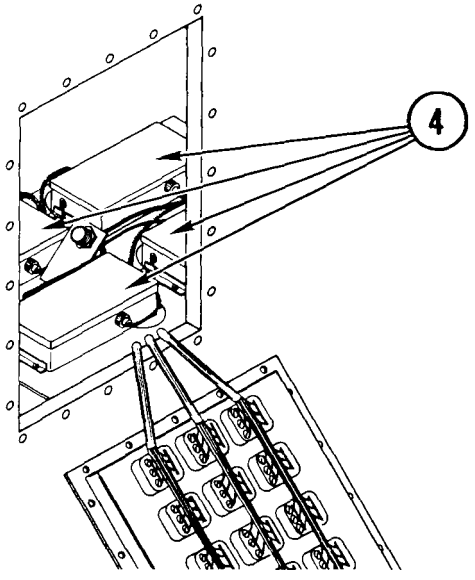
4-78. REMOVE/REPLACE SIGNAL LINE PROTECTOR

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil





WARNING

Hazardous voltages can exist on filter terminals within the cabinet. Use extreme care when removing signal line protectors (SLP).

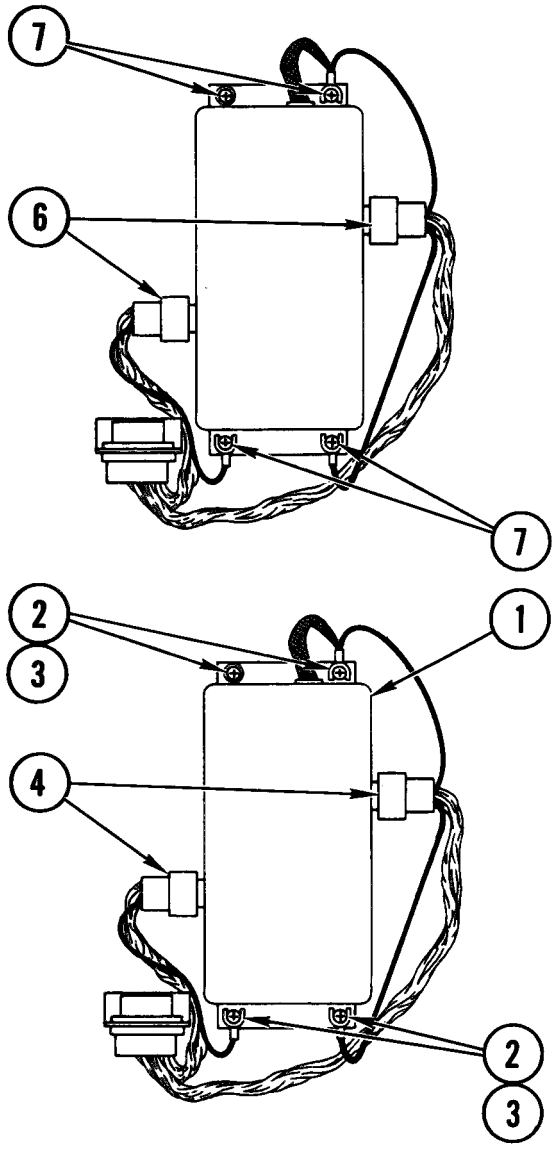
NOTE

Signal line protector panels are in both cabinet A and cabinet B. Use these procedures for removing and replacing a SLP on the panel in either cabinet.

Remove

1. Power OFF cabinet circuit breaker.
2. Remove mounting screws and washers from toggle switch panel.
3. Lift panel from cabinet and lay aside.
4. Find SLP to be removed.

4-78. REMOVE/REPLACE SIGNAL LINE PROTECTOR (CONT)



5. Tag all connections.
6. Unplug connectors.
7. Remove mounting screws, lockwashers and flatwashers.
8. Remove SLP.

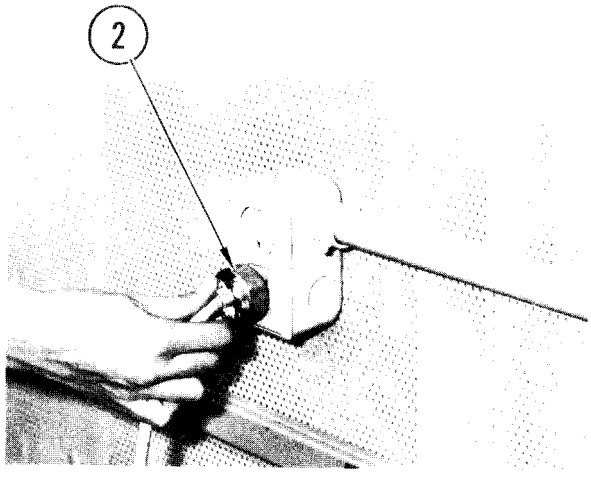
Replace

1. Place SLP on panel.
2. Install mounting screws but do not tighten.
3. Place wire lugs on screws and tighten screws.
4. Plug in and tighten connectors.
5. Place toggle switch panel on cabinet.
6. Install mounting screws and washers.
7. Power ON cabinet circuit breaker.

4-79. REMOVE/REPLACE CARD READER/PUNCH

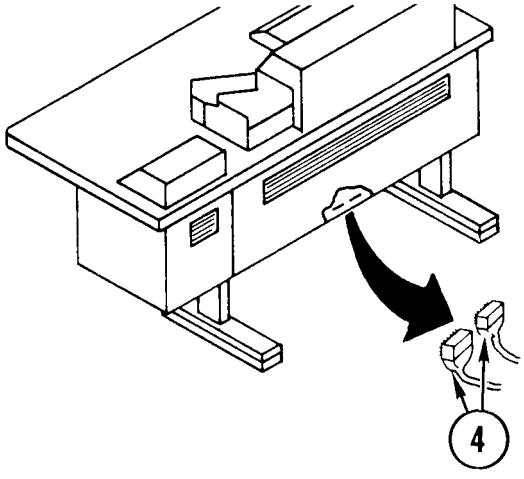
INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required
• Tool kit • Hex key allen set-decimal	• Alinement pins (2 ea)	• Four



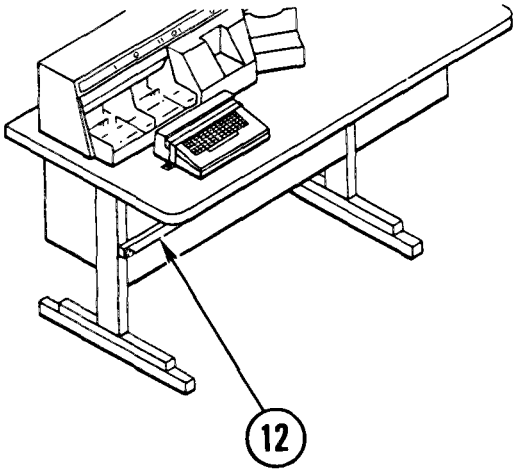
Remove

1. Power OFF.
2. Pull ac power plug from outlet.

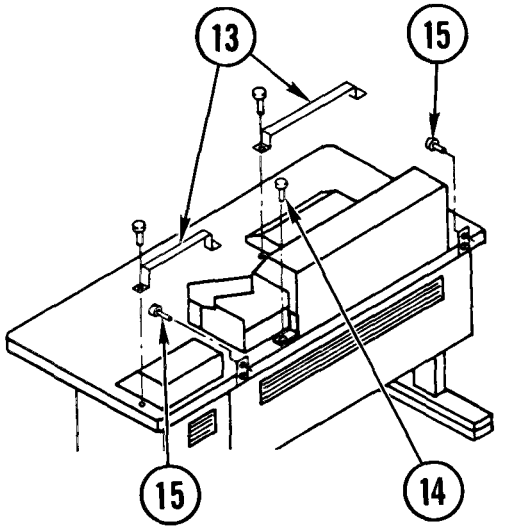


3. Prepare card reader/punch for movement (TM 11-7010-205-10).
4. Loosen mounting screws and remove bulkhead connectors.
5. Open controller door.
6. Lower logic cage.
7. Remove bolt and washer and pull off ground wire.
8. Save bolt and washer.
9. Feed ground wire through rear of cabinet.
10. Raise logic cage.
11. Close controller door.

4-79. REMOVE/REPLACE CARD READER/PUNCH (CONT)



12. If removed, put bar across front panel. Tighten screws.



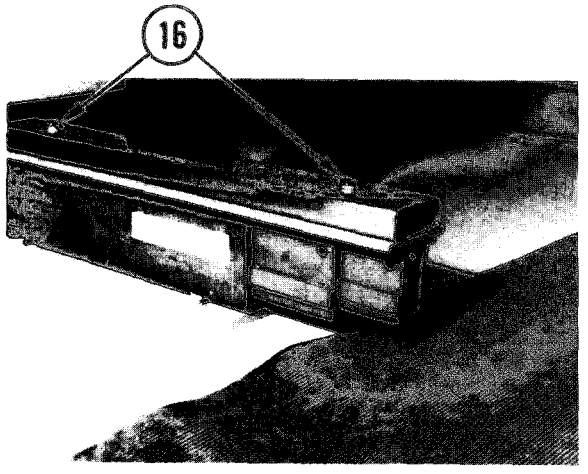
13. If removed previously, put holddown clamps over keyboard and controller control panel. Replace and tighten bolts.

14. Put mounting screw in top cover L-bracket, as shown. Tighten screw.

NOTE

Wall bolts are used for tie-down only. They should not be in place during normal operation.

15. Remove wall bolt at each end of device. Bag and retain bolts, spring nuts, and spacer.



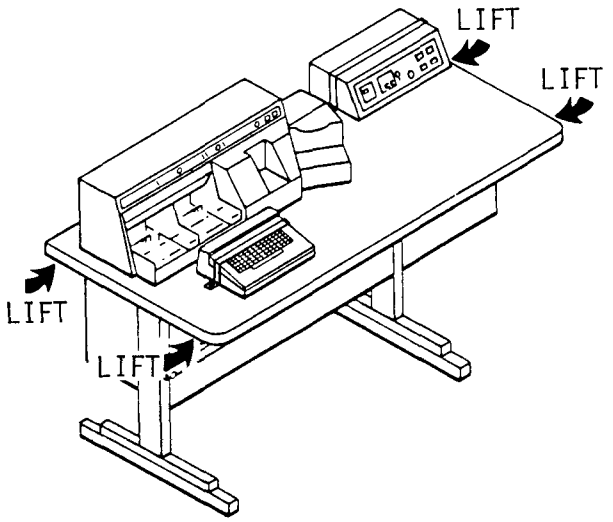
16. Remove four floor bolts at feet of device.

WARNING

Device is heavy. You need four persons to move device.

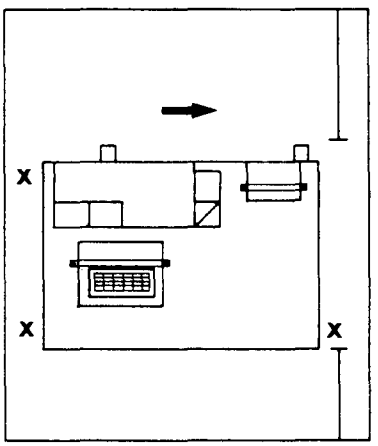
17. Lift device onto floor, away from wall, and remove and retain spacers.

4-79. REMOVE/REPLACE CARD READER/PUNCH (CONT)



18. Pull hinge pins off vestibule door. Remove door. Set door outside van.

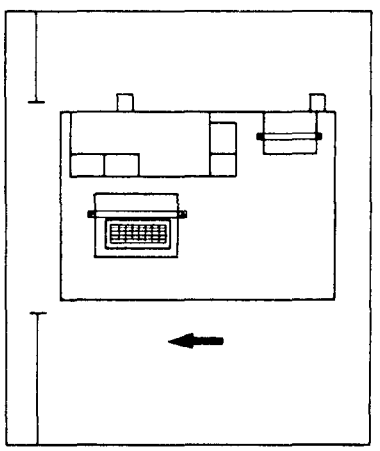
19. Hold device as shown. Lift device and carry to vestibule doorway.



20. At doorway, line up unit in aisle, as shown.

21. Carry through vestibule doorway.

22. Carry through rear door.



Replace

1. Make sure keyboard and front panel are bolted down.

WARNING

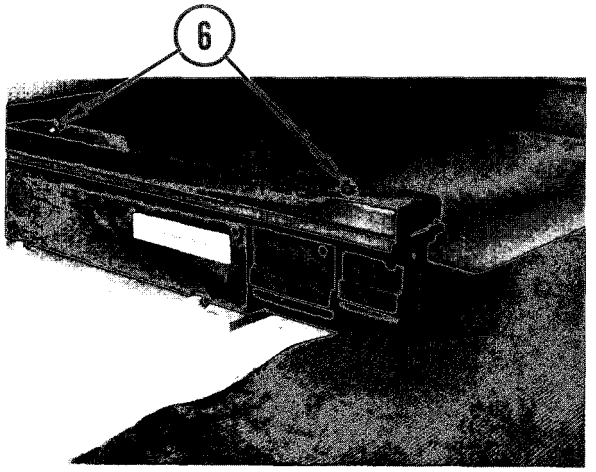
Device is heavy. You need four persons to move device.

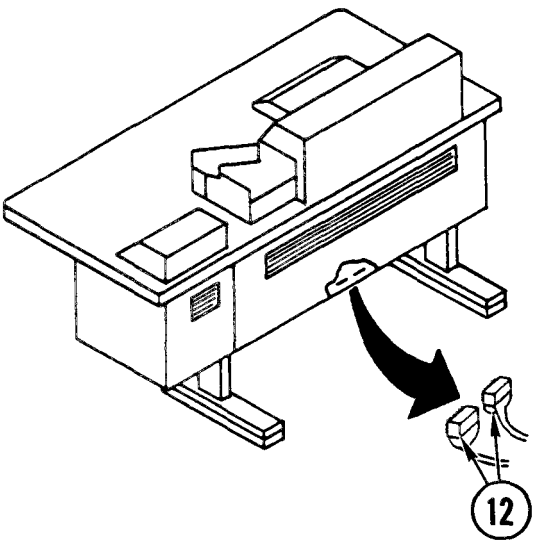
2. Lift device up. Carry device through rear door.

3. At vestibule doorway, line UP as shown.

4. Carry device through door. Lower device next to floor mounts, but away from wall.

4-79. REMOVE/REPLACE CARD READER/PUNCH (CONT)





5. Lift device onto floor mounts.
6. Replace spacers and push in and tighten bolts.
7. Open controller door.
8. Lower logic cage.
9. Feed ground wire through rear of cabinet and secure with bolt and washer.
10. Raise logic cage.
11. Close controller door.
12. Replace bulkhead connectors in position and secure with mounting screws.
13. Push ac power plug into outlet.
14. Replace vestibule door.
15. Prepare card reader/punch for operation (TM 11-7010-205-10).

4-80. REMOVE/REPLACE UTILITY/TECH POWER BOX

INITIAL SETUP

Common Tools
- Tool kit

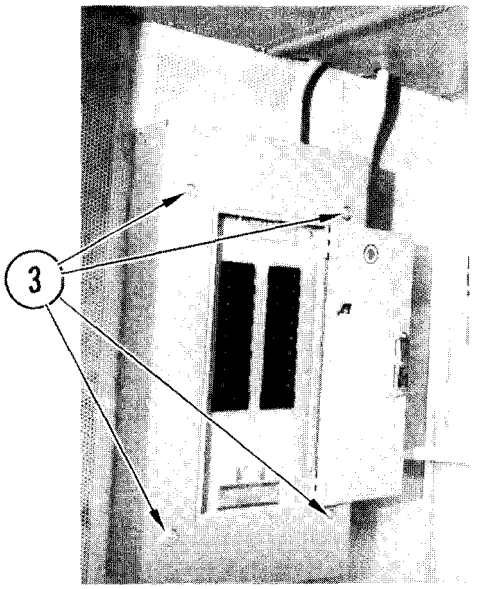
Materials/Spare Parts
- Electrical tape
- Paper
- Pencil or pen

WARNING

Electrocution may result if task is done with power on.

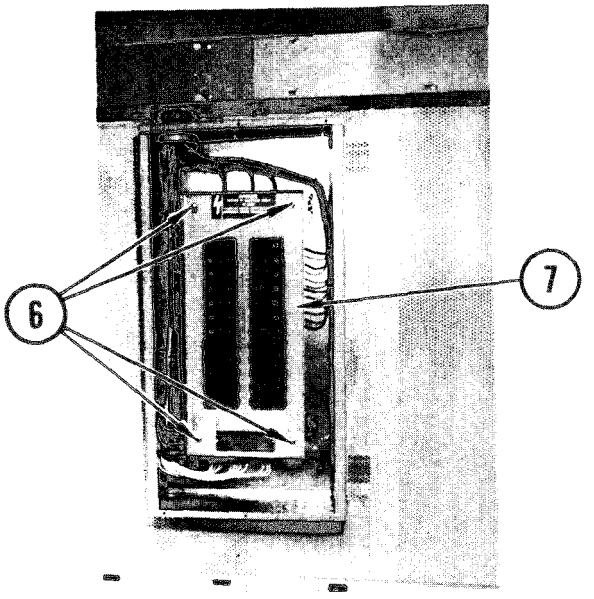
Remove

1. At power distribution box, set power box circuit breakers to OFF.
2. Place strip of tape over circuit breaker to indicate that a repair is in process.



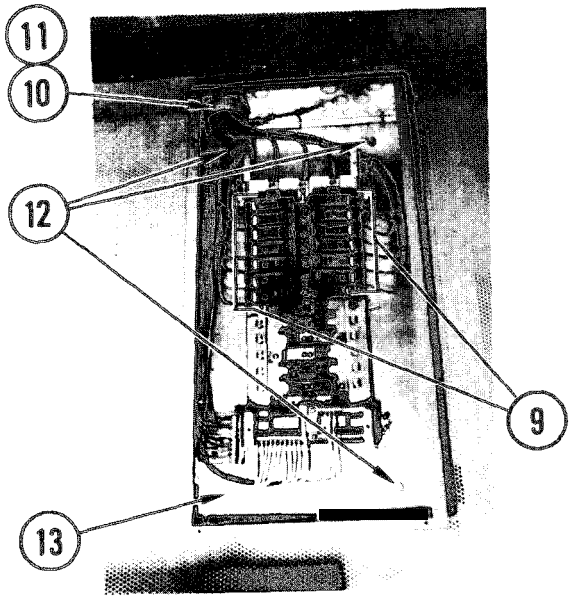
3. On power box panel, loosen four corner screws on cover.
4. Turn screws so that notches are in a vertical position.
5. Remove cover.

4-80. REMOVE/REPLACE UTILITY/TECH POWER BOX (CONT)



6. On circuit breaker cover, remove four screws.

7. Remove cover and set aside.



8. Note wire positions in circuit breaker assembly.

9. Loosen screws and disconnect wires.

10. Remove locknut and plastic bushing.

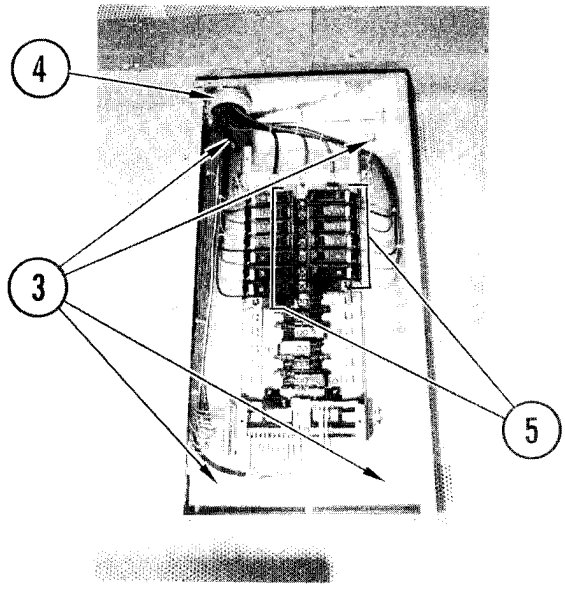
11. Pull locknut and plastic bushing over wires until cleared.

12. Remove three bolts securing power box to van wall.

13. While holding power box, remove fourth bolt.

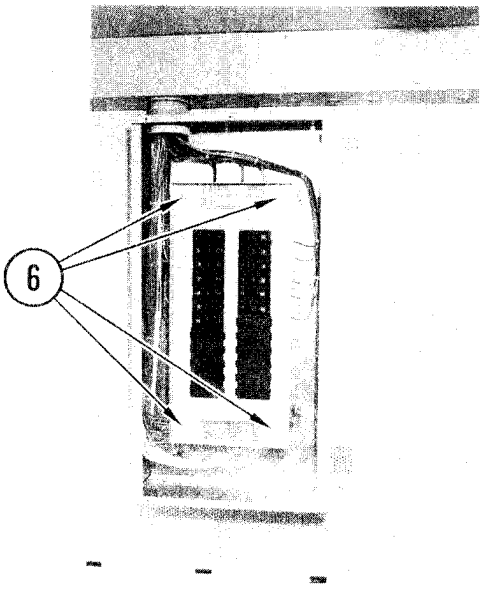
14. Remove power box from van wall.

4-80. REMOVE/REPLACE UTILITY/TECH POWER BOX (CONT)



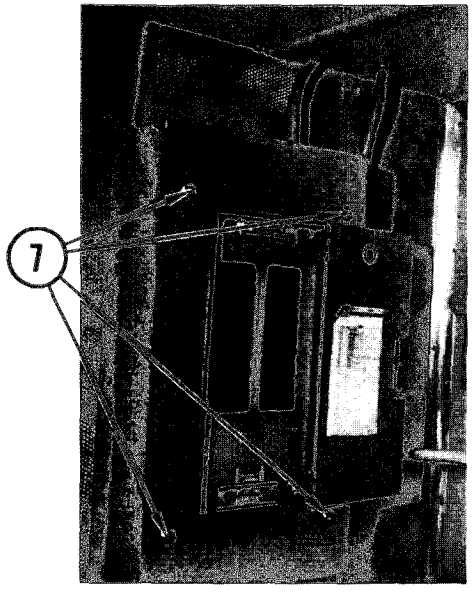
Replace

1. At power distribution box, check that utility or tech power circuit breaker is set to OFF. Place strip of tape over breaker to indicate that a repair is in progress.
2. Insert plastic bushing in position then feed wires through bushing in top of power box. Set power box into position on van wall.
3. Install and tighten four screws, lockwashers, and flatwashers.
4. Push locknut over wires and screw into position.
5. Using notes on scratch paper, replace wires and tighten screws.



6. Replace circuit breaker cover. Tighten four screws.

4-80. REMOVE/REPLACE UTILITY/TECH POWER BOX (CONT)



NOTE

Make sure screw notches on power box cover are in vertical position before replacing cover.

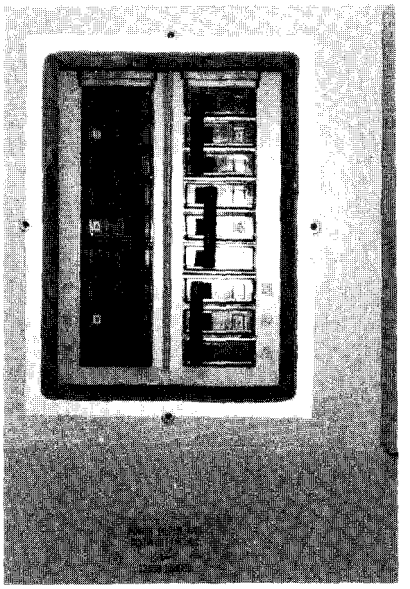
7. Set power box cover into position.
8. Turn screws so notches are in a horizontal position.
9. Tighten screws.
10. At power distribution box, remove tape and set utility or tech power circuit breaker to ON.
11. Open power box panel.
12. Inside power box set circuit breakers ON to check repair.
13. If utility or technical power is not required, set circuit breakers to OFF .

4-81. REMOVE/REPLACE UTILITY/TECH POWER BOX CIRCUIT BREAKER

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Electrical tape
- Paper
- Pen or pencil

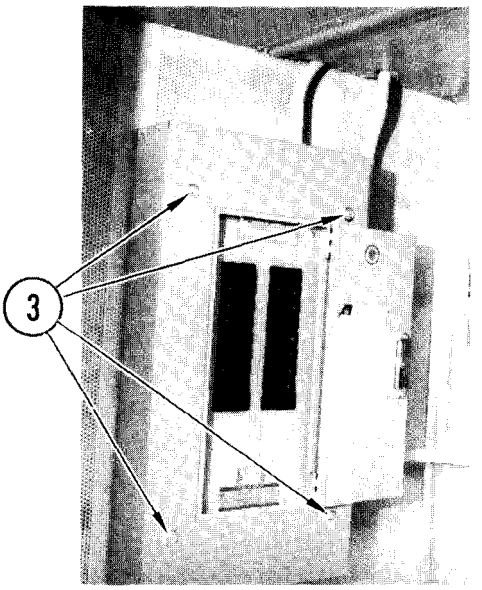


WARNING

Electrocution may result if task is done with power on.

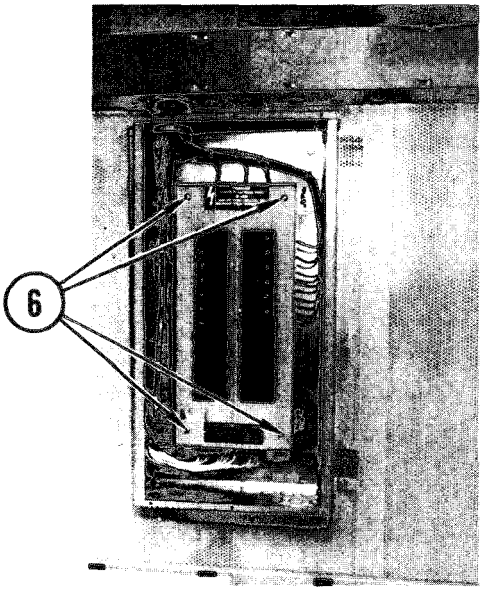
Remove

1. At power distribution box, set power box circuit breaker to OFF.
2. Place a strip of tape over circuit breaker to indicate that a repair is in progress.



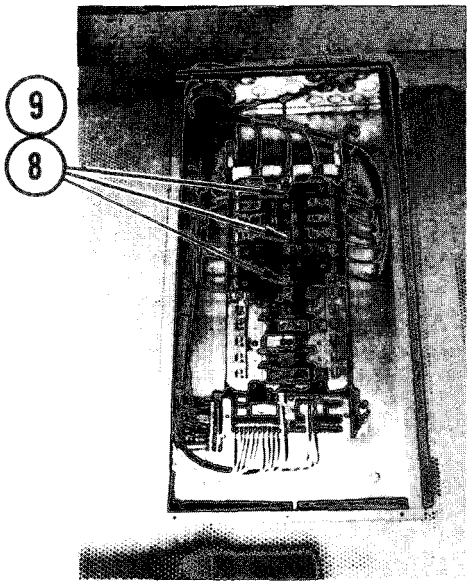
3. On power box, loosen four corner screws on cover.
4. Turn washers so that notches are in vertical position.
5. Remove cover.

4-81. REMOVE/REPLACE UTILITY/TECH POWER BOX CIRCUIT BREAKER (CONT)



6. On circuit breaker cover, remove four screws.

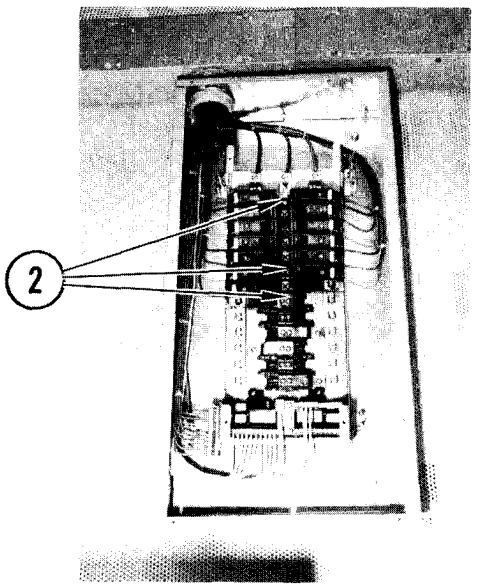
7. Remove cover and set aside.



8. Remove center screws holding circuit breaker in bracket. Remove wire from circuit breaker.

9. Lift up on inside corner and slide circuit breaker out of bracket. Pull out.

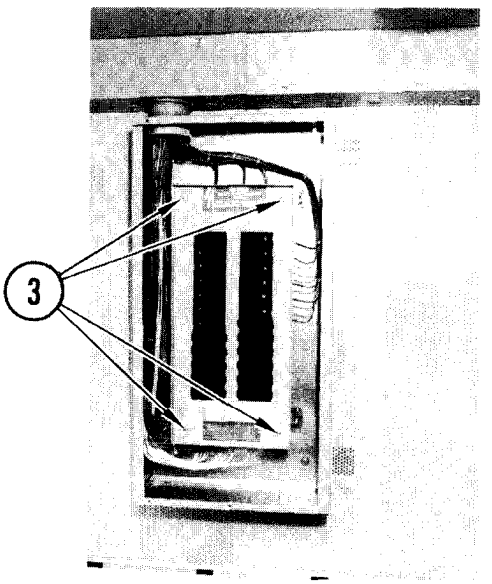
4-81. REMOVE/REPLACE UTILITY/TECH POWER BOX CIRCUIT BREAKER (CONT)



Replace

1. Insert edge of circuit breaker under lip of bracket and push in.

2. Replace center screw to secure breaker. Insert wire in circuit breaker.



3. Replace circuit breaker cover. Tighten four corner screws.

NOTE

Make sure washer notches on power box cover are in vertical position before replacing cover.

4. Set power box cover into position.

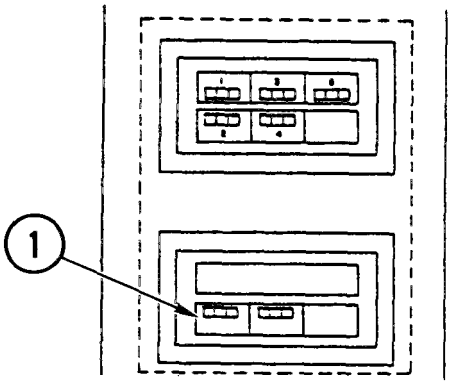
5. Turn four corner washers until notches are in horizontal position.

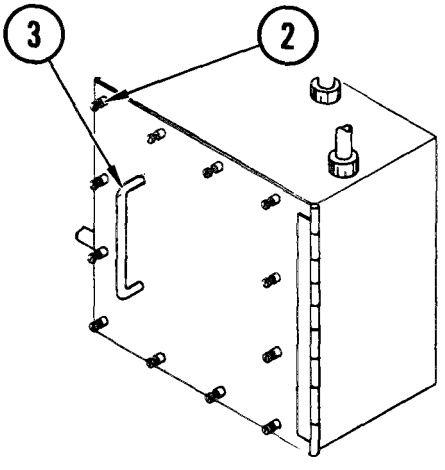
6. Tighten screws.

4-82. REMOVE/REPLACE COMMUNICATIONS CIRCUIT BREAKER BOX OR CIRCUIT BREAKERS

INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags • Pen or pencil





Remove

NOTE

Breaker CB25 controls power to communication circuit breaker box.

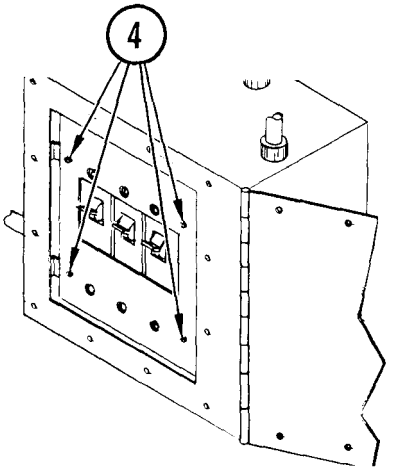
1. At power distribution box, set breaker CB25 OFF.

NOTE

To replace circuit breaker, do steps 1-6. To replace circuit breaker box, do steps 1-10.

2. Loosen screws on RFI filter cover.
3. Open cover accessing circuit breakers.

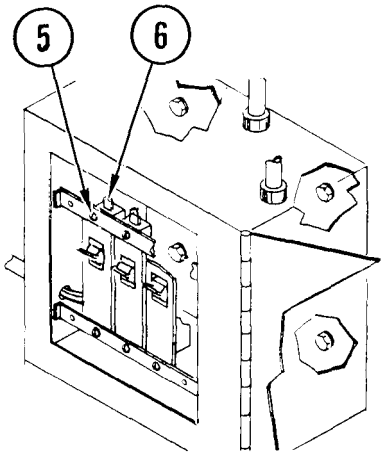
4-82. REMOVE/REPLACE COMMUNICATIONS CIRCUIT BREAKER BOX OR CIRCUIT BREAKERS (CONT)



4. Remove four screws holding breaker mounting panel. Lift off panel.

NOTE

More than one circuit breaker may have to be removed to replace a defective circuit breaker.

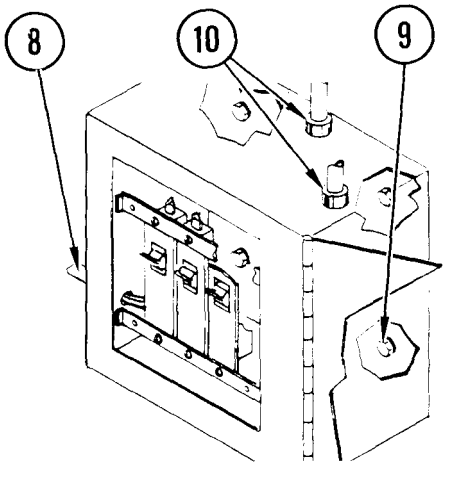


5. Remove circuit breaker mounting screws. Pull circuit breaker out of box .

6. Loosen line lugs and remove wire leads. Tag wire leads.

   • If removing only circuit breaker, go to Replace

   • If removing box, go to step 7



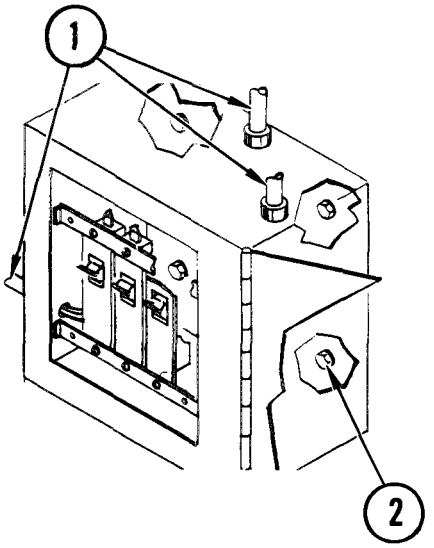
7. Remove wire nut and separate neutral wires.

8. Remove nut from stud and ground wire.

9. Remove four mounting bolts securing circuit breaker box to wall.

10. Remove conduit fittings and lift circuit breaker box from wall.

4-82. REMOVE/REPLACE COMMUNICATIONS CIRCUIT BREAKER BOX OR CIRCUIT BREAKERS (CONT)

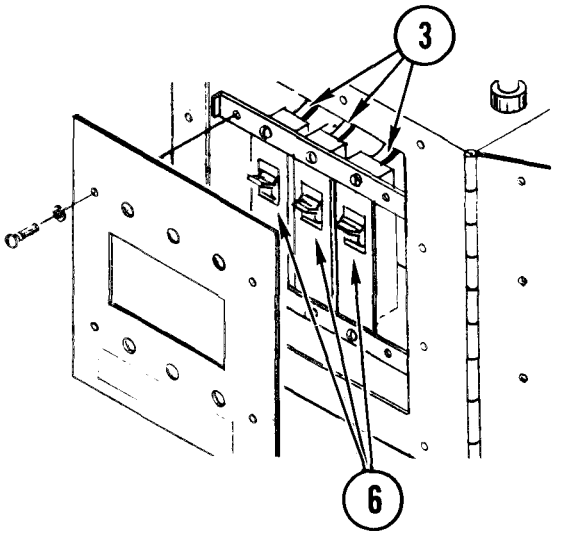


Replace

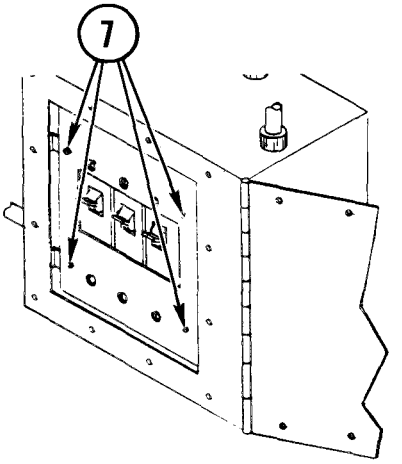
NOTE

To replace circuit breaker box, do steps 1-10. To replace circuit breaker only, do steps 3-7.

1. Install conduit fittings and place circuit breaker box on wall.
2. Install four mounting bolts.

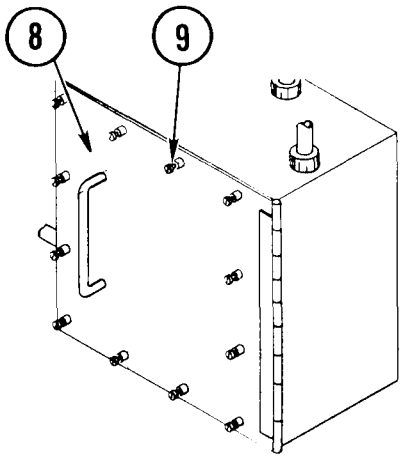


3. Connect wire leads and tighten line lugs.
4. Replace ground wires on stud and secure with nut.
5. Replace neutral wires and secure with nut.
6. Insert circuit breaker(s) onto mounting plate and install mounting screws.



7. Mount breaker panel on support struts in circuit breaker box and install mounting screws.

4-82. REMOVE/REPLACE COMMUNICATIONS CIRCUIT BREAKER BOX OR CIRCUIT BREAKERS (CONT)



8. Set all circuit breakers to ON. Close RFI filter cover on circuit breaker box.

9. Tighten screws on RFI filter cover.

10. At power distribution box, set breaker CB25 ON.

4-83. REMOVE/REPLACE ELECTRICAL SWITCHES

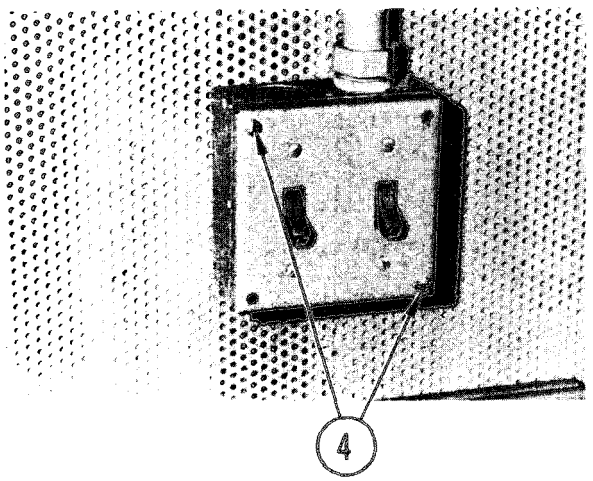
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Electrical tape • Paper • Pen or pencil

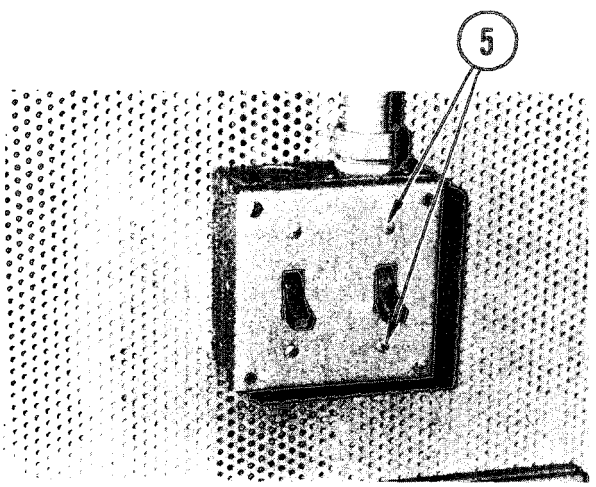
WARNING

Electrocution may result if task is done with power on.

Remove



1. At power box, set circuit breaker to OFF .
2. Place a strip of tape over circuit breaker to indicate that a repair is in progress.
3. Find switch you want to remove.
4. Remove corner screws from cover plate. Pull out cover plate with switches attached.

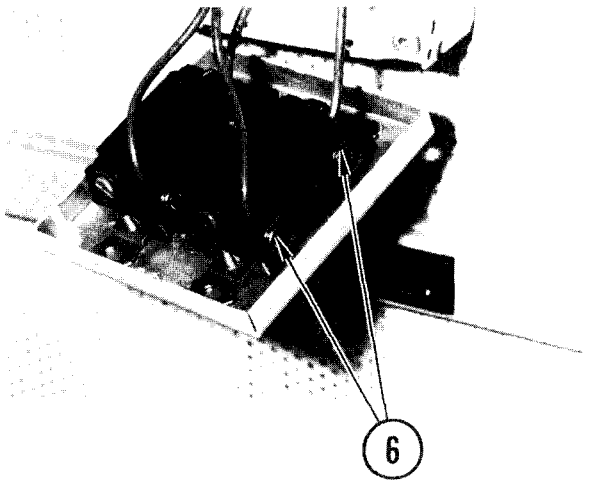


5. Remove screws from above and below faulty switch handle. Remove switch.

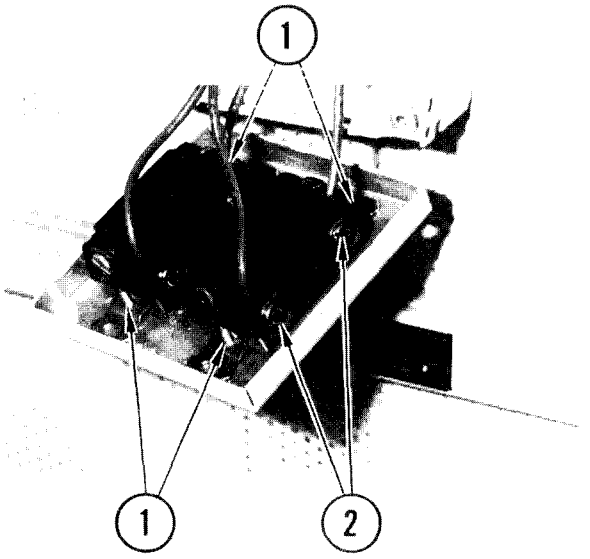
NOTE

If the left-hand switch is bad, remove the right-hand switch first to access wire screws on the left-hand switch.

4-83. REMOVE/REPLACE ELECTRICAL SW ITCHES (CONT)



6. Loosen two screws on side of switch and pull out wires.



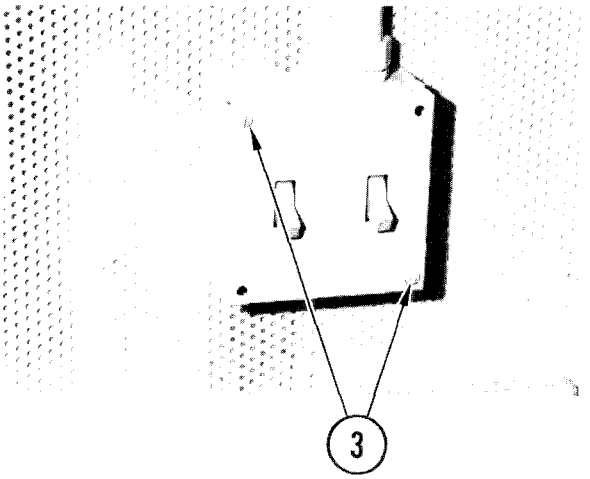
Replace

CAUTION

Make sure ends of wires are not frayed. Twist and tin end with solder (if necessary) before pushing the exposed wire end into the switch.

1. Position switch (left-hand switch first) on cover plate with mounting holes lined up. Insert and tighten screws.

2. Reinstall wires into side of switch and tighten screws.



3. Replace switches and cover plate. Insert corner screws and tighten.

4. At power box, remove strip of tape and set circuit breaker to ON.

4-84. REMOVE/REPLACE POWER OUTLETS

INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Electrical tape • Paper • Pen or pencil

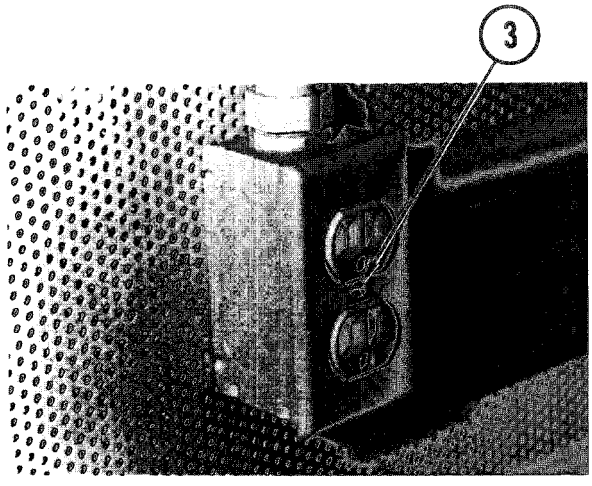
WARNING

Electrocution may result if task is done with power on.

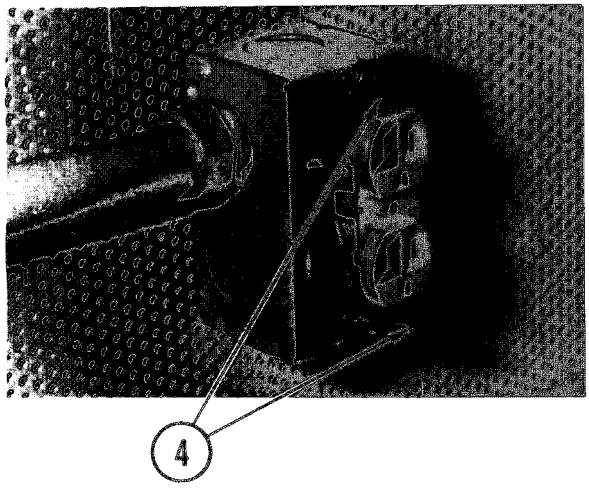
Remove

1. At power box, set circuit breaker to OFF .

2. Place a strip of tape over circuit breaker to indicate that a. repair is in progress.

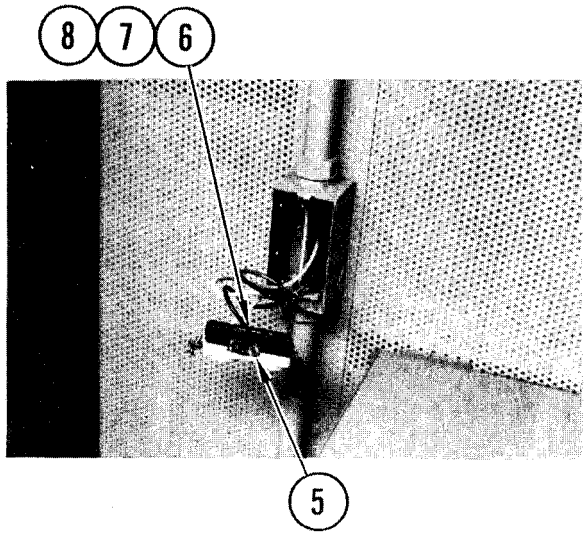


3. Remove retaining screw from cover plate. Remove cover plate and set aside.



4. Remove screws holding receptacle into wall box. Pull out receptacle and let hang on wires.

4-84. REMOVE/REPLACE POWER OUTLETS (CONT)

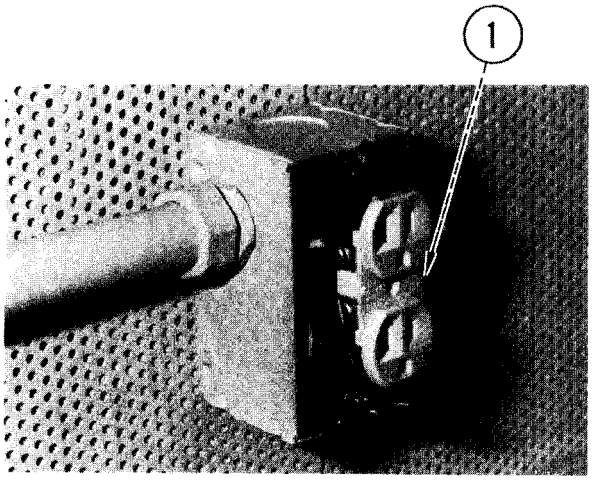


5. Loosen screw holding red wire to right-hand side of receptacle. Remove red wire.

6. On the other (right-hand) side of receptacle, loosen and remove white (neutral) and green (ground) wire.

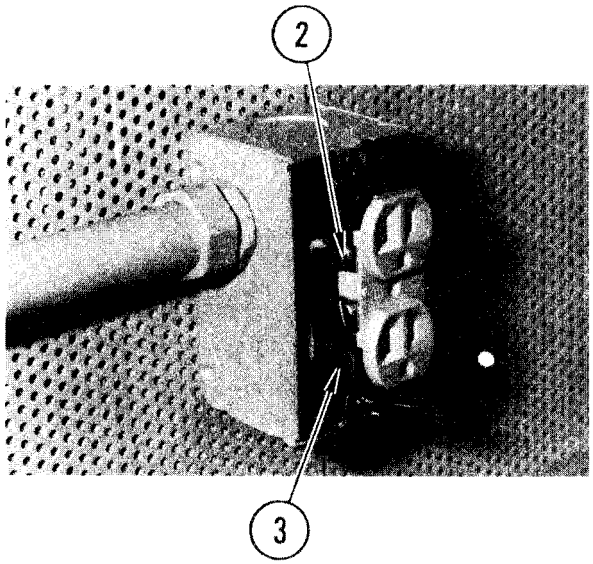
7. On underside of receptacle, loosen and remove green (ground) wire.

8. Remove faulty receptacle.



Replace

1. Loosen bottom brass screw on right-hand side of receptacle and curl exposed end of red wire around screw. Tighten screw.



2. Loosen top white-metal screw on left-hand side of receptacle and curl exposed end of white wire around screw. Tighten screw.

3. Loosen bottom-most (hex-head green) screw and curl exposed end of green wire around screw. Tighten screw.

4. Push receptacle back into wall box. Insert and tighten retaining screws.

5. Replace cover plate and tighten screw.

4-85. REMOVE/REPLACE FLUORESCENT LIGHT BALLAST

INITIAL SETUP

Common Tools
- Tool kit

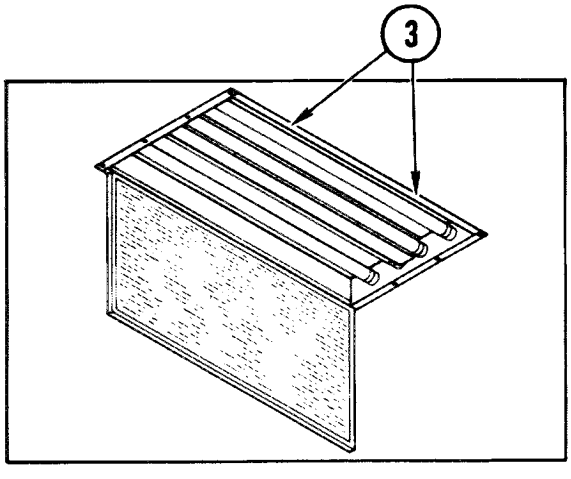
Materials/Spare Parts
- Electrical tape
- Paper
- Pen or pencil

WARNING

Electrocution may result if task is done with power on.

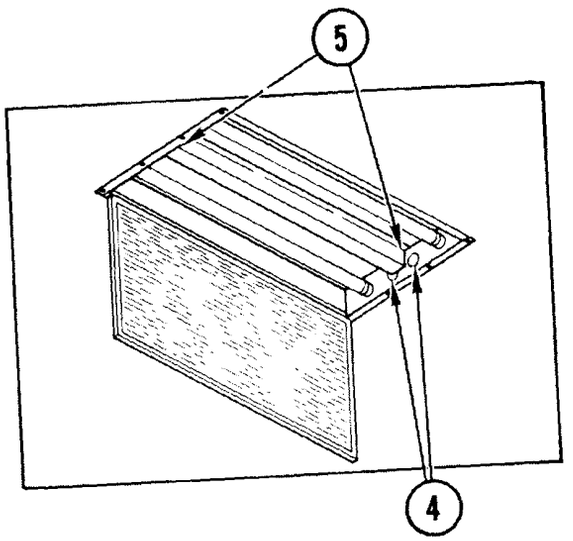
Remove

1. At utility power box, set circuit breaker for faulty light to OFF.
2. Place a strip of tape over circuit breaker to indicate that a repair is in progress.



3. At side of translucent cover panel, slide two latches toward ends of panel to release. Swing down cover panel on hinge and let hang.

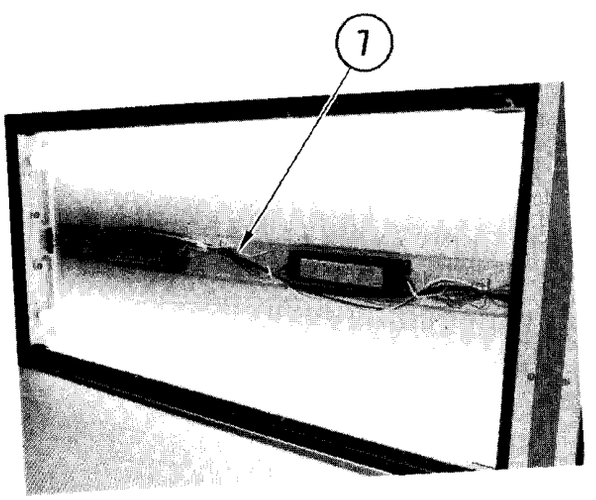
4-85. REMOVE/REPLACE FLUORESCENT LIGHT BALLAST (CONT)



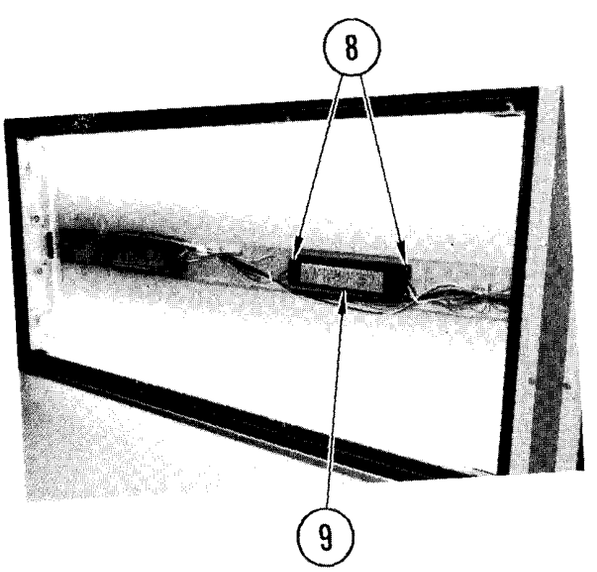
4 4. Remove two center lamps and set aside.

5. Remove screws at either end of the center cover plate, remove cover plate and set aside.

6. Use your scratch paper to make a sketch of wiring arrangement and note color codes.



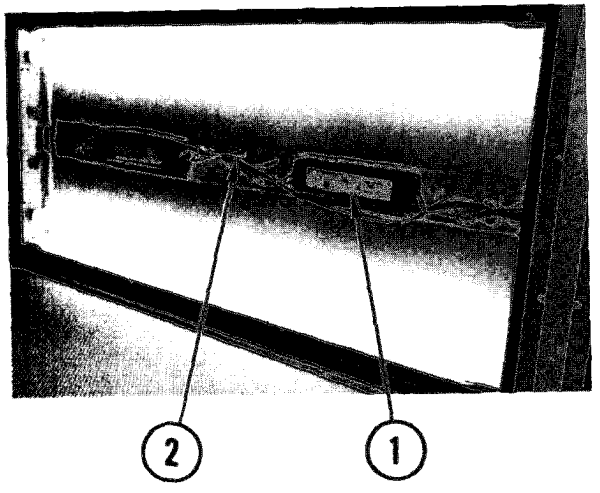
7. Remove wire nuts. Untwist ends of wires.



8. Remove four screws holding ballast to frame.

9. Remove ballast.

4-85. REMOVE/REPLACE FLUORESCENT LIGHT BALLAST (CONT)



Replace

1. Set ballast into position. Insert and tighten four screws.
2. Using your notes, match up ends of wires. and twist together using wire nuts to secure.
3. Replace center cover plate and tighten screws.
4. Replace two center lamps.
5. Swing up translucent cover panel. Slide latches toward ends of panel until they enter notches in frame. Push in and release latches to secure panel.
6. Remove tape and set circuit breaker at utility power box to ON.

4-86. REMOVE/REPLACE POWER CONTROL BOX

INITIAL SETUP

Common Tools
- Tool kit

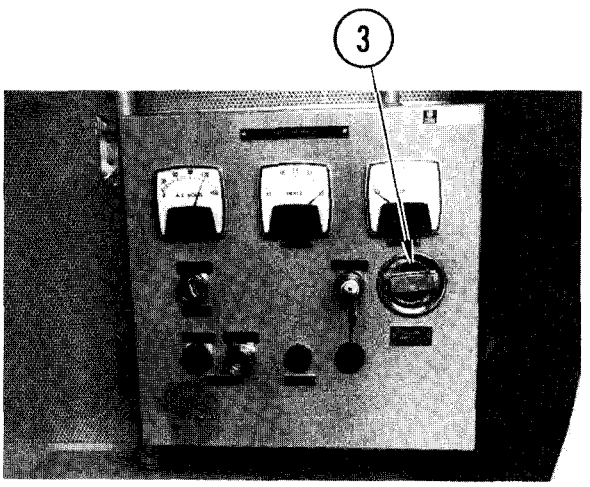
Materials/Spare Parts
- Electrical tape
- Paper
- Pen or pencil

Remove

WARNING

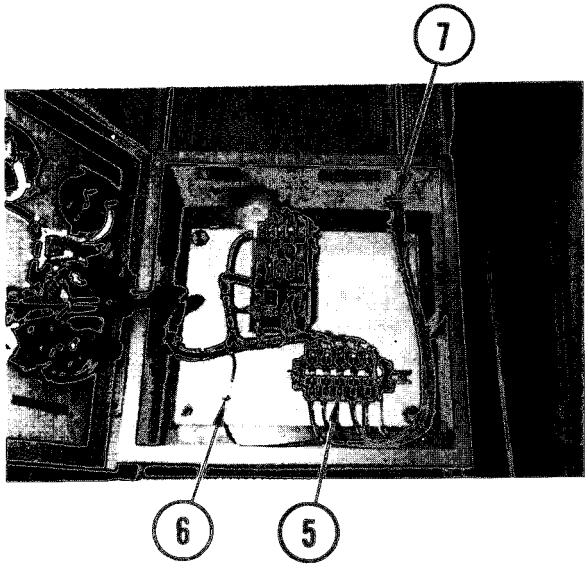
Electrocution may result if task is done with power on.

1. At power distribution box, set CB1 and CB2 circuit breakers OFF.
2. Place a strip of tape over circuit breakers to indicate that a repair is in progress.



3. On power control box door, turn latch to open.

4-86. REMOVE/REPLACE POWER CONTROL BOX (CONT)

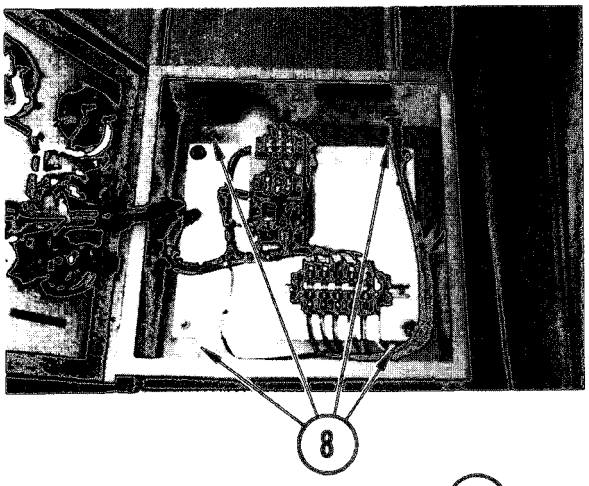


4. Use your scratch paper to note position of wires.

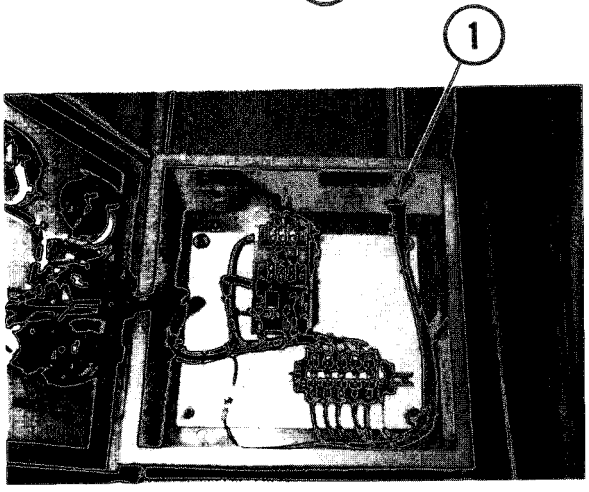
5. Remove screws and disconnect wires labeled A, B, C, 11, 12 and neutral.

6. Remove nut and green ground cable.

7. On top right side, remove locknut and pull down over loose wires until cleared.



8. In back of power control box, remove four screws, lockwashers, and flatwashers then remove box at the same time feeding wires through conduit fitting.

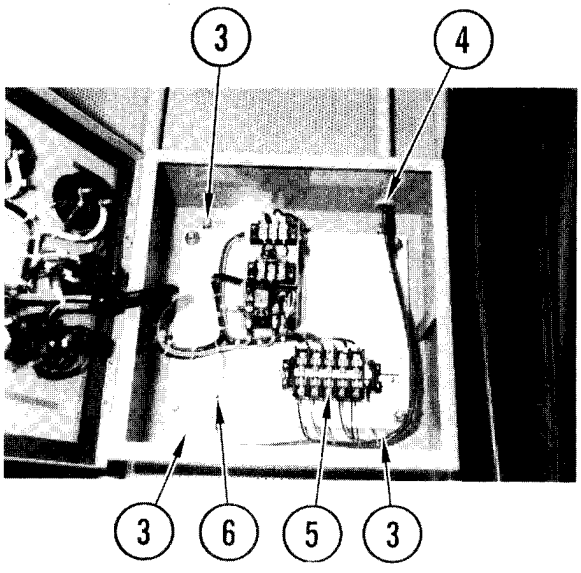


Replace

1. Hold power control box and insert loose wires through conduit fitting.

2. Hold power control box in position on van wall.

4-86. REMOVE/REPLACE POWER CONTROL BOX (CONT)

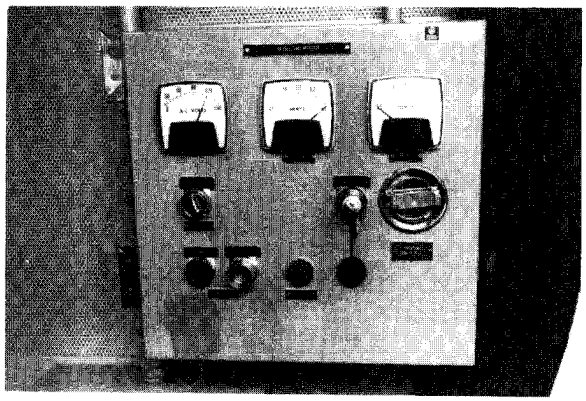


3. Install and tighten four screws, lockwashers, and flatwashers connecting power control box to van wall.

4. Push locknut over loose wires and install into top of power control box .

5. Use your notes to replace screws and wire connectors labeled A, B, C, ll l2, and neutral.

6. Replace ground wire and nut.



7. Close and lock power control box.

8. At power distribution box, remove tape from circuit breaker and set to ON.

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS, RELAY, FUSES,SWITCHES, AND INDICATORS

INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Electrical tape •Paper • Pen or pencil

NOTE

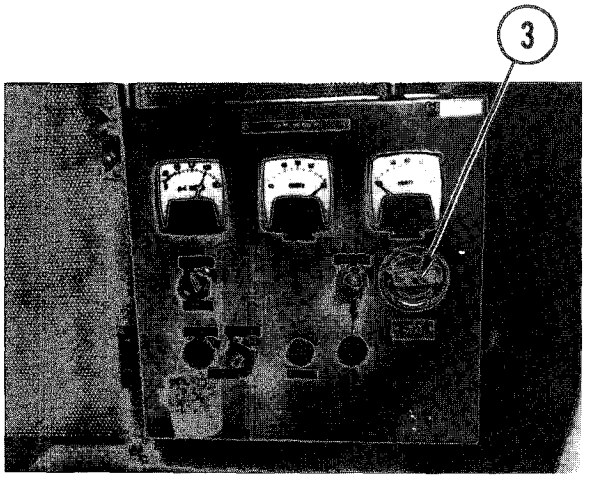
This procedure will tell you how to remove meters switches, buzzer, fault indicator, relay Kl, and fuses on power control box.

Remove

WARNING

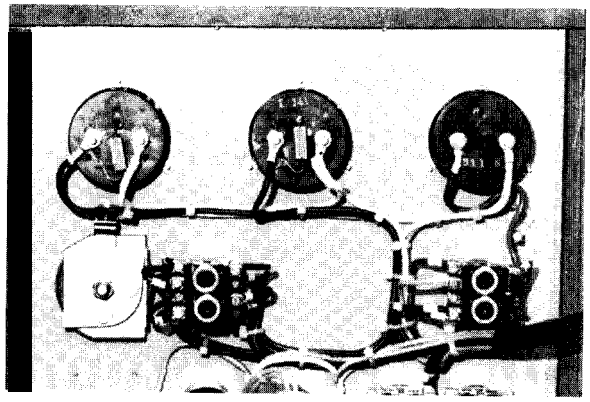
Electrocution may result if task is done with power on.

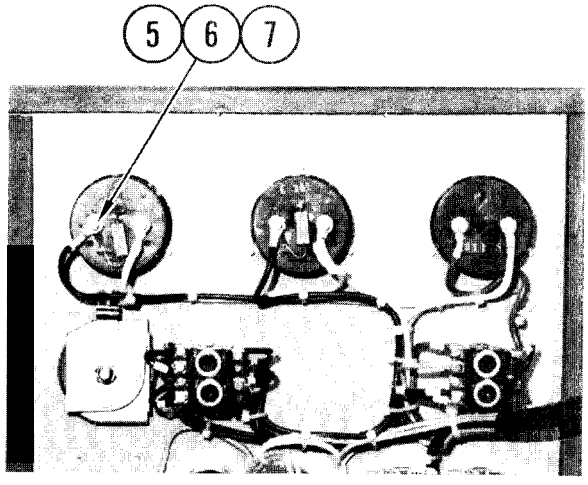
1. At power distribution box, set upper circuit breakers CBl (100 amp) and CB2 (60 amp) to OFF.
2. Place a strip of tape over each circuit breaker to indicate that a repair is in progress.

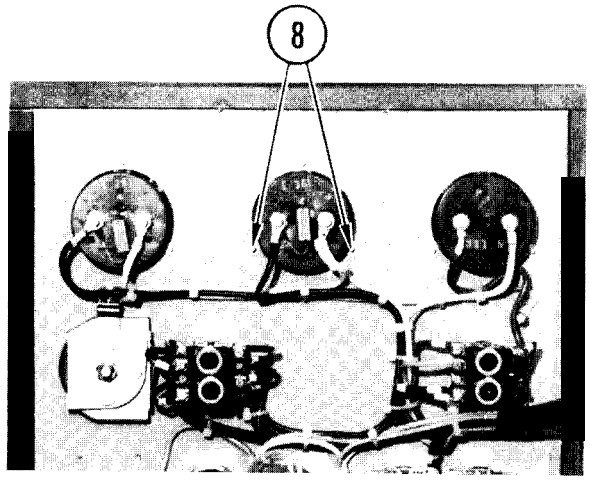


3. On front of power control box, turn latch to open.

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS. RELAY. FUSES. SWITCHES AND INDICATORS (CONT)







4. On back of power control box door. find meter. switch. buzzer, or light indicator you want to remove.

   - If you are removing meter, go to step 5
   - If you are removing switch, go to step 12
   - If you are removing buzzer, go to step 20
   - If you are removing fault indicator, go to step 26
   - If you are removing relay K1, go to step 32
   - If your are removing a fuse go to step 36

Meters

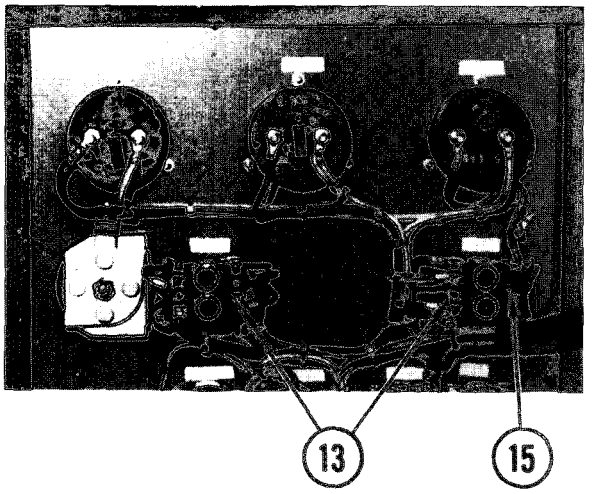
5. Use your scratch paper to note position of wires.
6. Remove nuts and washers from both posts.
7. Remove wires.

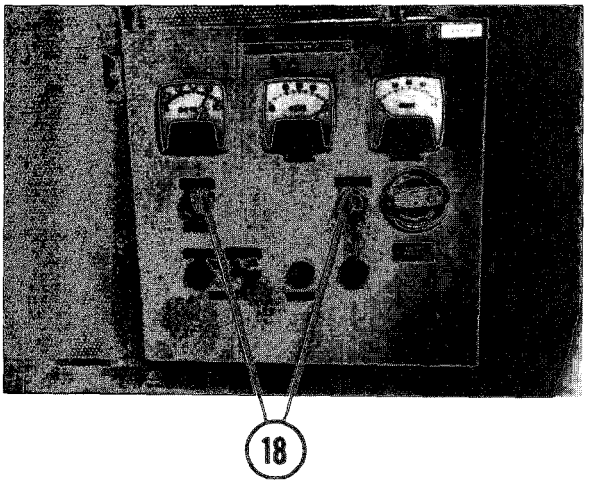
CAUTION

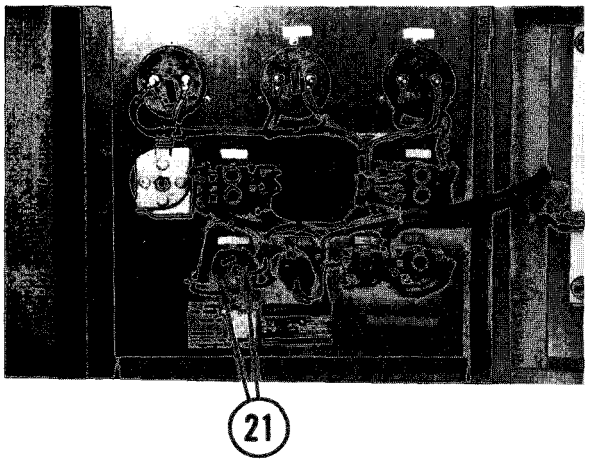
When last nut and washer are removed, meter can fall from front of power box door.

8. Remove two nuts and washers from two studs at sides of meter.
9. On front of power control box door, place hand on meter.
10. On back of power control door, remove remaining nut and washer from third stud.
11. Remove meter.

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS, RELAY, FUSES, SWITCHES AND INDICATORS (CONT)







Switches

12. Use your scratch paper to note position of wires,

13. Loosen screws connecting wires to switch.

14. Remove wires.

    - If you are removing phase switch, go to step 15
    - If you are removing pushbutton or key switches, go to step 16

15. Remove resistor from phase switch and set aside. Go to step 17.

16. On front of power control box door, find switch to be removed. If key is in lock, remove it.

17. While holding switch, unscrew knurled locking ring.

18. Take off plate.

19. Remove switch.

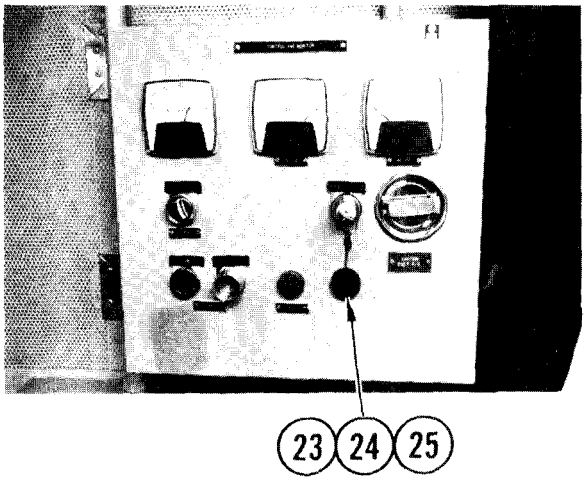
Buzzer

20. Use your scratch paper to note position of wires.

21. Remove two screws holding wires on buzzer.

22. Remove wires.

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS, RELAY, FUSES, SWITCHES AND INDICATORS (CONT)



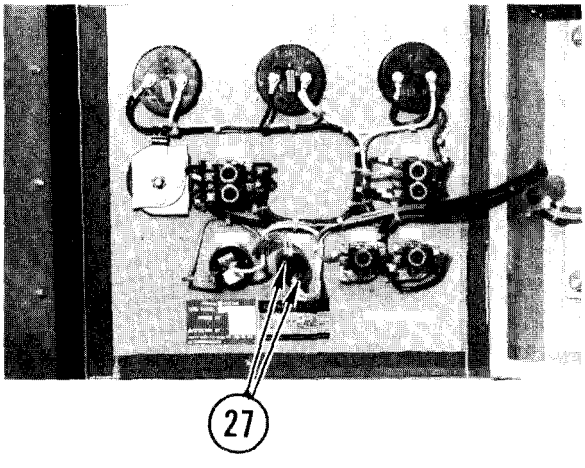
23. On front of power control box door, find knurled locking ring holding buzzer.

24. Hold buzzer and unscrew knurled locking ring.

25. Remove buzzer.

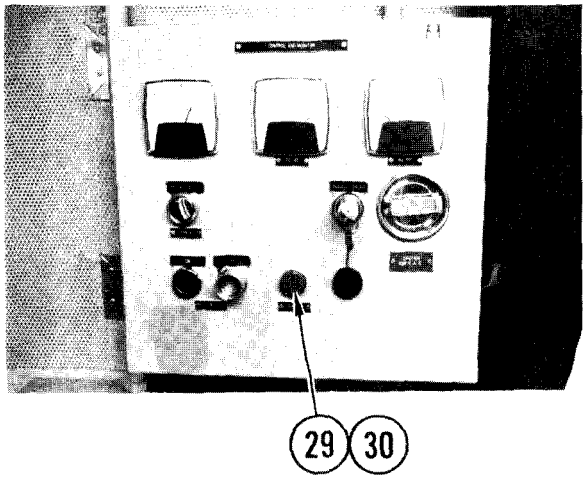
Fault Indicator

26. Use your scratch paper to note position of wires.



27. Remove two screws holding wires to fault indicator.

28. Remove wires.

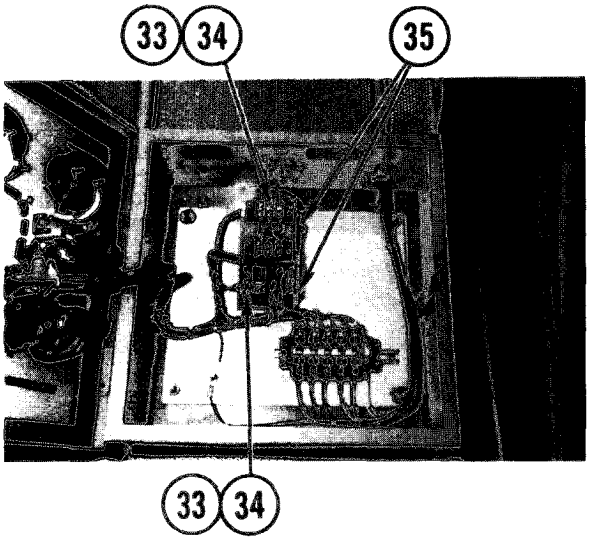


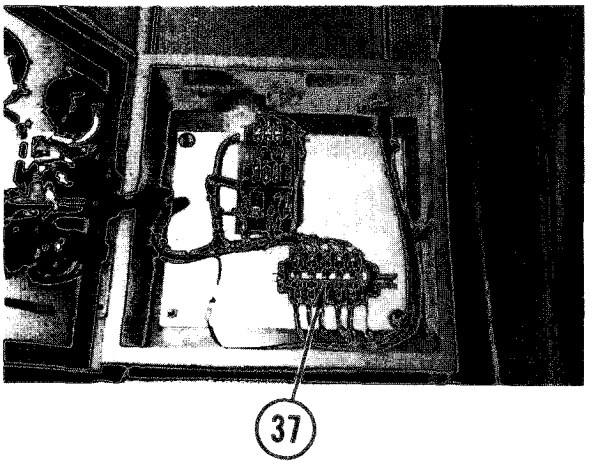
29. On front of power control box door, find knurled locking ring that covers fault indicator.

30. While holding fault indicator, unscrew and remove knurled locking ring and washer.

3l. Remove fault indicator.

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS, RELAY, FUSES, SWITCHES AND INDICATORS (CONT)





Relay K1

32. Use your scratch paper to note position of wires.

33. Loosen or remove screws connecting wires to relay and terminals.

34. Remove wires.

35. Remove three mounting screws, lockwashers and washers and remove relay Kl from rear panel.

Fuse(s)

36. Locate defective fuse(s).

37. Pull fuse(s) from fuseholder clips.

NOTE

This procedure tells you how to replace meters, switches, buzzer, fault indicator, relay Kl, and fuses on power control box.

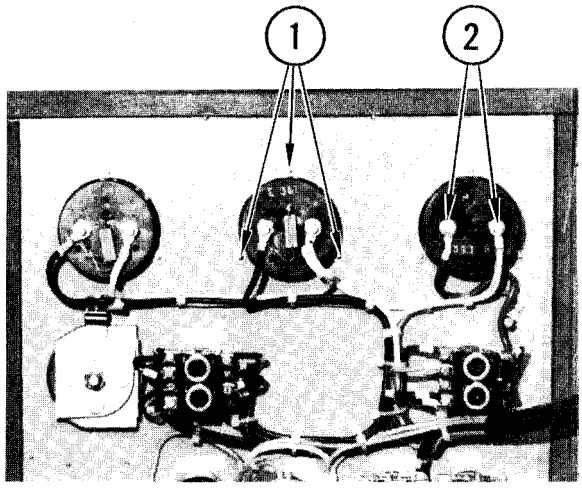
Replace

NOTE

Replace items as follows:

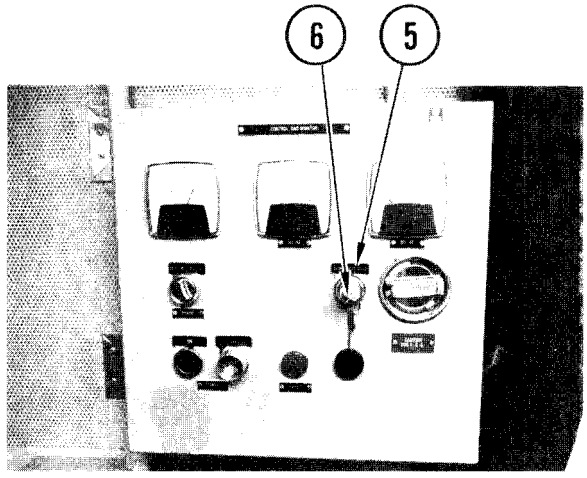
- If you are replacing a meter, go to step 1
- If you are replacing a switch, go to step 4
- If you are replacing the buzzer, go to step 10
- If you are replacing the fault indicator, go to step 13
- If you are replacing relay K1, go to step l6
- If you are replacing a fuse, go to step 19

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS, RELAY, FUSES, SWITCHES AND INDICATORS (CONT)



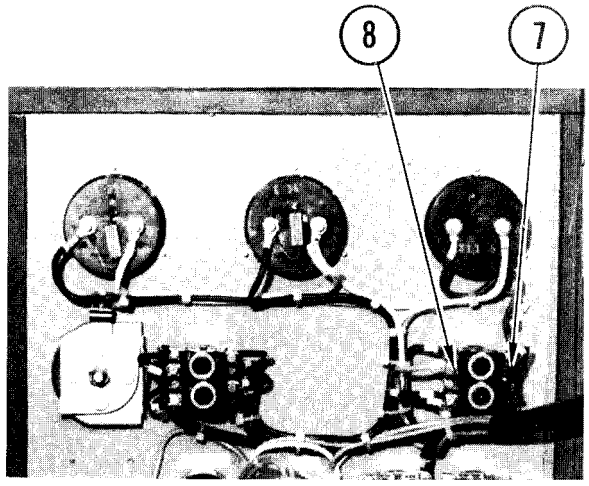
Meters

1. Install meter in door. Put washer and nut on each mounting stud and tighten.
2. Use your notes to replace wires on post. Install washers, nuts, and tighten.
3. Go to step 20.



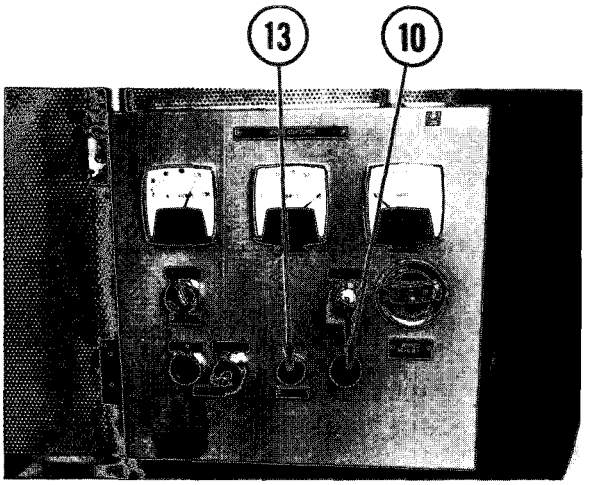
Switches

4. Install switch in door.
5. Put on switch plate.
6. Spin on locking ring and tighten.



7. If switch is phase selector, install resistor on rear terminals.
8. Use your notes to replace wires. Tighten screws.
9. Go to step 20.

4-87. REMOVE/REPLACE POWER CONTROL BOX METERS, RELAY, FUSES, SWITCHES AND INDICATORS (CONT)



Buzzer

10. Install buzzer in door, spin on locking ring and tighten.

11. Use your notes to install wires, replace screws and tighten.

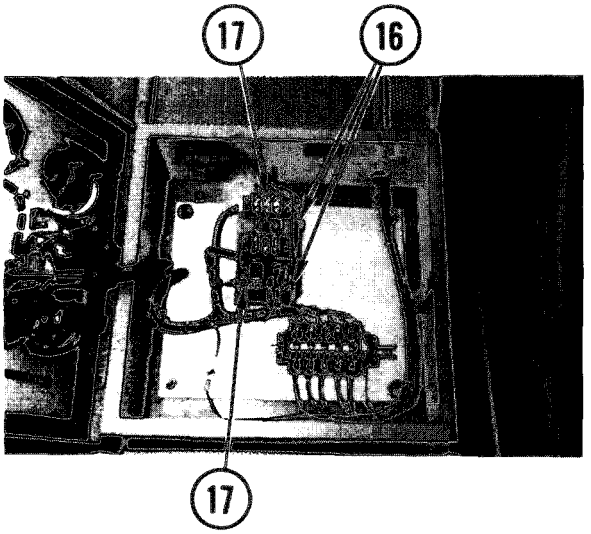
12. Go to step 20.

Fault Indicator

13. Install fault indicator in door. Put on washer, spin on and tighten knurled locking ring.

14. Use your notes to replace wires. Tighten screws.

15. Go to step 20.

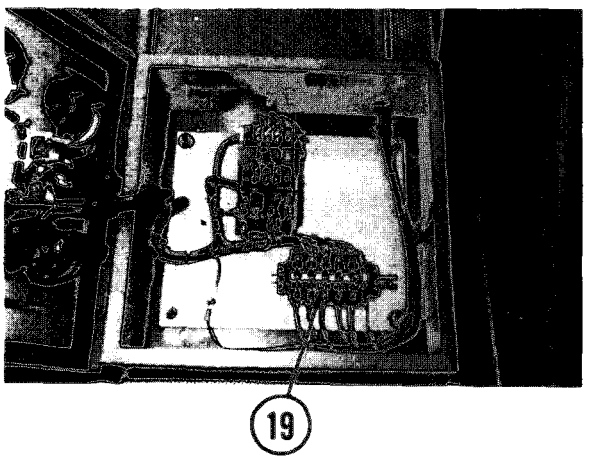


Relay

16. Position relay Kl on rear panel and secure in position with three screws and washers.

17. Using your notes to install wires, replace and tighten screws.

18. Go to step 20.



Fuse(s)

19. Replace fuse(s) in fuseholder clips. make sure proper fuse is in position before turning on power.

20. Close power control box door and turn latch to lock.

2l. At power distribution box, remove tape strips from CBl (100 amp) and CB2 (60 amp).

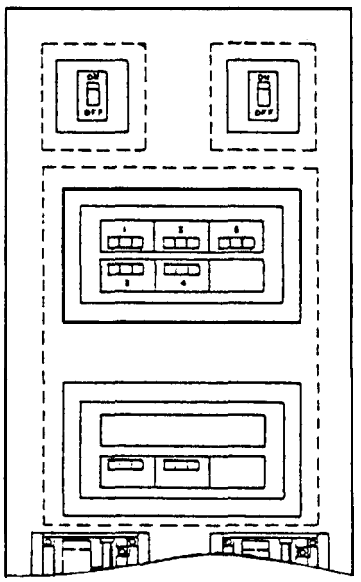
22. Set CBl and CB2 to ON and close door.

4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER

INITIAL SETUP

Common Tools
- Tool kit
- Worklight

Personnel Required
- Two



WARNING

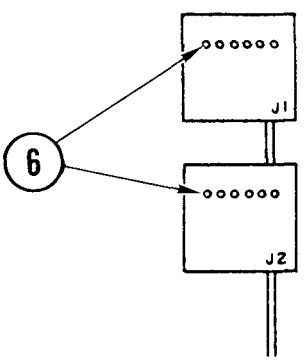
Electrocution can result if this procedure is attempted with power ON.

NOTE

This procedure requires a worklight from a power source other than van power.

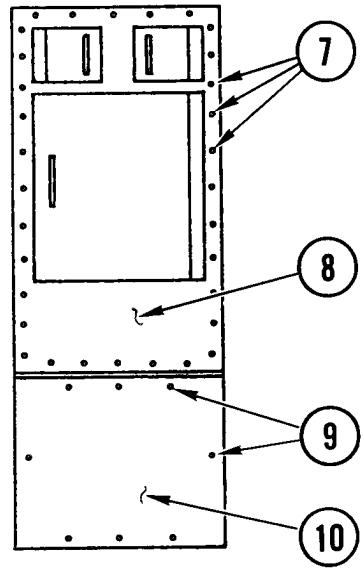
Remove

1. Shutdown all van equipment.
2. Power OFF all van equipment.
3. Set up worklight.
4. Power OFF all power distribution box circuit breakers.
5. Power OFF external power source and disconnect ac power cables from van (TM 11-7010-205-10).



6. Check that all indicators on power arrestor boxes are off.

4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER (CONT)



7. While partner supports top front cover, remove all mounting screws.

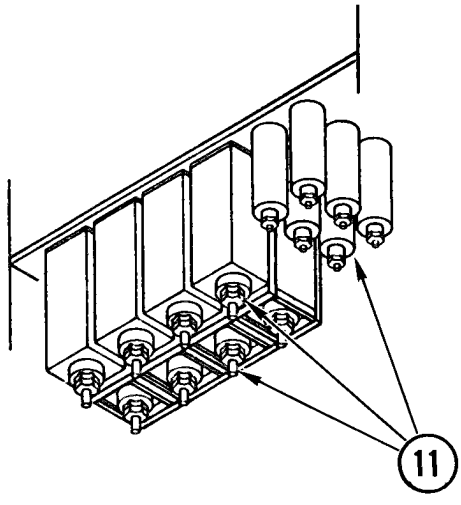
8. With help from partner, remove top front cover.

9. While partner supports bottom front cover, remove all mounting screws. Remove bottom front cover.

WARNING

Hazardous voltages can exist on filter terminals within the filter box. Make sure that filters are discharged before performing any maintenance.

10. Discharge all filters.



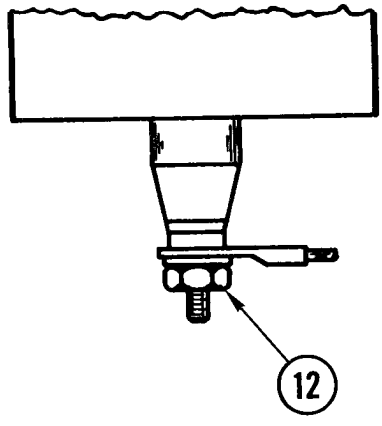
11. Inside lower cabinet, find filter to be removed.

NOTE

To remove a small filter, use steps 12 thru 16.

To remove a large filter from front row, use steps 17 thru 23.

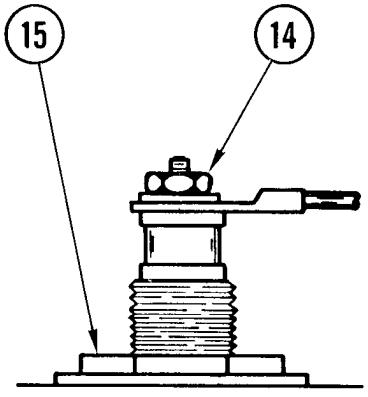
To remove a large filter from back row, use steps 17 thru 29.



12. On bottom of small filter, remove nut, washer, and wire lug. Save hardware.

13. On bottom of upper cabinet, find filter being removed.

4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER (CONT)



Remove nut, washer, and wire lug. Save hardware.

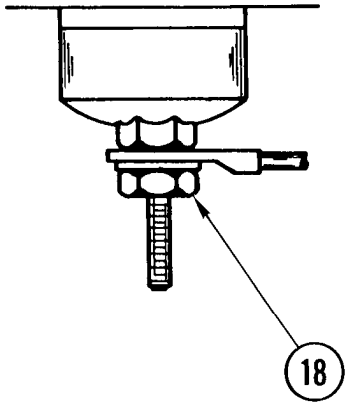
Loosen and remove nut and washer.

16. Remove filter from bottom cabinet.

NOTE

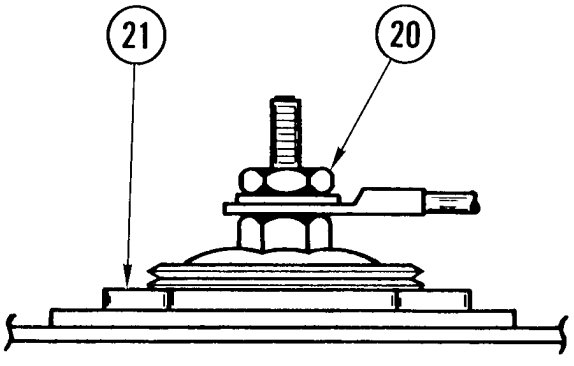
Use steps 17 thru 23 to remove a large front row filter or to remove the filter in front of a back row filter that is to be replaced.

17. In bottom cabinet, find large filter to be removed.



18. Remove nut, washer, and wire lug (may be two wire lugs). Tag wire(s) and save hardware.

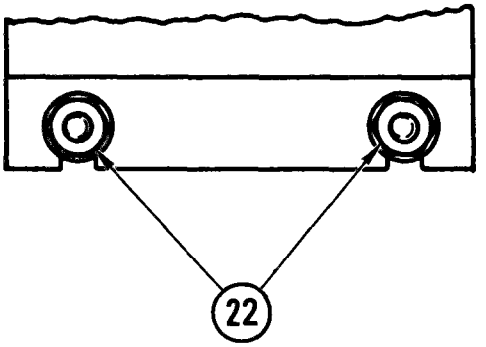
19. On bottom of upper cabinet, find filter being removed.



20. Remove nut, washer, and wire lug.

21. Loosen and remove conduit nut and spacer.

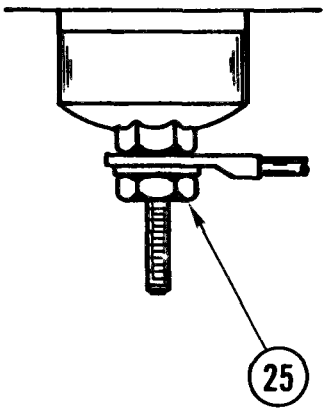
4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER (CONT)



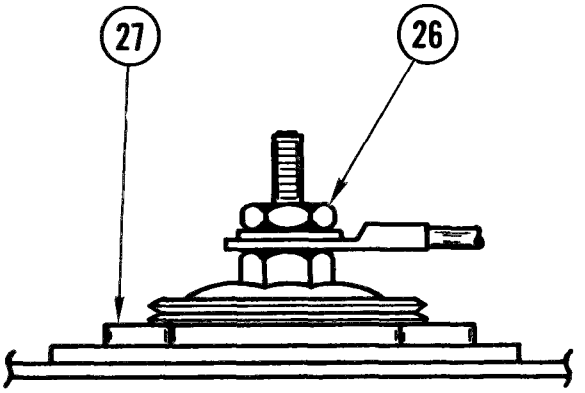
22. In bottom cabinet, support filter and remove mounting nuts and washers.

23. Remove filter from bottom cabinet.

24. If not removing filter from back row, go to Replace.



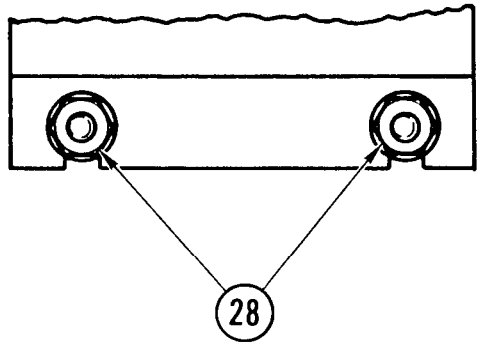
25. In bottom cabinet, remove nut, washer, and two wire lugs; tag wires.



26. On bottom of upper cabinet, remove nut, washer, and two wire luqs; tag wires.

27. Loosen and remove conduit nut and spacer.

4-88 REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER CONT)



28. In bottom cabinet, support filter and remove standoffs.

29. Remove filter and spacer from bottom of cabinet.

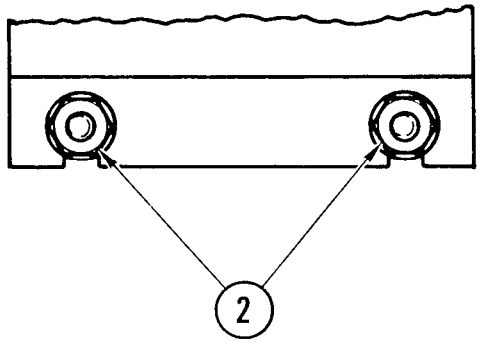
Replace

NOTE

To replace a large back row filter, use steps 1 thru 13 and steps 18 thru 24.

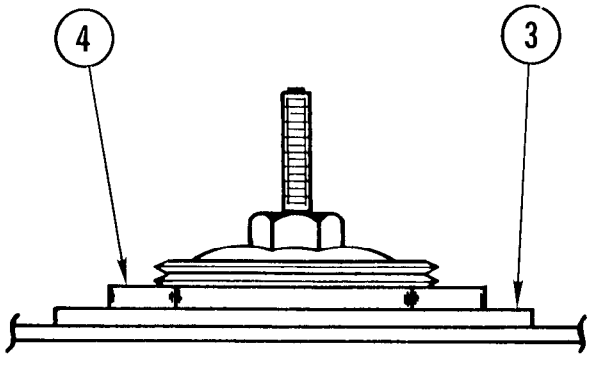
To replace a large front row filter, use steps 7 thru 13 and steps 18 thru 24.

To replace a small filter, use steps 14 thru 24.



1. Hold filter in bottom cabinet with threads up through rear mounting hole.

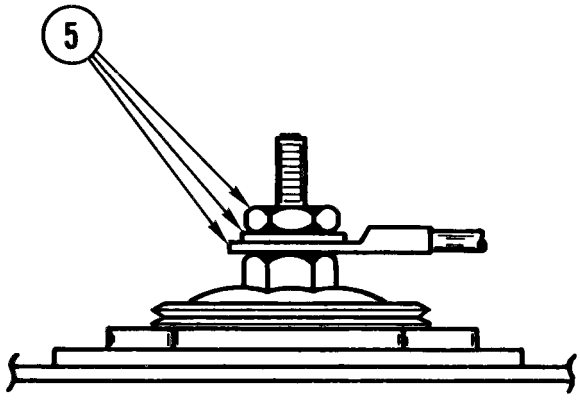
2. Install standoffs.



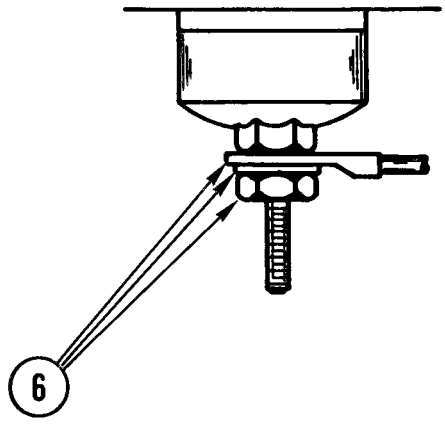
3. On bottom of upper cabinet, position spacer.

4. Install conduit nut on filter.

4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER (CONT)

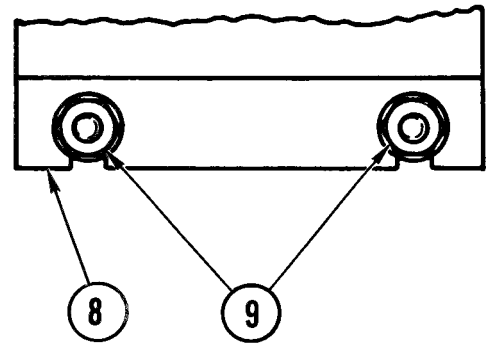


5. Install wire lug, washer, and nut. Hold nut on top of filter while tightening nut.



6. In bottom cabinet, install two wire lugs, washer, and nut. Hold nut on filter while tightening nut.

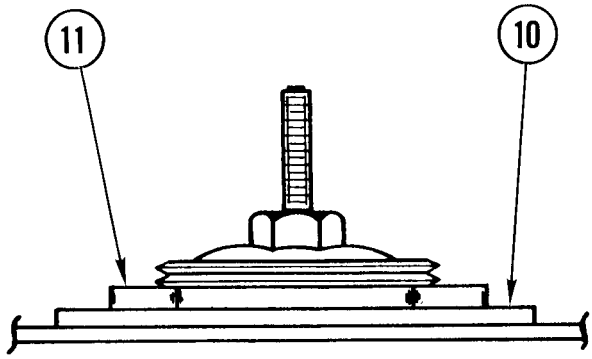
7. Hold front filter in bottom cabinet with threads up through mounting hole.



8. Seat filter on standoffs.

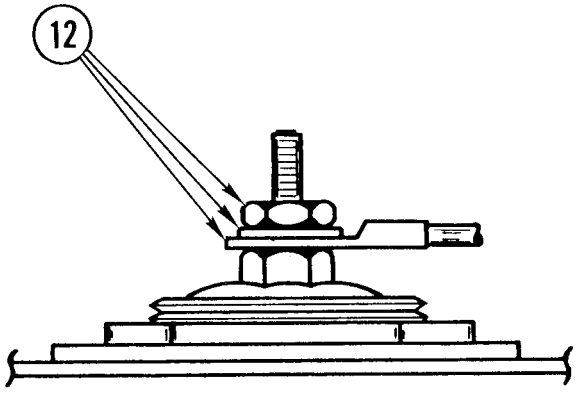
9. Install washers and nuts on standoffs.

4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER (CONT)

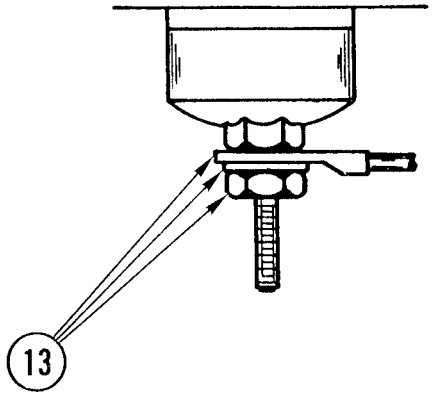


10. On bottom of upper cabinet, position spacer plate.

11. Install conduit nut on filter.

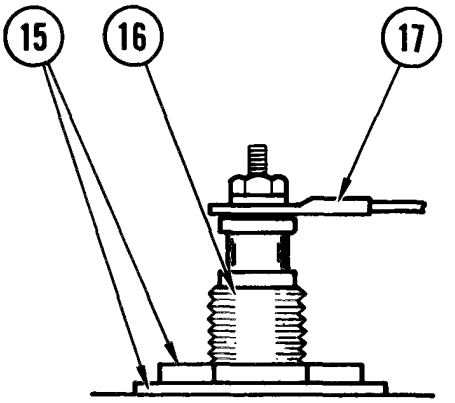


12. Install wire lug (may be two wire lugs), washer, and nut. Hold nut on top of filter while tightening nut.



13. In bottom cabinet, install wire lug, washer, and nut. Hold nut on filter while tightening nut. Go to step l9.

4-88. REMOVE/REPLACE POWER DISTRIBUTION BOX FILTER (CONT)

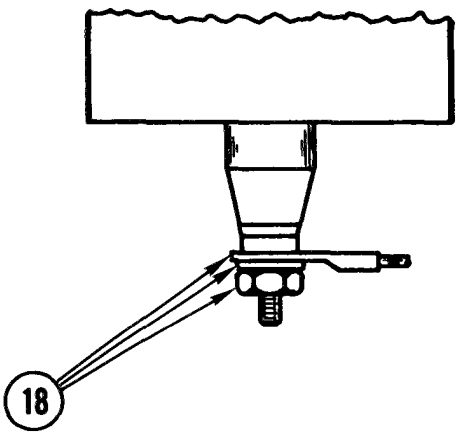


14. To install small filter, hold threaded top end up through mounting from bottom cabinet.

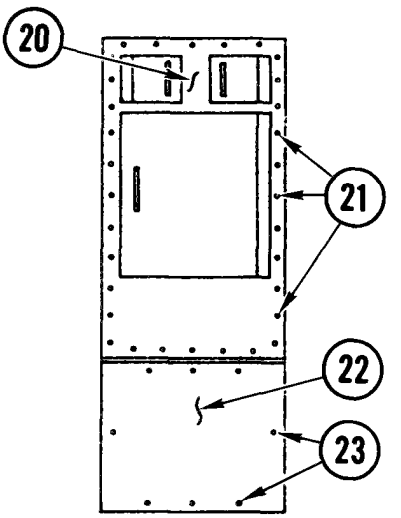
15. Install lockwasher and nut.

16. Hold filter across flats on threaded bushing while tightening nut.

17. Install wire lug, washer, and nut.



18. Install wire lug, washer, and nut.



19. When all filters are installed, continue with the following steps.

20. With partner, place top front cover on cabinet.

21. While partner supports cover, install all cover mounting screws.

22. Place bottom front cover on cabinet.

23. While partner supports cover, install all cover mounting screws.

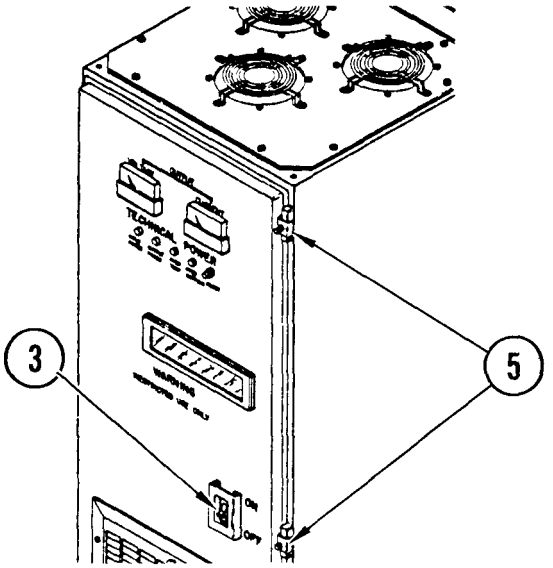
24. Connect ac power cables to van and power ON external power (TM 11-7010-205-10).

25. Power ON van and restore to normal operation.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER

INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required	Support Equipment
• Tool kit	• Tie wraps • Cardboard • Electrical tape • Paper • Pen or pencil	• Two	• Hydraulic hand truck



Remove

1. If cable reels are stored in vestibule, remove them and place outside van.
2. Remove vestibule door and place outside van.

WARNING

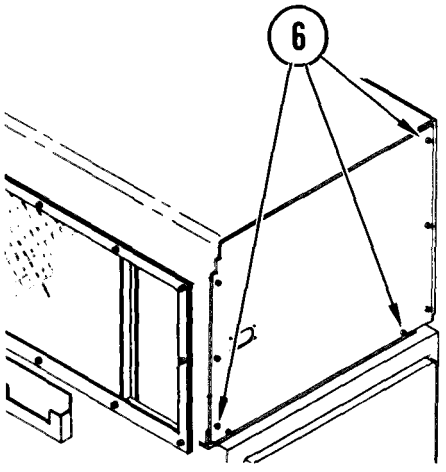
Electrocution may result if task is attempted with power on. Make sure power is off for one minute or longer before working inside the cabinet. High voltage is present at the input terminal blocks, at the input transformer, and at the rear of the front panel meters and indicators until the capacitors are discharged. During this time, contact with the terminals, indicators, or meters could cause serious injury or death.

CAUTION

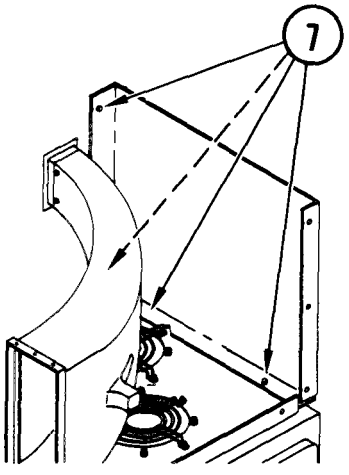
Damage to ADP equipment may result if technical power is cut with ADP subsystem in operation. Make sure ADP equipment is powered OFF.

3. Power OFF frequency converter.
4. Set CB2 in power distribution box to OFF. Place strip of tape over circuit breaker to indicate that repair is underway.
5. Loosen screws, slide three door clamps to the right, and open door.

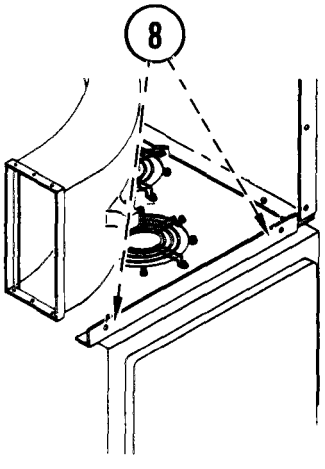
4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)



6. Remove screws holding duct plate. Remove duct plate.

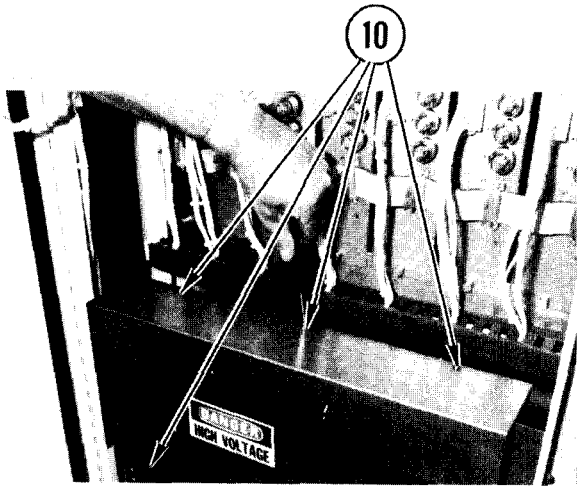


7. Remove wall screws with spacers and base angle screws and remove side plate. Use these screws to refasten top plate and fans for shipment.



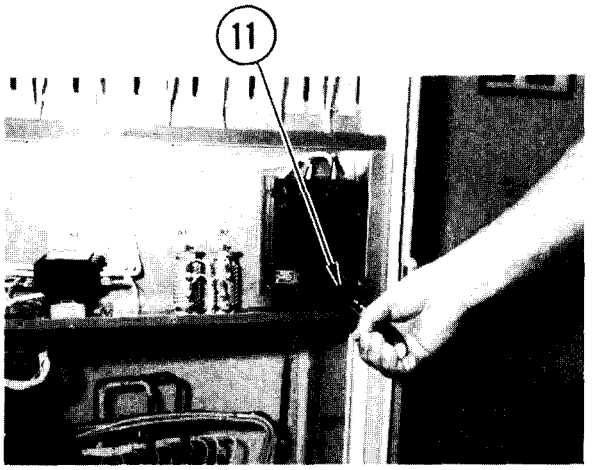
8. Remove screws and remove front angle.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)

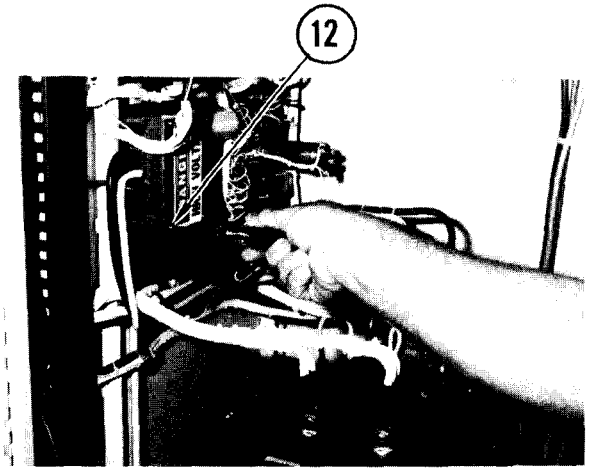


9. Tag front angle and side plate for reinstallation.

10. Remove screws from input power assembly cover and remove cover.

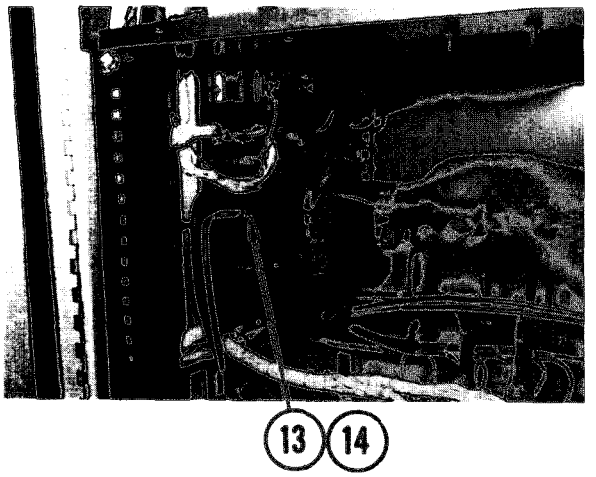


11. Using your scratch paper, note positions of wires. Loosen three screws in bottom of circuit breaker and pull out three wires. T ouch exposed ends to ground stud to discharge capacitors.



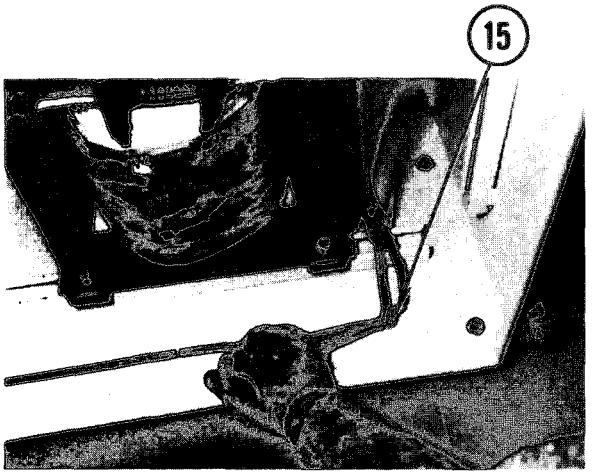
12. Remove four screws and remove TBl cover.

4-439. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)

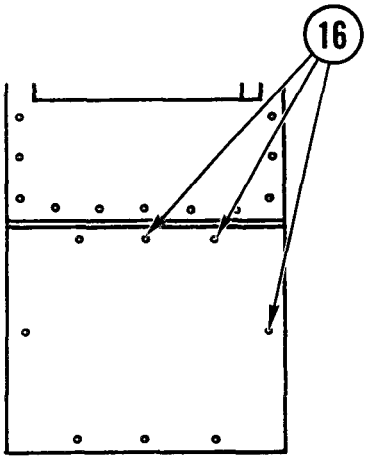


13. Using your scratch paper, note positions of wires. Loosen top two screws and remove wires.

14. Tighten top two screws and replace TB1 cover.



15. Remove nut and washer on ground stud and remove top ground wire from stud. Replace nut and washer and tighten.

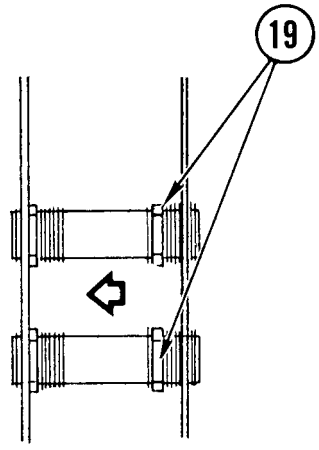


16. Remove screws, washers, and lock-washers holding the bottom plate of the power distribution box and remove bottom plate.

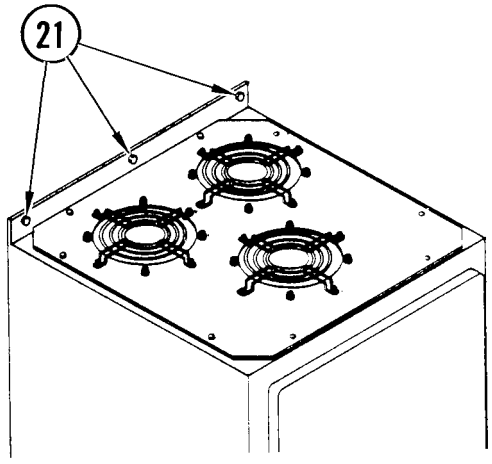
4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)

17. Cut tie wraps, then pull six wires from the frequency converter through nipples on right side panel and store in the bottom of the power distribution box. Tape bare ends of the wires.

18. Remove the plastic protectors from each nipple and remove retaining nut.



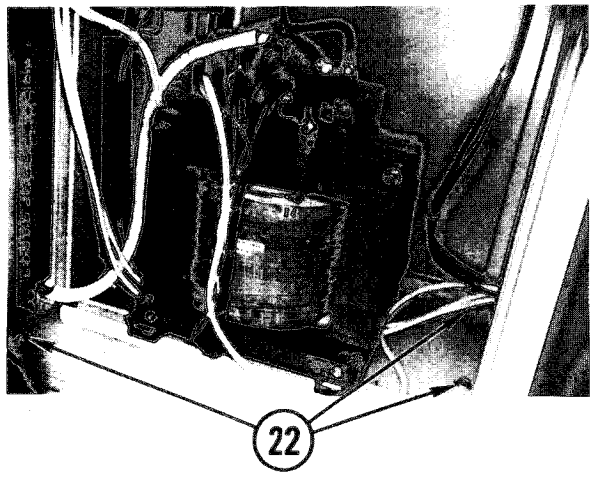
19. Loosen outer retaining nuts and slide nipples into power distribution box.



20. Replace bottom plate of power distribution box and fasten with hex screws.

21. Remove flange bolts, washers, lockwashers, and spacers securing frequency converter to wall.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)



22. Remove the bolts, washers, and lockwashers securing the frequency converter to the floor.

WARNING

The frequency converter weighs approximately 700 pounds. Handle with care. Do not move without help and proper support equipment.

23. Spread cardboard on floor and slide frequency converter to rear door with the back facing the door.

CAUTION

The rear platform cannot support the weight of the frequency converter. Either provide adequate support for the platform or remove the platform (see TM 9-2330-362-P).

24. Tilt the frequency converter so the truck forks go under the frequency converter.

25. Tilt truck and frequency converter and slowly pull it from van.

26. Replace vestibule door.

Replace

1. Remove vestibule door and set aside.
2. If cable reels are stored in vestibule, remove them.

CAUTION

The rear platform cannot support the weight of the frequency converter. Either provide adequate support for the platform or remove the platform (see TM 9-2330-362-P).

3. Bring frequency converter to rear platform, using either a hydraulic hand truck or a fork lift truck.
4. Remove four lifting eyes from top of frequency converter.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)

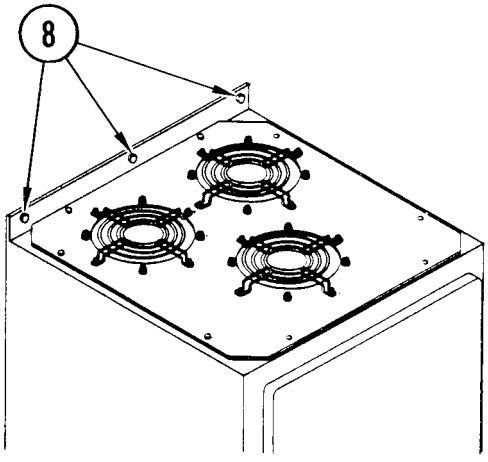
5. If frequency converter is skid mounted, open door and remove four lag screws holding skid to frequency converter.

NOTE

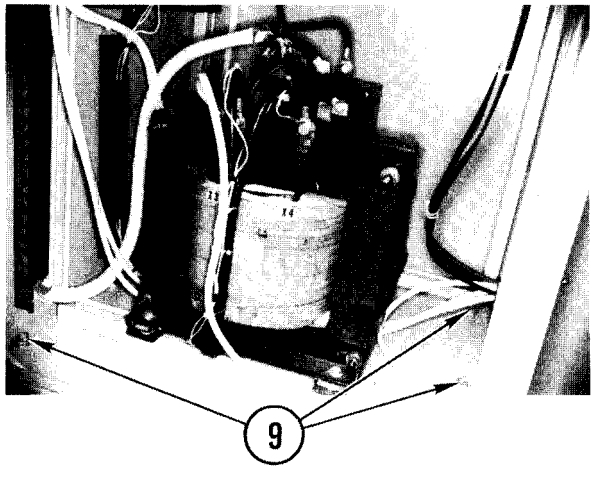
Floor of vestibule has a non-skid surface. Place cardboard or other material on floor to make it easier to slide unit across floor.

6. Move frequency converter so that holes in back panel flange line up with spring nuts in van wall.

7. Slide frequency converter back until back panel flange is against wall, and holes in frequency converter floor line up with holes in van floor.

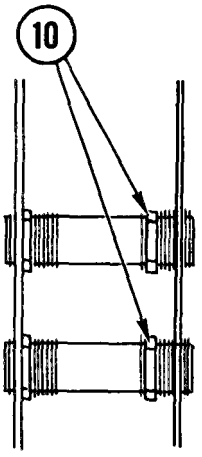


8. Insert flange bolts, washers, lockwashers, and spacers and fasten frequency converter to wall.

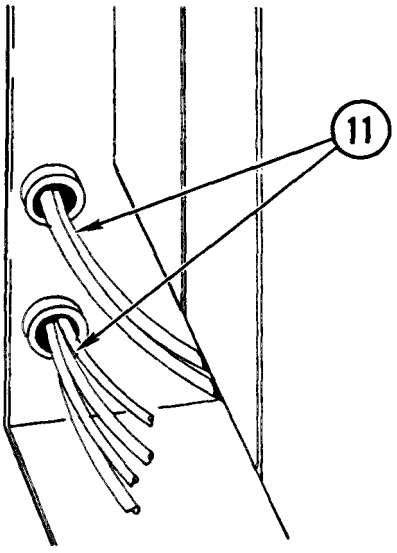


9. Insert bolts, washers, and lockwashers and fasten frequency converter to van floor.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)

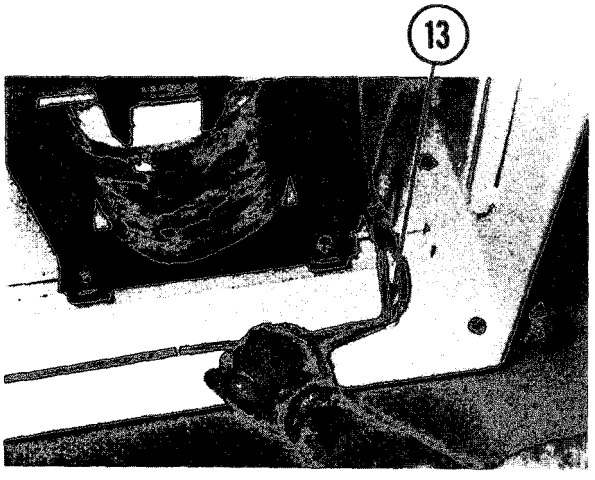


10. Remove bottom plate to access power distribution box. Place nipples between frequency converter and power distribution box, and fasten with retaining nuts. Cap each end of nipples with plastic end pieces.



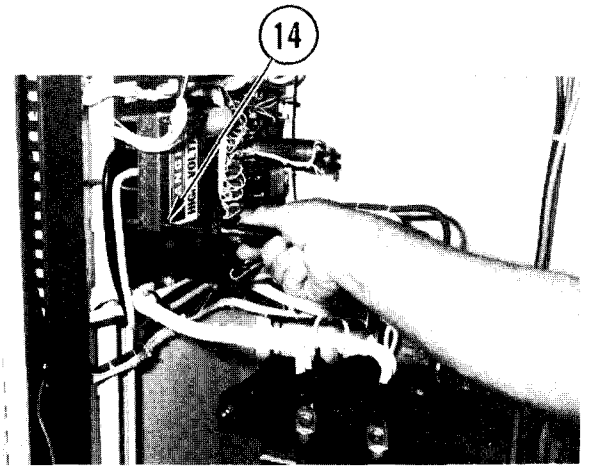
11. Bring six wires from power distribution box through nipples.

12. Replace bottom access plate on power distribution box. Tighten screws, washers, and lockwashers.

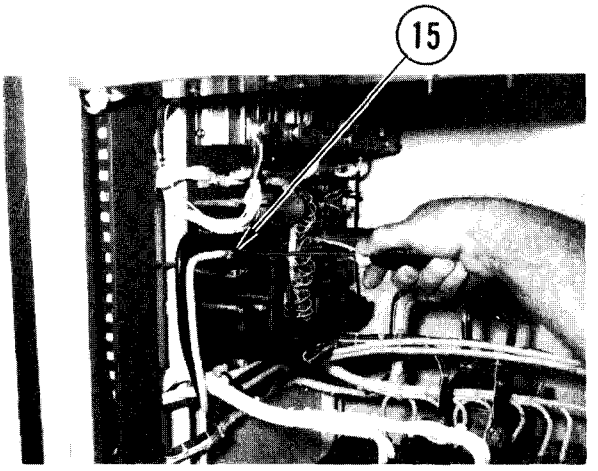


13. Connect green ground lead to ground stud of frequency converter. Tighten nut and lockwasher.

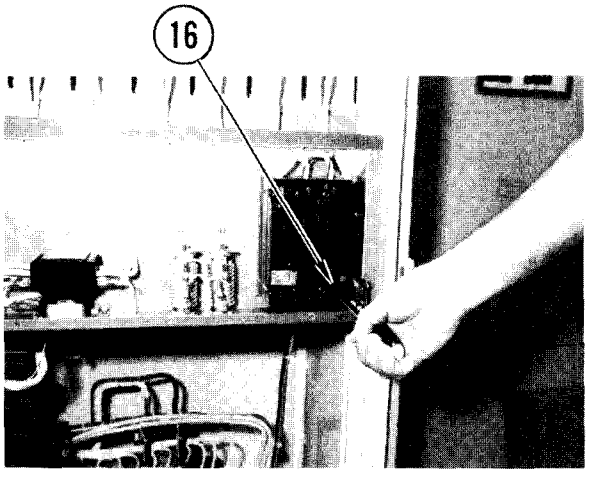
4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)



14. Remove four screws, washers, and lockwashers holding cover on TB1. Remove cover.

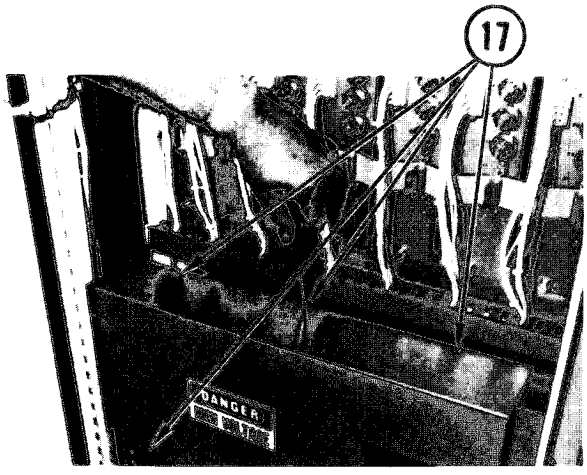


15. Loosen retaining screws. Using your notes, attach wires to TB1. Tighten retaining screws. Replace cover on TB1.



16. Loosen retaining screws in bottom of CB1. Using your notes, attach wires to CB1. Tighten retaining screws.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)



17. Replace cover. Insert screws and washers and tighten.

18. Dress wires together and bundle with tie wraps. Make sure that all wires are tied together, and that they do not interfere with entry or rub against other components.

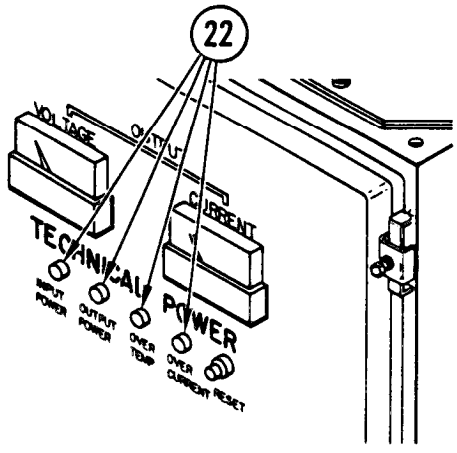
19. Remove any protective tape and wrappings.

20. Close frequency converter door. Slide on latches. Tighten screws.

CAUTION

Damage to ADP equipment may result if technical power is applied at CB2 with ADP equipment powered ON. Make sure all ADP is powered OFF.

21. Set CB2 in power distribution box to ON, and check for any evidence of burning or charring.



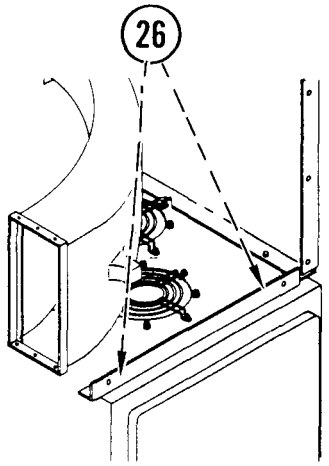
22. Power ON frequency converter. Check that:

- Fans start rotating
- INPUT POWER Indicator lights
- OUTPUT POWER indicator lights
- OVERTEMP indicator lights, then goes out

23. Power OFF frequency converter.

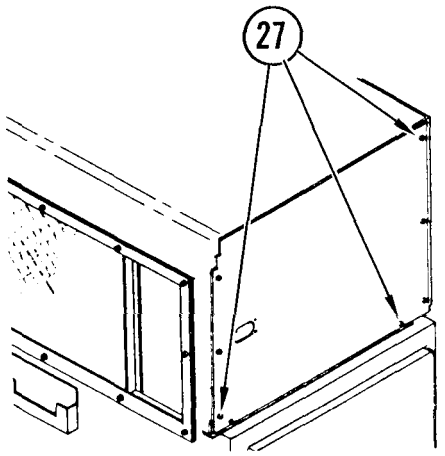
24. Remove two front and two right-hand-side screws from top plate of frequency converter.

4-89. REMOVE/REPLACE FREQUENCY CONVERTER (CONT)



25. Replace side plate. Replace wall screws with spacers and base angle screws.

26. Attach front angle to top of frequency converter. Fasten side plate to right side of frequency converter. Use screws and spacers removed from top plate.



27. Put duct plate in place and fasten to front angle, top angle, wall angle, and side plate.

28. Replace vestibule door.

29. If cable reels and cables had been in van, replace them.

30. Power ON frequency converter.

4-90. REMOVE/REPLACE FREQUENCY CONVERTER BLOWER

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil

NOTE

There are three blowers. Use these steps to remove/replace any of them.

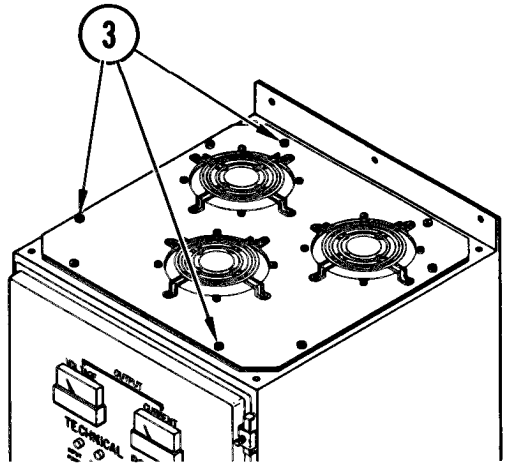
Remove

1. Power OFF frequency converter.
2. Remove duct plate and side plate (para 4-89, Remove, steps 4-9).

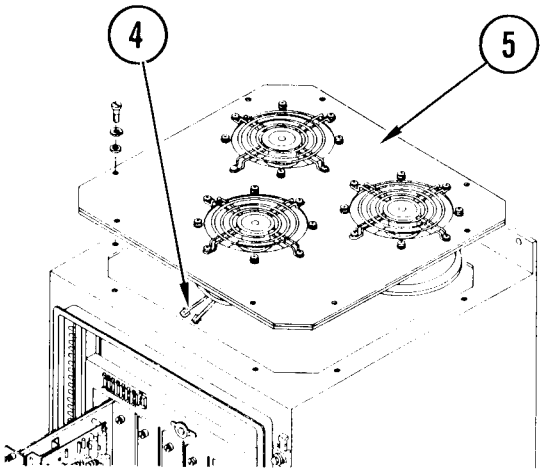
CAUTION

Do not let loose parts fall into device during removal. Loose metal can cause a short circuit and damage equipment.

3. Remove screws.

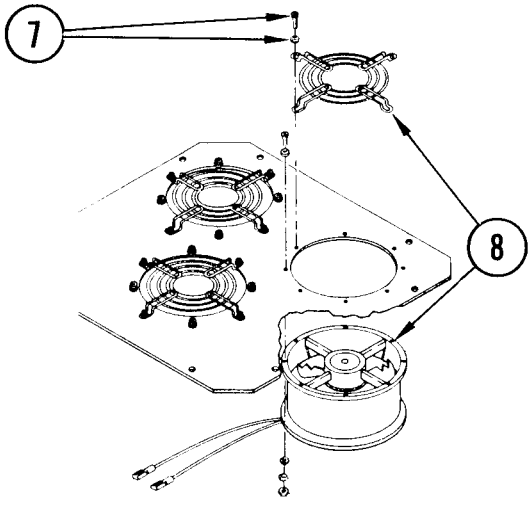


4-90. REMOVE/REPLACE FREQUENCY CONVERTER BL0WER (CONT)



4. Tag and remove blower leads from terminal block.

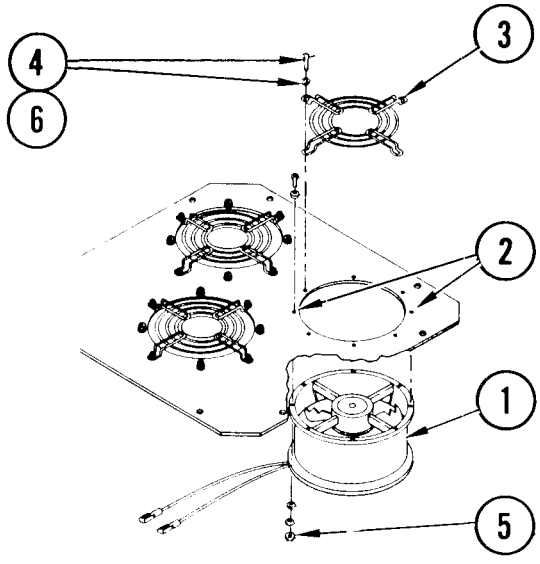
5. Lift blower assembly up and out of device.



6. Set blower assembly on table.

7. Note direction of air flow arrow and remove screws, nuts, and washers. Cut tie wraps.

8. Remove grille and blower from assembly.



Replace

1. Set blower in assembly so ac power connector faces same direction as on other blower fans. Make certain air flow arrow points in same direction as arrows on other fans.

2. Line up holes in b lower with holes in assembly.

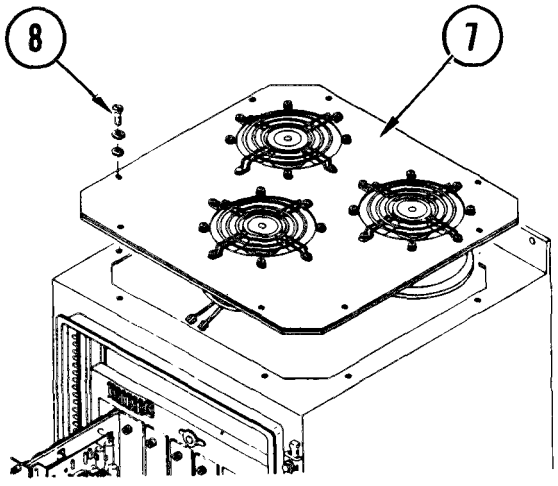
3. Set grill in place as shown.

4. Insert screws with washers.

5. Set washer on screw and twist on nut. Repeat for all remaining screws.

6. Tighten all screws.

4-90. REMOVE/REPLACE FREQUENCY CONVERTER BLOWER (CONT)



7. Lift blower assembly and set on device as shown.

8. Insert and tighten screws.

9. Replace diffuser, grille, front angle, side plate, and duct plate (para 4-89 Replace, steps 25-27).

10. Inside device, refer to wire tags and replace blower leads on terminal block. Match blower lead numbers to terminal block numbers.

11. Close cover. Push on latches. Tighten latch screws.

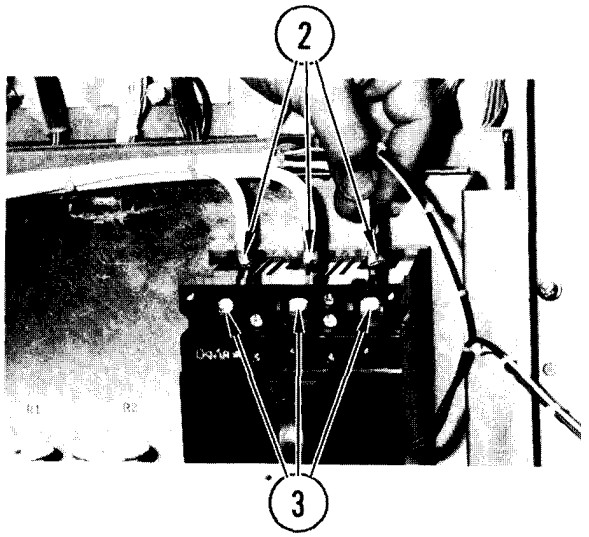
12. Power ON frequency converter.

4-91. REMOVE/REPLACE FREQUENCY CONVERTER CIRCUIT BREAKER

INITIAL SETUP

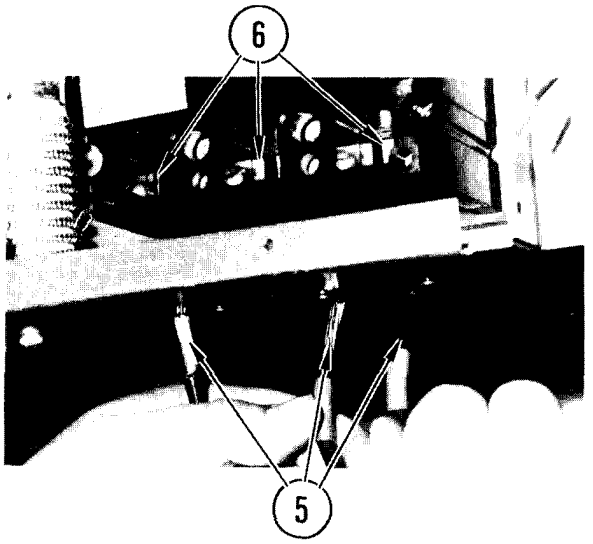
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pen or pencil



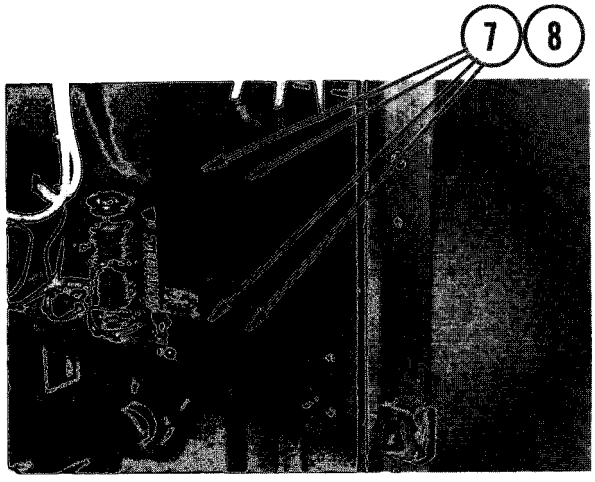
Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5 and 10).
2. Using your scratch paper, note positions of wires to top of circuit breaker.
3. Loosen lug screws. Pull out wires.
4. Remove interlock switch (para 4-92, Remove, steps 2, 3).



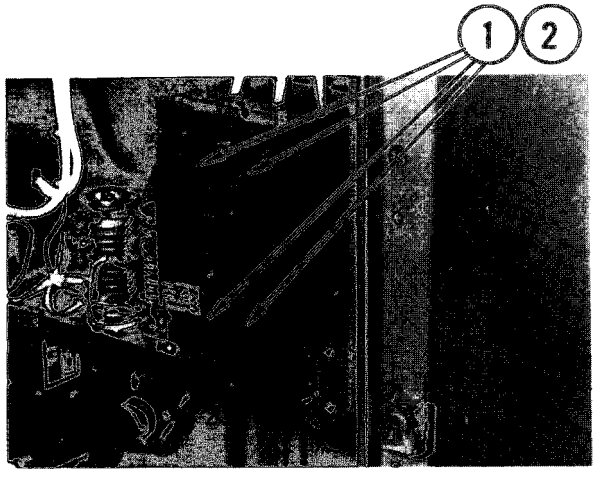
5. Using your scratch paper, note positions of wires to bottom of circuit breaker.
6. Loosen lug screws. Pull out wires. Touch exposed ends to ground to discharge capacitors.

4-91. REMOVE/REPLACE FREQUENCY CONVERTER CIRCUIT BREAKER (CONT)



7. Remove four screws, nuts, and washers.

8. Pull out circuit breaker.



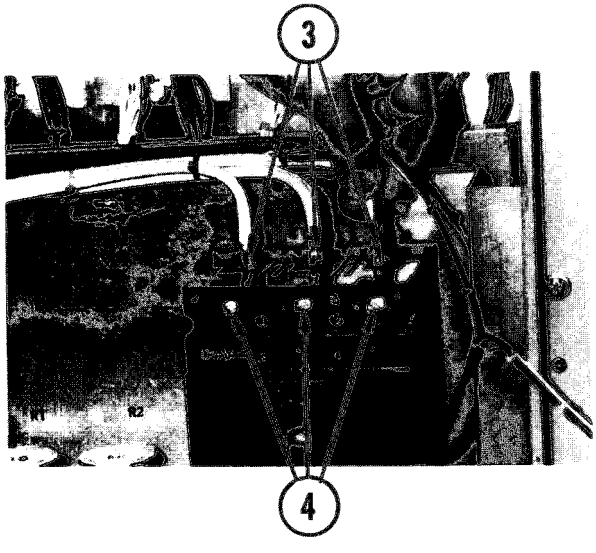
Replace

1. Set circuit breaker assembly in place so holes line up with holes in insulation board and frame.

NOTE

Use an alinement pin or long thin screwdriver to keep holes in line.

2. Push in screws. Set washers on screws. Turn on and tighten nuts.

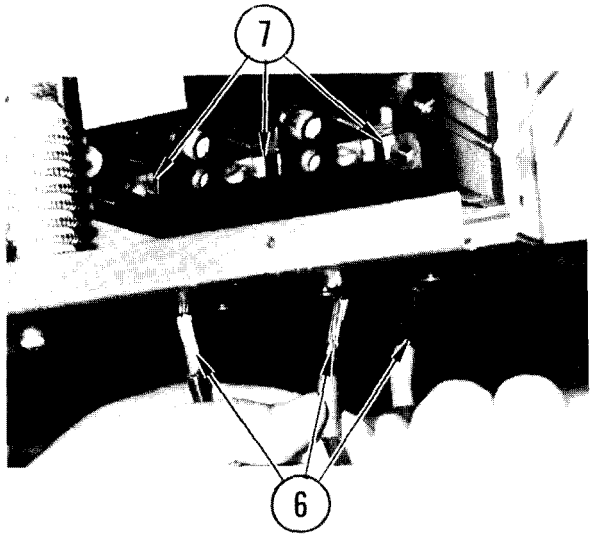


3. Using your notes, push wires into top of circuit breaker.

4. Tighten lug screws.

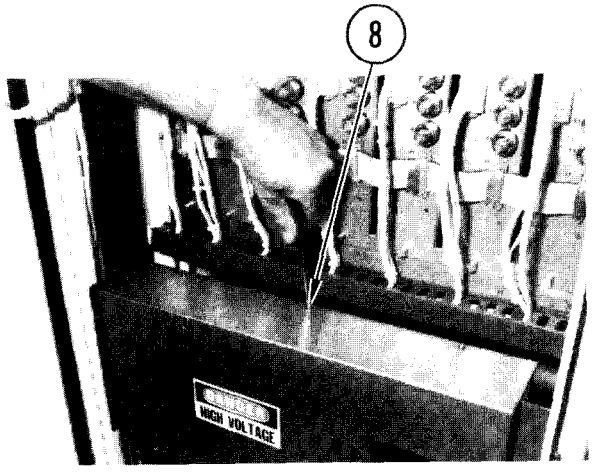
5. Replace and adjust interlock switch (para 4-92, Replace, steps 1-5).

4-91. REMOVE/REPLACE FREQUENCY CONVERTER CIRCUIT BREAKER (CONT)



6. Using your notes, push wires into bottom of circuit breaker.

7. Tighten lug screws.



8. Set cover in place. Insert and tighten screws.

9. Close door. Slide on latches. Tighten screws.

10. At power distribution box, set CB40 circuit breaker ON.

11. Power ON frequency converter.

4-92. REMOVE/REPLACE/ADJUST FREQUENCY CONVERTER INTERLOCK SWITCH

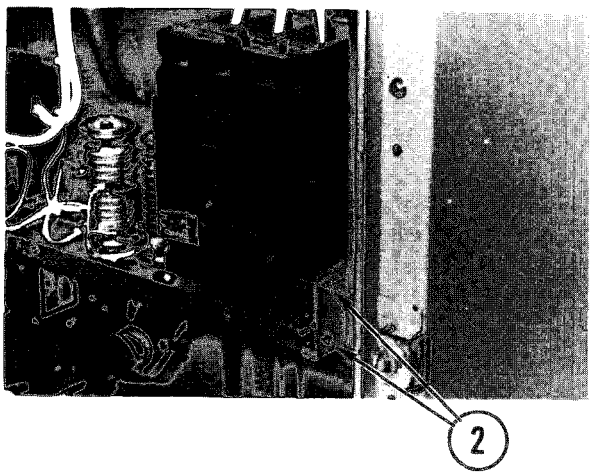
INITIAL SETUP

Common Tools
- Tool kit

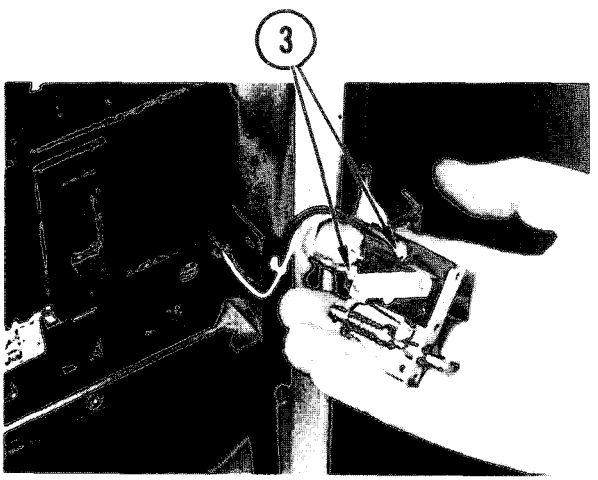
Material/Spare Parts
- Paper
- Pen or pencil

Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5 and 10).

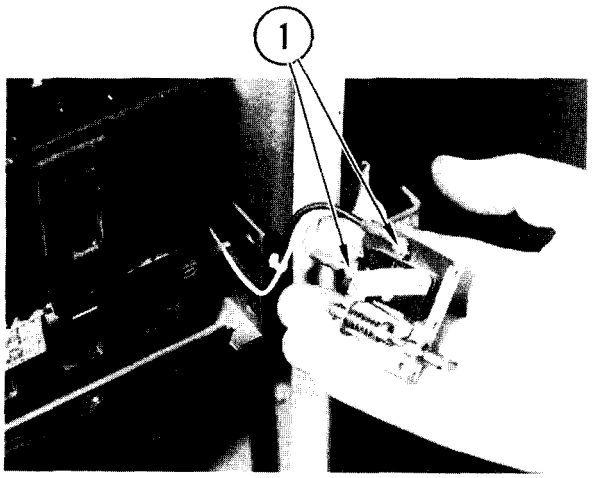


2. At side of interlock switch, remove two screws. Pull out switch.



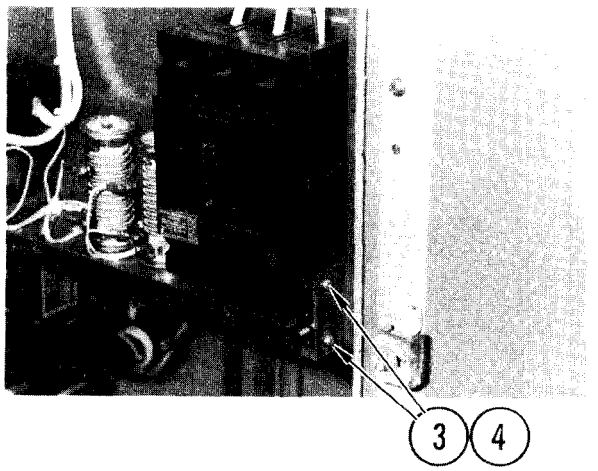
3. Using your scratch paper, note positions of wires to switch. Loosen screws. Pull off wires.

4-92. REMOVE/REPLACE/ADJUST FREQUENCY CONVERTER INTERLOCK SWITCH (CONT)



Replace

1. Using your notes, set wires on switch.
2. Tighten screws.

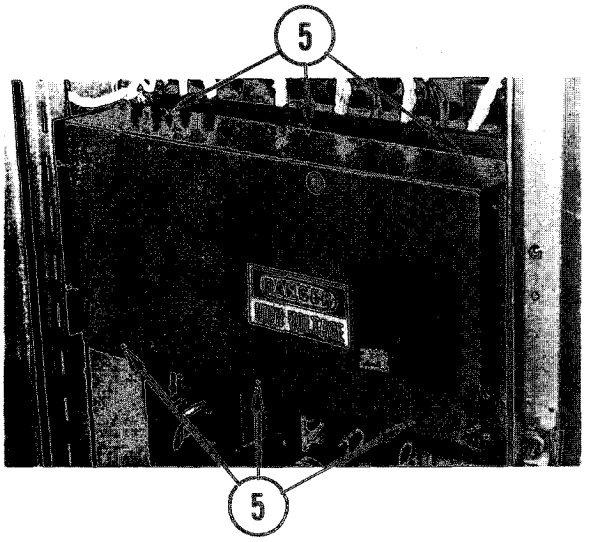


3. Set switch in place so holes line up with screw holes in frame.
4. Insert screws. Hand tighten only.
5. Adjust switch position. (Go to Adjust.)

Adjust

1. If mounting screws are tight, loosen them so you can move switch.
2. Pull switch forward as far as possible. Make sure edge of switch is even with edge of frame.
3. While holding switch in place, tighten mounting screws.

4-92. REMOVE/REPLACE/ADJUST FREQUENCY CONVERTER INTERLOCK SWITCH (CONT)



4. Listen for click of switch as you close door.

   l If switch does not click, try opening and closing the door again. If switch still does not click, repeat steps 1 thru 4 and readjust switch

   If switch clicks, go to step 5

5. Set cover in place. Insert and tighten screws.

6. Close door. Slide on latches. Tighten screws.

7. At power distribution box, set CB40 circuit breaker to on.

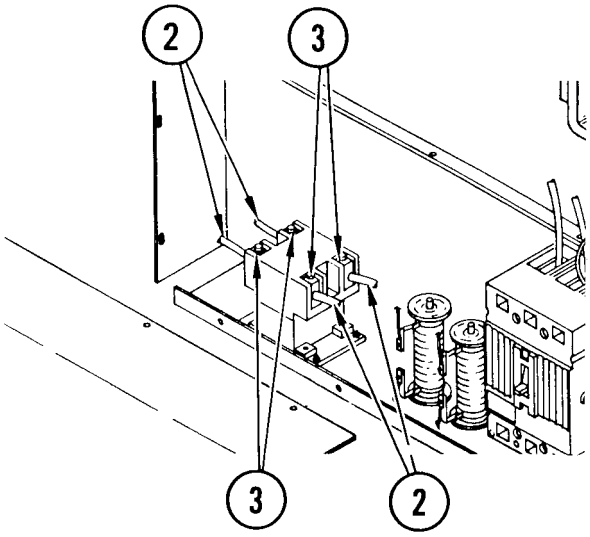
8. Power ON frequency converter.

4-93. REMOVE/REPLACE FREQUENCY CONVERTER CONTACTOR

INITIAL SETUP

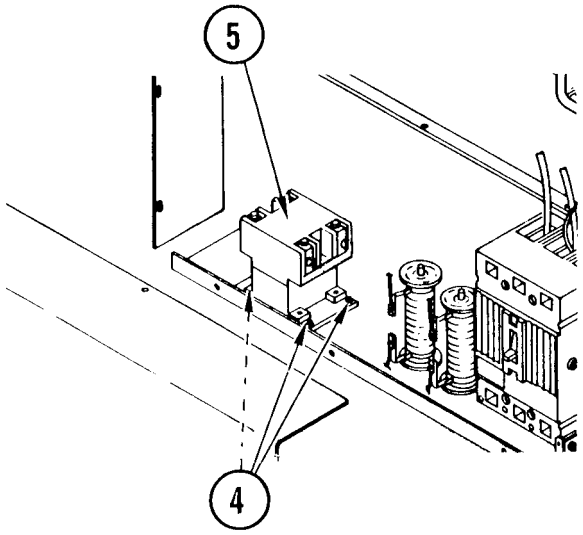
Common Tools
• Tool kit

Material/Spare Parts
• Paper
• Pen or pencil



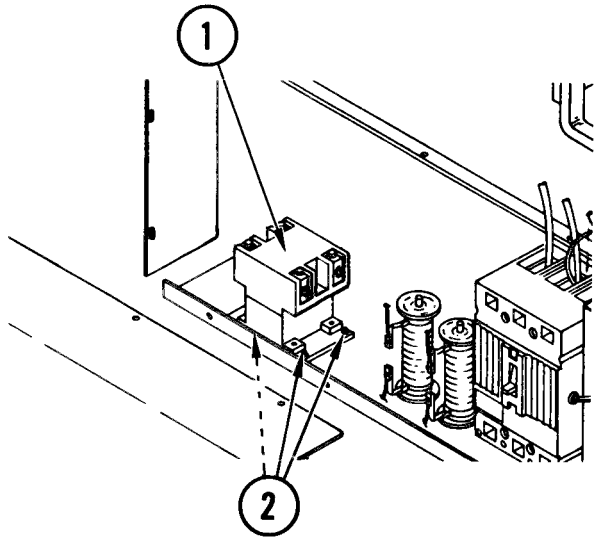
Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5 and 10).
2. Use your scratch paper to note positions of wires on terminal of contactor.
3. Loosen lug screws and remove wires from contactor.



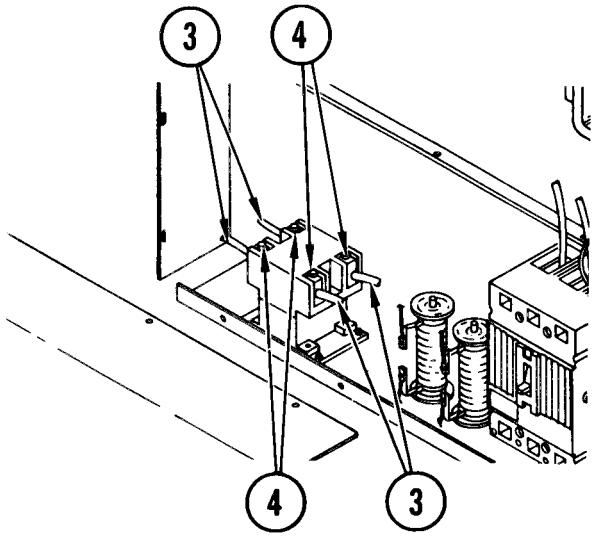
4. Remove nuts, washers, and bolts securing contactor to frame.
5. Lift contactor out of frame.

4-93. REMOVE/REPLACE FREQUENCY CONVERTER CONTACTOR (CONT)

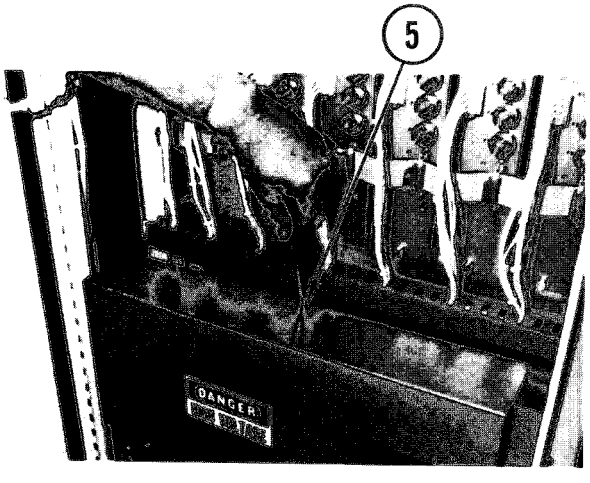


Replace

1. Place contactor in frame with mounting holes alined.
2. Insert bolts through frame and contactor. Install and tighten washers and nuts.



3. Using your notes, place wires on terminal lugs of contactor.
4. Tighten lug screws.



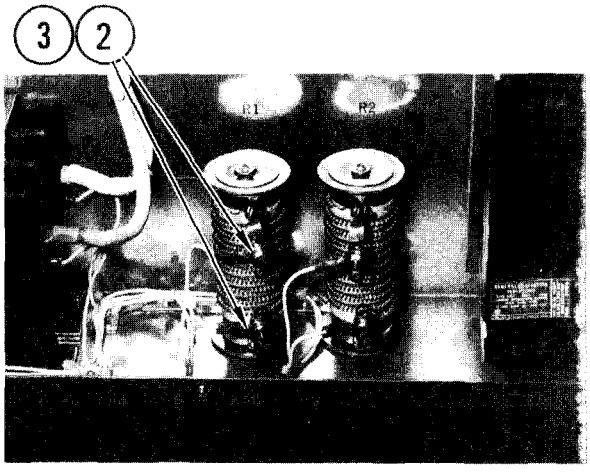
5. Set cover in place. Insert and tighten screws.
6. Close door. Slide on latches. Tighten screws.
7. At power distribution box, set CB40 circuit breaker to ON.
8. Power ON frequency converter.

4-94. REMOVE/REPLACE FREQUENCY CONVERTER WIREWOUND RESISTORS

INITIAL SETUP

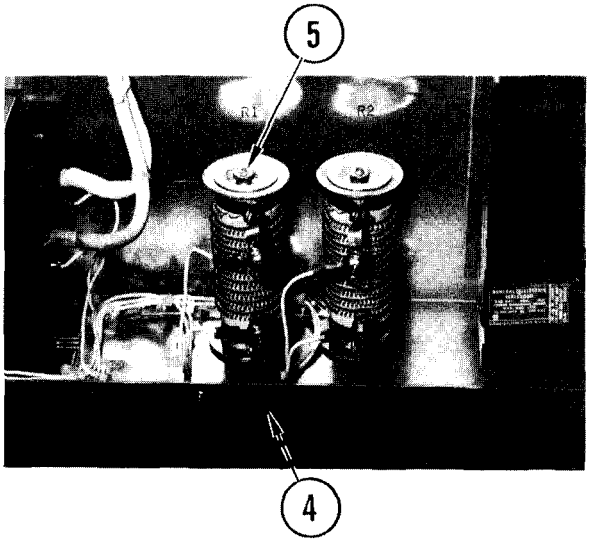
Common Tools
- Tool kit

Material/Spare Parts
- Paper
- Pen or pencil



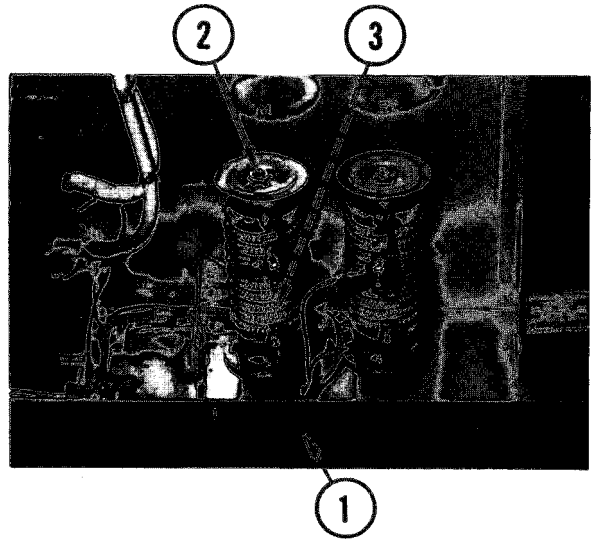
Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5 and 10).
2. Using your scratch paper, note positions of wires to resistor terminals.
3. Loosen and remove lug screws on resistor and remove wires.



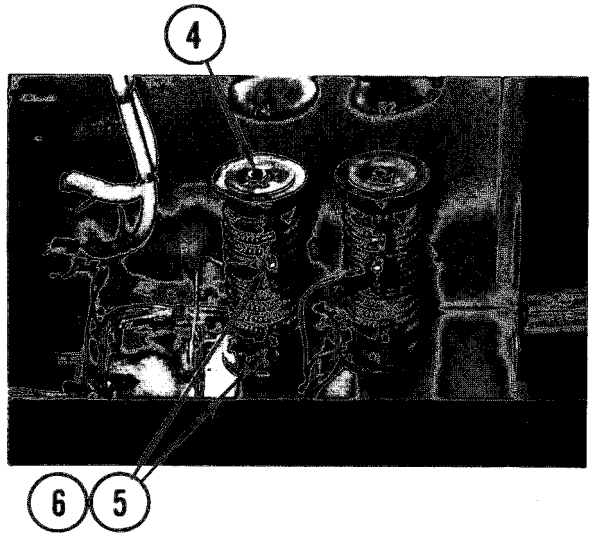
4. Reach beneath frame and hold resistor mounting nut in place.
5. Remove top nut on resistor. Pull off resistor and washers. Place washer and nut back on threaded rod.

4-94. REMOVE/REPLACE FREQUENCY CONVERTER WIREWOUND RESISTORS (CONT)

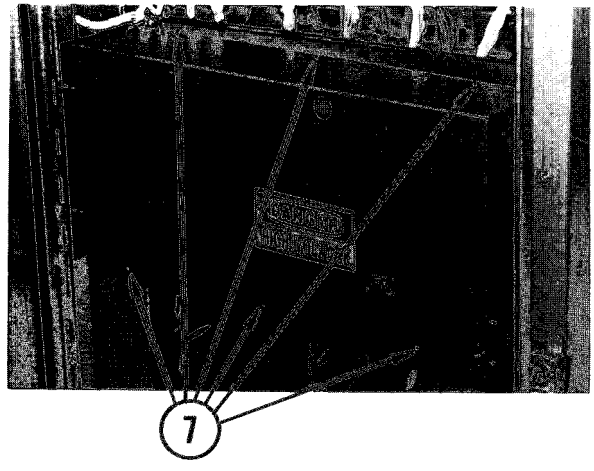


Replace

1. Reach beneath frame and push up and hold resistor mounting hardware.
2. Remove top nut and four washers from threaded rod.
3. Place resistor on threaded rod.



4. Place four washers and nut on threaded rod. Tighten nut.
5. Using your notes, place wires on terminal lugs of resistor.
6. Install and tighten lug screws.



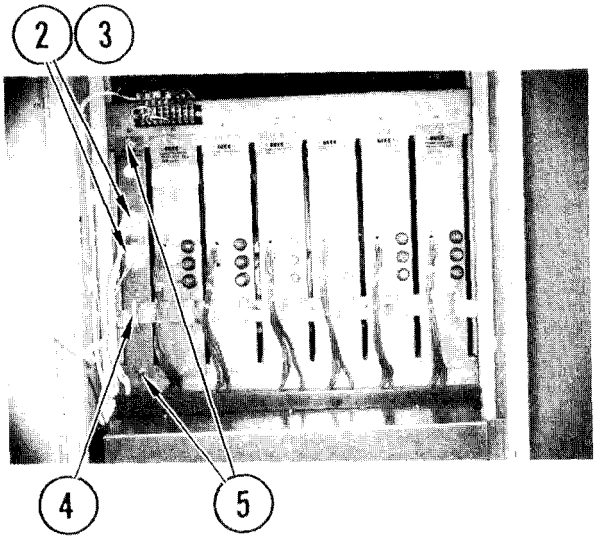
7. Set cover in place. Insert and tighten screws.
8. Close door. Slide on latches. Tighten screws.
9. At power distribution box, set CB40 circuit breaker to ON.
10. Power ON frequency converter.

4-95. REMOVE/REPLACE FREQUENCY CONVERTER LOGIC/BIAS MODULE

INITIAL SETUP

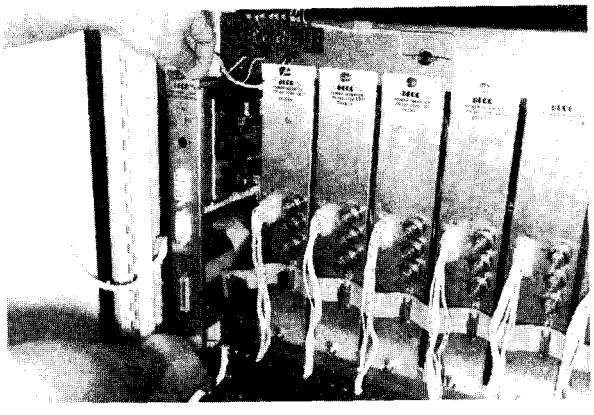
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pen or pencil



Remove

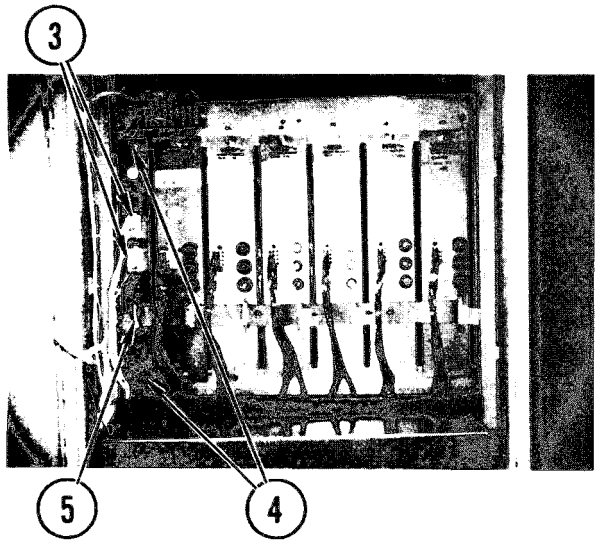
1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Find logic module. Note positions of two connectors.
3. Squeeze connector latches and pull off each connector.
4. Pull off ribbon cable connector.
5. Loosen captive screws.
6. Pull out module.



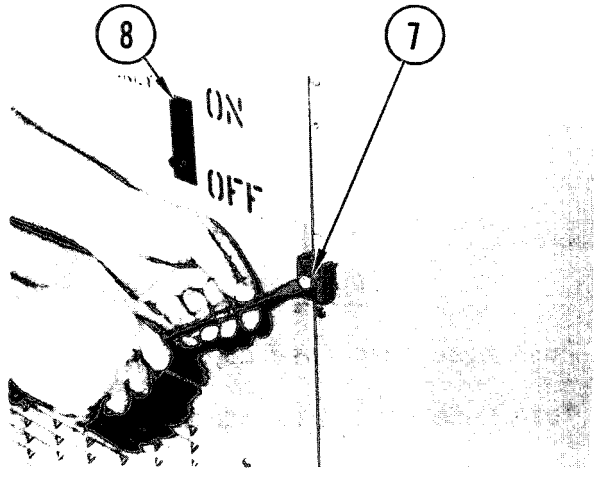
Replace

1. Hold logic module as shown and insert top and bottom ridges of module on tracks.
2. Push in module until firmly seated.

4-95. REMOVE/REPLACE FREQUENCY CONVERTER LOGIC/BIAS MODULE (CONT)



3. Push on two connectors.
4. Tighten captive screws.
5. Push on ribbon cable connector.



6. Close door.
7. Slide on latches. Tighten screws.
8. At power distribution box, set CB40 circuit breaker ON.
9. Power ON frequency converter.

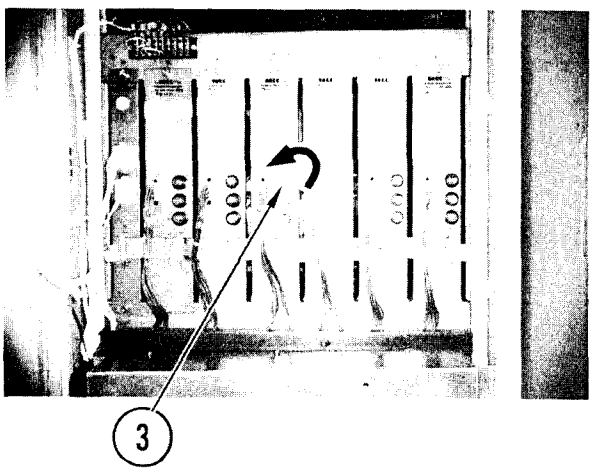
4-96. REMOVE/REPLACE FREQUENCY CONVERTER POWER INVERTER MODULE FUSES

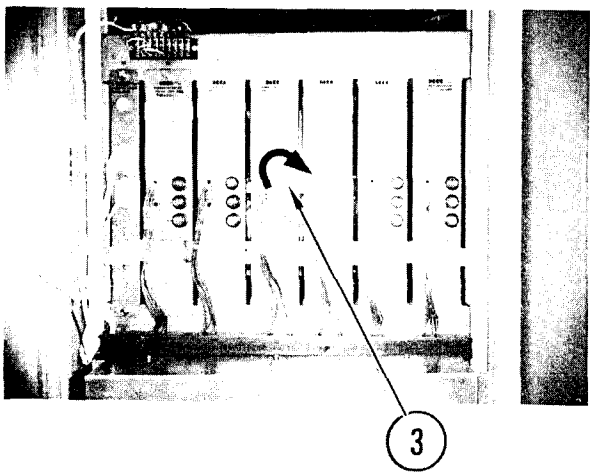
INITIAL SETUP

Materials/Spare Parts
- Fuse 3AB (F1)
- Fuse ABC25 (F2, F3)

NOTE

There are three fuses in each of the six power inverter modules. Use these steps to remove/replace any fuse.





Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Find bad fuse.
3. Twist fuse cap as shown. Pull out cap.
4. Pull off bad fuse.

Replace

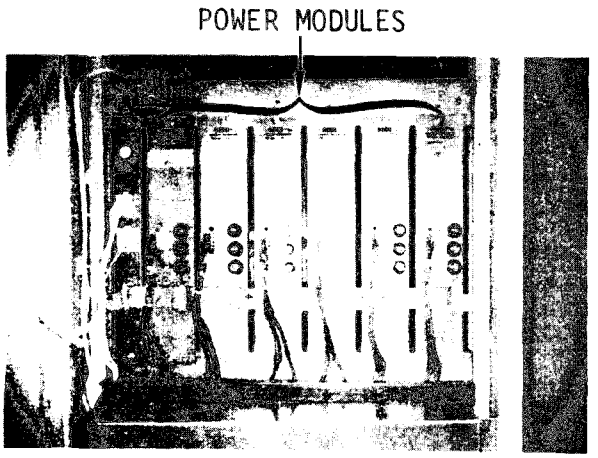
1. Push fuse into fuse cap.
2. Push fuse cap into module.
3. Twist fuse cap as shown.
4. Close door. Slide on latches. Tighten screws.
5. At power distribution box, set CB40 circuit breaker ON.
6. Power ON frequency converter.

4-97. REMOVE/REPLACE FREQUENCY CONVERTER POWER INVERTER MODULE

INITIAL SETUP

Common Tools
• Tool kit

Materials/Spare Parts
• Paper
• Pen or pencil

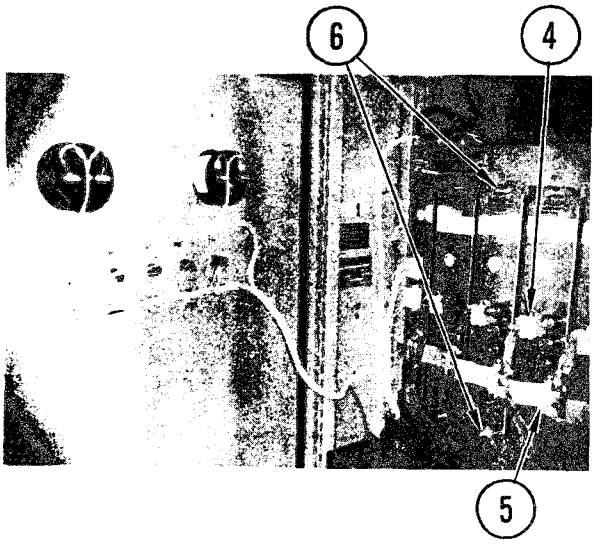


NOTE

There are six power modules. Use these steps to remove or replace any of them.

Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Find power module you will remove.

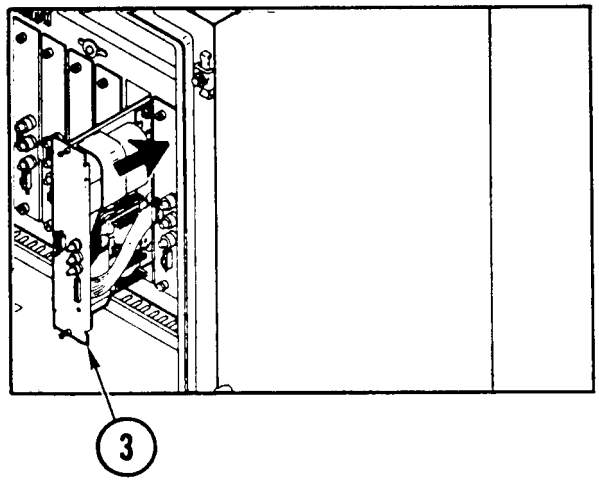


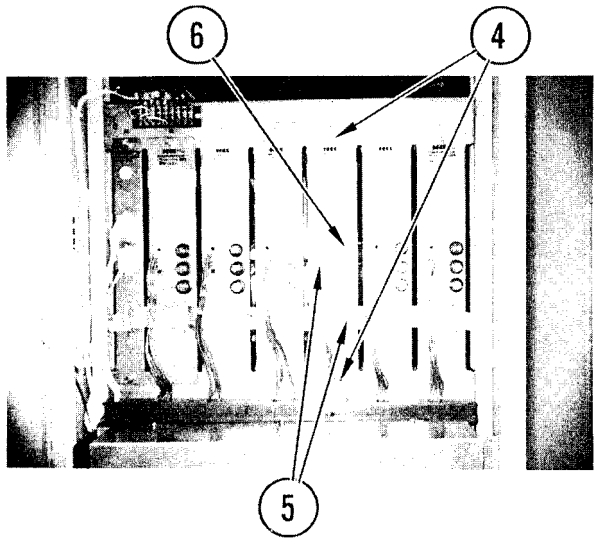
3. If you remove all power modules, use your scratch paper to note the positions of connectors before you Pull them off.
4. Squeeze connector latches. Pull off connector.
5. Pull off ribbon cable connectors as required.
6. Loosen two captive screws.
7. Pull out module.

4-97. REMOVE/REPLACE FREQUENCY CONVERTER POWER INVERTER MODULE (CONT)

Replace

1. Hold power module by top and bottom of front plate.
2. Set bottom r idge of module frame on tracks.
3. Push in modu le.





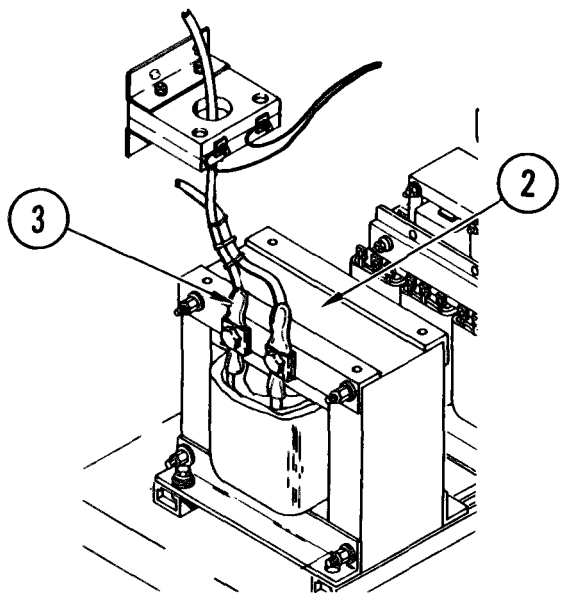
4. Tighten captive screws.
5. Push on all disconnected ribbon cable connectors and white wire connectors.
6. Make sure each fuse is installed (para 4-96).
7. Close door.
8. Slide on latches. Tighten screws.
9. At power distribution box, set CB40 circuit breaker ON.
10. Power ON frequency converter.

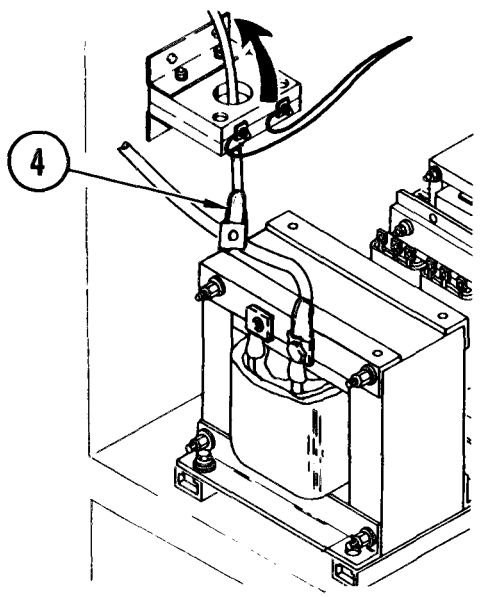
4-98. REMOVE/REPLACE FREQUENCY CONVERTER CURRENT TRANSFORMER

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil
- Cable ties

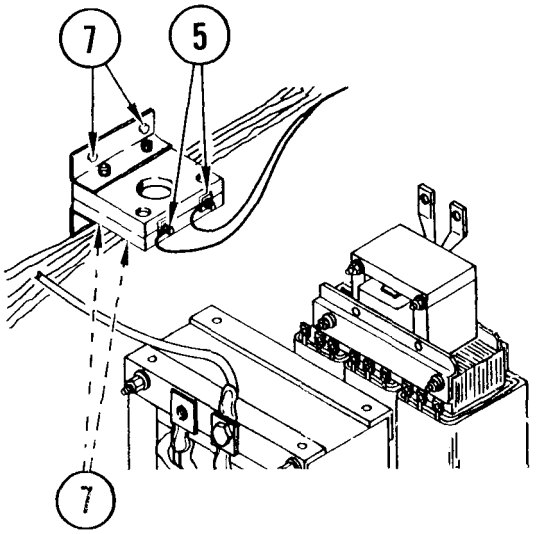




Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Find output transformer T2. Note positions of wires on output transformer T2.
3. Loosen and remove cable tie wrap, bolt, two flatwashers, lockwasher and nut, then remove cable attached to terminal H2 of transformer T2.
4. Feed cable up through center of current transformer T3.

4-98. REMOVE/REPLACE FREQUENCY CONVERTER CURRENT TRANSFORMER (CONT)

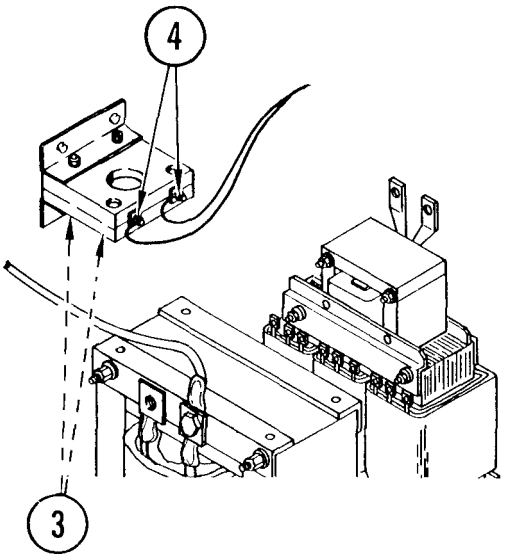


5. Tag and remove wire leads from top mounting posts of current transformer.

6. Cut tie wrap from wires and pull wires away from wall.

7. Remove mounting screws, lockwasher, washers and nut from base (flange) of transformer. Remove current transformer from chassis interface board.

8. Cut tie wrap holding wires to current transformer.



Replace

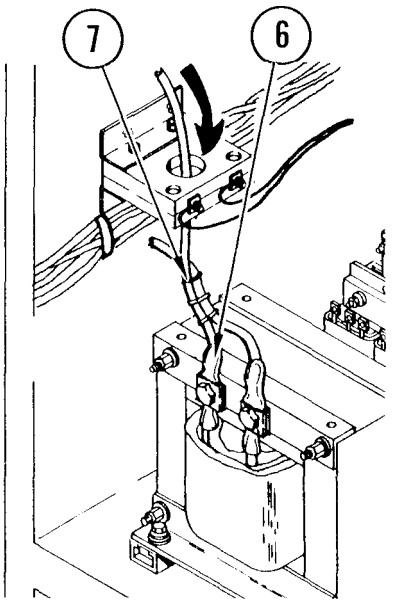
1. Secure small wires with tie wrap to current transformer.

2. Install current transformer on chassis interface board. Line up holes in base (flange) with holes in board.

3. Insert screws from bottom. Install washers, lockwasher and nut and tighten.

4. Refer to tags and install wire leads on top mounting posts. Tighten nuts.

5. Tie wrap wires to wall.



6. Feed power cable from voltage transformer down through hole in case of current transformer. Attach end of cable onto terminal H2 of current transformer T2.

7. Replace tie wraps.

8. Close door of frequency converter. Slide on latches. Tighten screws.

9. In power distribution box, set CB40 to ON.

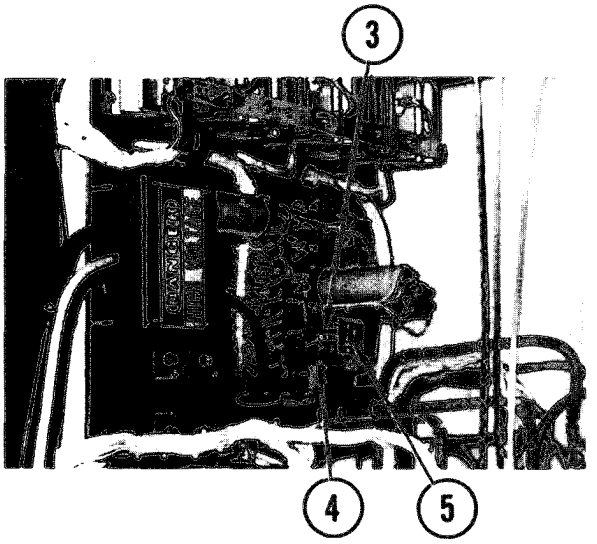
10. Power ON frequency converter.

4-99. REMOVE/REPLACE FREQUENCY CONVERTER TIME DELAY RELAY

INITIAL SETUP

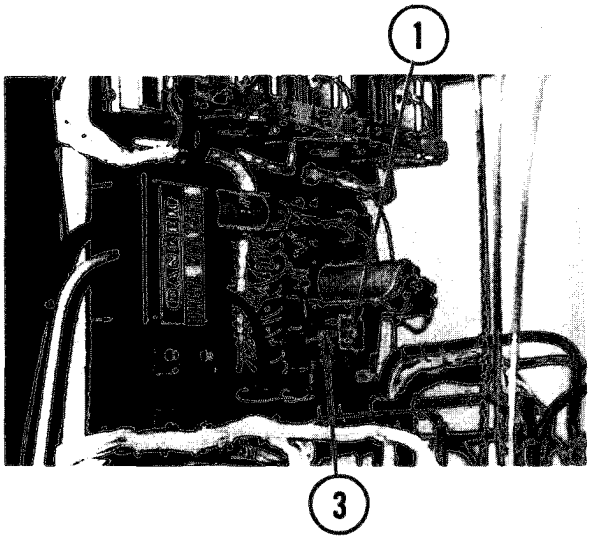
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pen or pencil



Remove

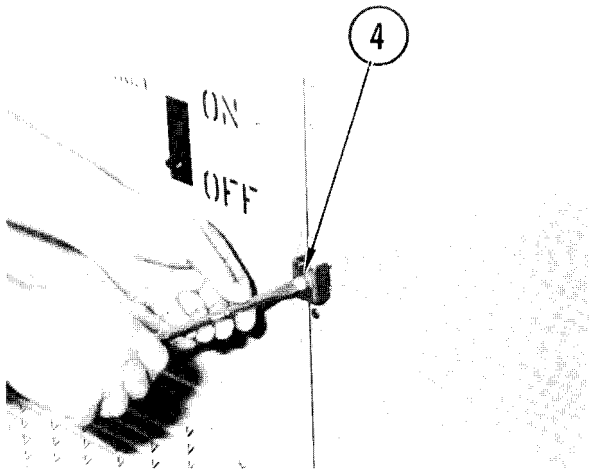
1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Make a sketch identifying all wire leads to relay by color code.
3. Remove all wire leads from relay.
4. Remove two screws holding relay to mounting assembly.
5. Remove relay.



Replace

1. Place new time delay relay K2 on chassis interface assembly board and line up holes in flanges with holes in board.
2. Insert and tighten screws.
3. Replace all wire leads on the relay using your sketch as a guide.

4-99. REMOVE/REPLACE FREQUENCY CONVERTER TIME DELAY RELAY (CONT)



4 . Close door of frequency converter. Slide on latches. Tighten screws.

5 . In power distribution box, set CB40 to ON.

6 . Power ON frequency converter.

4-l00. REMOVE/REPLACE FREQUENCY CONVERTER FILTER CAPACITOR

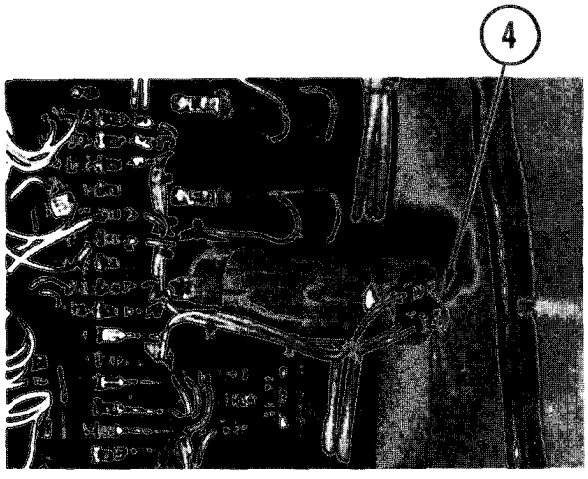
INITIAL SETUP

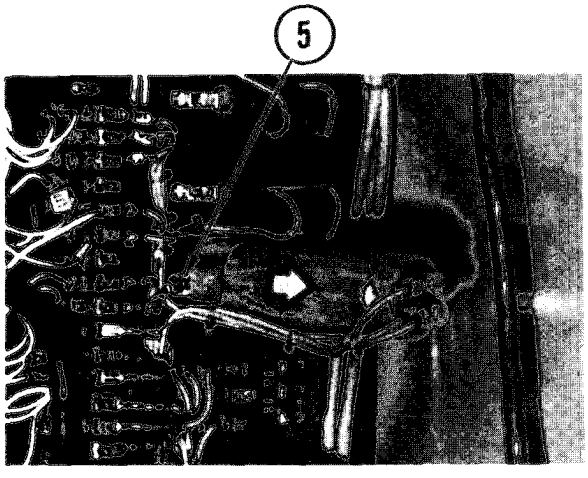
Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pen or pencil

Remove

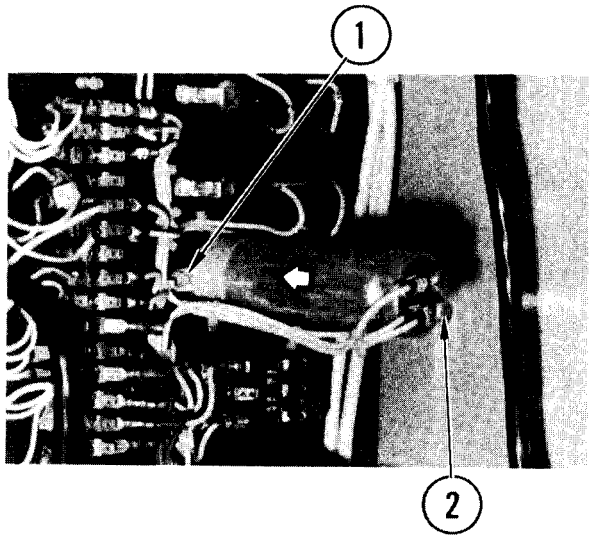
1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Find capacitor on interface chassis. Make sure capacitor is discharged.
3. Note positions of wires attached to capacitor.
4. Remove screws. Pull off wires.





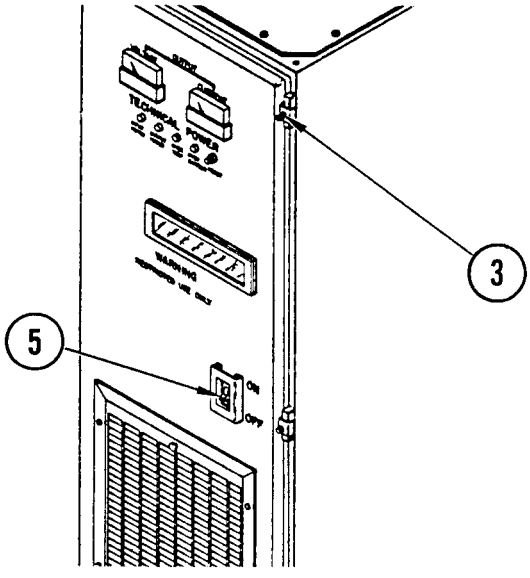
5. Loosen clamp screw.
6. Pull out capacitor.

4-100. REMOVE/REPLACE FREQUENCY CONVERTER FILTER CAPACITOR (CONT)



Replace

1. Push capacitor in base on interface chassis. Tighten clamp screw.
2. Using your notes, set wire leads on posts. Insert and tighten screws.



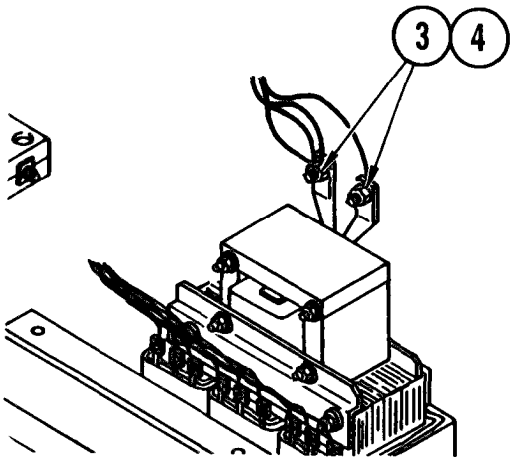
3. Close door. Slide on latches. Tighten screws.
4. At power distribution box, set CB40 to ON.
5. Power ON frequency converter.

4-101. REMOVE/REPLACE FREQUENCY CONVERTER INDUCTOR

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Paper
- Pen or pencil



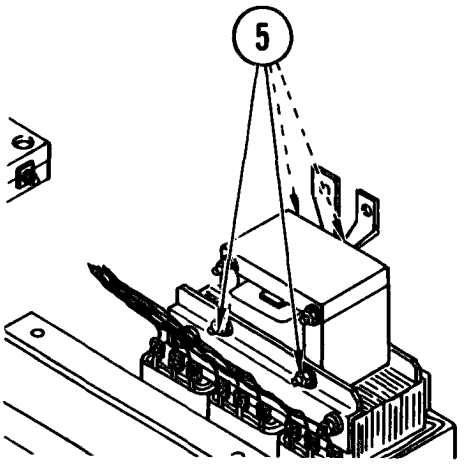
Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Find inductor.
3. Note position of wires on inductor posts.

CAUTION

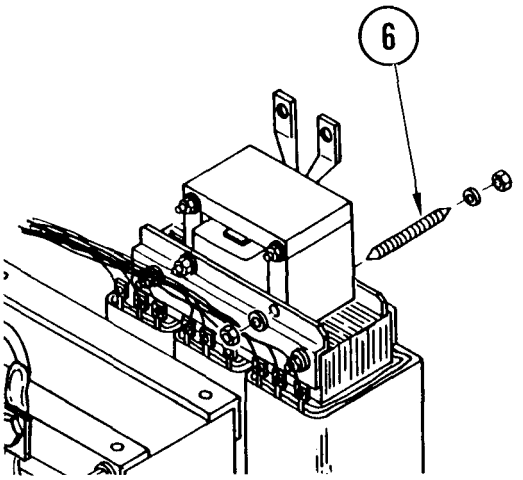
Do not let loose parts drop into transformer assembly. Loose metal may cause a short circuit and damage equipment.

4. Remove nuts, bolts, and washers. Pull off wires.

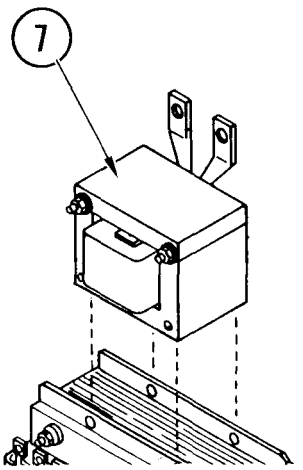


5. Remove nuts and washers.

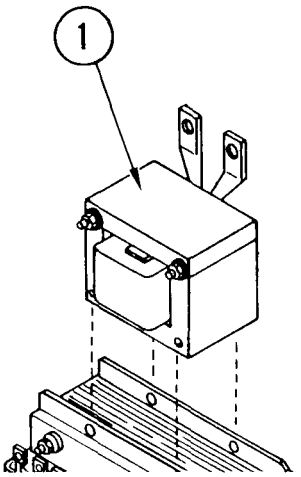
4-101. REMOVE/REPLACE FREQUENCY CONVERTER INDUCTOR (CONT)



6. Pull bolts out from back of inductor.



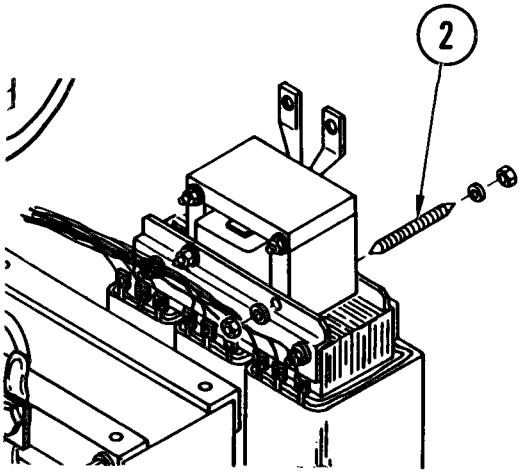
7. Lift inductor up and out of device.



Replace

1. Set inductor in place on transformer so holes in base of inductor line up with holes in bracket.

4-101. REMOVE/REPLACE FREQUENCY CONVERTER INDUCTOR (CONT)

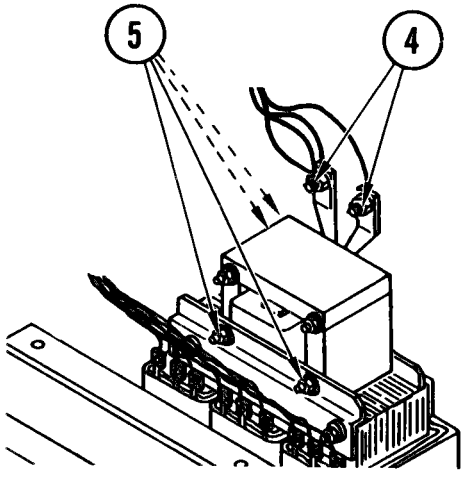


2. From back of inductor, push in two bolts.

CAUTION

Do not let loose parts drop into transformer assembly. Loose metal can cause a short circuit and damage equipment.

3. At front of inductor, set washers on bolts. Tighten nuts.



4. Using your notes, replace wire leads on inductor posts with nuts, bolts, and washers.

5. Set washers on bolts. Tighten nuts.

6. Close door. Slide on latches. Tighten screws.

7. In power distribution box, set CB40 to ON.

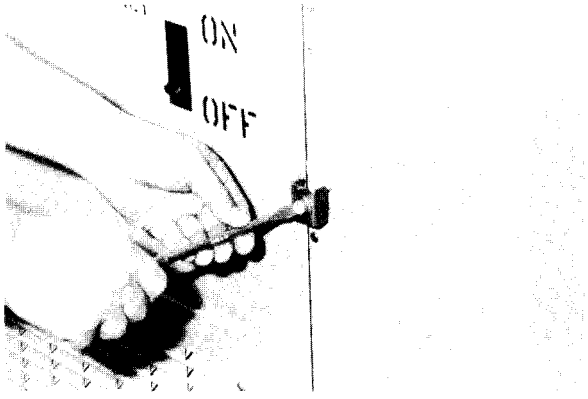
8. Power ON frequency converter.

4-102. REMOVE/REPLACE FREQUENCY CONVERTER OUTPUT TRANSFORMER

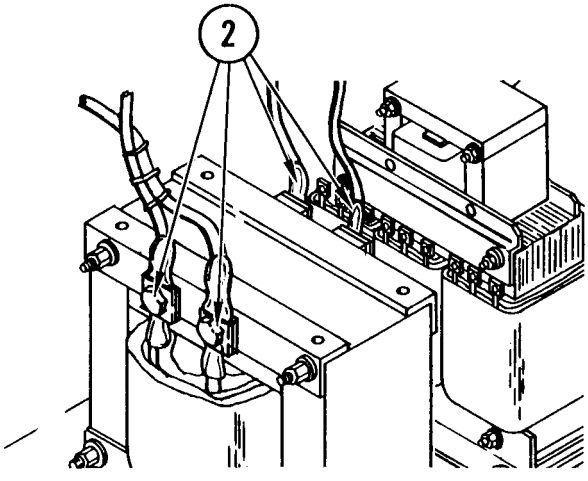
INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required
• Tool kit	• Paper • Pen or pencil	• Two

Remove

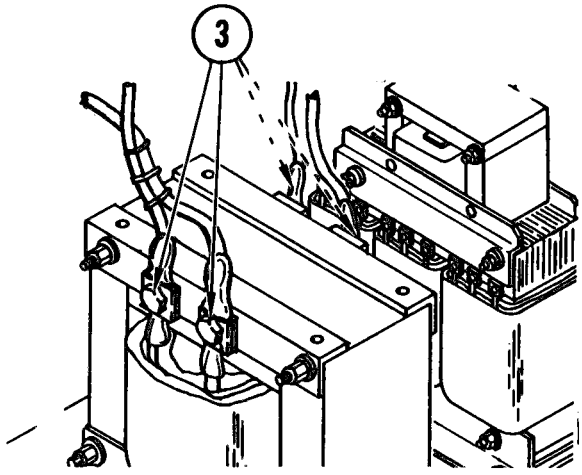


1. Open frequency converter (para 4-89, Remove, steps 3-5).



2. Find output transformer T2. Note positions of wires on output transformer T2.

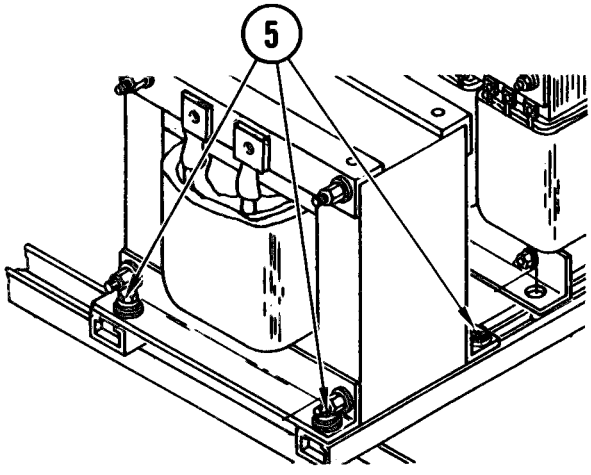
4-102. REMOVE/REPLACE FREQUENCY CONVERTER OUTPUT TRANSFORMER (CONT)



CAUTION

Do not let loose parts drop into transformers. Loose metal may cause a short circuit and damage equipment.

3. Remove two front and rear bolts, washers, and nuts from four wire leads on output transformer posts.



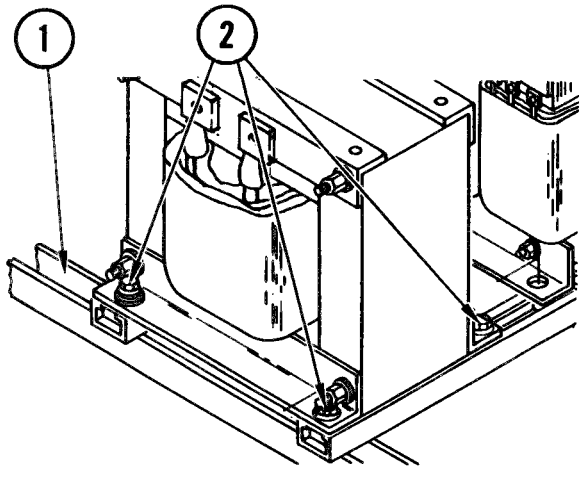
4. Remove wire from posts and set aside.

5. Remove four mounting bolts and washers from bottom flange of transformer.

WARNING

Transformer is heavy. Do not lift it yourself. Get help.

6. Remove transformer T2 from frequency converter cabinet.

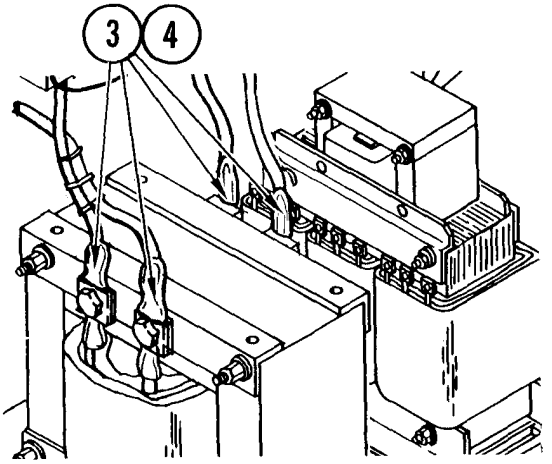


Replace

1. Set output transformer T2 onto mounting rails in frequency converter cabinet and line up holes in bottom flange with holes in mounting rails.

2. Insert four bolts and washers and tighten securely.

4-102. REMOVE/REPLACE FREQUENCY CONVERTER OUTPUT TRANSFORMER (CONT)



3. Using your notes as a guide, set four wire leads in place on output transformer posts.

4. Install washers, nuts, and bolts on wires and tighten.

5. Close door of frequency converter. Slide on latches. Tighten screws.

6. In power distribution box, set CB40 to ON.

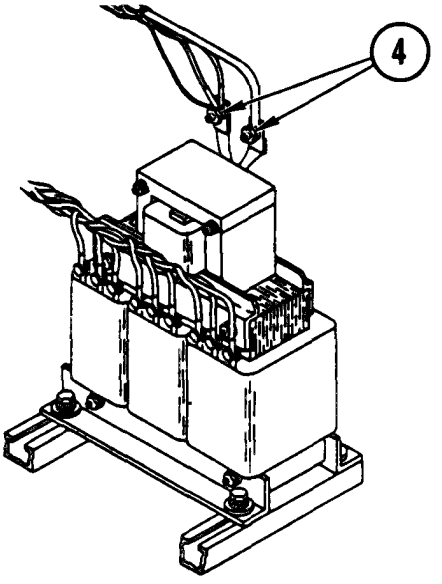
7. Power ON frequency converter.

4-103. REMOVE/REPLACE FREQUENCY CONVERTER INPUT TRANSFORMER

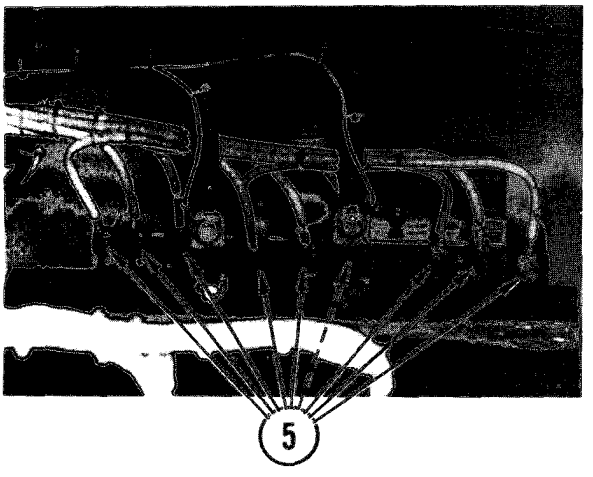
INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required
• Tool kit	• Paper • Pen or pencil	• Two

Remove

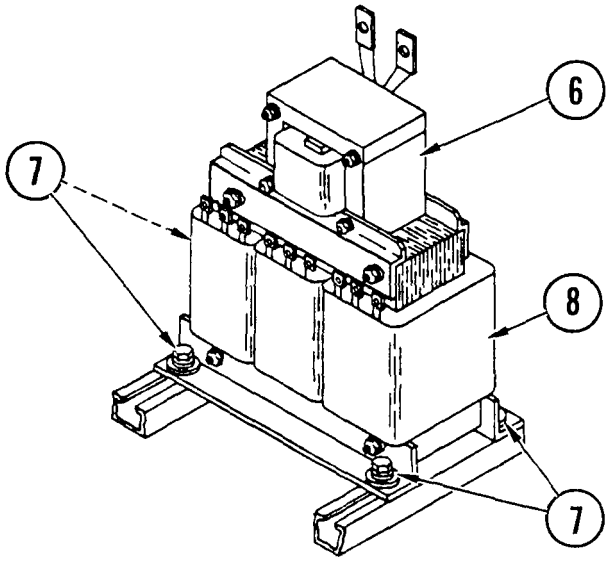


1. Open frequency converter para 4-89, Remove, steps 3-5).
2. Remove output transformer T2 (para 4-102, Remove, steps 2-6)
3. Note wire positions and color codes of leads on inductor L1 and input transformer T1.
4. Remove bolts and washers from leads at top of inductor L1. Tag and remove wires and set aside.



5. Unbolt tag and remove the ten white wires leading to the coils of T1.

4-103. REMOVE/REPLACE FREQUENCY CONVERTER INPUT TRANSFORMER (CONT)



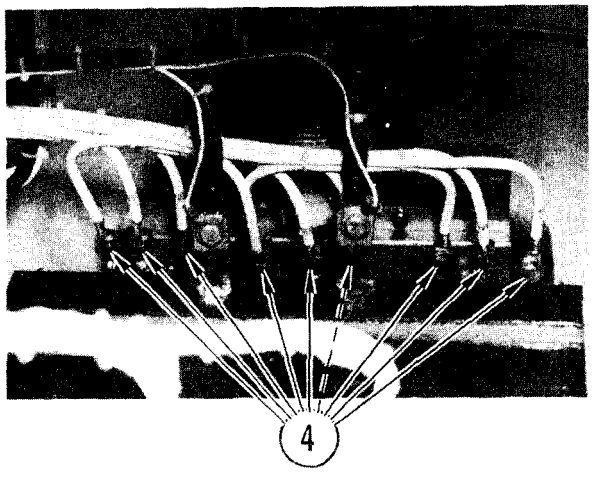
WARNING

Transformer T1 and inductor L1 bolted together are heavy. Lift them out separately in a way that avoids injury. Do not handle them yourself. Get help.

6. Remove inductor L1 and set aside (para 4-101, Remove, steps 3-7).
7. Remove four bolts and washers at the base of transformer T1.
8. Get help from another crew member to lift transformer T1 out of cabinet.

Replace

1. Set input transformer T1 into position in the rear of frequency converter cabinet.
2. At bottom of input transformer T1, install and tighten four bolts.
3. Replace inductor L1 (para 4-101, Replace, steps 1-5).



4. Using your notes, set white wire leads in place on input transformer T1.
5. Install washers, nuts, and bolts on wires and tighten.
6. Replace output transformer T2 (para 4-102, Replace, steps 1-4).
7. Close frequency converter door. Slide on latches. Tighten screws.
8. In power distribution box, set CB40 to ON.
9. Power ON frequency converter.

4-104. REMOVE/REPLACE FREQUENCY CONVERTER RECTIFIERS

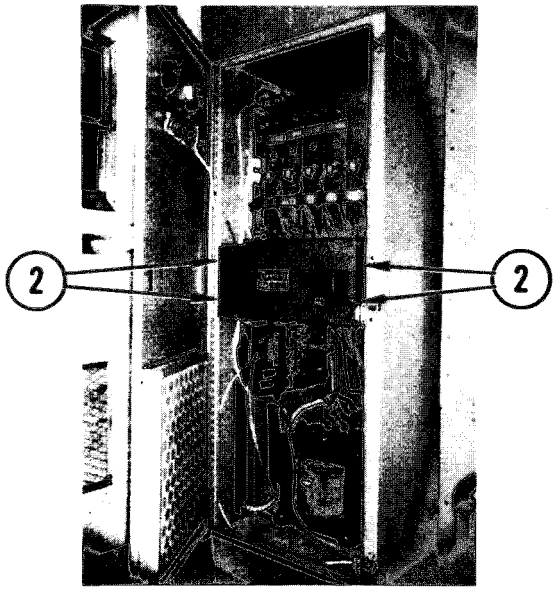
INITIAL SETUP

Common Tools
- Tool kit

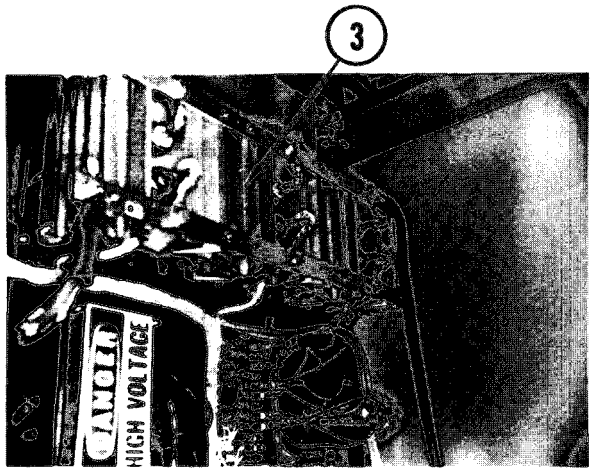
Materials/Spare Parts
- Heat sink compound
- Paper
- Pen or pencil

Remove

1. Open frequency converter (para 4-89, Remove, steps 3-5).



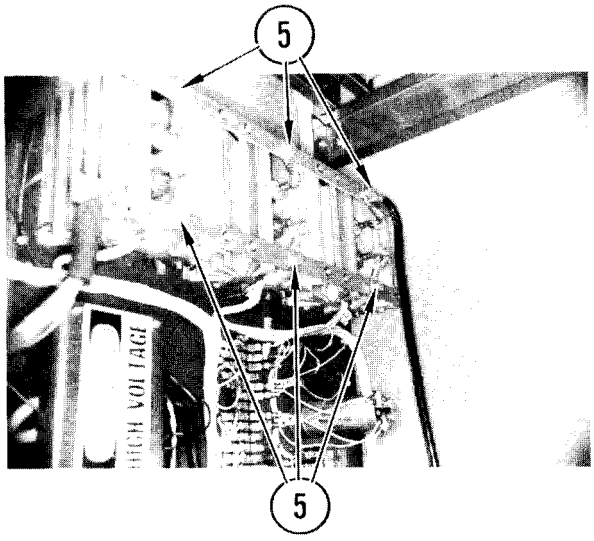
2. Remove four bolts, washers, and nuts holding the input power module assembly and set aside. You can now access the heat sink assembly.



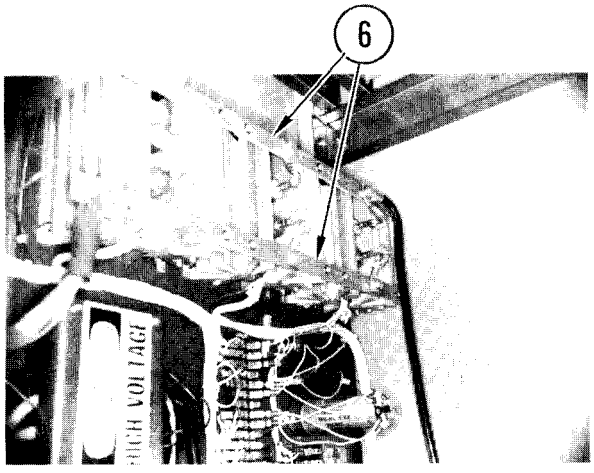
3. Make a diagram of all wires connected to heat sink assembly.

4. Disconnect all wires connecting to heat sink assembly.

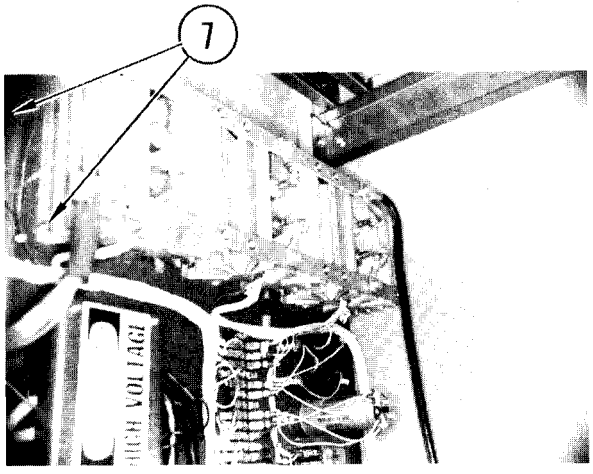
4-104. REMOVE/REPLACE FREQUENCY CONVERTER RECTIFIERS (CONT)



5. Disconnect all rectifier pigtails by removing screws.



6. Remove screws holding two bars across front of heat sink assembly.



7. Remove nuts and washers holding heat sink(s) to assembly.

8. Lift off heat sink(s).

CAUTION

Be careful not to damage components.

9. Remove faulty rectifier from heat sink.

4-104. REMOVE/REPLACE FREQUENCY CONVERTER RECTIFIERS (CONT)

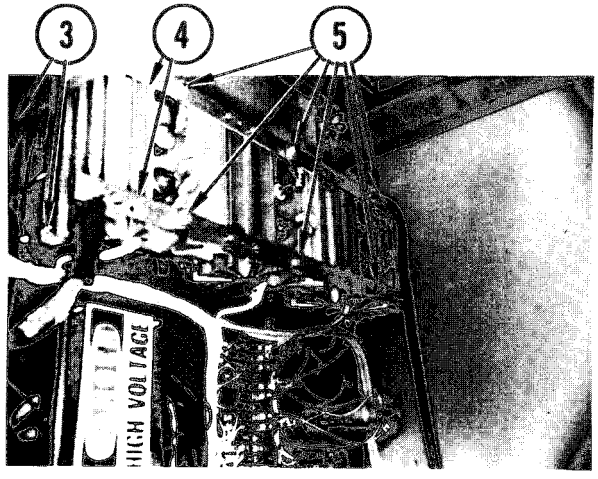
Replace

1. Clean contact surface on heat sink and apply a thin coating of heat sink compound to area rectifier diode is to occupy.

CAUTION

Do not overtighten nuts, bolts, or screws. Damage to components may result.

2. Install rectifier on heat sink and tighten.

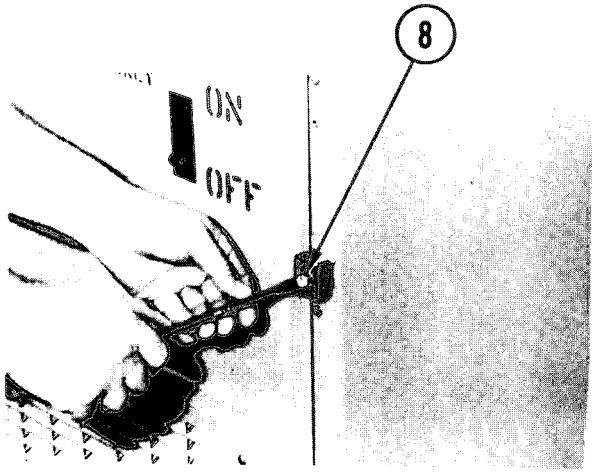


3. Place heat sink on mounting plate. Put on four washers and nuts. Tighten nuts.

4. Install the two bars across the front of the heat sink assembly.

5. Fasten rectifier pigtails to cross bars.

6. Using your notes and diagram, reconnect all wires to heat sink assembly.



7. Install input power module assembly. Tighten bolts and nuts.

8. Close frequency converter door and secure the latches.

9. In power distribution box, set CB40 to ON.

10. Set input-power circuit to ON and check frequency converter indicators for correct operation.

4-105. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS

INITIAL SETUP

Common Tools
- Tool kit

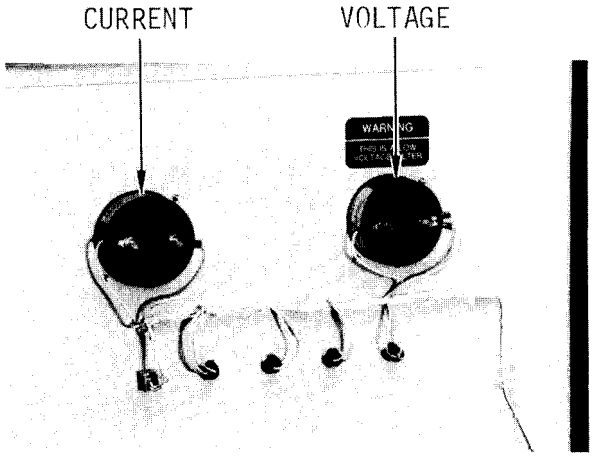
Materials/Spare Parts
- Electrical tape
- Tags
- Pen or pencil

WARNING

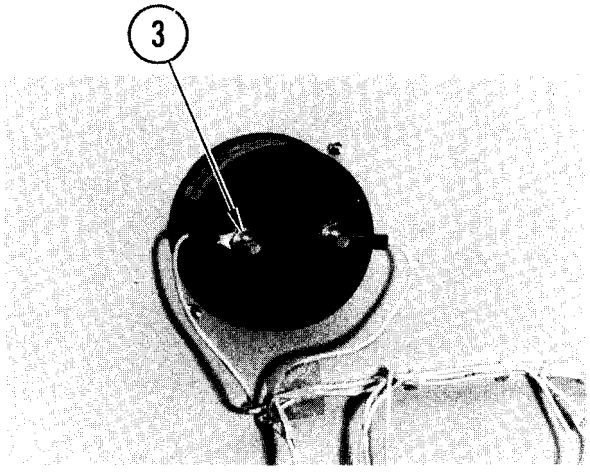
Electrocution may result if task is done with power on.

METERS

Remove

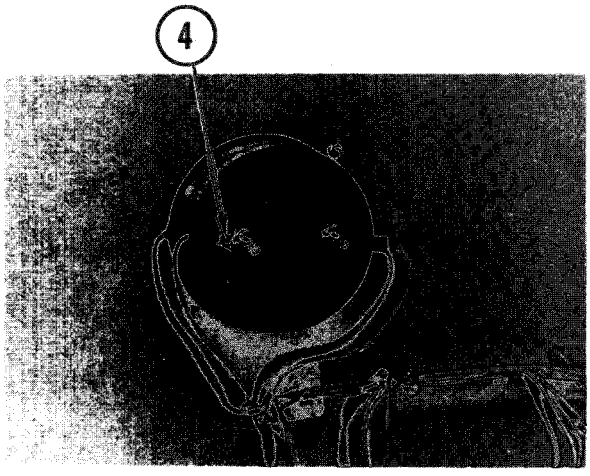


1. Open frequency converter (para 4-89, Remove, steps 3-5).
2. Look at back of door. Find meter you want to remove.
   - If removing CURRENT meter, go to step 3
   - If removing VOLTAGE meter, go to step 12

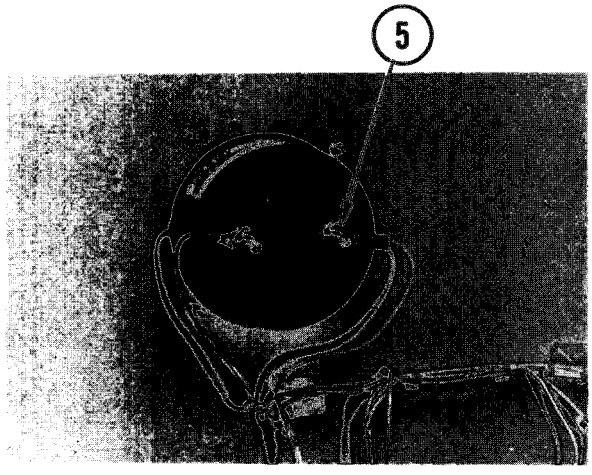


3. Remove nut and washer on first post.

4-105. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS (CONT)



4. Tag and pull off wire.

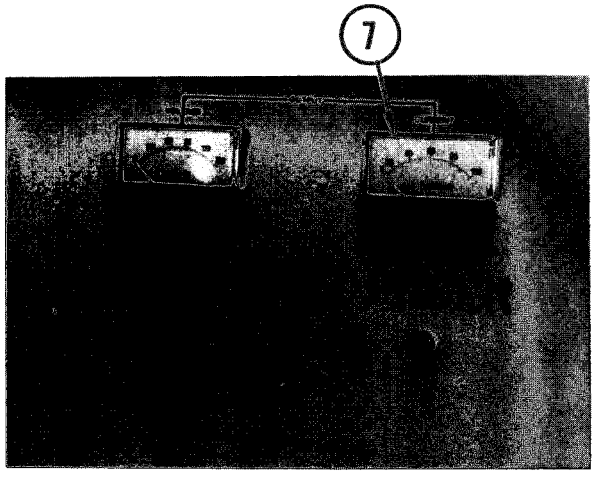


5. Remove nut and washer from second post.

6. Tag and pull off wire.

CAUTION

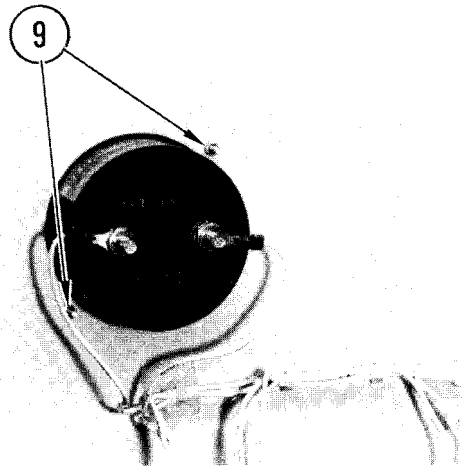
When last nut and washer are removed, meter can fall from front of cabinet.



7. Locate CURRENT meter at front of cabinet.

8. Put your hand against meter to keep it from falling.

4-105. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS (CONT)

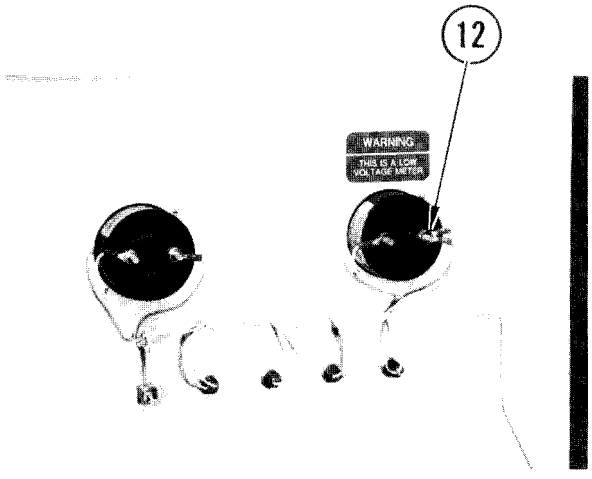


9. Remove nuts and washers from two posts at sides of meter.

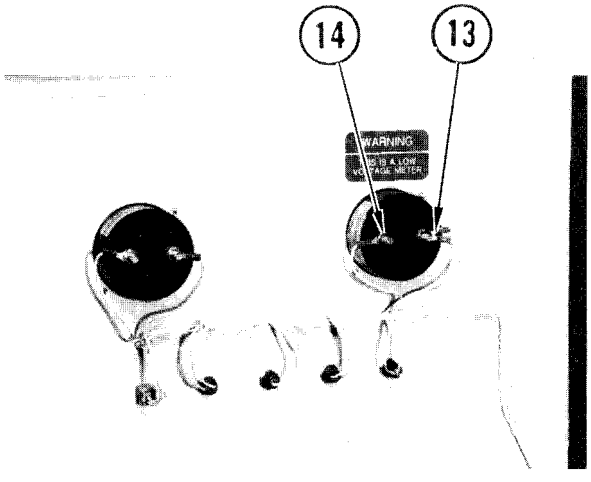
10. Pull out CURRENT meter.

11. If you're removing VOLTAGE meter, go to step 12.

    • If you're not removing VOLTAGE meter, go to replacement step l



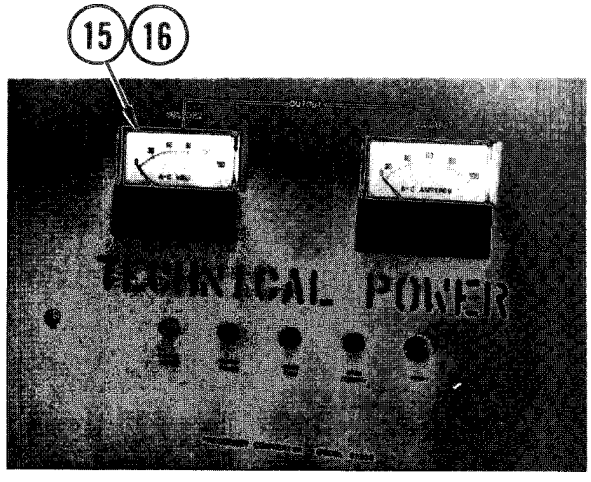
12. To remove VOLTAGE meter, remove nut.



13. Tag and pull off both wires and washer.

14. Remove second nut, tag and pull off wire.

4- l05. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS (CONT)

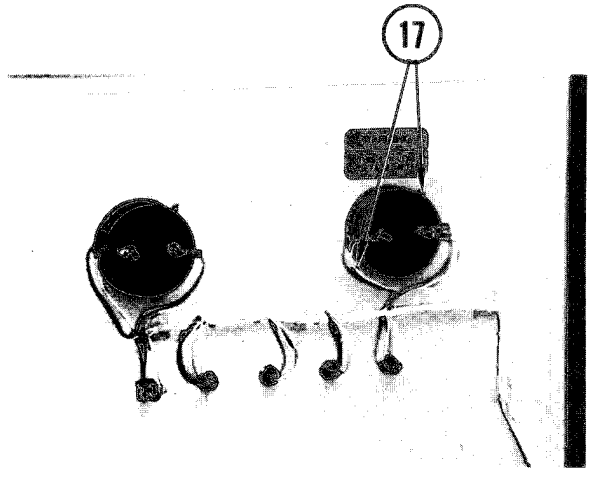


CAUTION

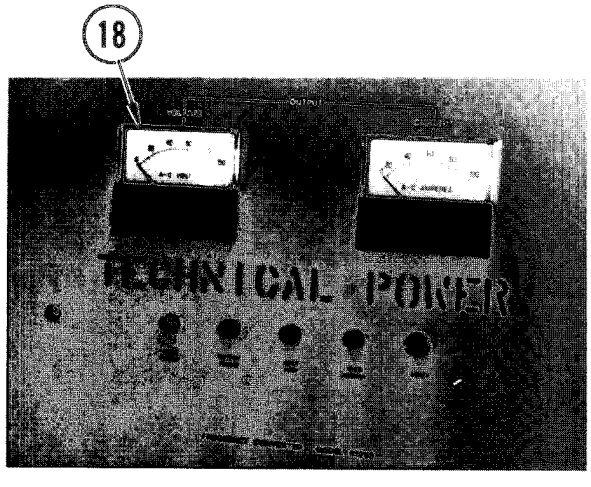
When last nut and washer are removed, meter will fall from frequency converter.

l5. Locate VOLTAGE meter at front of cabinet.

l6. Put your hand against it to keep it from falling.



l7. Remove nuts and washers from posts at sides of meter.

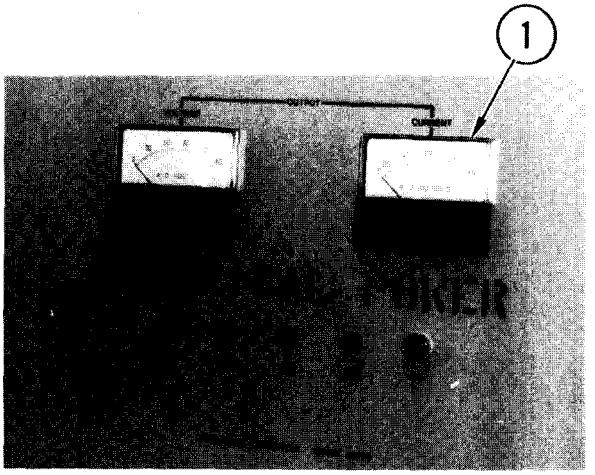


l8. Pull meter out of cabinet.

l9. If you are replacing both meters, go to replacement step l.

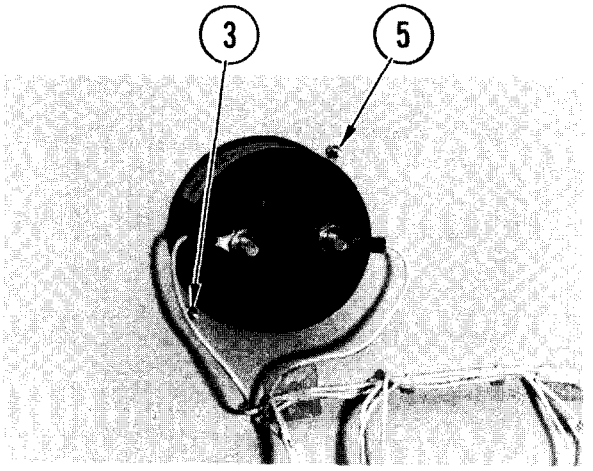
- If you are replacing only VOLTAGE meter, go to replacement step 9

4-105. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS (CONT)

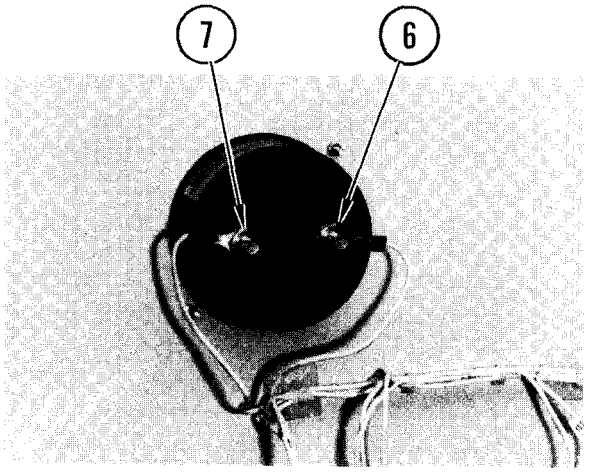


Replace

1. Guide CURRENT meter through front of cabinet door.
2. Hold it in place with one hand.



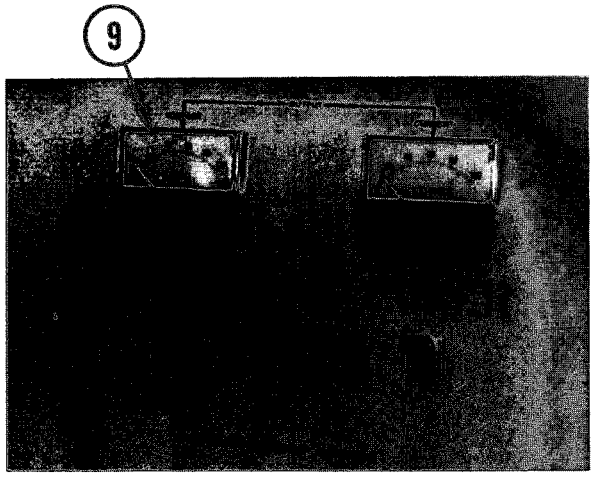
3. Replace washer and nut.
4. Let go of front meter.
5. Replace other washer and nut.



6. Referring to tag, replace washer, wire, and nut on first post.
7. Referring to tag, replace washer, wire, and nut on second post.
8. If you are also replacing VOLTAGE meter, go to replacement step 9.

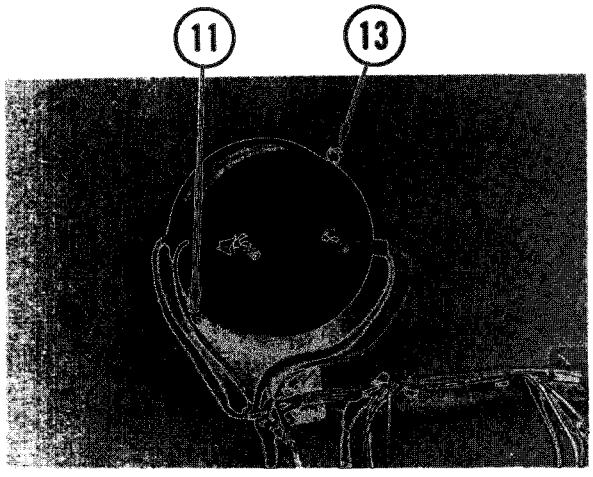
   • If you are replacing only CURRENT meter, go to replacement step 15

4-105. REMOVE/REPLACE FREQUENCY CONVERTERS METERS AND INDICATORS (CONT)



9. Guide VOLTAGE meter through front of cabinet door.

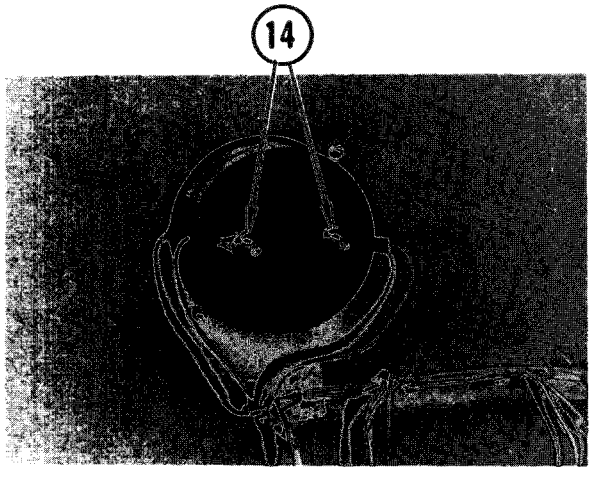
10. Hold it in place with one hand.



11. Replace washer and nut.

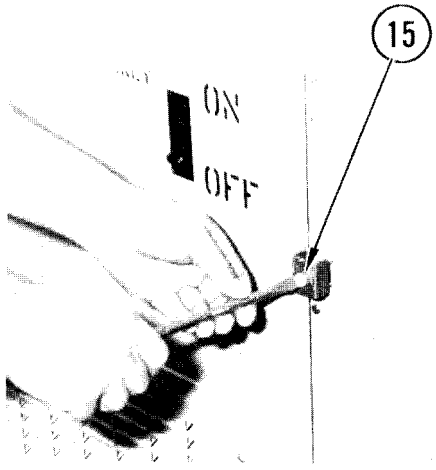
12. Let go of front of meter.

13. Replace other washer and nut.



14. Referring to tags, replace wires, washers, and nuts on posts.

4-105. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS (CONT)



15. Close frequency converter. Slide on latches. Tighten screws.

16. In power distribution box, set CB40 to ON.

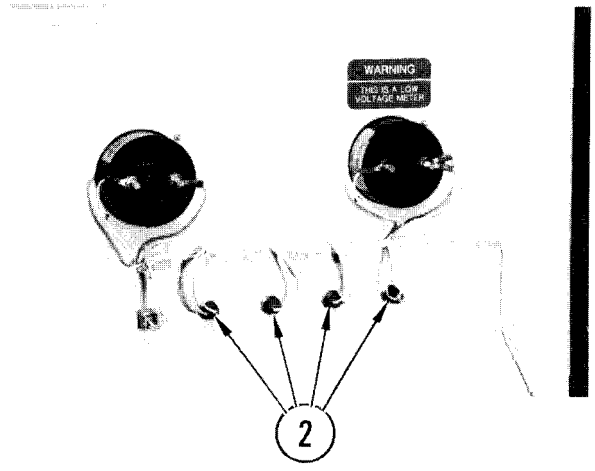
17. Power ON frequency converter.

INDICATORS

Remove

NOTE

There are four indicators. Use these steps to remove any of them.



1. Open frequency converter (para 4-89, Remove, steps 3-5).

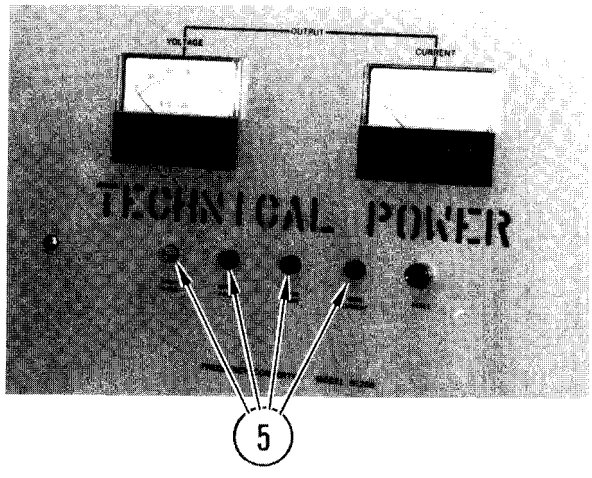
2. Look at back of door. Locate indicator you want to remove.

NOTE

Follow these steps to remove any indicator.

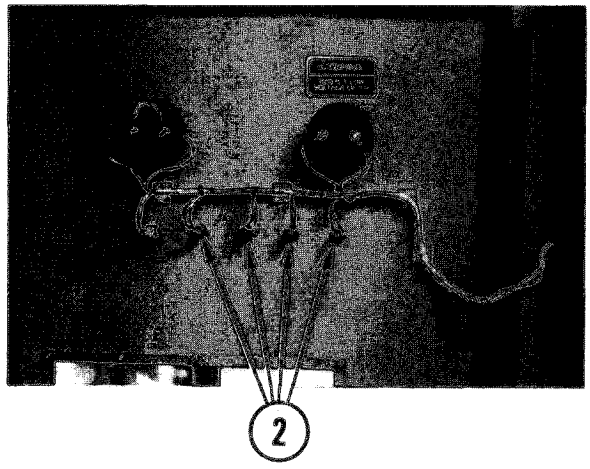
3. Tag wires and using needlenose pliers, pull connectors off posts.

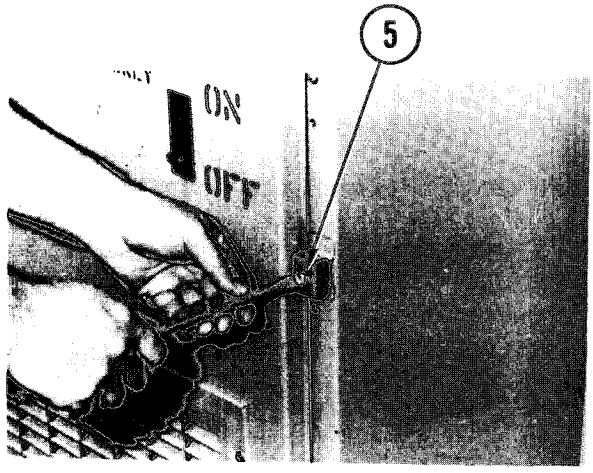
4. Remove retaining nut.



5. Pull indicator out of panel.

4-105. REMOVE/REPLACE FREQUENCY CONVERTER METERS AND INDICATORS (CONT)





Replace

NOTE

There are four indicators. Use these steps to replace any of them

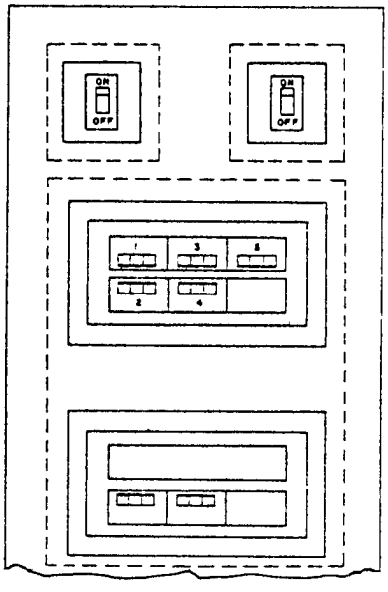
Some meters have a wire connecting both terminals. Do not remove this wire.

1. Insert indicator through front of door.
2. Replace retaining nut.
3. Tighten nut so indicator is snug against door.
4. Referring to tags, push on two connectors.
5. Close door. Slide on clamps. Tighten screws.
6. In power distribution box, set CB40 to ON.
7. Power on.

4-106. REMOVE/REPLACE POWER DISTRIBUTION BOX CONTACTOR

INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required
• Tool kit • Worklight	• Paper • Pen or pencil	• Two



WARNING

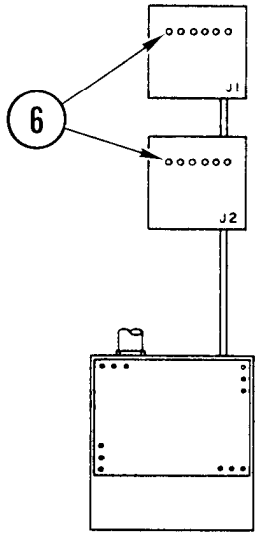
Electrocution may result if task is done with power on. Make sure that power is off.

NOTE

This procedure requires a worklight from a power source other than van power.

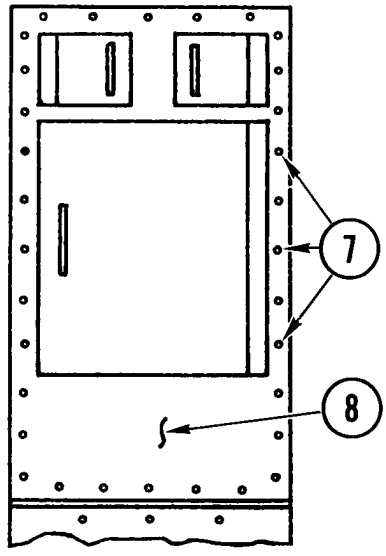
Remove

1. Shutdown all van equipment.
2. Power OFF al van equipment.
3. Set up work light.
4. Power OFF all power distribution box circuit breakers.



5. Power OFF external power source and disconnect ac power cables from van (TM 11-7010-205-10).
6. Check that all indicators on power arrestor boxes are off.

4-106. REMOVE/REPLACE POWER DISTRIBUTION BOX CONTACTOR (CONT)



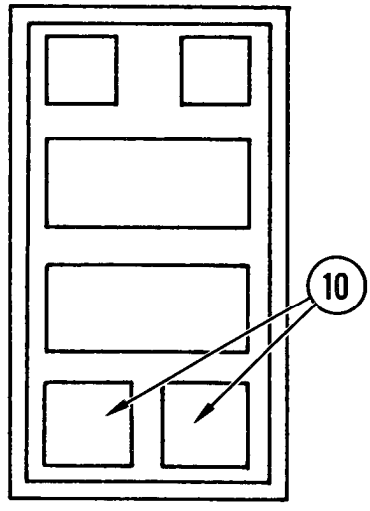
7. While partner supports top front cover, remove all mounting screws.

8. With help from partner, remove top front cover.

WARNING

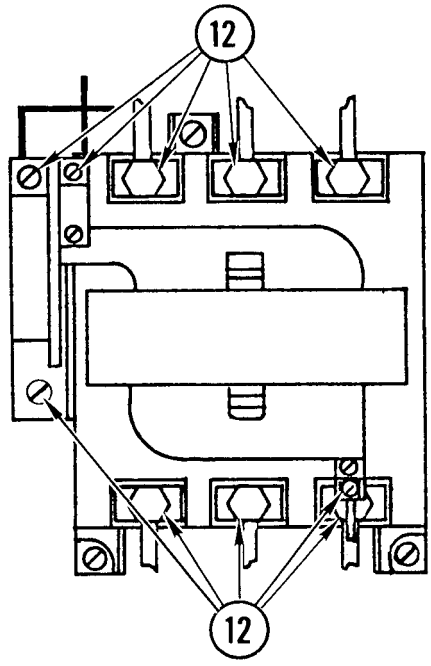
Hazardous voltages can exist on filter terminals within the filter box . Make sure that filters are discharged before performing any maintenance.

9. Discharge all filters.



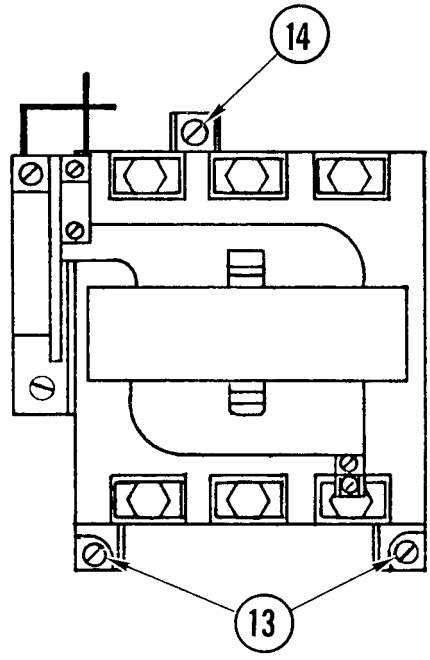
10. Find contractors. Decide which one is to be removed.

4-106. REMOVE/REPLACE POWER DISTRIBUTION BOX CONTACTOR (CONT)



11. Make a drawing of wire connections and colors.

12. Loosen terminal screws and remove all wires.

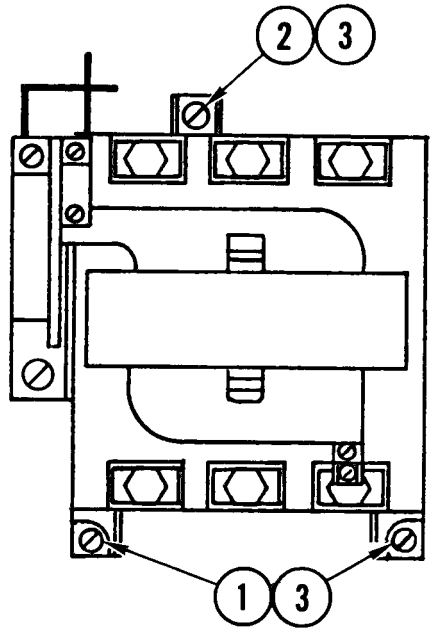


13. Loosen two bottom mounting screws.

14. Support contactor and remove top mounting screw, nut, and washers.

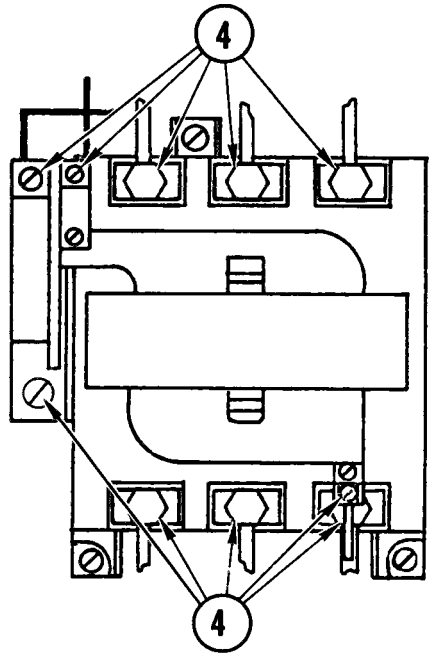
15. Move wires aside as needed and lift up contactor and remove from cabinet.

4-106. REMOVE/REPLACE POWER DISTRIBUTION BOX CONTACTOR (CONT)



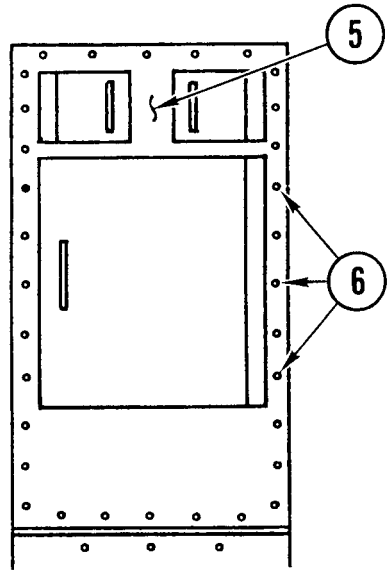
Replace

1. Position a contactor in cabinet. Lower contactor in back of two bolts and washers.
2. Install bolt, lockwasher, washer, and nut at top of contactor.
3. Using wrench to hold nut, tighten all bolts.



4. Following drawing made during removal, connect wires to contactor terminals.

4-106. REMOVE/REPLACE POWER DISTRIBUTION BOX CONTACTOR (CONT)



With partner, place front cover on cabinet.

While partner holds cover, install all mounting screws and washers.

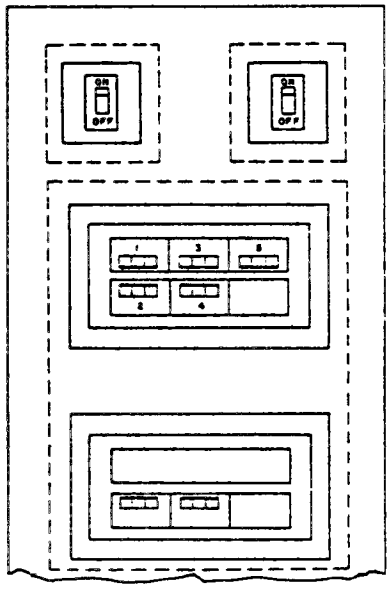
7. Connect ac power cables to van and power ON external power source (TM 11-7010-205-10) .

8. Power ON van and restore to normal operation.

4-107. REMOVE/REPLACE POWER DISTRIBUTION BOX CIRCUIT BREAKER

INITIAL SETUP

Common Tools	Materials/Spare Parts	Personnel Required
• Tool kit	• Paper	• Two
• Worklight	• Pen or pencil	



WARNING

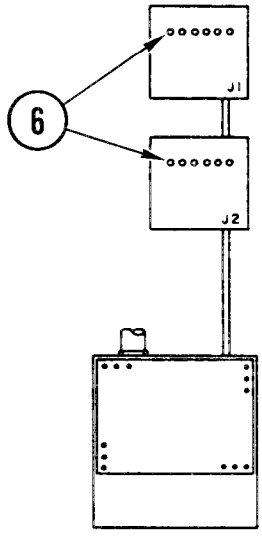
Electrocution may result if task is done with power on.

NOTE

This procedure requires a worklight from a power source other than van power.

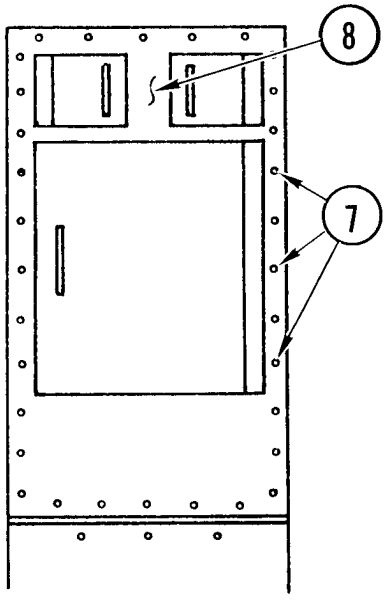
Remove

1. Shutdown all van equipment.
2. Power OFF all van equipment.
3. Set up workliqht.
4. Power OFF all power distribution box circuit breakers.



5. Power OFF external power source and disconnect ac power cables from van (TM 11-7010-205-10).
6. Check that all indicators on power arrestor boxes are off.

4-107. REMOVE/REPLACE POWER DISTRIBUTION BOX CIRCUIT BREAKER (CONT)

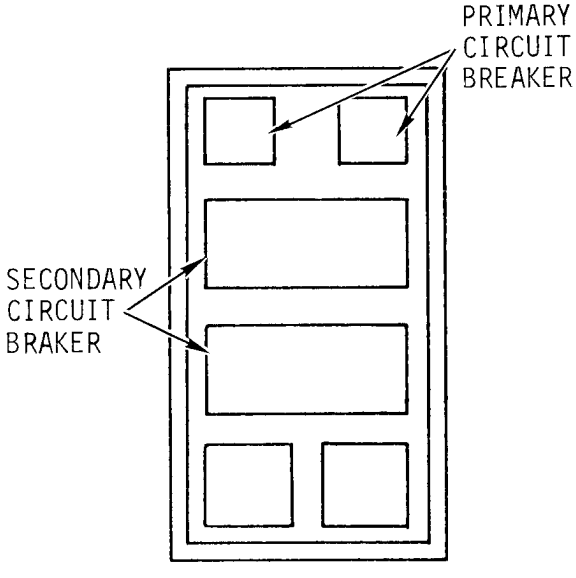


7. While partner supports top front cover, remove all mounting screws.

8. With help from partner, remove top front cover.

WARNING

Hazardous voltages can exist on filter terminals within the filter box. Make sure that filters are discharged before performing any maintenance.

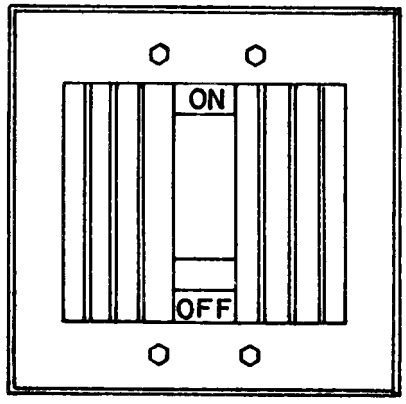


NOTE

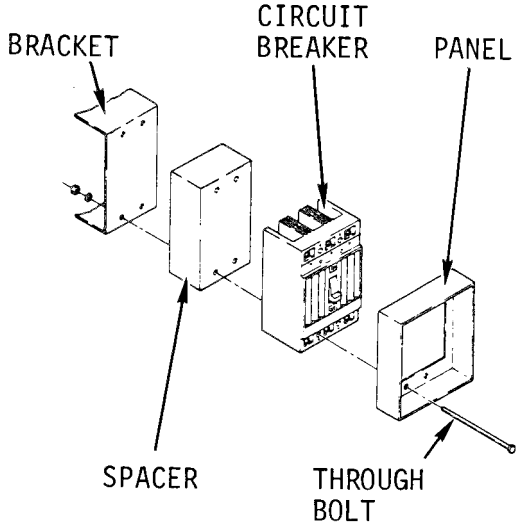
To remove a primary circuit breaker, use steps 9 thru 14.

To remove a secondary circuit breaker, use steps 15 thru 23.

4-107. REMOVE/REPLACE POWER DISTRIBUTION BOX CIRCUIT BREAKER (CONT)

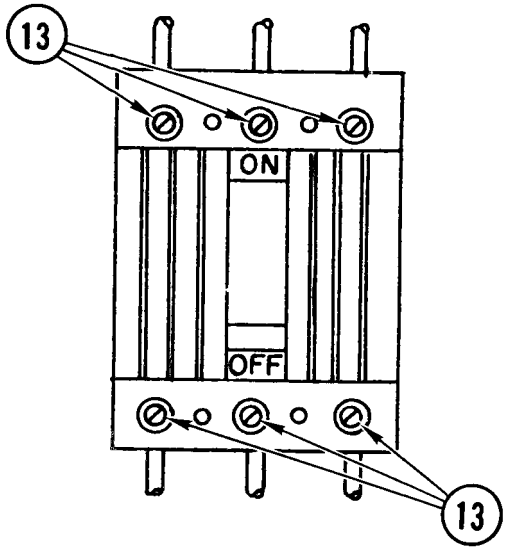


9. Find the primary circuit breaker to be removed.



10. Remove through-bolts holding panel, circuit breaker, and spacer to mounting bracket. Nuts under bracket may be attached to bracket or may need a small wrench.

11. Lay panel, spacer, bolts, nuts, and washers aside.

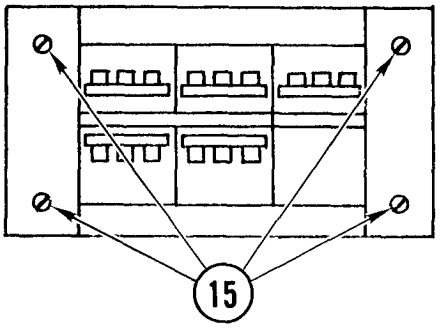


12. Make a drawing of wire connectors and colors.

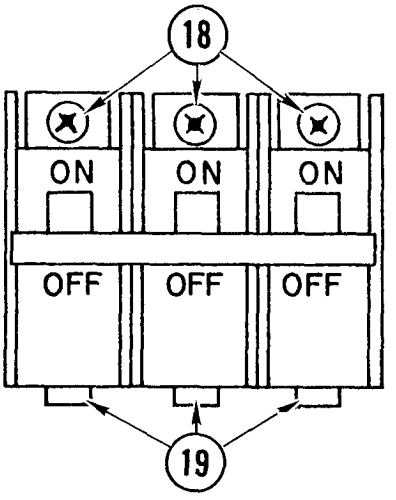
13. Loosen terminal screws and remove wires.

14. Remove circuit breaker from cabinet.

4-107. REMOVE/REPLACE POWER DISTRIBUTION BOX CIRCUIT BREAKER (CONT)



15. To remove a secondary breaker, remove panel mounting screws.
16. Remove panel.
17. Find circuit breaker to be removed.



18. Remove mounting screws.
19. Slide circuit breaker from retaining ears.
20. Pull circuit breaker from frame far enough to get access to wires.
21. Make a drawing of wire connections and colors.
22. Remove wires from circuit breaker.
23. Remove circuit breaker.

Replace

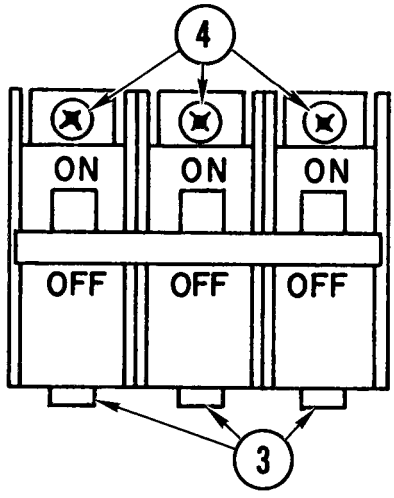
NOTE

Use steps 1 thru 6 and 12 thru 15 to replace a secondary circuit breaker.

Use steps 7 thru 15 to replace a primary circuit breaker.

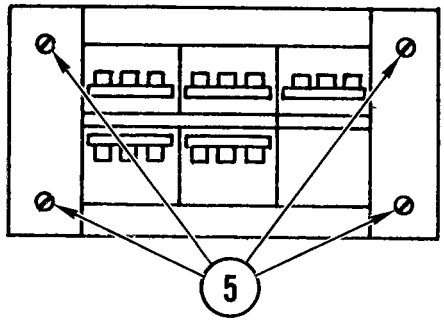
1. Following drawing made during removal connect wires to circuit breaker.
2. Push circuit breaker into frame.

4-107. REMOVE/REPLACE POWER DISTRIBUTION BOX CIRCUIT BREAKER (CONT)



3. Slide circuit breaker onto retaining ears.

4. Install mounting screws.



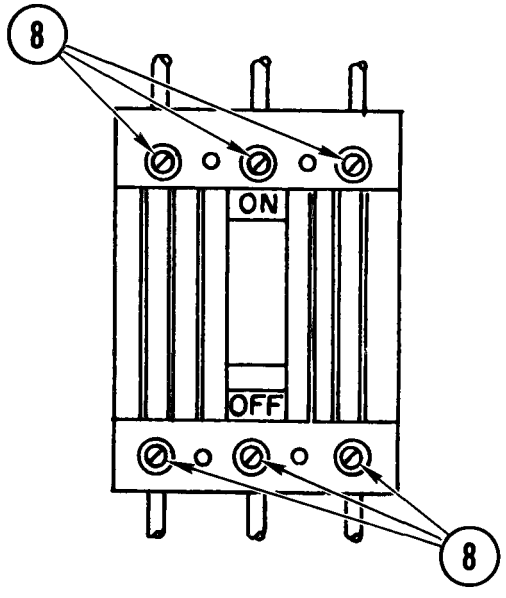
5. Place panel over circuit breakers and install mounting screws.

6. Go to step 12.

7. Use the following steps to replace a primary circuit breaker.

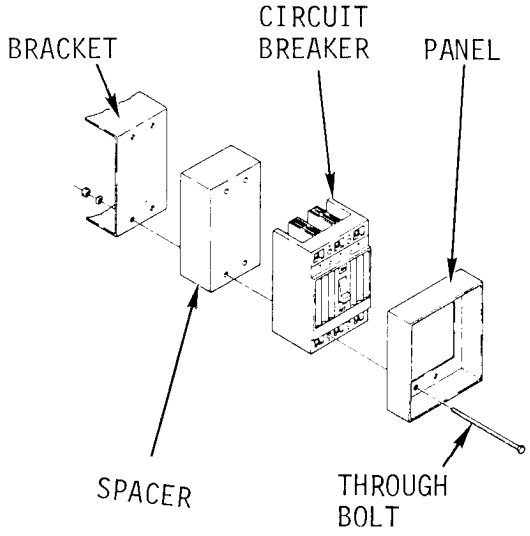
NOTE

Do not change TRIP adjustment on front of circuit breaker. It is preset by manufacturer.



8. Following wire identification drawing made during removal, insert wires in terminals and tighten screws.

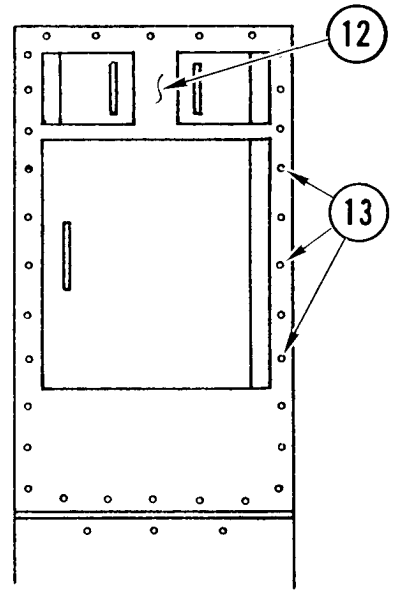
4-107. REMOVE/REPLACE POWER DISTRIBUTION BOX CIRCUIT BREAKER (CONT)



9. Pass bolts through panel, circuit breaker, and spacer.

10. Place the assembly on mounting bracket in cabinet.

11. Install washers and nuts on through-bolts.



12. With partner, place front cover on cabinet.

13. While partner holds cover, install all mounting screws and washers.

14. Power ON external power source and connect ac power cables to van (TM 11-7010-205-10-1).

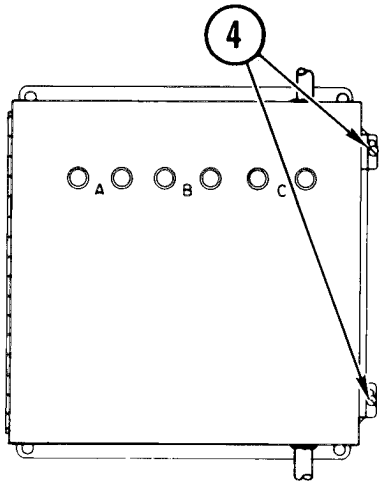
15. Power ON van and restore to normal operation.

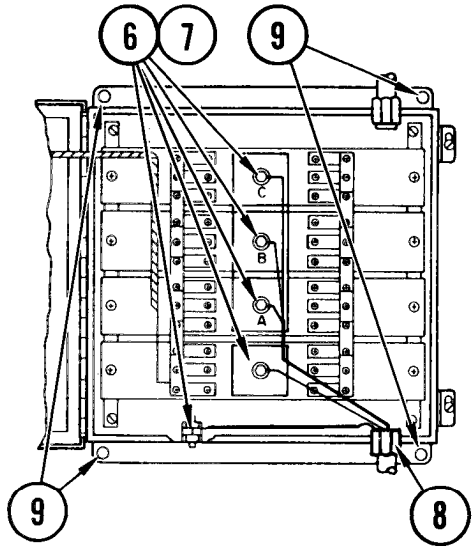
4-108. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR

INITIAL SETUP

Common Tools
- Tool kit
- Work light

Materials/Spare Parts
- Paper
- Pen or pencil





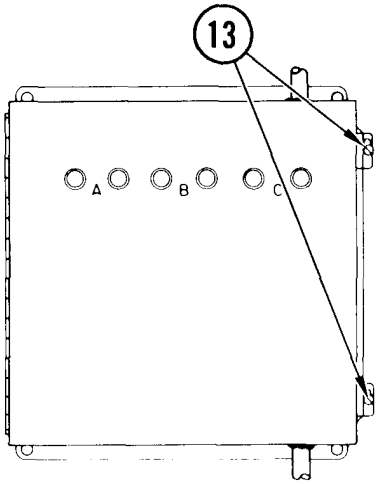
Remove

NOTE

This procedure requires a work light from a power source other than van power.

1. Power OFF all van equipment.
2. Set up work light.
3. Power OFF van at source and r emove power input cables.
4. On 100 amp (top) power line protector, loosen door clamp ing screws.
5. Move cl amps aside and open door.
6. Make a drawing showing power wire colors to studs A, B, C, N, and ground
7. Using hex key wrench to hold stud steady while removing nuts and washers, lift off wires.
8. Unscrew conduit nut.
9. Remove four screws holding box to wall.
10. Lift box from conduit.
11. Feed wires through conduit hole in box.
12. Save conduit nut.

4-108. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR (CONT)

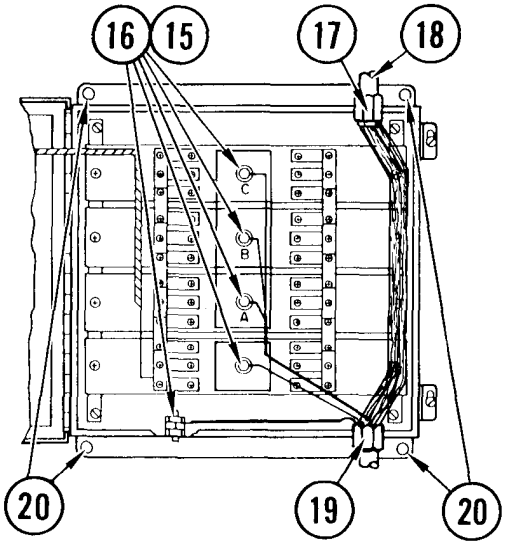


NOTE

If only l00 amp box needed removal, task is complete. If 60 amp box is to be removed, continue with steps that follow.

13. On 60 amp (bottom) power line protection box, loosen door clamp screws.

14. Move clamps aside and open door.



15. Make a drawing showing power wire colors to studs A, B, C, N, and ground.

16. Using hex key wrench to hold stud steady while removing nuts and washers, lift off wires.

17. Unscrew upper conduit nut.

18. Remove upper conduit from upper box wires.

19. Unscrew lower conduit nut.

20. Remove four screws holding box to wall.

21. Remove box by feeding wires through conduit nuts and conduit holes in box.

22. Save conduit nuts.

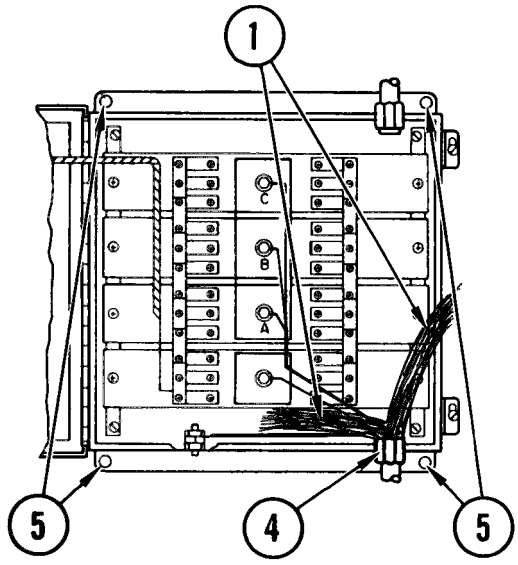
Replace

NOTE

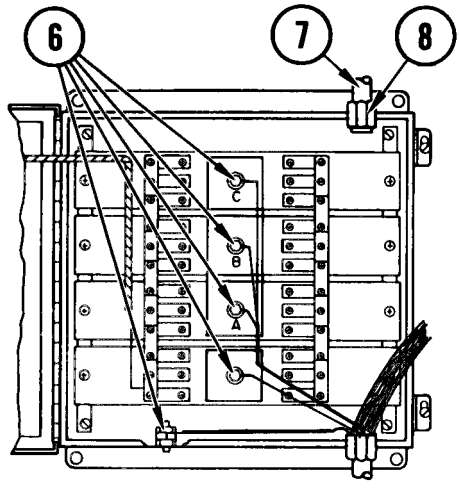
If just 100 amp box was removed, start at step 12.

If both boxes were removed, start at step 1.

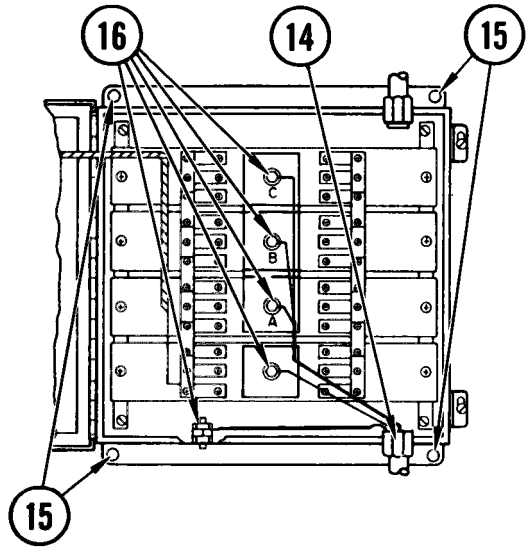
4-108. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR (CONT)



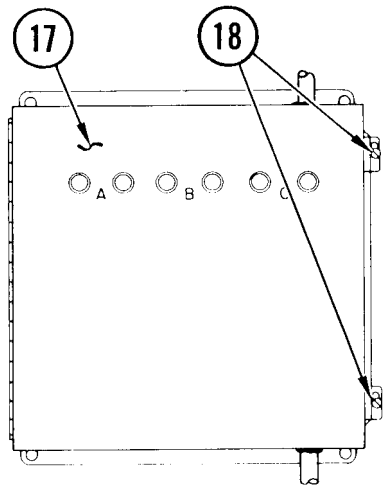
1. Feed wires for both line protector boxes in through bottom hole of 60 amp box.
2. Feed both sets of wires through one conduit nut.
3. Seat 60 amp box on conduit.
4. Install conduit nut.
5. Install box mounting screws.



6. Following drawing made at removal, replace power wires to their studs in 60 amp box. Replace nuts and washers. Use hex key wrench to hold stud steady while tightening nuts.
7. Insert upper conduit in top conduit hole.
8. Inside box, install a conduit nut.
9. Feed wires for 100 amp box up through conduit.
10. Close 60 amp box door.
11. Seat door clamps and tighten screws.
12. Feed wires for 100 amp box through conduit hole.
13. Seat box on conduit.
14. Install conduit nut on conduit.
15. Install box mounting screws.
16. Following drawing, replace wires to studs. Replace nuts and washers., Use hex key wrench to hold studs steady while tightening nuts.



4-108. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR (CONT)



17. Close box door.

18. Seat door clamps and tighten screws.

19. Replace power input cables. Power ON van at source.

20. Power ON voan.

21. Power OFF work light.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG

INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tags
• Worklight	• Pen or pencil

WARNING

Electrocution may result if this procedure is done with power on.

Remove

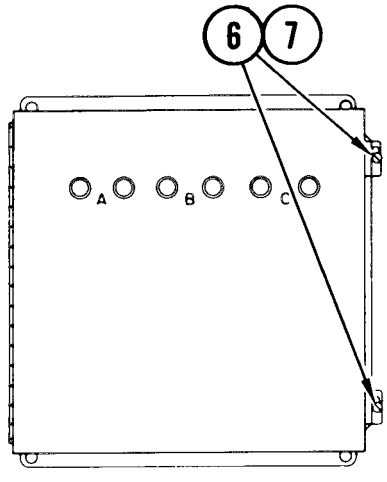
NOTE

If you are removing arrester legs A, B, or C, do steps 1 thru 16. If you are removing arrester leg N, do steps 1 thru 7 and 17 thru 23.

1. Power OFF all van equipment.

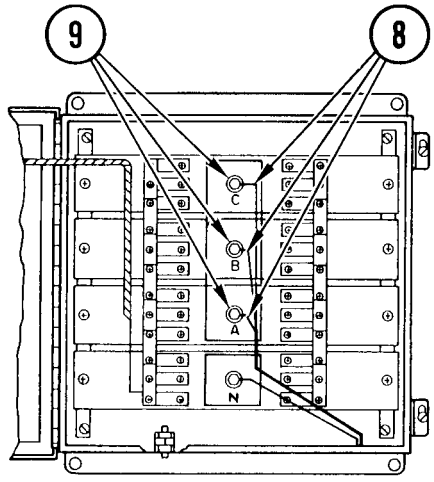
NOTE

This procedure requires a worklight since all van lights will be off.



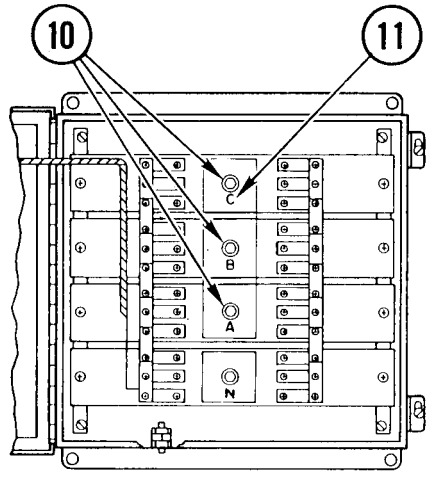
2. Set up worklight.
3. Power OFF system (TM 11-7010-205-10-1).
4. Shut down power source (TM 11-7010-205-10-1).
5. Disconnect power cables (TM 11-7010-205-10-1).
6. At power line protector box, loosen door clamping screws.
7. Move clamps aside and open door.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)



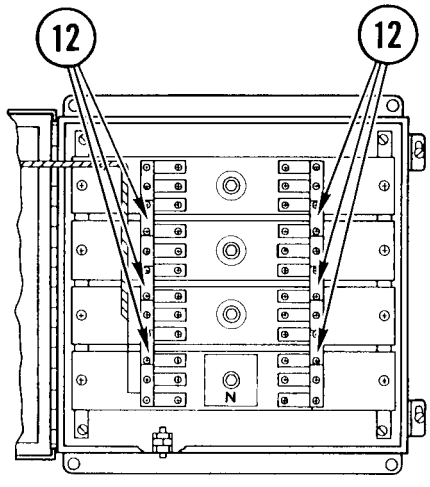
8. Tag wires.

9. Use hex key wrench to hold stud steady while removing nuts and washers. Lift off wires.



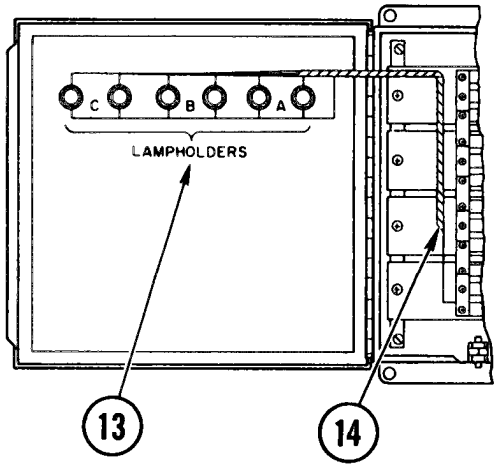
10. Remove nut and washer from terminal of defective arrester.

11. Locate defective arrester and lift off tray.



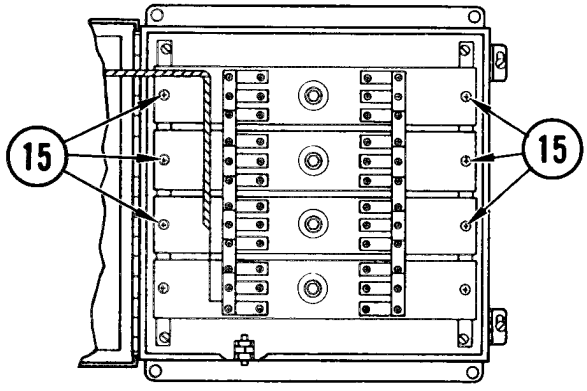
12. Remove screws and lift off bus connectors attached to adjacent arresters on each side of defective arrester. Retain bars for reinstallation.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)



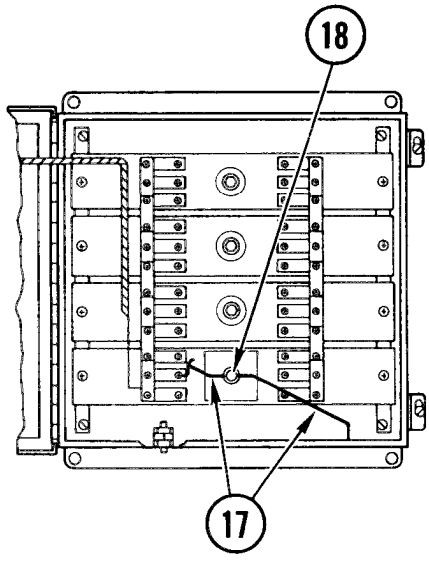
13. On inside of door, unsolder wires at lampholders connected to defective leg.

14. Pull wires down through spiral wrap.



15. Remove mounting screws at defective arrester.

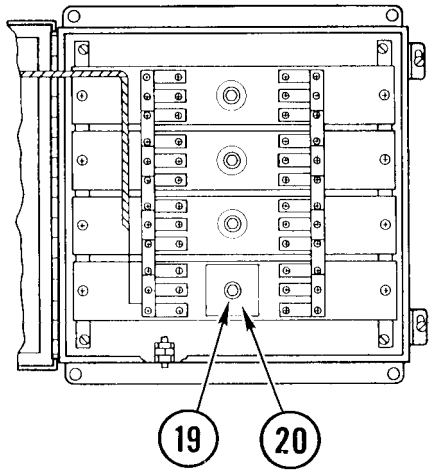
16. Lift out arrester leg.



l7. Tag wires.

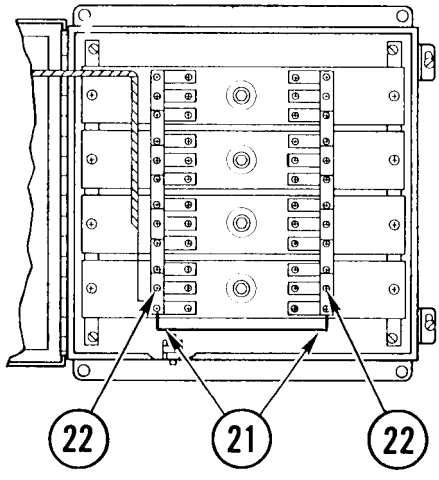
l8. Use hex key wrench to hold stud steady while removing nut and washer from terminal stud. Remove wires.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)



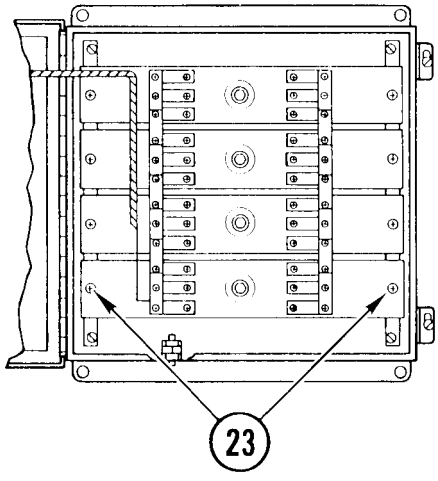
19. Use hex key wrench to hold terminal stud steady while removing nut and washer from terminal stud.

20. Lift off protective tray.



21. Tag wires.

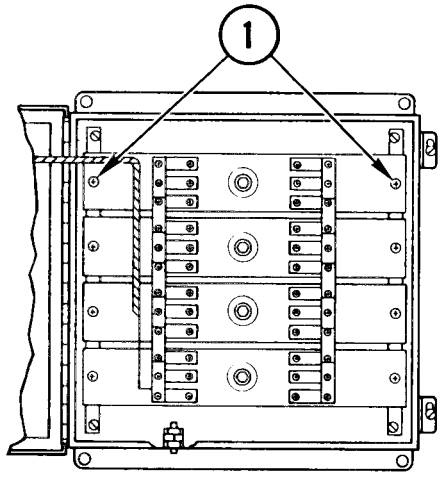
22. Remove screws from each bus bar. Lift off wires and lift off bus bars. Retain bus bars for reinstallation.



23. Remove mounting screws. Lift out arrester leg.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)

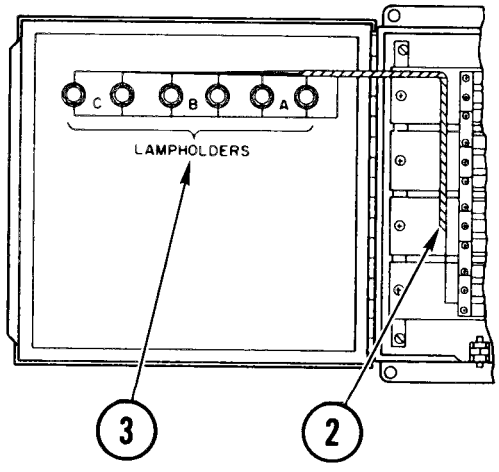
Replace



NOTE

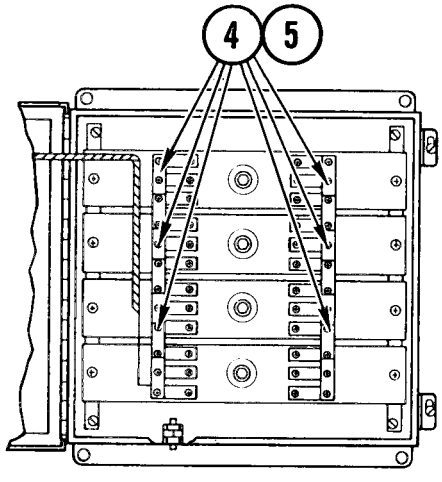
If you are replacing arrester legs A, B, or C, do steps 1 thru 9 and 18 thru 23. If you are replacing arrester leg N, do steps 10 thru 23.

1. Position arrester leg in box. Replace and tighten mounting screws.



2. Push lampholder wires up through spiral wrap.

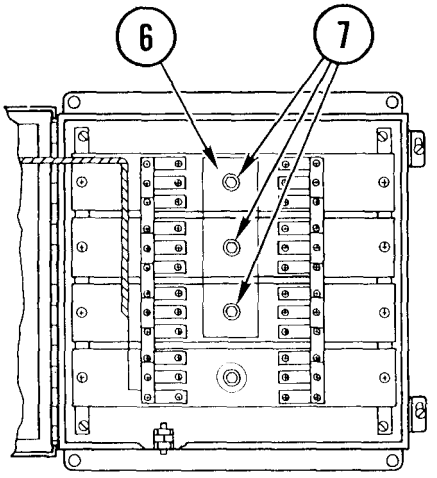
3. Solder wires from arrester leg to respective lampholder.



4. Place bus connectors into position.

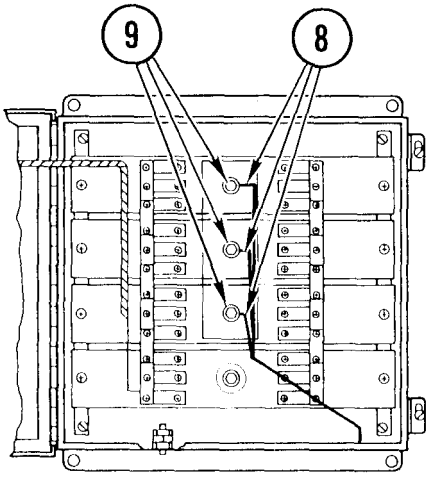
5. Replace and tighten mounting screws on each bus bar.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)



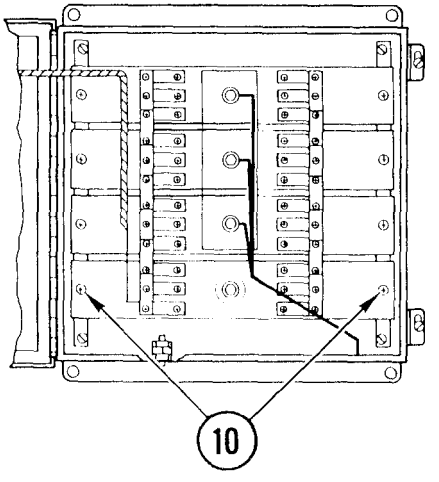
6. Position protective tray on terminal studs.

7. Replace nuts and washers on terminal studs.



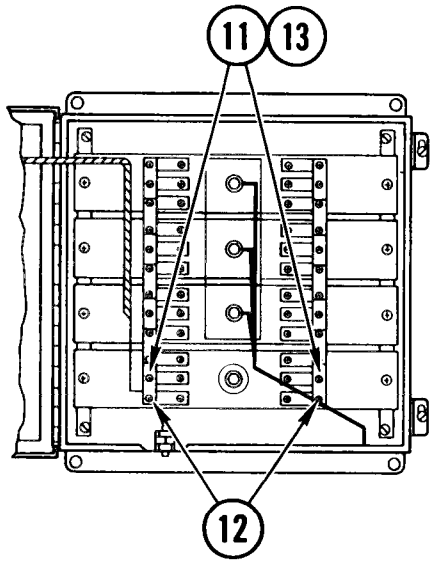
8. Replace wires on terminal studs.

9. Replace nuts and washers. Use hex key wrench to hold studs steady while tightening nuts and washers.



10. Position arrester leg in box. Replace and tighten mounting screws.

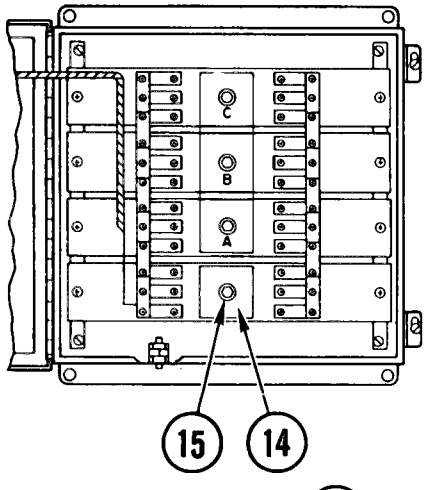
4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)



11. Replace bus bars.

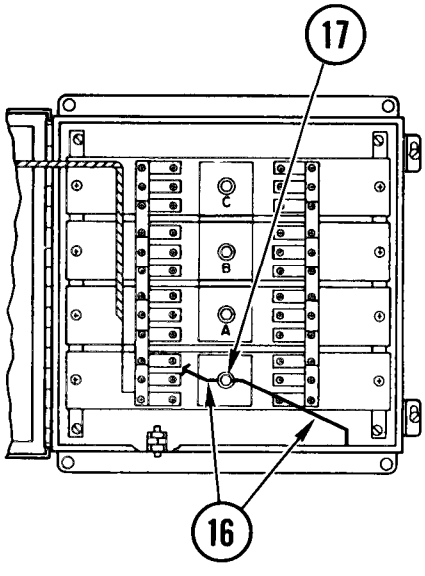
12. Position wires over bottom hole of bus bars.

13. Replace and tighten mounting screws on each bus bar.



14. Position protective tray on terminal stud.

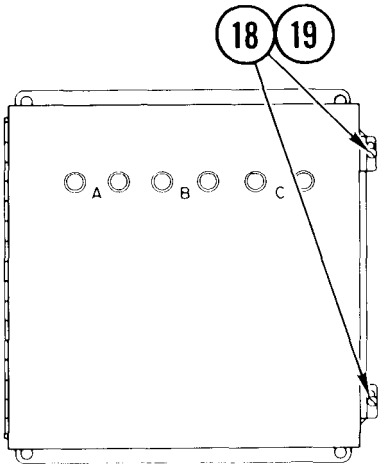
15. Replace nut and washer on terminal stud. Then use hex key wrench to hold stud steady while tightening nut and washer.



16. Replace wires on terminal stud.

17. Replace nut and washer on terminal stud. Use hex key wrench to hold stud steady while tightening nut and washer.

4-109. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR ARRESTER LEG (CONT)



18. Close door and reposition door clamps.

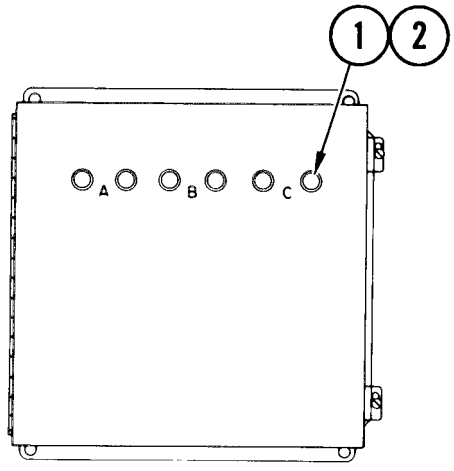
19. Replace and tighten screws.

20. Connect system power cables (TM 11-7010-205-10-1) .

21. Start up power source (TM 11-7010-205-10-1) .

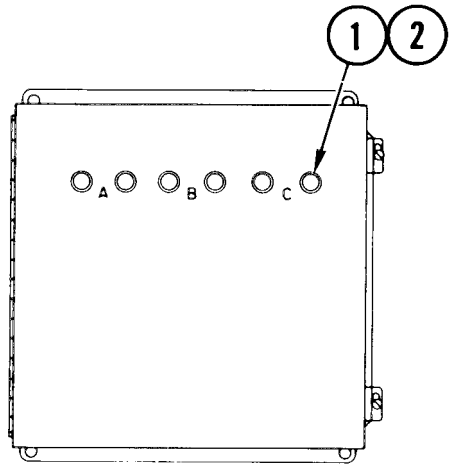
22. Power ON system (TM 11-7010-205-10-1).

4-110. REMOVE/REPLACE POWER ENTRANCE LINE PROTECTOR INDICATORS



Remove

1. Unscrew indicator lens cover by hand. Remove cover.
2. Push in and turn lamp. Remove lamp.



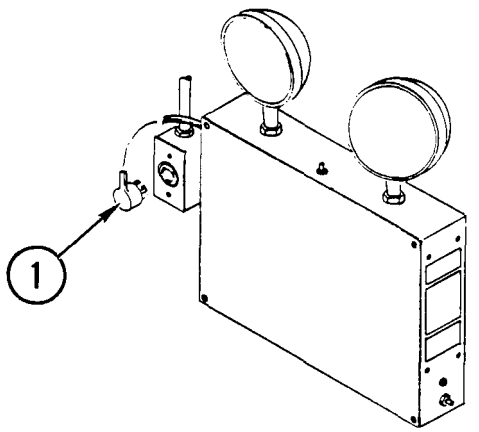
Replace

1. Insert new lamp. Push down and turn.
2. Replace and tighten indicator lens cover.

4-111. REMOVE/REPLACE EMERGENCY LIGHT

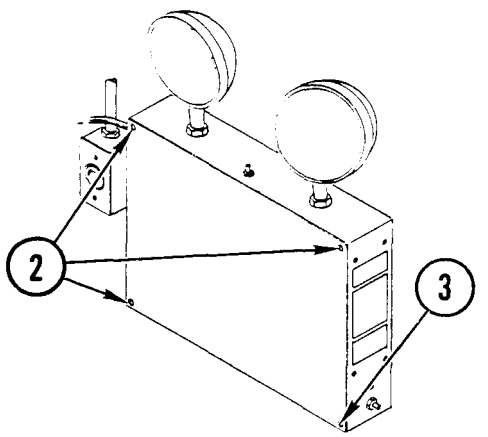
INITIAL SETUP

Common Tools
- Tool kit



Remove

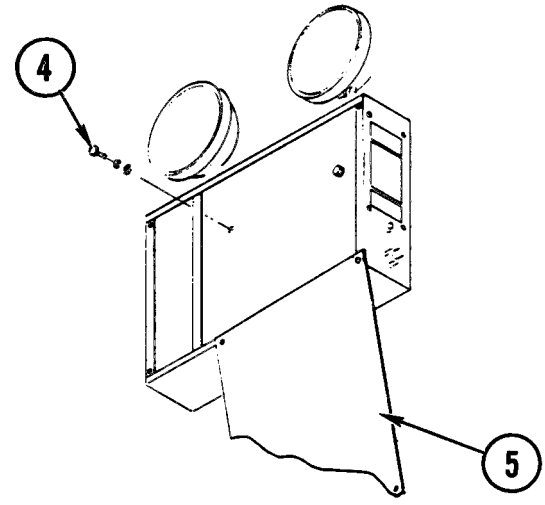
1. Pull ac power plug from outlet.



2. Remove three screws on battery case cover.

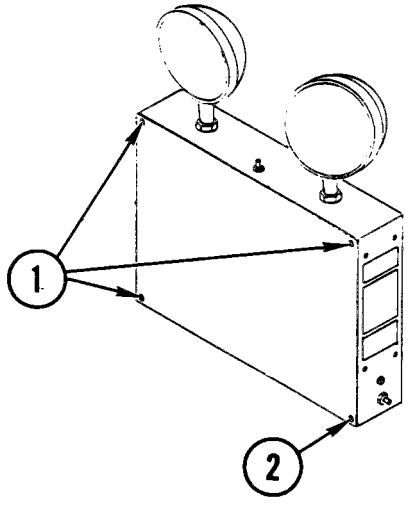
3. Loosen the fourth screw. Let cover hang from fourth screw.

4-111. REMOVE/REPLACE EMERGENCY LIGHT (CONT)



4. Remove two screws, lockwashers and flat washers that connect battery case to spring nuts in van wall.

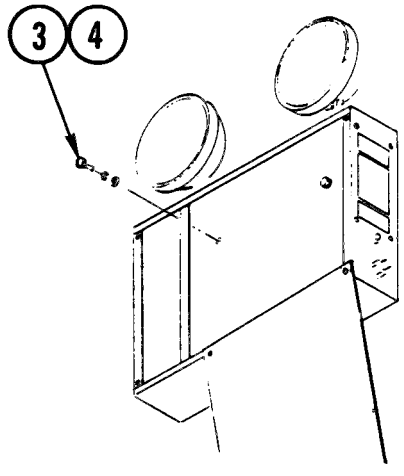
5. Replace cover.



Replace

1. Remove three screws on battery case cover.

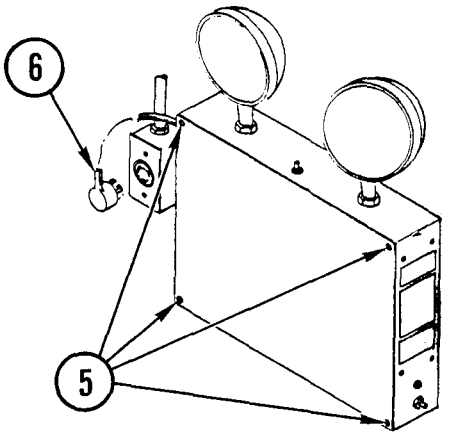
2. Loosen the fourth screw. Let cover hang.



3. Aline holes in back of battery case with spring nuts in van wall.

4. Insert and tighten screws into spring nuts.

4-111. REMOVE/REPLACE EMERGENCY LIGHT (CONT)



5. Insert and tighten three screws to battery case cover. Tighten fourth screw.

6. Push ac plug into technical power outlet.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S)

INITIAL SETUP

Common Tools	Special Tools	Materials/Spare Parts
• Tool kit	• TORX offset driver	• Tie wraps • Tags • Pen or pencil

Remove

NOTE

This procedure assumes you have a faulty CPU interface cable and will replace the entire cable from the peripheral device to the CPU. Because types of connectors and methods of routing differ, this procedure is divided by peripheral device. Always start at the affected device and work back to the CPU, except for the interface cables connected to the signal line filter box on cabinet B. If you will remove/replace more than one cable at a time, always note routing method so cables can be replaced the same way they were removed.

To aid in routing the replacement cable, fasten a cord or field wire to the end of the defective cable connected to the peripheral device, before pulling the defective cable back to the CPU. Use this cord to fish the replacement cable from the CPU back to the peripheral device to which it is to be connected.

As an aid in removing cables, refer to system wiring and van cable installation diagrams in appendix D.

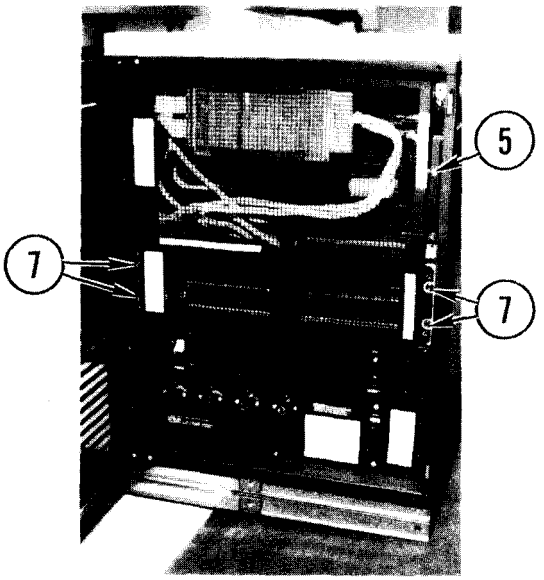
CPU

NOTE

If removing cables from the CPU bulkhead only, do steps 1 thru 3 and l0.

1. Remove locking pins from slides and pull CPU into aisle.
2. Power off.
3. Unlock and pull ac power plug from outlet.
4. Open door.

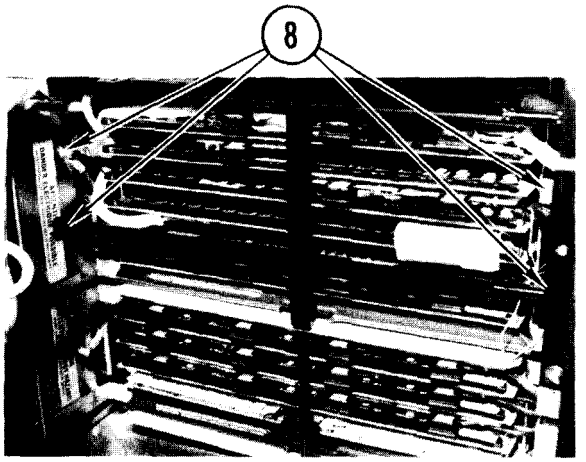
4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)



5. Loosen captive screw.

6. Open top grill.

7. Using TORX offset driver, loosen and remove four mounting screws. Remove bottom grill.

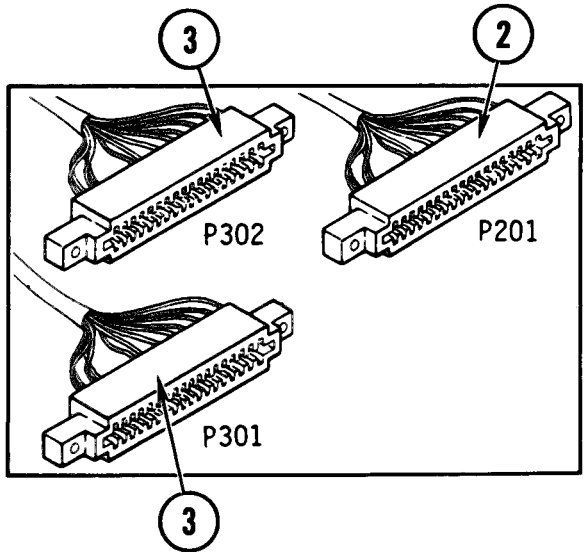


8. Using TORX offset driver, remove mounting screws securing upper support holding bracket. Remove bracket.

9. Remove support strips from boards in both 5-card and l0-card chassis.

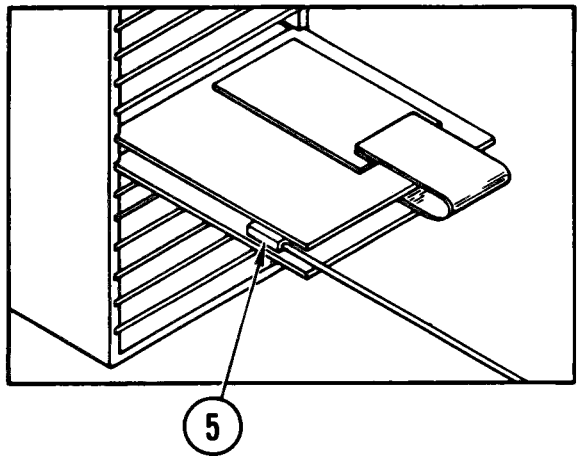
10. Remove back panel.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

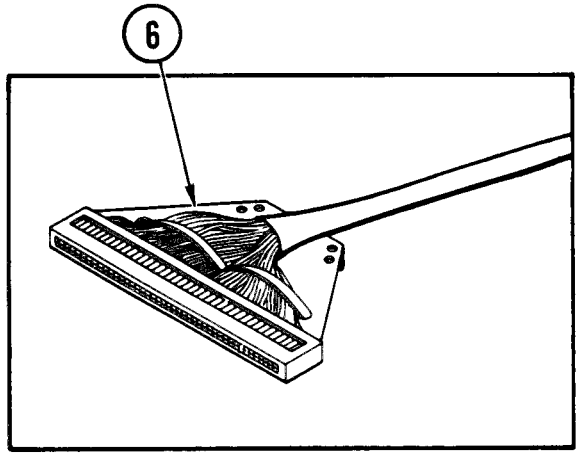


Tape Drive

1. Open tape drive (para 4-20, Remove, steps 1-6).
2. On control board, disconnect P201 from J201.
3. On data boards, disconnect P301 from J301 and P302 from J302.
4. Cut tie wraps to free cables from cabinet to CPU.



5. Pull out magnetic tape controller (MTC) and data recovery unit (DRU) boards from CPU far enough to access interface cable connector.



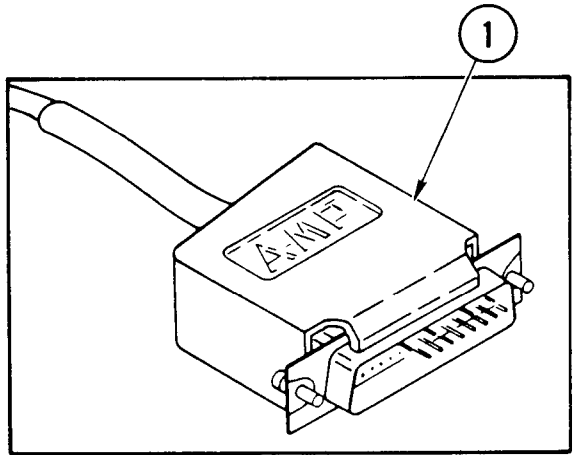
6. Disconnect cable from data recovery unit board.
7. At CPU, remove two screws from bottom of right side panel. Remove panel.

CAUTION

Connector can break or damage boards. Fish cable through CPU carefully. Do not force cable through.

8. Fish cable to back of CPU and out of cabinet.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)



Console Terminal

1. At back of terminal disconnect W1O-P1 from J1.
2. Remove screws from roadside access panel in floor. Remove panel.
3. Remove screws from raceway cover and set cover aside.
4. Cut tie wraps securing interface cables in bundle.
5. Separate console terminal interface cable from bundle.
6. Disconnect W1O-P2 from bulkhead connector.
7. Fish cable to back of CPU and discard.

Line Printer

1. Disconnect CPU interface cable from line printer (para 4-27, Remove, steps 2-10).
2. Remove screws from raceway cover and set cover aside.
3. Cut tie wraps securing interface cables in bundle.
4. Separate line printer interface cable from bundle.
5. Fish cable to back of CPU and remove from bulkhead connector.

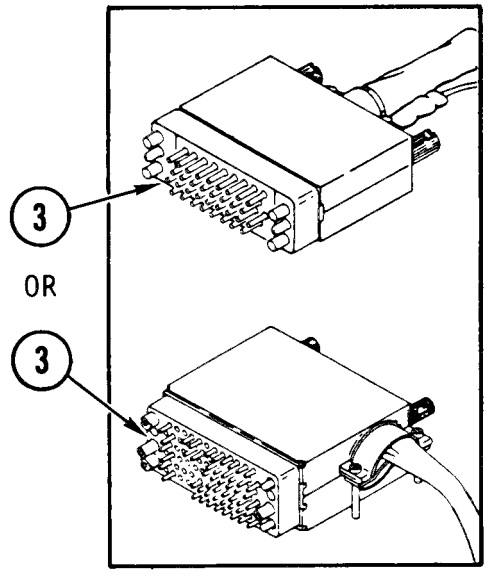
Disk Drive

1. At tech power box, set CB1 and CB2 to OFF.
2. Pull out disk drive drawer to access CPU interface cable connector(s).

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

NOTE

The interface cables to disk drives 480 and 680 each have two connectors connected to each disk drive. Disk drives 500 and 700 each have one connector connected to each drive. Disk drives 400 and 600 each have two connectors. One is connected to each drive and the other is a terminator plug and has no cable connected to it. Remove only the connector for the faulty interface cable you are replacing.



3. At back of disk drive drawer, disconnect CPU interface cable.

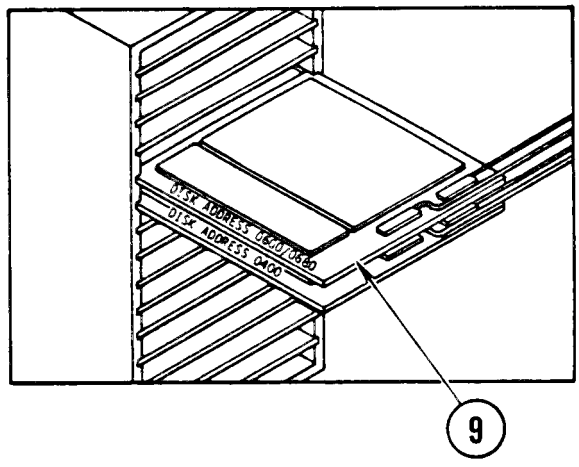
4. Cut tie wraps securing interface cables inside disk drive cabinet. Separate cable you are removing back to raceway.

5. Remove screws from raceway cover and set cover aside.

6. Cut tie wraps securing interface cables in bundle in raceway.

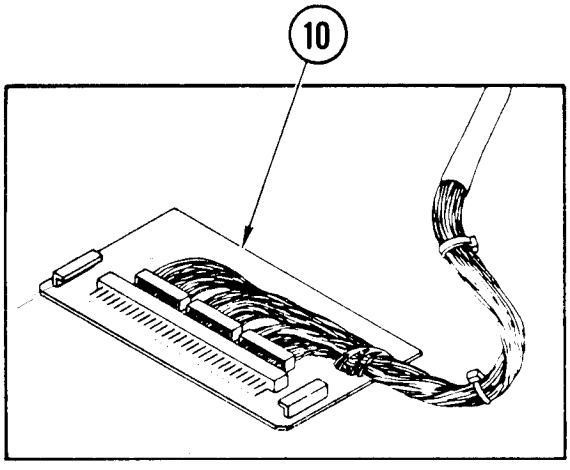
7. Fish interface cable out of disk drive cabinet and back to CPU.

8. Remove cable from bulkhead connector.



9. Pull out mass storage controller (MSC) board enough to remove paddleboard.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)



10. Note position of wires on paddleboard. Unsolder wires.

11. At CPU, remove two screws from bottom of side panel where cable you are removing is located. Remove panel.

12. Fish cables to back of CPU and out of cabinet.

I/0 Terminals

1. At back of terminal(s), disconnect interface cable W36-P2 or W20-P2.

2. Remove screws from raceway cover and set cover aside.

3. Pull cable bundle out of raceway up to access plate on floor.

4. Cut tie wraps securing interface cables in bundle.

5. Remove screws from access plate and set plate aside.

6. At back of CPU, remove screws from access plate and set plate aside.

7. Fish bundle out of channel to roadside.

8. Cut tie wraps securing interface cables in bundle.

9. Separate I/0 terminal interface cable from bundle.

10. Disconnect I/0 terminal interface cable from CPU at bulkhead (W36-P1 or W20-P1).

11. Fish interface cable from I/0 terminal thru floor channel back to CPU.

12. Remove cable from bulkhead connector.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

Card Reader/Punch

1. Power OFF.
2. Pull ac power plug from outlet.
3. Remove locking pins from card reader/ punch slides and pull it into aisle.
4. Underneath device, disconnect W23-P2 from J2 or W24-P2 from J1.
5. Remove screws from raceway cover and set cover aside.
6. Pull cable bundle out of raceway up to access plate on floor.
7. Cut tie wraps and separate device interface cable from bundle.
8. Remove screws from access plate and set plate aside.
9. At back of CPU, remove screws from access plate in floor and set plate aside.
10. Cut tie wraps securing interface cables in bundle.
11. Separate card reader/punch interface cable from bundle.
12. At back of CPU, disconnect W23-P1 from A5J18 or W24-P1 from A5Jl7.
13. Fish interface cable from card reader/punch thru floor channel back to CPU.
14. Remove cable from bulkhead connector.

Cabinet B

1. Disconnect interface cable from signal line filter box.
2. Remove screws from wall raceway cover and set cover aside.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

3. Cut tie wraps securing interface cables in bundle.

4. Separate interface signal line cable from bundle.

5. Remove screws from riser access plate and set plate aside.

6. Remove screws from access plate under card reader/punch table and set plate aside.

7. Fish cable back to access opening in floor and remove cable.

8. Disconnect cable from CPU bulkhead.

9. Cut tie wraps securing interface cables in bundles at bulkhead and in floor access opening.

10. Separate signal line interface cable from bundle.

11. Fish cable back to access opening under card reader/punch and remove cable.

103J Modem

NOTE

There are three 103J modem interface cables connected to the CPU bulkhead, but only one modem is installed at this time. The extra cables are for future expansion.

1. Power OFF modem.

2. Disconnect interface cable W37-P2 from J1 on rear of modem.

3. Cut tie wraps securing cables in bundle and separate interface cable from bundle.

4. Remove access plate from riser and set aside.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

5. Fish cable back to access opening in floor near CPU.

6. Cut tie wraps securing cables in bundle, and separate interface cable from bundle.

7. Remove cable from bulkhead connector.

Isolator

NOTE

There are three isolator interface cables connected to the CPU bulkhead, but only two isolators are installed at this time. The other cable is for future expansion.

1. Power OFF crypto cabinet circuit breaker.

2. Disconnect interface cable W32-P2 or W39-P2 from J1 on rear of applicable isolator.

3. Remove access plate from riser and set aside.

4. Fish cable back to access opening in floor near CPU.

5. Cut tie wraps securing cables in bundle, and separate interface cable from bundle.

6. Remove cable from bulkhead connector.

Replace

NOTE

Because types of connectors and methods of routing differ, this procedure is divided by peripheral device. Always start at the CPU and work to the affected device, except for the interface cables connected to the signal line filter box on cabinet B.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

NOTE

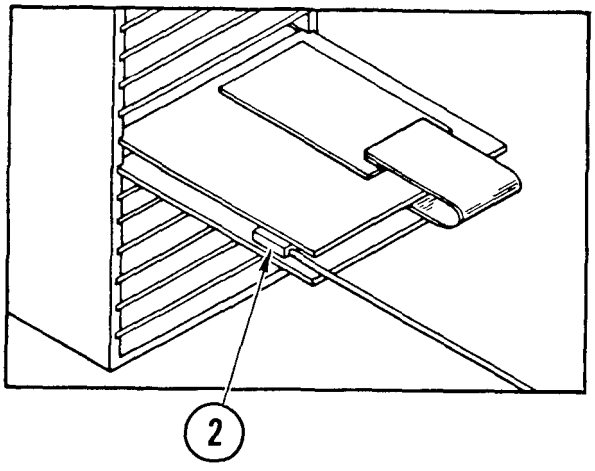
As an aid in routing the replacement cable(s), refer to system wiring and van cable installation diagrams in appendix D.

Tape Drive

CAUTION

Connector can break or damage boards. Fish cable through CPU carefully. Do not force cable through.

1. Fish cable W9-P1 through side of CPU cabinet to front.

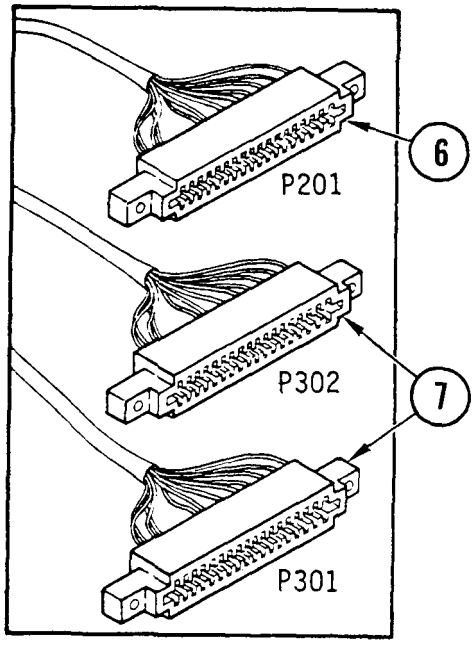


2. Pull out magnetic tape controller (MTC) and data recovery unit (DRU) boards from CPU far enough to access interface cable connector (port 4).

3. Push on connector.

4. Route cable out of CPU through opening at top rear side.

5. Carefully route three connectors through opening in bottom of tape drive cabinet.

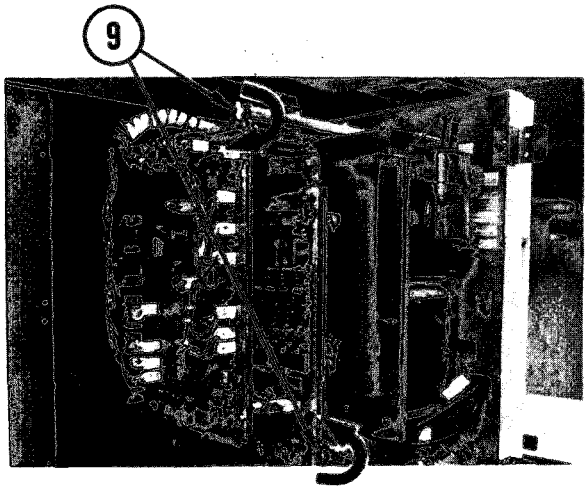


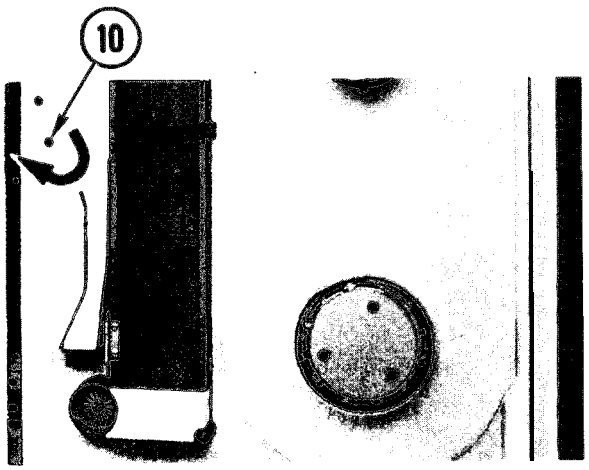
6. On control board, connect P20 to J201 .

7. On data boards, connect P301 to J301 and P302 to J302.

8. Tie wrap cables to bundle inside tape drive cabinet.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)





9. Close boards. Turn latches as shown.

10. Close cabinet. Insert flat-tip screwdriver in latch hole and turn as shown.

11. Replace cover and lock in place with spring-loaded pin at top inside.

12. Close tape drive cover.

13. Power ON tape drive and set CBO1 to ON on tape drive PDU.

14. Close up CPU (para 4-18, Replace, steps 29-31).

Console Terminal

1. Connect W1O-P2 to CPU bulkhead.

2. Route W1O-P1 inside raceway up to console terminal.

3. Connect W1O-P1 to J1 on terminal.

4. Tie wrap cable to rest of bundle in raceway.

5. Replace raceway cover and tighten screws.

6. Close up CPU (para 4-18, Replace, steps 29-31).

Line Printer

1. Connect W12-P2 to bulkhead connector.

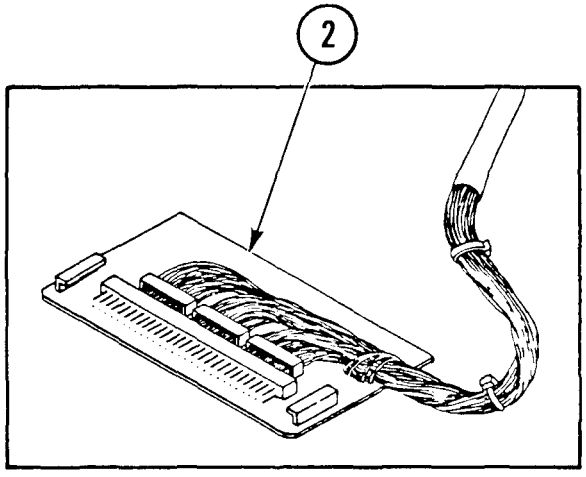
2. Route W12-P1 from CPU into raceway and back to line printer.

3. Connect W12-P1 to line printer.

4. Close up harness duct (para 4-27, Remove, steps 11-15).

5. Tie wrap cable to rest of bundle in raceway.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)



6. Replace raceway cover and tighten screws.

7. Close up CPU (para 4-18, Replace, steps 29-31).

Disk Drive

1. Fish cable through side of CPU to front of cabinet.

2. Using your notes, solder cable wires to paddleboard.

3. Connect paddleboard to MSC board.

4. Route cable from CPU into raceway and back to disk drive cabinet.

5. Fish cable into disk drive cabinet and connect to back of drive.

6. Tie wrap cable to bundle inside cabinet.

7. Tie wrap cable to rest of bundle in raceway.

8. Replace raceway cover and tighten screws. Replace port.

9. Close up CPU (para 4-18, Replace, steps 29-31).

I/0 Terminal

1. Connect I/0 terminal interface cable(s) W36-P1 or W20-P1 to CPU bulkhead connector(s).

2. Join I/0 terminal cable to rest of bundle. Tie wrap bundle together.

3. Fish bundle through crossover channel and into curbside raceway.

4. Route cables through raceway to I/0 terminals.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

5. Connect cable(s) W36-P2 or W20-P2) to I/0 terminals .

6. Replace raceway cover and tighten screws.

7. Replace access plates (curbside and roadside) and tighten screws.

8. Close up CPU (para 4-18, Replace, steps 29-31).

Card Reader/Punch

1. Connect card reader/punch interface cable W23-1 or WP-24-P1 to bulkhead connector.

2. Join card reader/punch cable to rest of bundle and tie wrap bundle.

3. Fish interface cable from CPU through floor channel back to raceway for card reader/punch.

4. Route cable through raceway.

5. Underneath card reader/punch, connect W23-P2 to J2 or W24-P2 to J1.

6. Join installed cable to rest of cables in raceway and tie wrap in bundle.

7. Replace raceway cover and secure in place with screws.

8. Slide card reader/punch back in place and replace locking pins in slides.

9. Replace ac power plug in outlet.

10. Power ON.

11. Replace access plate and secure in place with screws.

12. At back of CPU, replace access plate and secure in place with screws.

13. Close up CPU (para 4-18, Replace, steps 29-31).

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

Cabinet B

1. Connect cable to the CPU bulkhead.
2. Route cable thru access opening in floor back to access opening under card reader/punch table.
3. Fish cable under floor up to wall raceway.
4. Route cable up wall raceway and over to signal line filter box.
5. Connect cable to filter line signal box.
6. Tie wrap cable to rest of bundle in wall raceway.
7. Replace cover on raceway and secure in place with screws.
8. Replace plate on access opening under table and secure in place with screws.
9. At access opening in floor near CPU, tie wrap cable to rest of bundle in opening.
10. Close up CPU (para 4-18, Replace, steps 29-31).

103J Modem

1. Connect W37-P1 to CPU bulkhead.
2. Fish cable thru access opening in floor and back to modem.
3. Connect W37-P2 to J1 on rear of modem.
4. Tie wrap cable to bundle in cabinet.
5. Replace access cover in riser and secure in place with screws.

4-112. REMOVE/REPLACE CPU INTERFACE CABLE(S) (CONT)

6. Tie wrap cable to bundle in access opening in floor.

7. Power ON modem.

8. Close up CPU (para 4-18, Replace, steps 29-31).

Isolator

1. Connect W32-P1 or W39-P1 to CPU bulkhead.

2. Fish cable thru access opening in floor back to crypto cabinet and up to isolator.

3. Connect W32-P2 or W39-P2 to J1 on rear of applicable isolator.

4. Replace access cover in riser and secure in place with screws.

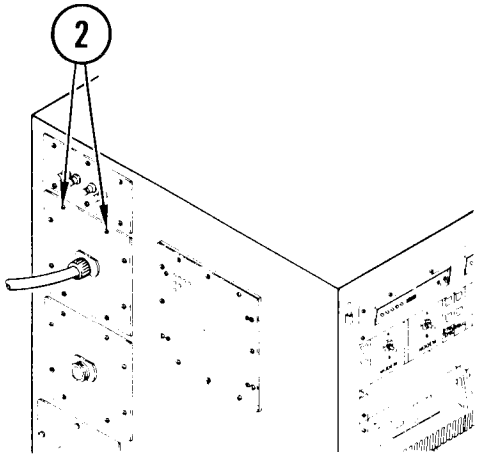
5. Tie wrap cable to bundle in access opening in floor.

6. Close up CPU (para 4-18, Replace, steps 29-31).

4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7

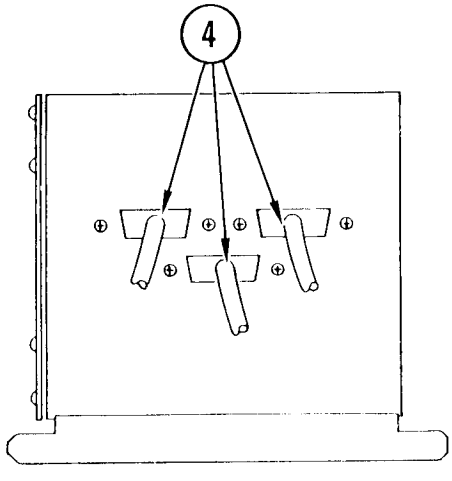
INITIAL SETUP

Common Tools	Test, Measurement and Diagnostic Equipment	Materials/Spare Parts	Personnel Required
• Tool Kit	• Multimeter	• Tags • Pen or pencil • Electrical tape	• Two



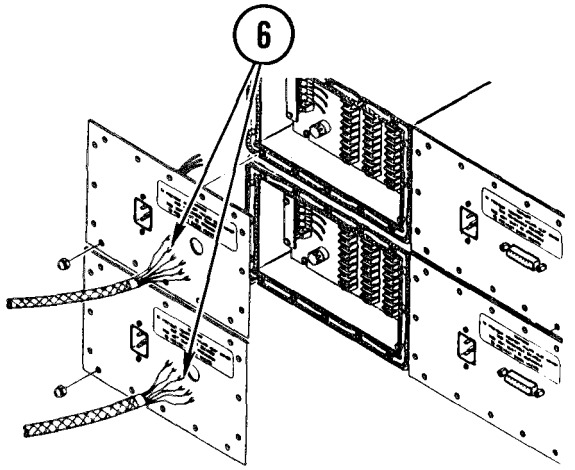
Remove

1. Power OFF cabinet A circuit breaker.
2. Remove mounting screws and washers attaching entrance box assembly to side of cabinet A.
3. Remove entrance box assembly from mounting slot and allow it to hang on its mounting ears from side of cabinet.



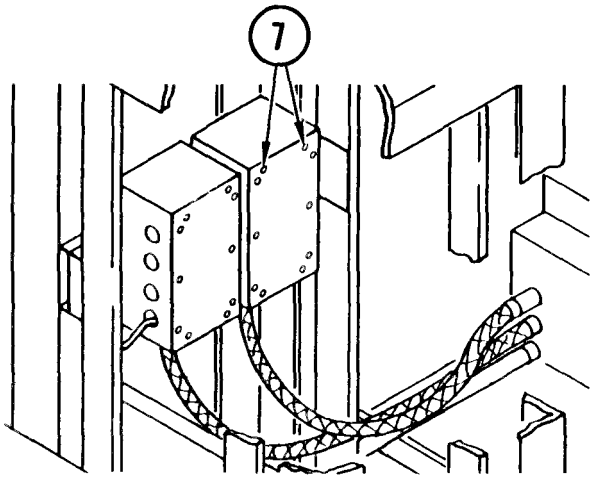
4. Tag and remove cable connectors from receptacles J1, J2 and J3 on rear of entrance box assembly.

4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)

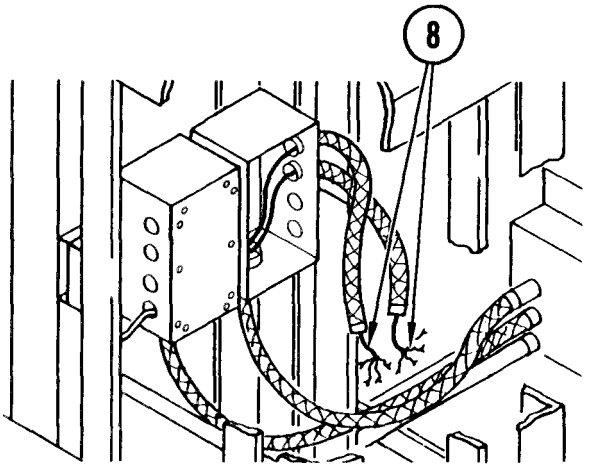


5. Remove both isolator assemblies (Para 4-37, Remove, steps 1-8 and 10).

6. With wire cutters, clip and remove all spade lugs from ends of wiring on cables CA6W18 and CA6W19 which were disconnected from terminals of the two isolator assemblies.



7. At upper rear section of crypto cabinet, remove mounting screws and washers and lift right side cover from junction box.



8. Carefully feed cables CA6W18 and CA6Wl9 back through the two sections of flexible conduit attached to right side of junction box.

9. Find cable CA6W17 (coiled inside) junction box. If spade lugs are attached to wire leads, clip and remove.

4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)

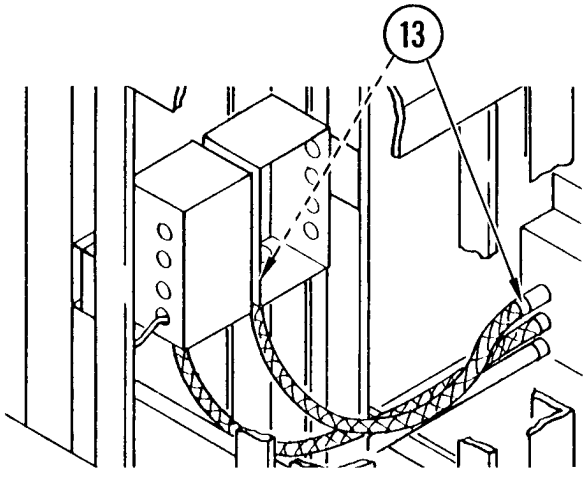
NOTE

The three lengths of field wire cut in the following step are to be used as fish wire for feeding the cables back through the conduit in the van.

10. Secure and cut three 20-foot sections of field wire.

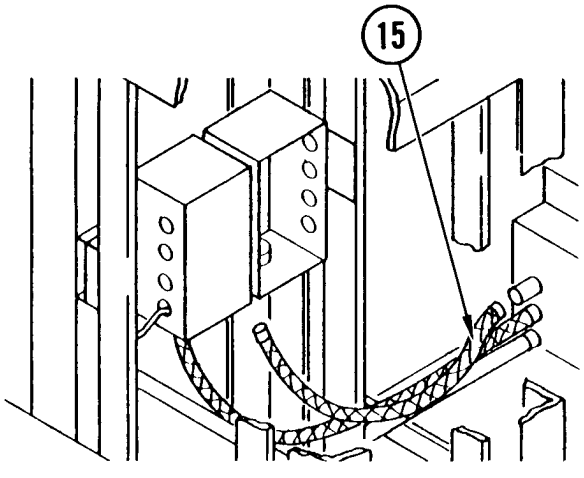
11. Strip one end of each length of wire and wrap securely or solder to end of each cable CA6W17, CA6W18, and CA6W19.

12. Tape each spliced end securely.



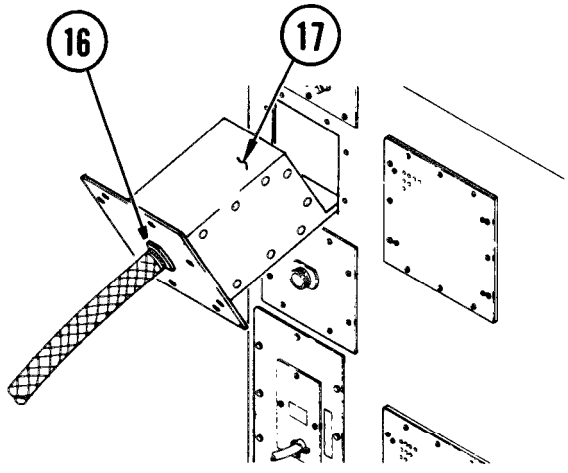
13. Disconnect section of flexible conduit between right lower section of junction box and solid van conduit located at front section of van.

14. With partner, feed the three cables, with attached fish wires, out through access hole in junction box and through flexible conduit.



15. Remove section of flexible conduit and stow, pending replacement.

4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)



16. On other side of van, disconnect the end of other flexible conduit from receptacle on entrance box assembly.

17. Have partner remove entrance box assembly from its mounting slot.

18. Have partner, holding entrance box assembly, carefully but firmly pull on the three attached cables. You, on other end of cabling, carefully push and feed cables into and through solid conduit in van front wall.

NOTE

In following steps, do not pull fish wire out of solid conduit.

19. Carefully continue feeding cables through solid conduit until spliced ends of cables come free of end of flexible conduit.

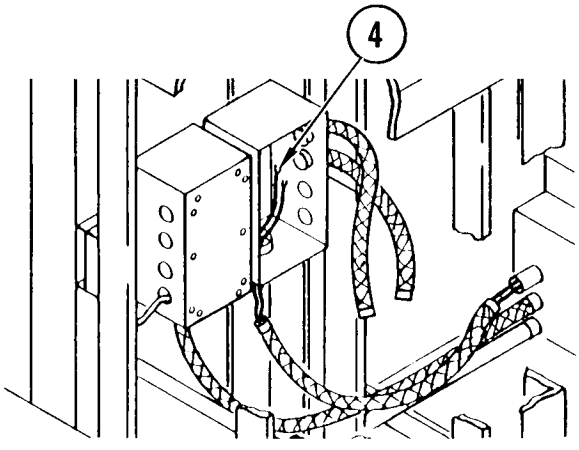
20. Cut cables free from ends of fish wire; leave fish wire in place in conduit.

21. Remove entrance box assembly with attached cabling.

Replace

1. Splice ends of new cables to fish wire. It is recommended that wires be wrapped, not soldered. Tape securely.

4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)



NOTE

When feeding new cables through conduit, start pulling and feeding just one cable. After you have pulled the cable a few inches, start pulling on second cable while at same time still pulling on first cable. After you have pulled both cables a few more inches, start pulling on the third cable while still pulling on the first two. This will allow the spliced sections to be fed through the conduit independent of each other.

2. Observing note, carefully but firmly pull on fish wires while partner, on other side, feeds the cables into the flexible conduit.

3. Continue to pull and feed cables through solid conduit until spliced ends come into view.

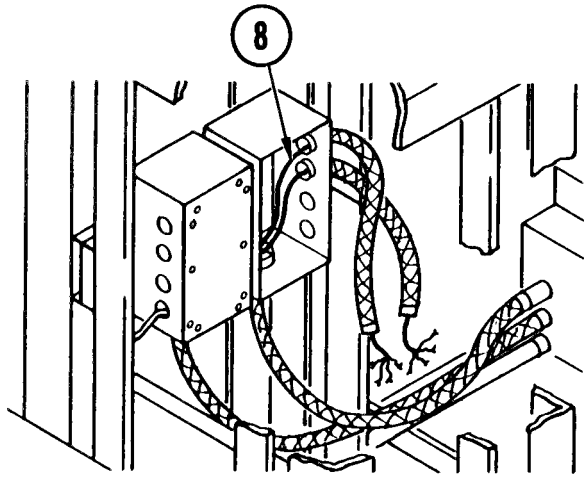
4. With partner, feed cables through other section of flexible conduit and up through access hole in lower section of junction box.

5. Connect and secure ends of flexible conduit to junction box and end of van conduit.

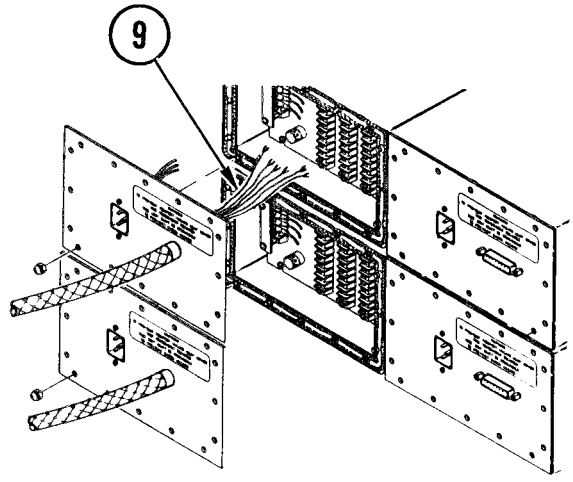
6. While you pull out all slack cabling from conduit at junction box, partner secures other section of flexible conduit to entrance box assembly.

7. Disconnect and remove fish wire connected to cable CA6W17. Coil cable in junction box for future use.

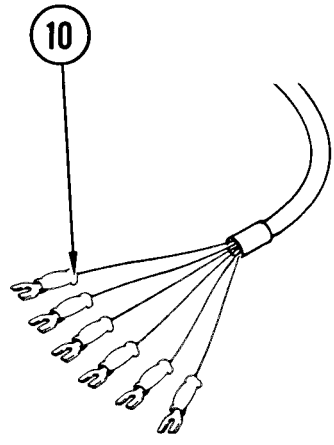
4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)



8. Continue feeding cables CA6W18 and CA6W19 through flexible conduits on right side of junction box (cable CA6W18 feeds through upper conduit and cable CA6W19 through lower conduit).

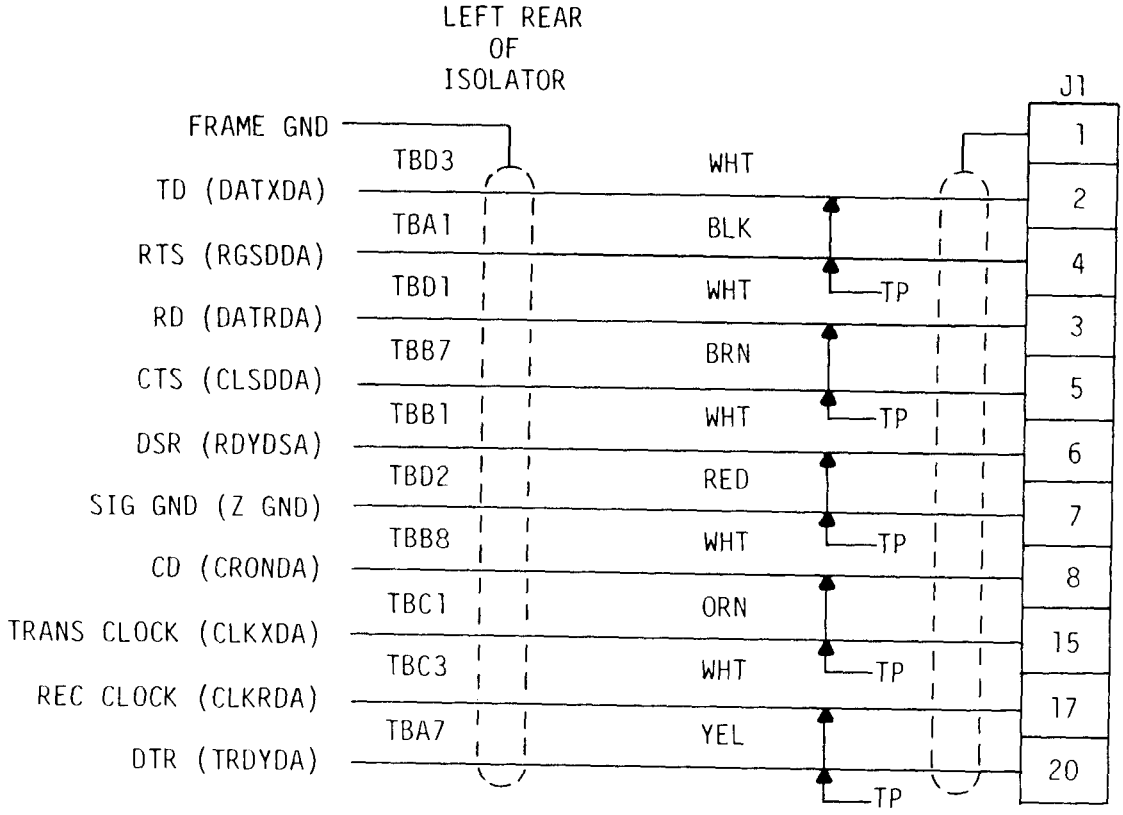


9. At isolator rear panels, feed conduit wiring through access holes, then connect two sections of flexible conduit.



10. Attach and crimp replacement spade lug to each cable lead at back of both isolators.

4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)

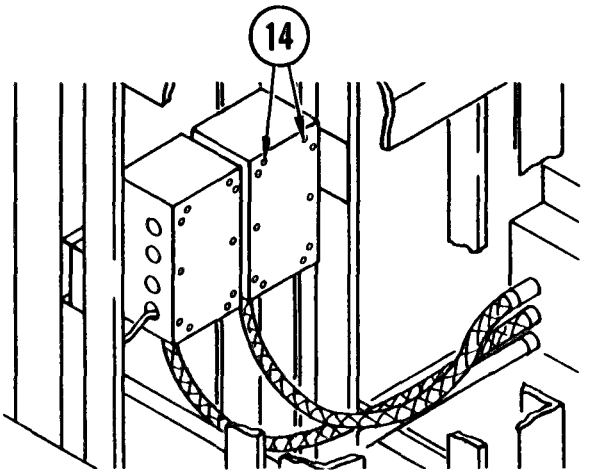


11. Using multimeter, identify and tag each wire lead according to wiring diagram.

12. While holding each isolator, refer to wiring diagram and connect respective cable CA6W18 and CA6W19 to proper terminals on each isolator.

13. Secure and replace the two isolator assemblies (para 4-37, Replace, steps 3-9).

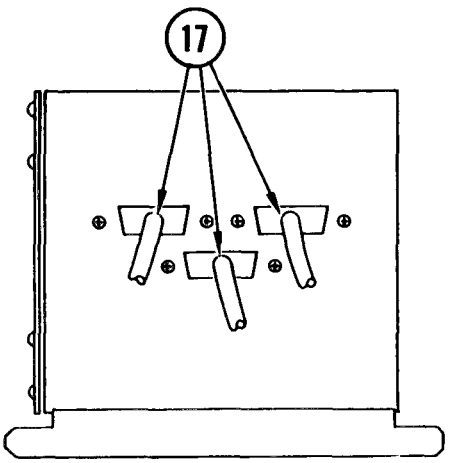
4-113. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A7 (CONT)



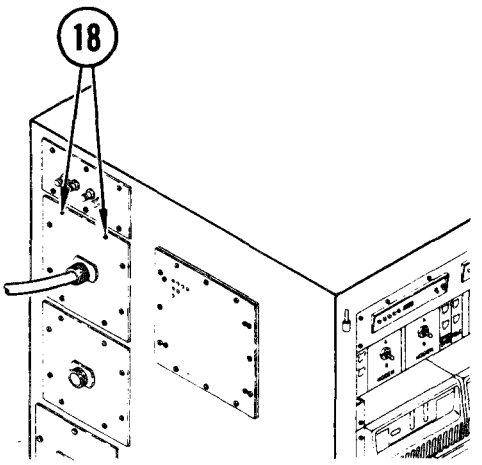
14. Position right side cover on junction box and secure in position with mounting screws and washers.

15. Check RFI gasket on entrance box assembly mounting surface to be sure it is not folded or damaged.

16. Place entrance box assembly in mounting slot and let hang at side of cabinet with mounting ears supplied.



17. Referring to connector tags, reconnect cables to receptacles J1 thru J3.



18. Place entrance box assembly in position through mounting slot on side of cabinet A, install mounting screws and washers.

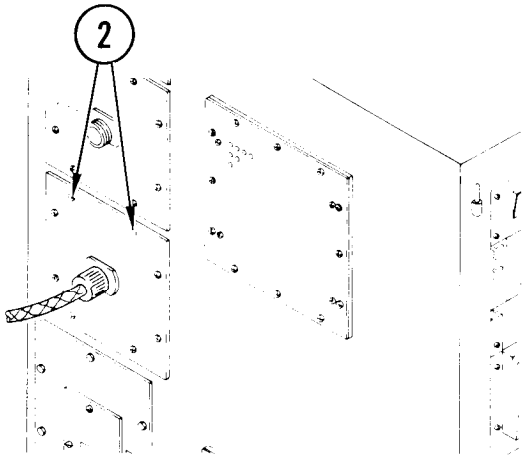
19. Power ON communications circuit breaker.

4-114. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A8

INITIAL SETUP

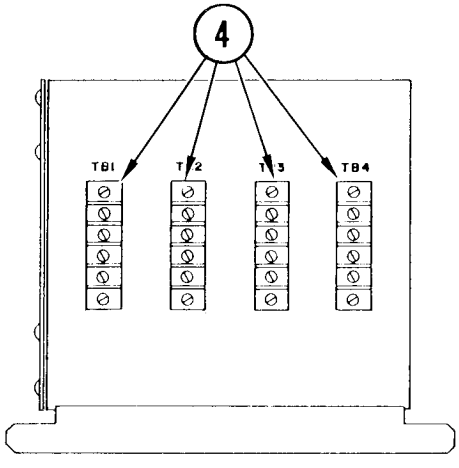
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil



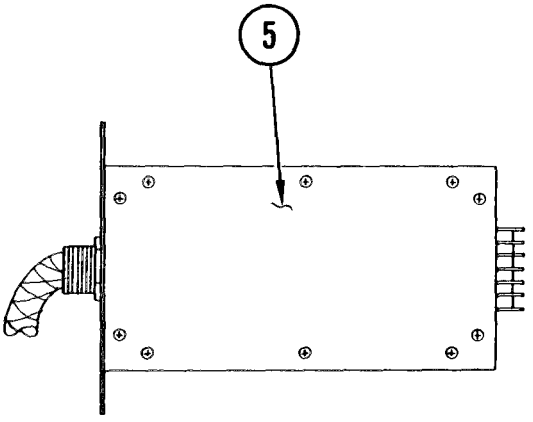
Remove

1. Power OFF cabinet A circuit breaker.
2. Remove mounting screws and washers attaching entrance box assembly to side of cabinet.
3. Remove entrance box assembly from mounting slot and allow it to hang on its mounting ears from side of cabinet.

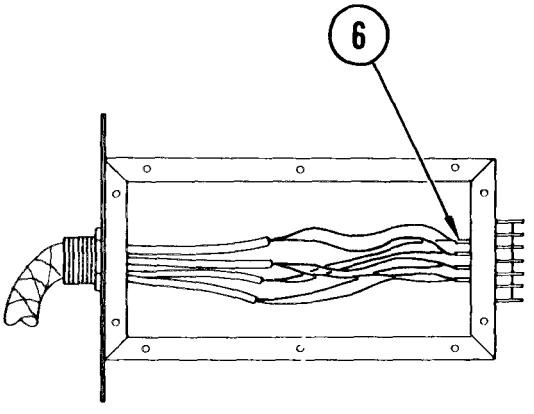


4. Tag and remove wire leads from terminal boards TB1 thru TB4.

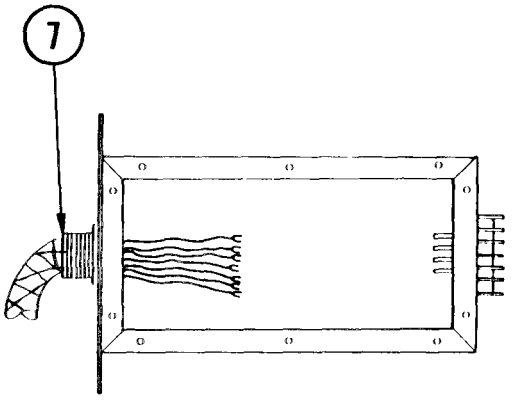
4-114. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A8 (CONT)



5. Remove ten mounting screws and washers and remove side panel from entrance box assembly.

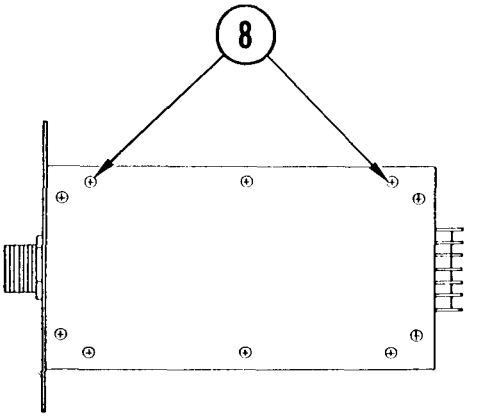


6. Tag and disconnect wire leads of cables from inside terminals of terminal boards TB1 thru TB4.

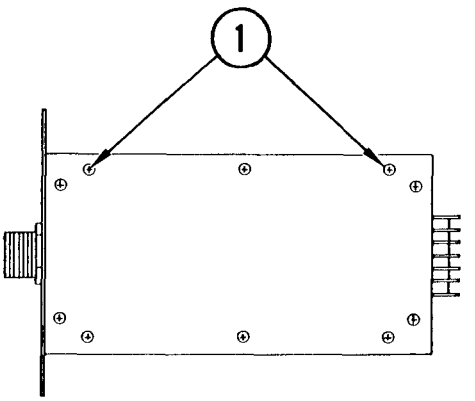


7. Disconnect conduit cable from entrance box assembly and feed cables out through access hole on front panel.

4-114. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A8 (CONT)

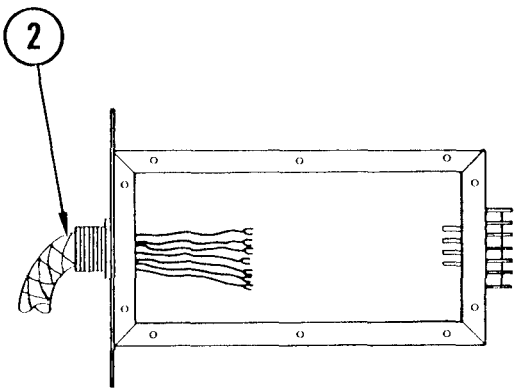


8. Replace side cover and secure in position with mounting screws and washers.



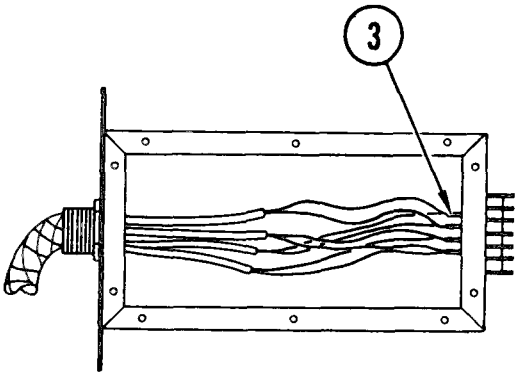
Replace

1. Remove ten mounting screws and washers and remove side panel from entrance box assembly.

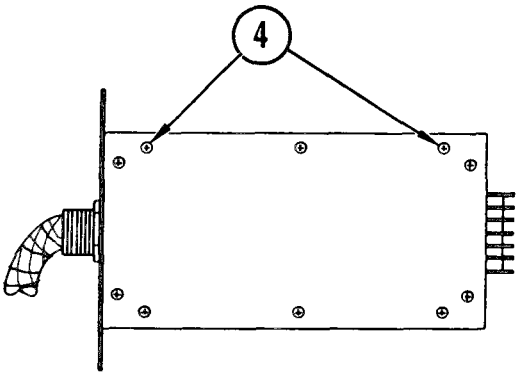


2. At front panel of entrance box assembly, feed conduit wiring through access hole, then reconnect section of flexible conduit to threaded insert.

4-114. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A8 (CONT)

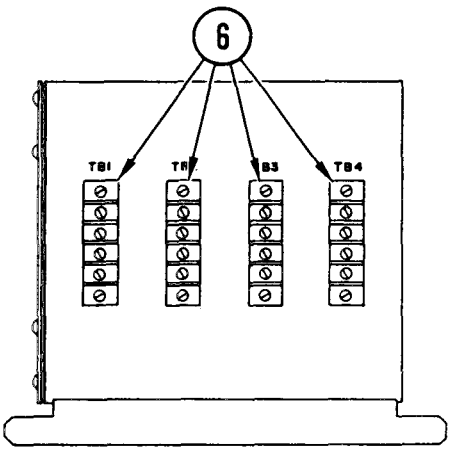


3. Referring to wire tags, reconnect wire leads to interior terminals on terminal boards TB1 thru TB4.



4. Replace side cover and secure in position with mounting screws and washers.

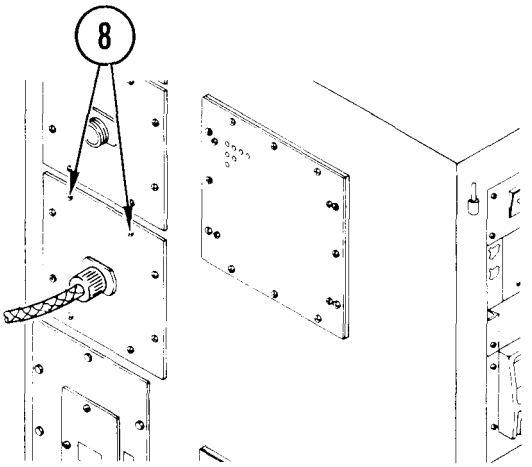
5. Place entrance box assembly in mounting slot and let hang at side of cabinet with mounting ears provided.



6. Referring to wire tags, connect wire leads to outside terminals of terminal boards TBl thru TB4.

7. Check RFI gasket on entrance box assembly mounting surface to be sure it is not folded or damaged.

4-114. REMOVE/REPLACE ENTRANCE BOX ASSEMBLY A8 (CONT)



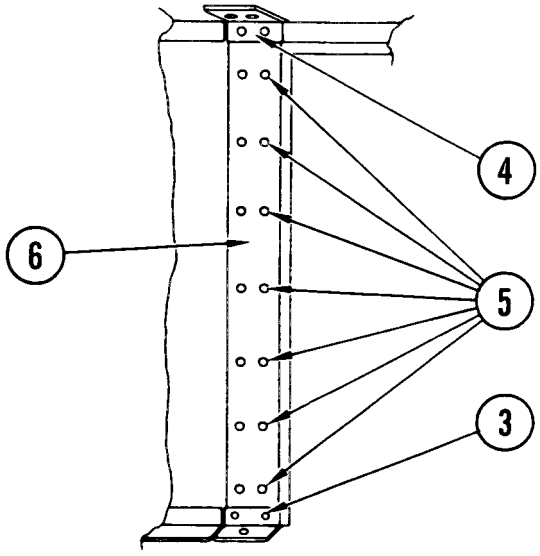
8. Place entrance box assembly in position through mounting slot in side of cabinet, install mounting screws and washers.

9. Power ON cabinet A circuit breaker.

4-115. REMOVE/REPLACE VESTIBULE DOOR AND SIDE FRAME

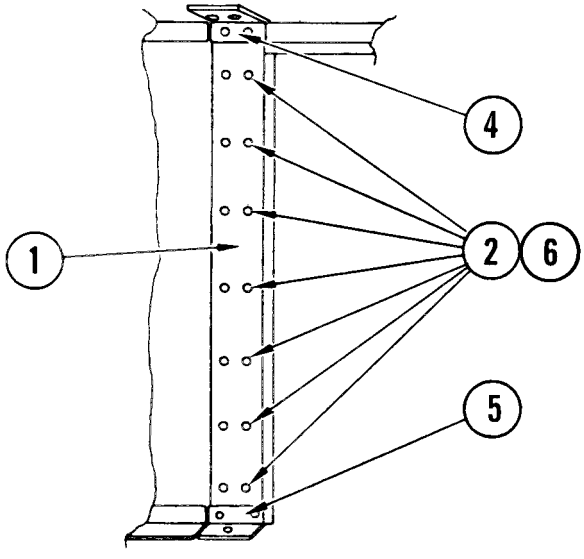
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Remove hinge pins from vestibule door.
2. Remove vestibule door.
3. In vestibule, on roadside of door frame, remove three screws holding angle at bottom. Remove angle.
4. Remove four screws holding angle at top. Remove angle.
5. Using two 7/16-inch wrenches, remove nuts, washers, and bolts.
6. Remove both plates and side frame.



Replace

1. Put side frame and both plates in position on wall.
2. From vestibule side, push 14 bolts with washers through holes in plates and wall.
3. From inside van. put on 14 washers and acorn nuts. Do not tighten.
4. Install top angle with 4 screws.
5. Install bottom angle with 3 screws.
6. Tighten nuts and bolts.
7. Set vestibule door on its hinge plates.
8. Install hinge pins.

4-116. REMOVE/REPLACE CABINET B TELEPHONE SELECTOR POWER TRANSFORMER

INITIAL SETUP

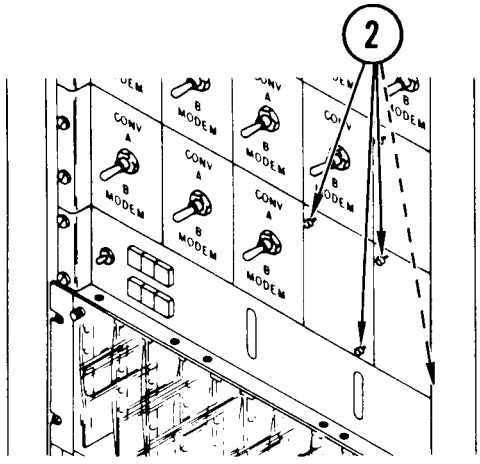
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Paper
- Pen or pencil

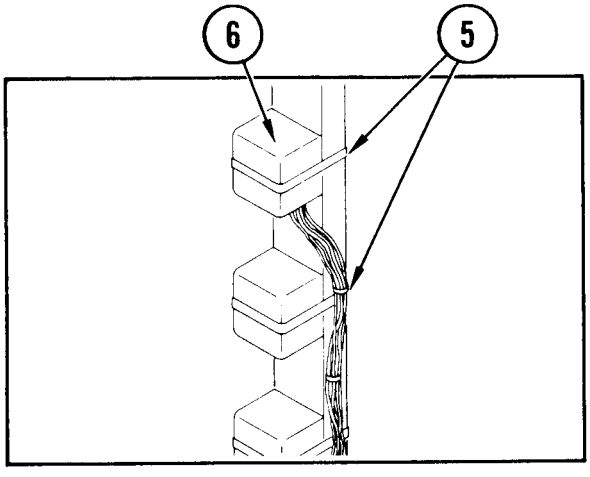
WARNING

Electrocution may result if task is done with power ON.

Remove



1. Power OFF communications circuit breaker and open cabinet B door.
2. Loosen screws securing two blank panels in bottom row of converter/modem array.
3. Remove panels.
4. Access voice data switch panel (para 4-62, Access, steps 2 and 3).



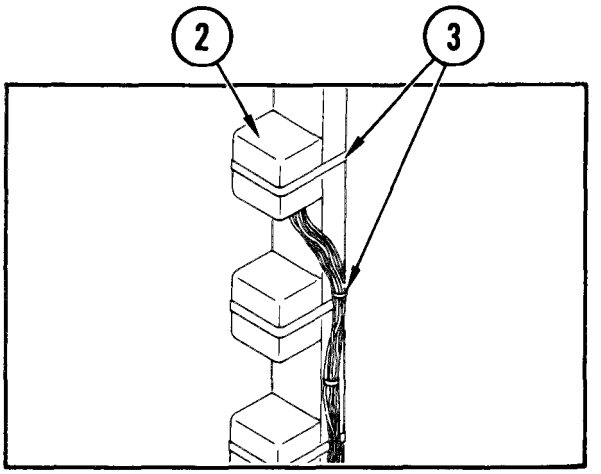
5. Cut tie wraps on power transformer and cable bundle.
6. Remove transformer from power strip and lift to front of cabinet.

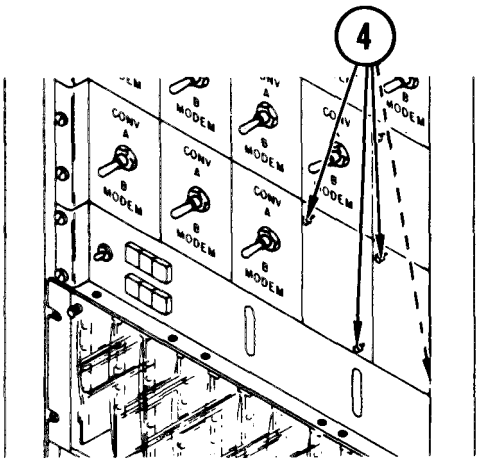
NOTE

If wire assembly is to be removed also, cut remaining tie wraps holding wires. Tag and remove other end of wires from terminals on DAA connection board.

7. Tag and remove wires from transformer.

4-116. REMOVE/REPLACE CABINET B TELEPHONE SELECTOR POWER TRANSFORMER (CONT)





Replace

NOTE

If wire assembly was removed, use note to fasten lower end to terminals on DAA connection board. Replace tie wraps.

1. Connect wires to transformer.
2. Replace transformer in power strip.
3. Replace tie wrap on transformer and cable bundle.
4. Replace blank panels in bottom row of converter/modem array, and secure in place with screws.
5. Close up voice data switch panel (para 4-62).

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals and technical manuals referenced in, or required for use with, this technical manual.

A-2. FORMS

Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404

Packaging Improvement Report . . . . . DD Form 6

Quality Deficiency Report . . . . . Form SF 368

Recommended Changes to Equipment Technical Manuals . . . . . DA Form 2028-2

Recommended Changes to Publications and B1 ank Forms . . . . . DA Form 2028

Maintenance Request . . . . . DA Form 2407

A-3. BULLETINS AND CIRCULARS

Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters . . . . . TB 43-0118

Electrical Power Generation in the Field . . . . . FM 20-37

Grounding Techniques . . . . . TC 11-6

A-4. TECHNICAL MANUALS

Operator’s Manual Automated Data Processing System, AN/MYQ-4A . . TM 11-7010-205-10

Operator’s Manual Processing Unit, Data CP-1435/MYQ-4 and CP-1435A/NIYQ-4 . . . . . TM 11-7021-200-10

Org/DS Maintenance Processing Unit, Data CP-1435/1VIYQ-4 and CP-1435A/MYQ-4 . . . . . TM 11-7021-200-23

Operator’s Manual Magnetic Tape Unit TW-430/PIYQ-4 . . . . . TM 11-7025-209-10

Org/DS Maintenance Magnetic Tape Unit TW-430/MYQ-4 . . . . . TM 11-7025-209-23

Operator’s Manual Disk Memory Unit MU-705/MYQ-4 . . . . . TM 11-7025-208-10

Org/DS Maintenance Disk Memory Unit MU-705/NYQ-4 . . . . . TM 11-7025-208-23

Operator’s Manual Keyboard-Display MX-10173/MYQ-4 . . . . . TM 11-7025-211-10

Org/DS Maintenance Keyboard Display
MX-10173/MYQ-4 . . . . . TM 11-7025-211-23

Org/DS Maintenance Teleprinter TT- MYQ-4A . . . . . TM 11-7025-233-23

Operator’s Manual Line Printer RP-309/MYQ-4 . . . . . TM 11-7025-232-1O

Org/DS Maintenance Line Printer RP-309/MYQ-4 . . . . . TM 11-7025-232-23

Operator’s Manual Card Punch-Reader Interpreter
RO-526/MYQ-4 and RO-526A/MYQ-4 . . . . . TM 11-7040-200-10

Org/DS Maintenance Card Punch-Reader
Interpreter RO-526/MYQ-4 and RO-526A/MYQ-4 . . . . . TM 11-7040-200-23

Operator’s Manual Magnetic Tape Cleaner MX-10172/MYQ-4. . . . . TM 11-7035-2O3-1O

Org/DS Maintenance Magnetic Tape Cleaner MX-10172/MYQ-4 . . . . . TM 11-7035-203-23

Operator’s Manual Modem Unit MD-1095/MYQ-4
and MD-1095A/MYQ-4 . . . . . TM 11-7025-212-10

Org/DS Maintenance Modem Unit MD-1095/MYQ-4
and MD-1095A/MYQ-4 . . . . . TM 11-7025-212-23

Org/DS Maintenance Modem Unit MD-1149/MYQ-4 . . . . . TM 11-7025-234-23

Org/DS Maintenance Isolator Unit MX-10486/MYQ-4A . . . . . TM 11-7010-206-23

Org/DS Maintenance Converter Unit CV-3787/MYQ-4A
And CV-3788/MYQ-4A . . . . . TM 11-7010-207-23

Operator and Org/DS Maintenance Remote Subsystem . . . . . TM 11-7035-204-13

Operator’s and Org/DS Maintenance Degausser . . . . . TM 11-7010-208-13

Procedures for Destruction of Electronic Materiel to Prevent
Enemy Use (Electronics Command) . . . . . TM 750-244-2

The Army Maintenance Management System (TAMMS) . . . . . TM 38-750

Administrative Storage of Equipment . . . . . TM 740-90-1

Operator, Organizational, Direct Support, General Support and
Depot Maintenance Manual: Air Conditioner . . . . . TM 5-4120-308-15

Operator’s Organizational, Direct Support and General Support
Maintenance Manual: Semitrailer Van: Data Center, XM 971 . . . . TM 9-2330-362-14&P

Operator, Organizational, Direct Support and General Support Maintenance Manual: Generator Set, Diesel Engine Driven, Trailer Mounted AN/MJQ-12A . . . . . TM 5-6115-545-12&P

Operator, Organizational, Director Support and General Support Maintenance Manual: Generator Set, Diesel Engine Driven, Trailer Mounted AN/MJQ-10A . . . . . TM 5-6115-594-14&P

A-5. MISCELLANEOUS PUBLICATIONS

Consolidated Index of Army Publications and Blank Forms . . . . . DA PAM 310-1

U.S. Army Index of Modification Work Order . . . . . DA PAM 310-7

Painting and Preservation Supplies Available for Field Use for Electronic Command Equipment . . . . . SB 11-573

Preservation, Packaging and Marking Materials, Supplies and Equipment Used by the Army. . . . . SB 38-100

Electric Power Generation in the Field FM-20-37

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. GENERAL INFORMATION

B-1. INTRODUCTION

This Maintenance Allocation Chart (MAC) provides a summary of maintenance operations for Automated Data Processing System AN/MYQ-4A. This document assigns categories of maintenance for specific maintenance functions on repairable items and identifies tools and equipment required to perform each function. Each maintenance function is assigned to the lowest level of maintenance prepared to perform that function. It should be understood that each maintenance function can also be performed at all higher levels of maintenance. The higher levels of maintenance will have tools and test equipment to perform the maintenance functions assigned to and normally performed by lower levels of maintenance.

B-2. MAINTENANCE FUNCTION DEFINITIONS

Maintenance Functions are limited to and defined as follows:

a. Inspect. Determination of the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. Verification of serviceability and detection of beginning failure by measuring mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Performance of operations required periodically to keep an item in proper operating condition. Such operations would include cleaning, preservation, draining, painting, or replenishment of fuel/lubricants/hydraulic fluids or compressed air supplies.

d. Adjust. Maintenance within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Aline. Adjustment of specified variable elements of an item to the maximum or desired performance.

f. Calibrate. Adjustment to instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparing two instruments, one a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. Emplacement, seating, or fixing into position an item, part, or module (component or assembly) in a manner to a' low proper functioning of the equipment/system.

h. Replace. Substitution of a serviceable like-type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. Application of maintenance services (inspect, test, service, adjust, aline, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, end item or system. This function does not include trial and error replacement of consumable spare type items such as fuses, lamps, or electronic tubes.

j. Overhaul. Periodic maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.g., DWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. Rebuild. Restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hour, miles etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF MAC COLUMN ENTRIES

a. Group Number. This column lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next highest assembly.

b. Component/Assembly. This column contains the noun names of components, assembles, subassemb les, and modules for which maintenance is authorized.

c. Maintenance Function. This column lists the functions to be performed on the item listed in the Component/Assembly column.

d. Maintenance Category. This column specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in the Maintenance Function column. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of man-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC.

Subcolumns of the Maintenance category Column are:

C -- Operation/Crew
O -- Organizational
F -- Direct Support
H -- General Support
D -- Depot

e. Tools and Equipment. This column specifies by code those common tool sets (not individual tools) and special tools, test, and supporting equipment required to perform the designated function.

f. Remarks. This column contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. EXPLANATION OF SECTION III COLUMN ENTRIES

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column presents the National/NATO Stock number of the specific tool or test equipment when these numbers are assigned.

e. Tool Number. This column lists the manufacturer's part number of the tool, followed by the Federal supply code for the manufacturer (5 digit) in parentheses, when these numbers are fully identified.

B-5. EXPLANATION OF SECTION IV COLUMN ENTRIES

a. Reference Code. The letters in this column coincide with the letters used in column 6 of the Maintenance Allocation Chart.

b. Remarks. This column lists the remarks which correspond with the reference code letters.

SECTION II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIP.	(6) REMARKS
			C	O	F	H	D		
0	DAS3 (D/C) System AN/MYQ-4A								
01	Processing Unit, Data CP-1435A/MYQ-4								
02	Disk Memory Unit MU-705/MYQ-4								
03	Magnetic Tape Unit TW-430/MYQ-4								
04	Teleprinter, Assembly TT-804/MYQ-4A								
05	Signal Terminal BD Assy "A"								
06	Keyboard Display, MX-10173/MYQ-4								
07	Line Printer, RP-309/MYQ-4A								
08	Card Punch-Reader Interpreter RO-526A/MYQ-4								
09	Magnetic Tape Cleaner MX-10172A/MYQ-4								
10	Modem Unit, MD-1095A/MYQ-4								
11	Cable Assembly, (50 ft)								
12	Cable Assembly, (10 ft)								
13	Modem MD-1150/MYQ-4A								
14	Control Panel Assembly (CPU)								
15	Converter Unit CV-3787/MYQ-4								

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SECTION II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIP.	(6) REMARKS
			C	O	F	H	D		
16	Switch Plate Assembly "A" Cabinet								
17	Switch Plate Assembly "B" Cabinet								
18	Cabinet Assembly Communications "A"								
19	Cabinet Assembly Communications "B"								
20	Isolator Assembly MX-10486/MYQ-4A								
22	Crypto Auxiliary Unit								
23	Frequency Converter CV-3661A/MYQ-4								
24	Temperature Control Panel C-10846/MYQ-4								
26	Filter Panel Assembly "A" Cabinet								
27	Modem Unit MD-1149/MYQ-4A								
28	Converter Unit CV-3848/MYQ-4A								
29	Filter Panel Assembly "B" Cabinet								
30	Protector Panel Assembly "A" Cabinet								

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SECTION II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP.	(6) REMARKS
31	Protector Panel Assembly "B" Cabinet								
32	Power Distribution Unit								
33	Eraser Magnetic MX-10387A/MYQ-4A								
34	Decollator Unit MX-10487/MYQ-4A								
35	Cable Assembly Signal Entrance								
38	Government Furnished Equipment								
39	Tools and Test Equipment for AN/MYQ-4A								

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Section II.

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
01	PROCESSING UNIT, DAT	TEST	.0	.2	.0	.0	0021	
		REPLACE	.0	1.0	.0	.0	0012 0027 0039 0040	
		REPAIR	.0	.5	.0	.0	0012 0039 0040	
		OVERHAUL	.0	.0	.0	40.0		A
0101	PROCESSOR, MEMORY UN	REPLACE	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	1.0		A
0102	PROCESSOR INSTRUCT	REPLACE	.0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	1.0		A
0103	10 CARD CHASSIS	TEST	.0	.5	.0	.0	0001	
		REPLACE	0	1.0	.0	.0	0012 0027	
		OVERHAUL	.0	.0	.0	1.0		A
0104	CIRCUIT CARD ASSY	REPLACE	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0105	TERMINATOR BOARD	REPLACE	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0106	TERMINATOR BOARD	REPLACE	.0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0107	POWER SUPPLY	TEST	.0	.1	.0	0	0001	
		REPLACE	0	.2	.0	0	0001 0012	
		REPAIR	.0	.2	.0	0	0001 0012	A
		OVERHAUL	.0	.0	.0	1.0		B
0108	5 CARD EXP CHASSIS	TEST	.0	.5	.0	.0	0001	
		REPLACE	.0	.8	.0	0	0012 0027	
		OVERHAUL	.0	.0	.0	1.0		A
0109	MEMORY RESTART	TEST	.0	.1	.0		0001	
		REPLACE	.0	.3	.0	.0	0001 0012	
		REPAIR	.0	.7		0	0012	
		OVERHAUL	.0	.0	.0	7		A
0110	PCB MEMORY CONT	REPLACE	0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	1.5		A
0111	PCB 128KW MEMORY	REPLACE	.0	.2		0	0012	
		OVERHAUL	.0	.0	.0	5		A
0112	CONTROLLER, MASS STO	REPLACE	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	1.5		A
0113	MOTHERBOARD	REPLACE	.0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	1.0		A
0114	ADAPTER, NINE CHANNE	REPLACE	.0	.2	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
0115	MOTHERBOARD	REPLACE	.0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	1.0		A
0116	CLOCK, ANALOG	REPLACE	.0	.2	.0	.0	0012	
		OVERHAUL	.0	.0	.0	5		A
0117	DISPLAY, DEVICE PAC	REPLACE	0	.2		0	0012	
		OVERHAUL	.0	.0	.0	5		A
0118	PRINTER, DEVICE PAC	REPLACE	.0	.2		.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0119	PROCESSOR-VERIFIER,	REPLACE	0	.1		0	0012	
		OVERHAUL	.0	.0	.0	1.0		A

MAINTENANCE ALLOCATION CHART

(DARCOM-P750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0120	PCB REAL TIME CLOCK	REPLACE	0	.2	.0	.0	0012	
		REPAIR	0	.2	.0	.0	0012	C
		OVERHAUL	.0	.0	.0	.5		A
0121	COMMUNICATIONS PAC	REPLACE	.0	.2	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0122	PCB DISKETTE	REPLACE	0	.1	.0	.0	0012	
		OVERHAUL	0	.0	.0	1.0		A
0123	PCB HDLC COMM PAC	REPLACE	0	.2	0	0	0012	
		OVERHAUL	0	0	0	.5		A
0124	PCB SYNC COMM PAC	REPLACE	.0	.2	.0	0	0012	
		OVERHAUL	0	.0	.0	.5		A
0125	PCB CALL COMM PAC	REPLACE	.0	.2	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0126	POWER DISTRIBUTION	REPLACE	0	.4	.0	.0	0012	
		REPAIR	0	5	.0	.0	0001 0012 0027	D
		OVERHAUL	.0	.0	0	1.0		A
0127	CPU CABINET	REPLACE	0	1	0	.0	0012	
		OVERHAUL	.0	.0	.0	2.0		A
02	DISK MEMORY UNIT	TEST	.0	.2	0	.0	0001 0012 0016 0017 0018 0019 0021	
		ADJUST	.0	5	.0	.0	0007 0012 0022 0028	
		REPLACE	.0	.3	.0	.0	0012 0027	
		REPAIR	.0	7	.0	.0	0001 0012 0016 0017 0018 0019 0020 0027	
		OVERHAUL	.0	.0	.0	80.0		A
0201	BASE ASSY	TEST	.0	.2	.0	.0	0001 0019	
		REPAIR	.0	3	.0	.0	0001 0012 0017 0038	
020101	POWER SUPPLY	TEST	0	.2	.0	.0	0001	
		ADJUST	.0	.2	.0	.0	0001 0012 0017	
		REPLACE	.0	1	0	.0	0012	
		REPAIR	0	.1	.0	.0	0001 0012	
		OVERHAUL	.0	.0	.0	8		A
0202	LOGIC CHASSIS ASSY	TEST	.0	.2	.0	0	0001 0016 0017 0018 0019	
		REPAIR	.0	.3	.0	0	0012 0018	
020201	LOGIC CHASSIS	TEST	0	1	0	.0	0012 0017 0021	
		REPLACE	.0	1.0	.0	0	0012	
		OVERHAUL	.0	.0	0	3.0		A
0203	DECK ASSY	TEST	.0	2	.0	0	0001 0017 0019 0041	
		ADJUST	.0	.2	.0	.0	0017 0019 0041 0044	
		REPAIR	.0	.5	.0	.0	0012 0041 0044 0046	
020301	CCA NZJN	TEST	.0	.2	.0	0	0001 0019	
		REPLACE	.0	.3	.0	.0	0012 0018	
		OVERHAUL	.0	.0	.0	.3		A
020302	CCA EZKN	TEST	0	.2	.0	.0	0001 0019	
		REPLACE	.0	.1	.0	.0	0012 0018	

MAINTENANCE ALLOCATION ALLOCATION CHART

(DARCOM-P 750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
020302	CCA EZKN	OVERHAUL	.0	.0	.0	.0	.3		A
020305	COIL CARRIAGE	TEST	.0	.0	.3	.0	.0	0017 0019	
		REPAIR	.0	.0	3.0	.0	.0	0001 0012 0017 0019 0041 0044 0046	
020306	SPINDLE	REPLACE	.0	.0	2.0	.0	.0	0012	
		REPAIR	0	.0	3.0	.0	.0	0012 0024 0043	
0204	CASE	REPLACE	.0	.0	1.0	.0	.0	0012	
		REPAIR	.0	.0	1.0	.0	.0	0012	
03	MAGNETIC TAPE UNIT	TEST	.0	.0	.1	.0	.0	0004 0021	
		SERVICE	.0	.0	.2	.0	.0	0012 0022 0028	
		ADJUST	.0	.0	.5	.0	.0	0001 0009 0012 0024 0037	
		REPLACE	.0	.0	.3	.0	.0	0012	
		REPAIR	.0	.0	.4	.0	.0	0001 0012 0019 0024 0027 0029 0037	
		OVERHAUL	.0	0	0	.0	80.0		A
0301	REEL RETAINER ASSEM	ADJUST	0	.0	.5	.0	.0	0012	
		REPLACE	.0	.0	.5	.0	0	0012	
		REPAIR	.0	.0	1.0	.0	.0	0012	
0302	VACUUM CHAMBER ASSE	TEST	.0	.0	.1	.0	0	0001 0012 0019	
		ADJUST	.0	.0	.5	.0	0	0012	
		REPLACE	.0	.0	.5	.0	0	0012 0014	
		REPAIR	0	.0	1	0	.0	0	0001 0012 0014 0019	
0303	HEAD/PLATE ASSY	TEST	.0	.0	.1	.0	.0	0009 0019 0037	
		ADJUST	.0	.0	.5	.0	.0	0001 0009 0012 0019 0037	
		ALIGN	.0	.0	.2	.0	0	0001 0009 0012 0019 0037 0038	
		REPLACE	.0	.0	.5	.0	0	0012	
		REPAIR	.0	.0	4	.0	0	0001 0005 0009 0012 0019 0037 0038	
0304	PNUEMATIC ASSY	TEST	.0	.0	1	.0	0	0001 0012	
		ADJUST	.0	.0	.1	.0	0	0012	
		REPLACE	.0	.0	.3	.0	0	0012	
		REPAIR	.0	0	.3	.0	.0	0012	
		OVERHAUL	0	.0	0	.0	.5		A
030401	BLOWER	TEST	.0	.0	.2	.0	0	0001 0012	
		REPLACE	.0	.0	.2	.0	0	0012	
		OVERHAUL	0	.0	1.0	.0	0		A
030402	TRIAC PLATE ASSY	TEST	.0	.0	1	.0	.0	0001	
		REPLACE	.0	.0	.1	.0	.0	0012	
		REPAIR	.0	.0	.2	.0	0	0001 0012 0035	
0305	POWER SUPPLY ASSY	TEST	.0	.0	1	.0	0	0001	
		REPAIR	.0	0	.2	.0	0	0001 0012 0015 0019 0035	
0306	PRINTED WIRING BOAR	TEST	.0	.0	.1	.0	0	0001 0019 0021	
		ADJUST	0	.0	.5	.0	.0	0001 0012 0037	
		REPLACE	.0	.0	.1	.0	.0	0001 0012 0019 0037	
		OVERHAUL	.0	.0	.0	.0	.2		A

MAINTENANCE ALLOCATION CHART

(DARCOM-P750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0307	CIRCUIT CARD ASSEMB	TEST	0	0	.1	.0	0	0001 0019 0021	
		ADJUST	0	0	.5	.0	.0	0001 0012 0037	
		REPLACE	.0	.0	.8	0	.0	0001 0012 0019 0037	
		REPAIR	.0	.0	5	0	.0	0001 0012 0019 0037	
		OVERHAUL	.0	.0	.0	0	.5		A
0308	CIRCUIT CARD ASSEMB	TEST	.0	0	1	.0	.0	0001 0019 0021	
		ADJUST	0	0	.5	0	.0	0001 0012 0037	
		REPLACE	0	0	8	0	.0	0001 0012 0037	
		OVERHAUL	0	.0	.0	.0	.5		A
0309	HEAT SINK ASSY	TEST	0	.0	.1	.0	0	0001	
		REPLACE	.0	.0	2	0	0	0012	
		REPAIR	.0	.0	.2	0	.0	0001 0012 0015	
04	TELEPRINTER ASSY	TEST	0	0	2	.0	.0	0001 0012 0047	
		REPLACE	.0	.0	.5	0	.0	0012	
		REPAIR	0	0	1 2	0	.0	0012 0030 0031 0032 0033	
		OVERHAUL	.0	0	0	.0	4.1		A
0401	LINE BUFFER,2K EXT	TEST	.0	.0	1	.0	0	0001	
		REPLACE	.0	.0	.4	.0	.0	0012	
		OVERHAUL	0	0	0	.0	1 0		
0402	TRACTOR ASSY	REPLACE	.0	0	.2	0	0	0012	
		OVERHAUL	0	.0	0	.0	1 0		A
0403	CONTROL PANEL	REPLACE	.0	.0	.3	0	.0	0012	
		OVERHAUL	.0	0	.0	0	1.0		
0405	PANEL ASSY	TEST	.0	0	.1	0	.0	0001	
		REPLACE	.0	.0	3	.0	0	0012	
		OVERHAUL	.0	0	0	.0	5		A
0406	BOTTOM ASSY. PRINTER	TEST	.0	0	.3	0	0	0001 0012	
		REPAIR	.0	0	.5	.0	0	0012 0027	
040801	CCA T3 MC/2	REPLACE	0	0	6	0	.0	0012	
		OVERHAUL	0	0	0	0	1 0		A
040601	FRAME&DRIVE ASSY	TEST	0	0	.3	0	0	0001 0012	
		REPLACE	0	0	.5	0	0	0012	
		REPAIR	.0	.0	.8	0	0	0012	
		OVERHAUL	.0	0	0	0	1.0		A
040602	ENCODER ASSY	TEST	0	0	3	0	0	0001 0012	
		REPLACE	0	0	2	.0	0	0012	
		OVERHAUL	0	0	0	0	1 0		A
04060201	PAPER PAN ASSY	TEST	.0	.0	3	.0	0	0012	
		REPLACE	.0	0	2	0	0	0012	
		REPAIR	.0	0	1 0	0	.0	0012	
040603	POWER SUPPLY ASSY	TEST	0	0	.2	0	0	0001 0012	
		REPLACE	0	0	.2	.0	.0	0012	
		REPAIR	0	0	1.0	0	.0	0012	
04060301	CCA PPS/2	TEST	0	0	2	.0	0	0001 0012	
		REPLACE	.0	0	2	0	0	0012	
		OVERHAUL	.0	0	.0	0	1.0		A
04060302	POWER SUPPLY SUBASY	TEST	.0	.0	3	0	.0	0001 0012	

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
04060302	POWER SUPPLY SUBASY	REPLACE	.0	.3	.0		0012	
		REPAIR	.0	1.0	.0	.0	0012	
0407	PLATEN ASSY	REPLACE	.0	1.0	.0	.0		
		REPAIR	.0	.1	.0	.0	0012	
05	SIG TERM BD ASSY	TEST	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.3	.0	.0	0012	
		REPAIR	.0	.5	.0	.0	0001 0012	
06	KEYBOARD DISPLAY	TEST	.0	.1	.0	.0		
		REPLACE	.0	.5	.0	.0	0012	
		REPAIR	.0	.5	.0	.0	0012	
		OVERHAUL	.0	.0	.0	40.0		A
0601	CHASSIS, DISPLAY	TEST	.0	.3	.0	.0	0001 0012 0019	
		ADJUST	.0	.3	.0	.0	0012	
		REPLACE	.0	.1		.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0602	REGULATOR, POWER	TEST	.0	.2	.0	.0	0001 0012	
		ADJUST	.0	.2	.0	.0	0001 0012	
		REPAIR	.0	.5	.0	.0	0001 0012	
060201	CIRCUIT CARD ASSEMB	TEST	.0	.3	.0	.0	0001 0012	
		REPLACE	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
06603	BOARD ASSEMBLY	TEST	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.2	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
0604	LOGIC, BOARD	TEST	.0	.3	.0	.0	0001 0012	
		REPLACE	.0	.1	.0	.0	0012	A
		OVERHAUL	.0	.0	.0	.5		
0605	KEYBOARD	TEST	.0	.3		.0	0001 0012	
		REPLACE	.0	.2	.0	.0	0012	
		REPAIR	.0	.2	.0	.0	0001 0012	
060501	CIRCUIT CARD ASSY	TEST	.0	.3		.0	0001 0012	
		REPLACE	.0	.2		.0	0012	
		OVERHAUL	.0	.0	.0	.2		A
07	LINE PRINTER ASSY	TEST	.0	.3	.0	.0	0001 0019 0021	
		SERVICE	.0	.3	.0	0	0005 0012 0045	
		REPLACE	.0	1.0	.0	0	0005 0012	
		REPAIR	0	1.0	.0	0	0005 0008 0012 0029	
		OVERHAUL	.0	.0	.0	40.0		A
0701	POWER SUPPLY	TEST	.0	.3	.0	0	0001 0019	
		REPLACE	.0	.9	.0	.0	0005 0012	
		REPAIR	.0	1.0	.0	0	0001 0005 0008 0012 0019	
		OVERHAUL	.0	.0	.0	1.0		A
070101	CCA RECTIFIER	TEST	.0	.4	.0	.0	0001 0019	
		REPLACE	.0	.9	.0	.0	0005 0012	
		OVERHAUL	.0	.0	.0	1.0		A
0702	PCB HAMMER	TEST	.0	.2	.0	0	0001 0012 0019	
		REPLACE	.0	.8	.0	0	0005 0012	

MAINTENANCE ALLOCATION CHART

(DARCOM-F 750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0702	PCB HAMMER	OVERHAUL	0	0	.0	0	1.0		A
0703	PCB, MOTHER	TEST	.0	0	.3	.0	0	0001 0012 0019	
		REPLACE	.0	.0	.9	.0	.0	0005 0012	
		OVERHAUL	.0	.0	.0	0	.8		A
0704	PCB INTERF	TEST	0	.0	.2	.0	.0	0001 0012 0019	
		REPLACE	.0	.0	.8	.0	.0	0005 0012	
		OVERHAUL	0	0	.0	0	1.0		A
0705	PCB, POWER	TEST	.0	0	.2	0	.0	0001 0012 0019	
		REPLACE	.0	.0	.8	.0	0	0005 0012	
		OVERHAUL	.0	.0	.0	0	1.0		A
0706	PCB, TIMING	TEST	.0	.0	.2	.0	.0	0001 0012 0019	
		REPLACE	.0	0	.8	.0	.0	0005 0012	
		OVERHAUL	.0	.0	.0	0	0		A
0707	PCB PRO CE	TEST	0	.0	.2	0	.0	0001 0012	
		REPLACE	0	.0	.8	0	0	0012	
		OVERHAUL	.0	0	.0	0	1.0		A
0708	CAPACITOR BANK ASSY	TEST	.0	.0	5	0	.0	0001 0012 0019	
		REPLACE	0	0	1.0	0	.0	0005 0012	
		REPAIR	.0	0	.5	0	.0	0001 0005 0012 0019	
0709	PAPER PULLER ASSY	TEST	0	0	4	.0	0	0001 0012 0019	
		REPLACE	.0	.0	1.0	0	.0	0005 0012	
		REPAIR	.0	.0	1	0	0	0012	
0710	MECH FRAME	TEST	.0	0	2	.0	.0	0001 0012 0019	
		ADJUST	.0	.0	.2	.0	.0	0001	
		REPLACE	.0	.0	8	0	.0	0005 0012	
		REPAIR	0	0	1.0	.0	.0	0001 0005 0012 0019	
071001	MOTOR ASSY	TEST	.0	0	.1	.0	.0	0001 0012 0019	
		REPLACE	0	0	.5	.0	.0	0005 0012	
		REPAIR	.0	.0	1.0	0	0	0005 0012	
071002	ARM PIVOT RI BBON	TEST	0	0	1	.0	0	0012	
		REPLACE	.0	0	.2	0	0	0012	
		REPAIR	0	0	.3	.0	.0	0012	
071003	HAMMER BANK ASSY	TEST	.0	.0	.2	.0	.0	0001 0012 0019	
		ADJUST	.0	.0	3	.0	0	0001 0012 0019	
		REPLACE	.0	0	.3	0	.0	0012	
		REPAIR	.0	.0	.5	.0	0	0001 0005 0012 0019	
0711	CONTROL PANEL ASSY	TEST	.0	.0	.4	.0	.0	0001 0012 0019	
		REPLACE	.0	.0	.8	.0	0	0005 0012	
		REPAIR	.0	.0	.9	.0	0	0001 0005 0012 0019	
0712	CAP BANK ASSY, AUX	TEST	.0	.0	.5	.0	0	0001 0012 0019	
		REPLACE	.0	.0	1.0	.0	0	0005 0012	
		REPAIR	.0	.0	.5	.0	0	0001 0005 0012 0019	
0713	PAPER FEED	TEST	0	.0	3	0	0	0001	
		ADJUST	.0	0	.2	0	0	0012 0013	
		REPLACE	.0	.0	.2	0	0	0012 0013	
		REPAIR	.0	.0	.3	.0	0	0012 0013	

MAINTENANCE ALLOCATION CHART

(DARCOM-F750-16)

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
0714	TCVFU ASSY	TEST	0	.0	1.0	.0	.0	0001 0012	
		REPLACE	.0	.0	.3	.0	.0	0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
0715	BASE ASSY	REPLACE	0	.0	1.0	.0	.0	0005 0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
0716	CABINET ASSY	REPLACE	.0	.0	1.0	.0	.0	0012	
		REPAIR	.0	.0	.5	.0	.0	0012	
08	CARD PUNCH, READ ASY	TEST	.0	.0	.2	.0	.0	0021 0026 0042	
		SERVICE	.0	.0	.6	.0	.0	0003 0007 0012 0028 0048	
		ADJUST	.0	.0	.2	.0	.0	0006 0012 0013	
		REPLACE	.0	.0	.5	.0	.0	0001 0011 0012 0013 0023 0025 0027 0029	
		REPAIR	.0	.0	.6	.0	.0	0001 0006 0011 0012 0013 0023 0025 0026 0027 0029 0042 0049	
		OVERHAUL	0	.0	.0	.0	30.0		A
0801	KEYBOARD ASSY	TEST	.0	.0	.1	.0	.0	0001	
		REPLACE	.0	.0	.7	.0	.0	0012	
		REPAIR	.0	.0	.5	.0	.0	0001 0012	
080101	KEY SWITCH CCA	TEST	.0	.0	.1	.0	0	0001	
		REPLACE	.0	.0	.4	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.8		A
0802	TOP COVER ASSY	REPLACE	.0	.0	1.0	.0	.0	0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
080201	SWITCH PANEL ASSY	TEST	0	.0	.3	.0	.0	0001	
		REPAIR	.0	.0	.4	.0	.0	0012	
080202	INDICATOR ASSY	REPLACE	.0		.01	.0	0	0012	
		REPAIR	.0	.0	.1	.0	.0	0012	
0803	RECORDER MECH ASSY	TEST	.0	.0	.3	.0	0	0001	
		REPLACE	.0	.0	.4	.0	.0	0012	
		REPAIR	.0	0	.7	.0	.0	0012	
080301	INPUT HOUSING ASM	TEST	.0	.0	.1	.0	.0	0001 0012	
		ADJUST	.0	.0	.1	.0	.0	0012 0013	
		REPLACE	.0	.0	.2	.0	.0	0012 0013	
		REPAIR	.0	.0	.7	.0	0	0012	
08030101	CLUTCH PL ASSY PRI	TEST	.0	.0	.1	.0	.0	0001	
		ADJUST	0	0	.3	.0	.0	0012	
		REPLACE	.0	.0	.2	.0	.0	0012	
		REPAIR	.0	.0	.5	.0	.0	0012	
08030102	CLUTCH PL ASSY SEC	TEST	.0	.0	.1	.0	.0	0001	
		ADJUST	.0	.0	.5	.0	.0	0012	
		REPLACE	.0	.0	.2	.0	0	0012	
		REPAIR	.0 0		.5	.0	.0	0012	
08030103	DRIVE ROLL ASSEMBLY	ADJUST	.0	.0	1.0	.0	.0	0012 0013	
		REPLACE	.0	0	1.0		.0 0	0012	
		REPAIR	.0	.01	.1		.0 0	0012	
080302	READ STATION ASM	TEST	0	.0	.1	.0	0	0001	
		ADJUST	.0	.0	.1	.0	0	0012 0013 0020	

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
080302	HEAD STATION ASM	REPLACE	.0	.0	.5	.0	0012 0013 0020	
		REPAIR	.0	.0	.2	.0	0012	
		OVERHAUL	.0	.0	.0	.5		A
080303	SENSOR HEAD ASM	TEST	.0	.0	.2	.0	0021 0026 0042	
		REPLACE	.0	.0	.2	.0	0012	
		OVERHAUL	.0	.0	.0	.4		A
080304	PUNCH MECHANISM ASY	TEST	.0	.0	.1	.0	0021	
		ADJUST	.0	.0	.1	.0	0006 0012	
		REPLACE	.0	.0	1.0	.0	0006 0012 0049	
		REPAIR	.0	.0	.8	.0	0006 0012 0049	
08030401	CARD REGISTRATION	TEST	.0	.0	.1	.0	0001	
		ADJUST	.0	.0	.3	.0	0012 0013 0026 0042	
		REPLACE	.0	.0	.4	.0	0012 0013	
		OVERHAUL	.0	.0	.0	.0		A
08030402	PUNCH ACTUATOR ASSY	TEST	.0	.0	.1	.0	0001	
		REPLACE	.0	.0	.7	.0	0012 0013	
		REPAIR	.0	.0	.8	.0	0012 0013	
		OVERHAUL	.0	.0	.0	.0		A
0803040201	ACTUATOR BOX ASSEMB	REPLACE	.0	.0	.4	.0	0012	
		OVERHAUL	.0	.0	.0	.0		A
0803040202	CIRCUIT CARD ASSEMB	TEST	.0	.0	.3	.0	0001	
		REPLACE	.0	.0	.1	.0	0012	
		OVERHAUL	.0	.0	.0	.0		A
08030403	PUNCH-DIE ASSEMBLY	TEST	.0	.0	.1	.0	0001	
		ADJUST	.0	.0	.2	.0	0012 0013	
		REPLACE	.0	.0	1.2	.0	0012 0013	
		OVERHAUL	.0	.0	.0	.0		A
080305	PRINTER	TEST	.0	.0	.1	.0	0001 0021	
		ADJUST	.0	.0	.2	.0	0012 0013	
		REPLACE	.0	.0	.4	.0	0012	
		REPAIR	.0	.0	.2	.0	0001 0012	
		OVERHAUL	.0	.0	.0	.0		A
080306	PCB, MOTOR	TEST	.0	.0	.3	.0	0001 0012 0021 0042	
		REPLACE	.0	.0	.1	.0	0012	
		OVERHAUL	.0	.0	.0	.0		A
080307	CARRIAGE ASSY, PRI	ADJUST	.0	.0	.1	.0	0012	
		REPLACE	.0	.0	.2	.0	0012	
		REPAIR	.0	.0	.7	.0	0012	
080308	CARRIAGE ASSY, SEC	ADJUST	.0	.0	.1	.0	0012	
		REPLACE	.0	.0	.2	.0	0012	
		REPAIR	.0	.0	.7	.0	0012	
0804	POWER SUPPLY	TEST	.0	.0	.1	.0	0001	
		ADJUST	.0	.0	.2	.0	0001 0012	
		REPLACE	.0	.0	.4	.0	0001 0012	
		REPAIR	.0	.0	.5	.0	0001 0012	
		OVERHAUL	.0	.0	.0	.0		A
0805	MODULE ASSY DD I/F	TEST	.0	.0	.2	.0	0001 0012	

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0805	MODULE ASSY DD I/F	REPLACE	.0	.0	.5	.0	.0	0012	
		REPAIR	.0	.0	.5	.0	.0	0012	
080501	BACKPLANE ASSEMBLY	TEST	.0	.0	.4	.0	.0	0001 0019 0026 0042	
		REPLACE	.0	.0	1.5	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080502	CIRCUIT CARD ASSY	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080503	KEYBOARD DATA	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080504	KEYBOARD FUNCTION	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080505	COMPONENT ASSEMBLY	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		ADJUST	.0	.0	.2	.0	.0	0012	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080506	PUNCH CONTROL	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080507	COMPONENT ASSEMBLY	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080508	CIRCUIT CARD ASSEMB	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080509	PCB #8. MOTION CNTRL	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080510	MEMORY. INPUT	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080511	READ.CONTROL	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080512	PROGRAM,REVERT	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080513	CIRCUIT CARD ASSEMB	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080514	POSTPUNCH,READ	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A
080515	PCB #14 OEM INTFC	TEST	.0	.0	.3	.0	.0	0001 0026 0042	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.4		A

MAINTENANCE ALLOCATION CHART

IDARCOM-P75D-16

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
080516	CIRCUIT CARD ASSEMB	TEST	0	0	3	.0	0 0001 0026 0042	
		REPLACE	0	0	.1	.0	.0 0012	
		OVERHAUL	0	.0	.0	.0	4	A
080517	PCB,PRINTER MEMORY	TEST	0	.0	.3	.0	0 0001 0026 0042	
		REPLACE	.0	0	.1	.0	.0 0012	
		OVERHAUL	0	.0	.0	.0	.4	A
080518	PRINTER.DRIVER	TEST	0	.0	.3	0	.0 0001 0026 0042	
		REPLACE	.0	0	1	0	.0 0012	
		OVERHAUL	.0	0	.0	0	.4	A
0806	PCB SOLENOID DRIVER	TEST	0	.0	.3	.0	.0 0001 0012	
		REPLACE	.0	0	.3	.0	.0 0012	
		OVERHAUL	.0	0	.0	.0	.3	A
0807	DRIVER,INPUT	TEST	0	0	.3	.0	.0 0001 0012	
		REPLACE	.0	0	3	0	.0 0012	
		OVERHAUL	.0	.0	0	.0	.3	A
0808	DRIVER HAMMER PRINT	TEST	0	0	3	0	0 0001 0012	
		REPLACE	0	0	5	0	0 0012	
		OVERHAUL	.0	0	0	0	.3	A
0809	TOP COVER ASSEMBLY	REPLACE	0	0	3	0	0 0012	
		REPAIR	.0	.0	.2	0	.0 0012	
080901	PCB CONTROL DISPLAY	TEST	0	0	2	0	0 0001 0012	
		REPLACE	0	0	1	0	.0 0012	
		OVERHAUL	0	0	.0	.0	.3	A
080902	SWITCH PANEL ASSY	TEST	.0	.0	.3	0	0 0001 0012	
		REPAIR	.0	.0	4	.0	0 0012	
0810	POWER SUPPLY ASSY	TEST	.0	.0	.2		.0 0 0001 0012	
		ADJUST	0	0	.2	0	0 0001 0012	
		REPLACE	.0	0	3	0	0 0012	
		REPAIR	.0	0	1		.0 0 0012	
		OVERHAUL	.0	0	0	0	5	A
0811	MODULE ASSY DD/IF	TEST	0	0	5	0	0 0001 0012	
		REPLACE	.0	0	.3	0	0 0012	
		REPAIR	0	0	.2		0 0 0012	
081101	PCB PROCESSOR	TEST	0	0	.2	.0	.0 0001 0012	
		REPLACE	.0	.0	1		.0 0 0012	
		OVERHAUL	.0	0	.0	.0	3	A
081102	PCB,PRI I/O	TEST	.0	0	.2	0	0 0001 0012	
		REPLACE	0	.0	1	0	0 0012	
		OVERHAUL	0	0	.0	0	3	A
081103	PCB,SECTI/O	TEST	0	0	.2		.0 0 0001 0012	
		REPLACE	.0	0	.1	.0	.0 0012	
		OVERHAUL	0	0	.0	.0	.3	A
081104	PCB,TRANSLATE	TEST	.0	.0	.2	.0	0 0001 0012	
		REPLACE	.0	0	.1		.0 0 0012	
		OVERHAUL	0	.0	0		.0 3	A
09	MAG TAPE CLEAN ASSY	TEST	.0	0	.5	0	0 0001	
		SERVICE	0	0	6	.0	0 0012	
		REPLACE	.0	0	1	.0	0 0012 0027	

MAINTENANCE ALLOCATION ALLOCATION CHART

(DARCOM-P 750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
09	MAG TAPE CL EAN ASSY	REPAIR	.0	.0	1.0	.0	.0	0001 0012 0024 0027 0029	
		OVERHAUL	.0	.0	.0	.0	8.0		A
0901	CIRCUIT CARD ASSY	TEST	0	.0	.5	.0	.0	0001 0012	
		REPLACE	.0	.0	1	.0	.0	0012	
		REPAIR	.0	.0	1	0	.0	.0	0012
		OVERHAUL	.0	.0	.0	.0	1.0		A
0902	HUB AS SY. SNAPLOCK	REPLACE	.0	.0	.1	.0	.0	0012	
		REPAIR	.0	.0	.1	.0	.	0012	
0903	BAND BLADE ASSY	TEST	.0	.0	.1	.0	.-	0012	
		REPLACE	.0	.0	.2	.0	.0	0012	
		REPAIR	.0	.0	.2	.0	.0	0012	
10	MODEM UNIT	TEST	.0	0	.1	.0	.0		
		REPLACE	.0	.0	.8	.0	.0	0012	
		REPAIR	.0	.0	.2	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	8.0		A
1001	PCB ASSY MODEM	TEST	.0	.0	1	.0	.0		
		REPLACE	.0	.0	.2	.0	.0	0012	
		OVERHAUL	.0	0	.0	.0	.5		A
1002	PCB ASSY. MODEM	TEST	.0	.0	1	.0	.0		
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	0	.0	.0	.5		A
1003	PCB ASSY, AUTO DIAL	TEST	0	.0	1	.0	.0		
		REPLACE	0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.5		A
1004	PCB ASSY, MODEM	TEST	.0	.0	.1	.0	.0		
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.5		A
1005	PCB ASSY, MODEM	TEST	.0	.0	.1	.0	.0		
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	0	0	.5		A
1006	PCB AS SY. PWR SUPPLY	TEST	.0	.0	.2	.0	.0		
		REPLACE	.0	0	.2	.0	0	0012	
		OVERHAUL	.0	.0	.0	.0	.7		A
1007	CHASSIS ASSY	REPLACE	.0	.0	.2	.0	.0	0012	
		REPAIR	.0	.0	.7	.0	.0	0001 0012	
		OVERHAUL	.0	.0	.9	.0	.9		A
100701	PCB AS SY. MOTHER BD	REPLACE	.0	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.7		A
100702	PCB AS SY. FRT PNL	REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	.7		A
1008	PCB ASSY, MODEM	TEST	.0	.0	.1.0		0		
		REPLACE	.0	.0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	.0	5		A
11	CABLE ASSY 50FT	TEST	.0	.0	.3	.0	.0	0001	
		REPLACE	.0	.0	1.0	.0	0	0012	
		REPAIR	.0	.0	.1	.0	0	0012	
		OVERHAUL	.0	.0	.0	.2	1.0		A
12	CABLE STUB 10FT	TEST	.0	.0	.3	.0	0	0001	

MAINTENANCE A .OCATION CHART

(HARCOM 250-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBL)	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C		F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
12	CABLE STUB 10FT	EPLACE	.0	.0	1.0	.0	.0	0012	
		EPAIR	.0	.0	.1	.0	.0	0012	
		VERHAUL	.0	.0	.0	.0	1.0		A
13	MODEM UNIT	EST	.0	.0	.1	.0	.0		
		EPLACE	.0	.0	.1	.0	.0	0012	
		EPAIR	.0	.0	.3	.0	.0	0001 0012	
		VERHAUL	.0	.0	.0	.0	.6		A
14	CONTROL PNL AS Y, CPU	EST	.0	.0	.2	.0	.0	0001 0012	
		EPLACE	.0	.0	.1	.0	.0	0012	
		EPAIR	.0	.0	.3	.0	.0	0012	
		VERHAUL	.0	.0	.0	.0	.5		A
1401	CONTROL PANEL	EST	.0	.0	.2	.0	.0	0001 0012	
		EPLACE	.0	.0	.1	.0	.0	0012	
		VERHAUL	.0	.0	.0	.0	.5		A
1402	CONTROL PNL FRAME	EST	.0	.0	.2	.0	.0	0001 0012	
		EPLACE	.0	.0	.1	.0	.0	0012	
		VERHAUL	.0	.0	.0	.0	.5		A
15	CONVERTER UNIT	EST	.0	.0	.2	.0	.0		
		EPLACE	.0	.0	.3	.0	.0	0012	
		EPAIR	.0	.0	.5	.0	.0	0012	
		VERHAUL	.0	.0	.0	.0	.7		A
1501	CHASSIS, RACK MT	EPLACE	.0	.0	.3	.0	.0	0012	
		EPAIR	.0	.0	.5	.0	.0	0001 0012	
150101	EXTENDER ASSY PCB	EST	.0	.0	.2	.0	.0	0012	
		EPLACE	.0	.0	.2	.0	.0	0012	
		EPAIR	.0	.0	.2	.0	.0	0012	
16	SWITCH PLATE ASSY	EST	.0	.0	.2	.0	.0	0001 0012	
		EPLACE	.0	.0	.3	.0	.0	0012	
		EPAIR	.0	.0	.5	.0	.0	0001 0012	
17	SWITCH PLATE ASSY	EST	.0	.0	.2	.0	.0	0001 0012	
		EPLACE	.0	.0	.3	.0	.0	0012	
		EPAIR	.0	.0	.5	.0	.0	0001 0012	
18	CABINET ASS Y, COMM A	EPLACE	.0	.0	.7	.0	.0	0012	
		EPAIR	.0	.0	1.0	.0	.0	0012	
1801	I/O CABINET, A	EPLACE	.0	.0	.5	.0	.0	0012	
		EPAIR	.0	.0	1.0	.0	.0	0012	
1802	RK AS SY, SW&PATCH	EST	.0	.0	.2	.0	.0	0001 0012 003E	
		EPLACE	.0	.0	.5	.0	.0	0012	
		EPAIR	.0	.0	1.0	.0	.0	0012	
1803	PLATE ASSY SWITCH	EST	.0	.0	.2	.0	.0	0001 0012	
		EPAIR	.0	.0	1.0	.0	.0	0012	
1804	TEL LINE FLTR ASSY	EST	.0	.0	.2	.0	.0	0001 0012	
		EPLACE	.0	.0	.3	.0	.0	0012	
		EPAIR	.0	.0	2.0	.0	.0	0012	
1805	FILTER, POWERLINE	EST	.0	.0	.3	.0	.0	0001 0012	
		EPLACE	.0	.0	.4	.0	.0	0012	
		EPAIR	.0	.0	.5	.0	.0	0001 0012	
19	CABINET AS SY, COMM B	EPLACE	.0	.0	.7	.0	.0	0012	

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C		F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
19	CABINET ASS Y, COMM B	REPAIR	.0	.0	1.0	.0	.0	0012	
1901	I/O CABINET	REPLACE	.0	.0	.5	.0	.0	0012	
		REPAIR	.0	.0	1.0	.0	.0	0012	
1902	RACK ASSY, MODEM SH	TEST	0	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.0	.3	.0	.0	0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
1903	RACK AS SY, MODEM SH	TEST	.0	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.0	.3	.0	.0	0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
1904	RACK ASSY, MODEM SH	TEST	.0	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.0	.3	.0	.0	0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
1905	PATCH MODULE ASSY	TEST	.0	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.0	.3	.0	0	0012	
		REPAIR	.0	.0	.3	.0	.0	0012	
1906	TEL LINE FLTR ASSY	TEST	.0	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.0	.3	.0	.0	0012	
		REPAIR	.0	.0	2.0	.0	.0	0012	
1907	SIG LINE FLTR ASSY	TEST	.0	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.0	.5	.0	0	0012	
		REPAIR	.0	.0	2.0	.0	.0	0012	
1908	SIG LINE FLTR ASSY	TEST	.0	.0	1.3	.0	.0	0001 0012	
		REPLACE	.0	.0	1.0	.0	.0	0012	
		REPAIR	.0	.0	2.3	.0	0	0001 0012	
1909	FILTER, POWERLINE	TEST	0	0	.3	.0	.0	0001 0012	
		REPLACE	.0	.0	.4	.0	.0	0012	
		REPAIR	.0	.0	.5	0	.0	0001 0012	
1910	DATA COUPLER ASSY	TEST	.0	.0	.3	.0	.0	0001	
		REPLACE	.0	.0	.5	.0	.0	0012	
		REPAIR	.0	.0	1.0	.0	.0	0012	
20	ISOLATOR ASSY	TEST	.0	0	.2	.0	.0	0001 0019	
		REPLACE	.0	.0	.5	.0	.0	0012	
		REPAIR	.0	.0	.2	.0	.0	0001 0012	
2001	ISOLATOR HOUSING	TEST	.0	.0	.2	.0	.0	0001	
		REPLACE	.0	.0	.7	.0	.0	0012	
		REPAIR	.0	.0	.5	.0		0012	
		OVERHAUL	.0	.0	.0	.0	1.0		A
2002	POWER SUPPLY	TEST	0	.0	.1	.0	.0	0001	
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	1.0		A
2003	ISOLATOR, DUPLEX	TEST	.0	.0	.2	.0	.0		
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	1.0		A
2004	ISOLATOR, DUAL INPUT	TEST	.0	.0	.2	.0	.0		
		REPLACE	.0	.0	.1	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.0	1.0		A
2005	ISOLATOR, INPUT MDL	TEST	.0	.0	.2	.0	.0		
		REPLACE	.0	.0	.1	.0	.0	0012	

MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4)	(5)	(6) REMARKS
2005	ISOLATOR INPUT MDL	OVERHAUL	.0 0 0 0 1.0		A
2006	ISOLATOR, DUAL OUTPT	TEST	.0 0 .2 .0 .0		
		REPLACE	.0 .0 .1 .0 .0	0012	
		OVERHAUL	.0 .0 .0 .0 1.0		A
2007	ISOLATOR, OUTPUT MDL	TEST	.0 .0 .2 .0 0		
		REPLACE	0 .0 .1 0 .0	0012	
		OVERHAUL	0 .0 .0 .0 1.0		A
22	AUX UNIT, CRYPTO	TEST	.0 0 1 .0 0		
		REPLACE	0 0 1 1 0 0	0012	
		REPAIR	.0 0 .2 .0 .0	0012	
		OVERHAUL	.0 0 .0 .0 1.0		E A
2201	CIRCUIT CARD ASSY	REPLACE	.0 0 .2 .0 .0	0012	
		OVERHAUL	0 0 .0 .0 1.0		A
2202	CIRCUIT CARD ASSY	REPLACE	0 0 .2 0 .0	0012	
		OVERHAUL	0 .0 .0 .0 1.0		A
2203	BLACK MODULE ASSY	REPLACE	0 0 .2 .0 .0	0012	
		REPAIR	0 0 .2 0 0	0012	
220301	CIRCUIT CARD ASSY	REPLACE	.0 .0 .2 .0 0	0012	
		OVERHAUL	.0 0 .0 .0 1.0		A
220302	CIRCUIT CARD ASSY	REPLACE	.0 .0 .2 .0 .0	0012	
		OVERHAUL	.0 .0 .0 .0 1.0		A
220303	CIRCUIT CARD ASSY	REPLACE	0 0 .2 .0 .0	0012	
		OVERHAUL	0 0 .0 .0 1.0		A
220304	CIRCUIT CARD ASSY	REPLACE	.0 .0 .2 .0 .0	0012	
		OVERHAUL	.0 .0 .0 .0 1.0		A
220305	CHASSIS, BLACK MOD	REPLACE	.0 .0 2 .0 .0	0012	
		REPAIR	.0 .0 .5 .0 .0	0012	
220306	PWR SUPPLY SUBASSY	REPLACE	0 .0 .2 .0 .0	0012	
		OVERHAUL	.0 0 .0 .0 1.0		A
2204	CHASSIS ASSY	REPLACE	.0 .0 2 .0 .0	0012	
		REPAIR	.0 .0 .5 .0 0	0012	
23	CONVERTER, FREQUENCY	TEST	.0 .0 .5 .0 0	0001 0012	
		SERVICE	0 .0 .5 .0 .0	0002 0012 0022	
		ADJUST	.0 .0 1.0 .0 .0	0001 0012	
		REPLACE	.0 .0 2.0 .0 .0	0012	
		REPAIR	.0 .0 2.0 .0 .0	0001 0006 0010 0012 0029	
		OVERHAUL	.0 0 0 .0 20.0		A
2301	MODULE, LOGIC	REPLACE	0 0 .2 0 0	0012	
		OVERHAUL	.0 .0 .0 .0 2.0		A
2302	MODULE, POWER	TEST	.0 0 .1 .0 .0	0001 0012	
		REPLACE	0 .0 .1 .0 .0	0012	
		REPAIR	.0 .0 .1 .0 .0	0012	
		OVERHAUL	.0 .0 .0 0 2.0		A
2303	INPUT CHASSIS ASSY	TEST	0 .0 3 .0 .0	0001 0012	
		ADJUST	.0 0 .1 0 .0	0001 0012	
		REPAIR	.0 .0 1.0 .0 .0	0001 0012	
2304	CHASSIS, INTERFACE	TEST	.0 .0 .2 .0 .0	0001 0012	
		REPAIR	.0 0 1.0 .0 .0	0001 0012	

MAINTENANCE ALLOCATION CHART

(DARCOM-P750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
2305	FAN/COVER ASSEMBLY	TEST	.0	.3	.0	.0	0001 0012	
		REPAIR	.0	.5	.0	.0	0001 0012	
24	TEMP CONTROL ASSY	TEST	.0	.3	.0	.0	0001 0012	
		REPLACE	.0	.5	.0	.0	0012	
		REPAIR	.0	.5	.0	.0	0012 0024 0027	
25	SIG TERM BD ASSY	TEST	.0	.2	.0	.0	0001 0012	
		REPLACE	.0	.3	.0	.0	0012	
		REPAIR	.0	.5	.0	.0	0001 0012	
26	FILTER PANEL ASSY	TEST	.0	.3	.0		0001 0012	
		REPAIR	.0	.5	.0		0001 0012	
27	MODEM UNIT	TEST	.0	.5	.0	.0	0001 0012	
		REPLACE	.0	.2	.0	.0	0012	
		REPAIR	.0	.5	.0	.0	0012	
		OVERHAUL	.0	.0	.0	3.0		A
2701	PC B. PWR SPLY RGLTR	TEST	.0	.3	.0	.0	0001 0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2702	PCB. EIA INTERFACE	TEST	.0	.3	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2703	PCB. CONTROL CARD	TEST	.0	.2	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2704	PCB,RECEIVER	TEST	.0	.3	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2705	PCB,EQUALIZER	TEST	.0	.4	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2706	PCB,TRANSMITTER	TEST	.0	.3	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2707	PCB. REMOTE LOOPBACK	TEST	.0	.3	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2708	PCB,I/O	TEST	.0	.3	.0	.0	0012	
		REPLACE	.0	.3	.0	.0	0012	
		OVERHAUL	.0	.0	.0	.8		A
2709	CHASSIS, ELEC EQUIP	TEST	.0	.2	.0	.0	0012	
		REPLACE	.0	.4	.0	.0	0012	
		REPAIR	.0	.4	.0	.0	0012	
270901	POWER SUPPLY ASSY	TEST	.0	.5	.0	.0	0001 0012	
		REPLACE	.0	.5	.0	.0	0012	
		OVERHAUL	.0	.0	.0	1.0		A
270902	MODULE, DIGIT DISP	TEST	.0	.4	.0	.0	0012	
		REPLACE	.0	.4	.0	.0	0012	
		OVERHAUL	.0	.0	.0	1.0		A
270903	BOARD ASSY, MOTHER	TEST	.0	.4	.0	.0	0001 0012	

MAINTENANCE ALLOCATION CHART

(DARCOM-F 75 C-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
270903	BOARD ASSY, MOTHER	REPLACE	.0	0	.5	.0	.0	0012	
		OVERHAUL	0	.0	.0	.0	1.0		A
28	CONVERTER UNIT	TEST	.0	.0	.1	0	0	0001 0012	
		REPLACE	.0	.0	.3	0	.0	0001 0012	
		OVERHAUL	.0	.0	.0	.0	1.0		A
29	FILTER PANEL ASSY	TEST	.0	0	.3	0	0	0001 0012	
		REPAIR	.0	.0	5	.0	.0	0001 0012	
30	PROTECTOR PNL ASSY	TEST	.0	.0	.5	0	0	0001 0012	
		REPAIR	.0	.0	.7	.0	.0	0001 0012	
31	PROTECTOR PNL ASSY	TEST	.0	0	.5	.0	0	0001 0012	
		REPAIR	.0	.0	.7	.0	0	0001 0012	
32	POWER DISTRIBUTION	TEST	0	.0	.1	.0		0001 0012	
		REPLACE	.0	0	1	.0	0	0012	
		REPAIR	.0	.0	5	.0	.0	0001 0012	D
		OVERHAUL	.0	.0	0	.0	1.0		A
33	ERASER MAGNETIC	ADJUST	.0	0	.3	.0	.0	0012	
		REPAIR	.0	0	.5	0	0	0012	
		OVERHAUL	.0	.0	.0	.0	1.0		A
34	DECOLLATOR	REPAIR	.0	0	1	0	0	0012	
		OVERHAUL	.0	0	.0	.0	1.0		A
35	SEMI-VAN, DATAPROCS	SERVICE	.0	0	4.0	.0	.0	0001 0002 0005 0012 0024 0027 0029 0034	
		REPAIR	.0	.0	4.0	.0	.0	0001 0012 0027 0029	
3501	HUMIDIFIER SYS ASSY	TEST	.0	.0	.3	.0	.0	0001 0012	
		REPLACE	.0	0	.5	.0	0	0012	
		REPAIR	.0	.0	5	.0	0	0012	
3502	PWR FIL & DISTR CAB	TEST	.0	0	.5	.0	0	0001 0012	
		REPLACE	.0	0	4.0	.0	0	0012	
		REPAIR	.0	.0	.5	.0	0	0001 0012	
3503	BOX BRKR, UTIL POWER	TEST	.0	.0	1	0	0	0001 0012	
		REPLACE	0	.0	4.0	0	0	0012 0027	
		REPAIR	.0	.0	1 5	0	.0	0001 0012 0027	
3504	CONTROL BOX ASY, HMD	TEST	.0	0	.3	.0	0	0001 0012	
		REPLACE	.0	.0	1.0	.0	0	0012	
		REPAIR	.0	.0	5	.0	0	0012	
3505	PANEL PWR PTCT ASSY	TEST	.0	0	.3	.0	0	0001 0012	
		REPLACE	.0	0	2	0	.0	0012	
		REPAIR	0	0	4	0	0	0001 0012	
3506	BOX, BRKR TECH POWER	TEST	0	.0	1	0	0	0001 0012	
		REPLACE	0	0	4.0	0	0	0012 0027	
		REPAIR	.0	0	.6		.0	0001 0012 0027	
3507	CAB, MAG TAPE DRIVE	TEST	.0	.0	.2	0	.0	0001	
		REPLACE	0	0	2 0	0	0	0012 0027	
		REPAIR	.0	0	4	0	0	0012 0027 0029	
3508	CABINET, DISK DRIVE	TEST	.0	0	2	.0	0	0001	
		REPLACE	.0	0	2 0	0	0	0012 0027	
		REPAIR	0	.0	7	0	0	0001 0012 0027 0029	
3509	CONTR AND MON ASSY	TEST	0	0	5	0	0	0001 0012	

MAINTENANCE ALLOCATION CHART
(DARCOM-P750-16)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
3509	CONTR AND MON ASSY	REPLACE	.0	4.0	.0	.0	0012	
		REPAIR	.0	.5	.0	.0	0001 0012	
3510	CIRCUIT BREAKER BOX	TEST	.0	1	.0	.0	0001 0012	
		REPLACE	.0	1.0	.0	.0	0012	
		REPAIR	.0	.3	.0	.0	0001 0012	
3511	PANEL, PWR ENTRANCE	REPLACE	.0	.5	.0	.0	0012	
		REPAIR	.0	.3	.0	.0	0012	
3512	AIR CONDITIONER	SERVICE	.0	.5	.0	.0	0002 0012 0024	
		REPLACE	.0	6.0	.0	.0	0012 0027	
		REPAIR	.0	.0	.0	.0		F
3801	VOICE ENCRYPTOR	SERVICE	.0	.4	.0		0012	G
		REPLACE	.0	.2	.0	.0	0012	
3802	KEY GEN T-SEC, CRYPT	SERVICE	.0	.5	.0	.0	0012	H
		REPLACE	.0	.2	.0	.0	0012	
3803	INTERFACE UNIT, CRYP	SERVICE	.0	.5	.0	.0	0012	I
		REPLACE	.0	.2	.0	.0	0012	
3804	INTERFACE UNI T, GFE	SERVICE	.0	.5	.0	.0	0012	G
		REPLACE	.0	.2	.0	.0	0012	

Section III.

VD ITEM AN/MYQ-4A

TOOL AND TEST EQUIPMENT REQUIREMENTS
(DARCOM-P750-16)

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
0001	F	DIGITAL MULTIMETER	6625-01-139-2512	AN/PSM-45
0002	F	BRUSH, BRISTLE	7920-01-101-6686	BNS-14
0003	F	BRUSH, TUBULAR	7920-01-101-6685	BRTH
0004	F	CONNECTOR,RECEPTACL	5935-01-118-2514	B4003818
0005	F	METRIC TOOLS,SUPPLM	5180-01-G35-9893	CK-17MM
0006	F	LIGHT, EXTENSION	6230-01-032-0677	DRV8P-GK3
0007	F	MIRROR, INSPECTION	5120-00-448-2455	E2
0008	F	FUSE PULLER	5120-01-075-2824	FP-1
0009	F	MASTER SKEW TAPE	7010-01-101-6665	HIS60102310-006
0010	F	SOCKET SET, METRIC	5120-01-115-1152	HIS71002107
0011	F	GAUGE, CARD REGISTER	7010-01-101-6666	IBM450550
0012	F	TOLL KIT ELECTRONIC	5180-01-023-4982	JTK-17LMLD
0013	F	TENSIOMETER, DIALIN	6635-00-246-8465	LP-72
0014	F	SCREWDRIVER,PHILLIP	5120-01-G35-9904	L3B085
0015	F	SUCKER SOLDER	3439-01-158-6978	MB4
0016	F	CARD EXTENDER	7010-01-101-6679	MPI54109701
0017	F	TEST SET	7010-01-103-7623	MPI75255005
0018	F	TOOL,CARD EXTRACTIO	7010-01-101-6680	MPI87399200
0019	F	OSCILLOSCOPE	6625-00-127-0079	OS-261/U
0020	F	SHIM STOCK PLASTIC	- -	PSS5A
0021	F	T&V PACK-SMU PACK		SHU901J
0022	F	CLEANER, VACUUM	7910-01-G36-0607	S1015030W
0023	F	DRIVER,RATCHET,OFS	5120-01-G35-9901	1858035
0024	F	KEY SET, SOCKET HEAD	5120-01-G04-0322	198
0025	F	EXTENDER,BOARD,PCE	7045-01-086-8732	2006-01
0026	F	CIRCUIT CARD ASSEMB	7025-01-085-7646	2012-05
0027	F	WRENCH SET SOCKET	5120-00-247-0748	213-SFS
0028	F	MAGNETIC PICKUP	5120-01-G04-0439	384
0029	F	SCREWDRIVER PHILLIP		41296WS
0030	F	PIN,DOWEL,CRG ALIGN	5315-01-G35-9899	44A501679-001
0031	F	TOOL REMOVAL, SW	5120-01-G35-9897	44B502296-001
0032	F	TOOL REMOVAL, BTN	5120-01-G35-9898	44B503800-001
0033	F	TOOL ALIGNMENT	5120-01-G35-9896	44C415272-001
0034	F	WRENCH,OPEN-END	5120-01-G04-0393	44501
0035	F	PLIERS,HEAT SINK	3439-00-973-2249	46
0036	F	DGTL ACTIVITY IND		5979
0037	F	TRACKING TAPE	7010-01-101-6664	60102310-002
0038	F	SCREWDRIVER,OFFSET	5120-01-G35-9905	65-032
0039	F	TORX OFFSET DRIVER		71TX20S
0040	F	TORX OFFSET DRIVER	- - -	71TX40S
0041	F	ALIGNMENT PACK	7010-01-101-6681	71002211-001
0042	F	MASK, MAINTENANCE	7045-01-086-8731	7498-01
0043	F	ALIGN TOOL SPIN DEL		75018400
0044	F	TOOL,HEAD ADJUSTMEN	5120-01-059-6860	75018803
0045	F	TAPE PUNCH, VFU	5999-01-G35-9900	801313-001

END ITEM AN/MYQ-4A

TOOL AND TEST EQUIPMENT REQUIREMENTS
(DA RCOM-P 750-16)

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
0046	F	TORQUE. SCREWDRIVER	- - -	85002
0047	F	PLIERS .90 DEG. LN	5120-01-G35-9894	9HT30749
0048	F	TOOL. CARD REMOVAL	7010-01-101-6667	9180-00
0049	F	EXTENSION BLADE	5120-00-152-8991	99X5

Section IV. REMARKS

Reference Code	Remarks
A.	Repair by Contractor
B.	DS repair limited to replacement of fan, fuses, and power cable
c.	DS repair limited to repl acement of batteries
D.	DS repair limited to repl acement of fuses, circuit breakers, and power cable
E.	DS repair limited to circuit card replacement
F.	Repair per TM 5-4120-360-15
G.	Service per appropriate COMSEC manual
H.	Service per TM 11-581O-271-12P
I.	Service per TM 11-5810-308-34

APPENDIX C
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. GENERAL INFORMATION

C-1. INTRODUCTION

This appendix lists expendable supplies and materials you will need to operate and maintain the system. These items are authorized to you by CTA 50-970, Expendable items.

C-2. EXPLANATION OF COLUMNS

a. ITEM NO. This number is referenced in the narrative instructions to identify the material (for example, "Use cleaning compound, Item 3, App.C")

b. LEVEL Shows the lowest level of maintenance that needs the listed item. Enter as applicable:

C -- Crew/Operator
O -- Organizational Maintenance
F -- Direct Support Maintenance
H -- General Support Maintenance

c. NATIONAL STOCK NUMBER. Shows the National Stock Number assigned to each item and used to requisition that item.

d. DESCRIPTION. Shows the National Item Name and (if required) a short description to identify and locate the item. The last line for each item shows the Federal Supply Code for- Manufacturers (FSCM) in parentheses, followed by the part number.

e. UNIT OF MEASURE (U/M). Shows the measure of the item needed to perform the actual operational/maintenance function. This measure is shown by a two-letter abbreviation(for example, EA,OZ,IN).

Section II. EXPENDABLE SUPPLIES AND MATERIALS

NATIONAL STOCK NUMBER	DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	U/M	QTY REQD
6810-00-753-4993	Alchohol, Isopropyl 81348 TT1735		CN	
7010-01-086-6087	Roller, Inking 57583 3990-00		CT	
7010-01-101-6668	Ribbon, Cartridge 01526 44A419819-G07		EA	
7530-00-270-6182	Cards, Tabulating 81348 GC116 TYPE 1		BX	

Section II. Expendable SUPPLIES AND MATERIALS LIST (CONT)

NATIONAL STOCK NUMBER	DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	U/M	QT REQD
7530-00-145-0414	Paper, Tabulating machine, 81348 UU-P-546 Office 1 Part		BX	
7530-00-145-0415	Paper, Tabulating Machine, 81348 UU-P-546 Office 2 Part		BX	
7530-00-145-0416	Paper, Tabulating Machine, 81348 UU-P-546 Office 3 Part		BX	
7530-00-145-0417	Paper, Tabulating Machine, 81348 UU-P-546 Office 4 Part		BX	
7530-00-145-0418	Paper, Tabulating machine, 81348 UU-P-546 Office 5 Part		BX	
7530-00-145-0419	Paper, Tabulating Machine, 81348 UU-P-546 Office 6 Part		BX	
7010-01-101-9228	Cleaner Pad 12049 502-339B-1		EA	
7010-01-101-1263	Cleaner Kit, Tape 12049 159-133B-4		EA	
8305-00-267-3015	Cheesecloth 81348 CCCC440		YD	
6850-00-927-9461	Silicone Compound 71985 DC340		TU	
4020-00-656-	Tape, Lacing and Tying 81349 MIL-T-43435 Type 1, Size 3 Finish B		SL	
6515-00-303-8250	Applicator, Disposable 81348 GG-A-616		PG	
	Grease 630-AAME-D6A3			
	Oil SAE 10W-20W-40 Non-Detergent			

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONT)

NATIONAL STOCK NUMBER	DESCRIPTION (FSCM) AND PART NUMBER	USABLE ON CODE	U/M	QTY REQD
9150-01-047-0022	Graphite Solution, Anti Static 01526 44A410695-G01			
9150-01-085-5472	Aerosol Dry Lubricant 01526 44A417371-001			
5350-00-192-5049	Aluminum Oxide Paper 81348 P-C-451		PG	
5350-00-286-4851	Aluminum wool 81349 MIL-A-4864		LB	
6810-00-682-6867	Distilled Water 24774 243		GL	
8040-01-014-5869	Sealing Compound 81349 MIL-S-46163		BT	
7930-00-664-6910	Glass Cleaner (Non-spray) 58536 A-A-40		CO	
5975-00-451-5001	Strap, Tiedown 12 inch 96906 MS3367-3-9		HD	
5975-00-727-5153	Strap, Tiedown 2.72 inch 96906 MS3367-4-9		HD	
8105-00-773-7581	Plastic Bag 81348 PPP-B-28			
	Disk Packs (67MB)		EA	
	Magnetic Tape (10 1/2")		EA	
	Printer Paper, 1413, 1 part (2500 Sheets/box) for B-1000		BX	
	Printer Ribbon for B-1000		CT	
	Cards, 10,000/Case for 8010-80		CS	
5970-00-419-4920	Tape Insulation (Mag Tape Unit)		RL	
	Lamp (Fluorescent) General Use Graphite Solution Molykote			

APPENDIX D
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D-1. GENERAL

Troubleshooting sometimes requires checking for continuity, resistance, voltage, or signal flows. Replacement of boards or devices may require repositioning of switches and jumpers.

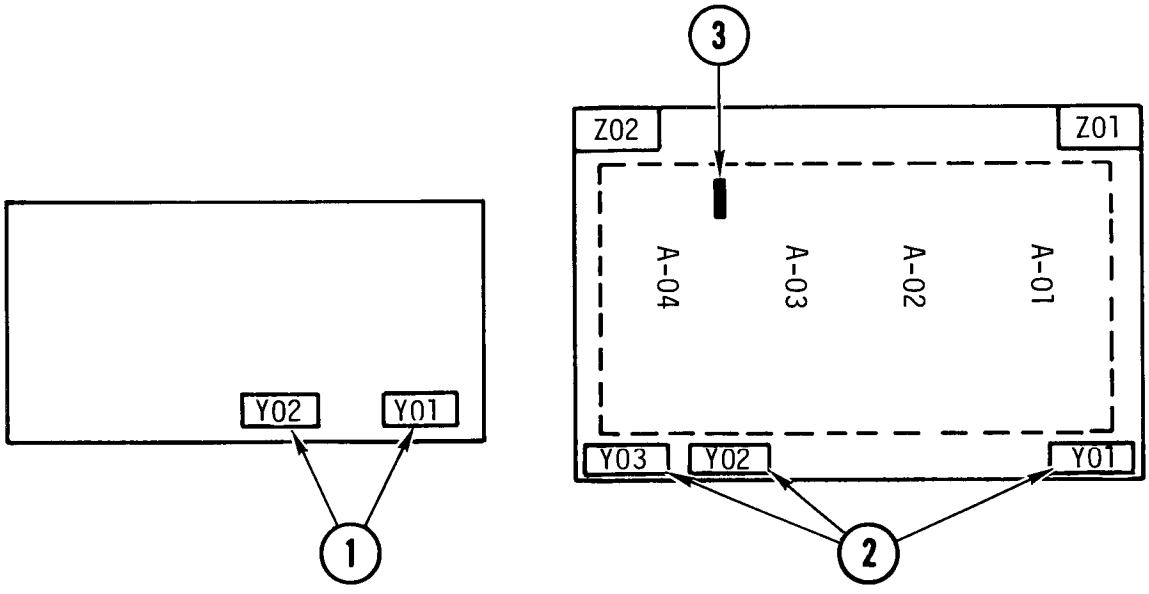
D-2. DIAGRAMS

The diagrams and tables included in this appendix are to help you do the checks and adjustments.

a. Support Diagrams. Support diagrams are to be used as aids when you are reconfiguring (addressing) boards and system devices. The setting of jumpers, dipswitches, and hexadecimal rotary switches is most important when you are swapping or replacing boards or when you are replacing a major piece of equipment. An identification of slot numbers and ports for cabling is also included.

b). Function Tables. I/0 terminal configuration switch functions, signal terminal pairs or communications, and the signal data flows for NRZI or PE boards in the tape drive unit, are included as tables. Use these tables whenever you are setting up remote communications or troubleshooting the system.

c. Schematic Diagrams. Schematics showing wiring, terminal numbers, pin numbers, and components are included in fold-out form at the back of the manual. If you are unable to isolate the fault by using the troubleshooting techniques given in Chapter 4, the schematic diagrams will allow you to make continuity, resistance, voltage, or signal checks.

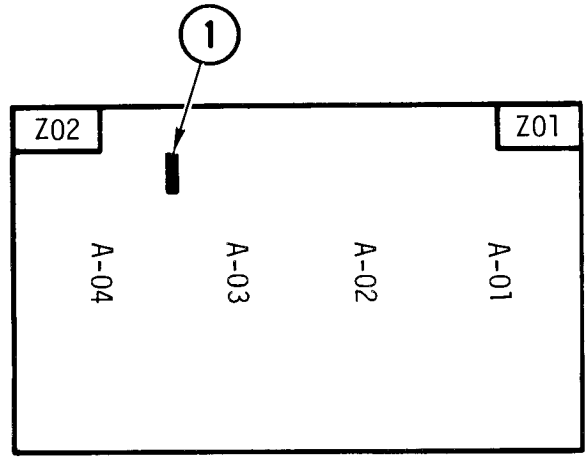


(1) Memory management ports YO1 and Y02. Always inspect the pins on these ports to make sure that none are touching. Contacting pins will damage the unit when power is applied.

(2) Central processor ports YO1 and Y02. Inspect the pins on these ports to make sure that none are touching. Contacting pins will damage the board. A ribbon cable connector from the CPU repeater board must be connected to port Y03. The connector should be labeled SLOT 15, PORT 4.

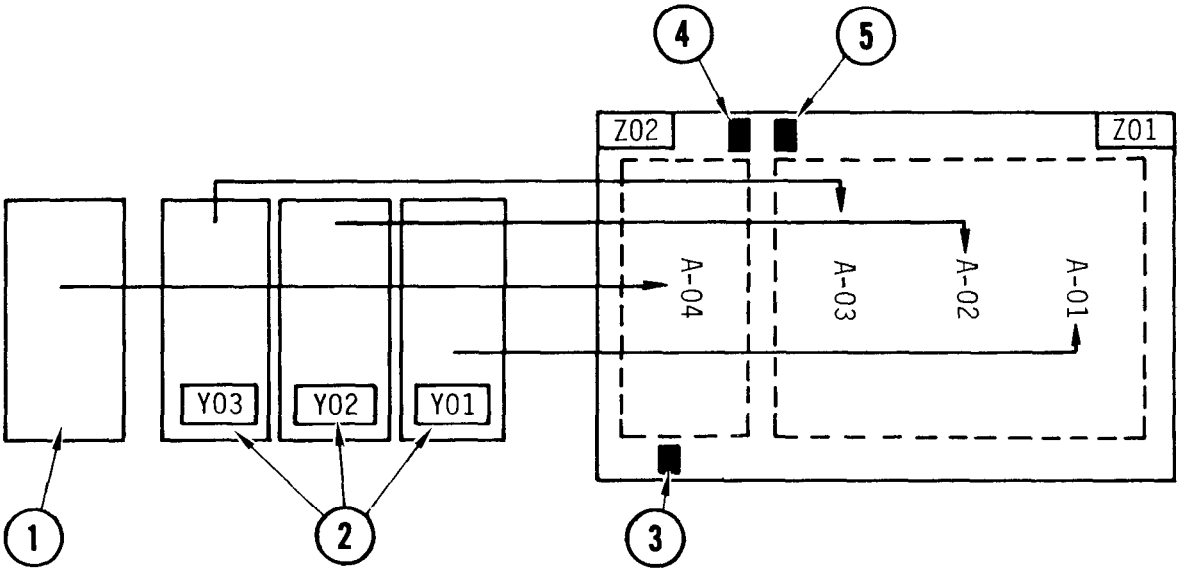
(3) Switch located on the central processor beneath the memory management unit. Set this switch to 0.

Figure D-1. CP and MMU Configuration and Addressing



Switch on commercial instruction processor. Set this switch to O.

Figure D-2. CIP Configuration and Addressing



① Firmware adapter must occupy position A-04 on the controller. There are no other configuration requirements.

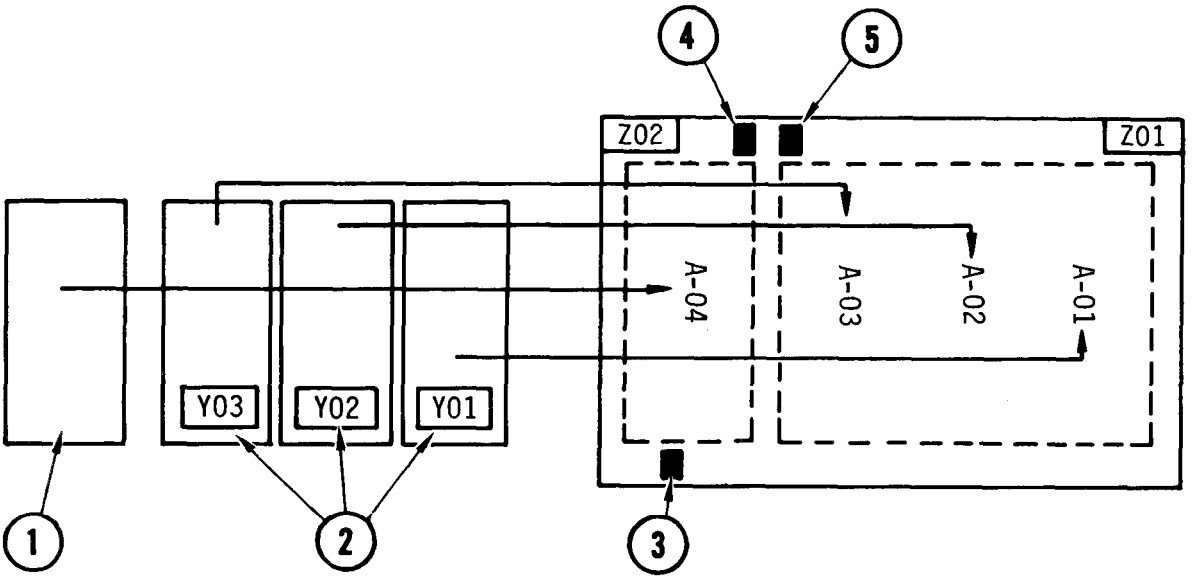
② Storage module adapters must occupy posit ions A-0 1 thru A-03 on the controller.

③ Rocker arm switch assembly located on the control er. Set switches 1 thru 5 OFF. Set switches 6 thru 8 ON.

④ Switch located on the controller. Set this switch to 6.

⑤ Switch located on the controller. Set this switch to O.

Figure D-3. Disk Drive Controller 0600, 0680, and 0700 Configuration and Addressing



① Firmware adapter must OCCUPY position A-04 on the controller. There are no other configuration requirements.

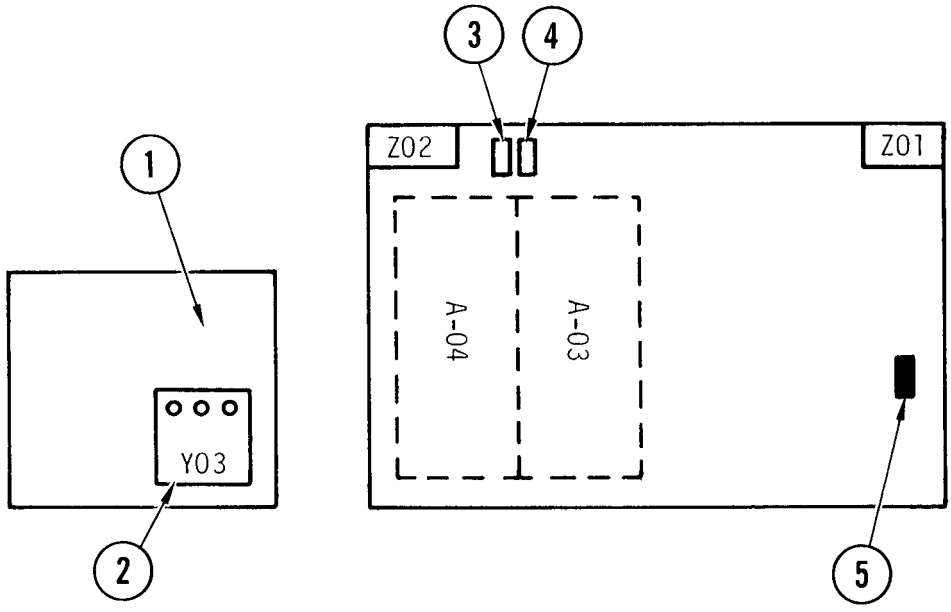
② Storage module adapters must occupy positions A-01 thru A-03 on the controller.

③ Rocker arm switch assembly on the controller. Set switches 1 thru 5 OFF. Set switches 6 thru 8 ON.

④ Switch located on the controller. Set this switch to 4.

⑤ Switch located on the controller. Set this switch to O.

Figure D-4. Disk Drive Controller 0400, 0480, and 0500 Configuration and Addressing



① Real time clock adapter must occupy positions A-03 and A-04 on the controller. A connector labeled SLOT 11 PORT 3 is connected at port Y03.

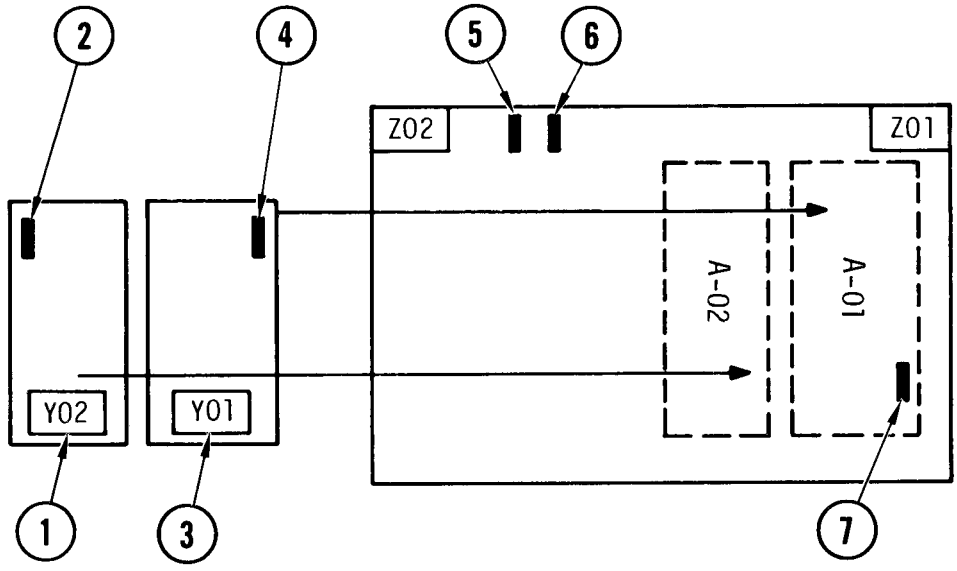
② Clock battery toggle switch. Set to ON for operation. Set to OFF for storage or transit.

③ Switch to 8.

④ Switch to 0.

⑤ Switch to F.

Figure D-5. SLOT 11 MDC Configuration and Addressing



① Line printer adapter must occupy position A-02 on controller. A connector labeled SLOT 10 PORT 2 is connected at PORT Y02.

② Switch located on the line printer adapter. Set this switch to A.

③ System console adapter must OCCUPY position A-01 on the controller. A connector, labeled SLOT 10 PORT 1 is connected at PORT YOl.

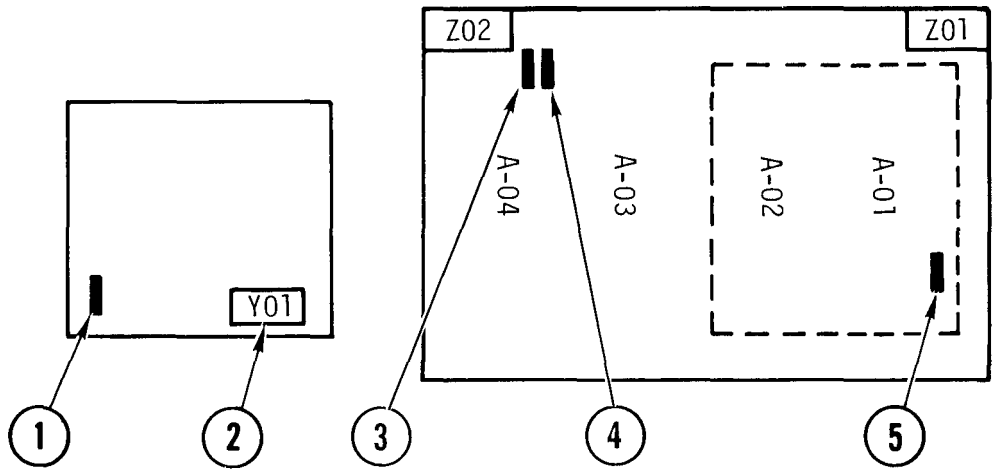
④ Switch located on the system console adapter. Set this switch to 9.

⑤ Switch located on the controller. Set this switch to 2.

⑥ Switch located on the controller. Set this switch to 1.

Switch located on the controller beneath the system console adapter. Remove the adapter to access the switch. Set this switch to F.

Figure D-6. Slot l0 MDC Configuration and Addressing



① Switch located on the PE/NRZI adapter. Set this switch to 3.

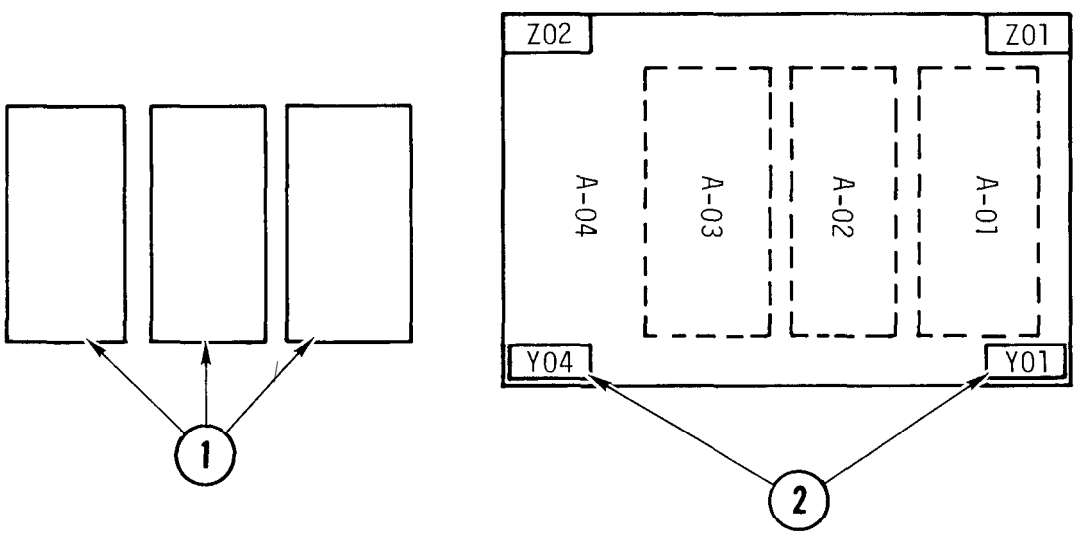
② PE/NRZI adapter must occupy positions A-01 and A-02 on the controller. A ribbon cable from the data recovery unit (slot 8) is connected at port YOl of the adapter.

③ Switch located on the controller. Set this switch to 6.

④ Switch located on the controller. Set this switch to 1.

⑤ Switch located on the controller beneath the PE/NRZI adapter. Remove the adapter to access this switch. Set the switch to F.

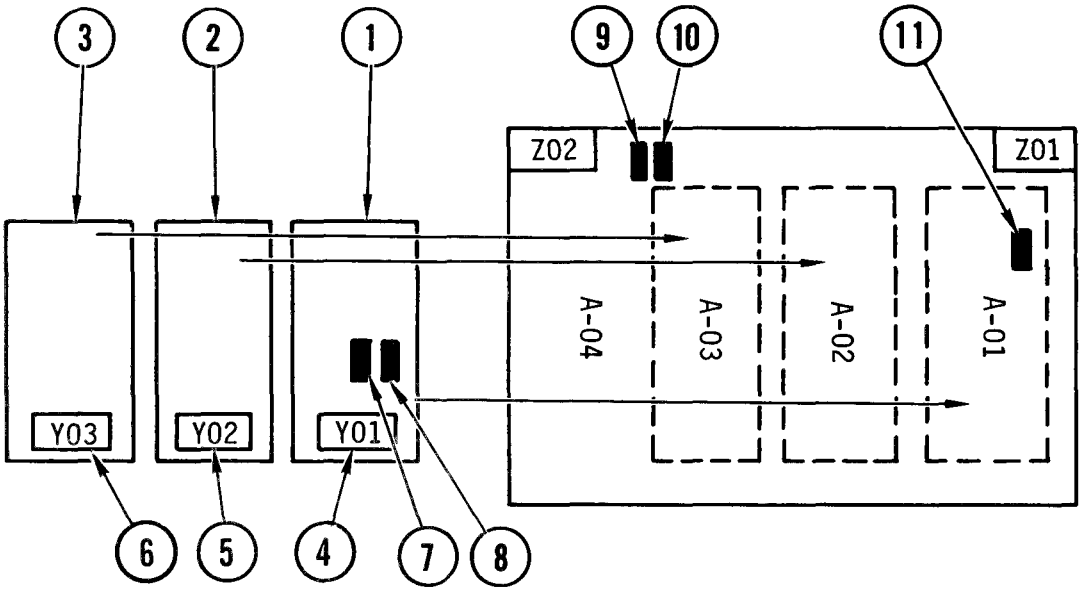
Figure D-7. Slot 9 MTC Configuration and Addressing



① PE clock adapters must occupy positions A-01 thru A-03 on the DRU. These adapters are interchangeable within their assigned controller positons.

② A cable connector, labeled SLOT 8 PORT 4, should be connected at Y04. A ribbon cable to the PE/NRZI adapter is connected at port YOl of the data recovery unit.

Figure D-8. Slot 8 DRU Configuration and Addressing



① Auto Dial adapter must occupy position A-01.

② Sync HDLC adapter must occupy position A-02

③ Async communications adapter must OCCUPY position A-03.

④ A connector labeled SLOT 7 PORT 1 is connected to YO1.

⑤ A connector Iabeled SLOT 7 PORT 2 is connected to Y02.

⑥ A connector labeled SLOT 7 PORT 3 is connected to Y03.

⑦ Switch controll ing auto dial line O. Set switch to 5.

⑧ Switch controll ing auto dial line 1. Set switch to 9.

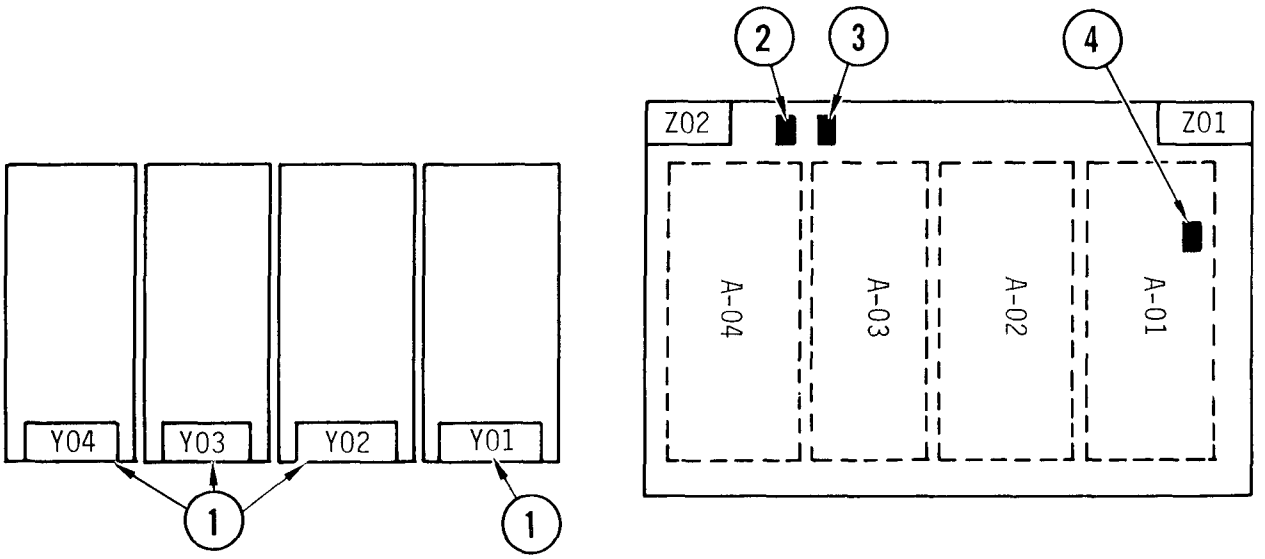
⑨ Switch located in the processor. Set this switch to C.

⑩ Switch located on the processor. Set this switch to O.

⑪ Switch located in the processor beneath the adapter. Remove the adapter to access the switch. Set the switch to 7. For other baud rates, set the switch to the position shown for the baud rate listed:

1 = 800	4 = 2152	7 = 9,600 (Standard for DAS3 (D/C))
2 = 1200	5 = 2400	8 = 14,400
3 = 1760	6 = 4850	9 = 19,200

Figure D-9. Slot 7 MLCP Configuration and Addressing



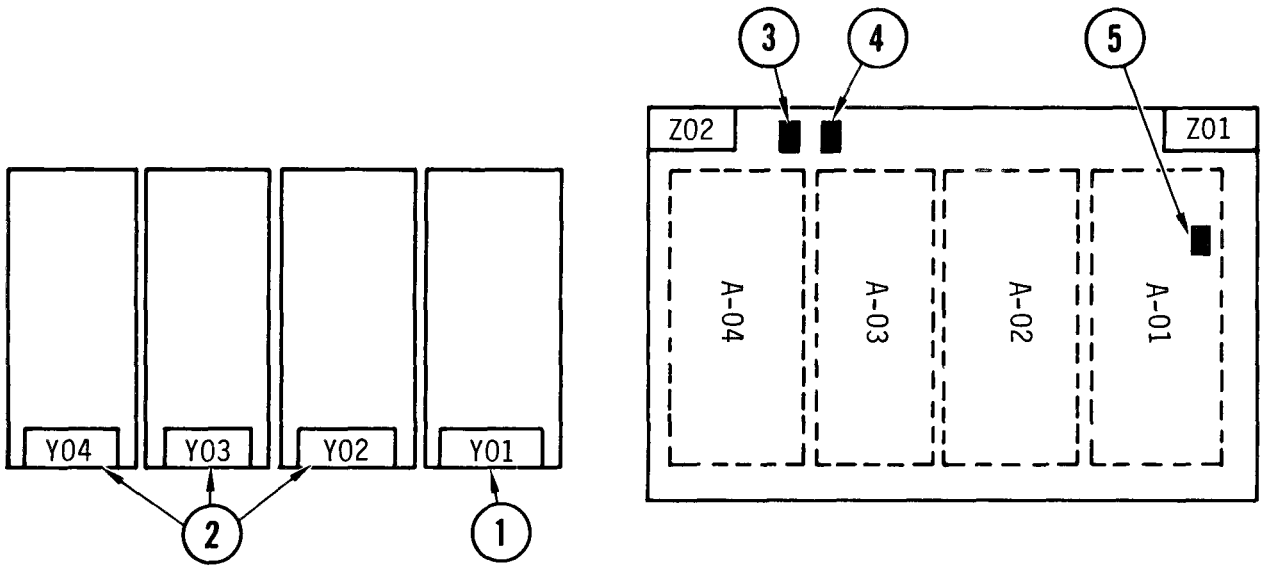
① Identical asynchronous communications adapters are in all four controller positions.

② Switch to C.

③ Switch to 1.

④ Switch setting is indifferent.

Figure D-10. Slot 5 MLCP Configuration and Addressing



① Synchronous adapter must occupy control ler 1ocation A-01.

② Identica1 asynchronous adapters occupy controller locations A-02, A-03, A-04.

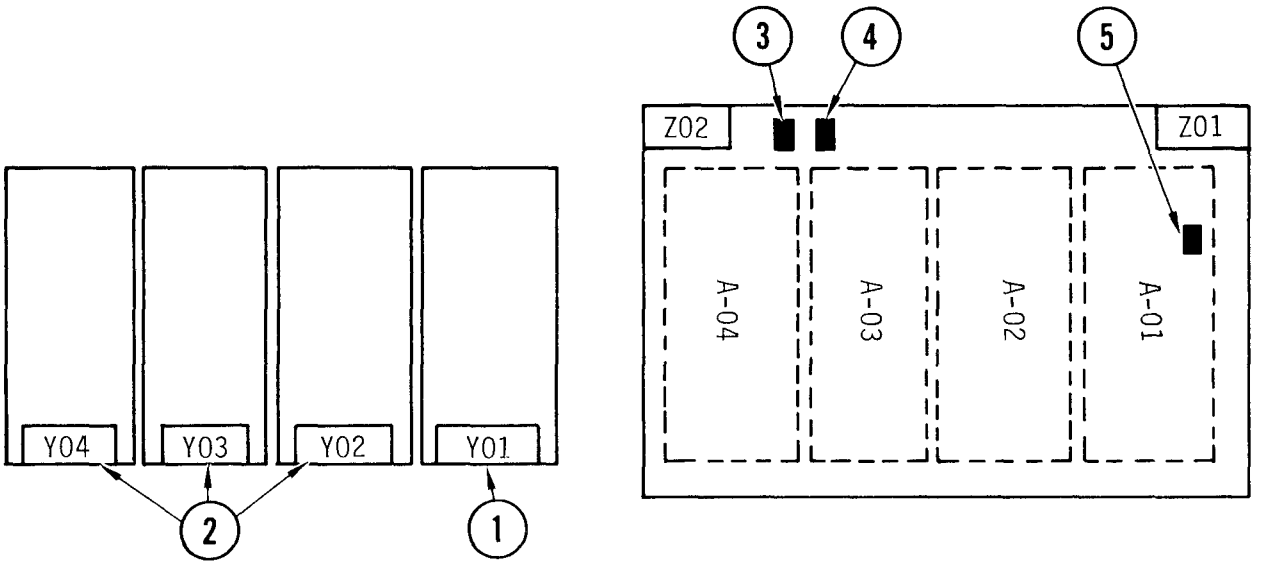
③ Switch to C.

④ Switch to 2.

Switch according to the desired baud rate, using the following:

Switch Position	Baud Rate	
1	800	
2	1,200	
3	1,760	
4	2,152	
5	2,400	
6	4,850	
7	9,600	(Standard for DAS3 (D/C))
8	14,400	
9	19,200	

Figure D-11. Slot 4 MLCP Configuration and Addressing



(1) Synchronous HDLC communications adapter must occupy controller location A-01.

(2) Identical asynchronous communications adapters occupy controller locations A-02, A-03, and A-04.

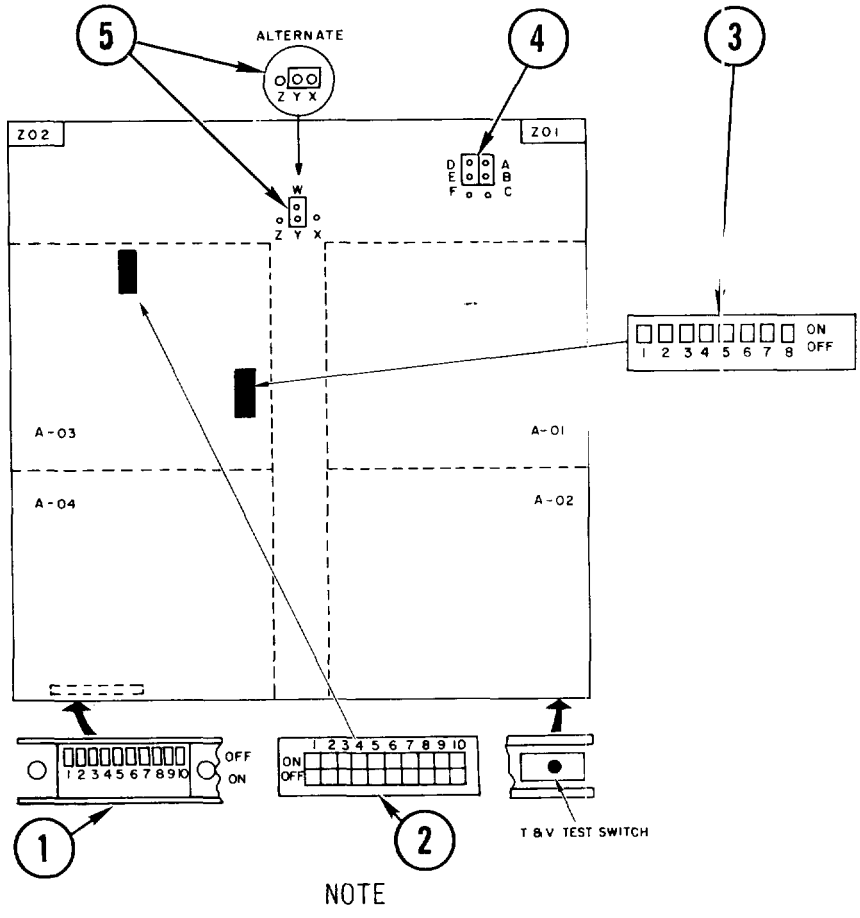
(3) Switch to C.

(4) Switch to 3.

(5) Switch according to the desired baud rate, using the following:

Switch Position	Baud Rate
1	800
2	1, 200
3	1,760
4	2,152
5	2,400
6	4,850
7	9,600 (Standard for DAS3 (D/C))
8	14,400
9	19,200

Figure D-12. Slot 3 MICP Configuration and Addressing



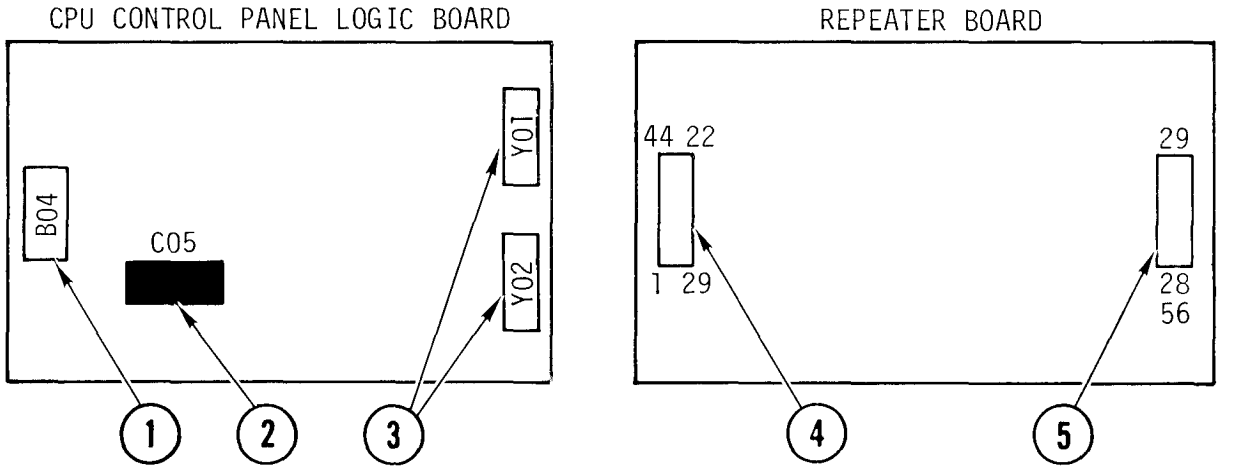
NOTE

Memory controller priorities are unlike those of other CPU circuit boards. Instead of right to left adapter priorities, (A-01 thru A-04) are assigned by quadrants. EDAC adapters may be interchanged from position to position and from controller to controller. All four adapters must be in place to assure maximum capacity. All configuration switches are located on the controller beneath the adapters at positions A-03 and A-04. Remove these adapters to set the dipswitches. Jumpers are on the controller behind the adapters.

Slot 1 MEMORY (2 Meg only), use steps 1, 3, and 4.
Slot 2 MEMORY (2 Meg only), use steps 2, 3, and 4.
Slot 2 MEMORY (1 Meg only) use steps 1, 3, and 4.

1. Set switches 5 and 6 ON. Set switches 1 thru 4 and 7 thru 10 OFF.
2. Set switches 5, 7 and 10 ON. Set switches 1 thru 4, 6, 8 and 9 OFF.
3. Set switches 1 and 4 ON. Set switches 2 and 3 and 5 thru 8 OFF.
4. Jumper pins A to B and D to E.
5. Jumper pins W to Y. If board has alternate configuration (no w pin), jumper pins X to Y.

Figure D-13. Main Memory Configuration and Addressing



(1) Keylock switch port.

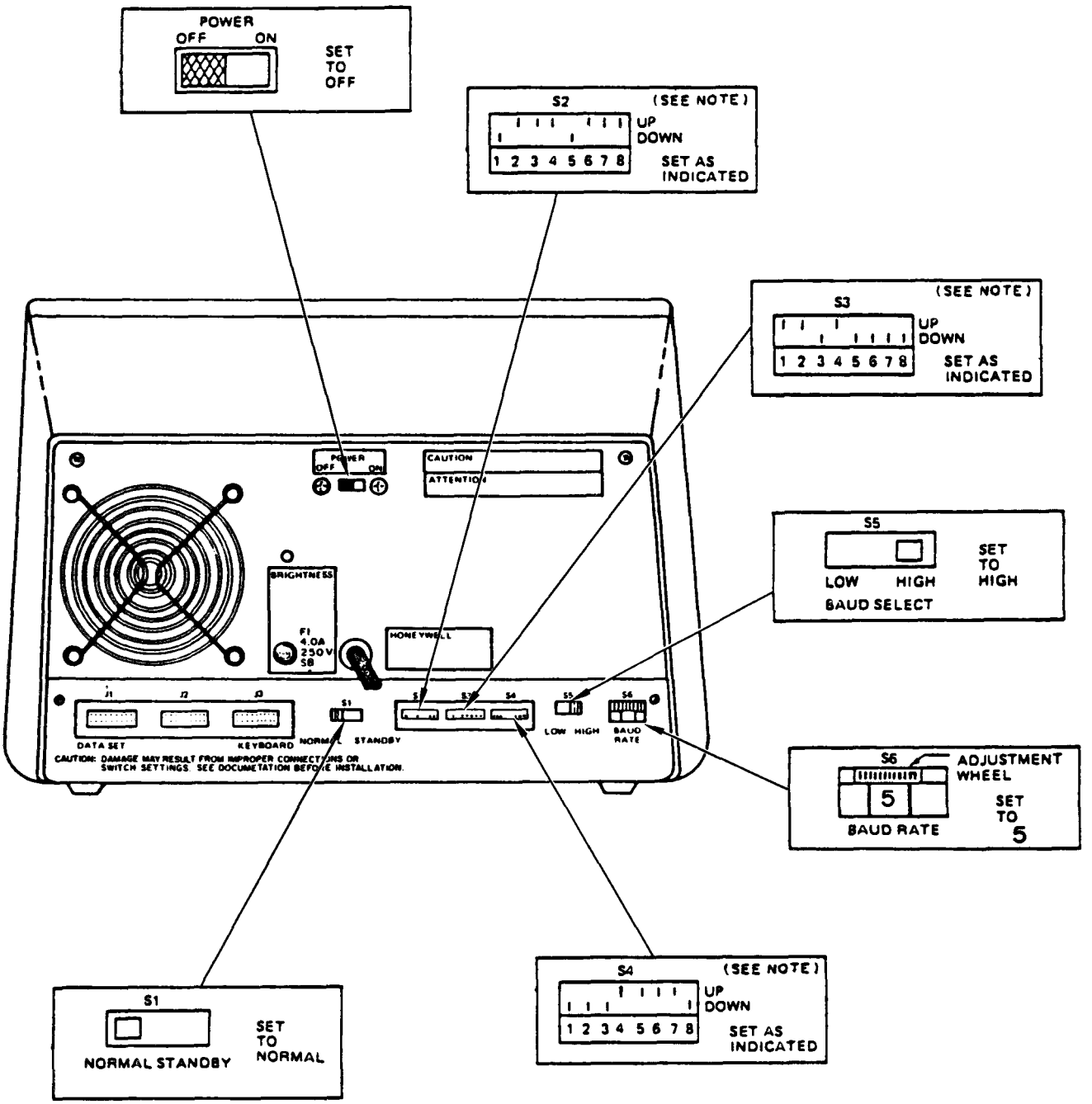
(2) Operating mode dipswitch. Set switches 1 and 2 OFF; 3 and 4 ON. (Set switch 4 in the ON position for LAF mode, OFF position for SAF mode. The normal setting for switch 4 is ON (LAF mode).)

(3) Ribbon cable connectors from the central processor board carry power and control signals to/from ports YO1 and Y02.

(4) Front connector receives connector (red cables) from control panel.

(5) Rear connector receives connector (flat ribbon cable) from port Y03 on CP board.

Figure D-14. CPU Control Panel Logic and Repeater Boards Configuration and Addressing



NOTE

IF SWITCHES S2, S3 and S4 CONTAIN 10 SLIDES, 9 and 10 CAN BE SET IN ANY POSITION. SEE TABLE D-2 FOR COMPLETE LIST OF CONSOLE TERMINAL SWITCH FUNCTIONS FOR DAS3 (D/C).

Figure D-15. Console Terminal Rear Panel Switch Settings

D-3. TELEPRINTER STRAPPING OPTIONS

The console printer (teleprinter) strapping options consist of bits stored in non-volatile RAM which can be used to select program parameters. The software strapping can be modified using the set-up sequence described below.

This sequence is initiated by holding the Function Key down and sequentially pressing the 0,S, and U keys (Option Set Up). This causes the current strapping opt ions to be printed out and initiates the option programming mode. The letters OSU are displayed on the PPI.

The Function sequence may be accepted at any time that vertical format (FSU) or opt ion (OSU) set-up modes are not already active and printing is not in progress.

When the set-up sequence is initiated, the processor will generate a message (fig. D-17) displaying the current strapping.

```
                                    etc             STRAP NO.
                                    etc.             STATUS
```

Figure D-16. Teleprinter Configuration Message

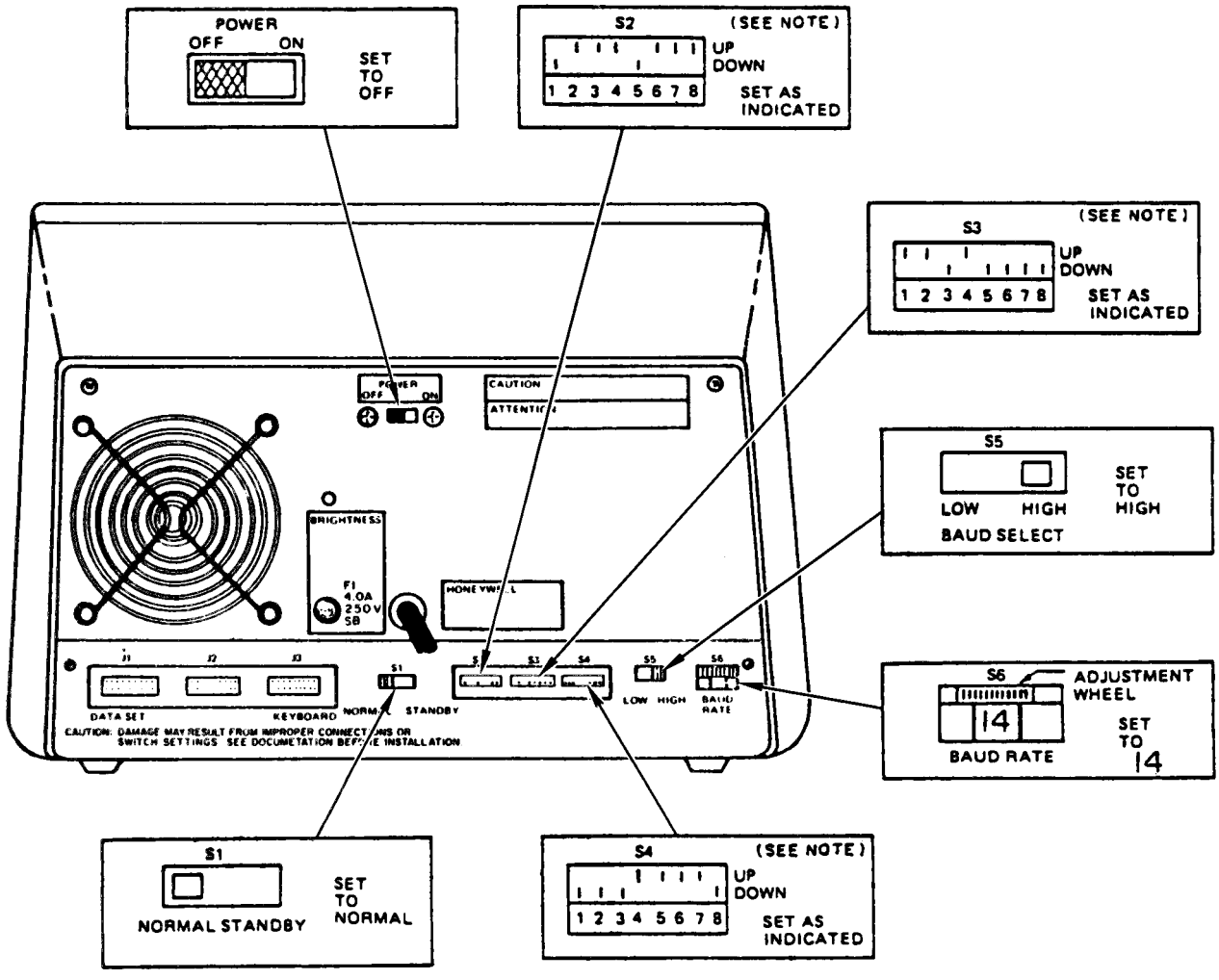
The I and O entries on the second line tell whether the particular numbered software strap is in or out, respectively. In the example shown, straps 1, 2, 5, 6, 10 and 12 are IN and all others are OUT. (See Table D-1 for the various strapping functions.) After printing the current status, the unit will perform a Carriage Return and wait for input. Four different characters will be acceptable:

I - Set this strap to In
0 - Set this strap to Out
SP - Space to next strap, leave this strap as is
CR - Carriage return code terminates strapping change operation

One of these characters will be entered under each succeeding strap number, until a Carriage Return is entered. Any other character than the above will be ignored. New strap settings do not take effect until completion of the sequence.

Table D-1. Teleprinter Configuration Strapping

STRAP NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
STATUS	1	1	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1



NOTE

IF SWITCHES S2, S3 and S4 CONTAIN 10 SLIDES, 9 and 10 CAN BE SET IN ANY POSITION. SEE TABLE D-2 FOR COMPLETE LIST OF I/0 TERMINAL SWITCH FUNCTIONS

S6 SWITCH SETTINGS	BAUD RATE (bits per second)
0	-
1	-
2	110
3	-
4	150
5	300
6	600
7	1200
8	1800
9	-
10	2400
11	-
12	4800
13	-
14	9600
15	-

Figure D-17. DAS3 (D/C) I/0 Term inal Rear Panel Switch Settings

Table D-2. I/O Terminal Configuration Switch Functions

CONFIGURATION SWITCH NO.	FUNCTION	DESCRIPTION	CPU/ KEYBOARD OVERRIDE	STATUS LINE DISPLAY	ACTIVATED BY POWER-ON/RIS COMMAND
-	POWER ON/OFF Left = Off Right = On	This switch controls ac power between the terminal and its power supply. When turned ON, it also causes the terminal to perform an automatic self-test.	No	No	No
S1	Reserved LEFT ONLY	This switch is reserved and should be in the LEFT position.	-	-	-
S2-1 S2-2	EIA/Current Loop EIA S2-1 = Down S2-2 = Up S3-8 = Down Current Loop S2-1 = Up S2-2 = Down S3-8 = Up	This switch allows the terminal to be set for connection to a modem or direct connect operation using the RS-232 interface, or for direct connect operation with a current loop interface. (Current loop interface is not used in DAS3 D/C.)	No	No	No
S2-3	20 mA/60 mA Up = 20 mA Down = 60 mA	When the EIA/Current Loop switches are set for Current Loop, this switch is used to select either a 20-mA or a 60-mA current level. This switch must be set for the correct current level in order for the terminal to operate properly.	No	No	No
S2-4	Disable/Enable Pin 11 Up = Disable Down - Enable	Switch must be in UP position for DAS3 D/C applications.	No	No	No
S2-5	50 Hz/60 Hz Up = 50 Hz Down = 60 Hz	Pertains to terminal refresh rate. For DAS3 D/C operation, 60 Hz must be selected.	No	No	No
S2-6	Even Parity/Mark or Odd Parity/Space Up = Even/Mark Down = Odd/Space	This switch is used in conjunction with the Enable/Disable Parity switch. If the Enable/ Disable Parity switch is set to Enable Parity, this switch selects odd or even parity for incoming data. If the Enable/Disable switch is set to Disable Parity, this switch selects Mark or Space bits for the transmitted data. Received Parity bit is ignored.	No	No	Yes
S2-7	Enable/Disable Parity Up = Enable Down = Disable	This switch determines whether or not parity will be set on transmitted data and checked on received data characters.	No	No	Yes

Table D-2. I/O Terminal Configuration Switch Functions -- Continued

CONFIGURATION SWITCH NO.	FUNCTION	DESCRIPTION	CPU/ KEYBOARD OVERRIDE	STATUS LINE DISPLAY	ACTIVATED BY POWER-ON/RIS COMMAND
S2-8	Reserved UP ONLY	This switch is reserved and must be in the UP position.	-	-	-
S2-9 & S2-10	Reserved DOWN ONLY	These switches are reserved and must be in the DOWN position.	-	-	-
S3-1	With/Without CR/LF Up = With Down = Without	This switch allows a CR/LF delimiter to be sent at the end of each line in the Text mode. No delimiter at the end of each line is sent when the switch is in the Without CR/LF position. This switch is ignored if Space Suppress is on.	No	No	Yes
S3-2	Default to Character/Text Up = Character Down = Text	This switch determines which mode the terminal will enter after a power-up or initialize. The terminal cannot enter the Form mode as a result of a power-up or initialize (see also S4-4).	Yes	Yes	Yes
S3-3	Reserved DOWN ONLY	This switch is reserved and must be in the DOWN position.	-	-	-
S3-4	Space Suppress On/Off Up = On Down = Off	This switch determines if trailing spaces on a line are to be suppressed on a data transmission to the CPU. If Space Suppress On is selected in the Form mode, trailing spaces in each full field transmitted from a form is delimited with an ASCII US (1F) character. If trailing spaces were suppressed however, the field data is delimited with an ASCII HT (09) character. For blank fields, the HT character is used.	Yes	No	Yes
S3-5	Underline/Block Cursor Up = Underline Down = Block	This switch allows the operator to select the cursor presentation as either a block or an underline.	No	No	Yes
S3-6	Nonblinking Cursor Up = Nonblink Down = Blink	This switch allows the operator to select a blinking or a nonblinking cursor.	No	No	Yes
S3-7	Reserved DOWN ONLY	This switch is reserved and must be in the DOWN position.	-	-	-
S3-8	EIA/Current Loop Up = Current Loop Down = EIA	Refer to S2-1 and S2-2.	No	No	No

Table D-2. I/O Terminal Configuration Switch Functions -- Continued

CONFIGURATION SWITCH NO.	FUNCTION	DESCRIPTION	CPU/ KEYBOARD OVERRIDE	STATUS LINE DISPLAY	ACTIVATED BY POWER-ON/RIS COMMAND
S3-9	Reserved DOWN ONLY	This switch is reserved and must be in the DOWN position.	-	-	-
S3-10	Reserved DOWN ONLY	This switch is reserved and must be in the DOWN position.	-	-	-
S4-1	Block Transmit Mode/Nonblock Transmit Mode Up = Block Down = Nonblock	When this switch is in the Block Transmit position, the terminal transmits messages in blocks of 256 characters. In Nonblock Transmit mode, the terminal transmits the entire message in one transmission.	Yes	No	Yes
S4-2	Test/Normal Mode Up = Test Down = Normal	When this switch is in the Test Mode position during a power-up, the terminal continues to loop on the automatic self test until the switch is set to the Normal Mode position or until a test error occurs.	No	No	Yes
S4-3	EOT/ETX Up = EOT Down = ETX	When this switch is in the EOT position, it terminates all transmitted messages with EOT; when in the ETX position, the message is terminated by ETX.	No	No	Yes
S4-4	Echo to TX-RET/ Nonecho or Nonb-TX-RET Up = Echo/TX-RET Down = Nonecho/ Non-TX-RET	This switch is used in conjunction with S3-2. If S3-2 is set to Character mode, the S4-4 switch selects Echo/Nonecho. If S3-2 is set to Text mode, the S4-4 switch selects TX-RET/ Non-TX-RET. In Text mode TX-RET, the RETURN key initiates a data transmission and causes the cursor to perform a CR or CR/LF, depending upon the setting of the AUTO LF key. This function is not effective in the Form or Character mode. In Echo mode, keyboard data is sent to the CPU and not displayed or acted upon until processed and returned from the CPU. In nonecho mode, keyboard data is displayed or acted upon as it is keyed.	Yes	Yes	Yes
S4-5	Roll/Nonroll Up = Roll Down = Nonroll	This switch allows or prevents rolling of data by the LF on the last line of data space.	Yes	Yes	Yes
S4-6	Hold/Drop DTR in Local Up = Hold Down = Drop	This switch determines whether or not the Data Terminal Ready (DTR) interface line is affected by the LOCAL key. In the Hold DTR in Local position, the DTR signal is kept on whenever the terminal is switched to Local.	No	No	Yes
S4-7	Reserved UP ONLY	This switch is reserved and must be in the UP position.	-	-	-

Table D-2. I/O Terminal Configuration Switch Functions -- Continued

CONFIGURATION SWITCH NO.	FUNCTION	DESCRIPTION	CPU/ KEYBOARD OVERRIDE	STATUS LINE DISPLAY	ACTIVATED BY POWER-ON/RIS COMMAND
S4-8	Display All/ Normal Mode Up = Display Down = Normal	When set to the Display position, this switch directly displays all characters received from the CPU or keyboard without interpreting or responding to the codes.	No	No	No
S4-9	Reserved DOWN ONLY	This switch is reserved and must be in the DOWN position.	-	-	-
S4-10	Reserved DOWN ONLY	This switch is reserved and must be in the DOWN position.	-	-	-
S-5	MODEM SPEED Left = low Right = high	This switch permits operation with two-speed modes. For DAS3 D/C applications, the switch must be set to the right (HIGH) position.	No	No	No
S-6	BAUD RATE	This switch permits the selection of various I/O rates. Rotate the switch adjustment wheel to obtain the desired baud rate. (See figure D-17 for baud rate switch selections).	No	No	Yes

LOGIC CAGE

Board 13

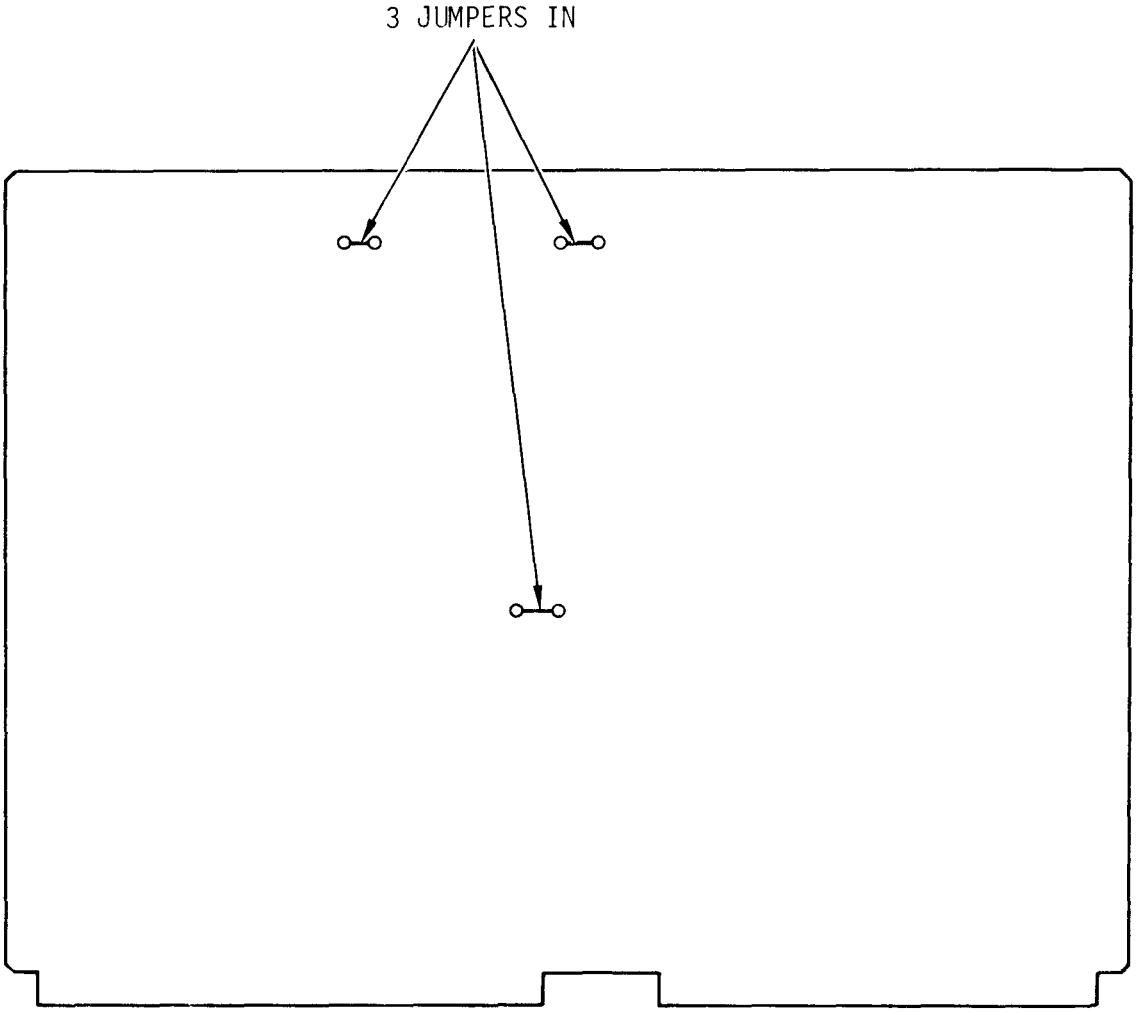
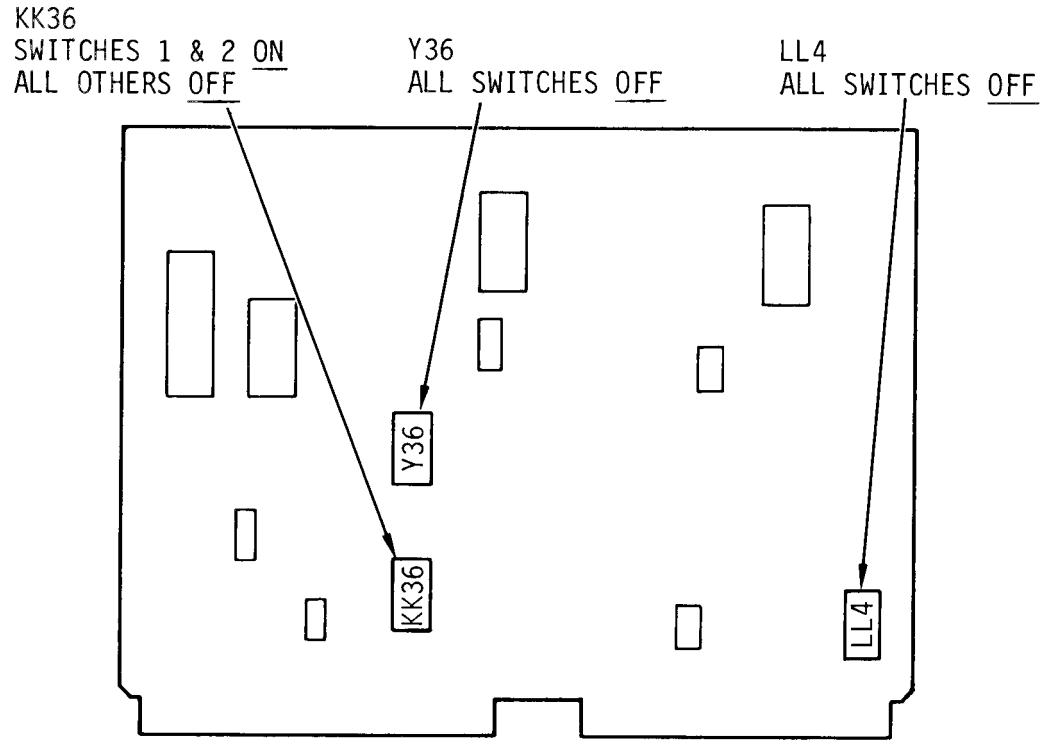
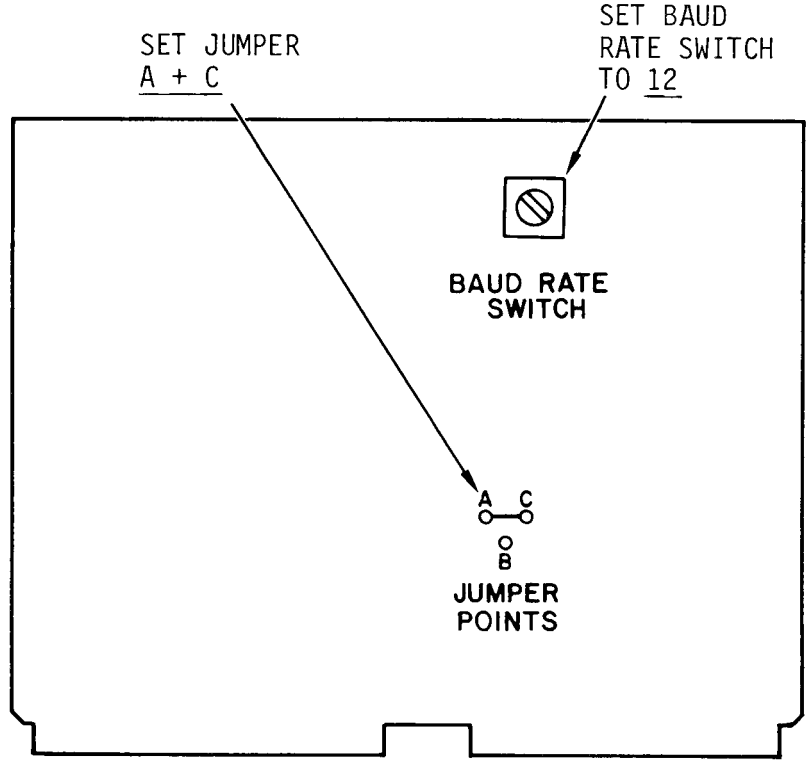


Figure D-18. Card Reader/Punch Switch and Jumper Settings (1 of 2)

SMART CONTROLLER LOGIC CAGE



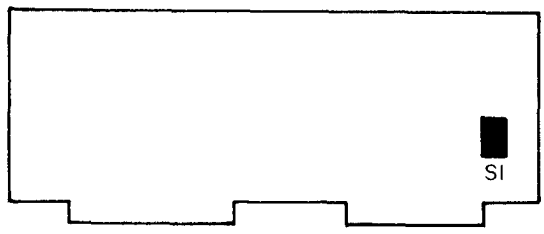
BOARD 1



BOARD 4

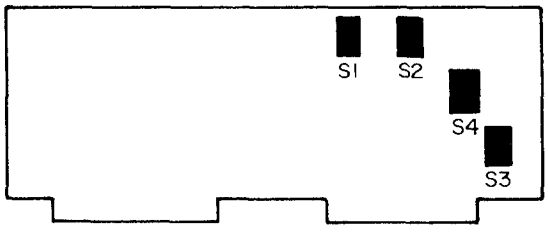
Figure D-18. Card Reader/Punch Switch and Jumper Settings (2 of 2)

PROCESSOR CCA (A3)



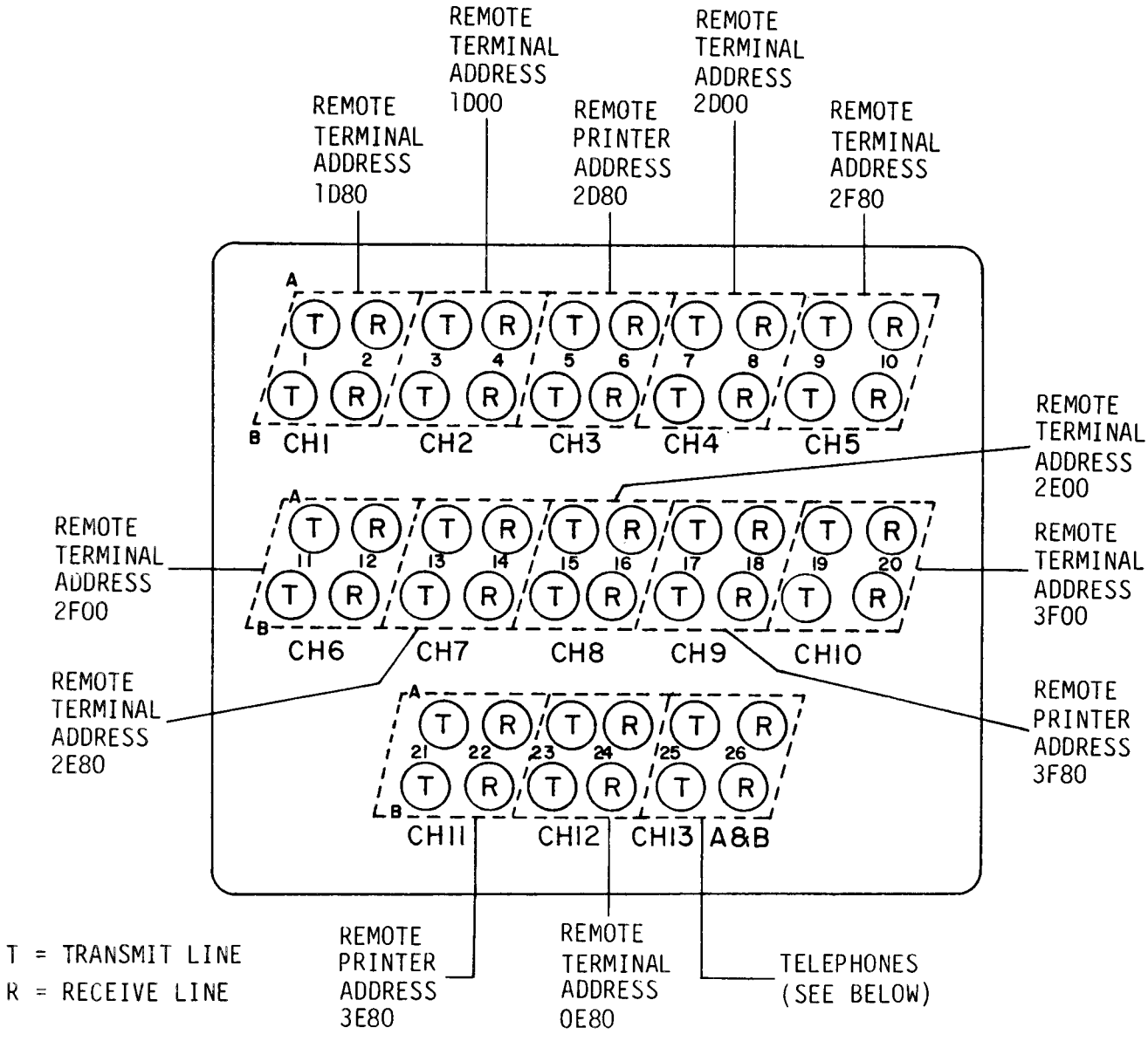
	S1
1	ON
2	OFF
3	OFF
4	OFF
5	OFF

INTERFACE BOARD

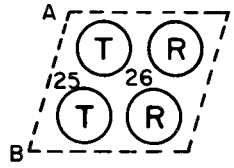


	S1	S2	S3	S4
1	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	OFF
3	ON	OFF	OFF	OFF
4	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF
6	OFF	OFF	OFF	OFF
7	ON	OFF	ON	OFF
8	OFF	OFF	OFF	OFF

Figure D-19. Line Printer Interface CCA Switch Settings

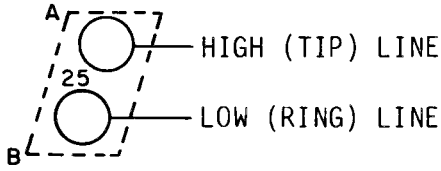


TELEPHONE LINE CONNECTIONS



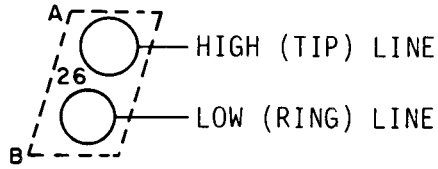
4-WIRE CONNECTION. FOR DATA TRANSMISSION, THE RM 201B MUST BE INSTALLED IN THE MODEM RACK AND 2-WIRE/4-WIRE SWITCH MUST BE IN THE 4-WIRE POSITION.

PAIR 25, TWO WIRE CONNECTION



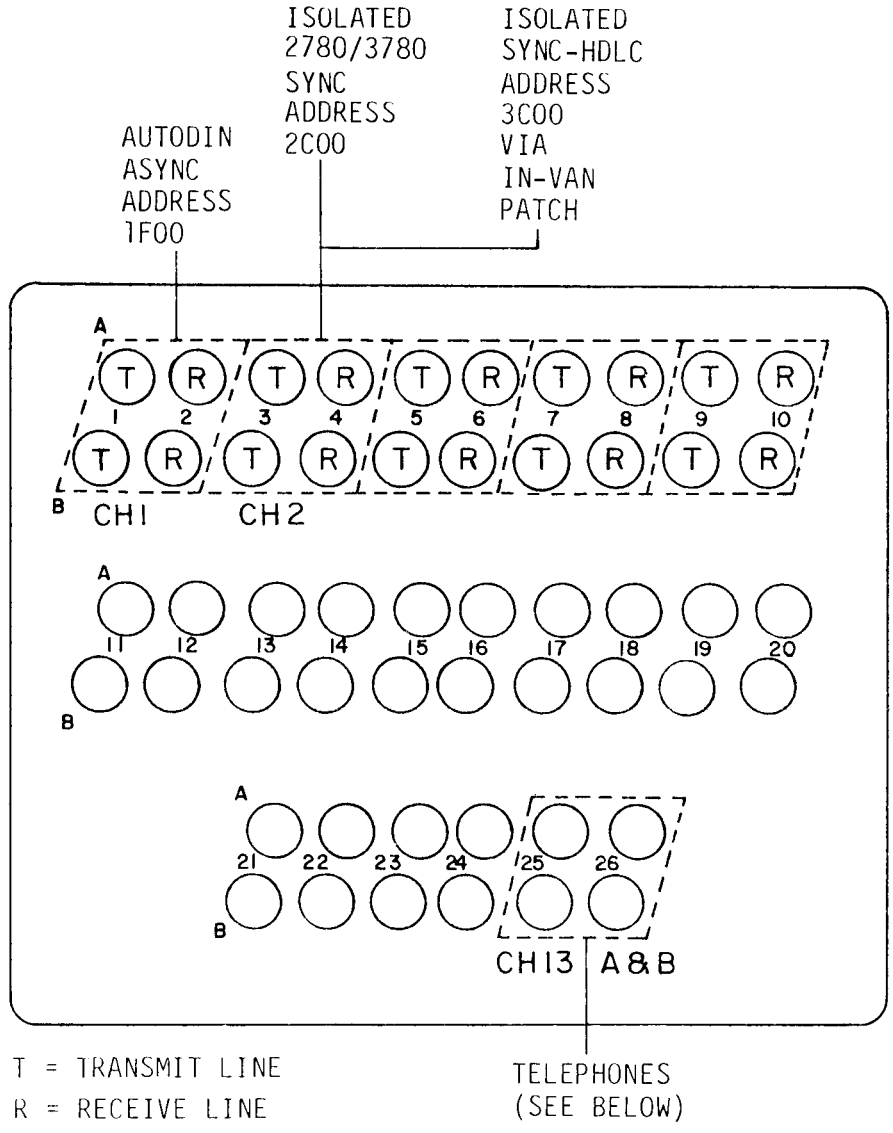
FOR SYNC HDLC CHANNEL, ADDRESS 0D00

PAIR 26, TWO WIRE CONNECTION

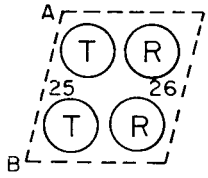


FOR ASYC CHANNEL, ADDRESS 0E00

Figure D-20. Signal Terminal Usage, Entrance Panel B



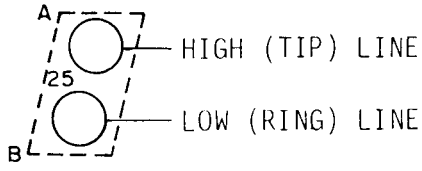
PAIR 25 AND 26 CONNECTIONS FOR DATA TRANSFER



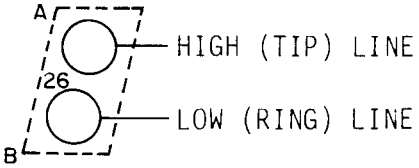
4-WIRE CONNECTION. THIS IS NOT AN AUTODIAL CIRCUIT. USED WITH 4-WIRE HANDSET FOR VOICE OR AS A DEDICATED 4-WIRE ASYNC DATA CHANNEL ON ADDRESS 3D80.

PAIR 25 AND 26 CONNECTIONS FOR VOICE CONNECTIONS

PAIR 25, TWO WIRE CONNECTION

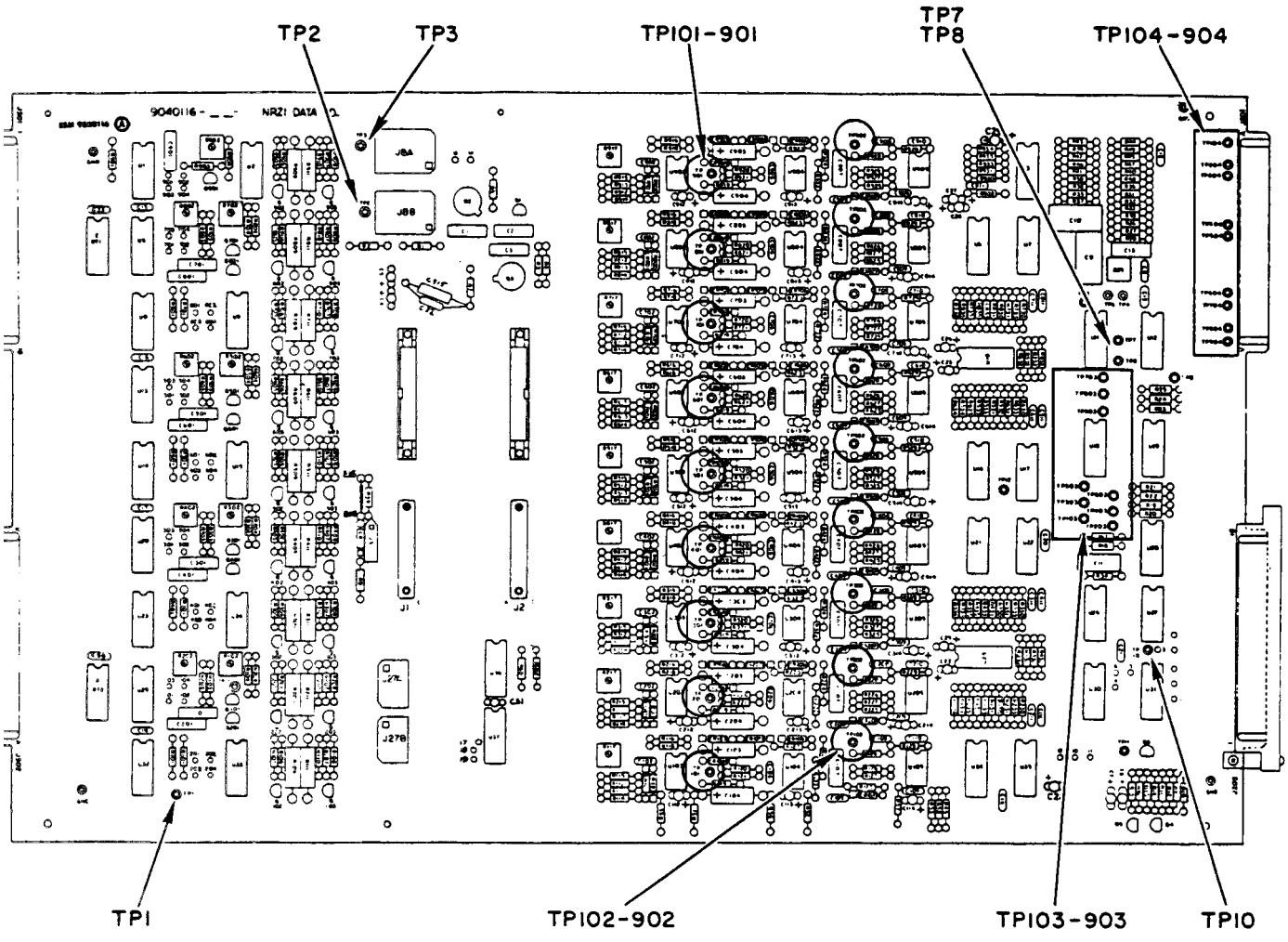


PAIR 26, TWO WIRE CONNECTION



2-WIRE/4-WIRE SWITCHES MUST BE SET TO 2-WIRE POSITIONS.

Figure D-21. Signal Terminal Usage, Entrance Panel A



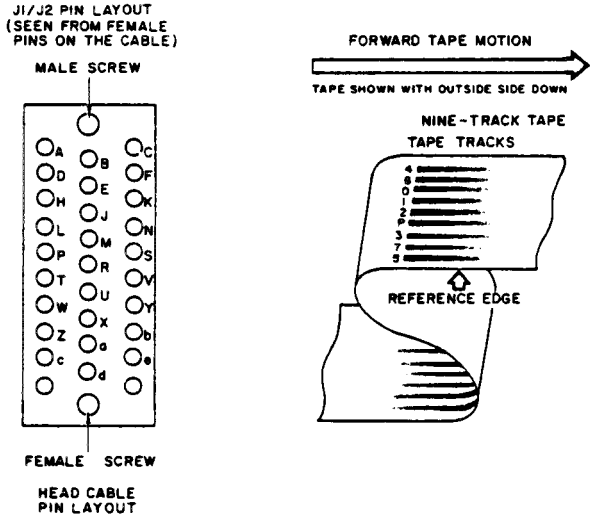
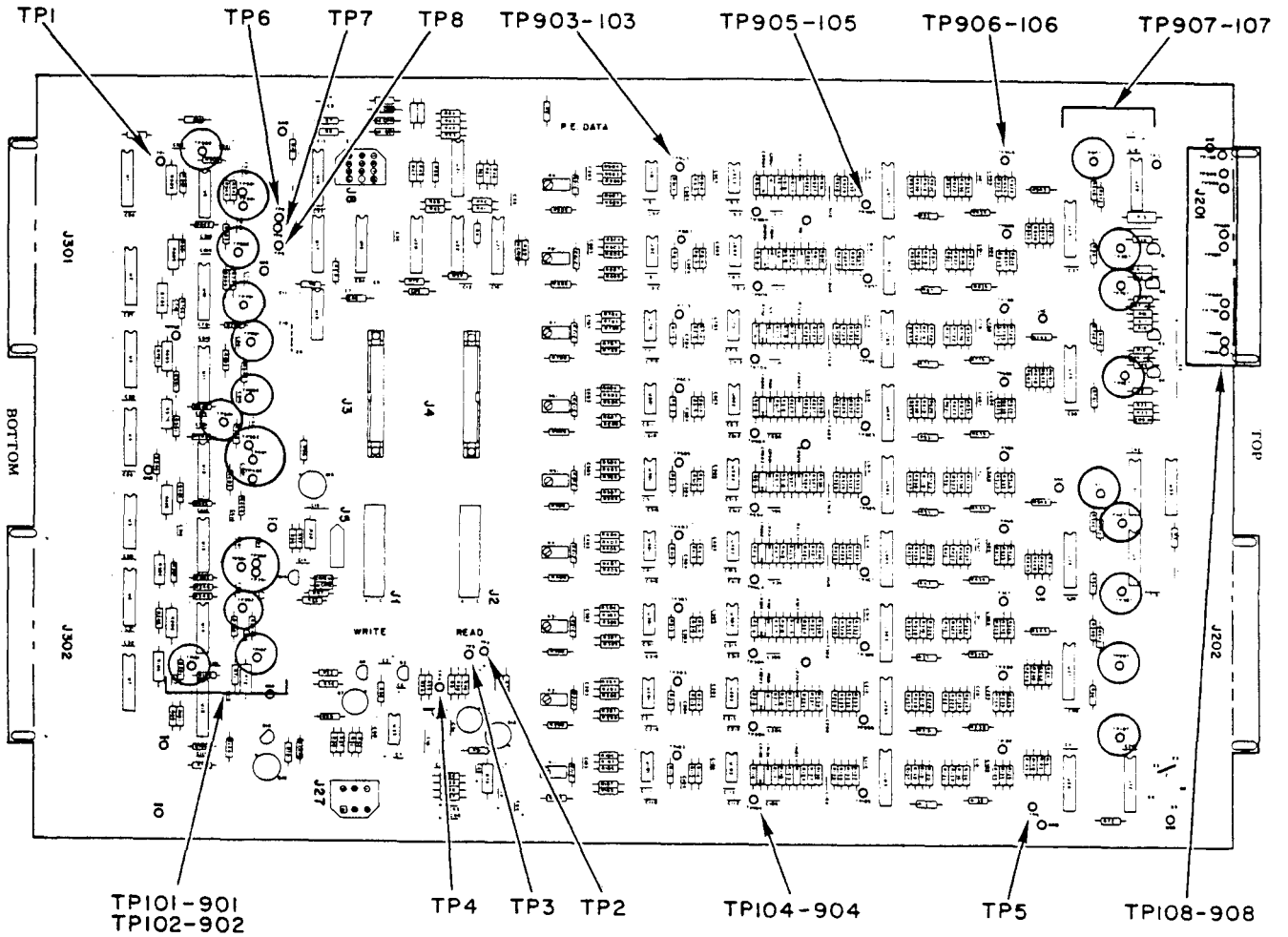


Figure D-22. Tape Drive NRZI Board Test Points and Pin Layout



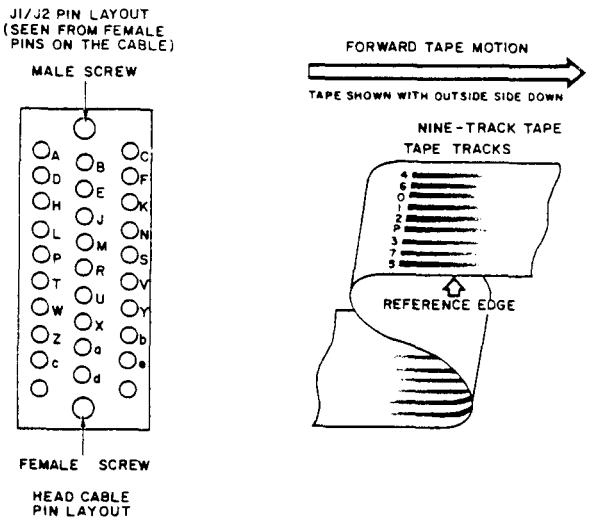


Figure D-23. Tape Drive PE Board Test Points and Pin Layout

Table D-3. NRZI Data Flow

INTERFACE DATA BITS	INPUT DATA INTERFACE CABLE CONNECTOR J302	WRITE DATA TO THE HEAD JACK J1 NRZI DATA BOARD	TRACKS ON TAPE 7	TRACKS ON TAPE 9	READ DATA FROM THE HEAD JACK J2 DATA BOARD	READ AMPLIFIER (SIGNAL SHOULD BE 10 VOLTS PP FOR AN ALL ONES TAPE SEE TM 11-7025-209-23)	RECTIFIED DATA (NOTE 1)	"NOT" SIDE OF THE READ REGISTER (NOTE 2)	INTERFACE TEST POINTS (NOTE 3)	OUTPUT DATA INTERFACE CABLE CONN. J202
PARITY	PIN L	PINS L/H	1	P	PINS H/L	TP101 PARITY	TP102	TP103	TP104	PIN 1
0 (MSB)	PIN M	PINS D/A	-	0	PINS A/D 9 TRACK ONLY	TP201	PP202	TP203	TP204	PIN 3
1	PIN N	PINS C/F	-	1	PINS F/C 9 TRACK ONLY	TP301	TP302	TP303	TP304	PIN 4
2	PIN P	PINS K/N	2	2	PINS N/K	TP401	TP402	TP403	TP404	PIN 8
3	PIN R	PINS S/V	3	3	PINS V/S	TP501	TP502	TP503	TP504	PIN 9
4	PIN S	PINS Y/b	4	4	PINS b/Y	TY601	TP602	TP603	TP604	PIN 14
5	PIN T	PINS e/h	5	5	PINS h/e	TP701	TP702	TP703	TP704	PIN 15
6	PIN U	PINS f/c	6	6	PINS c/f	TP801	TP802	TP803	TY804	PIN 17
7 (LSB)	PIN 7	PINS W/Z	7	7	PINS Z/W	T0901	TP902	TP903	TP904	PIN 18
WRITE STROBE	PIN A	TP1	ERASE CURRENT TO HEAD TP2		PINS P/T		READ STROBE REQUIRES DRIVE SELECTED AND ON LINE TP8 & TP7		TP10	PIN 2
LRC STROBE	PIN C	TP3								

NOTE 1:
IF BAD HERE, CHECK THE THRESHOLD SETTINGS PER TM 11-7025-209-23.
RAW = 2 VOLTS
NORMAL READ = 1.3 VOLTS
READ LOW
THRESHOLD (IRTH2) = 0.7 VOLTS

NOTE 2:
IF BAD HERE, CHECK READ STROBE ADJUSTMENT (TM 11-7025-209-23).

NOTE 3:
CHECK READ STROBE IF BAD HERE. IF TP8 OR TP7 ARE NOT AT GROUND, THE CONTROL BOARD OR ADAPTER MAY BE DEFECTIVE. CHECK THE INTERFACE (TM 11-7025-209-23).

Table D-4. PE Data Flow

INTERFACE DATA BITS	INPUT DATA INTERFACE CABLE CONNECTOR J302	WRITE DATA VOLTAGES (NOTE 1)	WRITE HEAD DATA JACK J1 PE DATA BOARD	TRACKS ON TAPE	READ HEAD DATA JACK J2 PE DATA BOARD	1ST AMPLIFIER 6.0 VOLTS PEAK TO PEAK SINE WAVES (NOTE 2)	2ND AMPLIFIER 6.0 VOLTS PEAK TO PEAK SINE WAVES (NOTE 2)	THRESHOLD DETECTOR GROUND WHEN DATA VALID (NOTE 3)	RECTIFIED DATA	INTERFACE READ DATA "AND" ENVELOPE DETECTOR (NOTE 4)	OUTPUT DATA INTERFACE CABLE CONNECTOR J202
PARITY	PIN L	TP101/TP102	PINS L/H	P	PINS H/L	TP103	TP104	TP105	TP107	TP108	PIN 1
0 (MSB)	PIN M	TP201/TP202	PINS D/A	0	PINS A/D	TP203	TP204	TP205	TP207	TP208	PIN 3
1	PIN N	TP301/TP302	PINS C/F	1	PINS F/C	TP303	TP304	TP305	TP307	TP308	PIN 4
2	PIN P	TP401/TP402	PINS K/N	2	PINS N/K	TP403	TP404	TP405	TP407	TP408	PIN 8
3	PIN R	TP501/TP502	PINS S/V	3	PINS V/S	TP503	TP504	TP505	TP507	TP508	PIN 9
4	PIN S	TP601/TP602	PINS Y/b	4	PINS b/Y	TP603	TP604	TP605	TP607	TP608	PIN 14
5	PIN T	TP701/TP702	PINS e/h	5	PINS h/e	TP703	TP704	TP705	TP707	TP708	PIN 15
6	PIN U	TP801/TP802	PINS f/e	6	PINS e/f	TP803	TP804	TP805	TP807	TP808	PIN 17
7	PIN 7	TP901/TP902	PINS W/Z	7	PINS Z/W	TP903	TP904	TP905	TP907	TP908	PIN 18

WRITE STROBE----------J302 PIN A----TP1-----PULSES TO +5 VOLTS WHEN EACH DATA BYTE IS READY ON THE INTERFACE LINES.

WRITE POWER SWITCH----------TP2-----ALLOWS THE WRITE CIRCUITS WHEN DEVICE AND PE DATA BOARD ARE SELECTED. NEEDS TP3 HIGH (SHOULD BE +5 VOLTS WHEN WRITING).

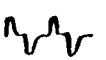
WRITE ALLOW----------TP3-----COMES FROM THE CONTROL BOARD (J8, PIN 1) TO SPECIFY THAT THE DEVICE IS POWERED-UP, TAPE TENSIONED, AND THE PERMIT RING IS INSTALLED. (SHOULD BE +5 VOLTS IF WRITING IS PERMITTED).

THRESHOLD VOLTAGE----------TP4----------WRITE EQUALS≈ 2.3 VOLTS (VOLTAGE WILL BE≈ 2.3 VOLTS WHEN WRITING AND GO TO 1.5 VOLTS BETWEEN RECORDS).

READ EQUALS 2.1 VOLTS.
READ LOW THRESHOLD EQUALS 0.7 VOLTS (CAN BE FORCED BY DOING A READ OPERATION AND GROUNDING PIN F OF CONNECTOR 302).

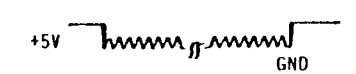
+5 VOLT DELAY----------TP10----------+5 VOLTS FROM THE CONTROL BOARD (IT IS DELAYED FOR A SHORT TIME AFTER POWER UP OF THE DEVICE TO INHIBIT NOISE ON THE DATA INTERFACE LINES). GENERATED ON THE PE DATA BOAD.

NOTE 1. THESE TEST POINTS SHOW THE VOLTAGES GOING TO THE WRITE HEAD. IF NONE OF THE SIGNALS ARE PRESENT, CHECK TP'S 1, 2, 3, and 10.

 = TPx01/TPx02

NOTE 2. SEE TM 11-7025-209-23 IF NOT THE PROPER AMPLITUDE FOR AN ALL 1's TAPE.

NOTE 3. SIGNAL GOES TO GROUND WHEN DATA IS VALID.



NOTE 4. THE DEVICE MUST BE SELECTED AND A MOTION COMMAND IN PROGRESS IN ORDER FOR DATA TO BE VALID ON THE OUTPUT.

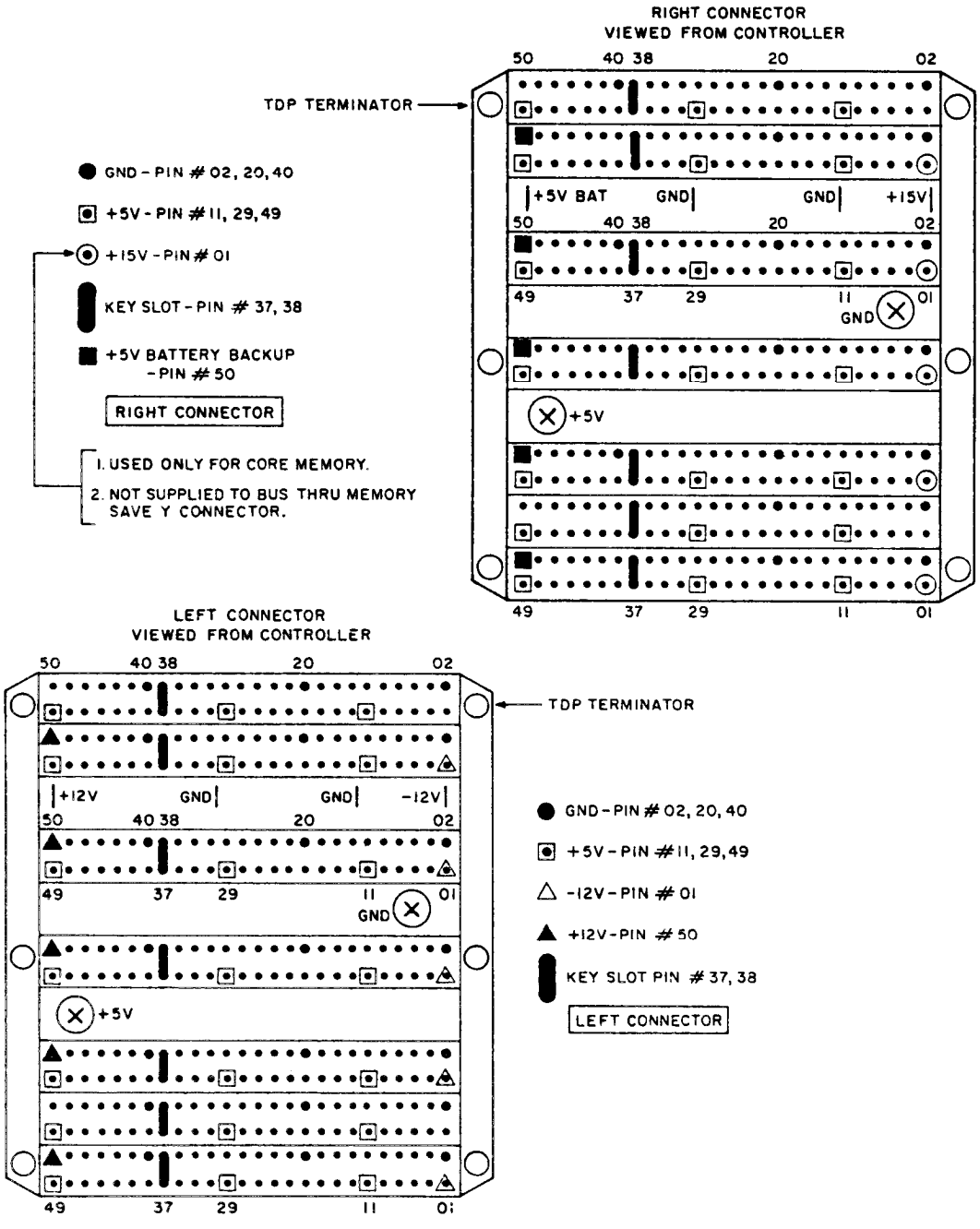


Figure D-24. CPU Backplane Connector Pins

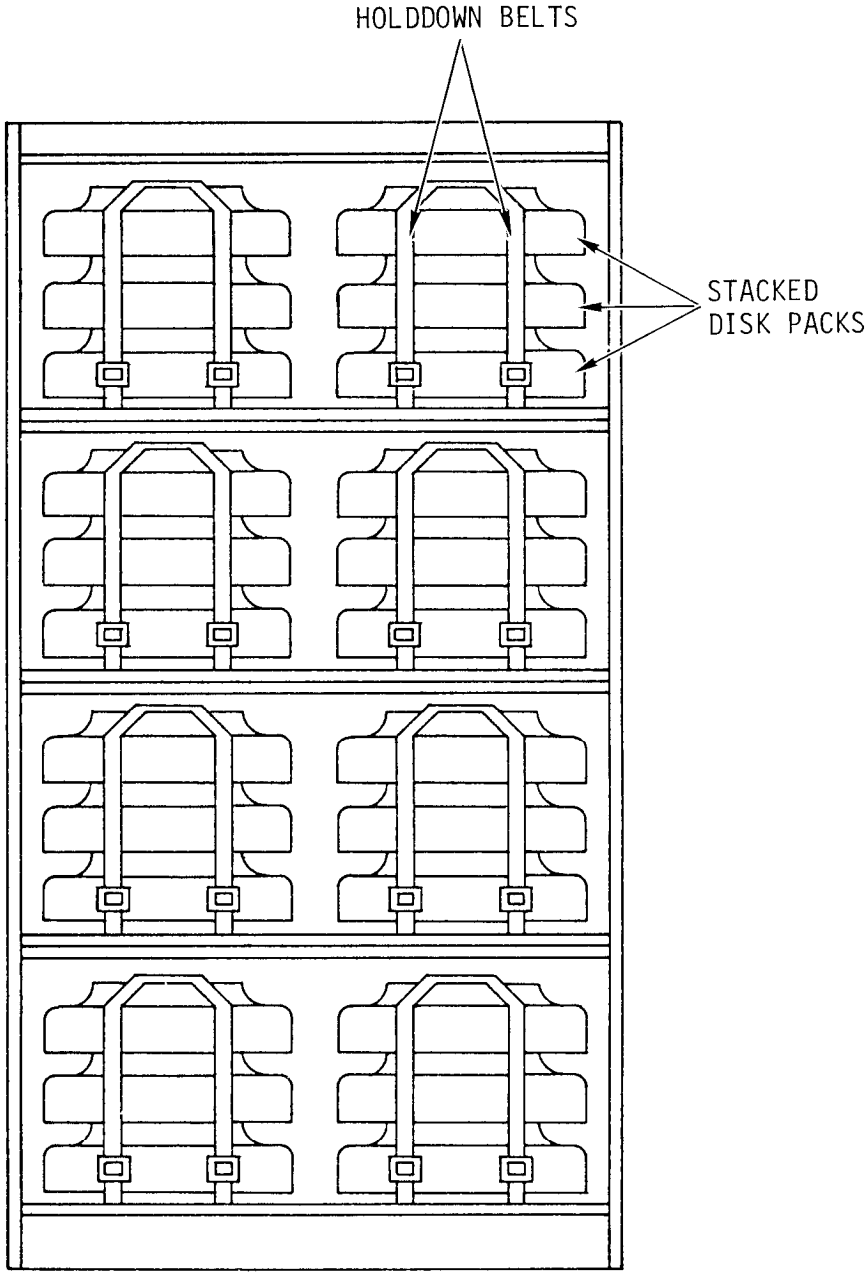


Figure D-25. Disk Storage Cabinet

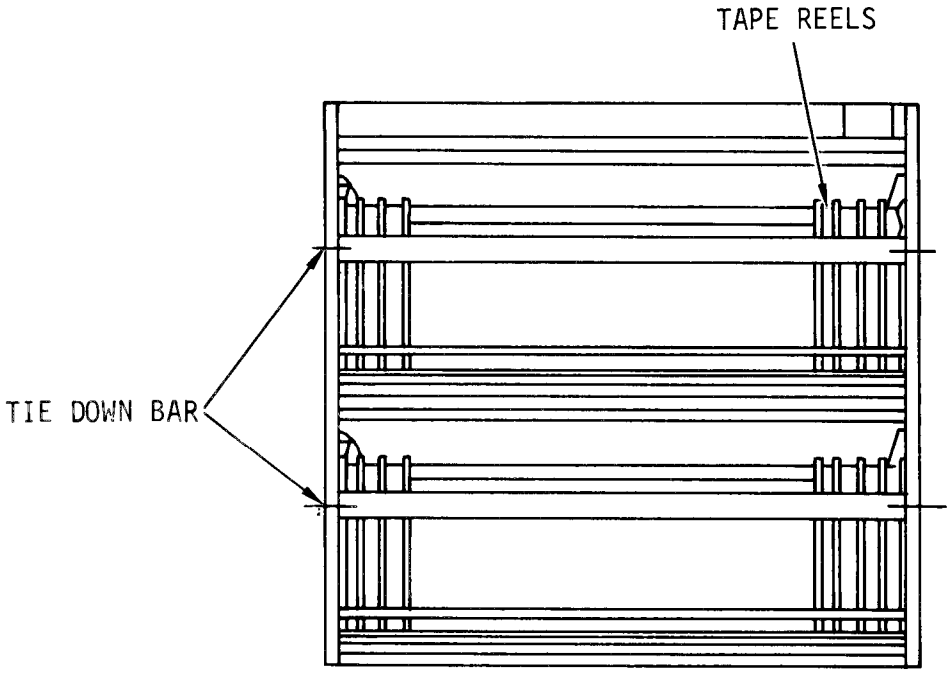


Figure D-26. Tape Storage Rack

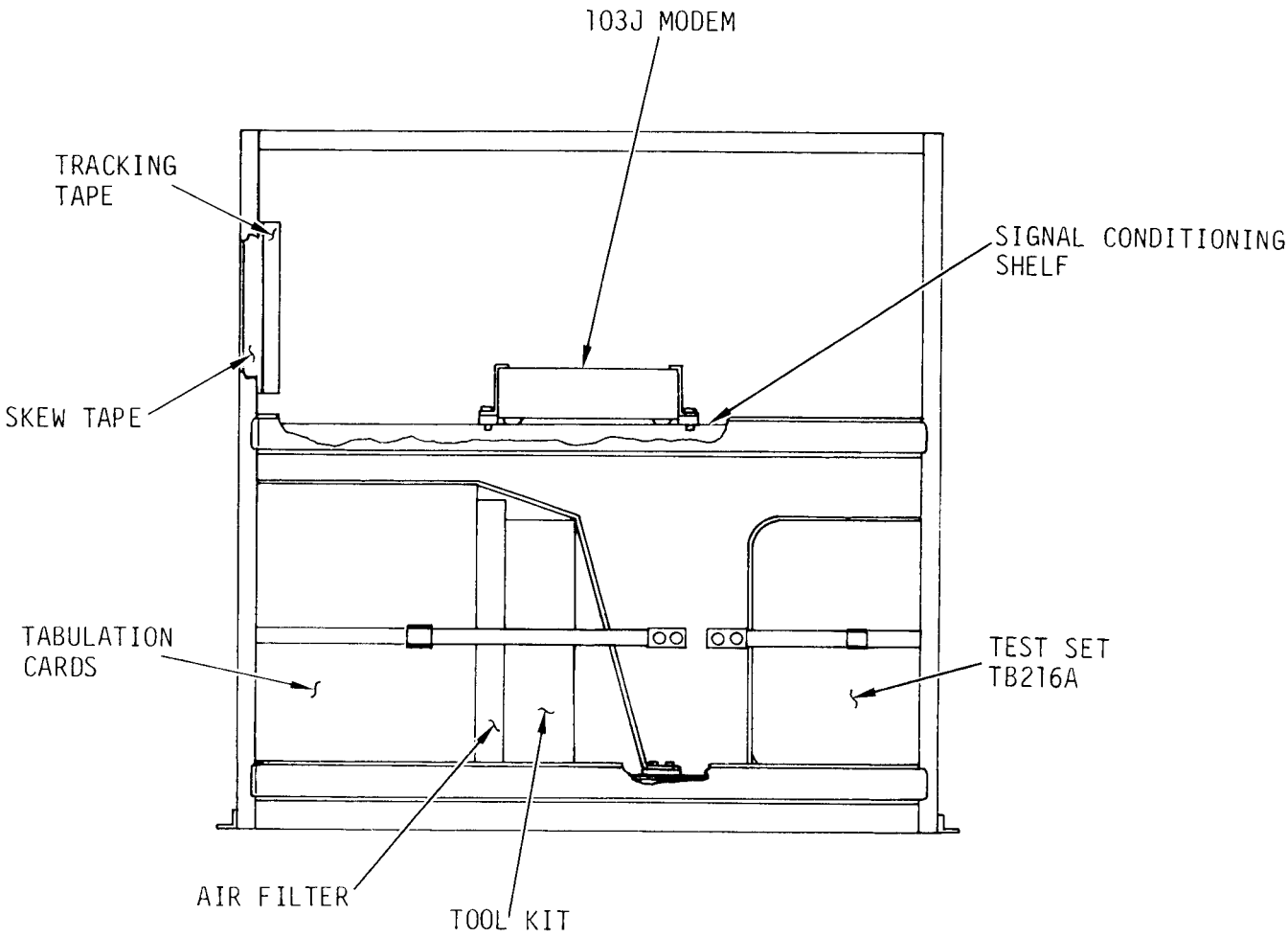


Figure D-27. Bulk Storage Rack

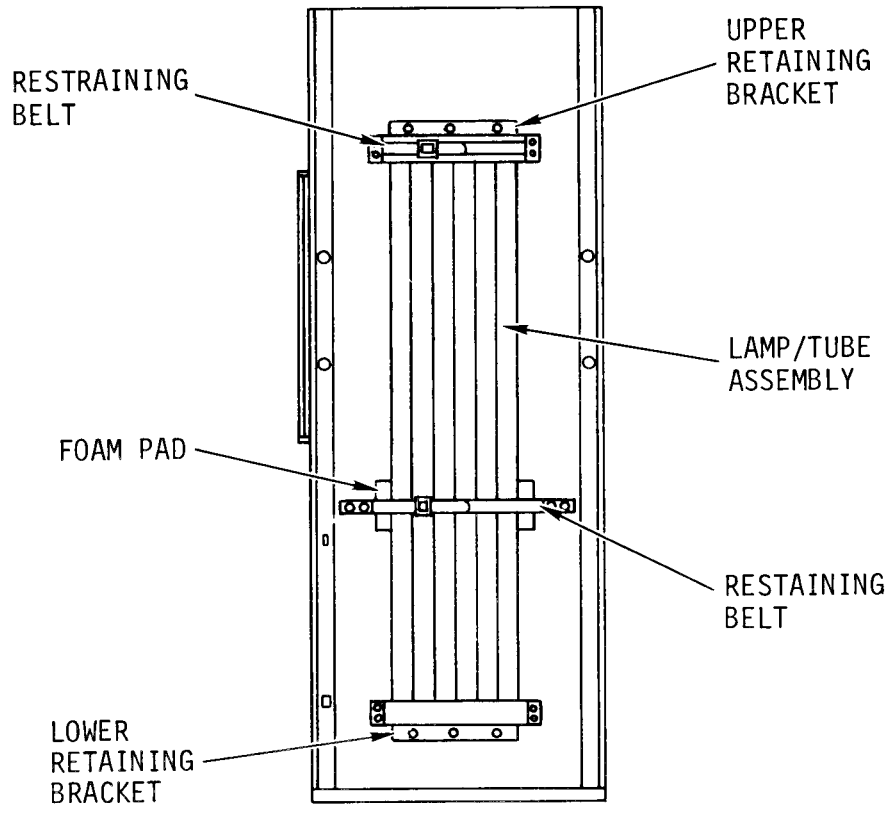


Figure D-28. Fluorescent Lamp Storage Rack

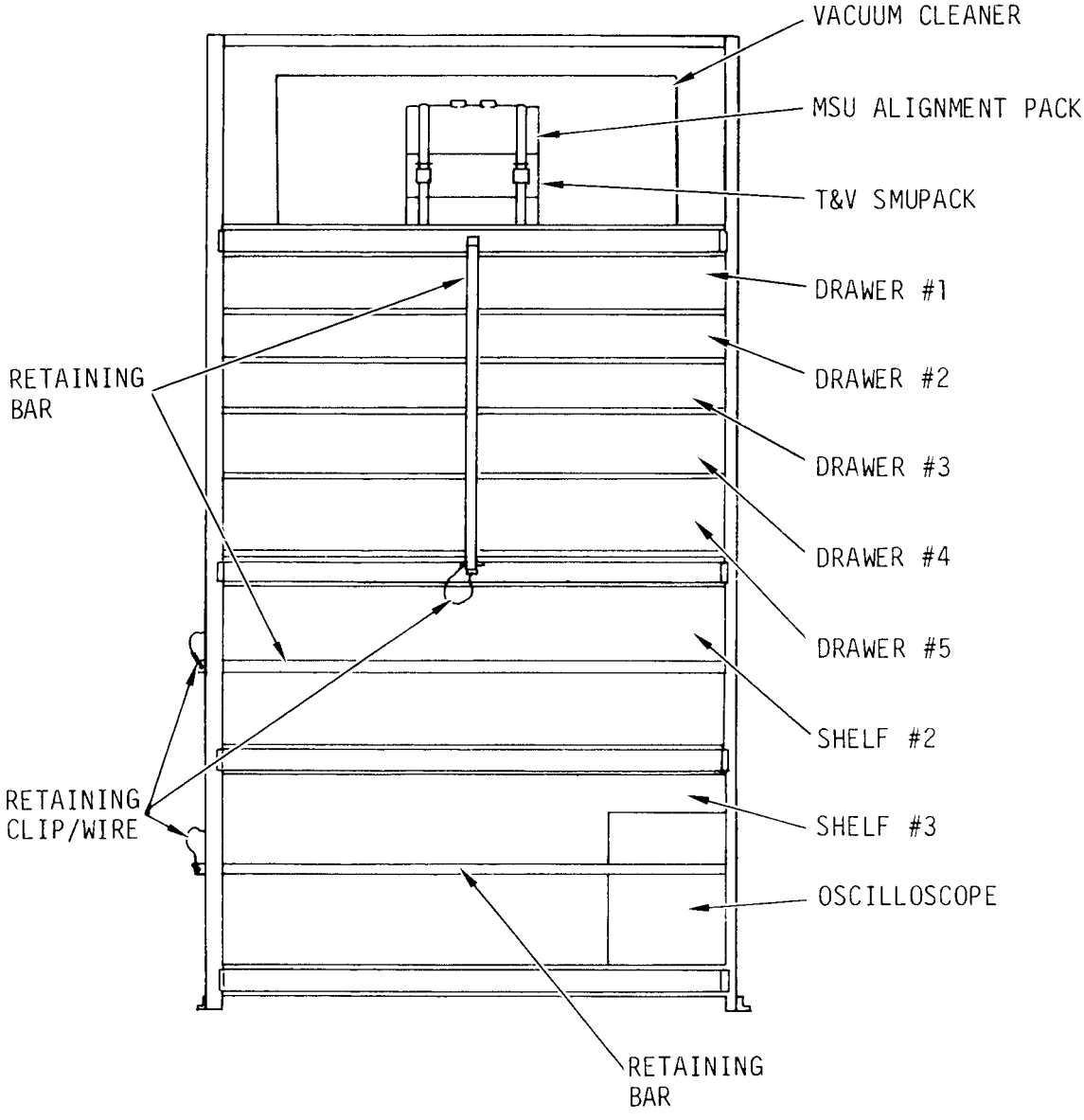


Figure D-29. Spare Parts and Tools Storage Rack

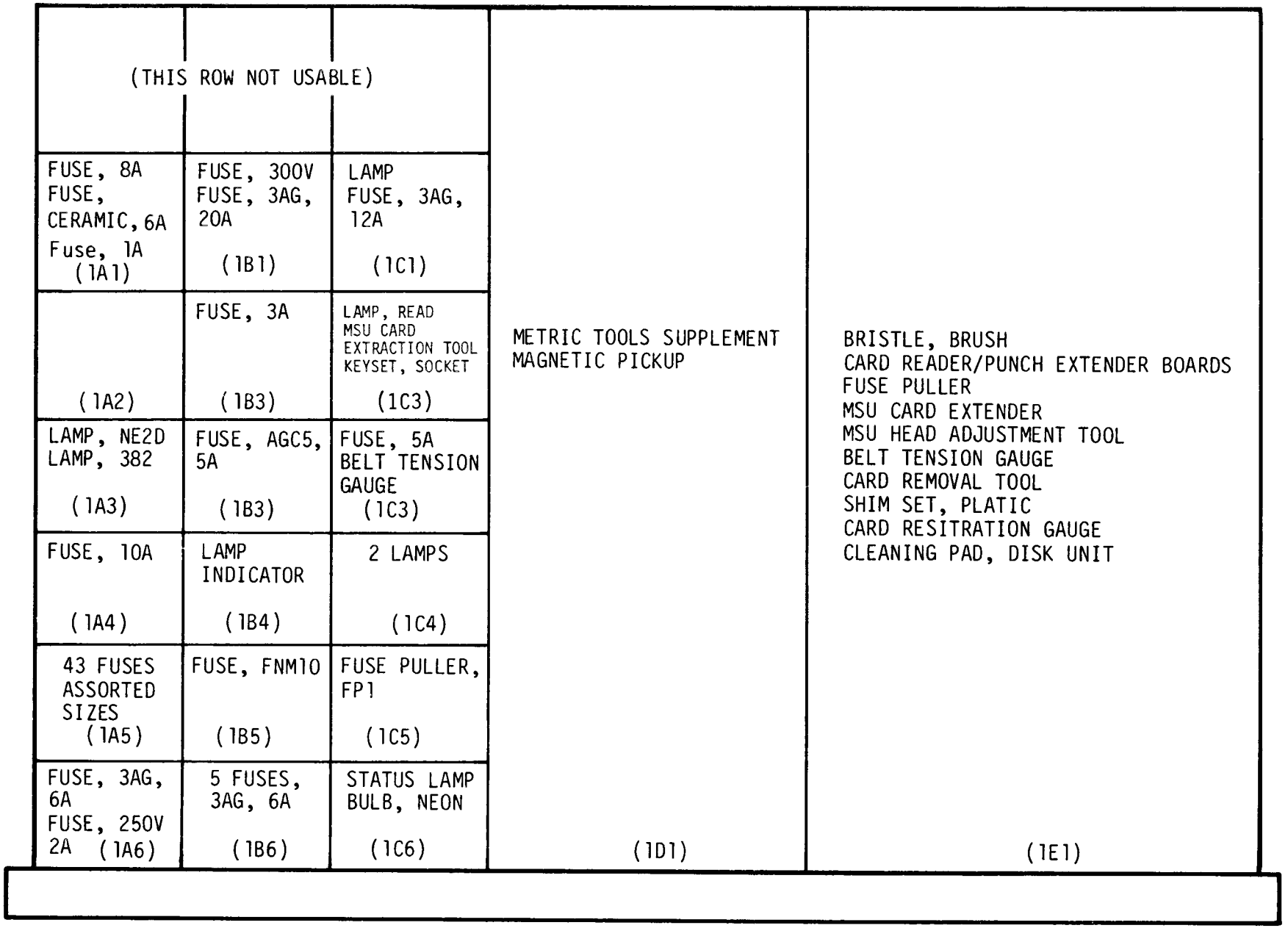


Figure D-30. Spare Parts/Tools Location, Drawer 1

BELT TIMING (2A1)	BLOWER MOTOR BELT (2B1)	(2C1)	BELT, TIMING (2D1)	BELT, 0-4000 FT, VACUUM ASSEMBLY TAPE DRIVE BLOWER MOTOR (2E1)	BELT, TIMING (2F1)
BELT, TIMING BELT, 132-TOOTH RIBBON DRIVE (2A2)	PRINTER, V-BELT (2B2)	BELT, TIMING (2C2)	BELT, FLAT, HORIZ. INPUT DRIVE (2D2)	BELT, COG, SECONDARY DRIVE INDEX (2E2)	125 TOOTH PULLER RUBBER RING (2F2)
BELT, O-RING (2A3)	BELT, IDLER CARD READER/ PUNCH BELT, FLAT, EJECT, CAPSTAN DRIVE (2B3)	BELT, COG VERT INPUT DRIVE (2C3)	BELT, 125 TOOTH (2D3)	BELT, DRIVE TAPE CLEANER O-RING (2E3)	BELT, COG, READ STATION TIMING (2F3)
BELT, 105 TOOTH (2A4)	BELT, FLAT, REGISTRATION DRIVE (2B4)	V-BELT, PUNCH DRIVE (2C4)	BELT, O-RING (2D4)	BELT, REEL MOTOR TAPE DRIVE (2E4)	BELT, DRIVE MOTOR TAPE CLEANER, O-RING (2F4)

Figure D-31. Spare Parts, Drawer 2

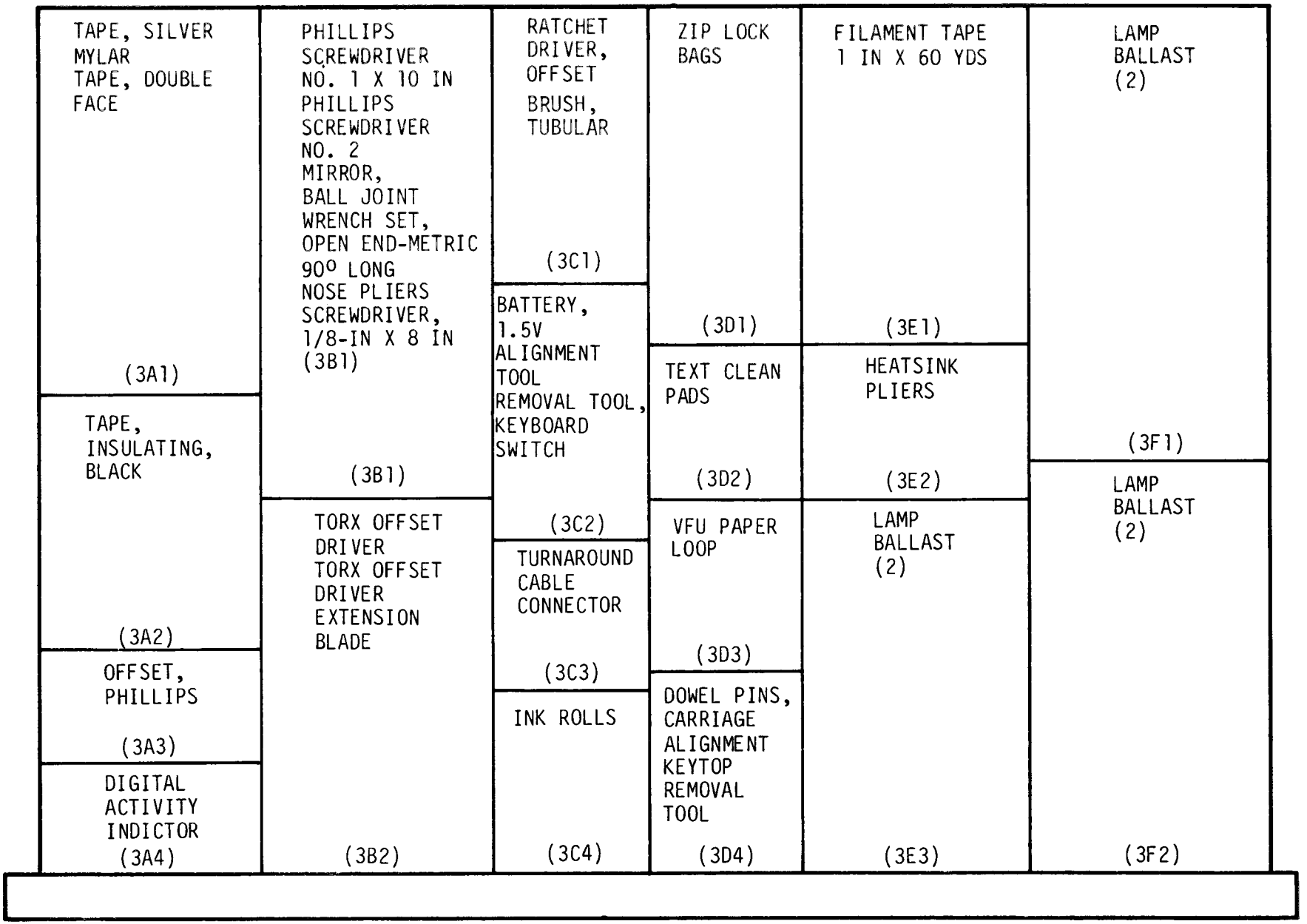


Figure D-32. Spare Parts/Tools Location, Drawer 3

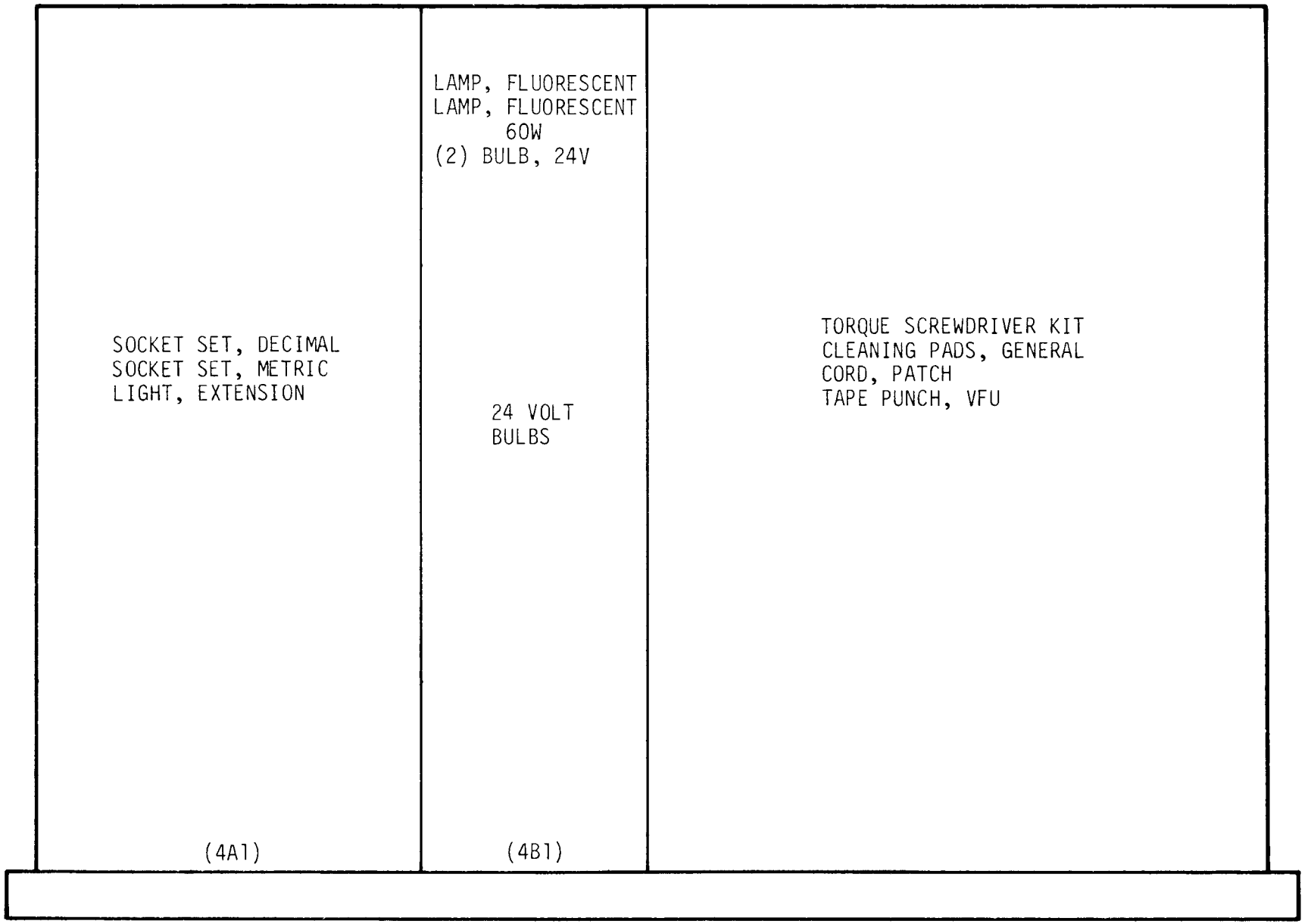


Figure D-33. Spare Parts/Tools Location, Drawer 4

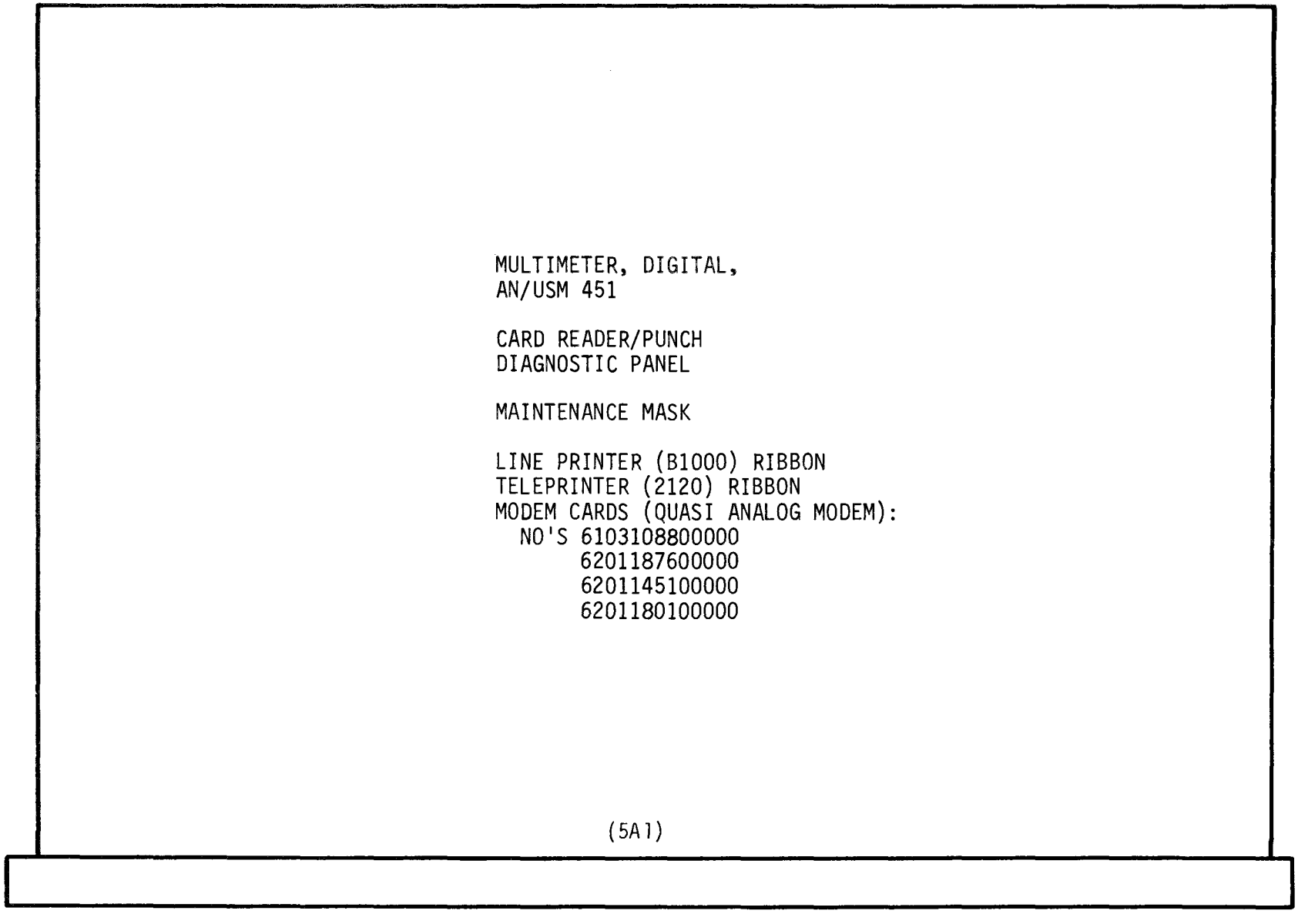


Figure D-34. Spare Parts/Tools Location, Drawer 5

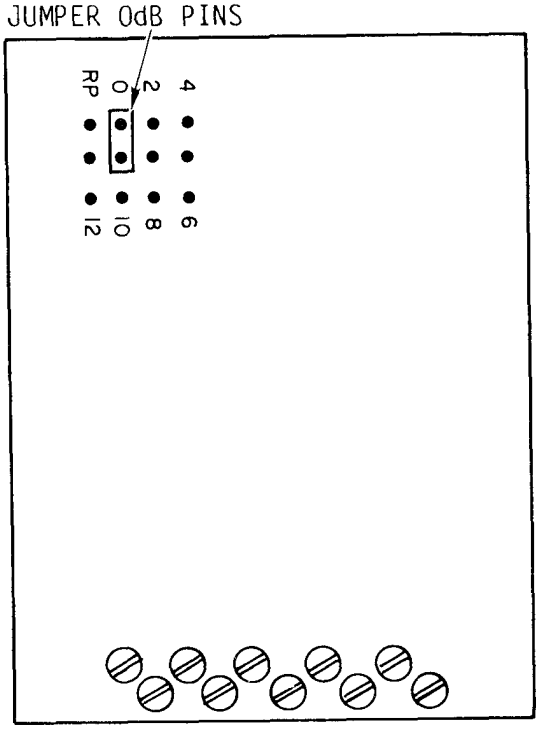


Figure D-35. Data Access Adapter (DAA) Jumper

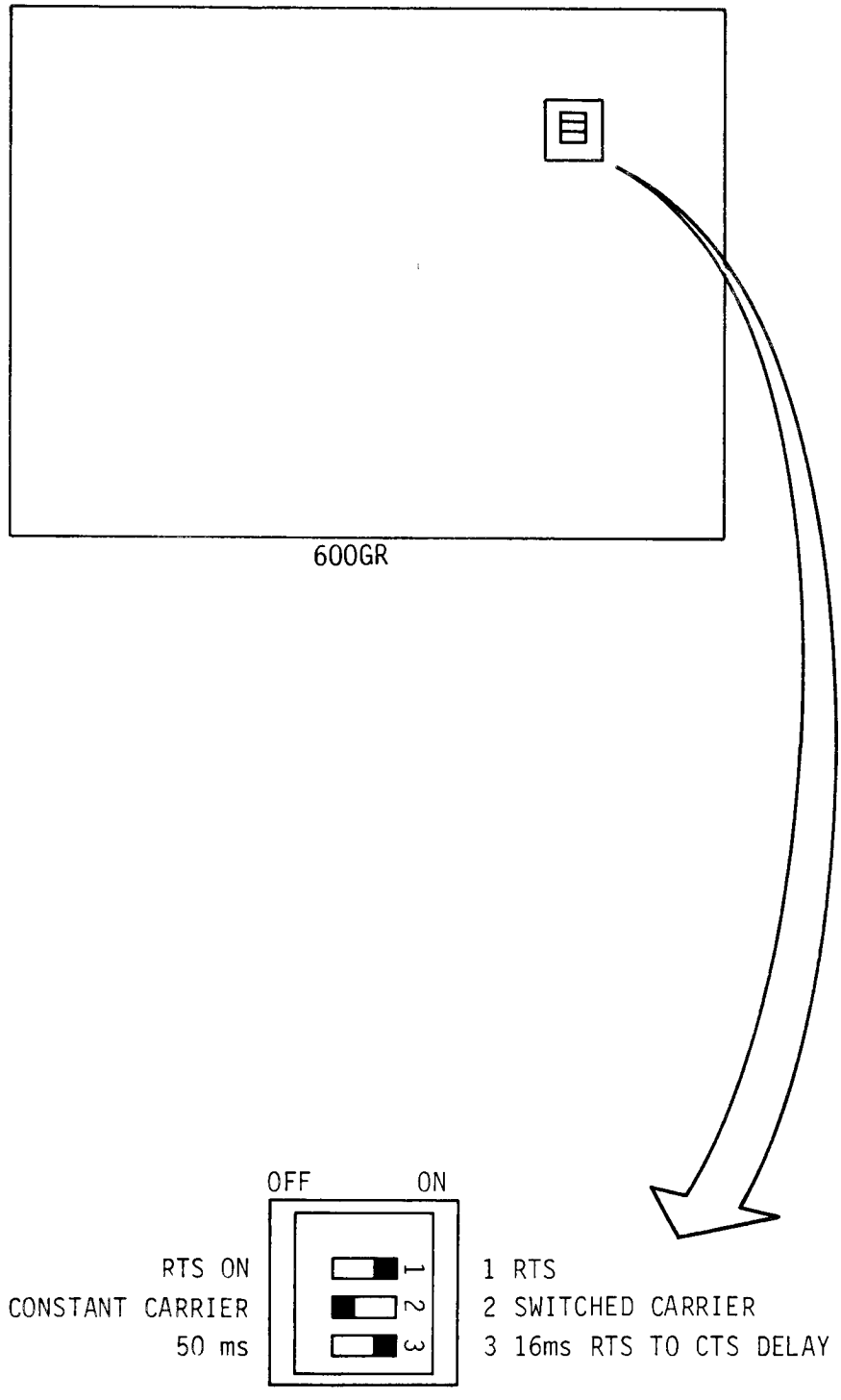


Figure D-36. 600GR Converter Switch Settings

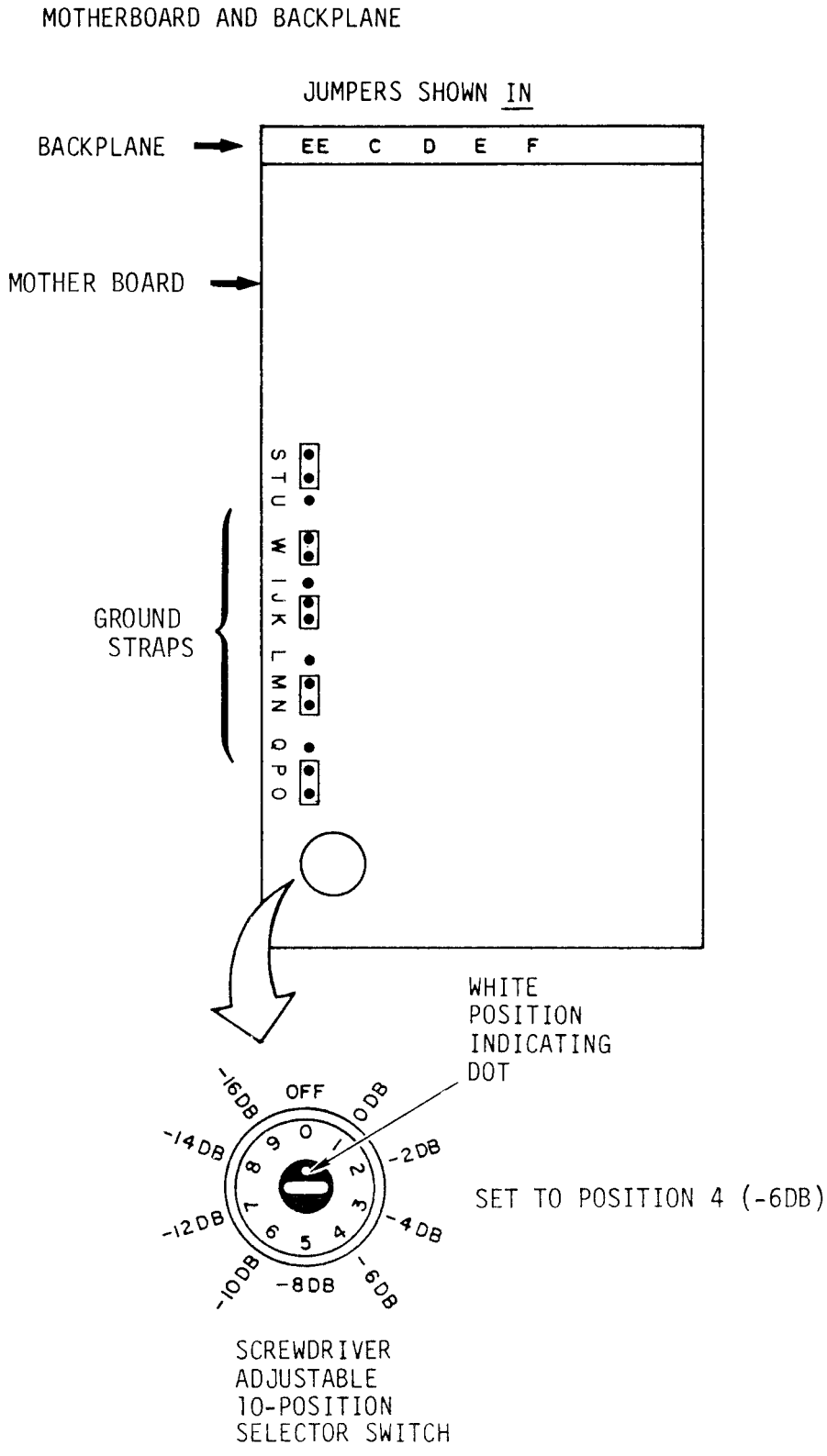
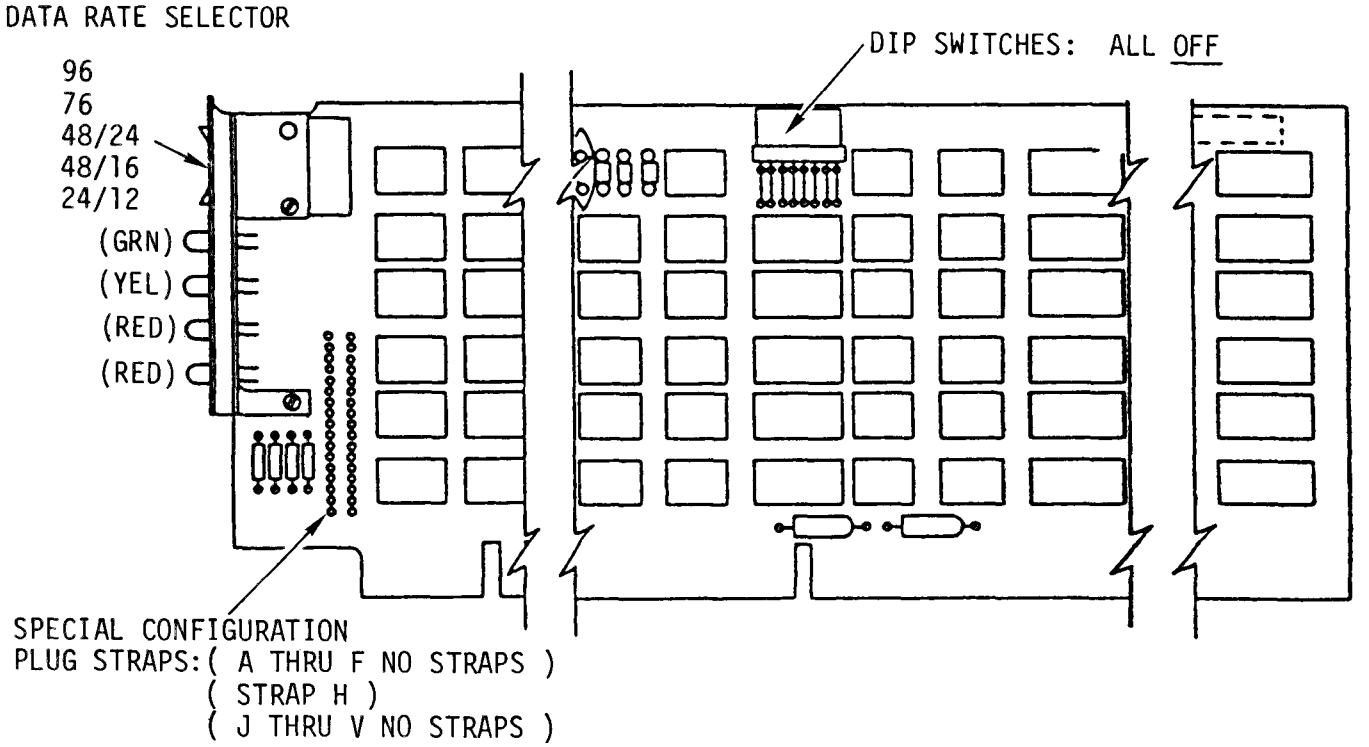


Figure D-37. V.29 Modem Switch Settings and Straps (1of3)

BOARD A8:

STRAP S-N-F SET TO N

BOARD A4, CONTROL :



BOARD A3, INTERFACE:

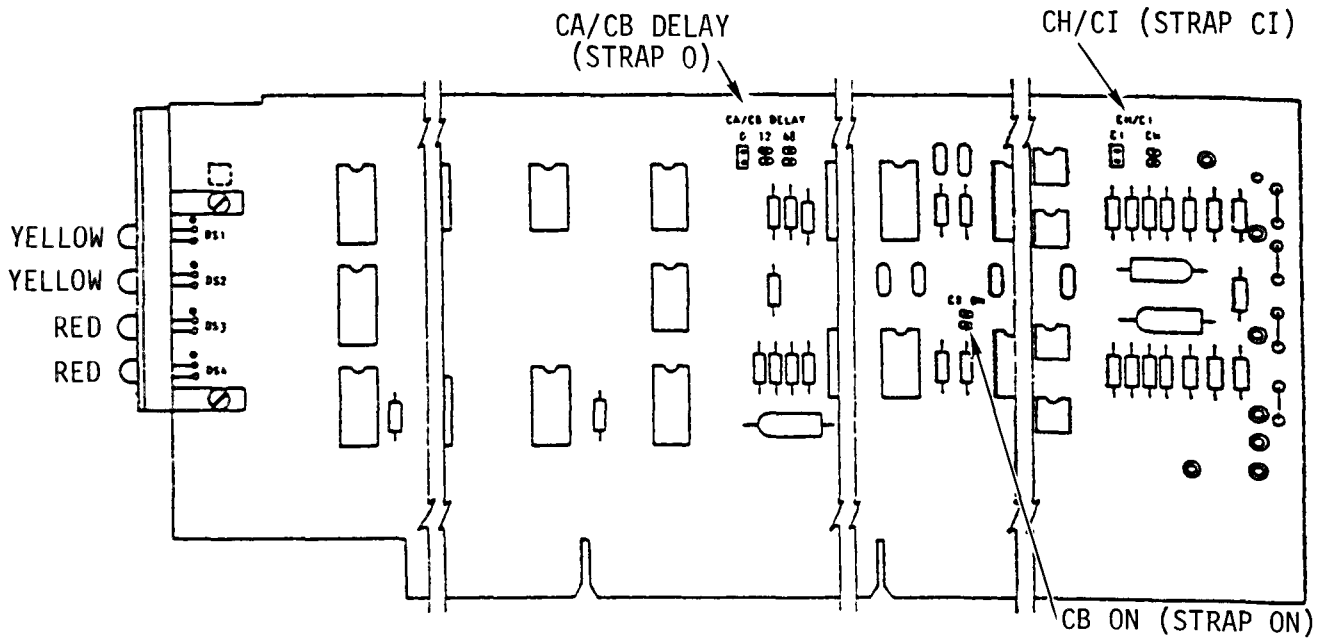
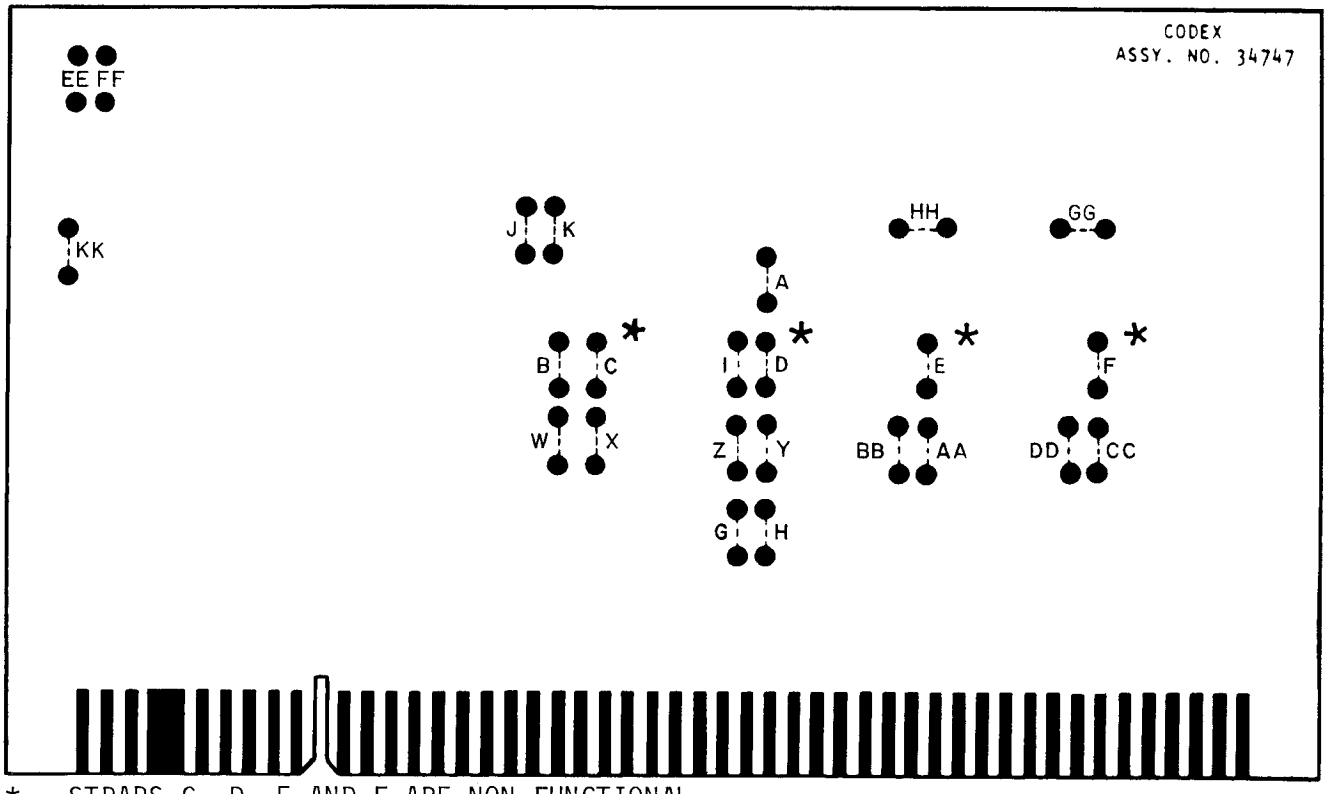


Figure D-37. V.29 Modem Switch Setting and Straps (2 of 3)



* - STRAPS C, D, E AND F ARE NON-FUNCTIONAL
AND ARE PROVIDED AS ADDITIONAL SPARES.

Figure D-37. V.29 Modem Switch Setting and Straps (3 of 3)

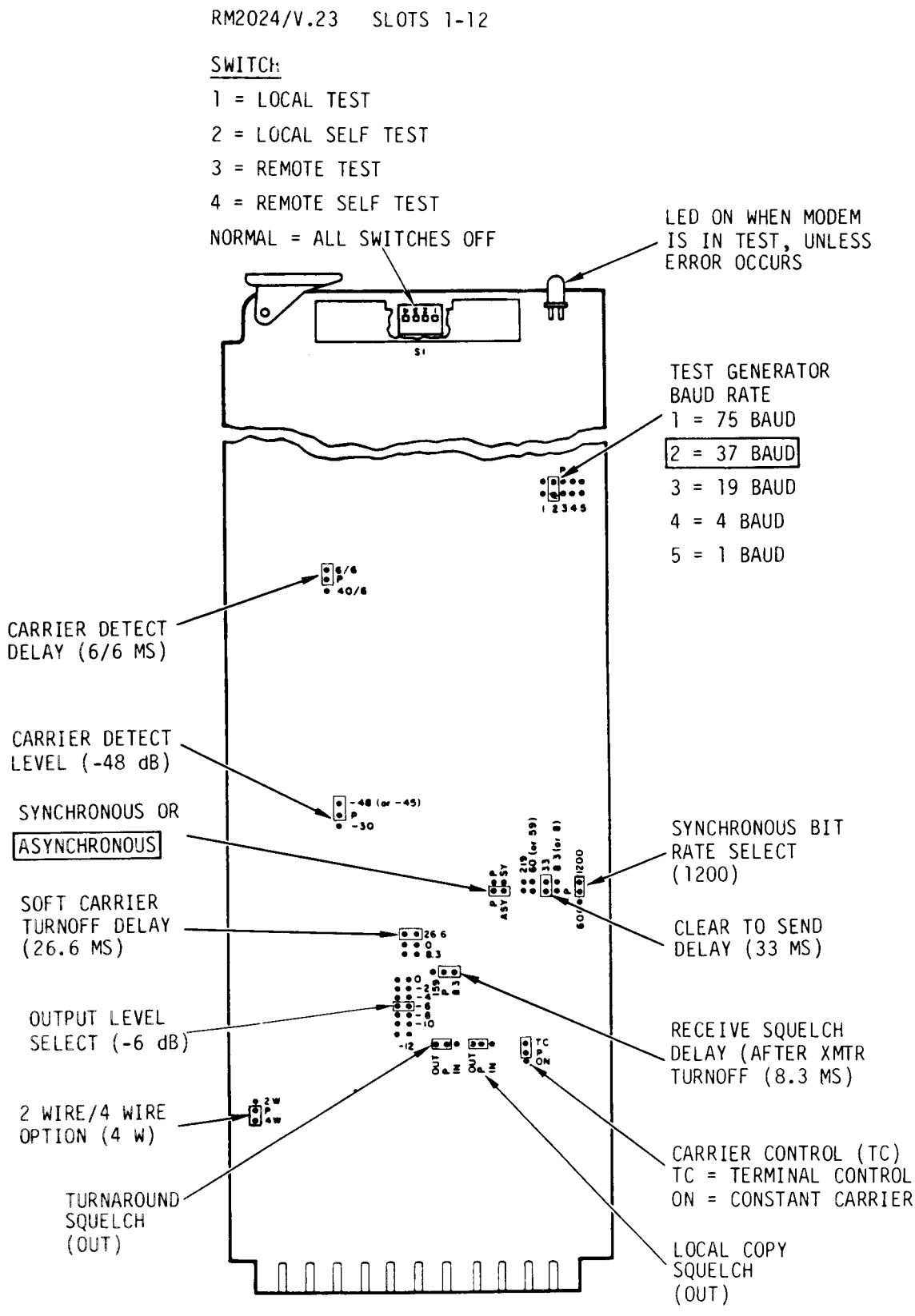


Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (1 of 7)

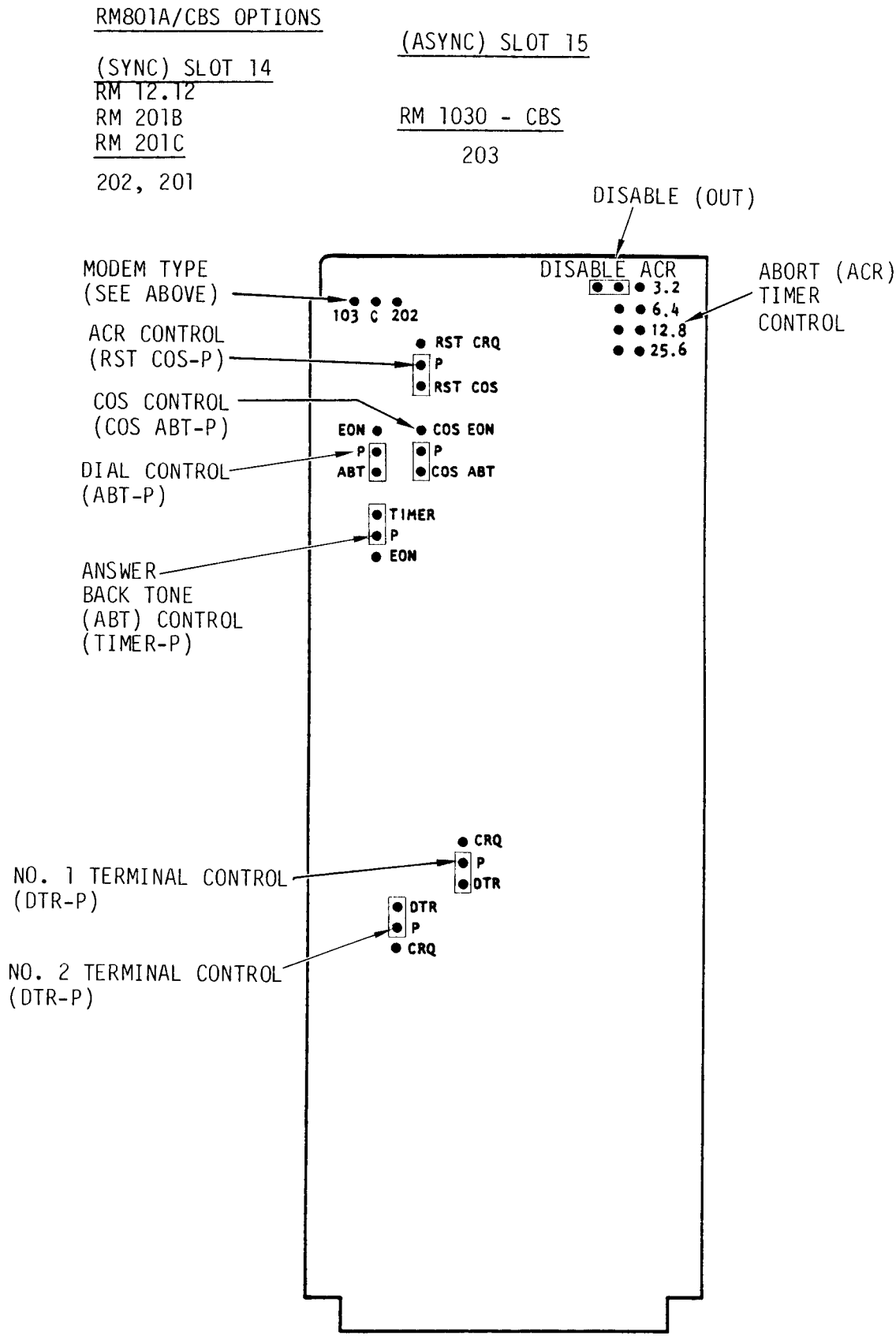


Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (2 of 7)

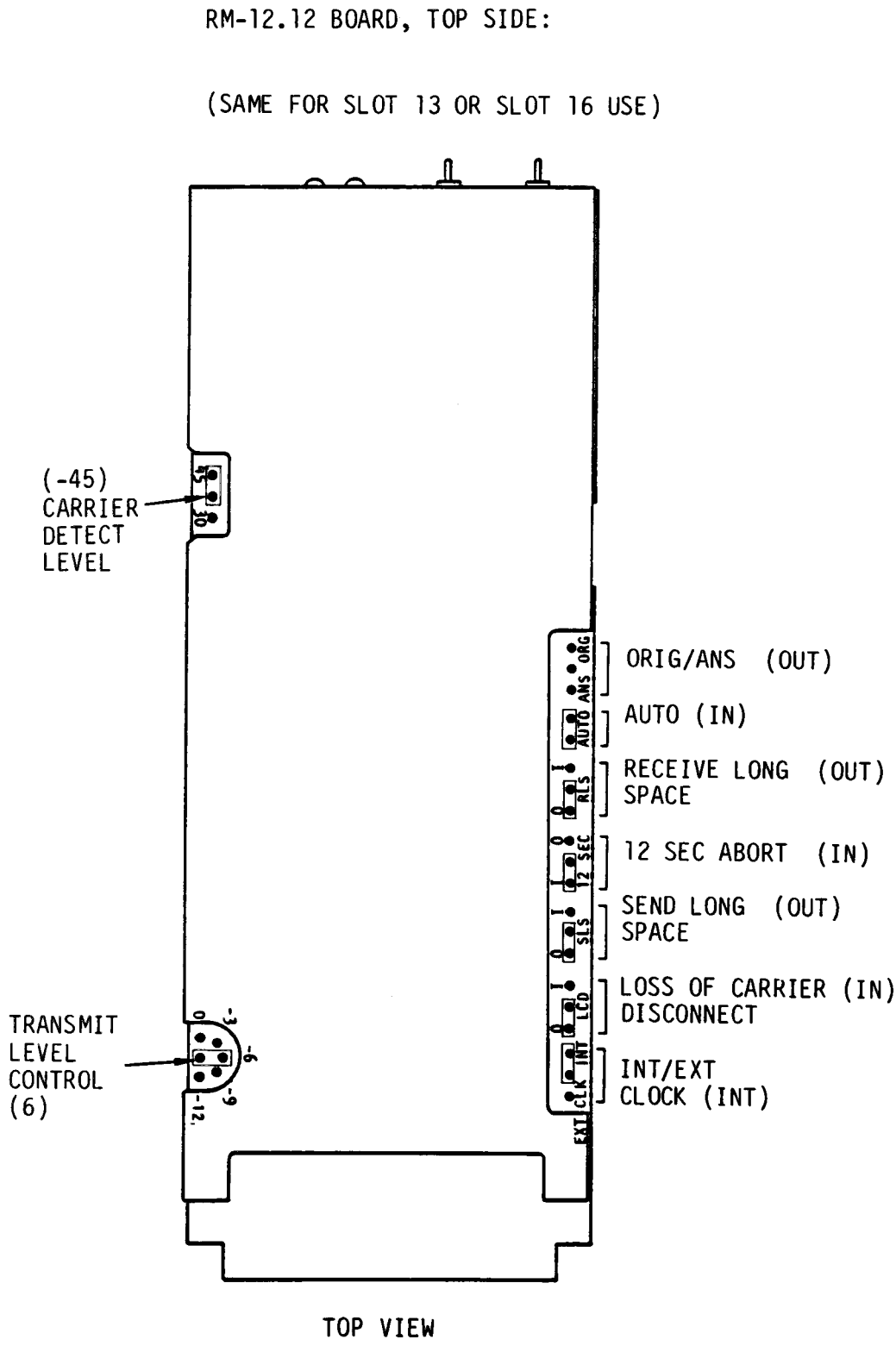
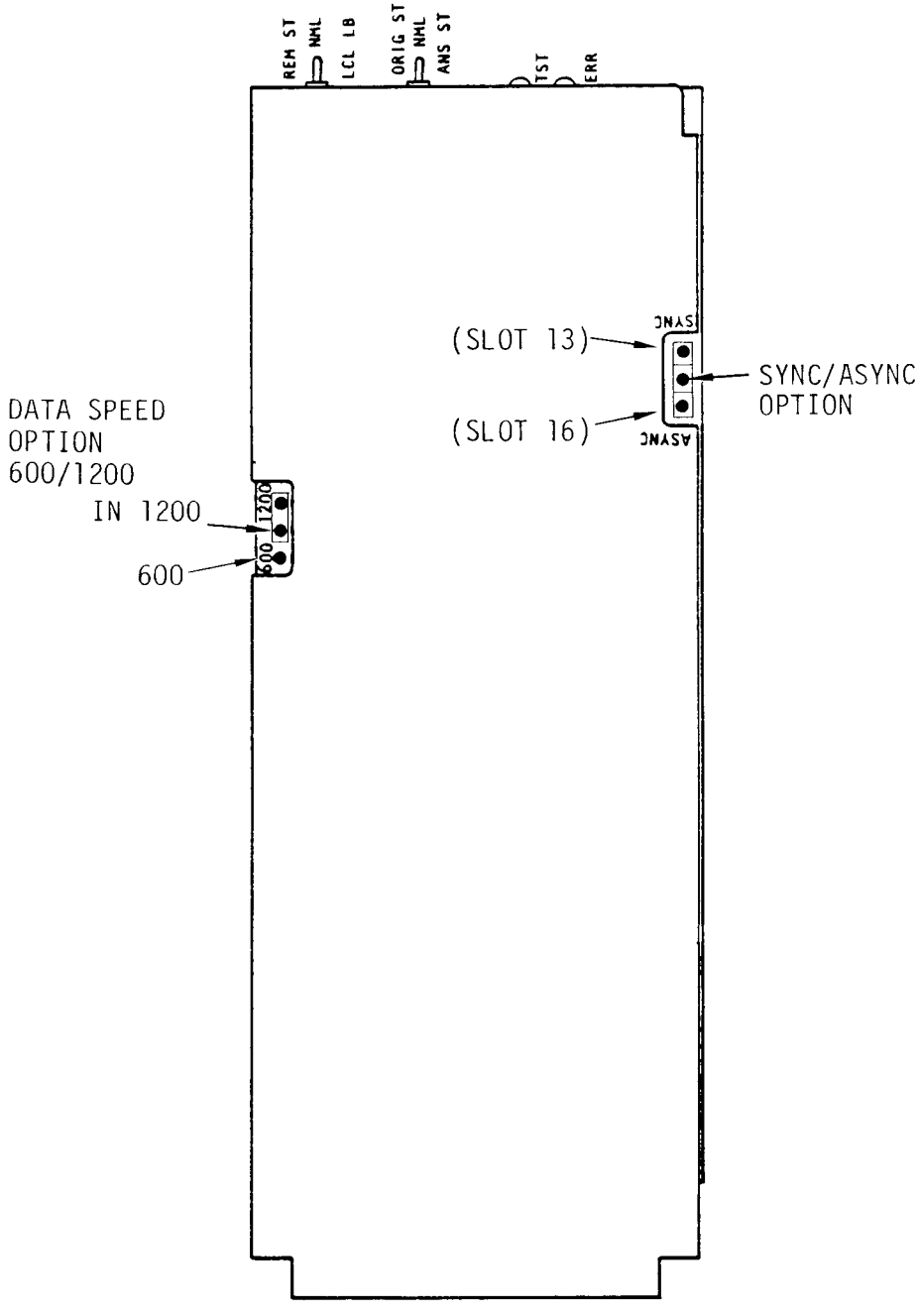


Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (3 of 7)

RM-12.12 BOARD, BOTTOM SIDE:



BOTTOM VIEW

Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (4 of 7)

RM-201C BOARD:
(USED IN SLOT 13)

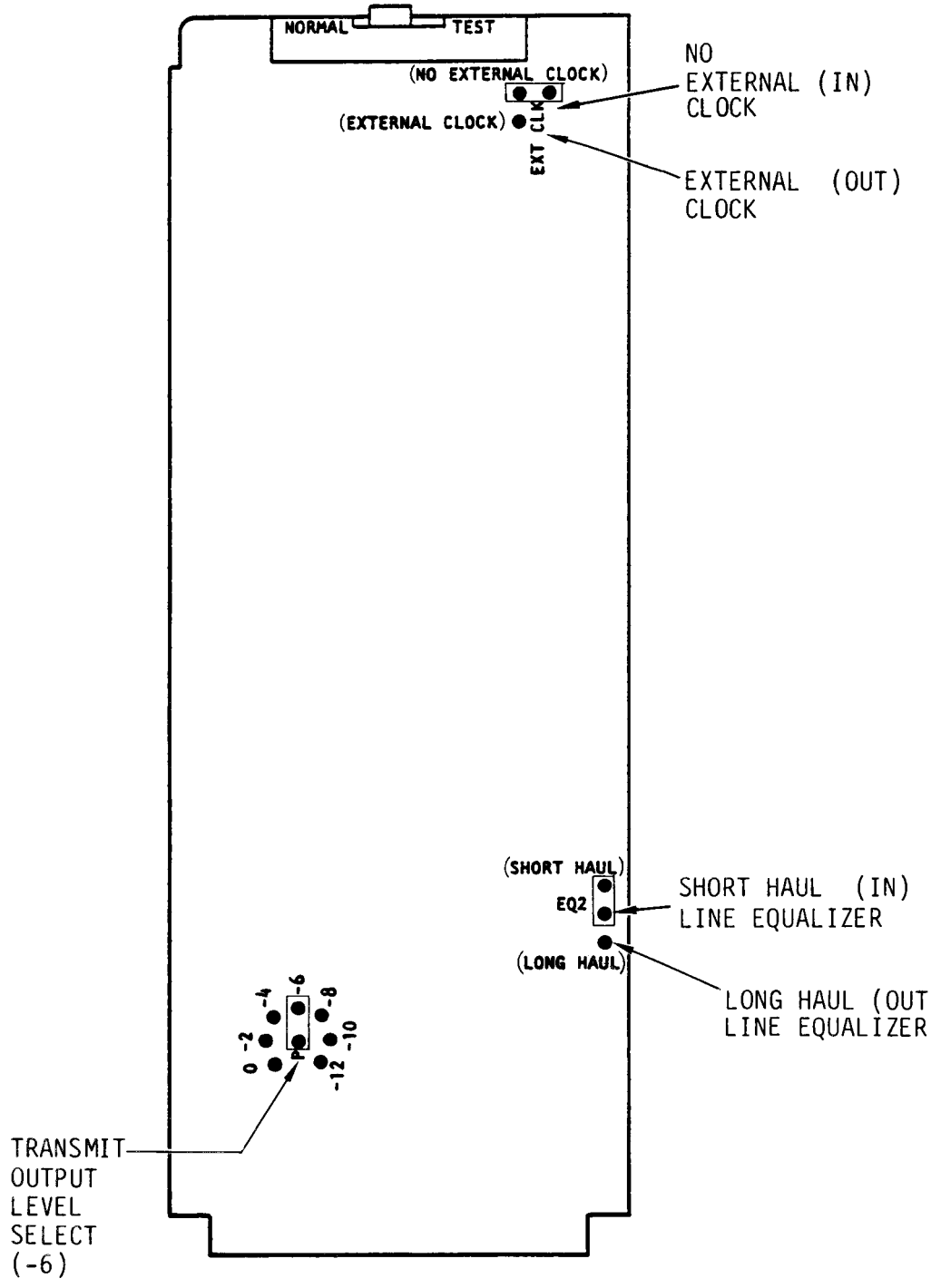


Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (5 of 7)

RM-1030 BOARD:
(103/113)

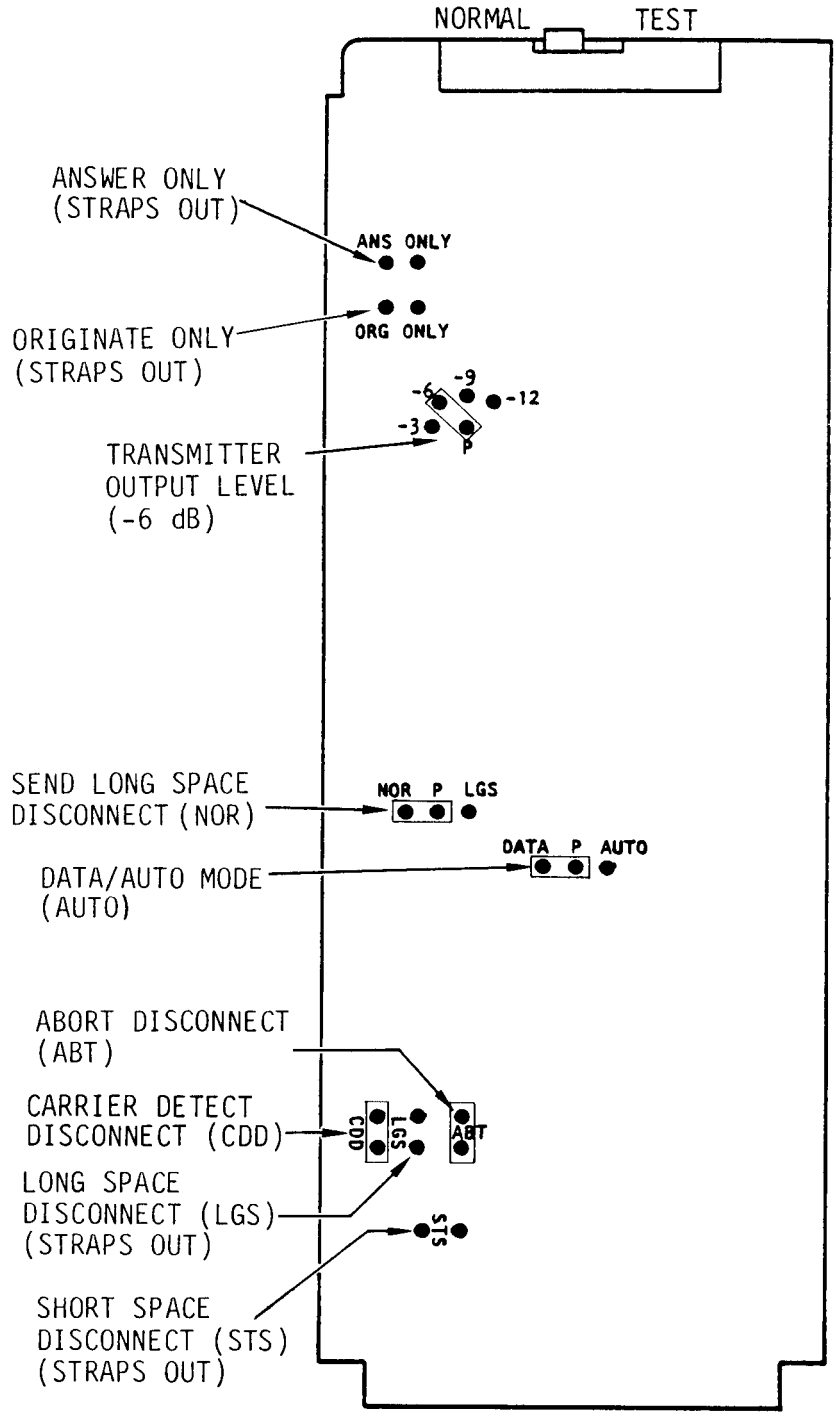


Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (6 of 7)

RM-201B BOARD:
(SLOT 13)

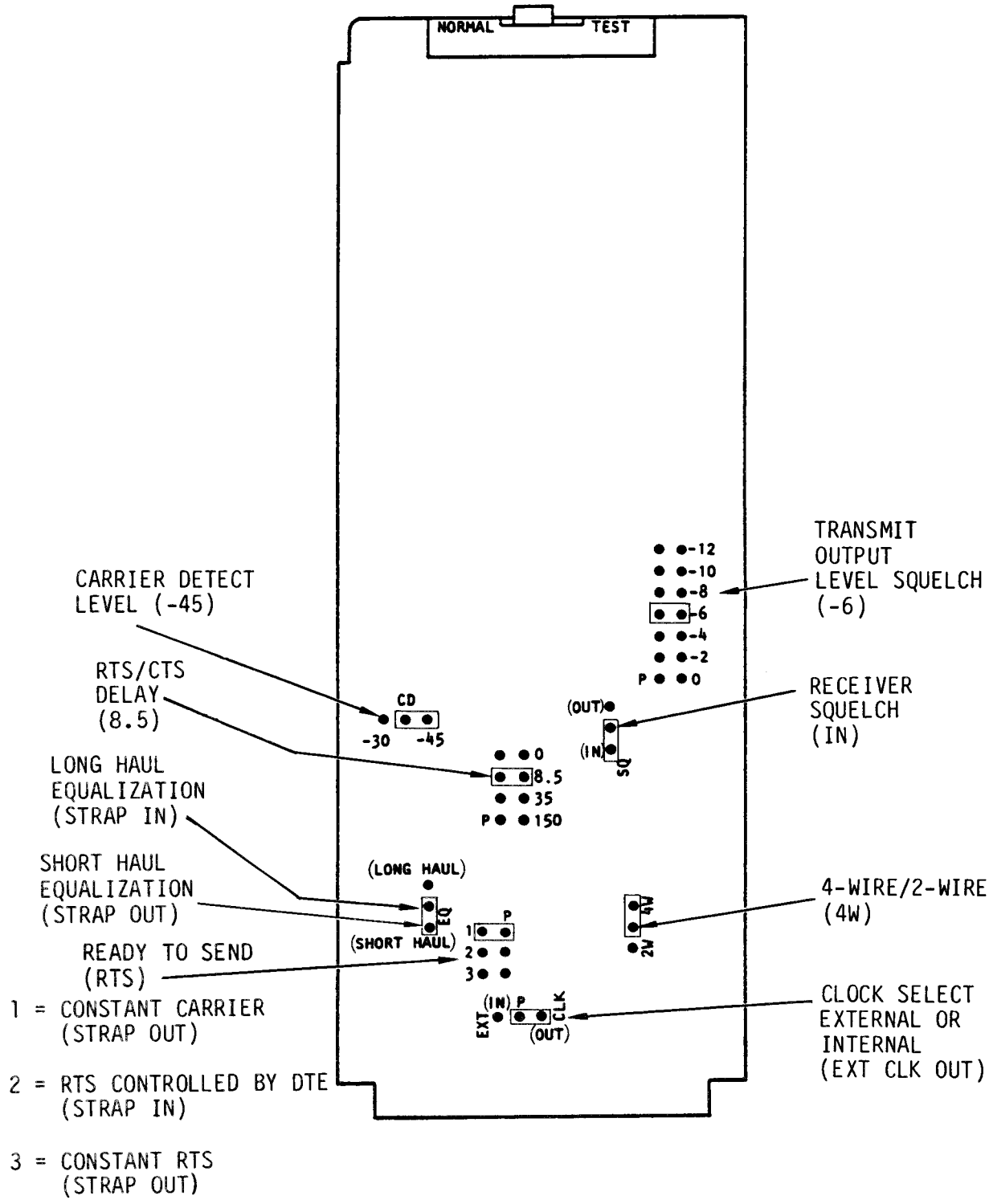


Figure D-38. Quasi-Analog Modem Switch Settings and Jumpers (7 of 7)

MODEM BOARD:

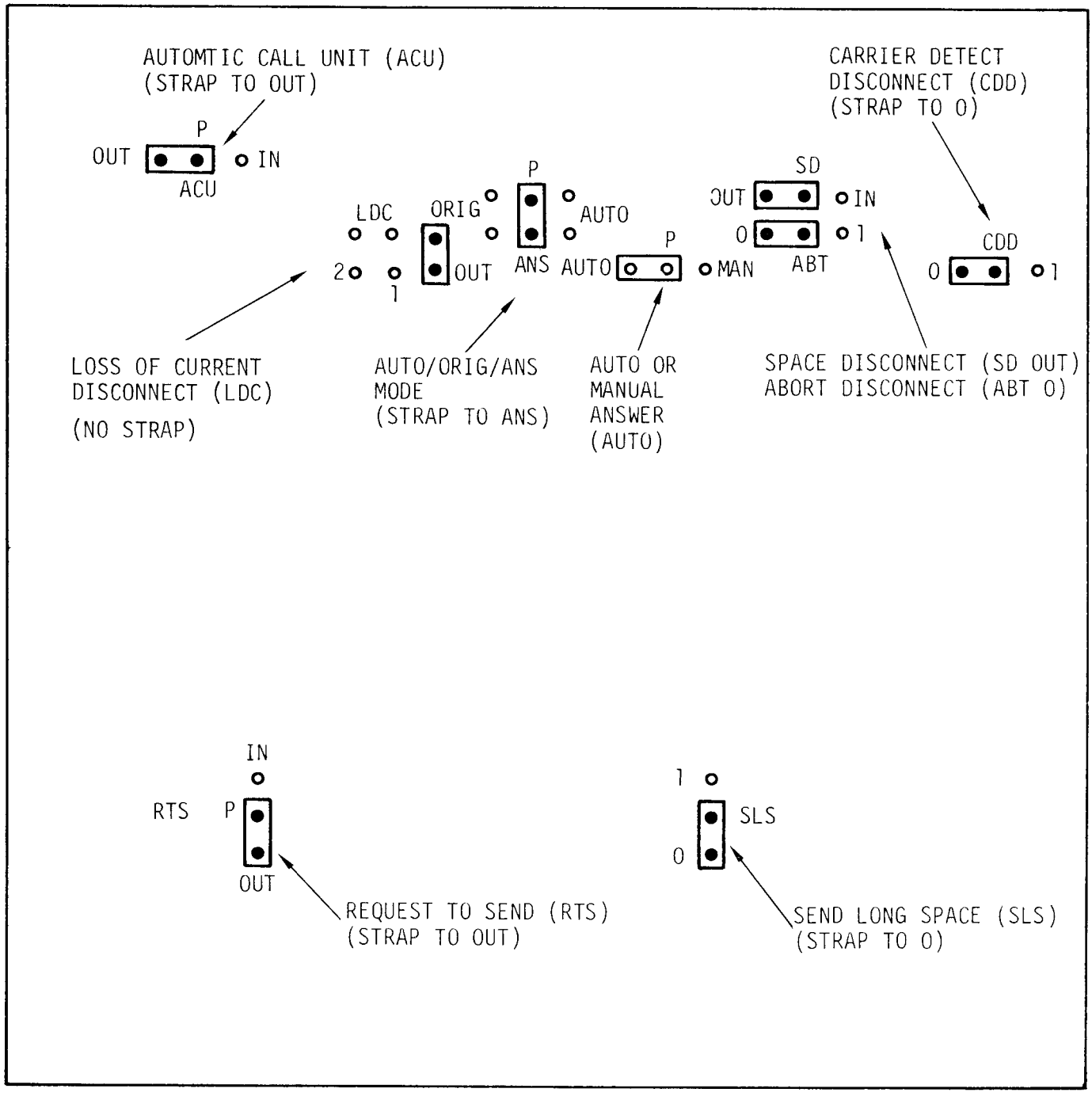


Figure D-39. 103J Modem Board Jumpers (1 of 2)

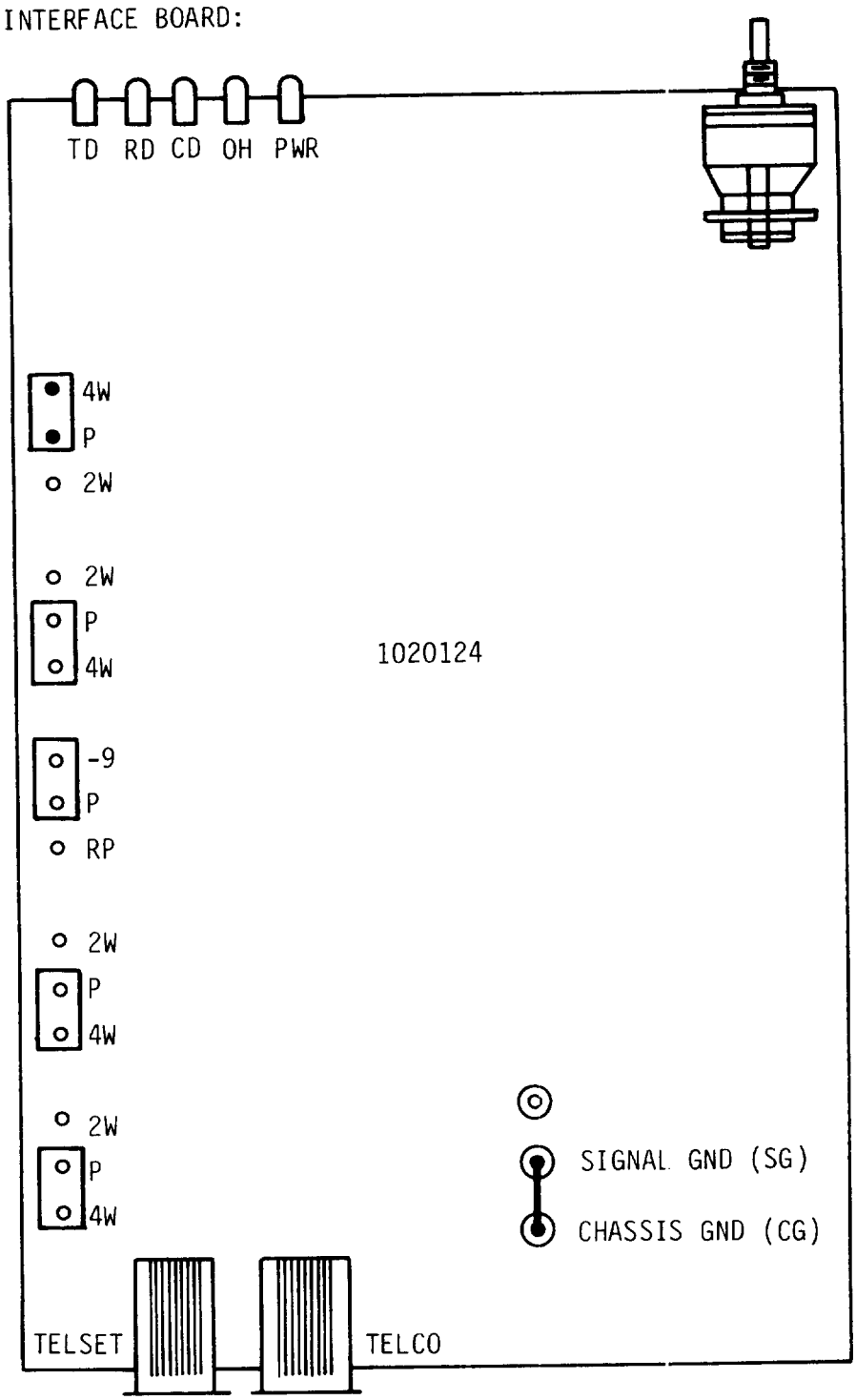
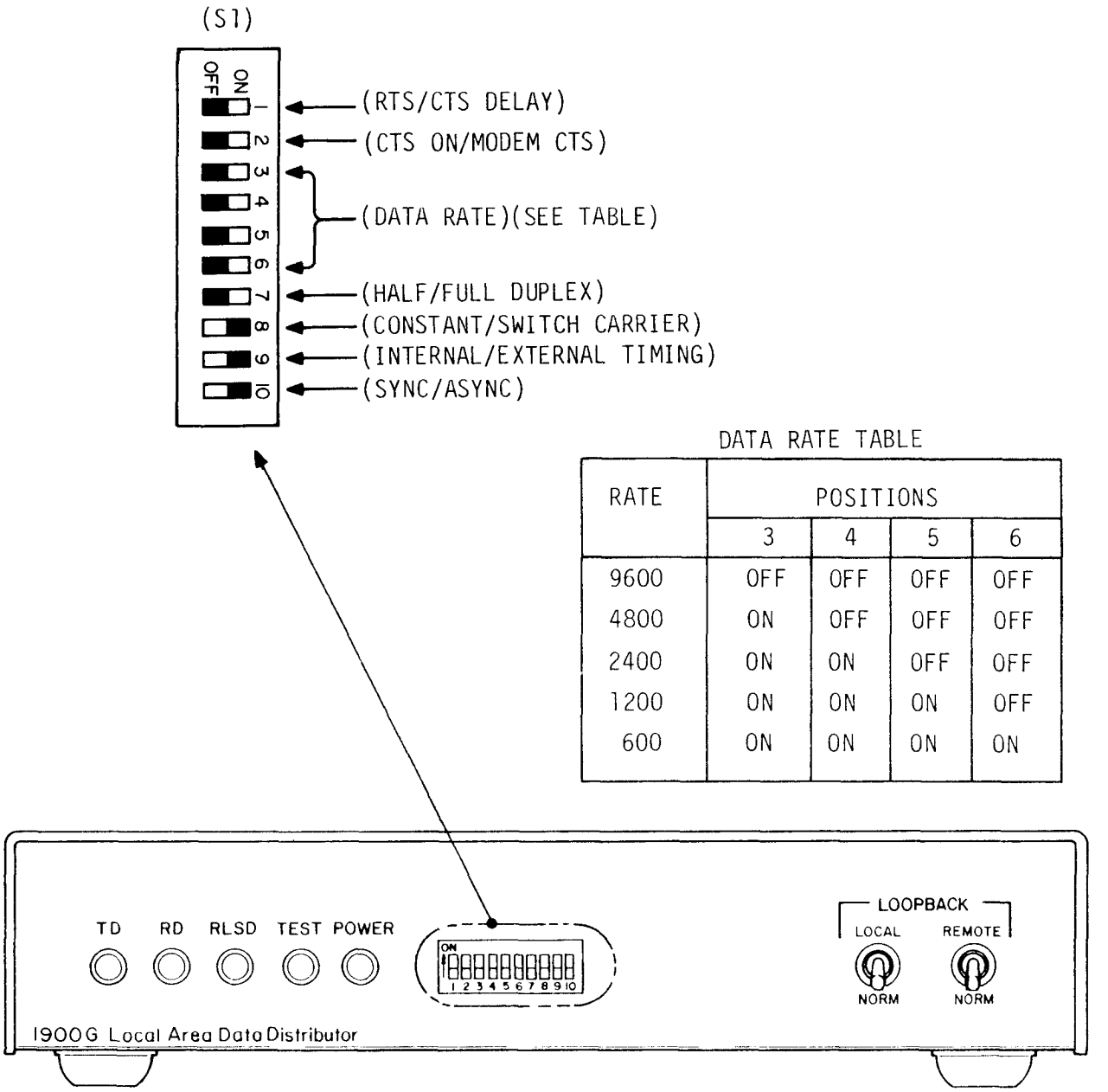


Figure D-39. 103J Modem Board Jumpers (2 of 2)



DATA RATE TABLE

RATE	POSITIONS			
	3	4	5	6
9600	OFF	OFF	OFF	OFF
4800	ON	OFF	OFF	OFF
2400	ON	ON	OFF	OFF
1200	ON	ON	ON	OFF
600	ON	ON	ON	ON

Figure D-40. 1900G Converter Dip Switch Settings

		Entrance Panel (CA3J1)		Switch Panel (CA2A6)		Entrance Panel (CA3A1)		Switch Panel (CA2A6)	
		B4004166-001 Cable		B4004143-003 Cable		B4004168-001 Cable		B4004143-002 Cable	
Chan	Quad	Post	Conn	Conn	Switch	Conn	Conn	Conn	Switch
1	Send+	1A	J1-A	P1-A	S1-1	J1-1A	J2-A	P1-A	S1-3
	Send-	1B	B	B	4	1B	B	B	6
	Rec+	2A	C	C	7	2A	C	C	9
	Rec-	2B	D	D	10	2B	D	D	12
2	Send+	3A	E	E	S2-1	3A	E	E	S2-3
	Send-	3B	F	F	4	3B	F	F	6
	Rec+	4A	G	G	7	4A	G	G	9
	Rec-	4B	H	H	10	4B	H	H	12
3	Send+	5A	J	J	S3-1	5A	J	J	S3-3
	Send-	5B	K	K	4	5B	K	K	6
	Rec+	6A	L	L	7	6A	L	L	9
	Rec-	6B	M	M	10	6B	M	M	12
4	Send+	7A	N	N	S4-1	7A	N	N	S4-3
	Send-	7B	P	P	4	7B	P	P	6
	Rec+	8A	R	R	7	8A	R	R	9
	Rec-	8B	S	S	10	8B	S	S	12
5	Send+	9A	T	T	S5-1	9A	T	T	S5-3
	Send-	9B	U	U	4	9B	U	U	6
	Rec+	10A	V	V	7	10A	V	V	9
	Rec-	10B	W	W	10	10B	W	W	12
6	Send+	11A	X	X	S6-1	11A	X	X	S6-3
	Send-	11B	Y	Y	4	11B	Y	Y	6
	Rec+	12A	Z	Z	7	12A	Z	Z	9
	Rec-	12B	a	a	10	12B	a	a	12
7	Send+	13A	b	b	S7-1	13A	b	b	S7-3
	Send-	13B	c	c	4	13B	c	c	6
	Rec+	14A	d	d	7	14A	d	d	9
	Rec-	14B	e	e	10	14B	e	e	12

TO SHEET 3 OF 25

TO SHEET 2 OF 25

Figure D-41. Communications Equipment Interconnections (1 of 25)

		Entrance Panel (CA3J1)		Switch Panel (CA2A6)		Entrance Panel (CA3A1)		Switch Panel (CA2A6)	
		B4004166-001 Cable		B4004143-003 Cable		B4004168-001 Cable		B4004143-002 Cable	
Chan	Quad	Post	Conn	Conn	Switch	Conn	Conn	Conn	Switch
		FROM SHEET 1 OF 25							
8	Send+	15A	f	f	S8-1	15A	f	f	S8-3
	Send-	15B	g	g	4	15B	g	g	6
	Rec+	16A	h	h	7	16A	h	h	9
	Rec-	16B	i	i	10	16B	i	i	12
9	Send+	17A	j	j	S9-1	17A	j	j	S9-3
	Send-	17B	k	k	4	17B	k	k	6
	Rec+	18A	m	m	7	18A	m	m	9
	Rec-	18B	n	n	10	18B	n	n	12
10	Send+	19A	p	p	S10-1	19A	p	p	S10-3
	Send-	19B	q	q	4	19B	q	q	6
	Rec+	20A	r	r	7	20A	r	r	9
	Rec-	20B	s	s	10	20B	s	s	12
11	Send+	21A	t	t	S11-1	21A	t	t	S11-3
	Send-	21B	u	u	4	21B	u	u	6
	Rec+	22A	v	v	7	22A	v	v	9
	Rec-	22B	w	w	10	22B	w	w	12
12	Send+	23A	x	x	S12-1	23A	x	x	S12-3
	Send-	23B	y	y	4	23B	y	y	6
	Rec+	24A	z	z	7	24A	z	z	9
	Rec-	24B	AA	AA	10	24B	AA	AA	12
13 2W S/R	Send+	25A	BB	BB	S13-1	25A	BB	BB	S13-3
	Send-	25B	CC	CC	4	25B	CC	CC	6
14 2W S/R	Rec+	26A	DD	DD	S14-1	26A	DD	DD	S14-3
	Rec-	26B	EE	EE	4	26B	EE	EE	6
	Spare	N.C.	FF	FF	N.C.	N.C.	FF	FF	N.C.
	Spare	N.C.	GG	GG	N.C.	N.C.	GG	GG	N.C.

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Figure D-41. Communications Equipment Interconnections (2 of 25)

FROM SHEET 1 OF 25

Switch Panel (CA2A6)		Line Protector Panel (CA2A4)				
B4004143-001 Cable		B4004128-002 Cable		Slip Ref. No.	B4004128-001 Cable	
Switch	Conn	Conn	Conn		Conn	Conn
S1-2	P1-A	J1-A	P1-A	CA2A4A1	P1-A	J1-A
5	B	B	B		B	B
8	C	C	C		C	C
11	D	D	D		D	D
S2-2	E	E	E		E	E
5	F	F	F		F	F
8	G	G	G		G	G
11	H	H	H		H	H
S3-2	J	J	J		J	J
5	K	K	K		K	K
8	L	L	L		L	L
11	M	M	M		M	M
S4-2	N	N	N		N	N
5	P	P	P		P	P
8	R	R	R		R	R
11	S	S	S		S	S
S5-2	T	T	P2-A	CA2A4A2	P2-A	T
5	U	U	B		B	U
8	V	V	C		C	V
11	W	W	D		D	W
S6-2	X	X	E		E	X
5	Y	Y	F		F	Y
8	Z	Z	G		G	Z
11	a	a	H		H	a
S7-2	b	b	J		J	b
5	c	c	K		K	c
8	d	d	L		L	d
11	e	e	M		M	e
S8-2	f	f	N		N	f
5	g	g	P		P	g
8	h	h	R		R	h
11	i	i	S		S	i

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TO SHEET 4 OF 25

Figure D-41. Communications Equipment Interconnections (3 of 25)

Switch Panel (CA2A6)		Line Protector Panel (CA2A4)				
B4004143-001 Cable		B4004128-002 Cable		Slip Ref. No.	B4004128-001 Cable	
Switch	Conn	Conn	Conn		Conn	Conn
FROM SHEET 3 OF 25						
S9-2	j	j	P3-A	CA2A4A3	P3-A	j
5	k	k	B		B	k
8	m	m	C		C	m
11	n	n	D		D	n
S10-2	p	p	E		E	p
5	q	q	F		F	q
8	r	r	G		G	r
11	s	s	H		H	s
S11-2	t	t	J		J	t
5	u	u	K		K	u
8	v	v	L		L	v
11	w	w	M		M	w
S12-2	x	x	N		N	x
5	y	y	P		P	y
8	z	z	R		R	z
11	AA	AA	S		S	AA
S13-2	BB	BB	P4-A	CA2A4A4	P4-A	BB
5	CC	CC	B		B	CC
S14-2	DD	DD	C		C	DD
5	EE	EE	D		D	EE
N.C.	FF	FF	NC		E	FF
N.C.	GG	GG	NC		F	GG

FROM SHEET 2 OF 25

TO SHEET 6 OF 25

Figure D-41. Communications Equipment Interconnections (4 of 25)

FROM SHEET 3 OF 25

Filter Panel (CA2A2)				Cabinet B (CA1)			
B4004126-002 Cable		B4004126-001 Cable		B4004028-1 Cable		Wire Jacket Color	Twist Pair (TP)
Conn	Filter	Filter	Conn	Conn	Conn		
P1-A	FL1-1	FL1-2	J1-A	P1-A	P2C1-7	BLK	TP
B	10-1	10-2	B	B	-6	RED	
C	19-1	19-2	C	C	-5	BLK	TP
D	28-1	28-2	D	D	-1	WHT	
E	37-1	37-2	E	E	P3C1-7	BLK	TP
F	46-1	46-2	F	F	-6	GRN	
G	2-1	2-2	G	G	-5	BLK	TP
H	11-1	11-2	H	H	-1	BLU	
J	20-1	20-2	J	J	P4C1-7	BRN	TP
K	29-1	29-2	K	K	-6	YEL	
L	38-1	38-2	L	L	-5	BLK	TP
M	47-1	47-2	M	M	-1	BRN	
N	3-1	3-2	N	N	P5C1-7	BLK	TP
P	12-1	12-2	P	P	-6	ORN	
R	21-1	21-2	R	R	-5	RED	TP
S	30-1	30-2	S	S	-1	WHT	
T	39-1	39-2	T	T	P6C1-7	BLU	TP
U	48-1	48-2	U	U	-6	ORN	
V	4-1	4-2	V	V	-5	RED	TP
W	13-1	13-2	W	W	-1	BLU	
X	22-1	22-2	X	X	P7C1-7	RED	TP
Y	31-1	31-2	Y	Y	-6	YEL	
Z	40-1	40-2	Z	Z	-5	RED	TP
a	49-1	49-2	a	a	-1	BRN	
b	5-1	5-2	b	b	P8C1-7	RED	TP
c	14-1	14-2	c	c	-6	ORN	
d	23-1	23-2	d	d	-5	GRN	TP
e	32-1	32-2	e	e	-1	WHT	

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TO SHEET 6 OF 25

Figure D-41. Communications Equipment Interconnections (5 of 25)

FROM SHEET 4 OF 25

Filter Panel (CA2A2)				Cabinet "B" (CA1)			
B4004126-002 Cable		B4004126-001 Cable		B4004028-1 Cable		Wire Jacket Color	Twist Pair (TP)
Conn	Filter	Filter	Conn	Conn	Conn		
				FROM SHEET 5 OF 25			
f	41-1	41-2	f	f	P9C1-7	GRN	TP
g	50-1	50-2	g	g	-6	BLU	
h	6-1	6-2	h	h	-5	GRN	TP
i	15-1	15-2	i	i	-1	YEL	
j	24-1	24-2	j	j	P10C1-7	GRN	TP
k	33-1	33-2	k	k	-6	BRN	
m	42-1	42-2	m	m	-5	GRN	TP
n	51-1	51-2	n	n	-1	ORN	
p	7-1	7-2	p	p	P11C1-7	WHT	TP
q	16-1	16-2	q	q	-6	BLU	
r	25-1	25-2	r	r	-5	WHT	TP
s	34-1	34-2	s	s	-1	YEL	
t	43-1	43-2	t	t	P12C1-7	WHT	TP
u	52-1	52-2	u	u	-6	BRN	
v	8-1	8-2	v	v	-5	WHT	TP
w	17-1	17-2	w	w	-1	ORN	
x	26-1	26-2	x	x	P13C1-7	BLU	TP
y	35-1	35-2	y	y	-6	YEL	
z	44-1	44-2	y	y	-5	BLU	TP
AA	53-1	53-2	AA	AA	-1	BRN	
BB	9-1	9-2	BB	BB	A5A5TB1-7	RED	TP
CC	18-1	18-2	CC	CC	-8	GRN	
DD	27-1	27-2	DD	DD	A5A5TB2-7	YEL	TP
EE	36-1	36-2	EE	EE	-8	BLK	
FF	45-1	45-2	FF	FF	NC	BRN	TP
GG	54-1	54-2	GG	GG	NC	ORN	

Note 7

TO SHEET 7 OF 25

Figure D-41. Communications Equipment Interconnections (6 of 25)

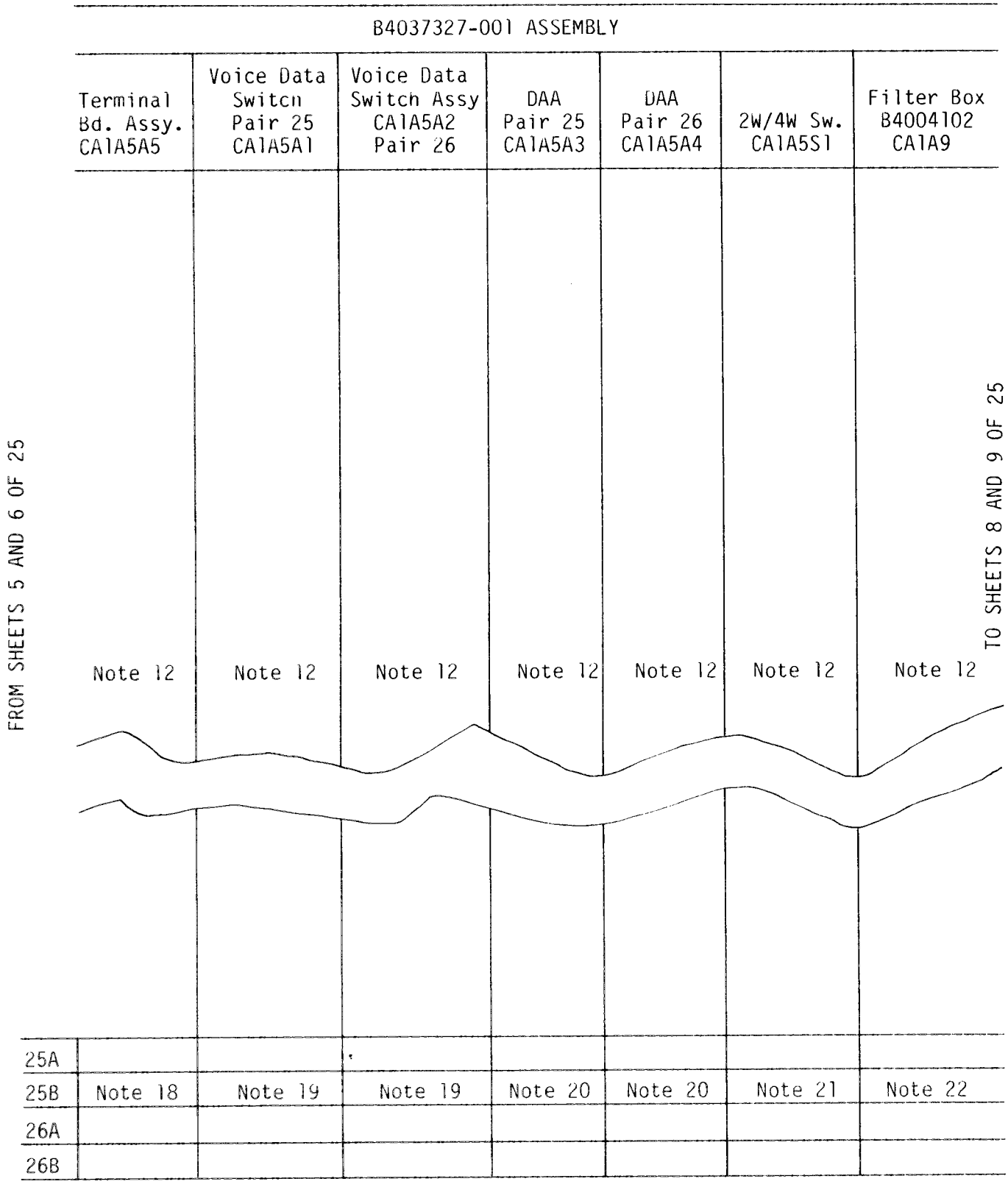


Figure D-41. Communications Equipment Interconnections (7 of 25)

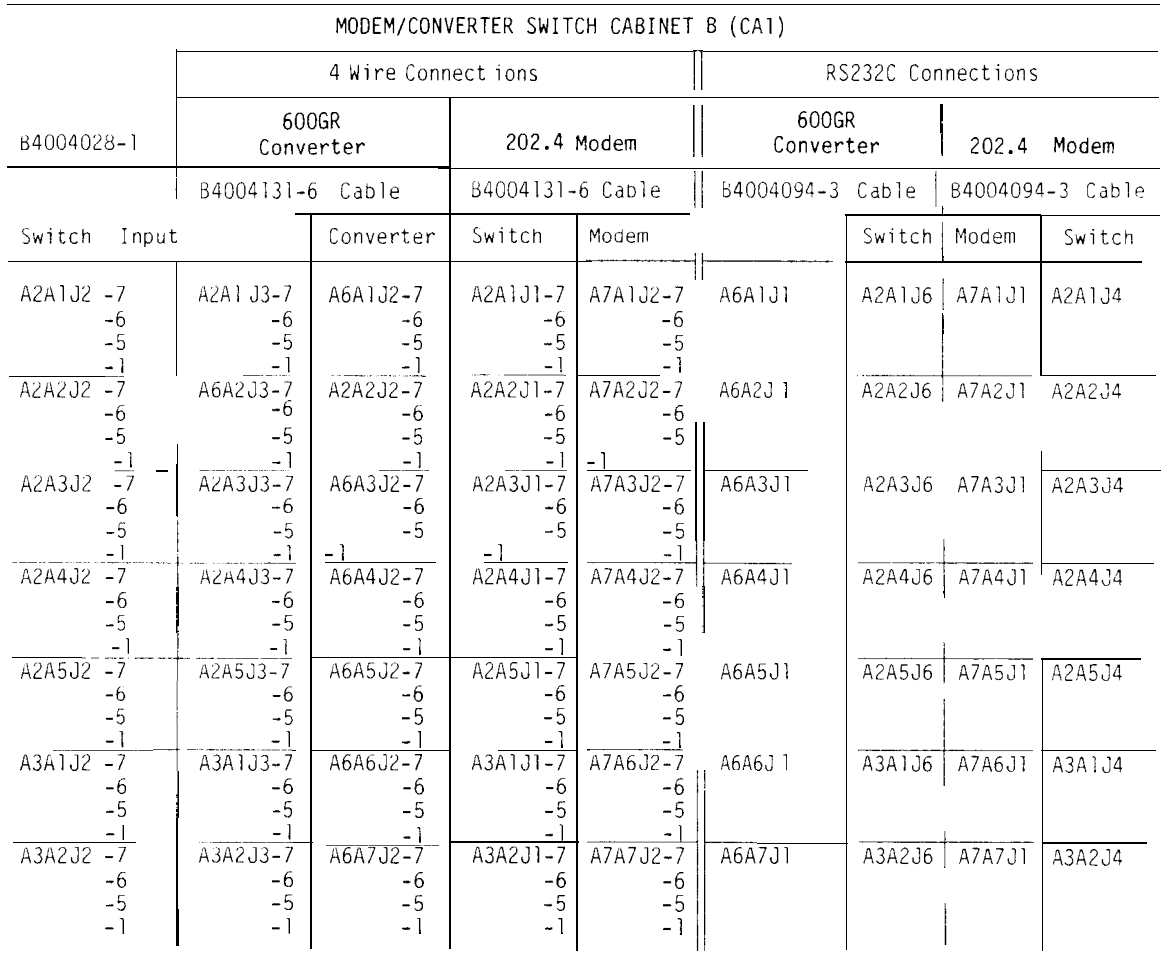
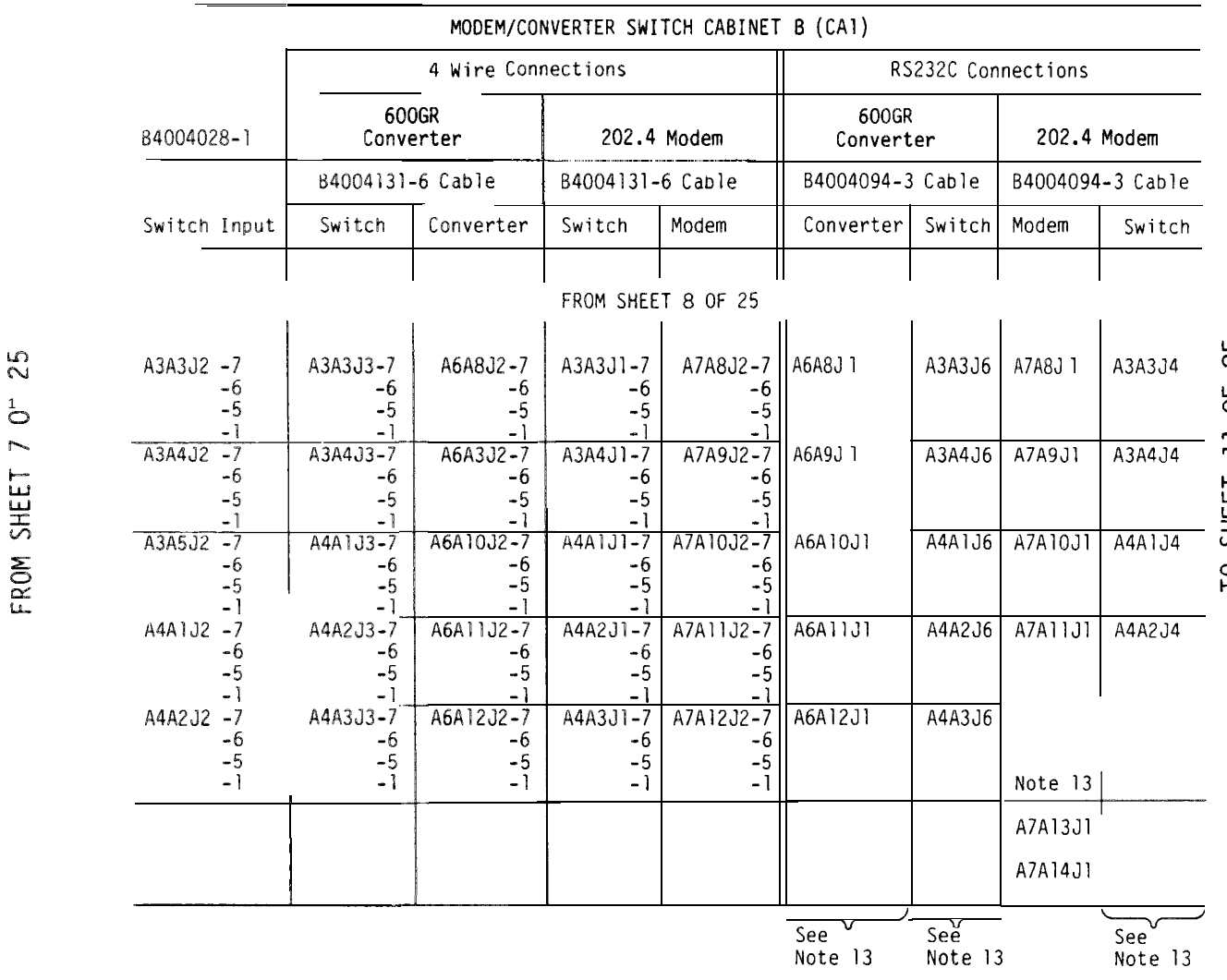


Figure D-41. Communications Equipment Interconnections (8 of 25)



MODEM/CONVERTER SWITCH CABINET B (CA1)

B4004028-1	4 Wire Connections				RS232C Connections			
	600GR Converter		202.4 Modem		600GR Converter		202.4 Modem	
	B4004131-6 Cable		B4004131-6 Cable		B4004094-3 Cable		B4004094-3 Cable	
Switch Input	Switch	Converter	Switch	Modem	Converter	Switch	Modem	Switch
			FROM SHEET 8 OF 25					
A3A3J2 -7	A3A3J3-7	A6A8J2-7	A3A3J1-7	A7A8J2-7	A6A8J1	A3A3J6	A7A8J1	A3A3J4
-6	-6	-6	-6	-6				
-5	-5	-5	-5	-5				
-1	-1	-1	-1	-1				
A3A4J2 -7	A3A4J3-7	A6A3J2-7	A3A4J1-7	A7A9J2-7	A6A9J1	A3A4J6	A7A9J1	A3A4J4
-6	-6	-6	-6	-6				
-5	-5	-5	-5	-5				
-1	-1	-1	-1	-1				
A3A5J2 -7	A4A1J3-7	A6A10J2-7	A4A1J1-7	A7A10J2-7	A6A10J1	A4A1J6	A7A10J1	A4A1J4
-6	-6	-6	-6	-6				
-5	-5	-5	-5	-5				
-1	-1	-1	-1	-1				
A4A1J2 -7	A4A2J3-7	A6A11J2-7	A4A2J1-7	A7A11J2-7	A6A11J1	A4A2J6	A7A11J1	A4A2J4
-6	-6	-6	-6	-6				
-5	-5	-5	-5	-5				
-1	-1	-1	-1	-1				
A4A2J2 -7	A4A3J3-7	A6A12J2-7	A4A3J1-7	A7A12J2-7	A6A12J1	A4A3J6		
-6	-6	-6	-6	-6				
-5	-5	-5	-5	-5				
-1	-1	-1	-1	-1			Note 13	
							A7A13J1	
							A7A14J1	
					See Note 13	See Note 13		See Note 13

FROM SHEET 7 OF 25

TO SHEET 11 OF 25

Figure D-41. Communications Equipment Interconnections (9 of 25)

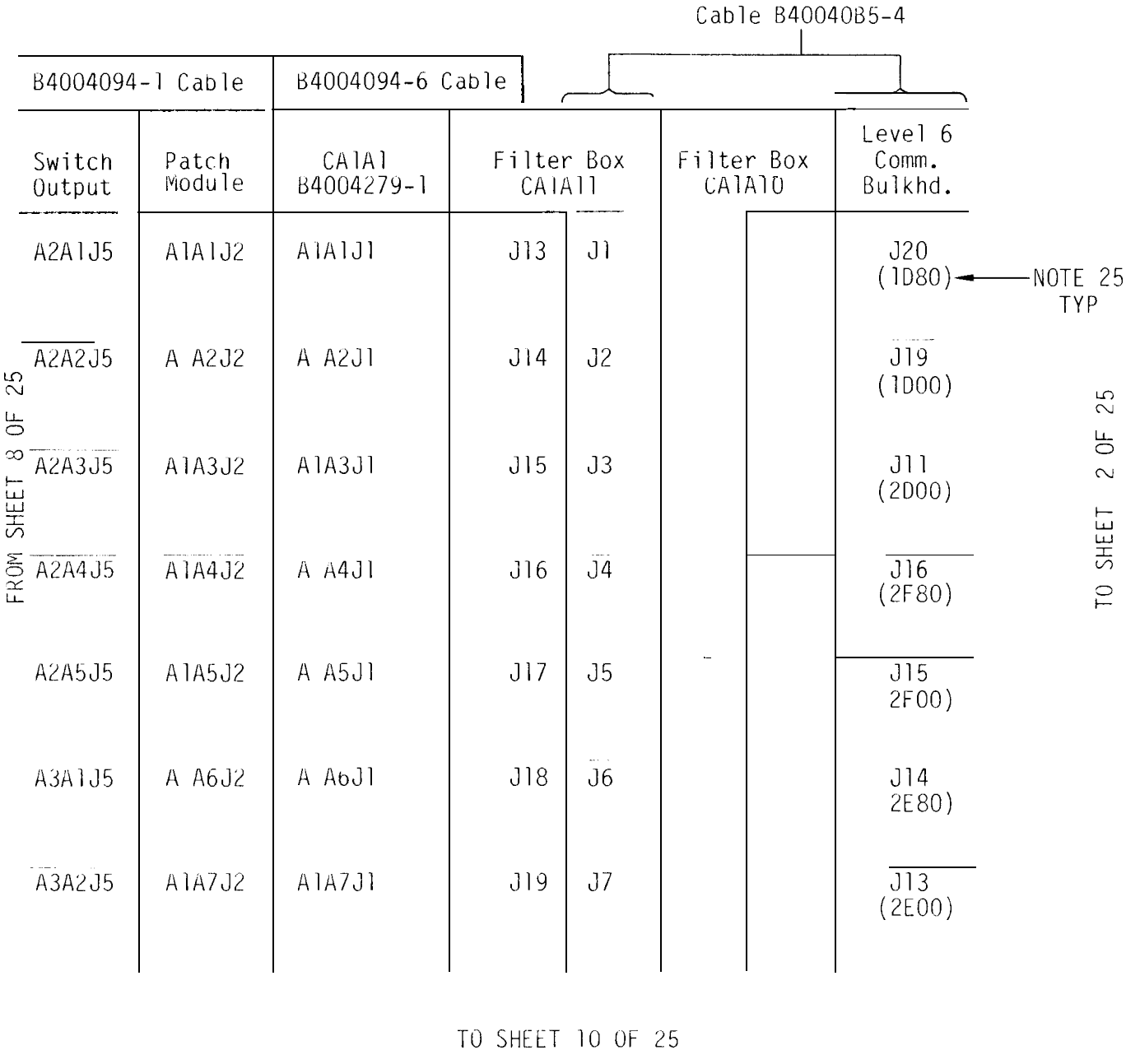


Figure D-41. Communications Equipment Interconnections (10 of 25)

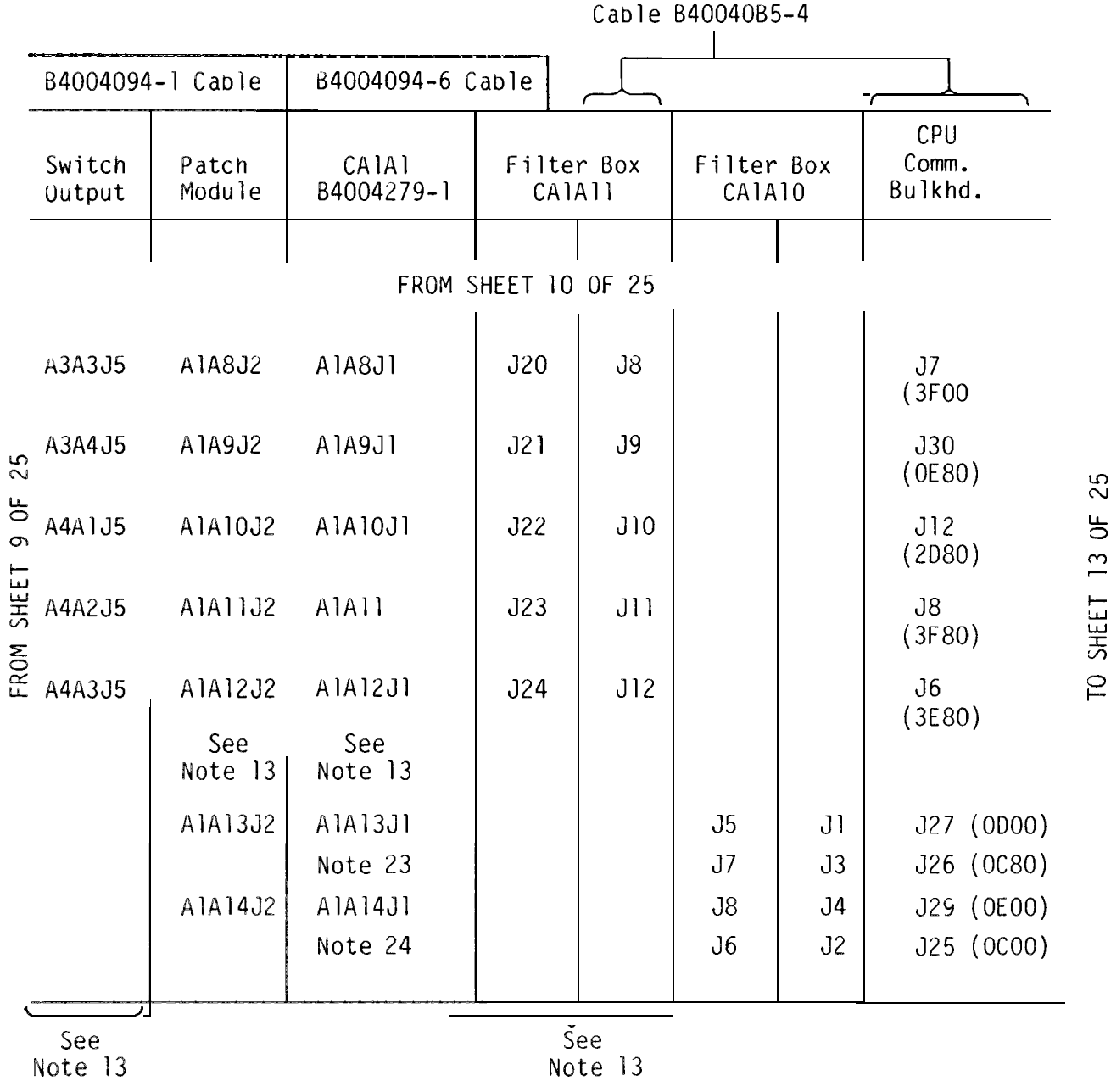


Figure D-41. Communications Equipment Interconnections (11 of 25)

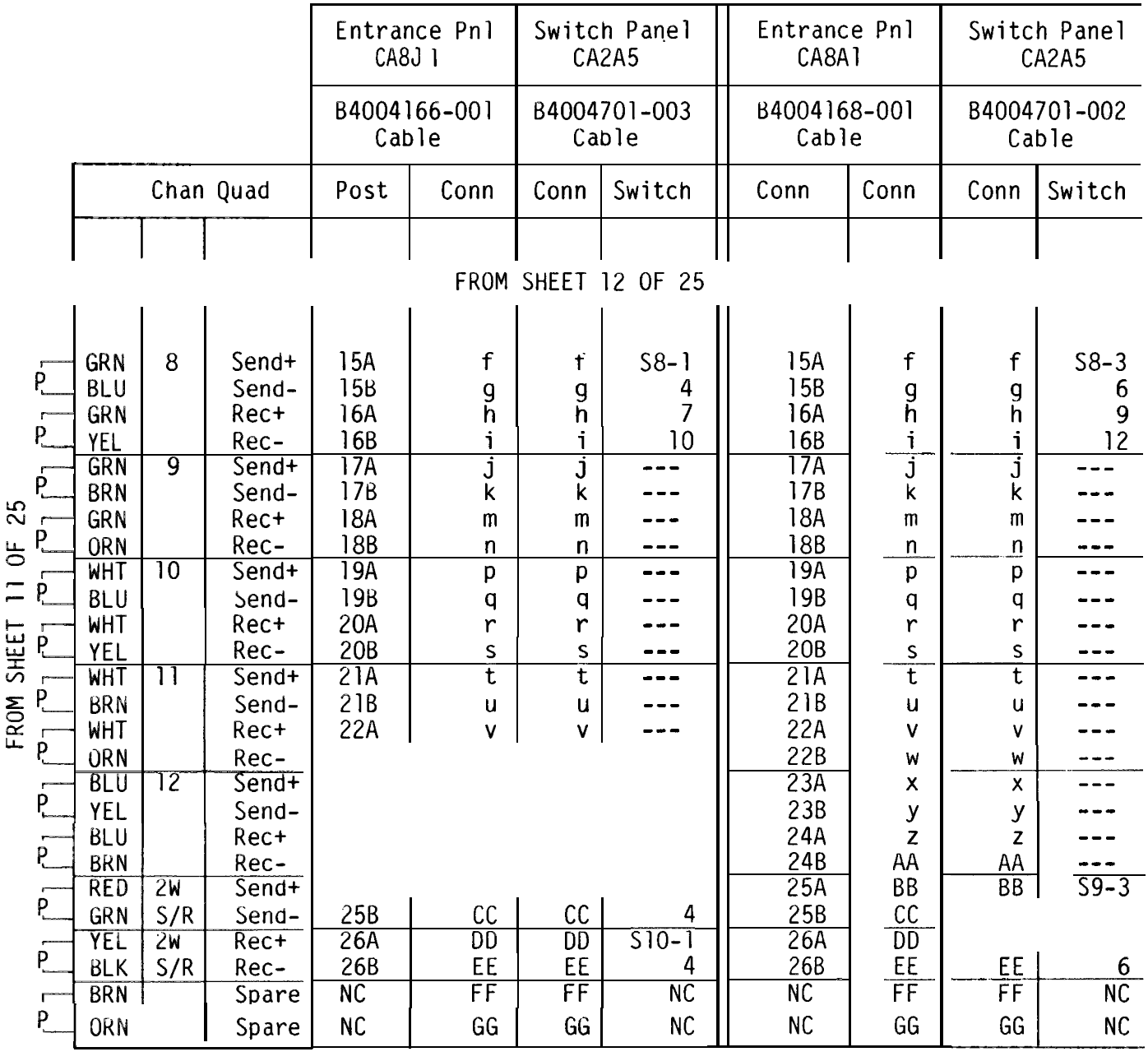
FROM SHEET 10 OF 25

	Chan	Quad	Entrance Pnl CA8J1 B4004166-001 Cable Post	Entrance Pnl CA8J1 B4004166-001 Cable Conn	Switch Panel CA2A5 B4004701-003 Cable Conn	Switch Panel CA2A5 B4004701-003 Cable Switch	Entrance Pnl CA8A1 B4004168-001 Cable Conn	Entrance Pnl CA8A1 B4004168-001 Cable Conn	Switch Panel CA2A5 B4004701-002 Cable Conn	Switch Panel CA2A5 B4004701-002 Cable Switch
P	BLK	1 Send+	1A	J1-A	P1-A	S1-1	J1-1A	J2-A	P1-A	S1-3
	RED	Send-	1B	B	B	4	1B	B	B	6
P	BLK	Rec+	2A	C	C	7	2A	C	C	9
	WHT	Rec-	2B	D	D	10	2B	D	D	12
P	BLK	2 Send+	3A	E	E	S2-1	3A	E	E	S2-3
	GRN	Send-	3B	F	F	4	3B	F	F	6
P	BLK	Rec+	4A	G	G	7	4A	G	G	9
	BLU	Rec-	4B	H	H	10	4B	H	H	12
P	BRN	3 Send+	5A	J	J	S3-1	5A	J	J	S3-3
	YEL	Send-	5B	K	K	4	5B	K	K	6
P	BLK	Rec+	6A	L	L	7	6A	L	L	9
	BRN	Rec-	6B	M	M	10	6B	M	M	12
P	BLK	4 Send+	7A	N	N	S4-1	7A	N	N	S4-3
	ORN	Send-	7B	P	P	4	7B	P	P	6
P	RED	Rec+	8A	R	R	7	8A	R	R	9
	WHT	Rec-	8B	S	S	10	8B	S	S	12
P	BLU	5 Send+	9A	T	T	S5-1	9A	T	T	S5-3
	ORN	Send-	9B	U	U	4	9B	U	U	6
P	RED	Rec+	10A	V	V	7	10A	V	V	9
	BLU	Rec-	10B	W	W	10	10B	W	W	12
P	RED	6 Send+	11A	X	X	S6-1	11A	X	X	S6-3
	YEL	Send-	11B	Y	Y	4	11B	Y	Y	6
P	RED	Rec+	12A	Z	Z	7	12A	Z	Z	9
	BRN	Rec-	12B	a	a	10	12B	a	a	12
P	RED	7 Send+	13A	b	b	S7-1	13A	b	b	S7-3
	ORN	Send-	13B	c	c	4	13B	c	c	6
P	GRN	Rec+	14A	d	d	7	14A	d	d	9
	WHT	Rec-	14B	e	e	10	14B	e	e	12

TO SHEET 14 OF 25

TO SHEET 13 OF 25

Figure D-41. Communications Equipment Interconnections (12 of 25)



	Chan	Quad		Entrance Pnl CA8J1 B4004166-001 Cable Post	Entrance Pnl CA8J1 B4004166-001 Cable Conn	Switch Panel CA2A5 B4004701-003 Cable Conn	Switch Panel CA2A5 B4004701-003 Cable Switch	Entrance Pnl CA8A1 B4004168-001 Cable Conn	Entrance Pnl CA8A1 B4004168-001 Cable Conn	Switch Panel CA2A5 B4004701-002 Cable Conn	Switch Panel CA2A5 B4004701-002 Cable Switch
				FROM SHEET 12 OF 25							
P	GRN	8	Send+	15A	f	f	S8-1	15A	f	f	S8-3
P	BLU		Send-	15B	g	g	4	15B	g	g	6
P	GRN		Rec+	16A	h	h	7	16A	h	h	9
P	YEL		Rec-	16B	i	i	10	16B	i	i	12
P	GRN	9	Send+	17A	j	j	---	17A	j	j	---
P	BRN		Send-	17B	k	k	---	17B	k	k	---
P	GRN		Rec+	18A	m	m	---	18A	m	m	---
P	ORN		Rec-	18B	n	n	---	18B	n	n	---
P	WHT	10	Send+	19A	p	p	---	19A	p	p	---
P	BLU		Send-	19B	q	q	---	19B	q	q	---
P	WHT		Rec+	20A	r	r	---	20A	r	r	---
P	YEL		Rec-	20B	s	s	---	20B	s	s	---
P	WHT	11	Send+	21A	t	t	---	21A	t	t	---
P	BRN		Send-	21B	u	u	---	21B	u	u	---
P	WHT		Rec+	22A	v	v	---	22A	v	v	---
P	ORN		Rec-					22B	w	w	---
P	BLU	12	Send+					23A	x	x	---
P	YEL		Send-					23B	y	y	---
P	BLU		Rec+					24A	z	z	---
P	BRN		Rec-					24B	AA	AA	---
P	RED	2W	Send+					25A	BB	BB	S9-3
P	GRN	S/R	Send-	25B	CC	CC	4	25B	CC		
P	YEL	2W	Rec+	26A	DD	DD	S10-1	26A	DD		
P	BLK	S/R	Rec-	26B	EE	EE	4	26B	EE	EE	6
P	BRN		Spare	NC	FF	FF	NC	NC	FF	FF	NC
P	ORN		Spare	NC	GG	GG	NC	NC	GG	GG	NC

Figure D-41. Communications Equipment Interconnections (13 of 25)

FROM SHEET OF 25

TO SHEET 6 OF 25

Switch Panel CA2A5		Line Protector Panel CA2A3				
B4004701-001 Cable		B4004710-002 Cable		Slip Ref No.	B4004710-001 Cable	
Switc	Conn	Conn	Conn		Conn	Conn
S1-2	P1-A	J1-A	P1-A	CA2A3A1	P1-A	J1-A
5	B	B	B		B	B
8	C	C	C		C	C
11	D	D	D		D	D
S2-2	E	E	E		E	E
5	F	F	F		F	F
8	G	G	G		G	G
11	H	H	H		H	H
S3-2	J	J	J		J	J
5	K	K	K		K	K
8	L	L	L		L	L
11	M	M	M		M	M
S4-2	N	N	N		N	N
5	P	P	P		P	P
8	R	R	R		R	R
11	S	S	S		S	S
S5-2	T	T	P3-E	CA2A3A3	P3-E	T
5	U	U	F		F	U
8	V	V	G		G	V
11	W	W	H		H	W
S6-2	X	X	P2-E	CA3 3A1	P2-E	X
5	Y	Y	F		F	Y
8	Z	Z	G		G	Z
11	a	a	H		H	a
S7-2	b	b	J		J	b
5	c	c	K		K	c
8	d	d	L		L	d
11	e	e	M		M	e

TO SHEET 15 OF 25

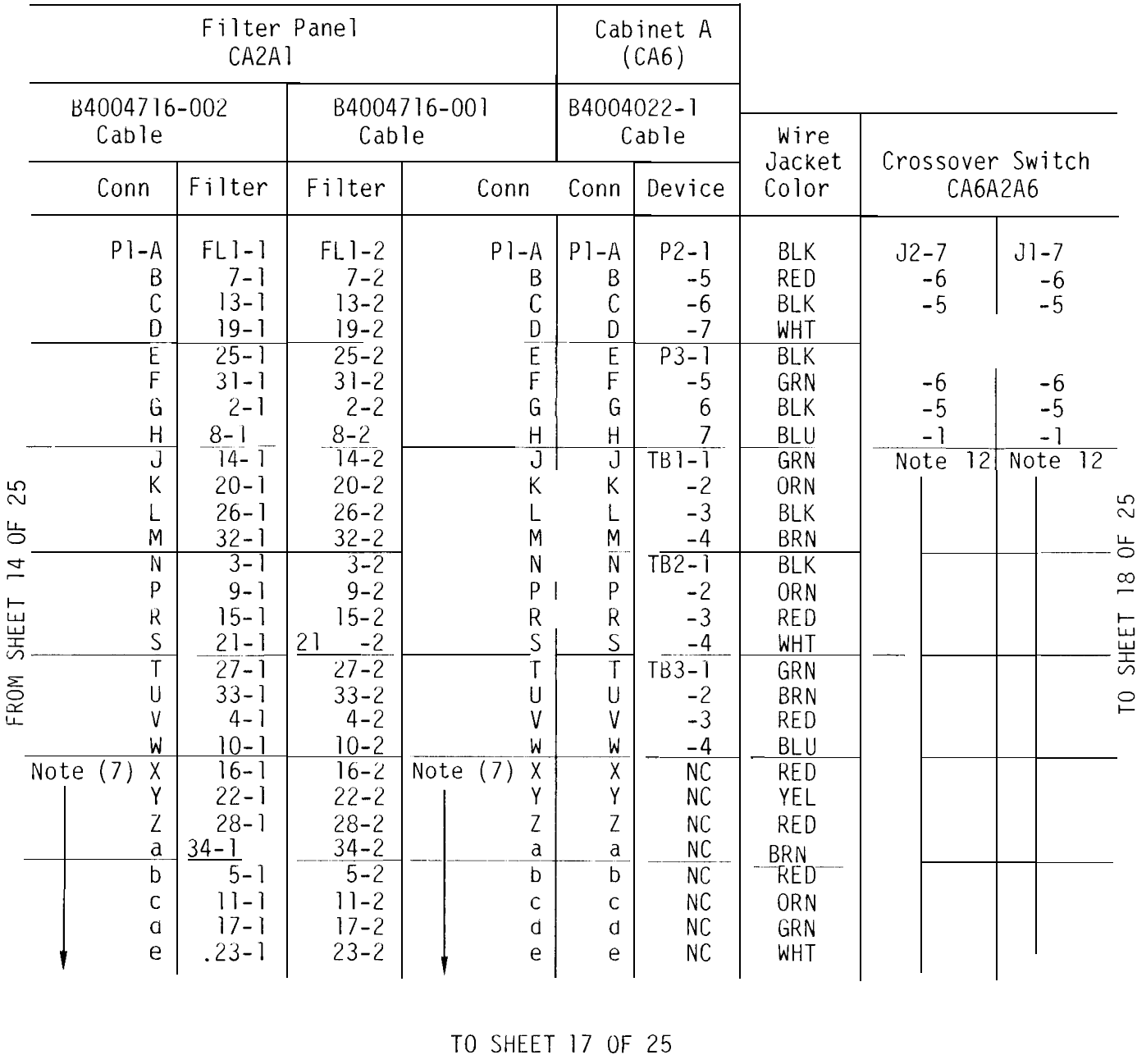
Figure D-41. Communications Equipment Interconnections (14 of 25)

FROM SHEET 13 OF 25

Switch Panel CA2A5		Line Protector Panel CA2A3				
B4004701-001 Cable		B4004710-002 Cable		Slip Ref No.	B4004710-001 Cable	
Switch	Conn	Conn	Conn		Conn	Conn
FROM SHEET 14 OF 25						
S8-2	f	f	N	CA3A3A1	N	f
5	g	g	P		P	g
8	h	h	R		R	h
11	i	i	S		S	i
---	j	j	---		---	j
---	k	k	---		---	k
---	m	m	---		---	m
---	n	n	---		---	n
---	o	o	---		---	o
---	p	p	---		---	p
---	q	q	---		---	q
---	r	r	---		---	r
---	s	s	---		---	s
---	t	t	---		---	t
---	u	u	---		---	u
---	v	v	---		---	v
---	w	w	---		---	w
---	x	x	---		---	x
---	y	y	---		---	y
---	z	z	---		---	z
---	AA	AA	---		---	AA
S9-2	BB	BB	P3-A	CA2A3A3	P3-A	BB
5	CC	CC	B		B	CC
S10-2	DD	DD	C		C	DD
5	EE	EE	D		D	EE
NC	FF	FF	NC		NC	FF
NC	GG	GG	NC		NC	GG

TO SHEET 17 OF 25

Figure D-41. Communications Equipment Interconnections (15 of 25)



Filter Panel CA2A1				Cabinet A (CA6)				
B4004716-002 Cable		B4004716-001 Cable		B4004022-1 Cable			Wire Jacket Color	Crossover Switch CA6A2A6
Conn	Filter	Filter	Conn	Conn	Device			
P1-A	FL1-1	FL1-2	P1-A	P1-A	P2-1		BLK	J2-7 / J1-7
B	7-1	7-2	B	B	-5		RED	-6 / -6
C	13-1	13-2	C	C	-6		BLK	-5 / -5
D	19-1	19-2	D	D	-7		WHT	
E	25-1	25-2	E	E	P3-1		BLK	
F	31-1	31-2	F	F	-5		GRN	-6 / -6
G	2-1	2-2	G	G	6		BLK	-5 / -5
H	8-1	8-2	H	H	7		BLU	-1 / -1
J	14-1	14-2	J	J	TB1-1		GRN	Note 12 / Note 12
K	20-1	20-2	K	K	-2		ORN	
L	26-1	26-2	L	L	-3		BLK	
M	32-1	32-2	M	M	-4		BRN	
N	3-1	3-2	N	N	TB2-1		BLK	
P	9-1	9-2	P	P	-2		ORN	
R	15-1	15-2	R	R	-3		RED	
S	21-1	21 -2	S	S	-4		WHT	
T	27-1	27-2	T	T	TB3-1		GRN	
U	33-1	33-2	U	U	-2		BRN	
V	4-1	4-2	V	V	-3		RED	
W	10-1	10-2	W	W	-4		BLU	
Note (7) X	16-1	16-2	Note (7) X	X	NC		RED	
Y	22-1	22-2	Y	Y	NC		YEL	
Z	28-1	28-2	Z	Z	NC		RED	
a	34-1	34-2	a	a	NC		BRN	
b	5-1	5-2	b	b	NC		RED	
c	11-1	11-2	c	c	NC		ORN	
d	17-1	17-2	d	d	NC		GRN	
e	23-1	23-2	e	e	NC		WHT	

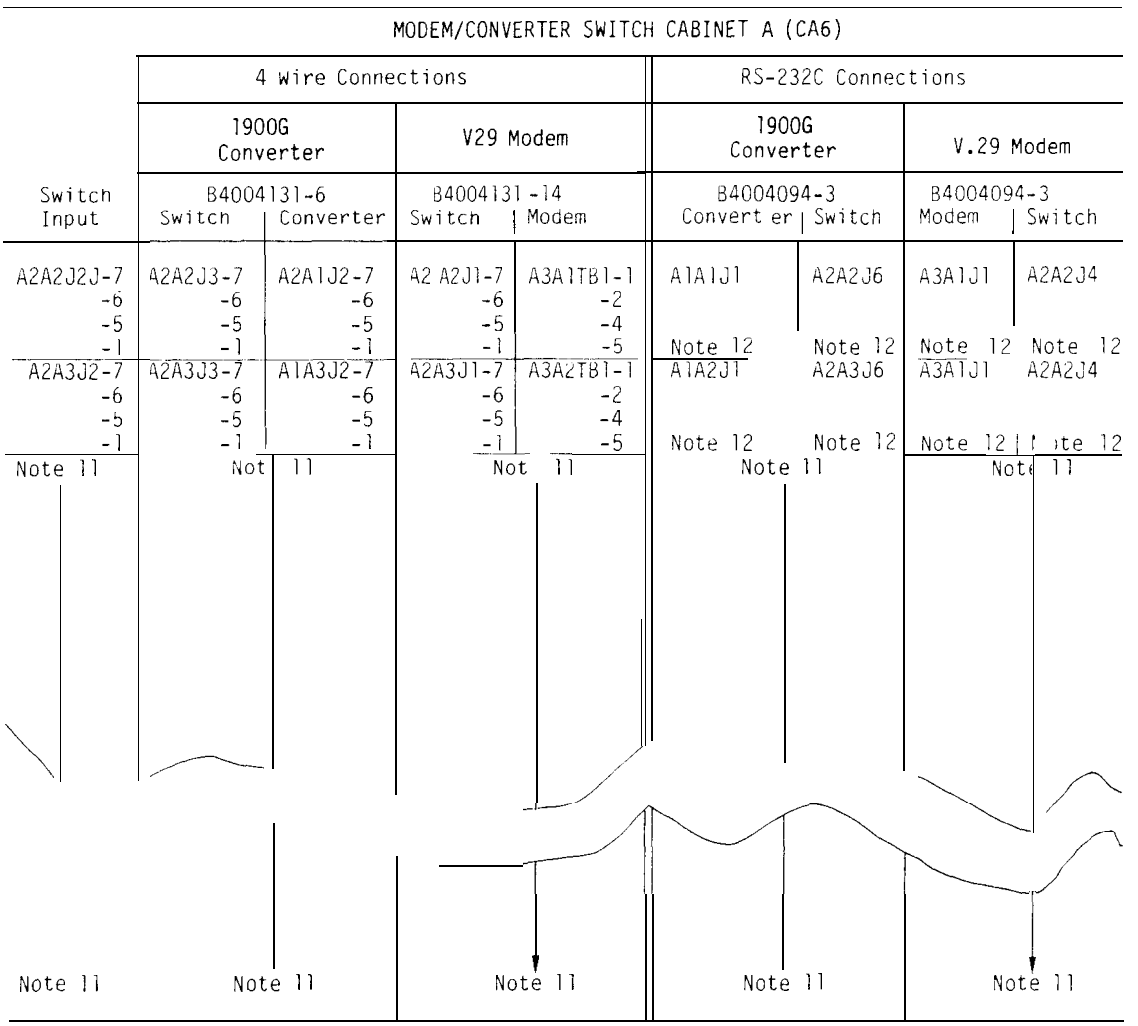
Figure D-41. Communications Equipment Interconnections (16 of 25)

Filter Panel CA2A1		Cabinet A (CA6)					
B4004716-002 Cable		B4004716-001 Cable		B4004022-1 Cable		Wire Jacket Color	Crossover Switch CA6A2A6
Conn	Filter	Filter	Conn	Conn	Device		
FROM SHEET 16 OF 25							
f	29-1	29-2	f	f	NC	GRN	
g	35-1	35-2	g	g	NC	BLU	
h	6-1	6-2	h	h	NC	GRN	
Note (7) i	12-1	12-2	Note (7) i	i	NC	YEL	
J	---	---	J	j	---		
k	---	---	k	k	---		
m	---	---	m	m	---		
n	---	---	n	n	---		
p	---	---	p	p	---		
q	---	---	q	q	---		
r	---	---	r	r	---		
-	---	---	d	d	---		
t	---	---	t	t	---		
u	---	---	u	u	---		
v	---	---	v	v	---		
w	---	---	w	w	---		
x	---	---	x	x	---		
y	---	---	y	y	---		
z	---	---	z	z	---		
AA	---	---	AA	AA	---		
BB	18-1	18-2	BB	BB	A4S1-2	RED	
CC	24-1	24-2	CC	CC	-5	GRN	
DD	30-1	30-2	DD	DD	-8	YEL	
EE	36-1	36-2	EE	EE	-11	BLK	
FF	NC	NC	FF	FF	NC	WHT	
GG	NC	NC	GG	GG	NC	BLU	Note 12 / Note 12

FROM SHEE 5 OF 25

TO SHEET 8 OF 25

Figure D-41. Communications Equipment Interconnections (17 of 25)



FROM SHEETS 16 AND 7 OF 25

TO SHEET 19 OF 25

Figure D-41. Communications Equipment Interconnections (18 of 25)

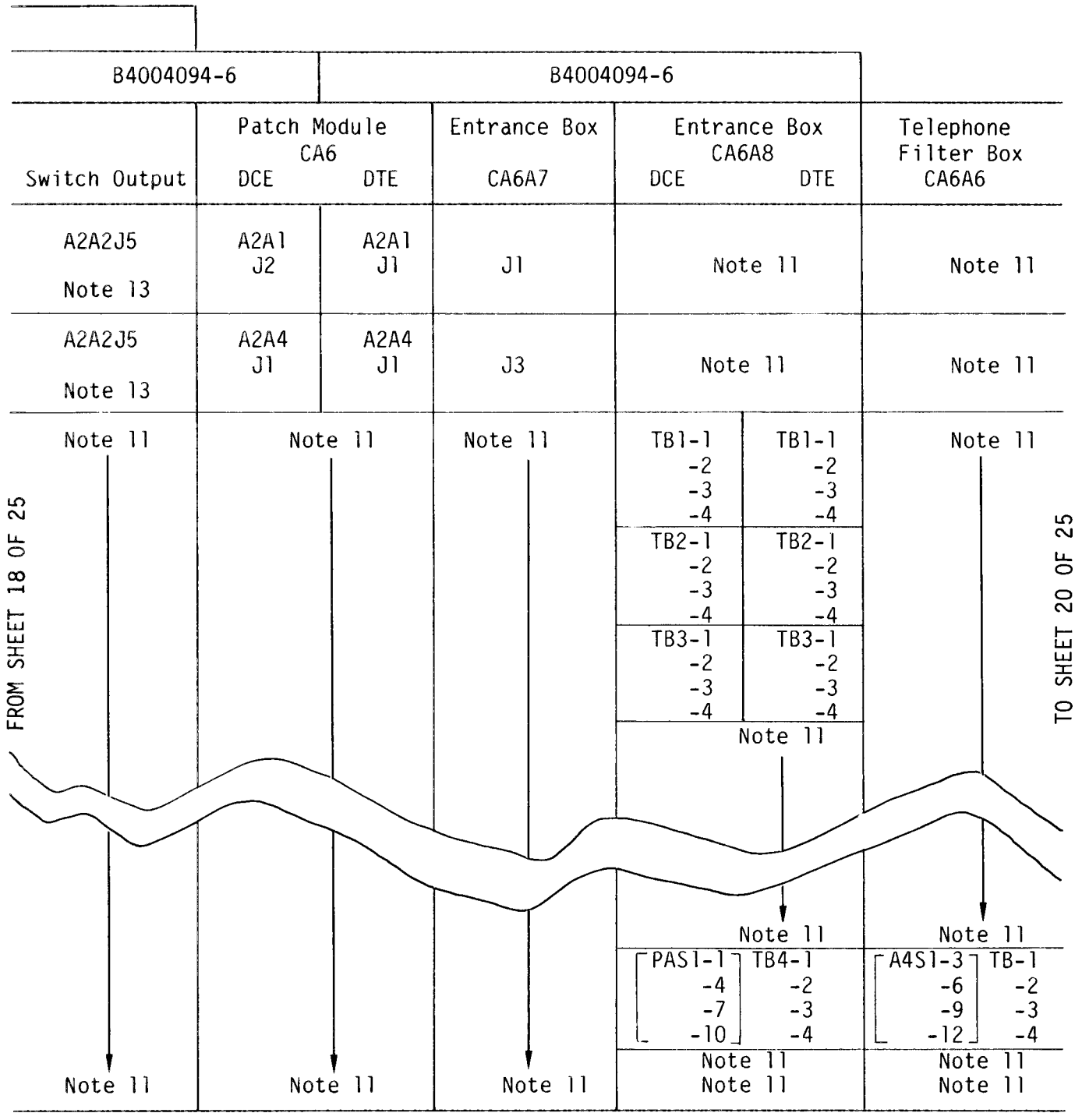


Figure D-41. Communications Equipment Interconnections (19 of 25)

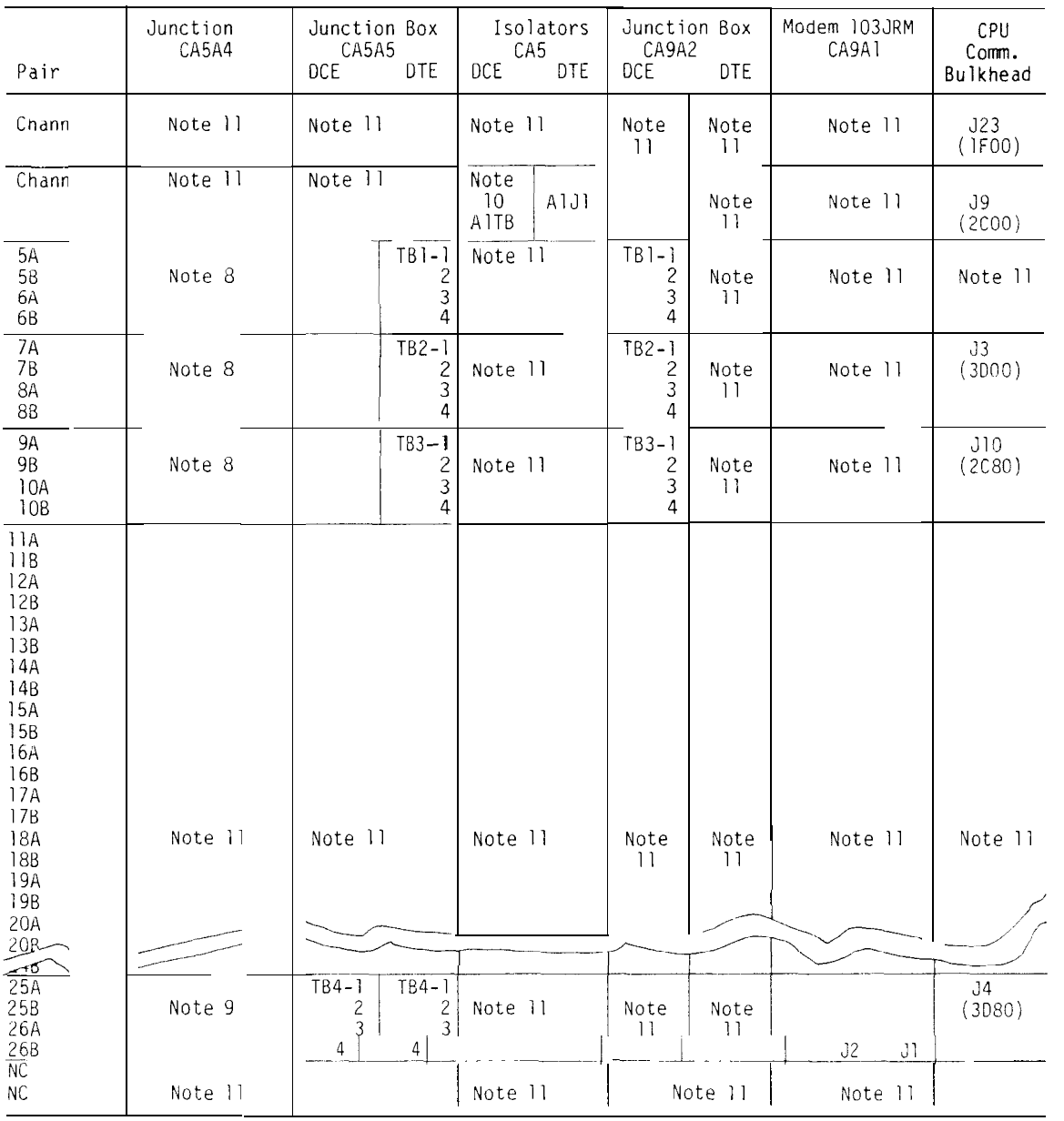


Figure D-41. Communications Equipment Interconnections (20 of 25)

NOTES :

1. For cable interconnections in Cabinet A see figure FO-7.
2. For cable interconnections in crypto cabinet see figure FO-8.
3. For cable interconnections on signal conditioning shelf and between shelf and crypto cabinet see figure FO-8.
4. For cable interconnections in Cabinet B see figure FO-6.
5. A dash (-) in any column signifies that no wire exists for that destination in the cable.
6. “NC” in any column indictes an existing wire not connected.
7. These filters are for future use (spares). Do no connect wires to these filters. Fold wire back at filter end and tie into bundles for future use.
8. Since crypto equipment is not installed, store these cables inside junction box and identify (CA6A8TB1, CA6A8TB2, and CA6A8TB3, as applicable).
9. Since crypto equipment is not installed, connect cable 64004736 from entance box CA6A8TB4 to junction box CA5A5TB4. The cable B4004735-001 normally connected to junction box CA5A5TB4 will be stored in spare parts and used when crypto equipment is installed.
10. For wiring from CA6A6J3 to CA5A1TB1 see chart 1 of figure D-41 (sheet 22 of 25).
11. These signal lines do not connect thru this assembly. The next connection is to the right or on the next sheet as indicated by the next filled-in assembly block.
12. For RS-232C interface see chart 2 of figure D-41 (sheet 22 of 25).
13. For RS-232C interface see chart 3 of figure D-41 (sheet 22 of 25).
14. For interface signals see chart 4 of figure D-41 (sheet 22 of 25).
15. For interface signals see chart 5 of figure D-41 (sheet 22 of 25).
16. For interface signals see chart 6 of figure D-41 (sheet 22 of 25).
17. Terminal ends are spliced in cable to pin 7 of connector.
18. For interface signals see chart 7 of figure D-41 (sheet 23 of 25).
19. For interface signals see chart 8 of figure D-41 (sheet 23 of 25).
20. For interface signals see chart 9 of figure D-41 (sheet 24 of 25).
21. For interface signals see chart 10 of figure D-41 (sheet 24 of 25).
22. For connections see chart 11 of figure D-41 (sheet 25 of 25).
23. Interconnecting cable is B403099G-2.
24. Interconnecting cable is 64036996-1.
25. CPU channel number.

Figure D-41. Communications Equipment Interconnections (21 of 25)

Chart 1

From	To	Wire Color
CA6A6J3-2	CA5A1TB1D3	RED
-7	-D2	BLK
-4	-A1	GRN
-20	-A7	BLK
-5	-B7	BLU
-6	-B1	BLK
-3	-D1	WHT
-8	-B8	YEL
-15	-C1	BRN
-17	-C3	ORN
-1	Frame Gnd	Shield

Chart 2

Signal Line Number	Description
1	Protective ground
2	Transmitted data
3	Received data
7	Signal ground
8	Received line signal Detector
15	Transmitter signal element timing DCE
17	Receive signal element timing

Chart 3

Signal Line Number	Description
2	Transmit data
3	Receive data
4	Request to send
5	Clear to send
6	Data set ready
7	Signal ground
8	Carrier detect
20	Terminal ready
22	Ring indicator
23	Reverse channel transmitter
25*	Reverse channel receiver

* Not an EIA standard connection

Chart 4

From	To	Wire Color	Notes
CA6A7J1-2	CAU TB5-3	RED	
-3	-5	WHT	
-8	-6	GRN	
-15	-2	BRN	
-17	-4	ORN	
-7	TB6-2	BLK	
	-3	BLK	17
	-4	BLK	
	-5	BLK	

Chart 5

From	To	Wire Color	Notes
CAU TB1-1	TLC-100 J1-2	BRN	
-3	-15	RED	
-4	-17	GRN	
-5	-3	BLU	
-6	-5	ORN	
-7	-10	YEL	
-13	-7	BLK	
-14		BLK	
-1b		BLK	17
-17		BLK	
-18		BLK	
-19		BLK	

Chart 6

From	To
TLC-100 J3-1	CPU J23-1
-2	-2
-3	-3
-2	-2
-3	-3
-4	-4
-5	-5
-6	-6
-7	-7
-20	-20

Figure D-41. Communications Equipment Interconnections (22 of 25)

Chart 7. Terminal Boards

From	To	Wire Color	Ref Pair	Cable
CA1A5A5TB1-1	CA1A5A3TB1-+V	BLU		B4037068-003
-2	CA1A5A3TB2 -A1	BLK		B4037068-003
-3	CA1T1 -1	RED		B4037068-001
-4	CA1A5A5TB2 -A	RED		B4037068-003
-5	CA1T1 -3	YEL		B4037068-001
-6	CA1A5A3TB1 -R1	BLK		B4037068-003
-7	B4004028-1 -BB	RED	25A	B4004028-1
-8	-CC	GRN	25B	B4004028-1
-9	CA1A5S1 -2	RED	25A	B4037068-002
-10	-5	GRN	25B	B4037068-002
-11	CA1A9TB1 -1	RED	25A	B4037068-001
-12	-2	GRN	25B	B4037068-001
CA1A5A5TB2-1	CA1A5A4TB1-+V	BLU		B4037068-003
-2	CA1A5A4TB2 -A1	BLK		B4037068-003
-3	CA1T1 -1	GRN		B4037068-001
-4	CA1A5A4TB2 -A	RED		B4037068-003
-5	CA1T1 -3	BLK		B4037068-001
-6	CA1A5A4TB1 -R1	BLK		B4037068-003
-7	B4004028-1 -DD	YEL	26A	B4004028-1
-8	-EE	BLK	26B	B4004028-1
-9	CA1A591 -8	YEL	26A	B4037068-002
-10	-11	BLK	26B	B4037068-002
-11	CA1A5TB1 -3	YEL	26A	B4037068-001
-12	-4	BLK	26B	B4037068-001

Chart 8. Ribbon Cable

From	To	Cable	From	To	Cable
CA1A5A5TB1 -1	CA1A5A1J1 -1	B4037067-001	CA1A5A5TB2 -1	CA1A5A2J1 -1	B4037067-001
-2	-2	↓	-2	-2	↓
-3	-3		-3	-3	
-4	-4		-4	-4	
-5	-5		-5	-5	
-6	-6		-6	-6	
-7	-7		-7	-7	
-8	-8		-8	-8	
-9	-9		-9	-9	
-10	-10		-10	-10	
-11	-11		-11	-11	
-12	-12	↓	-12	-12	↓

Figure D-41. Communications Equipment Interconnections (23 of 25)

Chart 9

From	To	Wire Color	Ref Pair	Cable
CA1A5A3TB1-DA	CA1A7A14J2-1	BLK		UDS6102O0770201
-RI	-2	BRN		
-SH	-3	ORN		
-SEND	-4	YEL		
-CCT	-5	BLU		
-DT	-6	GRN		
-DR	-7	RED		
-OH	-9	WHT		
-+V	CA1A5A5FB1-1	BLU		B4037068-003
-RI	-6	BLK		
CA1A5A3TB2-A1	-2	BLK		
-A	-4	RED		
CA1A5A3TB3-P1	CA1T2 -1	RED		
-P6	-2	BLK		
-P2	-3	WHT		
CA1A5A3TB5-T	CA1A5S1 -3	RED	25A	B4037068-001
-R	-6	GRN	25B	B4037068-001
CA1A5A4TB1-DA	CA1A7A15J2-1	BLK		UDS6102O0770201
-RI	-2	BRN		
-SH	-3	ORN		
-SEND	-4	YEL		
-CCT	-5	BLU		
-DT	-6	GRN		
-DR	-7	RED		
-OH	-9	MHT		
-+V	CA1A5A5TB2-1	BLU		B4037068-003
-RI	-6	BLK		
CA1A5A4TB2-A1	-2	BLK		
-A	-4	RED		
CA1A5A4TB3-P1	CA1T3 -1	RED		
-P6	-2	BLK		
-P2	-3	WHT		
CA1A5A4TB5-T	CA1A3S1 -9	YEL	26A	64037068-001
-R	-12	BLK	26B	64037068-001

Figure D-41. Communications Equipment Interconnections (24 of 25)

Chart 10. 2W/4W Switch

From	To	Wire Color	Ref Pair	Cable
CA1A5S1-1	CA1A7A13J2-7	RED	25A	B4036996-2
-4	-6	GRN	25B	↓
-7	-5	YEL	26A	
-10	-1	BLK	26B	
-2	CA1A5A5TB1-9	RED	25A	B4037068-002
-5	-10	GRN	25B	↓
-8	CA1A5A5TB2-9	YEL		
-11	-10	BLK		
-3	CA1A5A3TB5-T	RED		
-6	-R	GRN	25B	
-9	CA1A5A3TB5-T	YEL	26A	
-12	-R	BLK	26B	↓

Chart 11

From	To	Wire Color	Ref Pair	Cable
CA1A9TB1-1	CA1A5A5TB1-11	RED	25A	B4037068-001
-2	-12	GRN	25B	↓
-3	CA1A5A5TB2-11	YEL	26A	
-4	-12	BLK	26B	↓

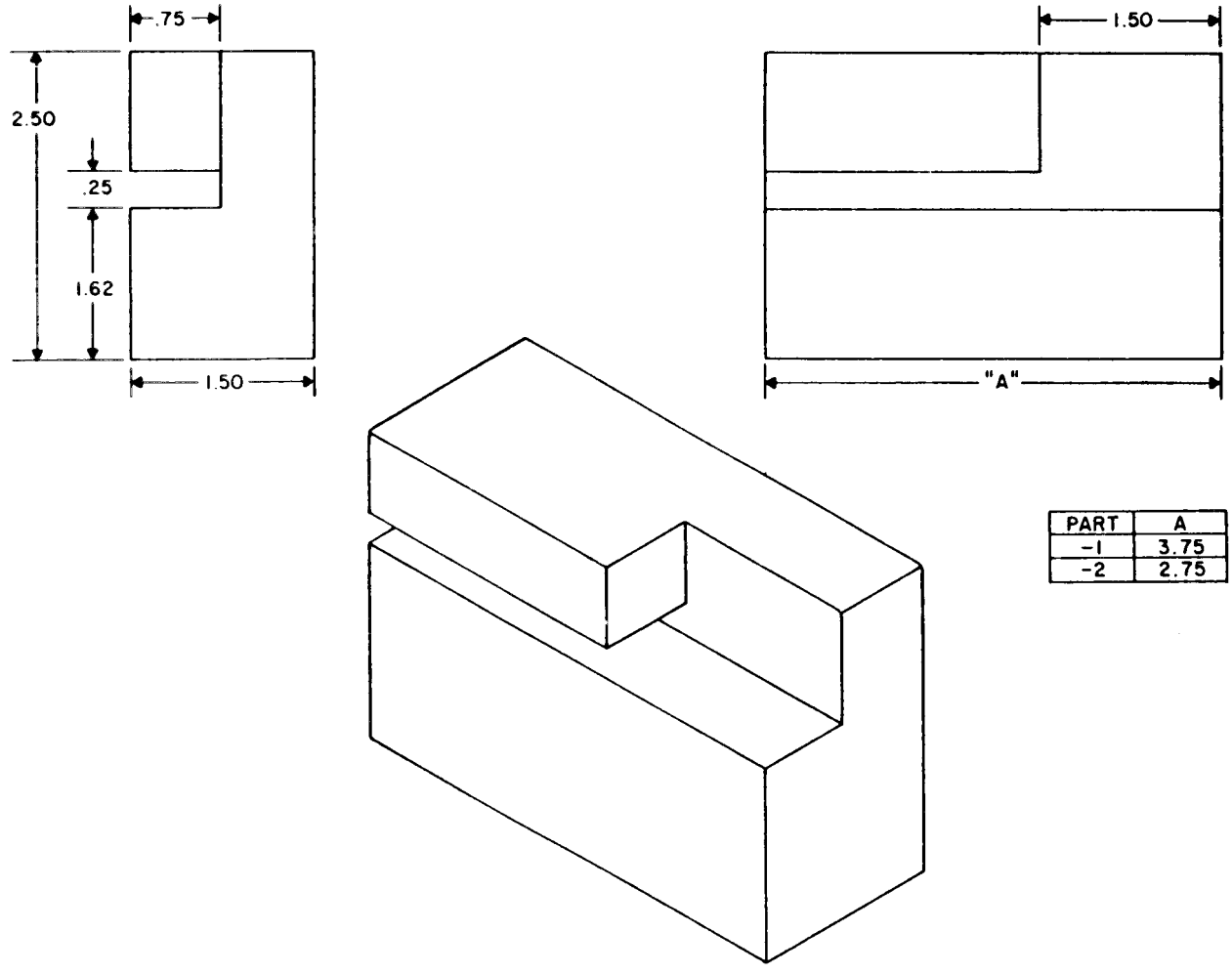
Figure D-41. Communications Equipment Interconnections (25 of 25)

APPENDIX E

ILLUSTRATED LIST OF MANUFACTURATED ITEMS

E-1. INTRODUCTION

This appendix includes complete instructions for making items authorized to be manufactured or fabricated at organizational level.



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NOTES :

1. DIMENSIONAL DATA IS BASED ON AMERICAN NATIONAL STANDARD ANSI-Y145-1973.
2. MARK "56996-B4003972" PER MIL-STD-130
3. WORKMANSHIP TO BE IN ACCORDANCE WITH MIL-STD-454B, REQUIREMENT 9.

MATERIAL: POLYPROPYLENE PER MIL-P-50266

Figure E-1. Shipping B1ock for Card Reader/Punch Stackers

G L O S S A R Y

Section I. DEFINITIONS OF ABBREVIATIONS

The following is a list of abbreviations that are commonly used with DAS3.

ACK	Acknowledge
ACL	Access control list
ACLA	Asynchronous communications line adapter
ACU	Automatic calling unit
ADP	Automated data processing
ALML	Alarm light
ALPHA	Alphabetical
ALRM	Alarm
ANS	Answer back
ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
ASM	Assembly
ASYNC	Asynchronous
AUTO	Automatic
AUX	Auxiliary
BDC	Basic device controller
BEL	Bell
BELS	Bell signal
BOT	Beginning of tape
BOT	Beginning of test
BPI	Bits per inch
BPS	Bits per second
BRK	Break
BS	Backspace
CACL	Common access control list
CAN	Cancel
CAP	Capital
CE	Clean entry
CI	Control interval
CIP	Commercial instruction processor
CLM	Configuration load manager
CLR	Clear
COEI	Components of end item
COMM	Communications
CONS	Console
CONT	Continued
CONT (PANEL)	Control panel
CORR	Correction
CP	Command processor
CP	Console printer
CPI	Characters per inch
CPS	Characters per second
CPU	Central processor unit
CR	Carriage return
CRB	Clock request block

CRBAR	Crowbar
CRT	Cathode ray tube
CT	Console terminal
CTB	Clock timer block
CTC	Cleaner transport control
CTL	Control
DAA	Data access arrangement
DC1	Device control 1
DC2	Device control 2
DC3	Device control 3
DC4	Device control 4
DCE	Data communications equipment
DD	Disk drive
DEL	Delete
DEVC	Device
DLCP	Dual-line communications processor
DLE	Data link escape
DMA	Direct memory access
DRU	Data recovery unit
DSR	Data set ready
DTE	Data terminal equipment
DUP	Duplicate
ECHO	Echoplex
EDAC	Error detection and correction
EIA	Electronic Industries Association
EM	End of medium
EMG	Emergency
EMI	Electromagnetic interference
ENQ	Enquiry
EOF	End of file
EOT	End of tape
EOT	End of test
EOT	End of transmission
ESC	Escape
ETB	End of transmission block
ETX	End of text
FCB	File control block
FCNT	Full count (signal)
FDB	File description block
FF	Form feed
FIB	File information block
FILE PROT	File protect
FL	Filter
FS	Field separator
FSK	Frequency shift keying
FTU	Field test unit
GD	Ground
GRD	Ground

HEX	Hexadecimal
HVS	High voltage switcher board
INT	Interface
I0, I/0	Input/Output
IORB	Input/output request block
IPS	Inches per second
ISA	Interrupt save area
KSR	Keyboard send/receive
LAF	Long address format
LCP	Control panel circuit board (line printer)
LED	Light emitting diode
LHD	Line hammer decoder board
LF	Line feed
LOG	Logic
LPT	Line printer
MAC	Maintenance allocation chart
MCB	Motor control board
MDC	Multiple device controller
MEM SAV PS	Memory save power supply
MLCP	Multi-line communications processor
MMU	Memory management unit
MPDC	Medium performance disk controller
MSC	Mass storage controller
MSC	Mass tape unit
MTC	Magnetic tape (unit) controller
MTU	Magnetic tape unit
MULT	Multiple
MUX	Multiplexer
NAK	Negative acknowledgment
NRZ	Nonreturn to zero
NRZI	Nonreturn to zero inverted
NUL	Null
OPT	Option/Optional
ORU	Optimum replaceable unit
PC	Print complete (signal)
PDU	Power distribution unit
PE	Phase encoded
PIO	Physical input/output
PLO	Phase lock oscillator
PROG	Program
PROM	Programmable read only memory
PSR	Power supply regulator board
PWB	Printed wiring board
QLT	Quality logic test

RA	Right adjust
-RA	Minus right adjust
RAM	Random access memory
REL	Release
RET	Return
RFI	Radio frequency interference
RFP	Ready for printing (signal)
ROM	Read only memory
ROP	Receive only printer
RPT	Repeat
RS	Reader stop
RSU	Reserved for system use
RTC	Real time clock
RX	Receive/receiver
SERVO	Servo motor or mechanism
SI	Shift in
SO	Shift out
SOH	Start of heading
SOP	Standard operating procedure
SP	Space
STX	Start of text
SUB	Substitute
SYN	Synchronous idle
SYNC	Synchronous
TC	Tape cleaner
TD	Tape drive
T & V	Test and verification
TMDE	Test, measurement and diagnostic equipment
TP	Test point
TRIAC	Three-element semiconductor
TRB	Task request block
TS	Troubleshooting
TSA	Trap save area
TX	Transmit
TYP	Typical
UAR/T	Universal asynchronous receiver/transmitter
US	Unit separator
USART	Universal synchronous/asynchronous transmitter/receiver
VER	Verify
VFU	Vertical format unit
VT	Vertical tabulation
WDT	Watch dog timer
XPS	Power control board (line printer)

Section II. DEFINITION OF UNUSUAL TERMS

ADAPTER. A printed circuit board which is attached to a controller board. Used as an interface control between the computer and a peripheral device. Also called daughter board or pac.

ALINEMENT DISK PACK. Magnetic disk pack used to aline the heads in the disk drive. Also called CE Pack.

ANALOG . When used in telecommunications, means a continuous electrical signal that varies n frequency or amplitude in relation to a digital input. Since digital signals cannot be transmitted, the modem is used to convert digital data into analog signals which can be transmitted.

APPLICATION PROGRAM. A user-written program for the solution of a business, industrial, or scientific problem.

ARGUMENT. User-selected items of data that are passed to a procedure. For example, system service macro call arguments that are passed to the called system service, or command arguments passed to the invoked task (see parameter).

ASCII. American Standard Code for Information Interchange. The standard used for transmission of data between computer systems and remote terminals over telephone lines.

ASYNCHRONOUS. Data communications which is not time related. Uses stop and start bits instead of time pulses to organize data for transmission.

ATTRIBUTE. A characteristic of a display field by which the field is enhanced, modified, or limited.

BACKPANEL. See bus.

BACKPLANE. See bus.

BAUD . A unit of measure for data transmission. One baud equals one bit per second.

BAUD RATE. Rate of data transmission expressed in bauds.

BOOTSTRAP. A procedure used by a computer operator to load a software program into the computer from an input device. Procedure may also call up program for use.

BOOTSTRAP ROUTINE. A routine, contained in a single record that is read into memory by a ROM bootstrap loader, which reads the operating system into memory. (See ROM bootstrap loader.)

BREAK . A user action, initiated by pressing the break or interrupt key, that interrupts a running task so that commands can be entered. After the break, the interrupted task can be restarted or terminated.

BUFFER. I/0. A storage area used to compensate for the differences in the flow rates of data transmitted between peripheral devices and memory.

BUFFER MEMORY. An electronic memory which stores data column by column until all 80 columns are accounted for; and from which cards are punched and printed.

BUS. An assembly used to join several logic boards into one working component. For example, the bus in a minicomputer may join device controller boards, memory boards and a compiler into one working unit. Also called backpanel, backplane, or megabus.

BYTE . A sequence of eight consecutive binary digits operated upon as a unit.

CE PACK. See alinement pack.

CHECKPOINT. A point in the user's program to which control can be returned and processing resumed following a task group abort. When the user takes a checkpoint, the system records the current contents of user memory and the current status of tasks, files, and screen forms on a checkpoint file. See restart.

CHECKPOINT FILE. A user-named file on which the system records the current status of the group request when a checkpoint is taken. Checkpoint files are created in pairs and checkpoints are written alternately to each file.

CLEANPOINT. A point in the user's processing in which the user considers all file updates to be valid. See rollback.

CLOCK MANAGER. A monitor component that handles all requests to control tasks based on real-time considerations, and requests for the time-of-day and date in ASCII format.

CLOCK REQUEST BLOCK. A control structure supplied by a task to request a service from the Clock Manager.

CLOCK SCAN CYCLE. The time in milliseconds between clock-generated interrupts.

CLOCK TIMER BLOCK. The control structure used by the clock manager to control the clock-related processing of tasks.

COMM PAC. Adapter board used for communications interface.

COMMAND. An order that is processed by the command processor.

COMMAND INPUT FILE (COMMAND-IN). Any file or device from which commands to the command processor are read.

COMMAND LANGUAGE. The set of commands that can be issued by a user to control the execution of the user's on-line or batch task.

COMMAND LEVEL. The state of the command processor, when it is capable of accepting commands, indicated by the display of the RDY (ready) message.

COMMAND PROCESSOR. A software component that interprets control commands issued by the operator or a user, and invokes the required function.

COMMERCIAL INSTRUCTION PROCESSOR. A computer component that includes an enhanced instruction set providing native commercial mode instructions.

COMMERCIAL SIMULATOR. A software component that executes a set of business-oriented instructions.

COMMON ACCESS CONTROL LIST. A list specifying the access rights to all files or directories subordinate to the directory in which the list is established.

COMMUNICATIONS DEVICE. A device that transfers data over communications lines and is connected through the MLCP.

CONTROL CHARACTER. An ASCII character interpreted by a device (such as a terminal) as having a keyboard control function.

CONTROL INTERVAL. The unit of transfer between main memory and the storage medium (primarily disk devices). Is comparable to a "block" for tapes. The size is specified by the user and remains constant for a file. For disk files, the size of the CI Must be a multiple of 256 bytes. A UFAS file is composed of CI's which are numbered starting at one. The control interval also determines the buffer size.

CROWBAR. A signal from the power regulator on the power supply board (XPS) to the crowbar circuit on the power supply regulator board (PRS) that turns off the high voltage supply in case of overcurrent detection.

CRT. Cathode-ray tube. An electron tube used for visual display purposes.

CURRENT LOOP. Serial method of transmitting data through wire, such as the interface wiring between two devices.

DAA CONNECTOR. Data Access Arrangement connector. Manufacturer's name for modem connector leading to transmission lines.

DAUGHTER BOARD. See adapter and device pac.

DEVICE PAC. An adapter used as the interface between the CPU and peripheral devices.

DIBIT. A group of two bits. In four phase modulation each dibit is encoded as one of four unique carrier phase shifts.

DIPSWITCH. Miniature rocker switch used to select configurations of circuit boards.

DISK. A generic name for mass storage devices such as diskette, cartridge disk, and storage module.

DTE CONNECTOR. Data Terminal Equipment connector. Manufacturer's name for modem connector leading to computer.

DUAL-LINE COMMUNICATIONS PROCESSOR. A programmable interface between a central processor and communications devices consisting of two lines.

ECHO (ECHOPLEX). Communications mode in which a data signal must pass through the computer before it is displayed at the terminal. Also called echoplex.

EDAC. Error Detection and Correction. Memory circuit which automatically corrects hardware-caused single bit data errors.

EIA. Electronic Industries Association. A trade organization of the electronics industry which sets technical standards used by government agencies and the electronics industry.

EMI. Electro-Magnetic Interference. Electronic signals which can interfere with the operation of equipment such as data processing devices.

ERROR LOGGING. Collection of memory and/or hardware-related error statistics for selected peripheral devices.

FIELD. A group of adjacent columns on a 80-column card, all of which contain either alphabetic or numeric data. Each type of field may also contain blank columns.

FIRMWARE. Programs or instructions stored in read-only memories. Software stored in hardware form.

FONT. Set of print characters in a particular size or style.

FREQUENCY SHIFT KEYING. A modulation-demodulation technique that shifts between two preset frequencies. A one bit is transmitted at one frequency and a zero bit is transmitted at the other frequency.

FULL DUPLEX. Communications mode which a11ows transmission and reception at the same time.

HALF DUPLEX. Communications mode which allows transmission and reception but not at the same time.

HALT. Automatic interruption in data processing caused by software or hardware fault.

HEAT SINK. A metal device used for absorbing and dissipating heat.

HEXADECIMAL. A base 16 number system using O, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F as numerical symbols.

HYSTERESIS. Residual magnetic force left in iron after a magnetic field is passed through it.

HYSTERESIS BRAKE. Stopping device built into an electric motor which uses hysteresis effect to prevent coasting after motor is powered off. Used in tape drive units to prevent tape from unraveling when unit is stopped.

INITIALIZE. Operator action required to ready a computer system for operation. Includes power ON and bootstrapping procedures.

INPUT/OUTPUT DEVICE. A peripheral or communications device such as a keyboard video display terminal.

INPUT/OUTPUT REQUEST BLOCK. A control structure used for communication between a program and an I/0 driver outside of the file system.

INTERFACE BOARD. An electronic printed circuit board that enables a computer to communicate with a peripheral device such as the card reader/punch.

INTERRUPT. Signal which tells computer to stop current processing to begin program having a higher priority.

JUMPER. A removable metal device for jumpering two pins together. Various jumper positions are available to configure a circuit for use with a specified system.

KEY. An identifier for a specific record within a disk file.

LAF. Long Address Format. 20-bit main memory addressing.

LEADER. Short length of magnetic tape at beginning and end of reel (usually before B0T marker and after EOT marker). Used for threading only. Should never contain record data.

MDC . Multiple Device Controller for peripheral devices other than cartridge disk, storage module, and magnetic tape.

MEDIA. An item such as a punch card, magnetic disk, print paper, punch tape, or magnetic tape on which data may be stored.

MEGABUS. See bus.

MEMORY MANAGEMENT UNIT. A hardware feature which intercepts all addresses generated by the CPU (virtual addresses) and transforms them to real memory addresses via its mapping array.

MEMORY PAC. Memory adapter board mounted on the memory controll er.

MEMORY SAVE AND AUTORESTART UNIT. A hardware feature that can preserve the memory image during a power failure lasting up to two hours.

MINUS RIGHT ADJUSTED FIELD. A numeric card field in which data has been moved from the leftmost columns to the rightmost columns and to which a minus (negative) value has been assigned. Primarily used for dollar-value fields.

MISFEED. A card either does not feed from a hopper, or feeds to a wrong position in the card transport sections of the mechanical assembly.

MISTOR. Magnetic sensor which detects changes in a magnetic field.

MODEM . Modulator-Demodulator. A device which converts digital data to analog form so it can be transmitted. Also receives analog form and converts it to digital data so it can be processed by a computer system.

MOTHER BOARD. See controller.

MSC . Mass Storage Controller for disk packs.

MTC . Magnetic Tape Controller for magnetic tapes.

MULTILINE COMMUNICATIONS PROCESSOR (MLCP). A programmable interface between a central processor and one or more communications devices. Can be programmed to handle specific communications devices.

NRZ. Non Return to Zero. A method of recording data on magnetic tape.

NRZI. Non Return to Zero Inverted. An inverted form of the NRZ recording method.

PAC. Any adapter or device board which plugs into a controller board. Also called daughter board.

PACK, DISK PACK. Magnetic media used for storage of data.

PACKING DENSITY. The number of useful storage elements per unit of dimensions, also the number of bits (characters) per inch stored on a magnetic tape.

PADDLEBOARD. A type of cable connector shaped like the broad end of a paddle.

PARABOLA. Moulded plastic component. Uses a curved reflecting surface to send light from a lamp through the punched holes of an 80 column card and into a light sensor device.

PARALLELISM. Refers to a constant distance between printhead and platen over the full length of head travel.

PARITY INHIBIT. Process of preventing parity bit additions and parity checks.

PARITY (BITS). A common technique for error detection in data transmission. Parity check bits are added to the data so that each group of bits adds up to an even number for even parity and an odd number for odd parity.

PE. Phase Encoded. A method of recording data on magnetic tape.

PERIPHERAL. Any component of a data processing system such as term inal, printer, tape drive, or disk drive.

PHASE ENCODED. A method of recording data on magnetic tape.

PHYSICAL INPUT/OUTPUT. Physical input/output, or physical I/0, which is initiated through a request I/0 macro call, outside of the file system, using IORBs.

PLATEN . Cylinder behind the paper in a printer. Provides hard striking surface for printing mechanism.

PLUGMOLD. Type of ac power outlet containing molded connectors in a strip.

PROM. Programmable Read Only Memory. A high speed permanently coded metal oxide semiconductor memory can be erased and reprogrammed.

QLT. Quality Logic Test. A hardware verification routine stored in the firmware of the CPU.

QUASI-ANALOG. A method of changing digital data to analog form using frequency shift keying as the analog form. See analog and modem.

RADIO FREQUENCY INTERFERENCE. See electro-magnetic interference.

RAM . Random Access Memory. A high speed, semiconductor memory commonly used for registers.

RANGE. The number of bytes transferred during an I/0 operation.

RECORD . A user-created collection of logically related data fields. Records are treated as a unit by the user and may be fixed or variable in length.

RED ERROR. Error code indicating probable hardware failure. Usually given after a series of yellow errors.

REQUEST I/0. Macro call, issued to a driver that performs physical input/output.

RESIDUAL RANGE. The difference between the number of bytes requested and the number of bytes transferred during an I/0 operation.

RESONATOR. Tuned circuit in power input transformer used to reduce hysteresis effect.

RESTART. A user-initiated process in which the system locates the most recently completed checkpoint on the checkpoint file and reads the checkpoint image, rebuilding the Executive data structures and memory blocks, reloading bound units, and repositioning active user files. See also checkpoint.

RIGHT ADJUSTED FIELD. Card field in which data has been moved from the leftmost columns to the rightmost columns, leaving leftmost columns blank. (Leftmost columns may be zero-filled at operator option.)

ROM BOOTSTRAP LOADER. A firmware routine (activated by pushing the Load key on the control panel) that reads the first record from a designated disk into memory.

RS-232-C INTERFACE. An EIA standard interface used to connect printers, terminals and modems to a computer system.

SAF . Short address format. 16-bit main memory addressing.

SCRATCH PACK. A blank disc pack (or pack containing worthless data) that can be placed in a dish drive for temporary data storage.

SERVO. A device or mechanism which automatically moves a control or series of controls.

SERVO HEAD. A mechanism used to move data heads to the read/write location on a disk pack. The servo head reads data from the magnetic surface of disk and uses it to position read/write heads.

SOFTWARE. Programs, routines and codes which instruct a computer to perform its function in a data processing system.

SOURCE DOCUMENT. Paper or papers defining fields to be used and information to be keypunched into cards.

SPANNED RECORD. A record that spans a control interval or block.

SPEED TRANSDUCER. A device which measures the speed of a spinning disk pack and converts it to an electronic signal used to operate a control.

STANDARD I/0 FILES. The command-in, user-in, user-out, operator-out, and error-out files.

STRAP . A jumper used across specific terminals to preset conditions for a peculiar application.

SYNC. Any signal that allows one device to operate precisely in step with another.

SYNCHRONOUS. Data communications which operates at one baud rate and does not need stop and start bits for transmission.

TECHNICAL POWER. Ac power which is controlled and filtered safe for use by ADP equipment.

TERMINAL. An input/output device. Also, a device specified for use in interactive communications between the computer operator and application software.

TERMINATE. A system service macro call request issued by the currently executing task at the end of its normal processing.

TERMINATOR. Board used to provide circuit continuity at either end of a bus.

TRANSDUCER. A device which measures a quantity such as speed and converts it to an electrical signal. An analog device.

TRANSPARENT MODE TRANSMISSION. A data transmission mode that allows data consisting of bytes having any bit configuration to be transmitted over communications lines. Thus, control characters can be transmitted as data.

TRIAC. A three-element solid state device used to control current in power circuits.

T&V. Test and Verification Program. Software routines used to test hardware, consists of central subsystem tests, I/0 subsystem tests, and communication subsystem tests. Usually stored on a disk pack or tape.

UNPROTECTED FIELD. A display field for which the operator can use the keyboard to enter, modify, or erase data.

UTILITY POWER. Uncontrolled power which can be used for lights and some support equipment. Not safe for use by ADP equipment.

VERIFYING. Process of determining the accuracy of data punched in an 80-column card. Data on the card is read into memory and compared with data keyed in from the same source document as used for punching the card.

VOLTAGE TRANSIENTS. A temporary stray voltage which may consist of voltage spikes, static variations, or a second erratic voltage wave superimposed on the incoming voltage.

WAIT. A task is in the wait state when it causes its own execution to be interrupted until a time request is satisfied, until another task releases a semaphore, until another task terminates, or until an I/0 operation terminates.

WORD. A sequence of l6 consecutive binary digits operated upon as a unit; two consecutive bytes.

YELLOW ERROR. An error code which tells the operator the EDAC memory has found and corrected a bit error during processing.

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
2-25	2-28		
3-10	3-3		3-1
5-6	5-8		
		F03	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Recommend that the installation antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o}.

REASON: Experience has shown that with only a 1^{o} lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2^{o} without degradation of operation.

Item 5, Function column. Change "2 db" to "3db."

REASON: The adjustment procedure the the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.

Add new step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE
I. M. DeSpiritof

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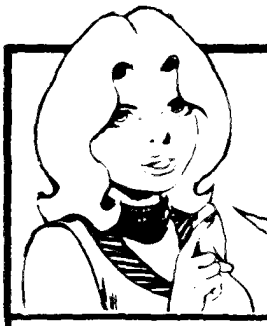

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PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-7010-205-23-1	13 May 85	Automated Data Processing System AN/MYQ-4A

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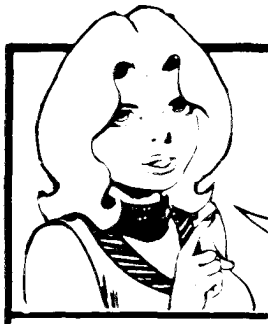

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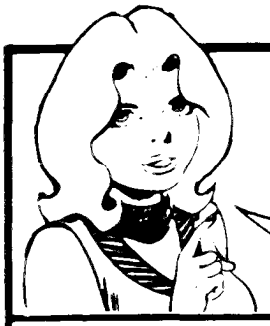

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General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
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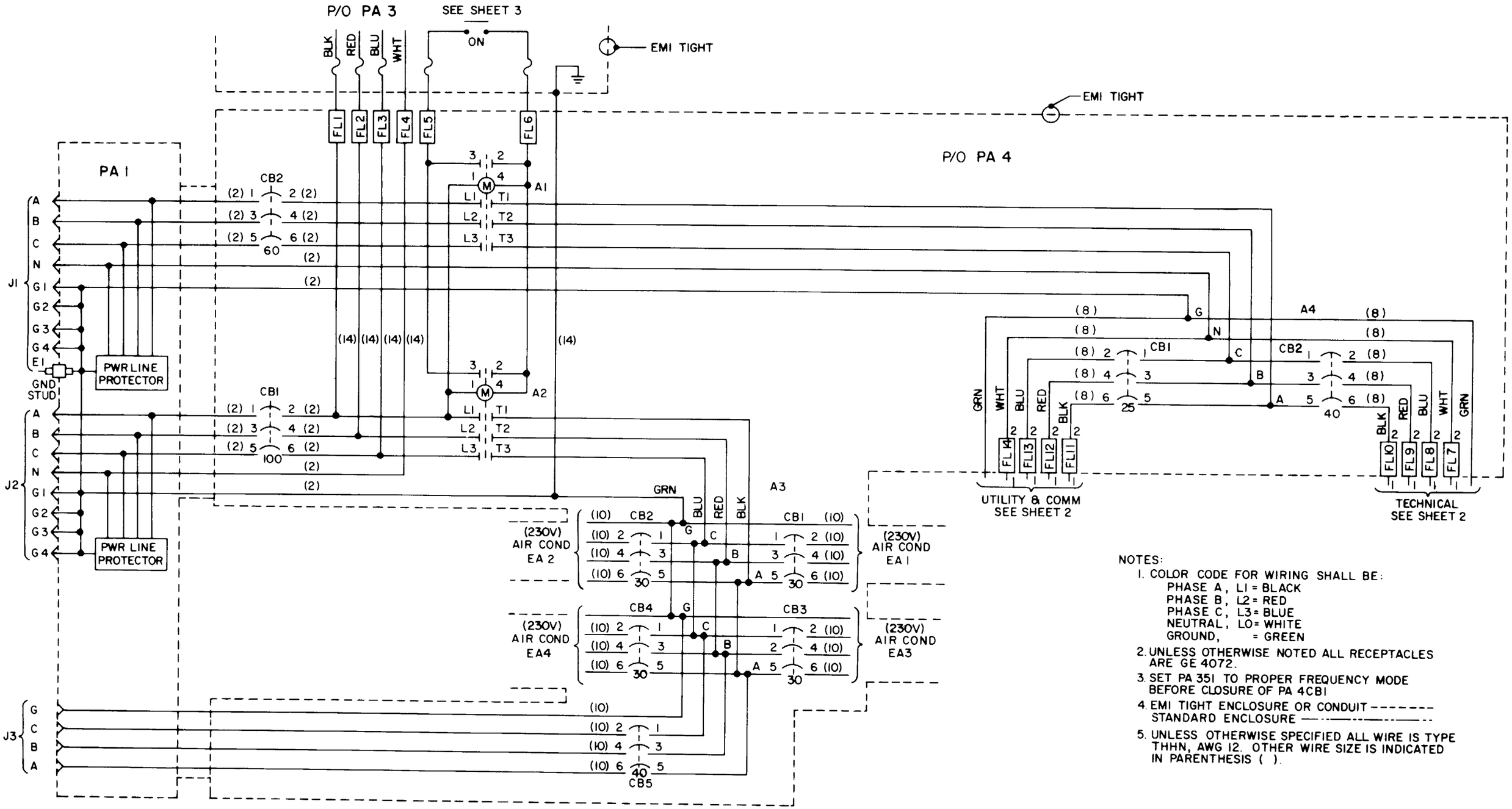
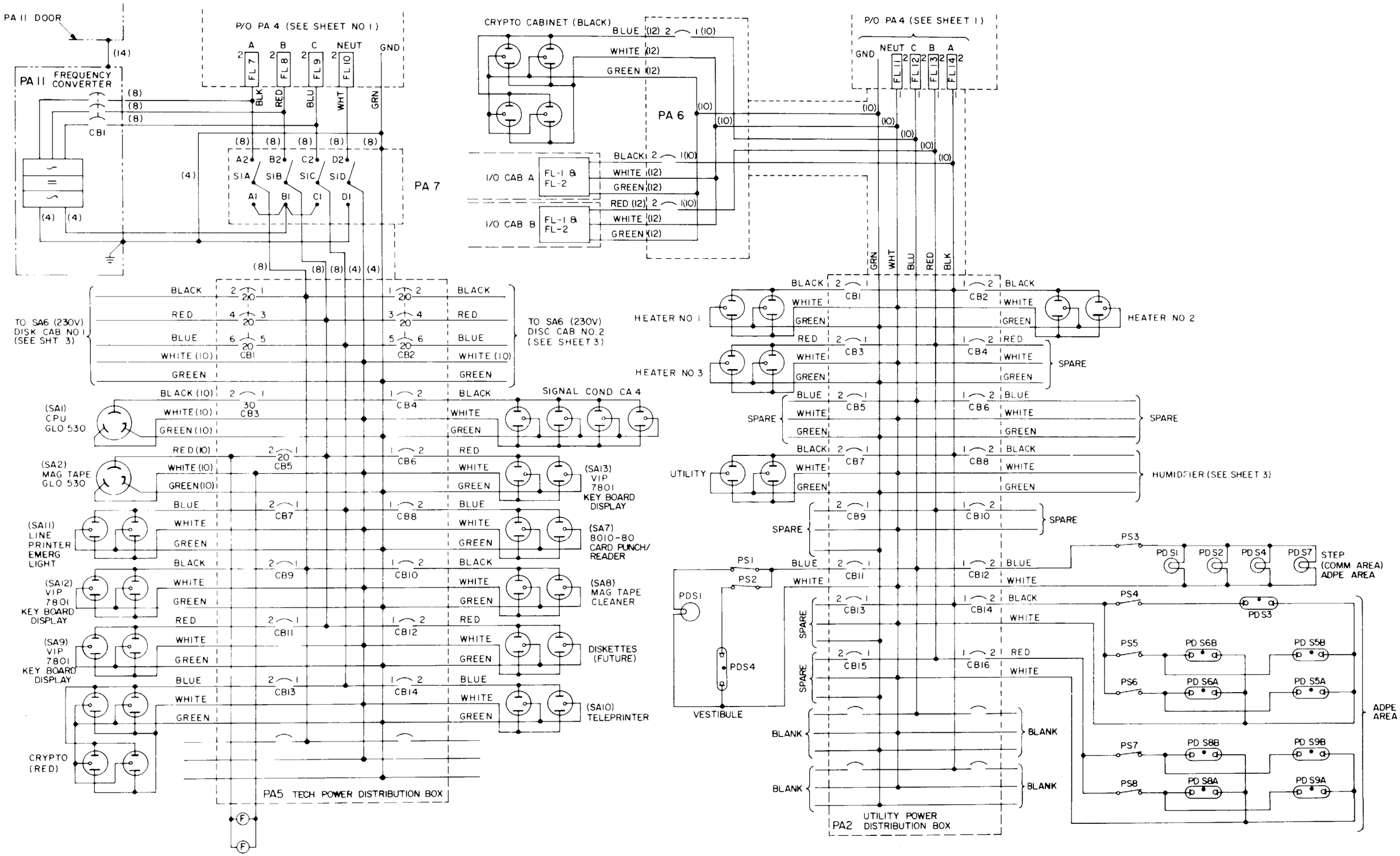


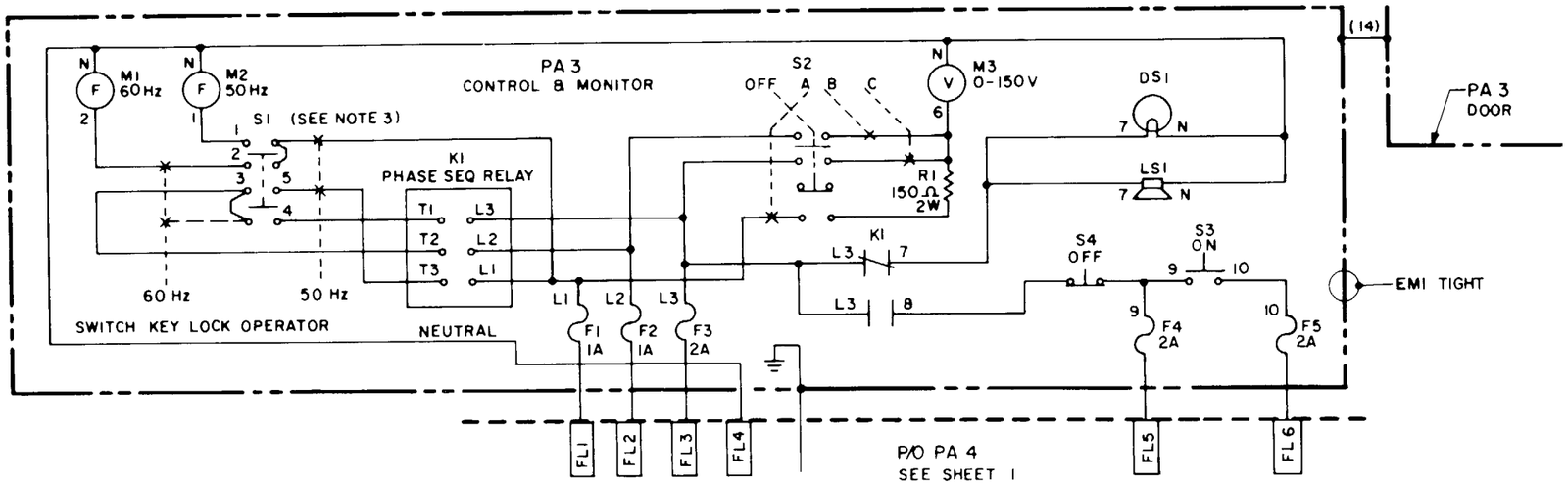
NOTES:

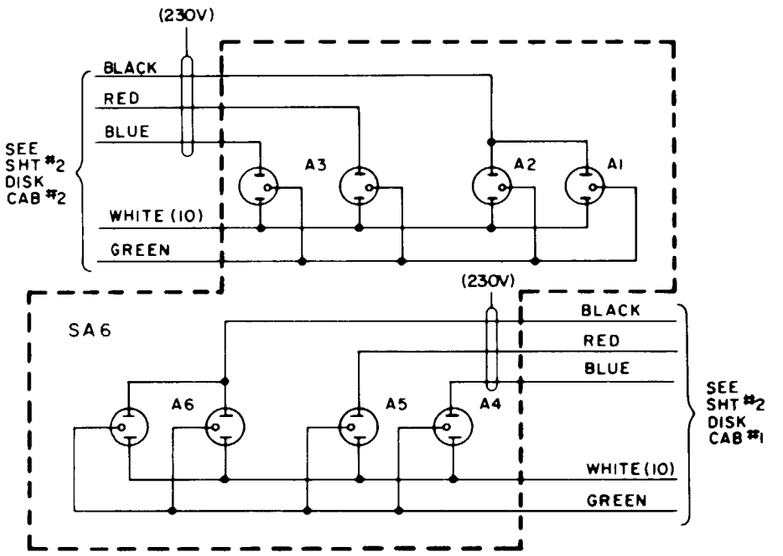
1. COLOR CODE FOR WIRING SHALL BE:
   PHASE A, L1 = BLACK
   PHASE B, L2 = RED
   PHASE C, L3 = BLUE
   NEUTRAL, LO = WHITE
   GROUND, = GREEN
2. UNLESS OTHERWISE NOTED ALL RECEPTACLES ARE GE 4072.
3. SET PA 351 TO PROPER FREQUENCY MODE BEFORE CLOSURE OF PA 4CB1
4. EMI TIGHT ENCLOSURE OR CONDUIT - - - - - - -
   STANDARD ENCLOSURE — · — · — · — · —
5. UNLESS OTHERWISE SPECIFIED ALL WIRE IS TYPE THHN, AWG 12. OTHER WIRE SIZE IS INDICATED IN PARENTHESIS ( ).

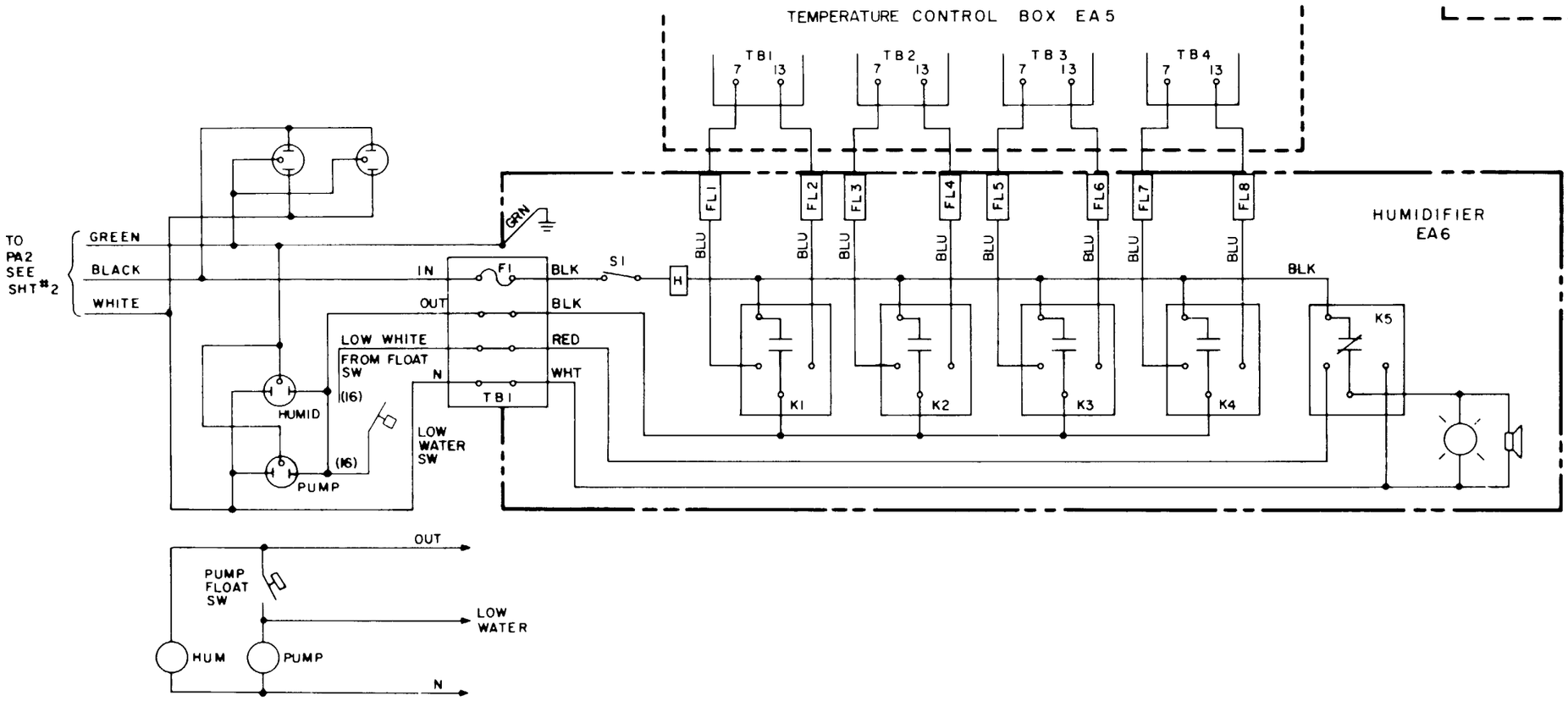
FO-1 : Power Distribution DAS3 (D/C)
(1of3)



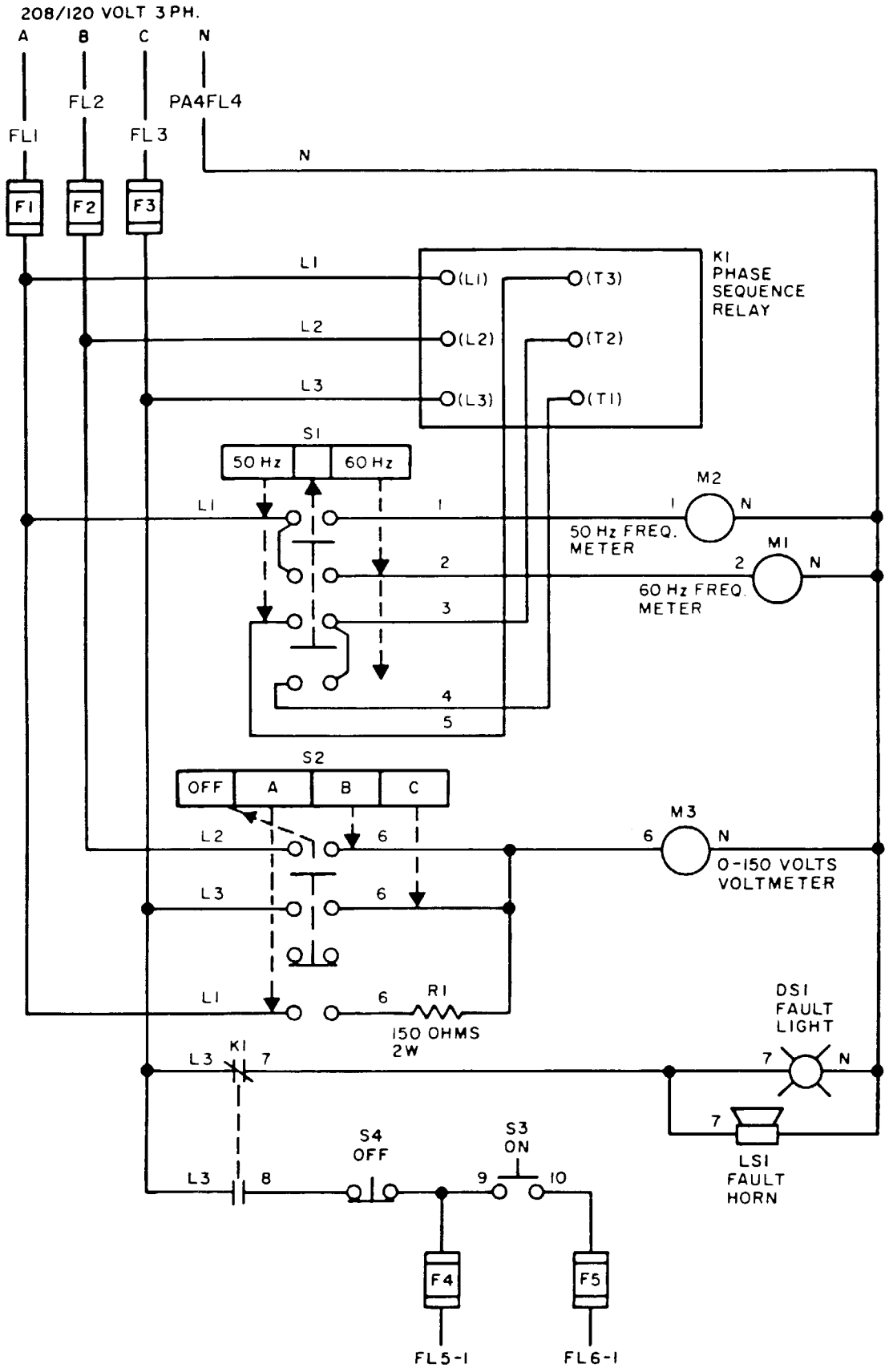
FO-1 : Power Distribution DAS3 (D/C) (2 of 3)

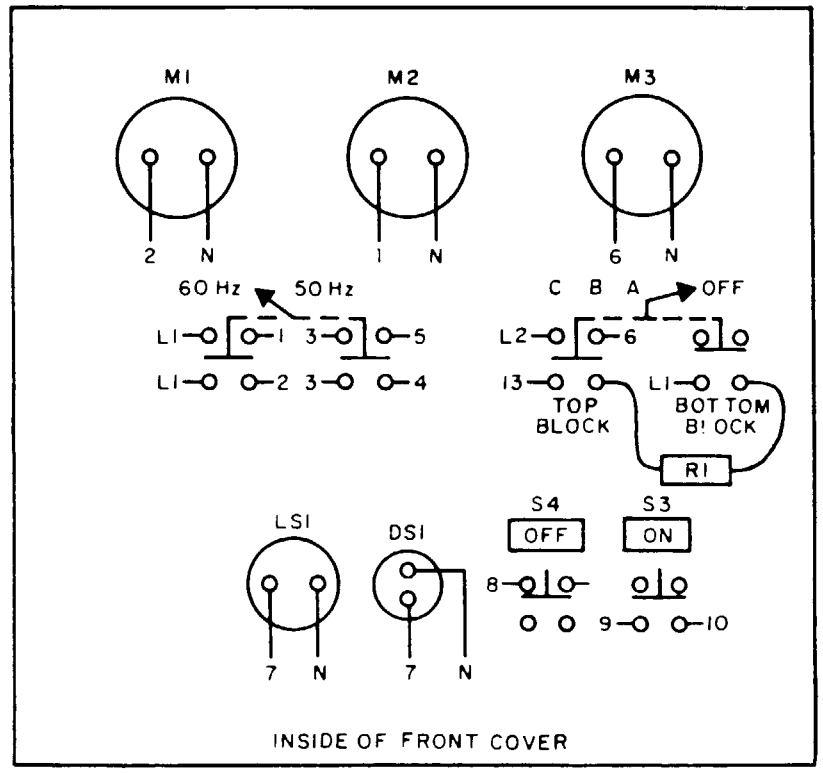


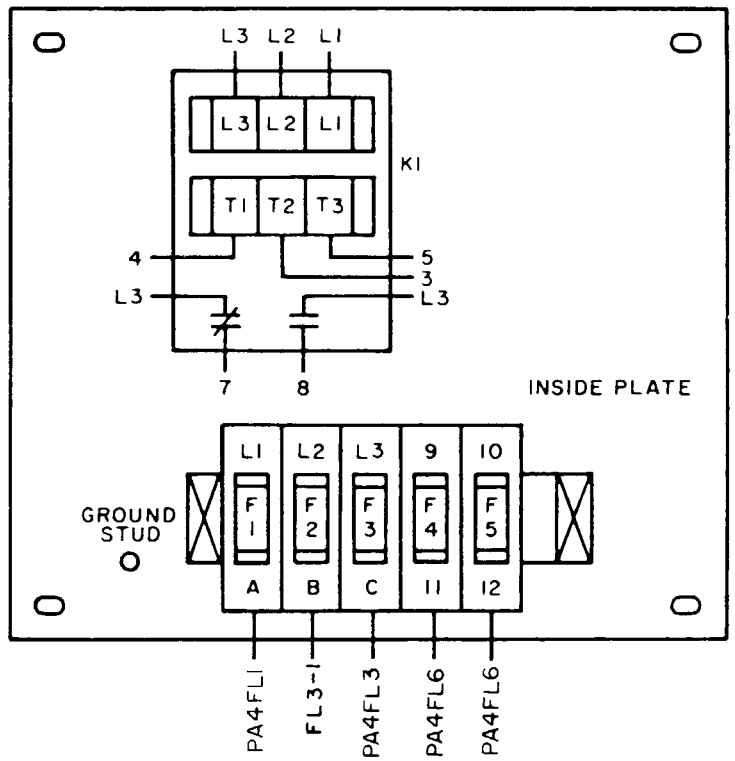




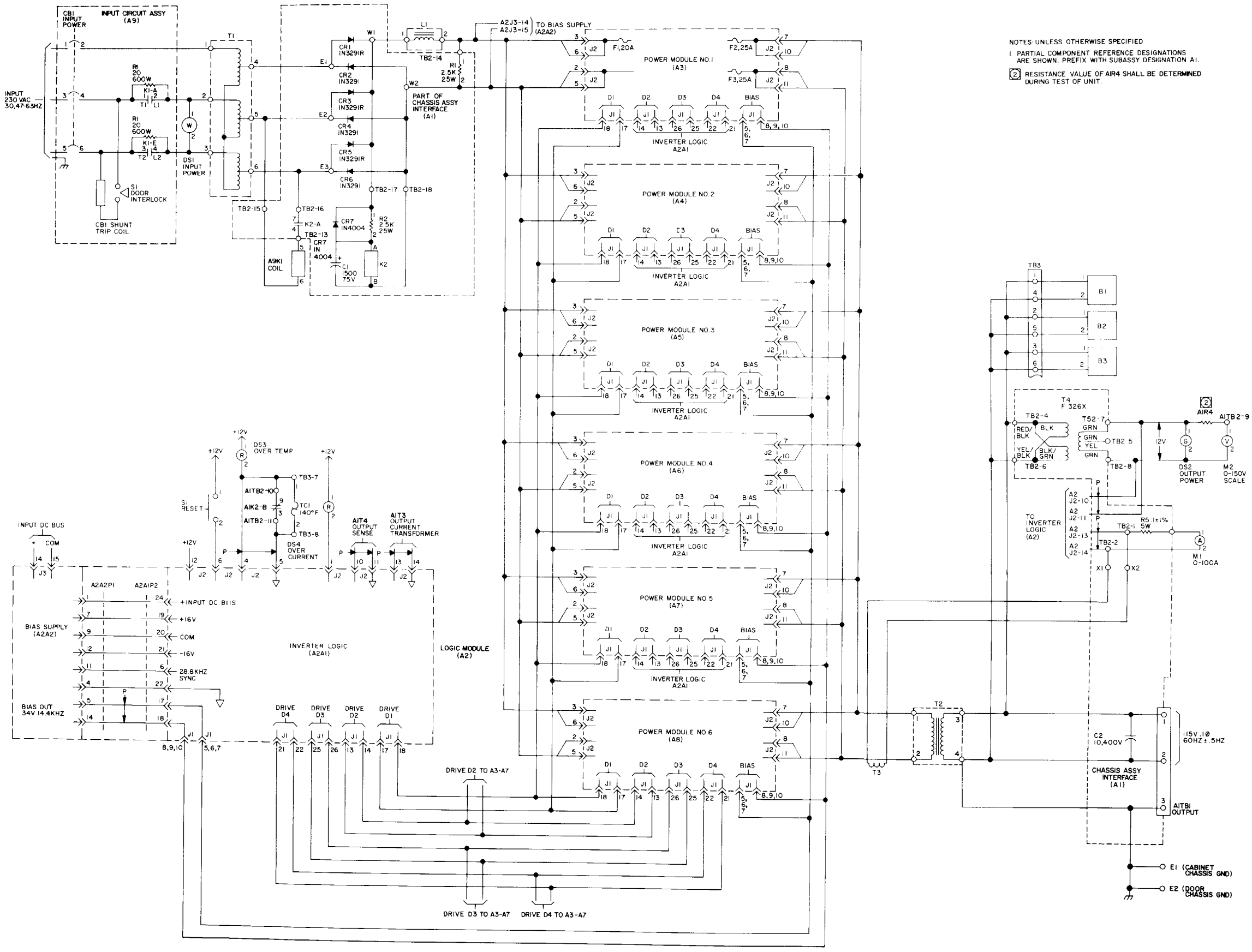
FO-1 : Power Distribution DAS3 (D/C)
(3 of 3)



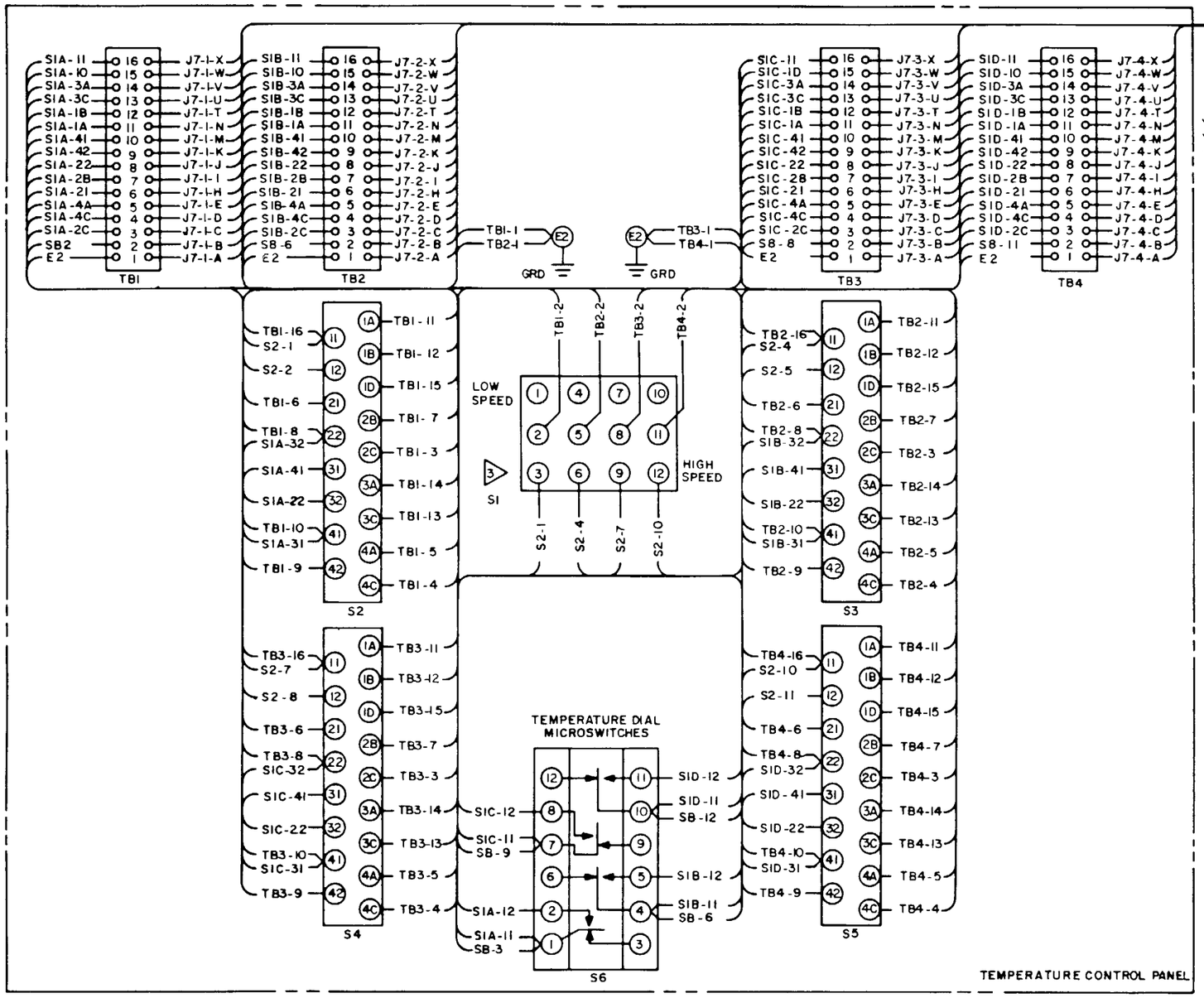


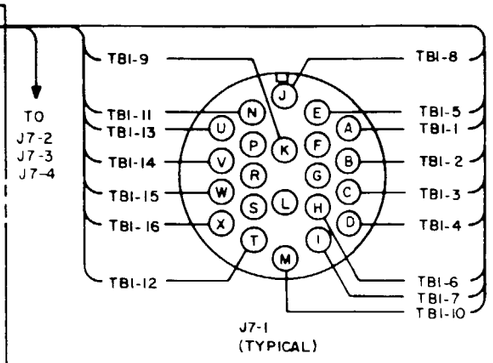


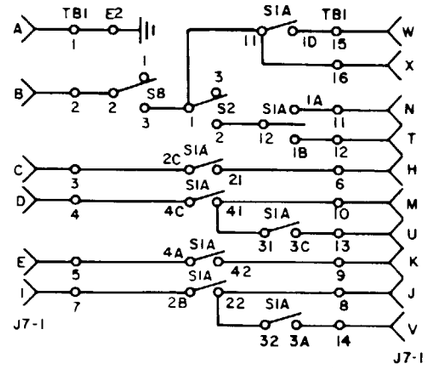
FO-2: Power Control and Monitor Box



FO-3: Frequency Converter







NO. 1 UNIT ELECTRICAL SCHEMATIC (TYPICAL)

FOR NO. 2 UNIT SCHEMATIC

CHANGE TB1 TO TB2
CHANGE J7-1 TO J7-2
CHANGE S8 TERMINAL DESIGNATIONS FROM 1,2 &3 TO 4,5 &6
CHANGE S2 TERMINAL DESIGNATIONS FROM 1,2 &3 TO 4,5 &6

FOR NO. 3 UNIT SCHEMATIC

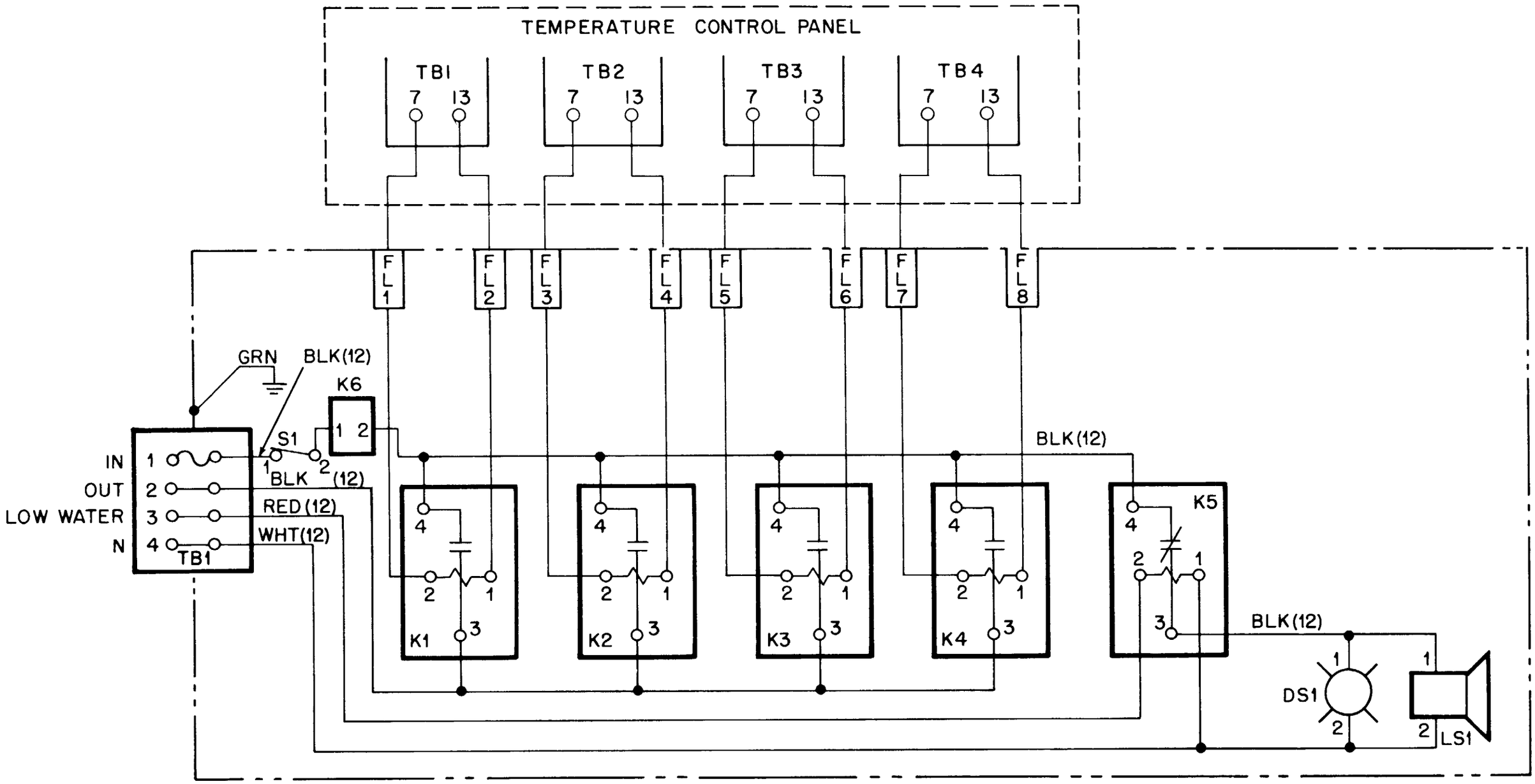
CHANGE TB1 TO TB3
CHANGE J7-1 TO J7-3
CHANGE S8 TERMINAL DESIGNATIONS FROM 1,2 &3 TO 7,8 &9
CHANGE S2 TERMINAL DESIGNATIONS FROM 1,2 &3 TO 7,8 &9

FOR NO.4 UNIT SCHMATIC

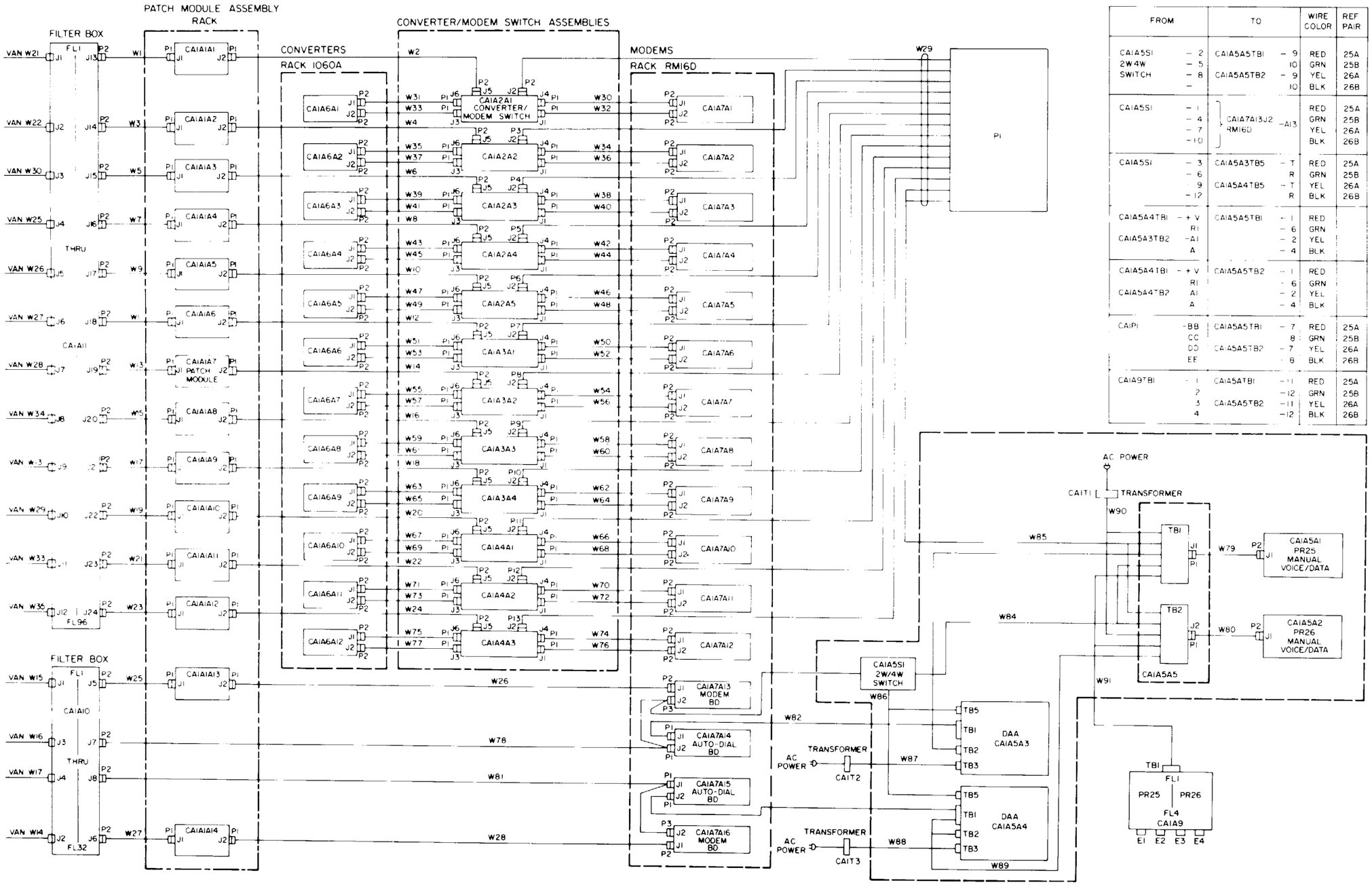
CHANGE TB1 TO TB4
CHANGE J7-1 TO J7-4
CHANGE S8 TERMINAL DESIGNATIONS FROM 1,2 &3 TO 10,11 & 12
CHANGE S2 TERMINAL DESIGNATIONS FROM 1,2 &3 TO 10,11 & 12

LEGEND	
E2	GROUND STUD
J7-1	CONNECTOR PLUG NO. 1 UNIT
J7-2	CONNECTOR PLUG NO. 2 UNIT
J7-3	CONNECTOR PLUG NO. 3 UNIT
J7-4	CONNECTOR PLUG NO. 4 UNIT
S2	SELECTOR SWITCH NO. 1 UNIT
S3	SELECTOR SWITCH NO. 2 UNIT
S4	SELECTOR SWITCH NO. 3 UNIT
S5	SELECTOR SWITCH NO. 4 UNIT
S6	TEMPERATURE CONTROL ALL UNITS
S1	SWITCH FAN SPEED ALL UNITS
TB1-TB4	TERMINAL BOARD

SELECTOR SWITCH S2, S3, S4 & S5 POSITION CHART					
SELECTOR SWITCH POSITION	SWITCH FUNCTION	SWITCH WAFERS AND TERMINALS CONNECTED			
		A	B	C	D
1	HIGH HEAT	12 AND 1A	21 AND 2C 22 AND 2B	31 AND 3C 32 AND 3A	41 AND 4C 42 AND 4A
2	LOW HEAT	12 AND 1A	21 AND 2C 22 AND 2B	31 AND 3C	———
3	OFF	———	———	———	———
4	VENT	———	21 AND 2C 22 AND 2B	31 AND 3C	———
5	COOL	12 AND 1B 11 AND 1D	21 AND 2C 22 AND 2B	31 AND 3C 32 AND 3B	41 AND 4D 42 AND 4B



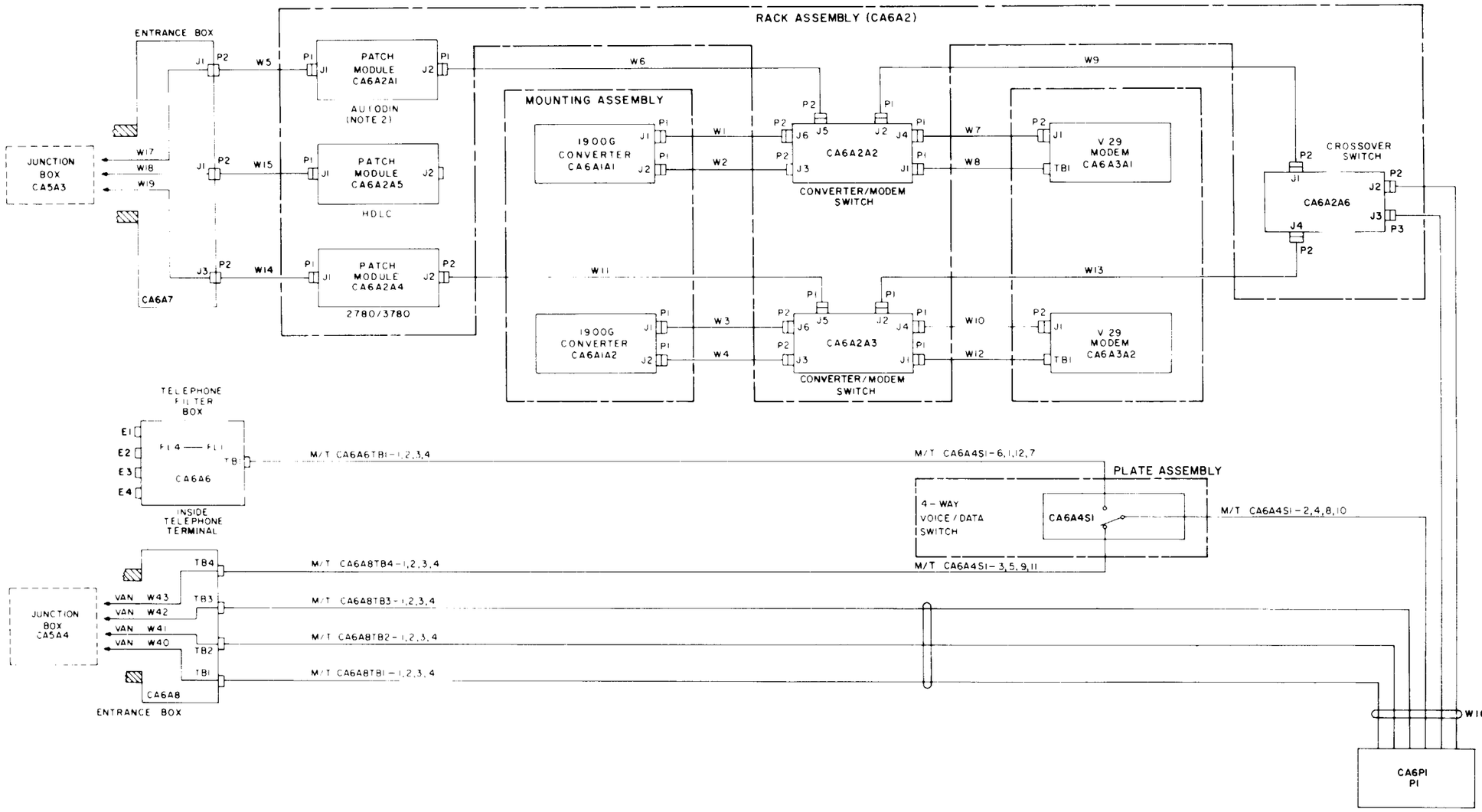
FO-5: Humidity Control Panel



FROM		TO		WIRE COLOR	REF PAIR
CA1A5S1 2W4W SWITCH	- 2 - 5 - 8 -	CA1A5A5TB1 CA1A5A5TB2 	- 9 10 - 9 10	RED GRN YEL BLK	25A 25B 26A 26B
CA1A5S1	- 1 - 4 - 7 -10	CA1A7A13J2 RM16D	-A13	RED GRN YEL BLK	25A 25B 26A 26B
CA1A5S1	- 3 - 6 - 9 -12	CA1A5A3TB5 CA1A5A4TB5 	- T R - T R	RED GRN YEL BLK	25A 25B 26A 26B
CA1A5A4TB1 CA1A5A3TB2	- + V RI -A1 A	CA1A5A5TB1	- 1 - 6 - 2 - 4	RED GRN YEL BLK	
CA1A5A4TB1 CA1A5A4TB2	- + V RI A1 A	CA1A5A5TB2	- 1 - 6 - 2 - 4	RED GRN YEL BLK	
CA1P1	-BB CC DD EE	CA1A5A5TB1 CA1A5A5TB2 	- 7 8 - 7 8	RED GRN YEL BLK	25A 25B 26A 26B
CA1A9TB1	- 1 2 3 4	CA1A5ATB1 CA1A5A5TB2 	-11 -12 -11 -12	RED GRN YEL BLK	25A 25B 26A 26B

FROM		TO		WIRE COLOR	REF PAIR
CA1T1	- 1 - 2	CA1A5A5TB1	- 3 - 5	RED GRN	
	- 1 - 2	CA1A5A5TB2	- 3 - 5	YEL BLK	
CA1A7A14J2		CA1A3A3TBI	DA RI SH SGND CCT DT DR OH	BLK BRN ORN YEL BLU GRN RED WHT	
CA1A7A15J2		CA1A5A4TBI	DA RI SH SGND CCT DT DR OH	BLK BRN ORN YEL BLU GRN RED WHT	
CA1T2	- 1 - 2 - 3	CA1A5A3TB3	-P1 -PG -P2	RED BLK WHT	
CA1T3	- 1 - 2 - 3	CA1A5A4TB3	-P1 -PG -P2	RED BLK WHT	

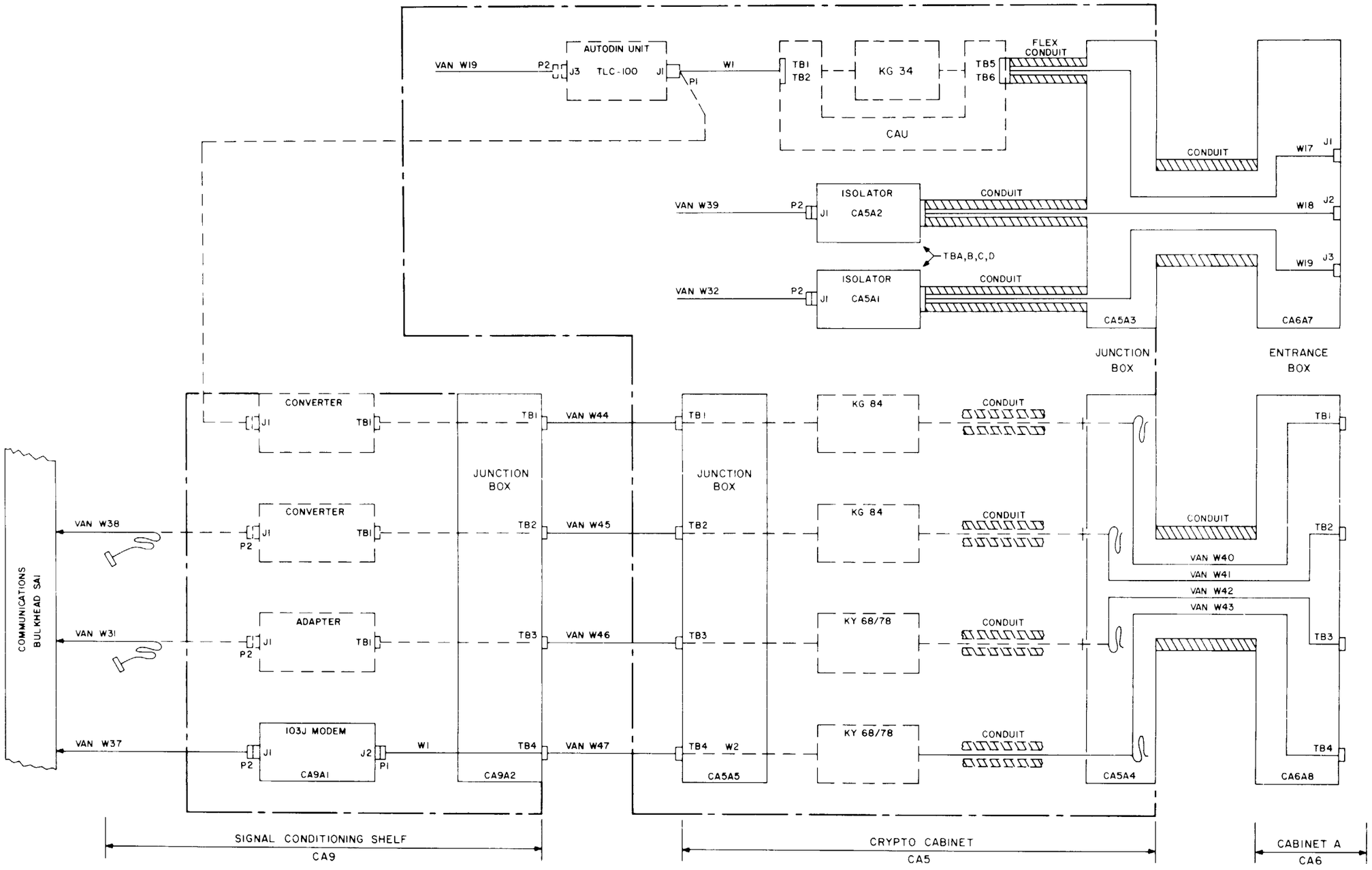
FO-6: Communications Cabinet “B” Wiring Diaqram



W NO	FROM		TO		WIRE COLOR	REF* PAIR
W8	CA6A2A2J1	7	CA6A3A1TB1	1	PUR	1-A
		6		2	ORN	1-B
		5		4	GRA	2-A
		1		5	WHT	2-B
W12	CA6A2A3J1	7	CA6A3A2TB1	1	PUR	3-A
		6		2	ORN	3-B
		5		4	GRA	4-A
		1		5	WHT	4-B
W16	CA6P1	J	CA6A8TB1	1	GRN	5-A
		K		2	ORN	5-B
		L		3	BLK	6-A
		M		4	BRN	6-B
W16	CA6P1	N	CA6A8TB2	1	BLK	7-A
		P		2	ORN	7-B
		R		3	RED	8-A
		S		4	WHT	8-B
W16	CA6P1	T	CA6A8TB3	1	GRN	9-A
		U		2	BRN	9-B
		V		3	RED	10-A
		W		4	BLU	10-B
W16	CA6P1	BB	CA6A4S1	2	RED	25-A
		CC		4	GRN	25-B
		DD		8	YEL	26-A
		EE		10	BLK	26-B
	CA6A4S1	6	CA6A6TB1	1	RED	25-A
		1		2	GRN	25-B
		12		3	YEL	26-A
		7		4	BLK	26-B
	CA6A4S1	3	CA6A8TB4	1	RED	25-A
		5		2	GRN	25-B
		9		3	YEL	26-A
		11		4	BLK	26-B

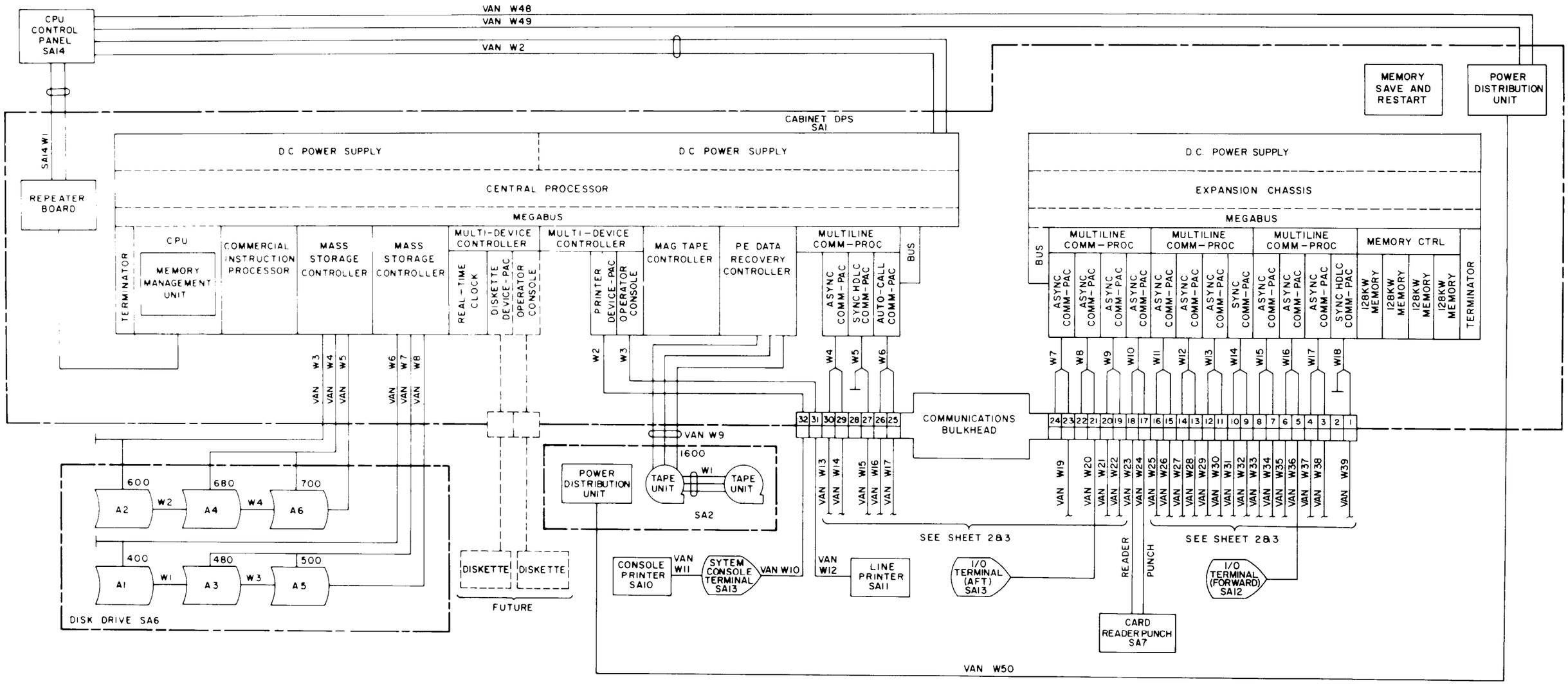
*REFERENCE PAIR ORIGINATES AT SIGNAL ENTRANCE PANEL

FO-7: Communications Cabinet A Wiring Diagram

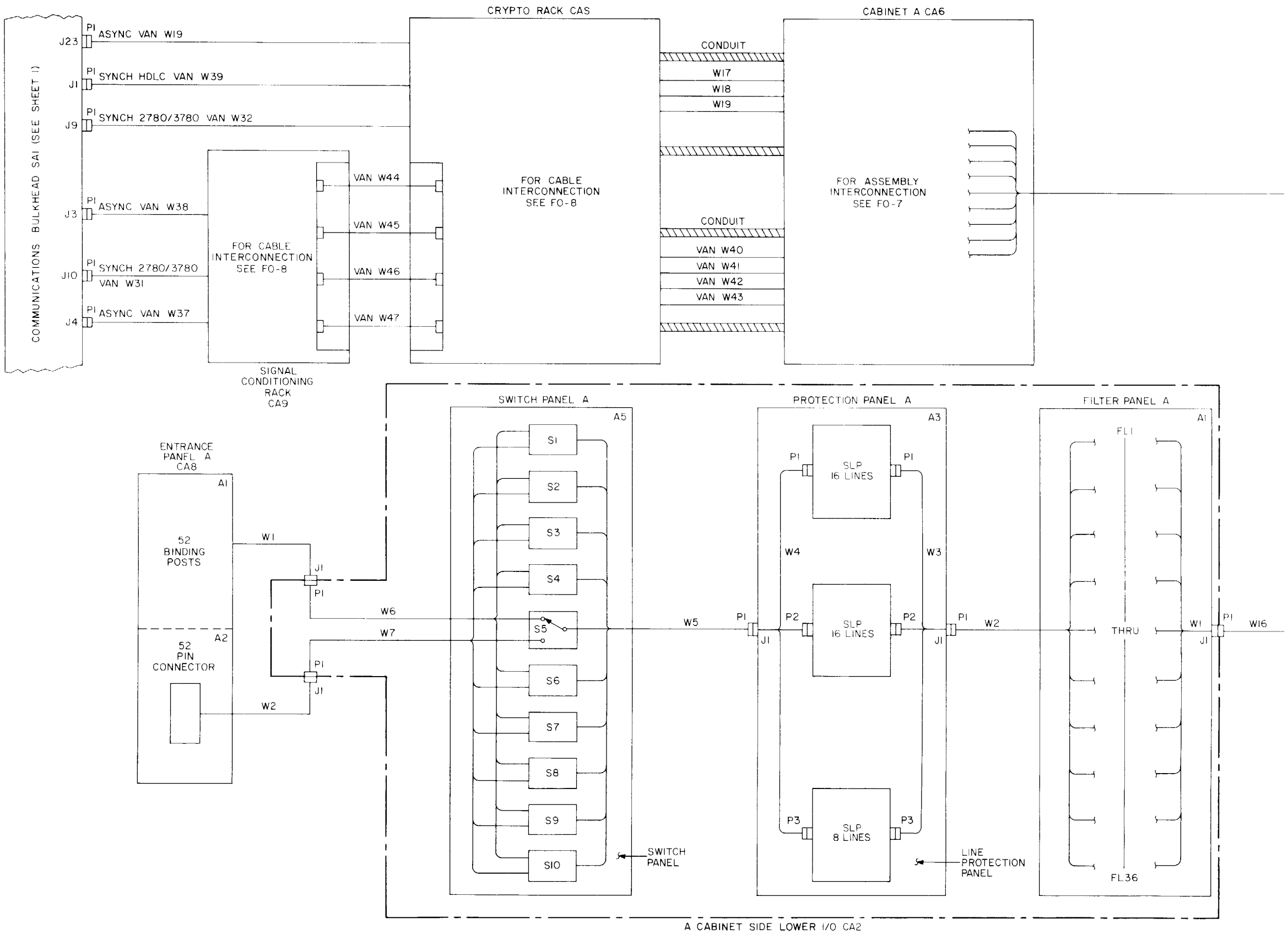


FROM	TO	WIRE COLOR
CA5A2 F GND	CA6A7J2-1	SHLD
TBD-3	-2	WHT
TBA-1	-4	BLK
TBD-1	-3	WHT
TBB-7	-5	BRN
TBB-1	-6	WHT
TBD-2	-7	RED
TBB-8	-8	WHT
TBC-1	-15	ORN
TBC-3	-17	WHT
TBA-7	-20	YEL
CA5A1 F GND	CA6A7J3-1	SHLD
TBD-3	-2	WHT
TBA-1	-4	BLK
TBD-1	-3	WHT
TBB-7	-5	BRN
TBB-1	-6	WHT
TBD-2	-7	RED
TBB-8	-8	WHT
TBC-1	-15	ORN
TBC-3	-17	WHT
TBA-7	-20	YEL
CA6A7J1 -1	CAUFUTURE TB6-13	SHLD
-2	TB5-3	WHT
-7	TB6-2	BLK
-15	TB5-2	WHT
-7	TB6-2	BRN
-8	TB5-6	WHT
-7	TB6-1	RED
-17	TB5-4	WHT
-7	TB6-4	ORN
-3	TB5-5	WHT
-7	TB6-5	YEL
-4	CA6A7J1-5	JUMPER
-5	CA6A7J1-4	JUMPER
CA6A8TB4-1	CA5A5TB4-1	RED
2	2	GRN
3	3	WHT
4	4	BLK
CA5A5-1	CA9A2-1	RED
TBI 2	TBI 2	GRN
THRU 3	THRU 3	WHT
TB4 4	TB4 4	BLK
CA6A8-1	NO CONNECTION	RED
TBI 2	CA5A4	GRN
TB2 3		WHT
TB3 4		BLK
CA9A1J2	CA9A2TB4-1	RED
	2	GRN
	3	YEL
	4	BLK

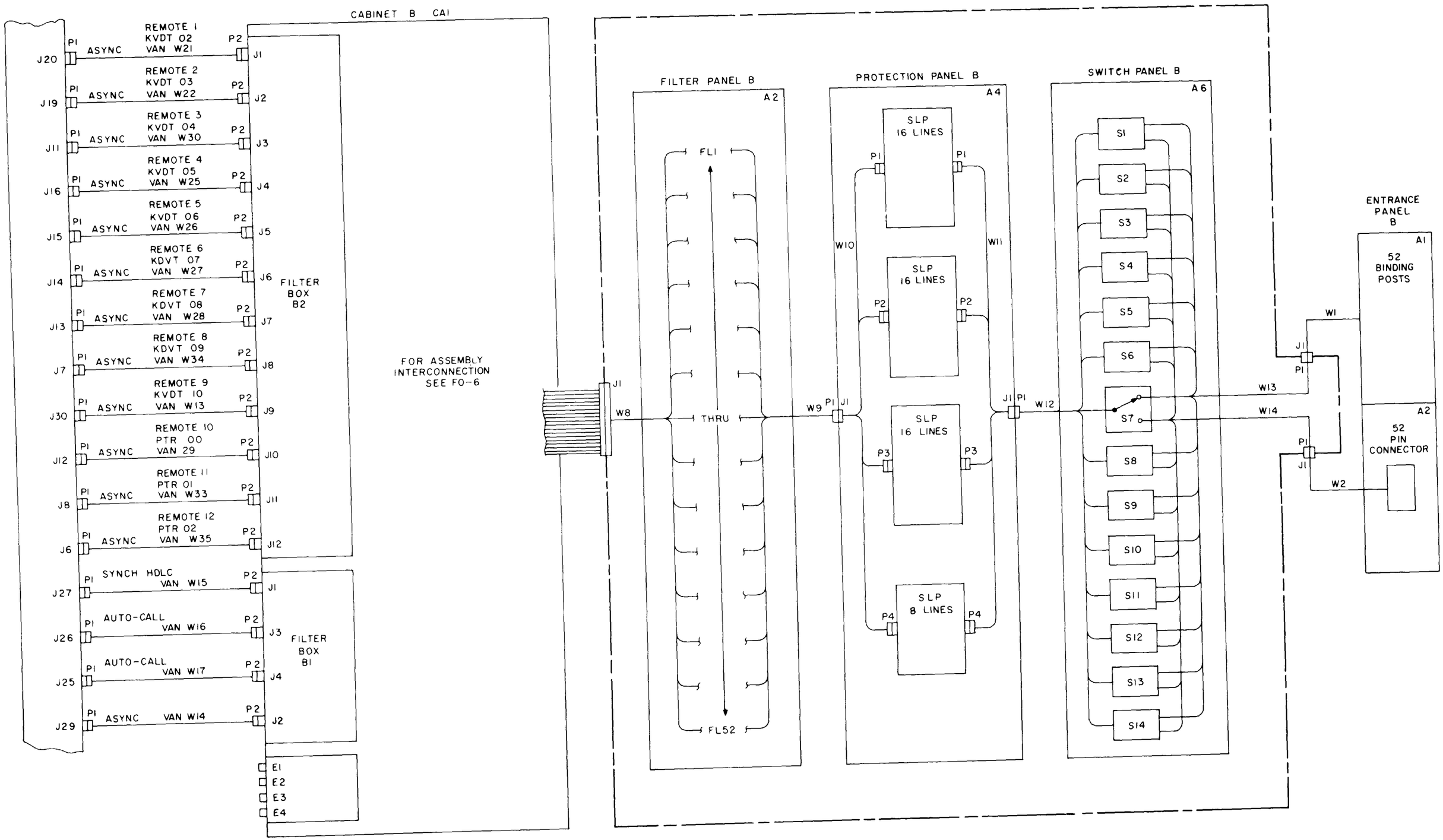
FO-8: Crypto cabinet Interconnecting Wiring Diagram



FO-9: System Wiring Diagram (1 of 3)



FO-9: System Wiring Diagram (2 of 3)



FO-9: System Wiring Diagram (3 of 3)

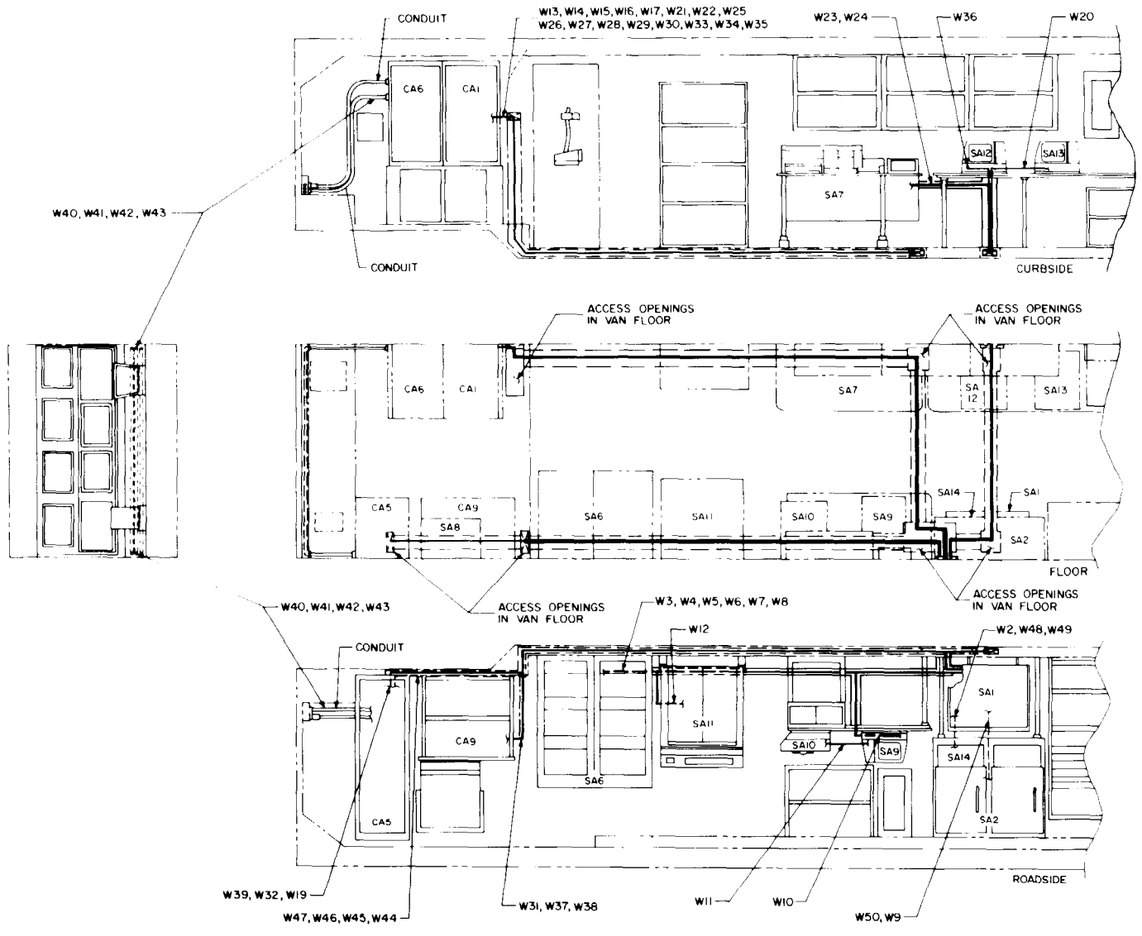


TABLE I

VAN CABLE DES	TAG A	TAG B
W23	VAN W23 P1 M/TSAIA5JI8	VAN W23 P2 M/TSA7J2
W24	VAN W24 P1 M/TSAIA5JI7	VAN W24 P2 M/TSA7J1
W20	VAN W20 P1 M/TSAIA5J21	VAN W20 P2 M/TSAI3J1
W36	VAN W36 P1 M/TSAIA5J5	VAN W36 P2 M/TSAI2J1
WII	VAN WII P1 M/TSA9J2	VAN WII P2 M/TSAIOJ1
WI2	VAN WI2 P1 M/TSAIIJ1	VAN WI2 P2 M/TSAIA5J31
WI9	VAN WI9 P1 M/TSAIA5J23	VAN WI9 P2
W32	VAN W32 P1 M/TSAIA5J	VAN W32 P2 M/TCA5AIJ1
W39	VAN W39 P1 M/TSAIA5J1	VAN W39 P2 M/TCA5A2J1
W31	VAN W31 P1 M/TSAIA5JIO	VAN W31 P2
W37	VAN W37 P1 M/TSAIA5J4	VAN W37 P2 M/TCA9AIAJ1
W38	VAN W38 P1 M/TSAIA5J3	VAN W38 P2
WI3	VAN WI3 P1 M/TSAIA5J30	VAN WI3 P2 M/TCAIAIIJ9
WI4	VAN WI4 P1 M/TSAIA5J29	VAN WI4 P2 M/TCAIAIOJ2
WI5	VAN WI5 P1 M/TSAIA5J27	VAN WI5 P2 M/TCAIAIOJ1
WI6	VAN WI6 P1 M/TSAIA5J26	VAN WI6 P2 M/TCAIAIOJ3
WI7	VAN WI7 P1 M/TSAIA5J25	VAN WI7

TABLE I

VAN CABLE DES	TAG A	TAG B
W21	VAN W21 P1 M/TSAIA5J20	VAN W21 P2 M/TCAIAIIJ1
W22	VAN W22 P1 M/TSAIA5JI9	VAN W22 P2 M/TCAIAIIJ2
W25	VAN W25 P1 M/TSAIA5JI5	VAN W25 P2 M/TCAIAIIJ5
W26	VAN W26 P1 M/TSAIA5JI5	VAN W26 P2 M/TCAIAIIJ5
W27	VAN W27 P1 M/TSAIA5JI4	VAN W27 P2 M/TCAIAIIJ6
W28	VAN W28 P1 M/TSAIA5JI3	VAN W28 P2 M/TCAIAIIJ7
W29	VAN W29 P1 M/TSAIA5JI2	VAN W29 P2 M/TCAIAIIJIO
W30	VAN W30 P1 M/TSAIA5JII	VAN W30 P2 M/TCAIAIIJ3
W33	VAN W33 P1 M/TSAIA5J8	VAN W33 P2 M/TCAIAIIJII
W34	VAN W34 P1 M/TSAIA5J7	VAN W34 P2 M/TCAIAIIJ8
W35	VAN W35 P1 M/TSAIA5J6	VAN W35 P2 M/TCAIAIIJI2
WIO	VAN WIO P1 M/TSA9JI	VAN WIO P2 M/TSAIA5J32
W44	VAN W44 M/TCA9A2TBI	VAN W44 M/TCA5A5TBI
W45	VAN W45 M/TCA9A2TB2	VAN W45 M/TCA5A5TB2
W46	VAN W46 M/TCA9A2TB3	VAN W46 M/TCA5A5TB3
W47	VAN W47 M/TCA9A2TB4	VAN W47 M/TCA5A5TB4
W40	VAN W40 M/TCA6A8TBI	VAN W40

TABLE I

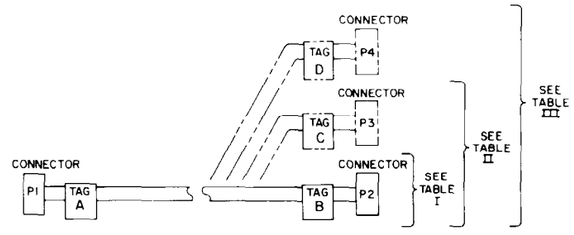
VAN CABLE DES	TAG A	TAG B
W41	VAN W41 M/TCA6A8TB2	VAN W41
W42	VAN W41 M/TCA6A8TB3	VAN W42
W43	VAN W43 M/TCA6A8TB4	VAN W43 M/TCA5A5TB4
W5	VAN W5 P1 M/TSAIAIA4A4JI	VAN W5 P2 M/TSA6A6J3
W8	VAN W8 P1 M/TSAIAIA5A4JI	VAN W8 P2 M/TSA6A5J3
W48	VAN W4 P1 M/TSAI4JI	VAN W48 P2 M/TSAIA4J3
W49	VAN W49 P1 M/TSAI4J2	VAN W49 P2 M/TSAIA4J2
W50	VAN W50 P1 M/TSA243J2	VAN W50 P1 M/TSAIA4J4

TABLE II

VAN CABLE DES	A	B	C
W3	VAN W3 P1 M/TSAIAIA4A2JI	VAN W3 P2 M/TSA6A2J2	VAN W3 P3 (NOT CONNECTED)
W4	VAN W4 P1 M/TSAIAIA4A3JI	VAN W4 P2 M/TSA6A6J2	VAN W4 P3 M/TSA6A4J2
W6	VAN W6 P1 M/TSAIAIA5A2JI	VAN W6 P2 M/TSA6AIJ2	VAN W6 P3 (NOT CONNECTED)
W7	VAN W7 P1 M/TSAIAIA5A3JI	VAN W7 P2 M/TSA6A5J2	VAN W7 P3 M/TSA6A3J2
W2	VAN W2 P1 M/TSAIAB2JI	VAN W2 M/TSAI4F1	VAN W2 M/TSAI4E2

TABLE III

VAN CABLE DES	TAG A	TAG B	TAG C	TAG D
W9	VAN W9 P1 M/TSAIAIA9JI	VAN W9 P2 M/TSA2AIA2J302	VAN W9 P3 M/TSA2AIAIJIOI	VAN W9 P4 M/TSA2AIA2J202



FO-10: Van Cabling Installation Diagram

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