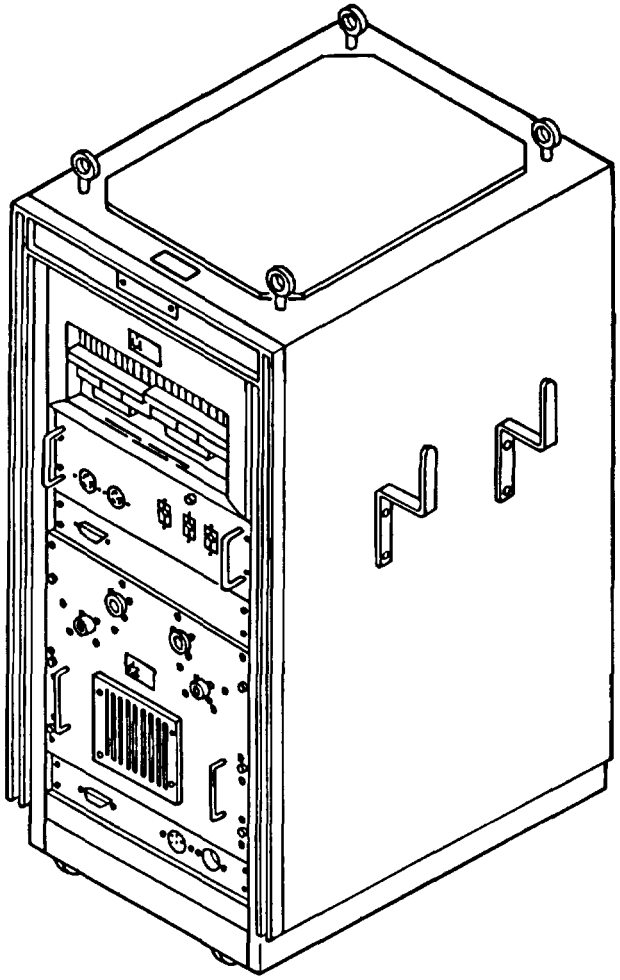
ARMY TM 11-6625-3268-14&P
NAVY EE133-CA-OMI-010/TS-4393UYK-42(V)4
AIR FORCE TO 33D7-3-336-1

OPERATOR'S, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST



TEST SET, COMPUTER
TS-4393/UYK-42(V)4
(NSN 6625-01-338-7972)
(EIC: N/A)

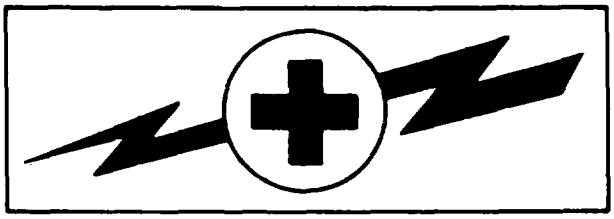
DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

15 SEPTEMBER 1993

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

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

WARNING



HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technicians are aided by operators, they must be warned about dangerous areas.

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

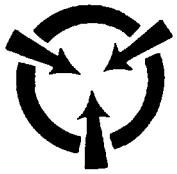
Be careful not to contact high-voltage connections or 120 volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

WARNING: DO NOT BE MISLED BY THE TERM "LOW VOLTAGE". POTENTIALS AS LOW AS 50 VOLTS MAY CAUSE DEATH UNDER ADVERSE CONDITIONS.

For Artificial Respiration, refer to FM 21-11. Air Force personnel refer to AFOSH 127-50 and AFOSH 127-66, Chapter 10.

CAUTION



This equipment contains certain static-sensitive solid state devices which are subject to damage from electrostatic discharge. Effective control of electrostatic discharge is maintained only through continuous strict observance of the following maintenance procedures:

- Any maintenance requiring disassembly of the equipment must be performed at an approved work station. The work station must include a grounded surface and grounded wrist strap in accordance with DOD-HDBK-263.
- All maintenance personnel must have completed training in the handling of static-sensitive devices before working on this equipment. Maintenance personnel must wear the grounded wrist strap and be at an approved work station when performing maintenance.
- The static-sensitive subassemblies or circuit cards must be stored in approved electrostatic free material when not installed in the equipment.

Technical Manual
No. 11-6625-3268-14&P
Technical Manual
EE133-CA-OMI-010/TS-4393UYK-42VC4
Technical Order
No. 33D7-3-336-1

DEPARTMENTS OF THE ARMY,
THE NAVY, AND THE AIR FORCE

Washington, DC, 15 September 1993

Operator, Unit, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools List TEST SET, COMPUTER TS-4393/UYK-42(V)4 (NSN 6625-01-338-7972) (EIC: N/A)

REPORTING 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 back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT, Fort Monmouth, New Jersey 07703-5007.

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

For Navy, mail comments to the Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC 20363-5100.

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

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SECTION I
INTRODUCTION

1-1. SCOPE

This manual contains operation and maintenance instructions for the Computer Test Set, as shown in Figure 1-1. The material includes operating instructions, functional descriptions, maintenance and troubleshooting procedures, repair parts and special tools list, and instructions for preparation for use, storage, and shipment.

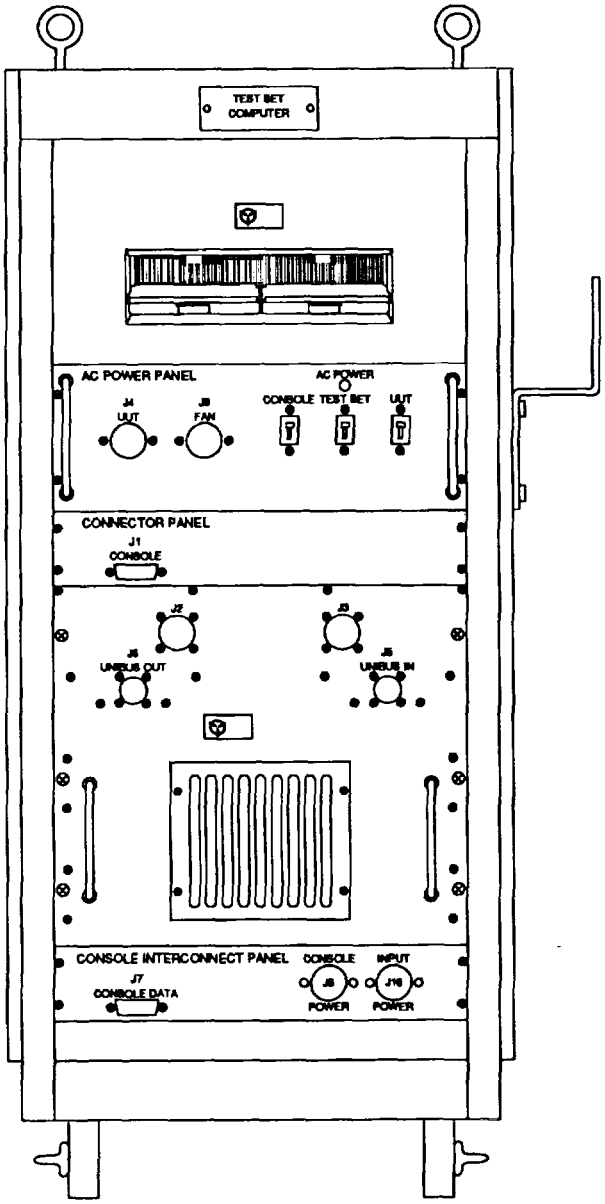


Figure 1-1. Computer Test Set

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-035D54 for unsatisfactory equipment reporting. Navy personnel, will report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) IAW OPNAVINST 4790.2, Vol. 3 and unsatisfactory material/conditions (UR submissions) IAW OPNAVINST 4790-2, Vol. 2, chapter 17.

b. Reporting of Item and Packaging Discrepancies (ROD). Fill out and forward SF 364 (Report of Discrepancy (ROD) as prescribed in AR 735- 11-2/DLAR 4140.55/SECNAVIST 4610.33C/AFR 400-54/MCO 4430.3J.

c. Reporting of Transportation Discrepancies (TDR). Fill out and forward Transportation Discrepancy Report (TDR) SF 361, as prescribed in AR 55-38/NAVSUPINST 4610.33C/AAFR 75-18/MCO P4610.19D/DLAR 4500.15

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

a. Army. If your Test Set 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. Fill out an SF 368 (Product Quality Deficiency Report). Mail it to: Commander. U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ED-CFO, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

b. Navy. Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.

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

1-4. DESTRUCTION OF MATERIAL TO PREVENT ENEMY USE

a. Army. The destruction of Army electronic material to prevent enemy use shall be in accordance with TM 750-244-2.

b. Navy. Navy personnel comply with the local Command Material Destruction Plan.

c. Air Force. Air Force personnel comply with TM 750-244-2 or the local Emergency Destruction Plan.

1-5. EQUIPMENT DATA

a. Rack Assembly

(1) Electrical Characteristics:

Voltage: 115 Vac (Nominal) 60 Hz, Single Phase

Current: 6 amps (Standalone)
9 amps (with Computer)
Power: 690 Watts

(2) Physical Characteristics:

Width:	23 in.	Height:	55 in
Depth:	31 in.	Total Weight:	370 lbs. (Includes Cooling Kit, all cables & Torque Kit)

(3) Disk Drive Characteristics: DEC 8" RX02 Dual Floppy
Disk Interface Characteristics: DEC CCA (PDP11 Interface with DMA)

Electrical (RX02). .....4 A at 115 Vac
(Disk Interface CCA)..... .....1.8A at 5 Vdc

Drive Performance (Each):

Capacity	Recording	8-bit bytes
Per Diskette	Single Density	256K
	Double Density	512K
Per Track	Single Density	3.3K
	Double Density	6.6K
Per Sector	Single Density	128
	Double Density	256

Data Transfer Rate (Each):

Diskette to controller buffer..... .....4 µs/data bit (Single Density)
2 µs/data bit (Double Density)

Buffer to CPU interface..... .....1.2µs/bit
Rotational speed .... 360 rpm +/- 2.5%
Track-to-track move .... .6 ms/track maximum
Head settle time..... ..... 25 ms maximum
Recording technique .... Double Frequency (FM)
Modified Miller code (MFM)

Average access .... 262 ms

1-5. EQUIPMENT DATA (Cont.)

Physical:

Width:	19 in.	Height:	10.5 in
Depth:	17 in.	Weight:	94 lbs

Environmental:

Temperature (Operating) ..... 150 to 320 C (590 to 909 F)
(Non-operating) ..... -350 to 600 C (-30° to 1400 F)

Heat Dissipation ..... Less than 225 Btu/hr

Relative Humidity (Operating) ..... 20% to 80%
(Non-operating) ..... 5% to 98% (no condensation)

b. Cooling Kit Assembly

(1) Electrical Characteristics:

Voltage:	115 VAC (Nominal) 60 Hz
Current:	0.amps
Power:	36 Watts

(2) Physical Characteristics:

Width:	10. in.	Height:	6.5 in
Depth:	6.5 in.	Weight:	9 lbs.

(3) Cooling Characteristics:

3355 RPM at 0.075 lbs/ft density
75C FM at 0.13 inches H20 at 0.075 lbs/ft
0 to 30K ft altitude

Temperature	Operating	-40^0 C to $+55^0$ C
	Non-operating	-62^0 C to $+85^0$ C
Humidity	to 94% +4% at $+30^0$ C	

1-6. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools, TMDE, and Support Equipment are listed in the Maintenance Allocation Chart (MAC), Appendix B.

SECTION II

FUNCTIONAL DESCRIPTION

2-1. GENERAL

This section contains a general description and purpose for the Computer Test Set, listing of major components, listings of controls, functional descriptions of major components and block diagrams.

2-2. DESCRIPTION

The Computer Test Set can test and verify the operation of the AN/UYK-42(V)4 Computer, as well as declassify its memory. The diagnostics can fault isolate the AN/UYK-42(V)4 down to the module level only. The Test Set is supplied with seven cable assemblies, a cooling kit assembly, a torque screwdriver set and two 8-inch diskettes with backups. A terminal, not supplied, is necessary as a console for the test setup to function. For this technical manual, the DEC LA120-DA was selected. This terminal includes an integral printer for obtaining a hard copy record of the test results. Figure 2-1 illustrates the major components of the Test Set, and Table 2-1 provides a brief description of each major component.

2-3. CONTROLS AND INDICATORS

Figure 2-2 illustrates the location of the controls and indicators on the front panel. Table 2-2 lists the controls and indicators by callout number and provides a functional description of each front panel call out.

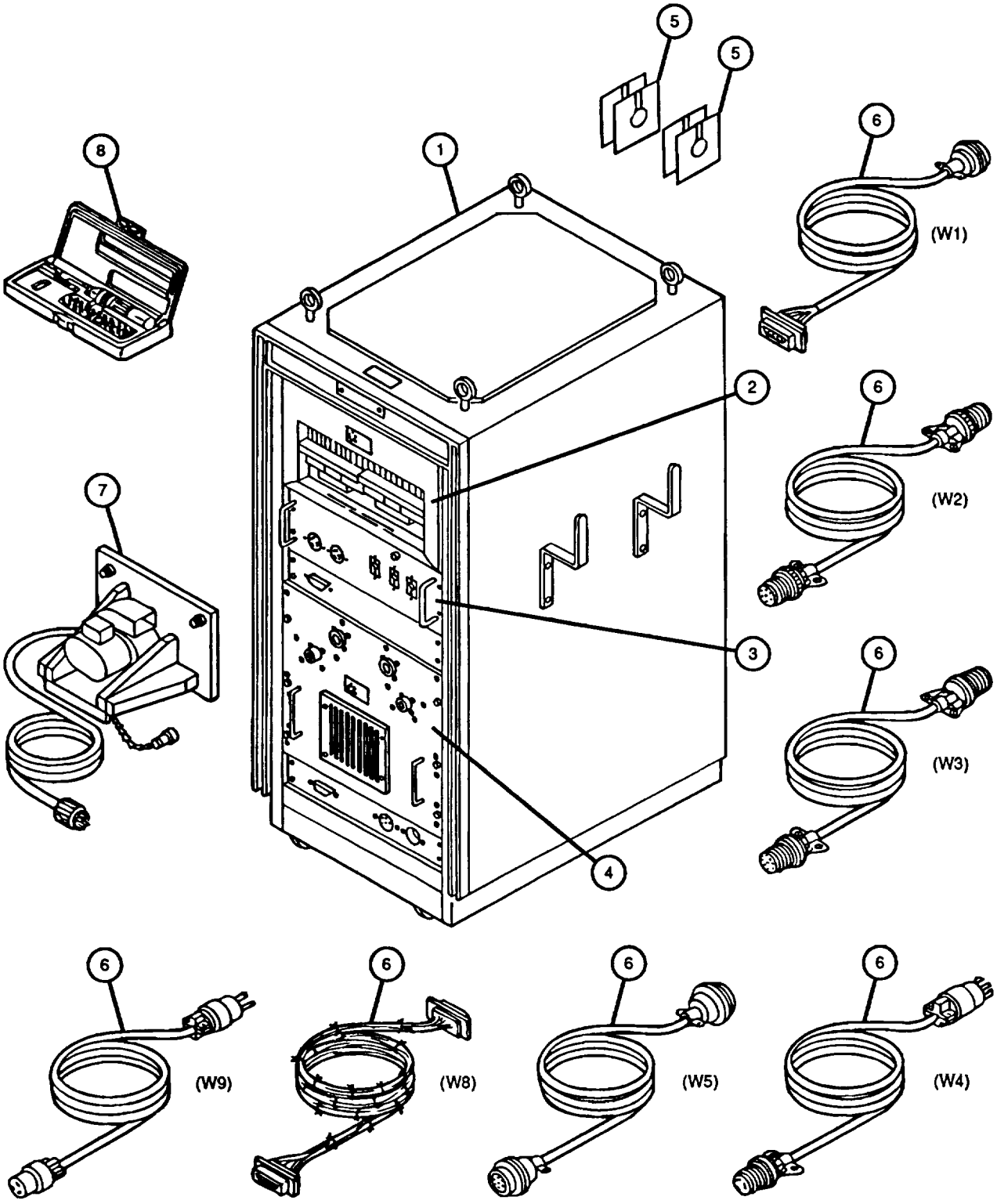


Figure 2-1. Major Components of the Computer Test Set

Table 2-1. Major Components of the Computer Test Set

Fig. Index	and No.	Component	Component Items
2-1	(1)	Test Set Rack Assembly	Computer Test Set Rack containing Floppy Disk Subsystem, Ac Power Panel, and Expansion Chassis Assembly
	(2)	Floppy Disk Subsystem	Two 8-inch floppy disk drives (Drive 0 and Disk Drive 1)
	(3)	AC Power Panel	Front Panel AC Power Light, front panel interface switches (Console, Test Set, and UUT), and front panel cable connectors J4 and J9
	(4)	Expansion Chassis Assembly	Front panel cable connectors J2, J3, J5, and J6 and internal components consisting of an Expansion Chassis which interfaces to a Disk Interface Card CCA and to a SMI Test Card CCA
	(5)	Diskettes	Two Copies of Diagnostics Diskette and two copies of Zeroization Diskette are provided. The Diagnostics Diskette is loaded into the Floppy Disk Subsystem to test the AN/UYK-42(V)4. The Zeroization Diskette is loaded into the Floppy Disk Subsystem to zeroize (erase the contents of the computer memory) the AN/UYK-42(V)4.
	(6)	Cables W1-W5, W8 and W9	Provides the necessary connections for powering-up and interfacing the test-set, console, and the AN/UYK-42(V)4
	(7)	Cooling Kit	Attaches to the CPU during testing to provide adequate cooling
	(8)	Torque Kit	Provides necessary torque wrenches used to torque down the CPU modules

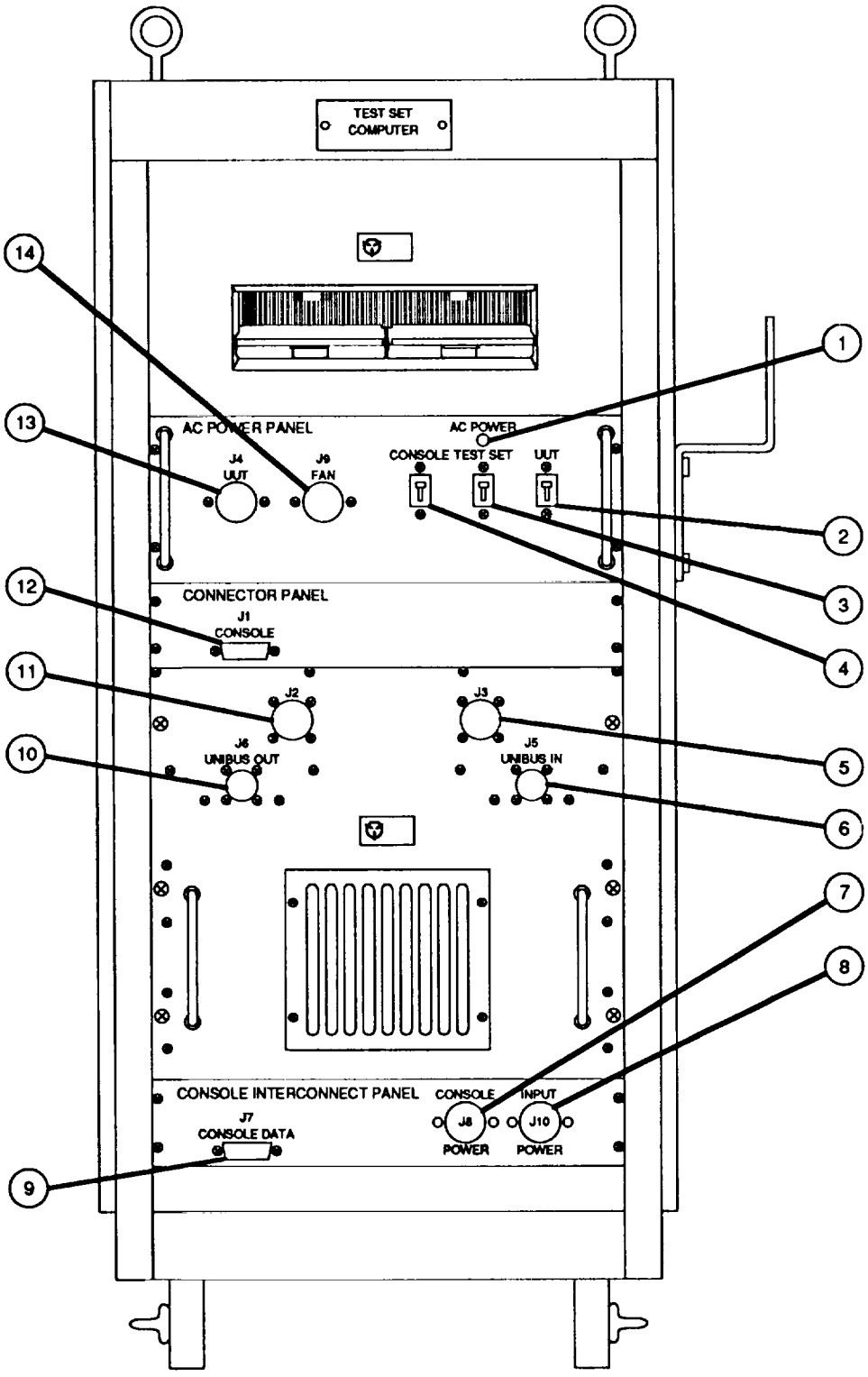


Figure 2-2. Computer Test Set Front Panel

Table 2-2. Major Components of the Computer Test Set

Fig. Index	and No.	Component	Component Items
2-2	(1)	AC Power Light	Indicates 115 Vac power is applied to the Test Set.
	(2)	UUT Power Switch	Circuit breaker used to apply 115 Vac to J4 UUT (Unit Under Test) and J9 Fan (Cooling Kit).
	(3)	TEST SET Power Switch	Circuit Breaker used to apply 115 Vac to the Test Set rack components.
	(4)	CONSOLE Switch	Circuit breaker used to apply 115 Vac to J8 (Console power plug).
	(5)	J3	Connector (for the W-3 cable) used to connect the synchronous outputs from the UUT to the Test Set.
	(6)	J5 UNIBUS IN	Connector (for the W-5 cable) used to connect the UUT to the Test Set Expansion Chassis.
	(7)	J8 Console Power	Connector used to supply 115 Vac to the Console, activated by CONSOLE Switch. (Item Qin this table)
	(8)	J10 Input Power	Connector used to provide 115 Vac to the Test Set.
	(9)	J7 CONSOLE DATA	Connector (for the W-8 cable) providing connection to the Console Data Port from the Test Set.
	(10)	J6UNIBUS OUT	Connector, where the UNIBUS terminator of the UUT is attached for testing.
	(11)	J2	Connector (for the W-2 cable) used to connect the asynchronous outputs from the UUT to the Test Set.
	(12)	J1 CONSOLE	Connector (for the W-1 cable) used to transfer data to and from the UUT.
	(13)	J4 UUT	Connector used to supply 115 Vac to the UUT.
	(14)	J9 Fan	Connector used to supply 115 Vac to the Cooling Kit Assembly.

2-4. FUNCTIONAL DESCRIPTION

The Computer Test Set is used to test and verify the operation of the AN/UYK-42(V)4 Computer. The major components of the Test Set are the Floppy Disk Subsystem (RX211-BA), AC Power Panel, and Expansion Chassis Assembly (BA11A-EX). The Test Set interfaces to a Cooling Kit (which is provided with the Test Set), the Unit Under Test (AN/UYK-42(V)4), and the LA120-DA console. Figure 2-3 represents external and internal Test Set interconnections, and Figure 2-4 represents interconnections between the Test Set and the Unit Under Test, Console, and the Cooling Kit. Table 2-3 lists the Computer Test Set Cable Assemblies.

The Floppy Disk Subsystem consists of the RXO2 which contains two double density 8-inch floppy disk drives. The disk drives are random access mass memory devices that stores or reads data from flexible diskettes. The RX02 also contains a single read/write electronics module, a micro-programmed controller module, and a power supply. The RX02 is cable connected to the Disk Interface Card CCA.

The AC Power Panel contains three circuit breakers (labeled Console, Test Set and UUT). These circuit breakers provide an independently controlled 115 Vac source to the Console, the Test Set, and the UUT (Unit Under Test). The UUT Circuit Breaker routes 115 Vac to the UUT and the Cooling Kit Assembly connectors. The AC Power Panel also contains an AC Power Light, which indicates when 115 Vac is applied to the Test Set.

The Expansion Chassis Assembly houses the Expansion Chassis, UNIBUS Cable adapters, and all cables and connectors necessary to interface test data with the UUT. The Expansion Chassis houses the Disk Interface Card CCA, SMI Test Card CCA, power supplies, and the UNIBUS backplane. The Expansion Chassis provides power to the Disk Interface Card CCA and the SMI Test Card CCA.

The Disk Interface Card CCA converts the RX02 diskette I/O (Input/Output bus to the UNIBUS bus structure of the AN/UYK-42(V)4 Computer. The Disk Interface Card CCA controls the CPU interrupts initiated by the RX02 disk drives and handles the data interface between the RX02 disk drives and the AN/UYK-42(V)4 Computer.

The SMI Test Card CCA provides the wrap around function for the AN/UYK-42(V)4 Computer's SMA (Serial Multiplexed Asynchronous, and SMS (Serial Multiplexed Synchronous) I/O modules. The SMI Test Card CCA receives the AN/UYK-42(V)4 computer's I/O data, reclocks synchronous data, and provides data drivers to the AN/UYK-42(V)4 computer.

2-4. FUNCTIONAL DESCRIPTION (Cont.)

The Cooling Kit Assembly provides the necessary cooling to the UUT. This assembly consists of a fan, mounting hardware, power cable, and a pendent chain that secures the W6 (dummy connector, plug) to the cooling kit hardware.

The DEC LA120-DA is used to communicate with the computer and provide a display/printout of the test results.

NOTE

Alternate consoles may be utilized in place of the LA120-DA. The selected terminal must maintain the requirements of EIA specification RS-232-C. This part provides full duplex asynchronous communication on a 25 pin connector. Required communication set-up parameters are contained in Table2-4.

2-5. THEORY OF OPERATION

The Test Set controls the AC power distribution, provides UNIBUS extension to the floppy disk subsystem, and contains serial multiplex data loop capabilities. Testing is done by loading the computer diagnostics and running them to ensure the operation of the AN/UYK42(V)4 computer. Testing of the AN/UYK-42(V)4 occurs when the diagnostic disk is placed in Drive "0" (Left hand drive), and the computer is booted from the Console (LA120-DA), which loads and runs the diagnostic program (109D-C600-4.1). The program responds via the Console which displays/prints test status, i.e. error message, with probable faulty module, or "end pass, " indicating a fully operational UUT. Declassification of the computer memory is accomplished by loading and running the declassification software (109D-C600-5.0) in the same manner as any diagnostic routine.

All testing, whether to troubleshoot the computer or zero the memory, relies on the running of the routines and responding to the message printout. Console keyboard information is interpreted by the computer and appropriate diagnostics are down loaded from the floppy disk subsystem via the disk interface through the UNIBUS Interface cable.

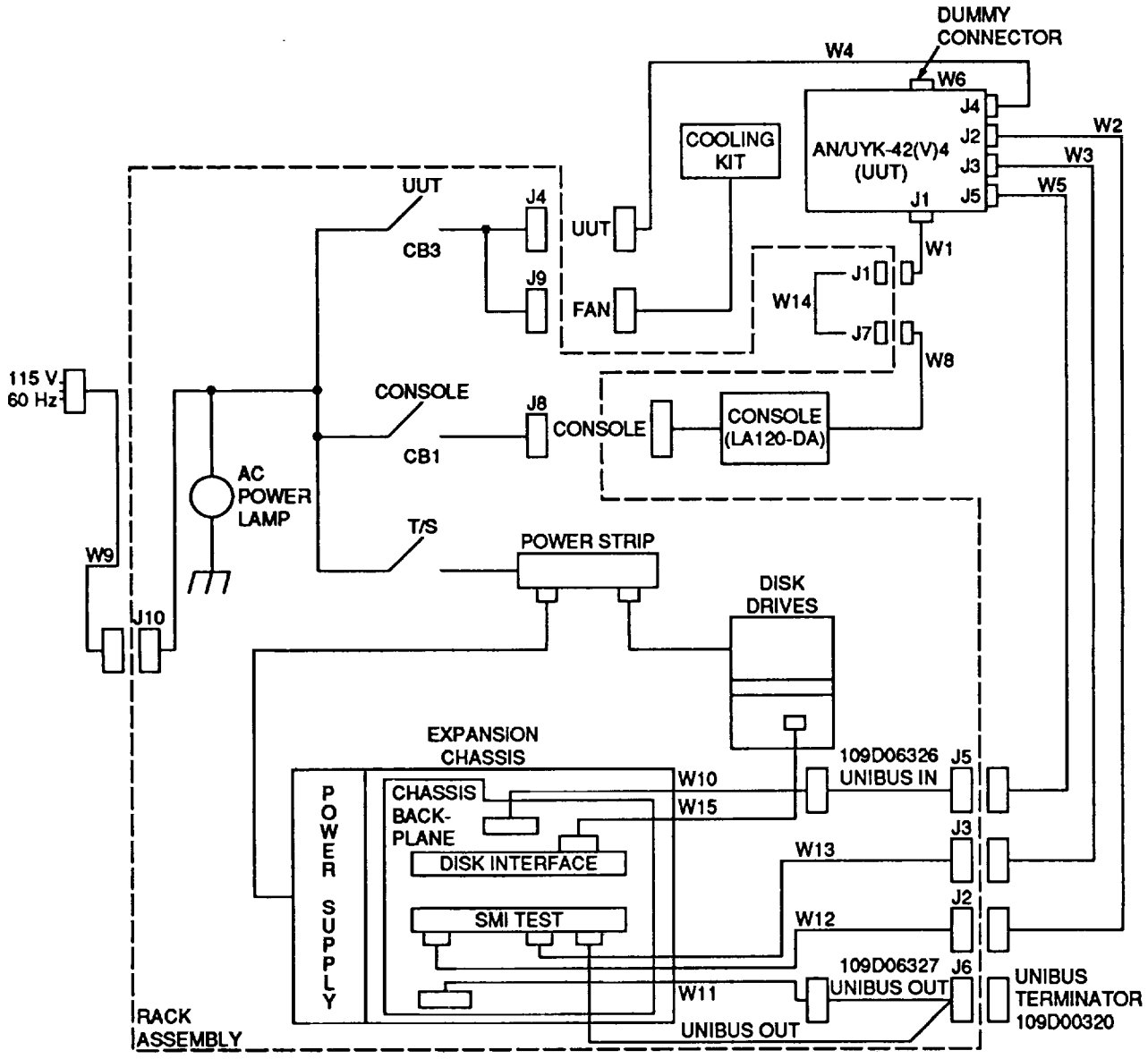


Figure 2-3. Test Set External / Internal Interconnection Diagram

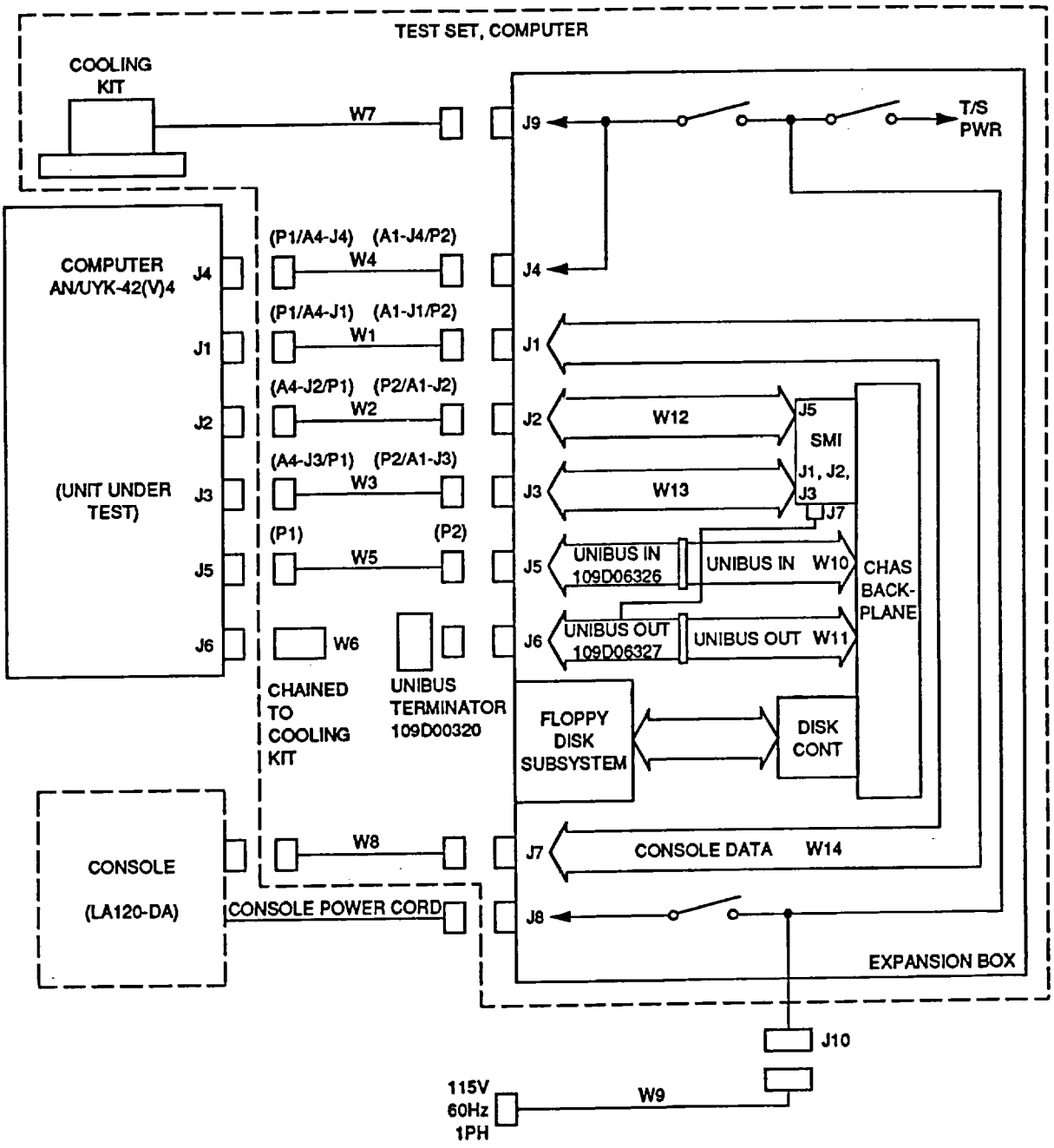


Figure 2-4. Interconnecting and Test Set Block Diagram

Table 2-3. Computer Test Set Cable Assemblies

Cable	Part Number	Title	Length
W1	109D06312-101	UUT test cable	8 ft.
W2	109D06313-101	UUT test cable	8 ft.
W3	109D06314-101	UUT test cable	8 ft.
W4	109D06315-101	UUT power cable	8 ft.
W5	109D00209-OOOA	UUT UNIBUS cable	10 ft.
W6*	109D06316-101	Dummy Connector, Plug	N/A
W7	109D06344-101	Cooling Kit power cord	12 ft.
W8	BC22D-25	RS-232 Console cable	25 ft.
W9	109D06317-101	Test Set power cable	10 ft.
W-** N/A		Console power cable	N/A

* W6 is a shunt plug that is chained to the fan
** Supplied with unit

Table 2-4. Terminal Communication Set-up Requirements

Data Bits:	8
Parity:	None
Stop Bits	1
Baud (Trans.=Rec.)	1200

SECTION III
PREPARATION FOR USE

3-1. GENERAL

Section III contains preparation instructions for the use of the Test Set. These include instructions for unpacking, inspecting unpacked equipment for damage, and any preliminary servicing procedures required to prepare the equipment for operation.

3-2. UNPACKING

Refer to Table 2-1 for a list of items supplied with the Test Set, and refer to Figure 3-1 when unpacking the Test Set. Perform the following steps to unpack the Test Set from its shipping container:

NOTE

Retain all packing material for later use in reshipping.

a. Remove the front panel from the shipping container by unscrewing 17 lag bolts (3 lag bolts from the top panel and 14 lag bolts from the front panel).

b. Remove the shipping container from its base by unscrewing 10 lag bolts (3 lag bolts on each side panel and 4 lag bolts on the back panel).

c. Remove any packing material that remained on the Computer Test Set when the shipping container was removed.

d. Remove the strapping and remove barrier bag from the Computer Test Set.

CAUTION

Equipment weighs 370 lbs. Use appropriate lifting device that supports this amount of weight.

e. Carefully lift the Test Set off of the base of the shipping container. (Eyehooks must be used for removal.)

NOTE

The side bracket can be used for cable storage, but shouldn't be used for lifting the Test Set

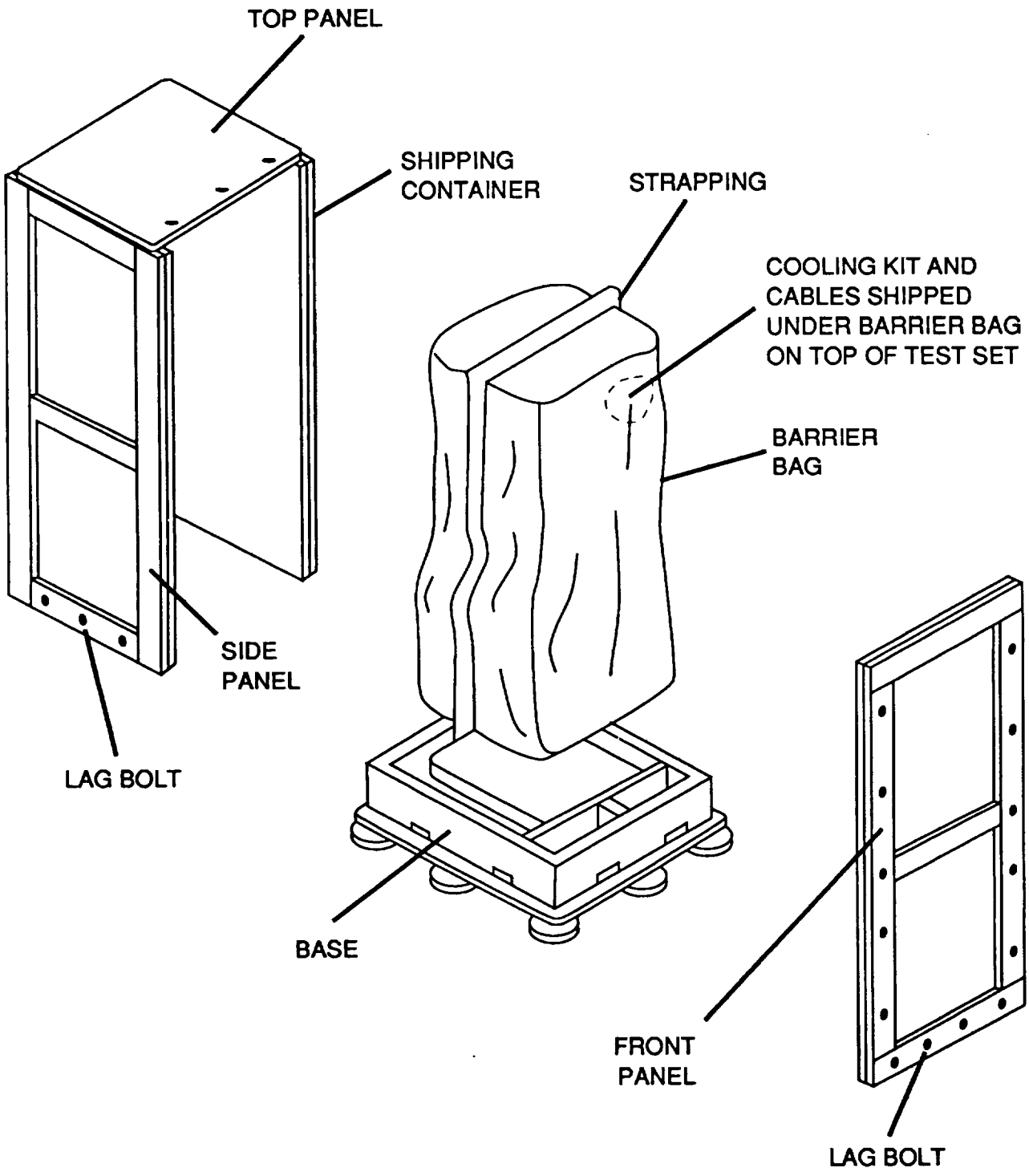


Figure 3-1. Unpacking the Computer Test Set

3-3. CHECKING UNPACKED EQUIPMENT

a. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735- 11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

b Transportation Discrepancies Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361), as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO , P4610.19D/DLAR 4500.15.

3-4. CONSOLE REQUIREMENTS

Alternate consoles may be utilized in place of the LA120-DA. The selected terminal must maintain the requirements of EIA specification RS-232-C. This part provides full duplex asynchronous communication on a 25 pin connector. Required pin numbers are defined in J7, cable W14 (Fig.E-18). Table 2-4 provides terminal communication set-up requirements.

3-5. PRELIMINARY SERVICING OF EQUIPMENT

Prior to placing the Test Set in service, perform the following visual inspection procedures. Refer to Table 2-1 for a list of the major components of the Test Set. Do not connect unit to primary power source or any other equipment during these procedures.

a. Check all front panel connectors for broken, bent or missing pins.

b. Check all front panel mounted switches, lamps, or other hardware for damage.

c. Check all external cables and cooling kit assembly for damage.

d. Check both floppy disks are not bent or physically damaged.

SECTION IV
OPERATION

Section **Page**

4-1. GENERAL

This section contains operating procedures for the Computer Test Set.

4-2. INITIAL POSITION OF CONTROLS

Table 4-1 lists the initial positions of the front panel controls prior to operating the equipment. See Figure 2-2 for location of front panel controls.

Table 4-1. Initial Position of Controls

Fig. And Item Number		Control	Name	Position
2-2-	(1)	AC POWER	Power Light	Off
	(2)	UUT (Unit Under Test)	Power Switch	Off
	(3)	TEST SET	Power Switch	Off
	(4)	CONSOLE	Power Switch	Off

4-3. OPERATING INSTRUCTIONS

To operate the Computer Test Set to verify the operation of the AN/UYK-42(V)4 computer, place controls to the positions indicated in Table 4-1. Before connecting any cables, verify that all power sources are off. Refer to TM 11-5895-1308-24 as necessary, and perform the following steps:

4-3. OPERATING INSTRUCTIONS (Cont.)

WARNING

Ensure that main power to the AN/UYK-42(V)4 is disconnected (OFF), before removing or installing any modules. Refer to TM11-5895-1308-24.

1. Ensure that all elements of the Computer Test Set are present and fully operational.

2. Ensure that prime power is available.

CAUTION

This equipment contains electrostatic discharge sensitive (ESD) devices. Methods to be followed are specified in DOD-STD-1686 and DOD-HDBK-263.

3. In the UUT (CPU), locate and remove Multifunction Assembly (A1A12) and Console IF module (A1A13). Refer to TM 11-5895- 1308-24.

4. Locate switch number 8 on switch S102 of AlA12A1 and change to the closed position. Refer to TM 11-5895-1308-24.

5. Locate switch number 5 on switch S2 of A1A13 and change to the closed position. Refer to TM 11-5895-1308-24.

6. Reinstall A1A12 and AlA13.

CAUTION

Once testing is completed, switches S102 on Multifunction Assembly (A1A12A1) module and S2 on Console IF (AlAI3) module must be reset to original position; otherwise the Computer will not operate properly. Refer to TM 11-5895-1308-24 to verify switch settings.

7. Ensure that all other plug-in modules are in place. Refer to TM 11-5895-1308-24.

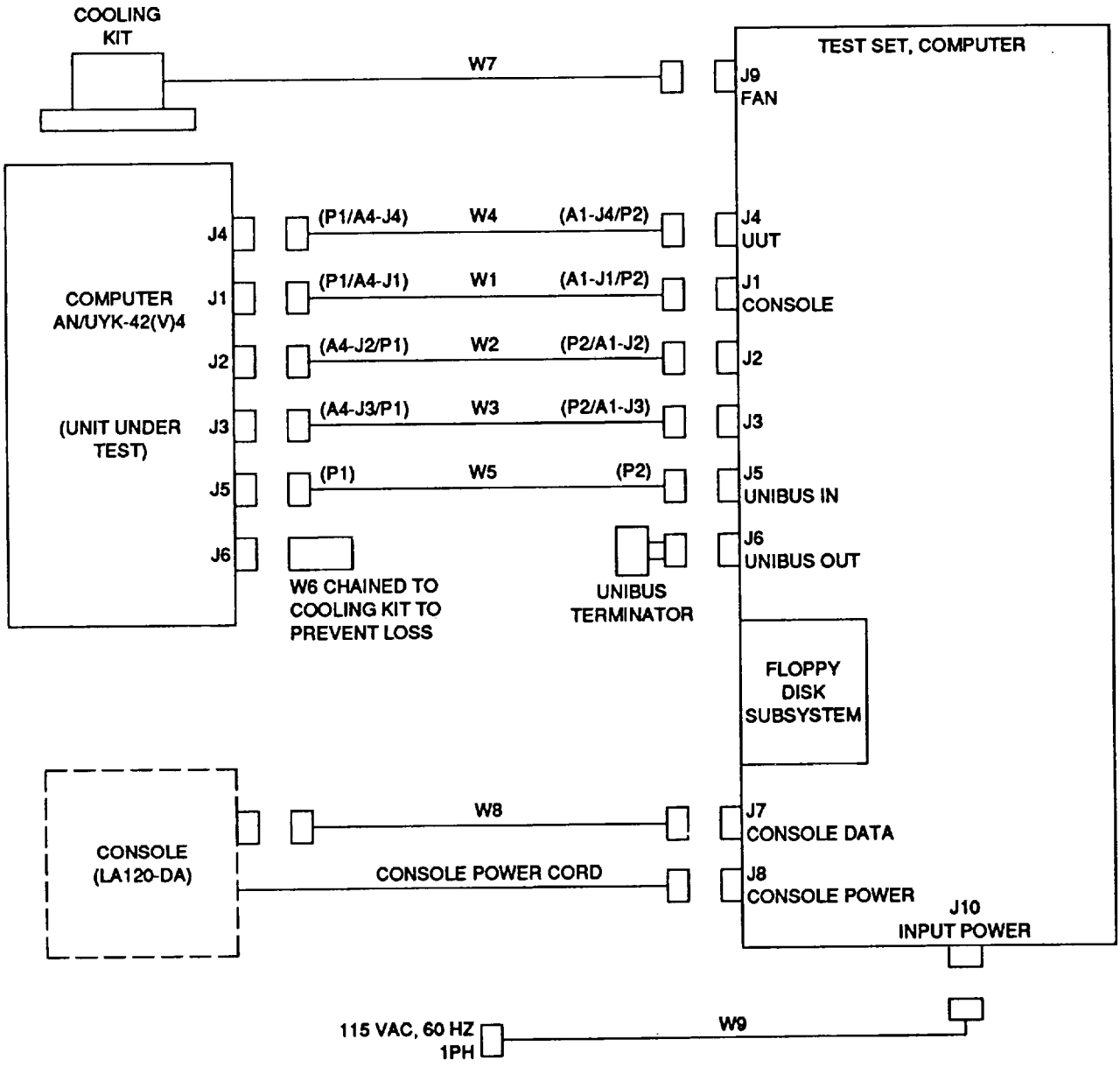


Figure 4-1. Test Setup Diagram

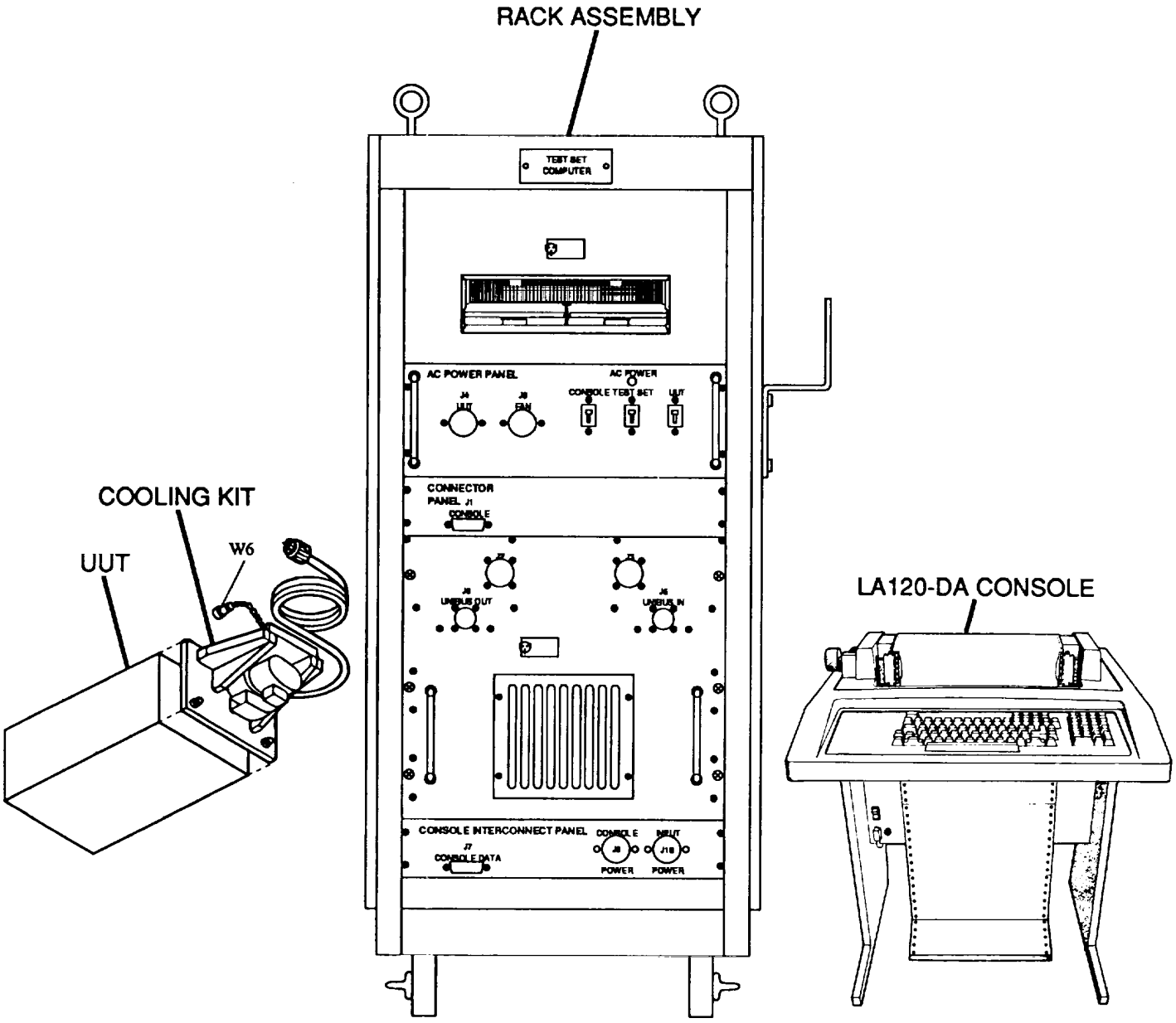


Figure 4-2. Test Setup Illustration

4-3. OPERATING INSTRUCTIONS (Cont.)

8. Remove UNIBUS Terminator from CPU J5 and connect to Test Set connector J6.

9. Refer to Figure 4-2 and install cooling kit assembly on the computer as follows:

   a. Position fan at back end of computer and align the top screws in the cooling kit with the threaded holes in the computer.

   b. Secure two top and two bottom screws.

   c. Attach chained dummy connector (W6) to J6 on the computer.

   d. Connect cooling kit power cord (W7) to J9 on the Test Set.

10. Connect all cables, connectors, and terminators as listed in Table 4-2. The connector reference designators (for example Al- J1/P2) are marked on both ends of the cable.

Table 4-2. Interconnecting Cable List

Cable Number	Test Set	Destination
W1	T/S-J1 (A1-J1/P2)	CPU-J1 (P1/A4-J1)
W2	T/S-J2 (P2/A1-J2)	CPU-J2 (A4-J2/P1)
W3	T/S-J3 (P2/A1-J3)	CPU-J3 (A4-J3/P1)
W4	T/S-J4 (A1-J4/P2)	CPU-J4 (P1/A4-J4)
W5	T/S-J5 (P2)	CPU-J5 (P1)
W8	T/S-J7	CONSOLE Data Connector (25 pin CANNON)
W9	T/S-J10	TEST SET Power Input Cord
- - -	T/S-J8	CONSOLE Power Cord

4-3. OPERATING INSTRUCTIONS (Cont.)

11. Connect the Test Set to the prime power (115 Vac). Check that the Test Set AC POWER light is lit.

12. Turn on Computer Test Set and equipment as follows:

    a. Set Console Switch on Computer Test Set to the ON position.

    b. While holding SET-UP key down, continue pressing BAUD key until 1200 appears in readout.

    c. Turn TEST SET switch on Computer Test Set to ON and check for operation of Test Set cooling fan.

    d. Set UUT switch on the Computer Test Set to the ON position.

13. Check proper fan operation by feeling for air flow at intake vents along each side of the front of the Computer housing while CPU is running.

14. Visually check the CPU front panel ELAPSED TIME indicator to verify that elapsed time indicator is running. Proper ETM operation is indicated by a flashing dot between the first two digits of the readout.

CAUTION

Do not open the drive door while the diskette is in use; this results in errors.

NOTE

The disk drive is designed for 60 cycle input only, 50 cycle input will result in errors.

15. Visually check the CPU front panel POWER ON LED. The LED is wired directly to +5 VDC. If LED is not on while CPU power is on, it may indicate a faulty power supply.

NOTE

System will not autoboot to run diagnostics. The console will print a console prompt ">>>" when the CPU is turned on.

4-3. OPERATING INSTRUCTIONS (Cont.)

NOTE

Instructions to declassify CPU are located in paragraph 4-4.

16. Install diagnostic diskette 109D-C600-4.1 into disk drive "0" (left disk drive) and secure disk drive door. Using the Console, enter commands and respond to displayed prompts as indicated as follows:

NOTE

The RX02 disk drive has no operator controls and indicators. The diskette is inserted in a drive after compressing the latch to allow the spring-loaded front cover to open. Place the diskette with the label or top up (the jacket seams are on the bottom) on the drive spindle. Close the front cover which will automatically lock when it is pushed down. When booting the system, listen for audible clicking sounds which indicate the head is moving over the diskette; the RX02 is ready for use.

NOTE

- Do not expose diskettes to a heat source or sunlight.
- Keep the diskettes from magnetic fields.
- Do not use paper clips on diskettes.
- Do not write on the diskette with an instrument that leaves an impression or flakes.

4-3. OPERATING INSTRUCTIONS (Cont.)

COMMAND ENTER	DISPTLAYED RESUTLTS PROMPTS	OPERATOR RESPONSE
<CTRL P> (simultaneously)	>>>	
H <CR>	>>>	

NOTE

If you type a wrong key, type <CTRL P> to restart.

B DYO <CR>	>>>	
	The computer will respond by printing a series of messages and prompts on the console as follows: CLEARING MEMORY CHMYAO XXDP+ DY MONITOR 28K BOOTED VIA UNIT 0	
	ENTER DATE (DD-MMM-YY)	(DD-MMM-YY) <CR>
	RESTART ADDRESS: 153726	
	50 HZ	N <CR>
	LSI?	N <CR>
	THIS IS XXDP+ TYPE "H" OR "H/L" FOR DETAILS Respond to each prompt above as indicated until the prompt "." appears. Then type the following on the console.	
C C600 <CR>	At this point the CPU will automatically run the diagnostics as called for in the chain file. A sample printout is shown in Appendix D.	

17. If unable to boot and execute diagnostics (no printer output) proceed to paragraphs 5-6 through 5-8.

4-3. OPERATING INSTRUCTIONS (Cont.)

NOTE

At this point the Computer will automatically run the diagnostics as called for in the chain file as listed in Appendix D. The Console will display/print test status, i.e. error message, with probable faulty module or "end pass, " indicating a fully operational UUT. When the final message is displayed on the Console, the operational check is complete.

18. If CPU boots and diagnostics begin to run, allow it to run until one of the following occurs:

    • Completion (indicated by END PASS)

    • Machine halts due to test failure

    • Failure is detected but CPU keeps running.
      • • Error message on printout, with or without END PASS message.

      • • Any message on printout, other than shown in Appendix D.

19. Observe console printout to identify any failures. CPU modules are so closely interrelated that a failed test merely indicates that one or more of a group of modules has failed. A recommended order of replacement is given on the printout. Prefix all reference designators on the printout with "Al".

20. Remove diagnostic diskette from Disk Drive "0". Return diskette to protective envelope and store in dust proof bag, away from heat or magnetic objects.

21. When testing is completed, reset switches S102 on Multifunction Switch (AlA12A1) and S2 on Console IF (AlA13) otherwise the Computer will not operate properly. Refer to TM11-5895-1308-24 to verify switch settings.

22. Turn off UUT power, Test Set power and Console power.

4-4. ZEROIZATION OF THE COMPUTER

To erase the contents of the memory of computers returned for repair, proceed as follows:

1. Perform steps 1-13 of paragraph 4-3.

NOTE

System will not autoboot to run zeroing procedure. The console will print a console prompt ">>>" when the CPU is turned on.

2. Install zeroizing diskette 109D-C600-5.0 into disk drive "0" (left disk drive) and secure disk drive door. Using the Console, the operator must enter commands and respond to displayed prompts as indicated as follows:

4-4. ZEROIZATION OF THE COMPUTER (Cont.)

COMMAND ENTER	DISPTAYED RESULTS PROMPTS	OPERATOR RESPONSE
<CTRL P> (simultaneously)	>>>	
H <CR>	>>>	

NOTE

If you type a wrong key, type <CTRL P> to restart.

B DYO <CR>	>>>	
	The computer will respond by printing a series of messages and prompts on the console as follows: CLEARING MEMORY CHMDYCO XXDP+ DY MONITOR 28K BOOTED VIA UNIT 0 28K UNIBUS SYSTEM	
	ENTER DATE RESTART ADDRESS: 152010 IS XXDP+ TYPE "H" OR /L" FOR HELP respond to each prompt above as indicated until the prompt "." appears. Then type the following on the console.	(DD-MMM-YY)(DD-MMM-YY) <CR>
L ZERO.BIN <CR>	When the "." prompt appears for the second time.	
S 200 <CR>	The Sequence listed in Appendix F now prints out at the console while the zeroizing program is running and memory locations are cleared. When "NEW" = displays press <CR>	

4-4. ZEROIZATION OF THE COMPUTER (Cont.)

3. If unable to boot and execute zeroing procedure (no printer output) proceed to paragraphs 5-6 through 5-8.

4. If computer boots and zeroing runs, allow it to run for approximately two (2) hours until the completion is signaled by the messages in Appendix F.

NOTE

At this point the Computer will automatically run the zeroizations as listed in Appendix F. The Console will display/print test status, i.e. Memory type/location indicating a fully zeroized UUT. When the final message is displayed on the Console, the zeroization is complete.

5. When the zeroizing program is complete, the following sequence halts the computer so memory locations can be examined.

COMMAND ENTER	DISPLAYED RESULTS PROMPTS
<CTRL P> <CR>	Selects Console mode
H <CR>	Halts program

6. To examine a selected memory address locations in each segment for zeroization, type E 105020 <CR>. The zeroized address should print out as 177777 in each case. A list of other addresses to be checked to verify zeroization is given in Appendix G.

4-4. ZEROIZATION OF THE COMPUTER (Cont.)

CAUTION

Once zeroization is completed, Console I/F module (A1A13) and Multifunction assembly (A1A12) must be removed and switches S2 and S102 must be reset for proper computer operation. Reference paragraph 3-16 in the Computer, Digital AN/UYK-42(V)4 Manual.

7. Remove zeroizing diskette from Disk Drive "0". Return diskette to protective envelope and store in dust proof bag, away from heat or magnetic objects.

NOTE

If a zeroize verification problem occurs, (i. e., the value read back is not what was expected, or the zeroizing procedure stops short), then one or all CCA's may contain classified data. This indicates that the UUT cannot be successfully zeroized, and must be repaired by cleared personnel. When the operator wants to restart the zeroize program, go to step 2.

NOTE

If a faulty CCA is the 256K Word Memory (A1A2), SMS (A1A5), SMA (A1A6), SMI (AlA7), Cache (A1A9), or Control (A1A1'); then that CCA must be treated as if it contains classified data and returned to the next higher repair level for fault isolation and repair. Applicable procedures for the handling and shipment of classified material must be followed.

8. When testing is completed, reset switches S102 on Multifunction Switch (A1A12) and S2 on Console IF (A1A13) otherwise the Computer will not operate properly. Refer to TM11-5895-1308-24 to verify switch settings.

9. Turn off UUT power, Test Set power and Console power.

SECTION V
MAINTENANCE

Section **Page**

5-1. GENERAL

This section contains operational checkout procedures, the ATP/CTP (Acceptance Test Procedure/Certification Test Procedure) fault isolation flowcharts, and removal/replacement procedures of SRUs for the Computer Test Set.

Troubleshooting and maintenance of the Test Set involves monitoring voltages and signal levels and checking cables using wire lists and diagrams supplied in Figure 2-3, Figure 2-4, and Appendix E. If repair is necessary, use standard Electronic practices to repair harnesses, cables, turn-around loop, fan assembly, AC power supply, UNIBUS adapters, and the SMI Test card.

Repair of Expansion Chassis Assembly does not include the Expansion Chassis or the Backplane which are returned to the vendor for repair.

5-1. GENERAL (Cont.)

Repair of the Disk Drive is limited to fault isolating the Drive to either the Drive itself, the Disk Interface CCA (physically located in the Expansion Chassis Assembly), or the Interconnect Cable W15. The Drive and Disk Interface CCA are repaired by sending these components to the vendor.

5-2. OPERATIONAL CHECK OF THE TEST SET, COMPUTER

The operational check is performed using the following test equipment:

Test Equipment (For Section 5)

Nomenclature	Manufacturer	Model/Type
DMM	Fluke	8050A-01
Oscilloscope	Tektronics	2235L
Pulse Generator	Wavetek	801
Console	DEC	LA120
Jumper Cable (approx 4 inches)		Male Pin to Male Pin
AN/UYK-42 (V) 4 (Known Good Unit)		

5-2.1 SMI OPERATIONAL CHECKOUT PROCEDURE

CAUTION

This equipment contains electrostatic discharge sensitive (ESD) devices. Methods to be followed are specified in DOD-STD 1686 and DOD-HDBK-263.

1. Connect test set (TS) to AC 115 Vac 60 Hz power source. The power indicator should illuminate.
2. Turn on "TEST SET POWER" switch.

NOTE

For all measurements called for in paragraph 5-2.1, the DMM and oscilloscope should have the ground reference connected to J2-125.

5-2.1 SMI OPERATIONAL CHECKOUT PROCEDURE (Cont.)

3. To perform the following tests, connect a jumper from J2-125 to the indicated pin and connect the DMM to the corresponding pin. (Remove the jumper after completing the tests.) Reference the preceding note.

JUMPER	DMM CONNECTION	VOLTAGE
No jumper	J3 pin 21	-5VDC +/-1V
J3 pin 13	J3 pin 21	-5VDC +/-1V
No jumper	J3 pin 43	+5VDC +/-1V
3 pin 46	J3 pin 43	-5VDC +/-1V
No jumper	J3 pin 89	+5VDC +/-1V
3 pin 92	J3 pin 89	-5VDC +/-1V
No jumper	J3 pin 111	+5VDC +/-1V
J3 pin 114	J3 pin 111	-5VDC +/-1V
J2 pin 119	J2 pin 66	-5VDC +/-1V
J2 pin 121	J2 pin 67	-5VDC +/-1V
2 pin 122	J2 pin 68	-5VDC +/-1V
J2 pin 122	J2 pin 69	-5VDC +/-1V

4. To perform the following test measurements, connect a jumper from J2-127 to the indicated pin, and connect the DMM to the corresponding pin. (Remove jumper upon completion.) Reference the note that follows step 2.

JUMPER	DMM CONNECTION	VOLTAGE
J2 pin 119	J2 pin 66	+5VDC +/-1V
J2 pin 121	J2 pin 67	+5VDC +/-1V
J2 pin 122	J2 pin 68	+5VDC +/-1V
J2 pin 122	J2 pin 69	+5VDC +/-1V

5. To perform the following tests, connect the oscilloscope to the indicated pins and observe the waveform as shown in Figure 5-1. Reference the note that follows step 2.

5-2.1 SMI OPERATIONAL CHECKOUT PROCEDURE (Cont.)

OSCITTLOSCOPE CONNECTION	WAVEFORM
J3 pin 19	See Figure 5-1
J3 pin 44	See Figure 5-1
J3 pin 90	See Figure 5-1
J3 pin 109	See Figure 5-1
J3 pin 23	See Figure 5-1
J3 pin 34	See Figure 5-1
J3 pin 79	See Figure 5-1
J3 pin 113	See Figure 5-1

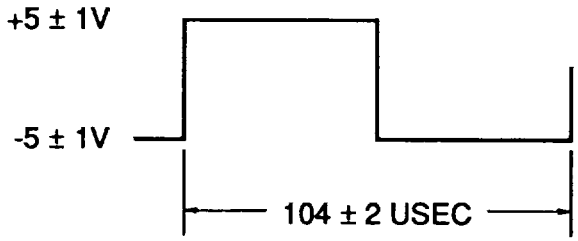


Figure 5-1. Expected Waveform

6. The following set-up uses a pulse generator and an oscilloscope. Connect the pulse generator to the channel 1 input on the Oscilloscope. Trigger the oscilloscope from channel 1 (internal) and adjust the pulse generator to produce the waveform shown in Figure 5-2.

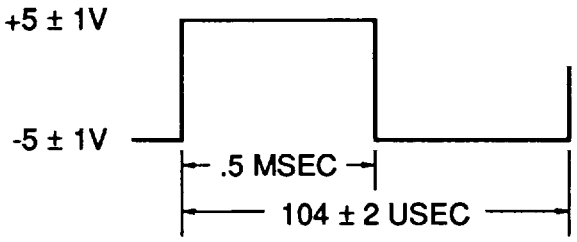


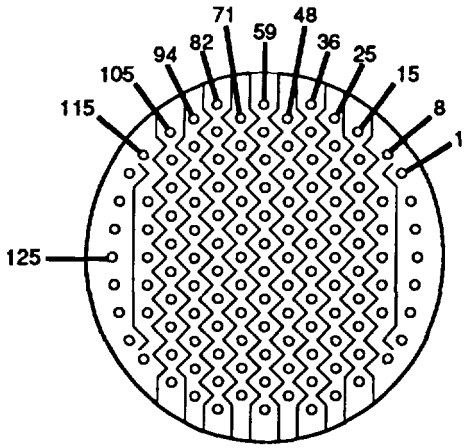
Figure 5-2. Set-Up Waveform

5-2.1 SMI OPERATIONAL CHECKOUT PROCEDURE (Cont.)

7. For each measurement, connect the pulse generator and oscilloscope channel 1 to the pins indicated in the column "Pulse Generator Connection", and oscilloscope channel 2 to the pins indicated in the column "Oscilloscope Channel 2 Connections". The setup for the first measurement to be taken is shown in Figure 5-3. For each subtest, move channel 1 and 2 on J3 inputs. Observe the channel 2 waveform in relation to the input waveform on channel 1. The waveform should be as shown in the corresponding waveform Figure indicated.

PULSE GENERATOR/ OSCILLOSCOPE CHANNEL. 1 CONNECTION		OSCILLOSCOPE CHANNEL 2 CONNECTION	EXPECTED WAVEFORM
J3 pin 9 J3 pin 10	SIGNAL RETURN	J3 PIN 115	See Figure 5-4
J3 pin 9 J3 pin 10	SIGNAL RETURN	J3 PIN 18	See Figure 5-5
J3 pin 26 J3 pin 27	SIGNAL RETURN	J3 PIN 77	See Figure 5-4
J3 pin 26 J3 pin 27	SIGNAL RETURN	J3 PIN 40	See Figure 5-5
J3 pin 75 J3 pin 76	SIGNAL RETURN	J3 PIN 33	See Figure 5-4
J3 pin 75 J3 pin 76	SIGNAL RETURN	J3 PIN 86	See Figure 5-5
J3 pin 107 J3 pin 108	SIGNAL RETURN	J3 PIN 6	See Figure 5-4
J3 pin 107 J3 pin 108	SIGNAL RETURN	J3 PIN 66	See Figure 5-5

8. When this test is completed, turn the "TEST SET" power switch off, and disconnect all test equipment.



J2 AND J3
PIN CONFIGURATIONS

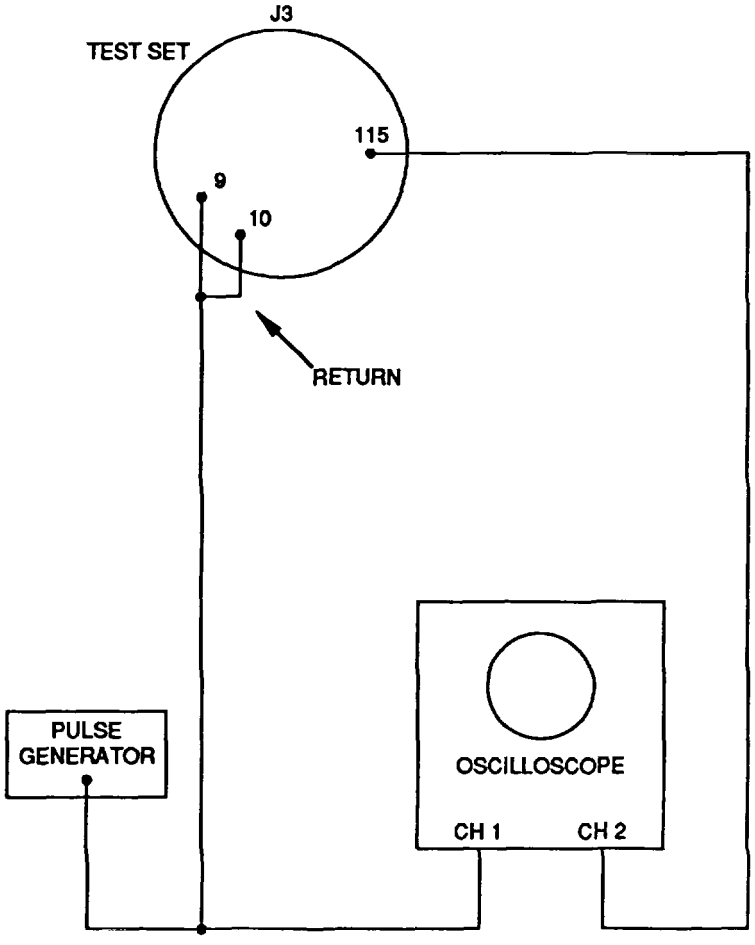


Figure 5-3. SMI Test Setup Configuration - Sub-Test 1

5-2.1 . SMI OPERATIONAL CHECKOUT PROCEDURE (Cont.)

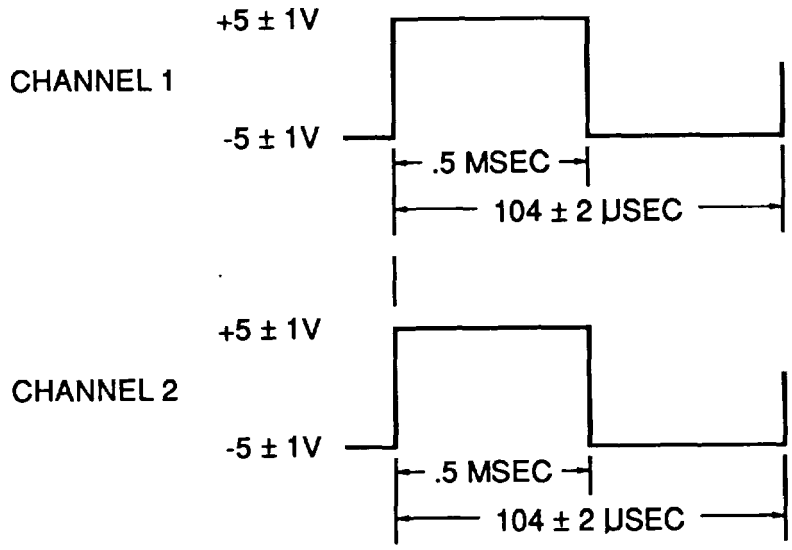


Figure 5-4. Waveform (Channel 1 and Channel 2)

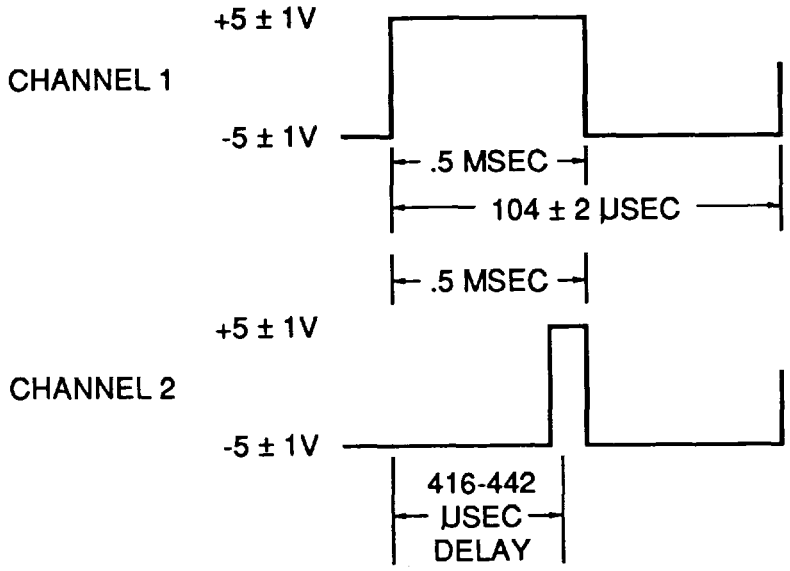


Figure 5-5. Waveform (Channel 1 and Channel 2)

5-2.2 . DATA INTERFACES

The console interface and the UNIBUS interface of the Test Set are indirectly checked by verifying if the CPU diagnostic software will successfully link-up and run in the test setup (Fig.5-6) using a known good computer.

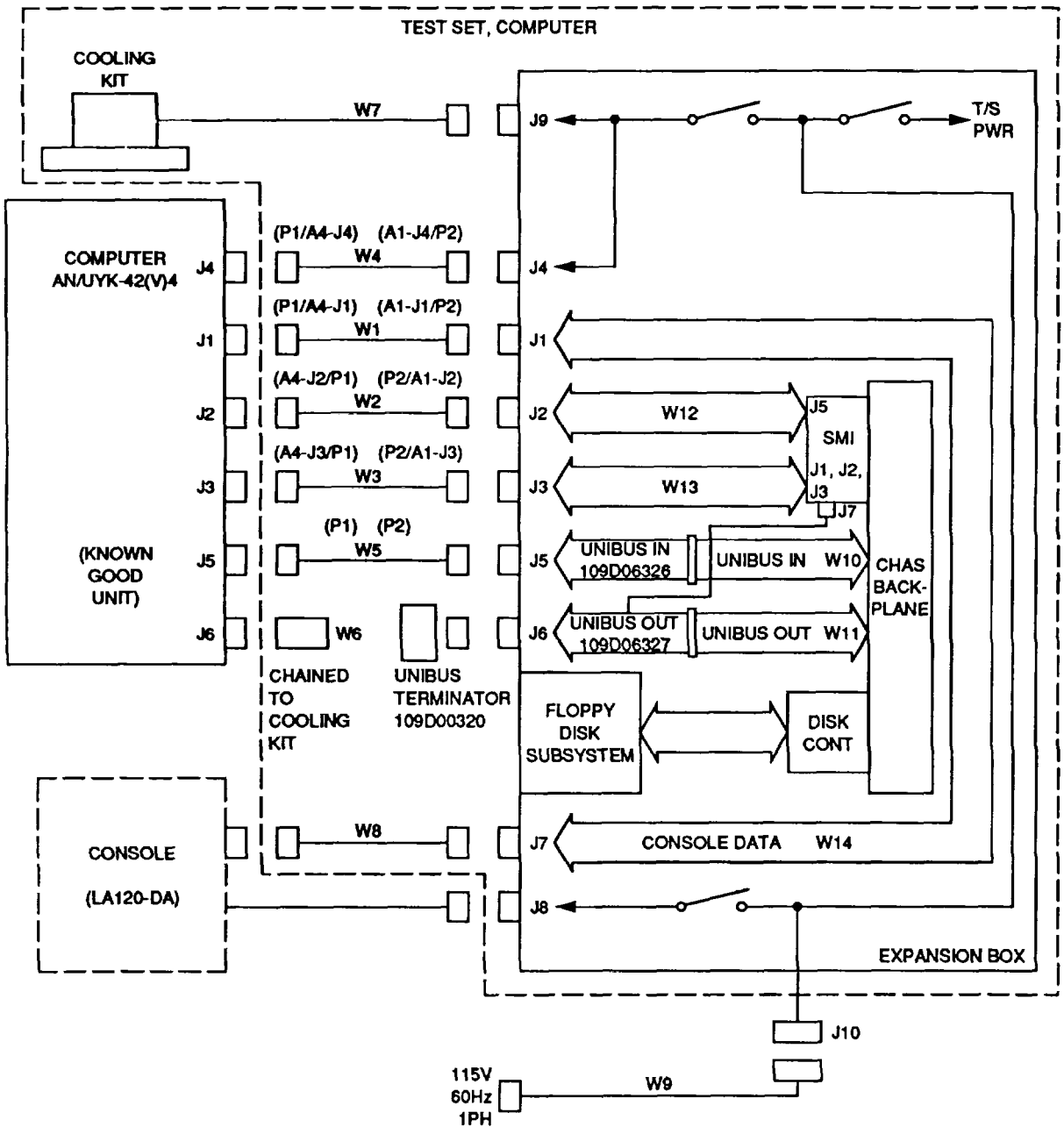


Figure 5-6. Interconnect and Test Set Block Diagram

5-3. SYMPTOM INDEX

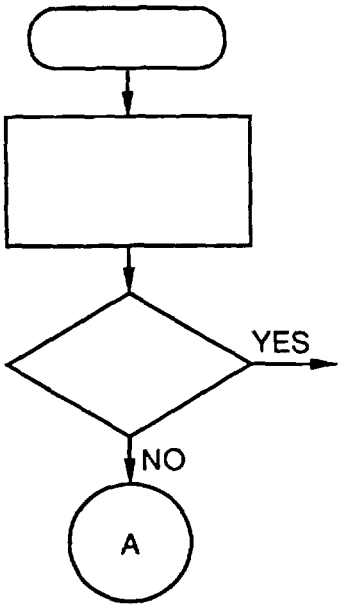
The following chart is intended to assist in rapid identification and replacement of faulty SRUs.

SYMPTOM	TROUBLESHOOTING FLOWCHART PARAGRAPH
AC Power LED Not Available To Units	5-5
Test Set Does Not Boot	5-6
Test Set Boots But Diagnostics Faulty or Missing	5-7
Console Not Interactive	5-8
Faulty or Missing Waveform During Operational Check	5-9

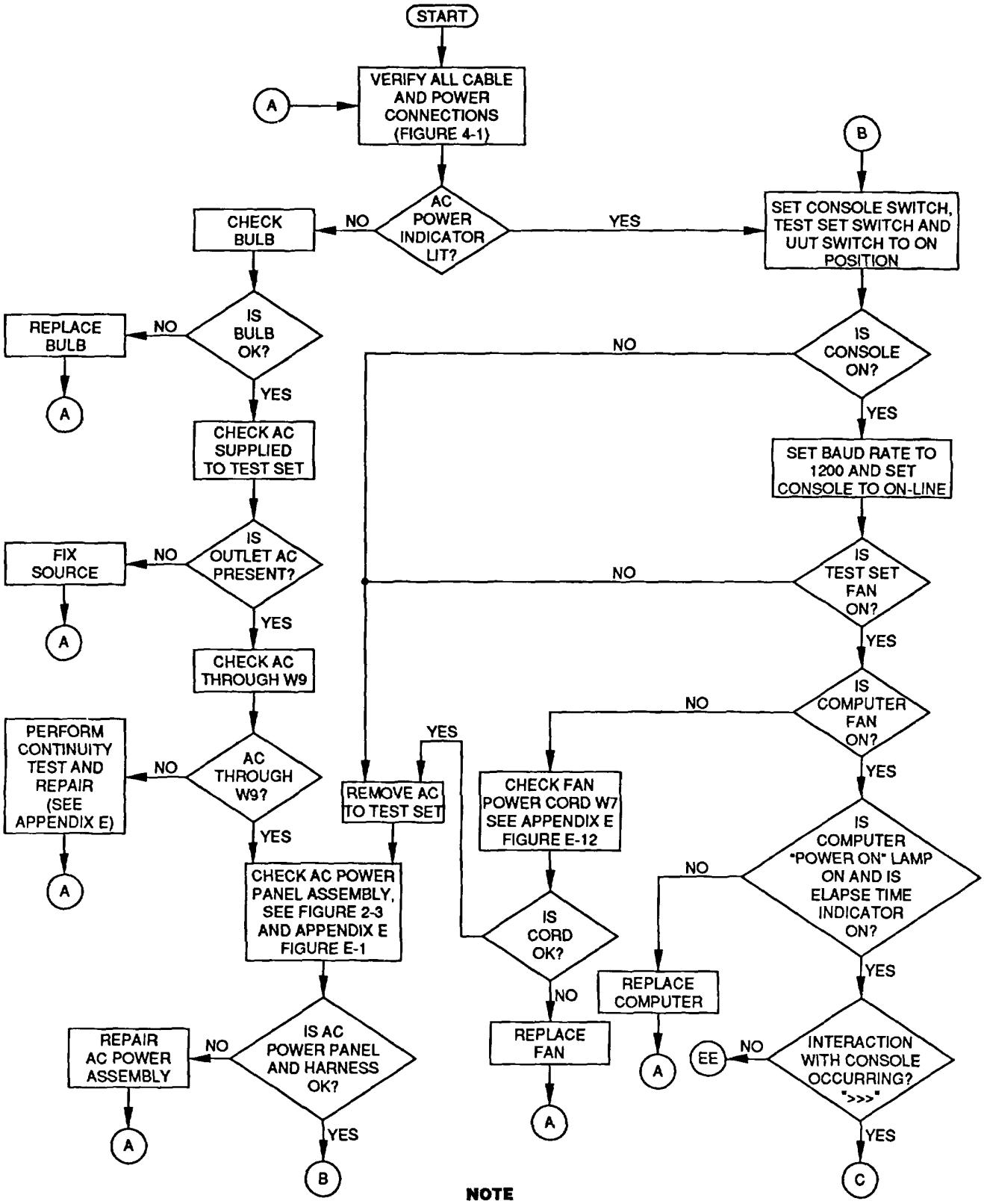
5-4. FLOWCHARTS AND HOW TO USE THEM

The flowcharts make troubleshooting easier and give maintenance personnel a clear path to follow.

To use the flowchart begin at the start and follow the path indicated by the arrow. Perform the task given by the task symbol block and then follow the arrow to the next block. At the decision symbol be sure to follow the correct path indicated by YES or NO.

SYMBOL	MEANING
	START AND FINISH SYMBOL INDICATES STARTING AND FINISHING POINTS. TASK SYMBOL INDICATES WHAT TO DO AND WHERE TO DO IT. DECISION SYMBOL (YES OR NO) INDICATES THAT A DECISION MUST BE MADE. THE DIRECTION TO GO FROM THE DECISION SYMBOL DEPENDS ON THE DECISION MADE. CONTINUATION SYMBOL INDICATES THAT THE PATH CONTINUES TO OR FROM ANOTHER FLOWCHART.

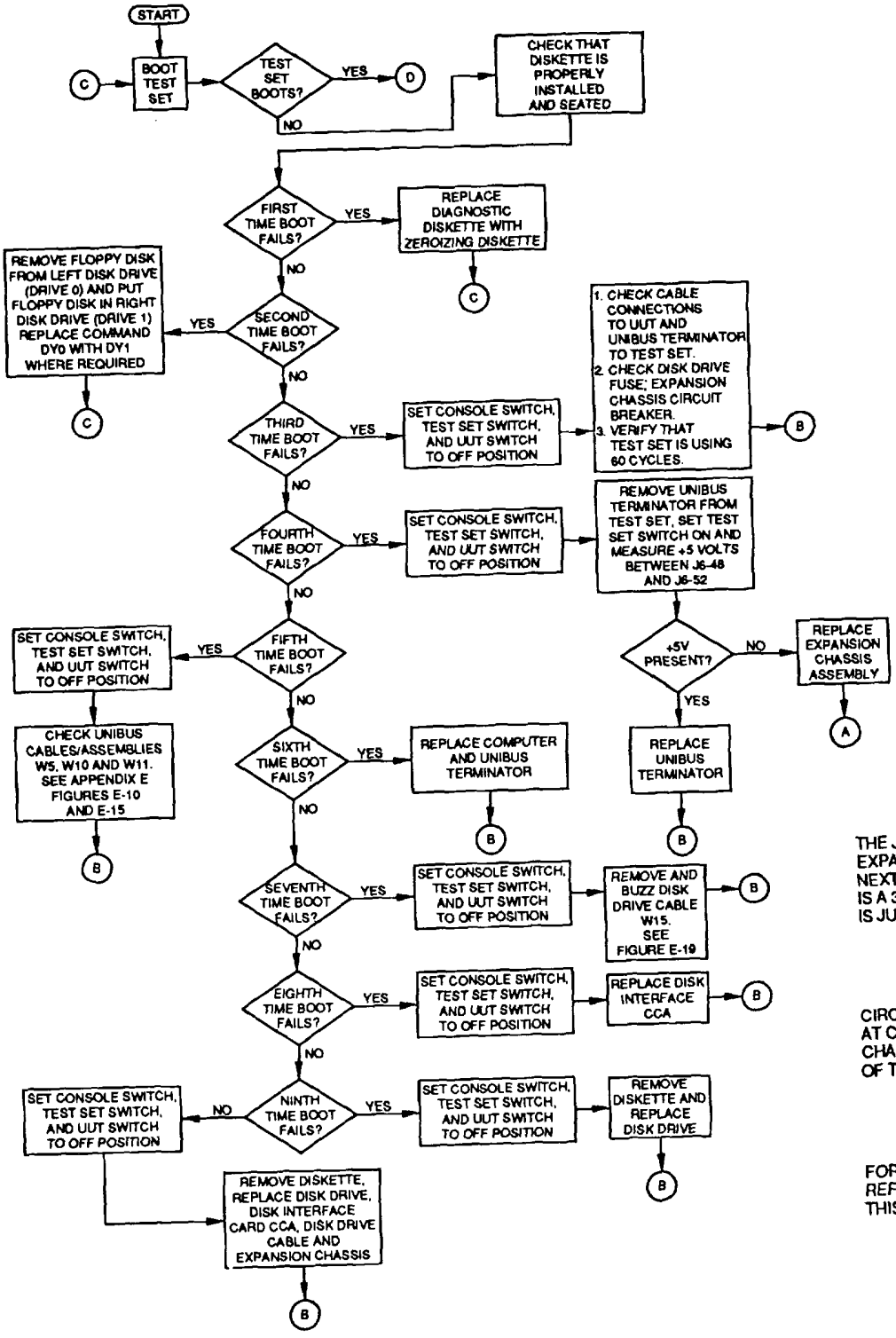
5-5. AC POWER NOT AVAILABLE TO UNITS



NOTE

FOR MAINTENANCE PROCEDURES, REFER TO INDEX AT BEGINNING OF THIS SECTION.

5-6. TEST SET DOES NOT BOOT



NOTE

THE JUMPER ON REAR OF EXPANSION CHASSIS ASSEMBLY, NEXT TO THE CIRCUIT BREAKER IS A 3 PIN CONNECTOR. THE TOP IS JUMPERED TO THE BOTTOM.

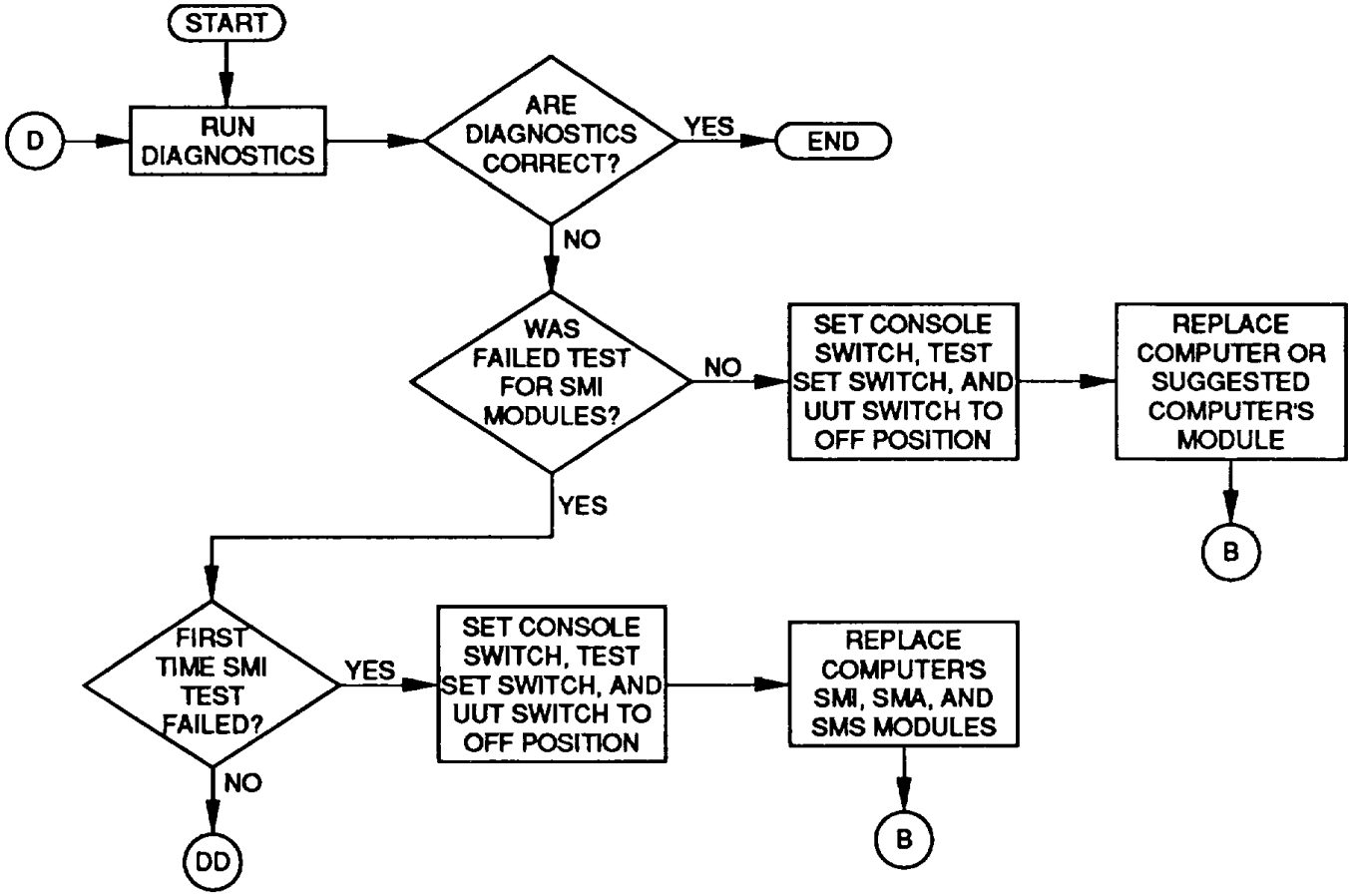
NOTE

CIRCUIT BREAKER IS LOCATED AT CENTER, REAR OF EXPANSION CHASSIS ASSEMBLY, AT BOTTOM OF TEST SET RACK.

NOTE

FOR MAINTENANCE PROCEDURES, REFER TO INDEX AT BEGINNING OF THIS SECTION.

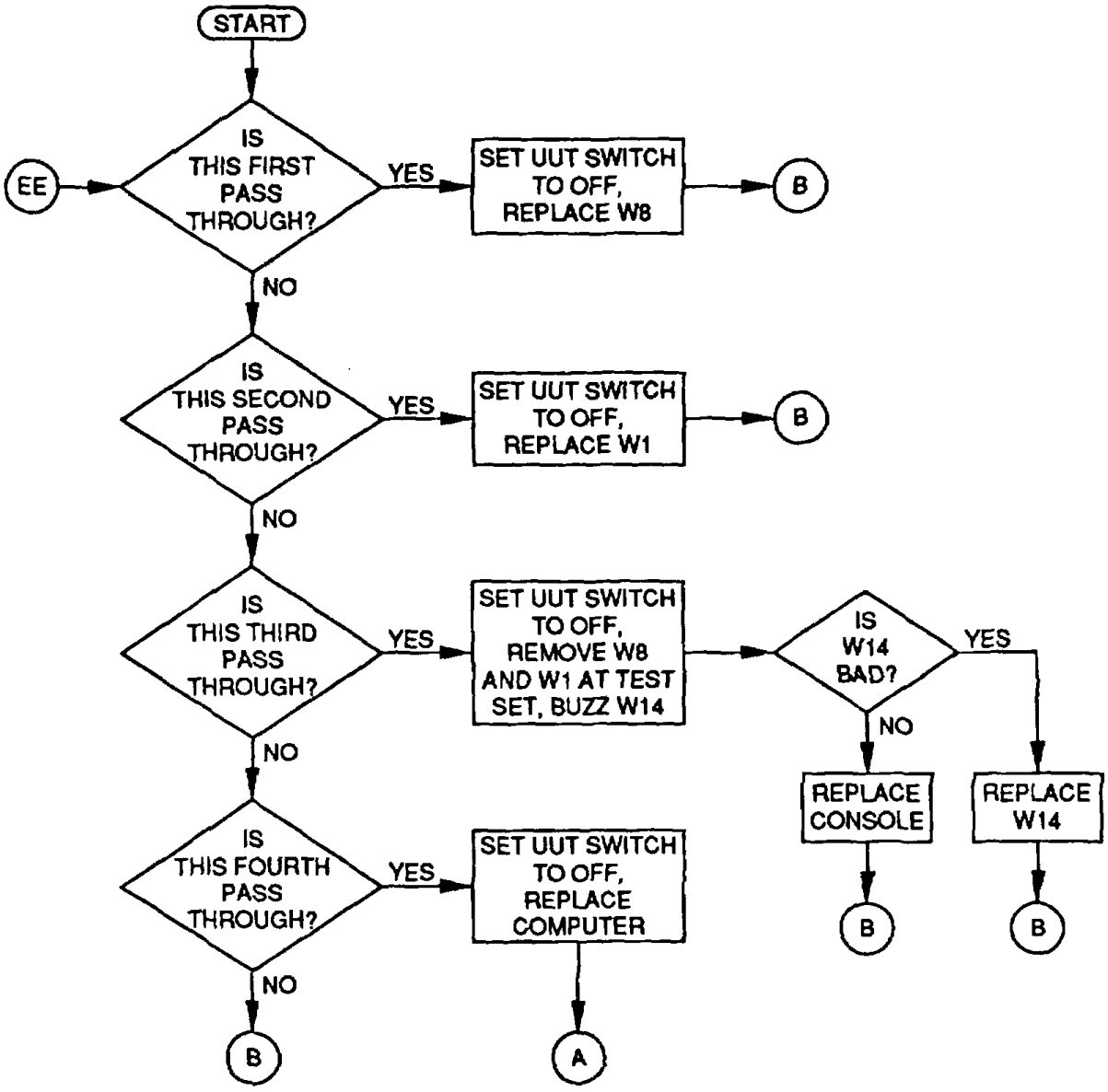
5-7. TEST SET BOOTS BUT DIAGNOSTICS ARE FAULTY OR MISSING



NOTE

FOR MAINTENANCE PROCEDURES, REFER TO INDEX AT BEGINNING OF THIS SECTION.

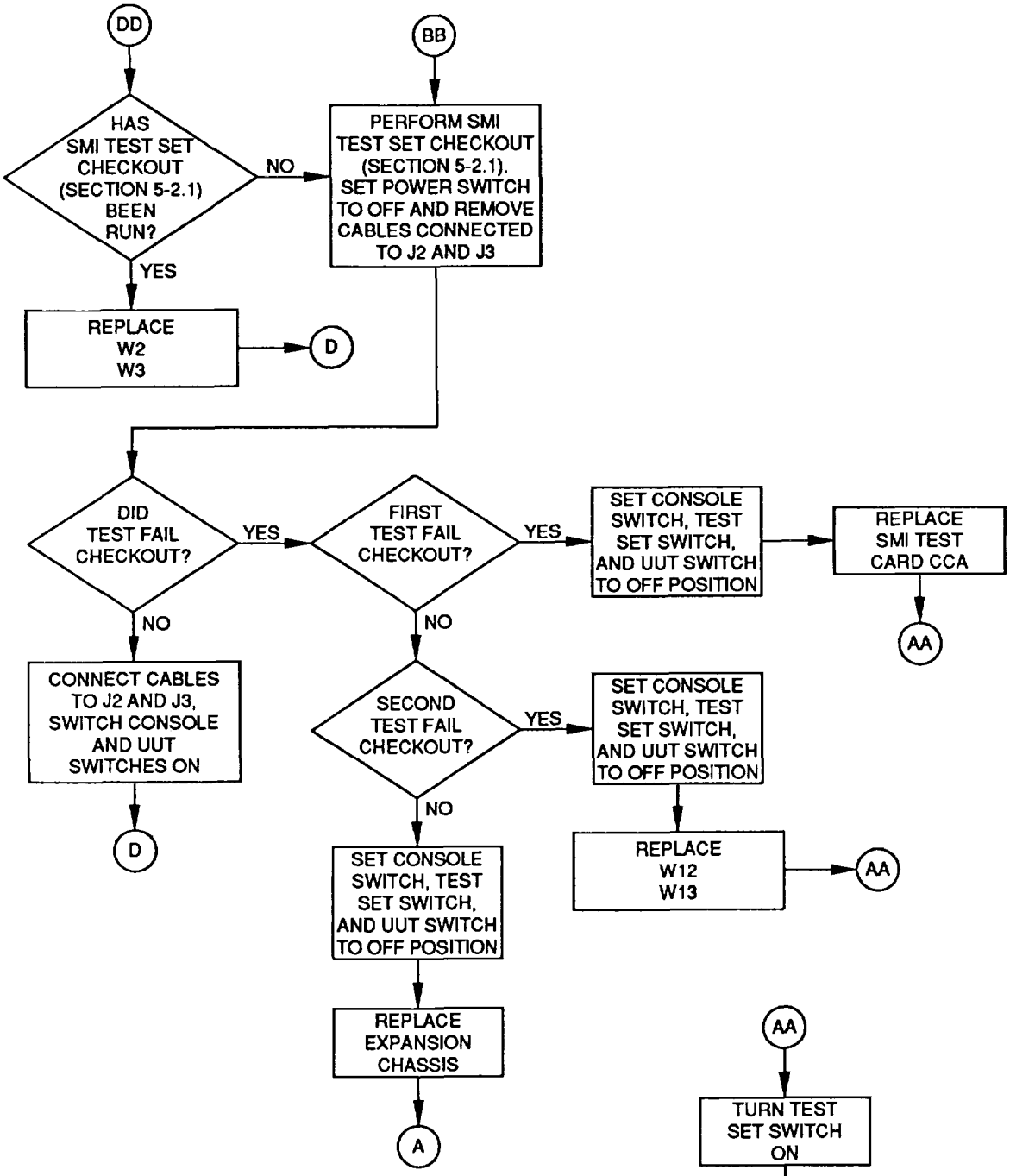
5-8. CONSOLE NOT INTERACTIVE



NOTE

FOR MAINTENANCE PROCEDURES, REFER TO INDEX AT BEGINNING OF THIS SECTION.

5-9. FAULTY OR MISSING WAVEFORM DURING OPERATIONAL TEST



NOTE

FOR MAINTENANCE PROCEDURES, REFER TO INDEX AT BEGINNING OF THIS SECTION.

5-10. REMOVAL/REPLACEMENT OF EXPANSION CHASSIS ASSEMBLY

WARNING

All Removal/Replacement procedures are performed with power removed. For safety purposes, unplug the Test Set from AC power before beginning procedures.

CAUTION

This equipment contains electrostatic discharge sensitive (ESD) devices. Methods to be followed are specified in DOD-STD-1686 and DOD-HDBK-263.

REMOVAL OF EXPANSION CHASSIS ASSEMBLY:

To remove the Expansion Chassis Assembly, perform the following steps:

1. See Figure 5-7 and remove the following cables from the Expansion Chassis Assembly front panel:

   W2 cable from J2 connector
   W3 cable from J3 connector
   W5 cable from J5 connector

2. Loosen six captive screws on front panel of Expansion Chassis Assembly. See Figure 5-7 to locate these captive screws.

3. Using handles, pull Expansion Chassis Assembly straight out until drawer clicks. See Figure 5-7 to locate these handles.

4. The Disk Drive Cable W15 (cable between the Disk Drive Assembly and the Disk Interface Card CCA) must now be removed. Locate the clamp that is beyond the fan and above the Expansion Chassis power supply. Remove the four screws and the remove the clamp. Now remove the cable from the clamp and unplug the disk drive cable from the Disk Interface Card CCA connector P1 by depressing tabs at end of CCA connector to release disk drive connector. Once the cable is removed and unplugged, return the clamp and the four screws to their original location. See Figures 5-7 and 5-9 to locate these items.

5. Open back door of Test Set and unplug Expansion Chassis Assembly power cord from AC Power Panel Assembly Power Strip. Power strip is located inside the Test Set to the left of the back door.

5-10. REMOVAL/REPLACEMENT OF EXPANSION CHASSIS ASSEMBLY (Cont.)

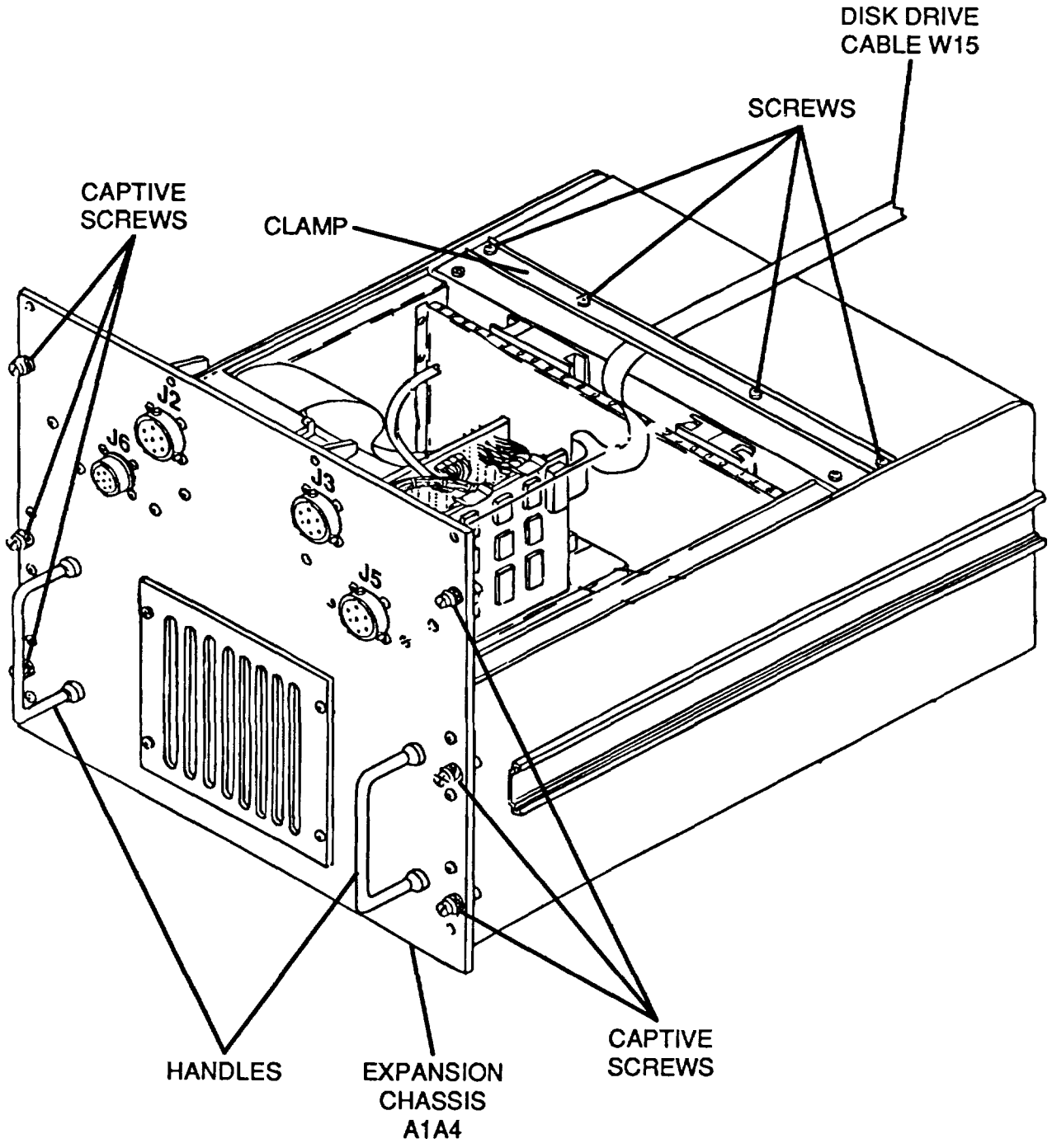


Figure 5-7. Expansion Chassis Removal

5-10. REMOVAL/REPLACEMENT OF EXPANSION CHASSIS ASSEMBLY (Cont.)

WARNING

Due to weight distribution and slides, use two persons when removing Expansion Chassis Assembly.

6. Continue pulling out the Expansion Chassis Assembly until it clicks and locks. Push Expansion Chassis Assembly in, slightly, and depress slide release tabs. See Figure 5-8 to locate these tabs. Continue pulling out the Expansion Chassis Assembly until it locks and clicks again. Push Expansion Chassis Assembly in, slightly and press up on silver tabs by placing finger below each silver tab and pushing tab toward the back of the rack. See Figure 5-8 to locate these tabs. Pull the Expansion Chassis Assembly completely out from the rack.

7. Press catch button on middle of each slide and push the slides back into Test Set. Refer to Figure 5-8 to locate these catch buttons.

5-10. REMOVAL/REPLACEMENT OF EXPANSION CHASSIS ASSEMBLY (Cont.)

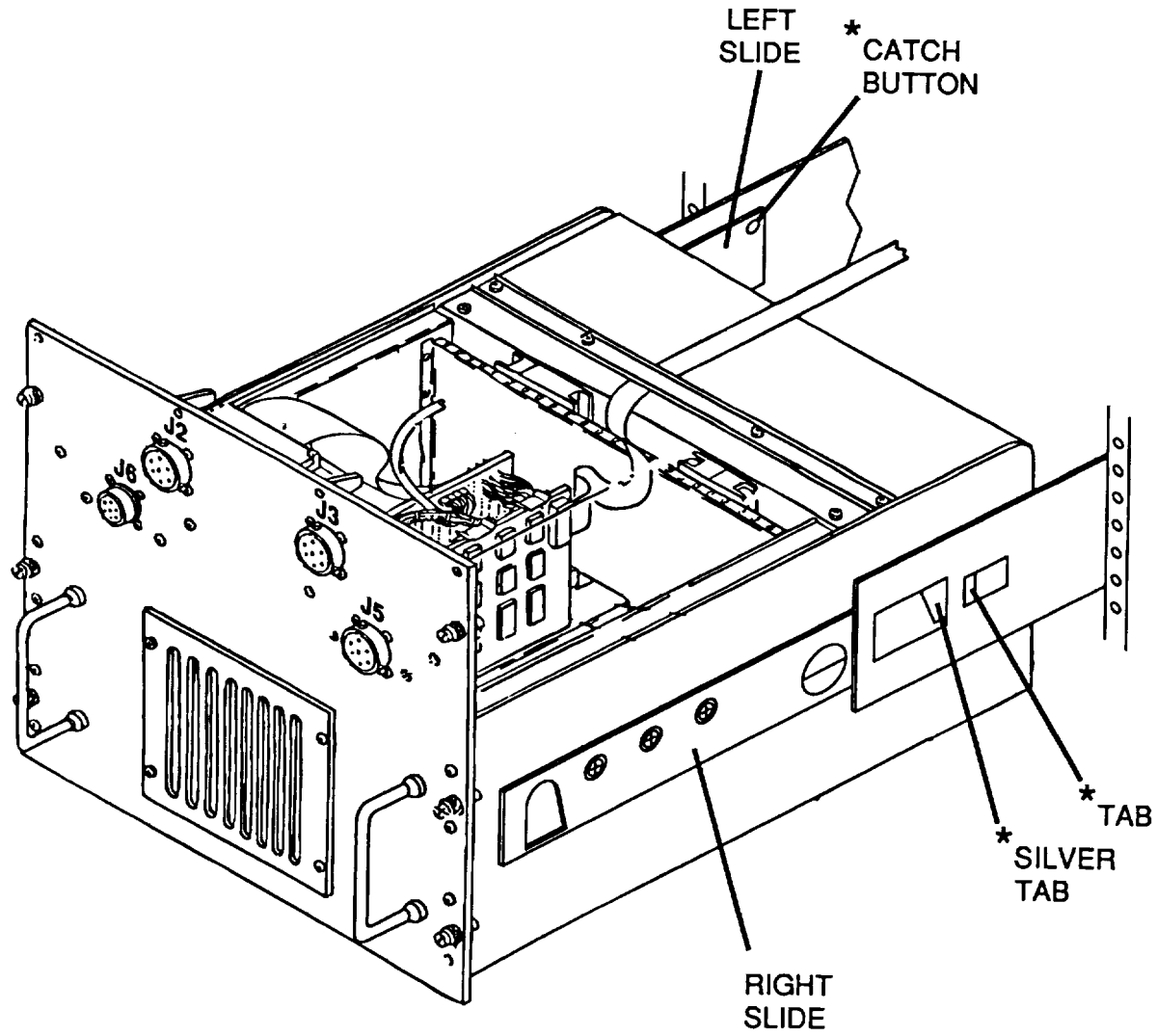


Figure 5-8. Tab and Catch Button Locations on Expansion Chassis Slides

5-10. REMOVAL/REPLACEMENT OF EXPANSION CHASSIS ASSEMBLY (Cont.)

REPLACEMENT OF EXPANSION CHASSIS ASSEMBLY:

To replace the Expansion Chassis Assembly, perform the following steps:

1. Pull slides out until they lock.

2. Engage Expansion Chassis Assembly into slides.

3. Using handles, push Expansion Chassis Assembly straight in until drawer clicks. See Figure 5-7 to locate these handles.

4. The Disk Drive Cable W15 (cable between the Disk Drive Assembly and the Disk Interface Card CCA) must now be replaced. Locate the clamp that is beyond the fan and above the Expansion Chassis power supply. Remove the four screws and the remove the clamp. Now replace the disk drive cable in the clamp and plug the cable into the Disk Interface Card CCA connector P1. See Figures 5-7 and 5-9 to locate these items. Once the cable is replaced, return the clamp and the four screws to their original location. See Figure 5-11 for proper cable orientation.

5. Open back door of Test Set and plug Expansion Chassis Assembly power cord into AC Power Panel Assembly Power Strip. Power strip is located inside the Test Set to the left of the back door.

6. Push the Expansion Chassis Assembly completely into the Computer Test Set Cabinet.

7. Tighten 6 captive screws on front panel of Expansion Chassis Assembly. Refer to Figure 5-7 to locate these screws.

8. See Figure 5-7 and connect the following cables to the Expansion Chassis Assembly front panel:

   W2 cable to J2 connector
   W3 cable to J3 connector
   W5 cable to J5 connector

5-11. REMOVAL/REPLACEMENT OF SMI TEST CARD CCA

WARNING

All Removal/Replacement procedures are performed with power removed. For safety purposes, unplug the Test Set from AC power before beginning procedures.

CAUTION

This equipment contains electrostatic discharge sensitive (ESD) devices. Methods to be followed are specified in DOD-STD-1686 and DOD-HDBK-263.

REMOVAL OF SMI TEST CARD CCA

To remove the SMI Test Card CCA, perform the following steps:

1. See Figure 5-7 and remove the following cables from the front panel of the Expansion Chassis Assembly:

   W2 cable from J2 connector
   W3 cable from J3 connector
   W5 cable from J5 connector

2. Loosen six captive screws on front panel of Expansion Chassis Assembly. See Figure 5-7 to locate these captive screws.

3. Using handles, pull Expansion Chassis Assembly straight out until drawer clicks.

4. Unplug cable connector P1 from SMI Test Card CCA connector J1. Unplug cable connector P2 from SMI Test Card CCA connector J2. Unplug cable connector P3 from SMI Test Card CCA connector J3. The cable for these P1, P2, and P3 connectors connects to Computer Test Set Front Panel connector J3. See Figure 5-9 to locate these connectors.

5. Unplug cable connector P1 from SMI Test Card CCA connector J5. The cable for this P1 connector connects to Computer Test Set Front Panel connector J2. See Figure 5-9 to locate these connectors.

6. Unplug cable connector P1 from SMI Test Card CCA connector J7. The cable for this P1 connector connects to the cable that is connected to Computer Test Set Front Panel connector J6. See Figure 5-9 to locate these connectors.

5-11. REMOVAL/REPLACEMENT OF SMI TEST CARD CCA (Cont.)

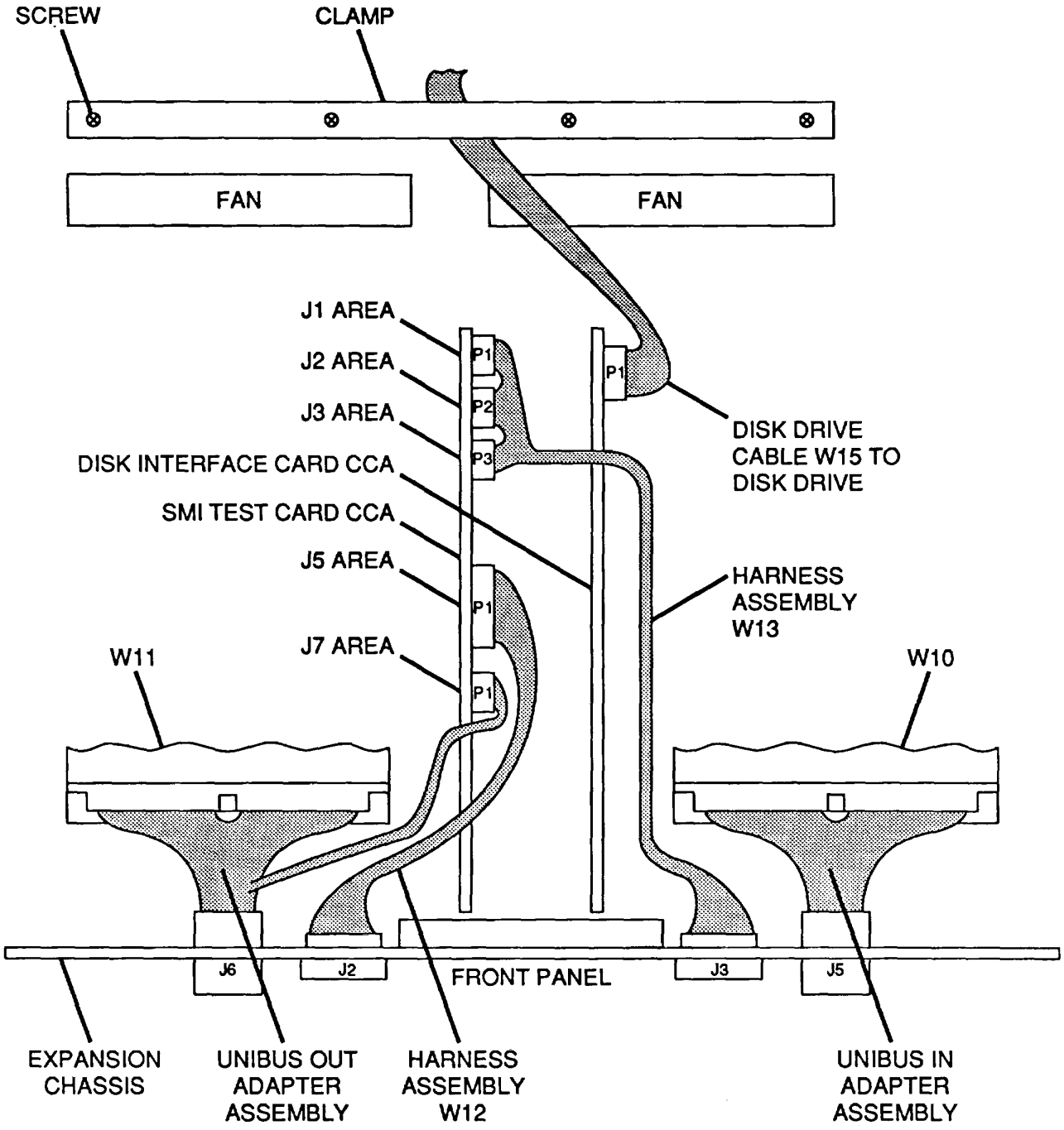


Figure 5-9. Internal Components of Expansion Chassis Assembly

5-11. REMOVAL/REPLACEMENT OF SMI TEST CARD CCA

7. Remove SMI Test Card CCA by grasping the card and lifting the card straight up.

REPLACEMENT OF SMI TEST CARD CCA

To replace the SMI Test Card CCA, perform the following steps:

1. Plug cable connector P1 into SMI Test Card CCA connector J5. The cable for this P1 connector connects to Computer Test Set Front Panel connector J2. See Figure 5-9 to locate these connectors. Refer to Section 5-14 and see Figure 5-14 and Figure 5-15 for cable keying information.

2. Plug cable connector P1 into SMI Test Card CCA connector j7. The cable for this P1 connector connects to cable that is connected to Computer Test Set Front Panel connector J6. See Figure 5-9 to locate these connectors. Refer to Section 5-14 and see Figure 5-14 and Figure 5-15 for cable keying information.

3. Plug cable connector P3 into SMI Test Card CCA connector J3. Plug cable connector P2 into SMI Test Card CCA connector J2. Plug cable connector P1 into SMI Test Card CCA connector J1. The cable for these P1, P2, and P3 connectors connects to Computer Test Set Front Panel connector J3. See Figure 5-9 to locate these connectors. Refer to Section 5-14 and see Figure 5-14 and Figure 5-15 for cable keying information.

4. Replace SMI Test Card CCA by grasping the card and pressing the card straight down into place. See Figure 5-10 for plug-in locations on the Expansion Chassis backplane.

5. Using handles, push Expansion Chassis Assembly straight in to Computer Test Set cabinet.

6. Tighten six captive screws on front panel of Expansion Chassis Assembly. See Figure 5-7 to locate these captive screws.

7. See Figure 5-7 and connect the following cables to the front panel of the Expansion Chassis Assembly:

   W2 cable from J2 connector
   W3 cable from J3 connector
   W5 cable from J5 connector

5-11. REMOVAL/REPLACEMENT OF SMI TEST CARD CCA (Cont.)

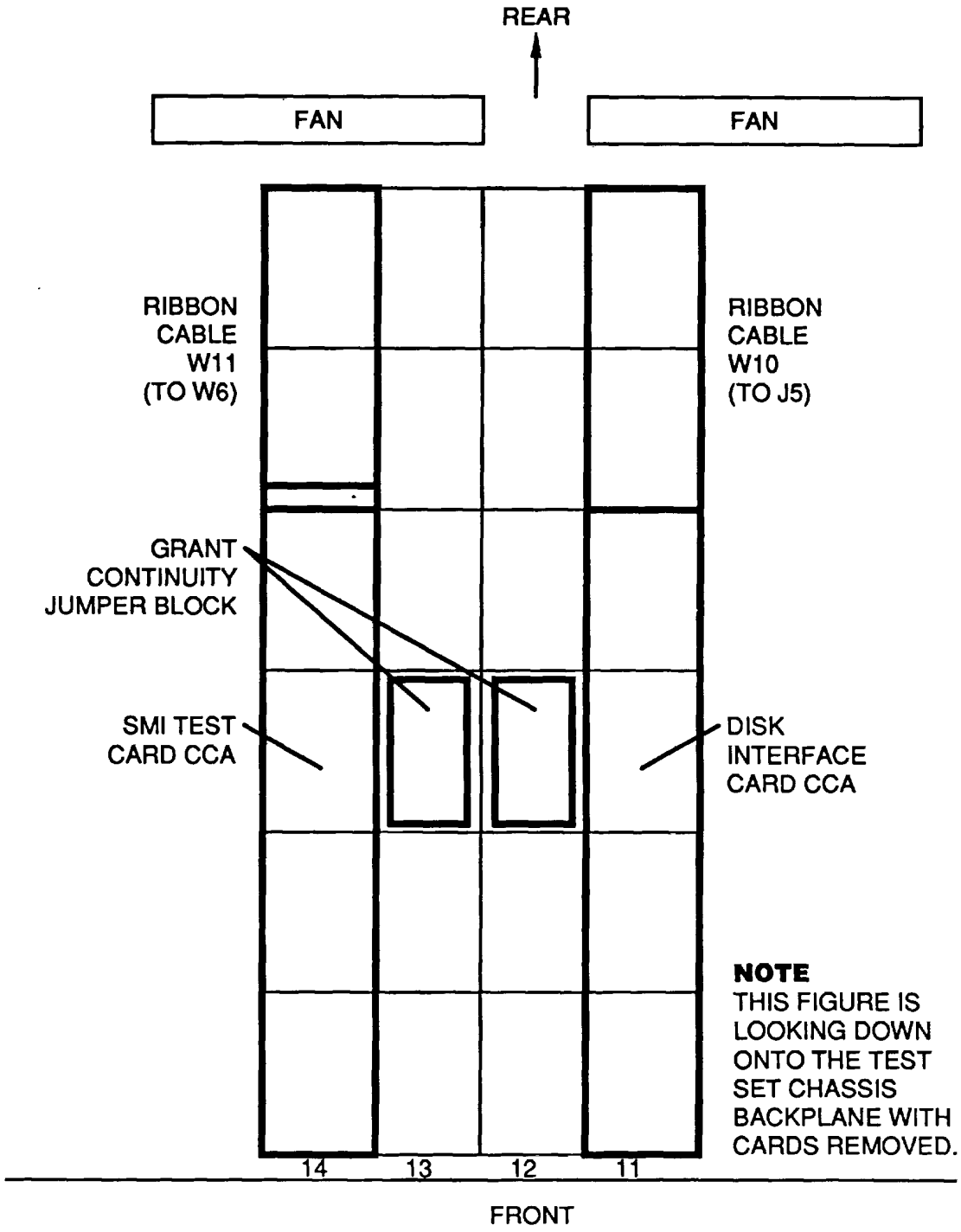


Figure 5-10. Module Locations On Expansion Chassis Backplane

5-12. REMOVAL/REPLACEMENT OF DISK INTERFACE CARD CCA

WARNING

All Removal/Replacement procedures are performed with power removed. For safety purposes, unplug the Test Set from AC power before beginning procedures.

CAUTION

This equipment contains electrostatic discharge sensitive (ESD) devices. Methods to be followed are specified in DOD-STD-1686 and DOD-HDBK-263.

REMOVAL OF DISK INTERFACE CARD CCA

To remove the Disk Interface Card CCA, perform the following steps:

1. See Figure 5-7 and remove the following cables from the front panel of the Expansion Chassis Assembly:

   W2 cable from J2 connector
   W3 cable from J3 connector
   W5 cable from J5 connector

2. Loosen six captive screws on front panel of Expansion Chassis Assembly. See Figure 5-7 to locate these captive screws.

3. Using handles, pull Expansion Chassis Assembly straight out until drawer clicks.

4. Push all cables from SMI Test Card to Computer Test Set front panel connectors out of the way. See Figure 5-9 to locate these cables.

5. Unplug the P1 cable connector of the W15 (ribbon) cable from Disk Interface Card CCA by depressing tabs at end of P1 connector and removing P1 connector from the Disk Interface Card CCA. See Figure 5-9 to locate the W15 cable and the P1 connector. The W15 cable is the ribbon cable connects the Disk Interface Card CCA to the Disk Drives.

6. Remove Disk Interface Card CCA by grasping the card and lifting the card straight up.

5-12. REMOVAL/REPLACEMENT OF DISK INTERFACE CARD CCA (Cont.)

REPLACEMENT OF DISK INTERFACE CARD CCA

To replace the Disk Interface Card CCA, perform the following steps:

1. Push all cables from SMI Test Card CCA to Computer Test Set front panel connectors out of the way. See Figure 5-9 to locate these cables.

2. Replace Disk Interface Card CCA by grasping the card and pressing the card straight down into place. See Figure 5-10 for plug-in locations on the Expansion Chassis backplane.

3. See Figure 5-9 and plug the P1 connector for the W15 cable to the Disk Interface Card CCA. Refer to Figure 5-11 for proper cable orientation.

4. Using handles, push Expansion Chassis Assembly straight in to the Computer Test Set cabinet.

5. Tighten six captive screws on front panel of Expansion Chassis Assembly. See Figure 5-7 to locate these captive screws.

6. See Figure 5-7 and connect the following cables to the front panel of the Expansion Chassis Assembly:

   W2 cable to J2 connector
   W3 cable to J3 connector
   W5 cable to J5 connector

5-12. REMOVAL/REPLACEMENT OF DISK INTERFACE CARD CCA (Cont.)

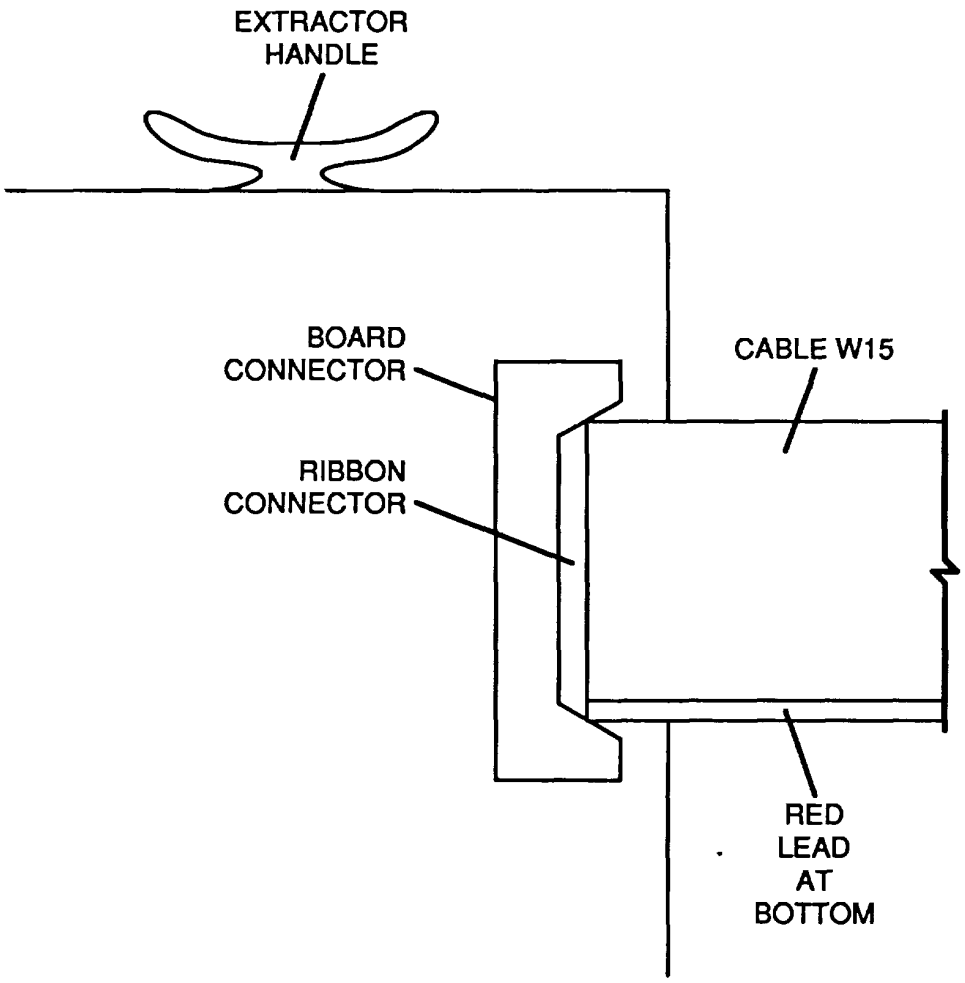


Figure 5-11. Component Side - Top Right Side of Disk Interface Card CCA

5-13.REMOVAL/REPLACEMENT OF DISK DRIVE ASSEMBLY

WARNING

All Removal/Replacement procedures are performed with power removed. For safety purposes, unplug the Test Set from AC power before beginning procedures.

WARNING

Due to weight distribution and slides, use two persons when removing Disk Drive Assembly.

CAUTION

This equipment contains electrostatic discharge sensitive (ESD) devices. Methods to be followed are specified in DOD-STD-1686 and DOD-HDBK-263.

REMOVAL OF DISK DRIVE ASSEMBLY

To remove Disk Drive Assembly, see Figure 5-12 and Figure 5-13. Figure 5-12 shows the Disk Drive Drawer and Figure 5-13 shows the component side, (bottom side) of the Disk Drive Controller CCA. Perform the following steps:

1. Grasp lip at bottom of disk drive drawer and pull Disk Drive Drawer straight out until it locks.

2. Remove and retain 2 screws, flat washers and lockwashers on right side of Disk Drive Controller CCA. Remove and save 1 screw, flat washer and lockwasher on middle of Disk Drive Controller CCA. See Figure 5-12 for the locations of these screws.

3. Lift right side of Disk Drive Controller CCA and unplug the cable W15 from under the left side of the Disk Drive Controller CCA. See Figure 5-12 and Figure 5-13 to locate the cable W15.

5-13. REMOVAL/REPLACEMENT OF DISK DRIVE ASSEMBLY (Cont.)

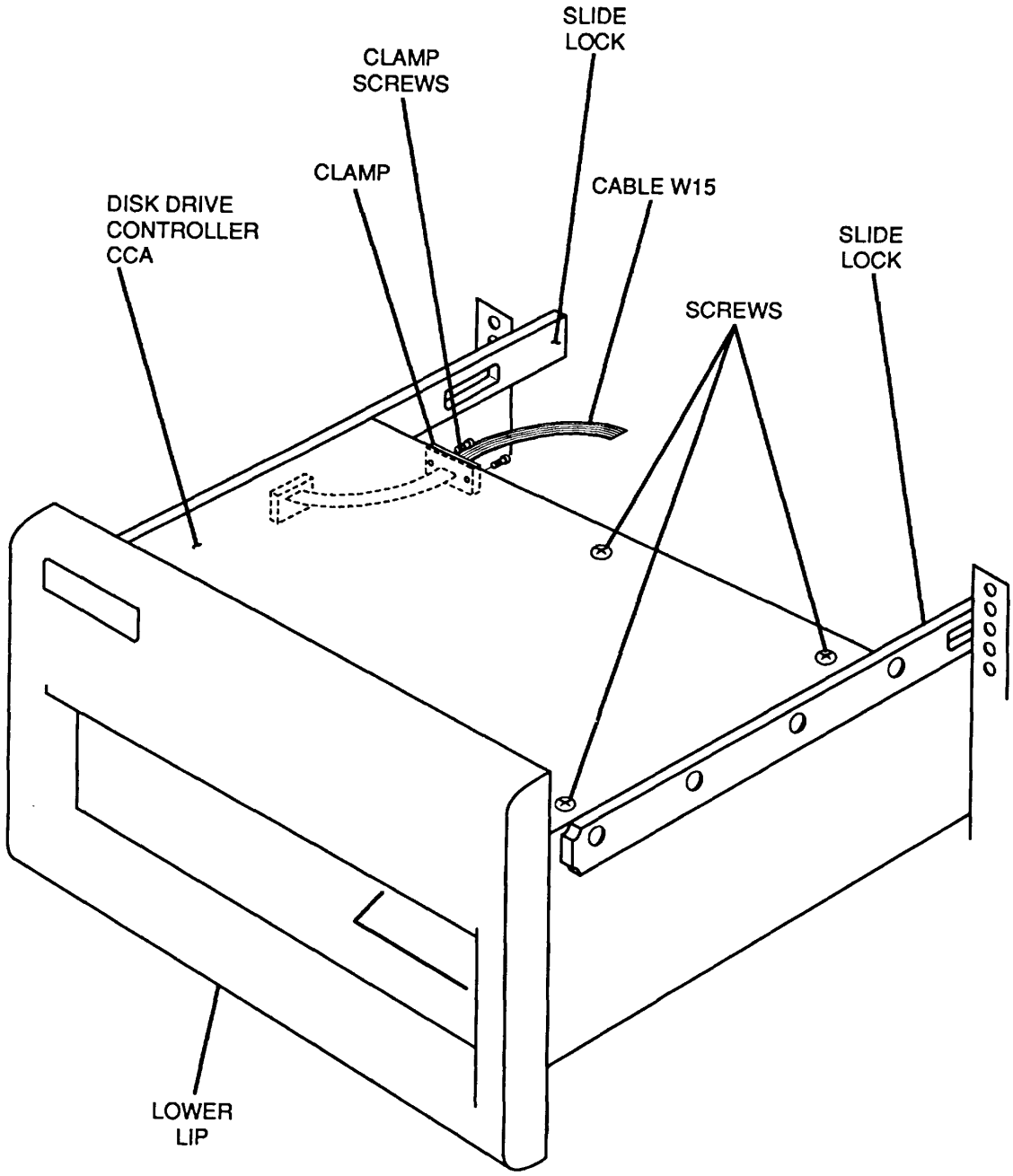


Figure 5-12. Removal of Disk Drive

5-13. REMOVAL/REPLACEMENT OF DISK DRIVE ASSEMBLY (Cont.)

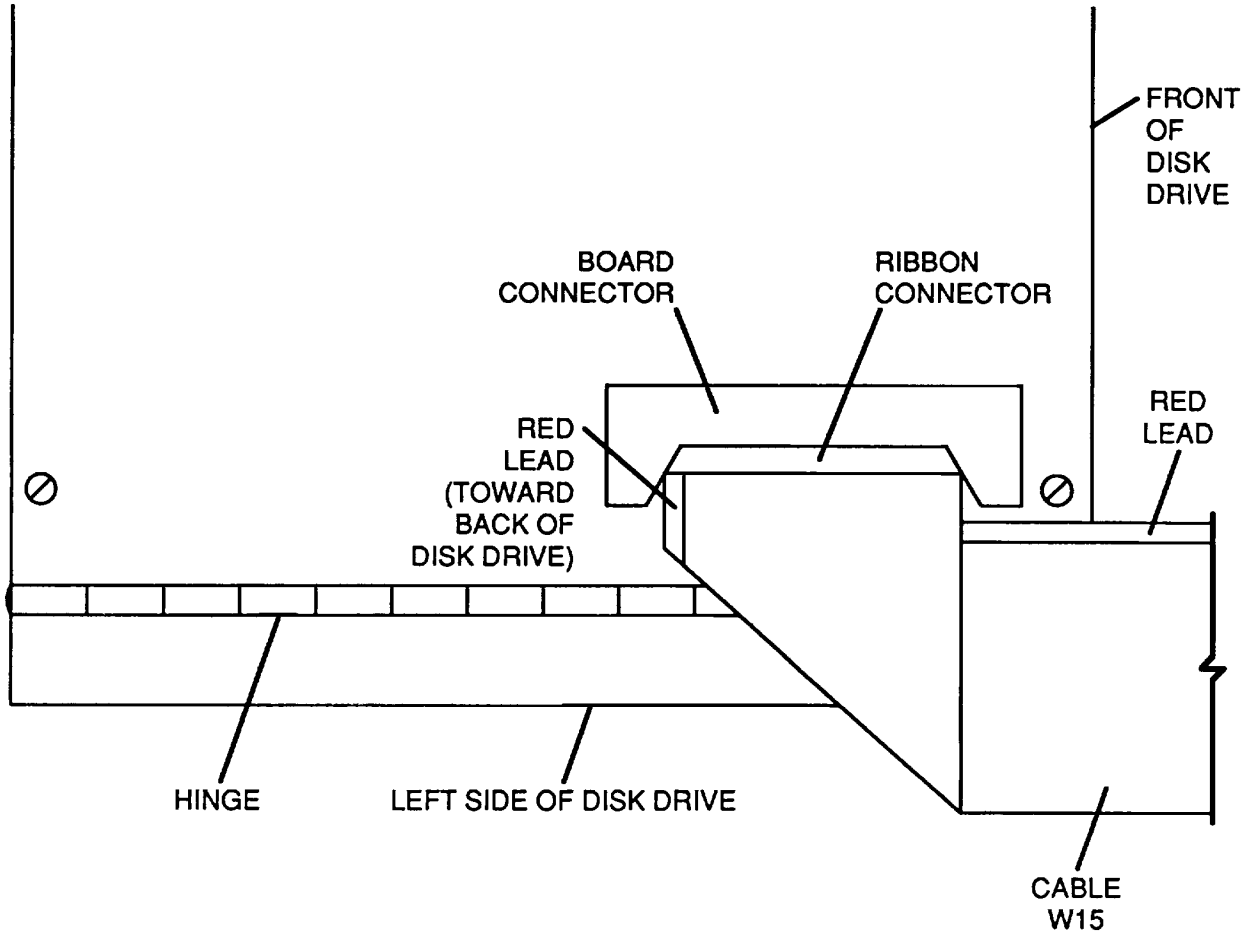


Figure 5-13. Component Side - Bottom Side of Disk Drive Controller CCA

5-13. REMOVAL/REPLACEMENT OF DISK DRIVE ASSEMBLY (Cont.)

4. Line up screw holes on the right side of the Disk Drive Controller CCA and replace the three screws, flat washers, and lockwashers that were removed and retained in step 2 of this procedure. See Figure 5-12 to locate these screw holes.

5. The cable W15 attached to back left side of Disk Drive Assembly must be removed. This cable can be accessed from the back of the Test Set. Open back door of Test Set and locate this cable. Looking from the back of the Test Set, this cable is located to the upper right on the back side of the Disk Drive Assembly. Remove and retain left screw, lockwasher and flat washer, and only loosen the right screw. Remove cable W15 from the disk drive assembly. Return left screw, lockwasher, and flat washer to cable clamp. Tighten both clamp screws. See Figure 5-12 to locate these items.

6. Open back door of Test Set and unplug Disk Drive Assembly power cord from AC Power Panel Assembly Power Strip. Power strip is located inside the Test Set to the left of the back door.

7. One slide lock is located on the left hand slide and one slide lock is located on the right hand slide. Press in on these slide locks to release the Disk Drive Drawer safety locks. See Figure 5-12 to locate these slide locks.

8. Pull the Disk Drive Assembly straight out.

REPLACEMENT OF DISK DRIVE ASSEMBLY

To replace Disk Drive Assembly, see Figure 5-12 and Figure 5-13. Figure 5-12 shows the Disk Drive Drawer. Figure 5-13 shows the component side, (bottom side) of the Disk Drive Controller CCA. Perform the following steps:

1. Place the Disk Drive Assembly into the slides and push the drawer straight in. Push metal tabs on slides to allow slides to lock into place.

2. Remove and save 2 screws flat washers, and lockwashers on right side of Disk Drive Controller CCA. Remove and save 1 screw, flat washer, and lockwasher on middle of Disk Drive Controller CCA. See Figure 5-12 for the locations of these screws.

5-13. REMOVAL/REPLACEMENT OF DISK DRIVE ASSEMBLY (Cont.)

3. Lift the right side of the Disk Drive Controller CCA and *plug* in the cable W15 to the left side of the Disk Drive Controller CCA. See Figure 5-13 to properly plug in the cable W15 to the Disk Drive Controller CCA.

4. Line up screw holes on the right side of the Disk Drive Controller CCA and replace the three screws, flat washers, and lockwashers that were removed and retained in step 2 of this procedure. See Figure 5-12 to locate these screw holes.

5. One slide lock is located on the left hand slide and one slide lock is located on the right hand slide. Press in on these slide locks to release the Disk Drive Drawer.

6. Push the Disk Drive Drawer straight into the Test Set so that its front panel lines up with the front panel of the Expansion Chassis Assembly.

7. Clamp cable W15 to back left side of Disk Drive Assembly. This can be accomplished from the back of the Test Set. Looking from the back of the Test Set, this cable is positioned to the upper right on the back side of the Disk Drive Assembly. Replace the left screw, flat washer, and lockwasher. Tighten both clamp screws. See Figure 5-12 to locate these items.

8. Open back door of Test Set and plug in the Disk Drive Assembly power cord from AC Power Panel Assembly Power Strip. Power strip is located inside the Test Set to the left of the back door.

5-14. KEYING OF REMOVABLE (UN-KEYED) INTERNAL CABLES

The following cable connectors can be removed and are keyed:

W13-P1, P2, P3
W12-P1
UNIBUS OUT ADAPTER ASSEMBLY-Pi

Figure 5-14 shows these cable connectors viewed from the cable end. Each cable connector has pin 1 located on the lower right side of the connector and the mark on the connector is at Pin 14.

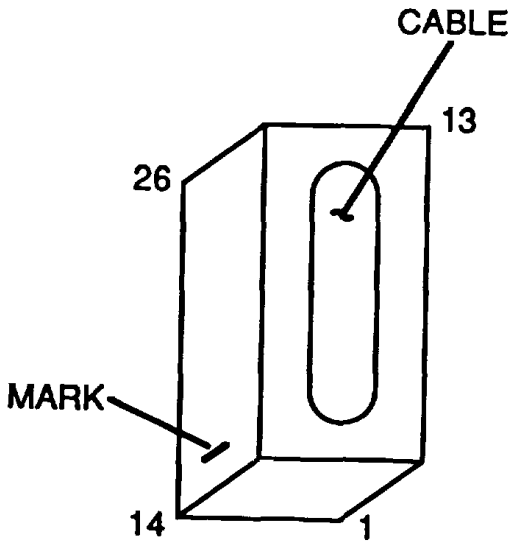


Figure 5-14. Cable Connector Pin Locations

5-14. KEYING OF REMOVABLE (UN-KEYED) INTERNAL CABLES (Cont.)

Figure 5-15 shows the component side-top of the SMI Test Card CCA. W13-P1 plugs into J1, W13-P2 plugs into J2 and W13-P3 plugs into J3. For each connector (J1, J2, and J3), pin 1 is located at the lower right side of the referenced area.

Locate J5 on Figure 5-15. W12-P1 plugs into J5 with J5's pin 1 located at the top right in referenced area.

Locate J7 on Figure 5-15. UNIBUS OUT ADAPTER ASSEMBLY P1 plugs into J7 with J7's pin 1 located at the top right in referenced area.

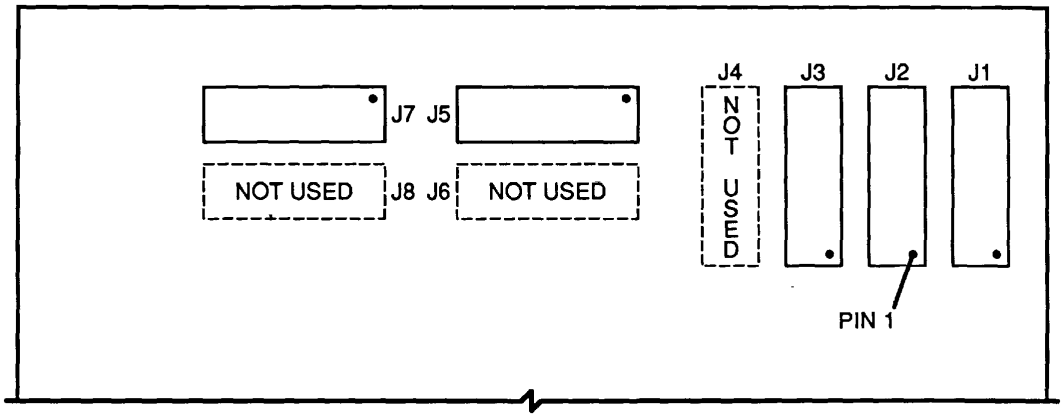


Figure 5-15. Component Side - Top of SMI Test Card CCA

5-15. MAINTENANCE AND REPAIR

The power supply of the Expansion Chassis Assembly can be checked during Computer Test Set operation, by monitoring the 5 volt supply at the Test Set J6 (UNIBUS OUT) connector. Connecting a DVM between J6-48 (+5V) and J6-52 (Return) should result in a 5 volt reading on the DVM.

5-16. SMI TEST CARD CCA TROUBLESHOOTING AND REPAIR

SMI Test Card CCA troubleshooting and repair can be accomplished on the test bench using Standard Electronics practices.

NOTE

Use standard Electronic bench procedures to fault isolate to the component level using the SMI Test Card schematic diagram provided in Appendix E.

With the CCA on an anti-static bench, connect a +5V and +12V power supplies as shown in Figure 5-16. Using the SMI Test Card schematic, either inject the appropriate stimuli and follow the results along the path, or use the CCA operational check out procedures in Section 5-2 and convert the J3 or J2 pin numbers using the W13 wire list (Appendix E page E-34), or the W12 wire list (Appendix E page E-33), to convert to module pin numbers. Refer to the SMI Test Card schematic and perform the operational test procedure at the module level tracing signals through the module.

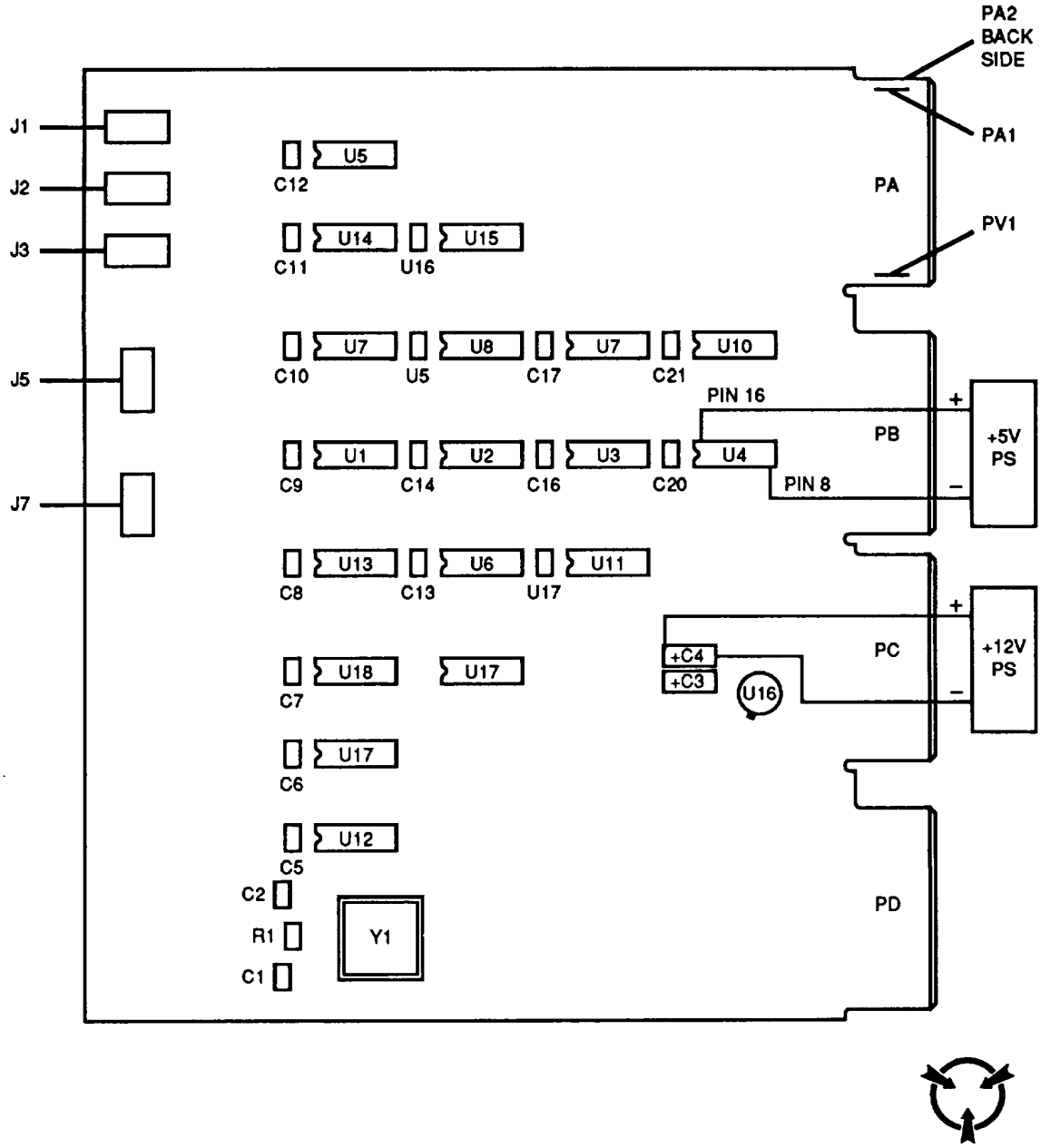


Figure 5-16. Connecting Power to SMI Test Card CCA

SECTION VI
PREPARATION FOR STORAGE OR SHIPMENT

6-1. GENERAL

a. Army. Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness.

b. Navy. Refer to NAVSUP PUB 503.

c. Air Force. Refer to AFM 66-267 (storage) and AFR 67-31 (shipment).

6-2. SHIPPING

Refer to Figure 3-1 when packing the Test Set. Perform the following steps to pack the Test Set in its shipping container:

CAUTION

Equipment weighs 370 lb. Use appropriate lifting device that supports this amount of weight.

a. Carefully place the Test Set on the base of the shipping container.

b. Place barrier bag on the Computer Test Set and attach strapping.

c. Place packing material on the Computer Test Set.

d. Attach the shipping container to its base by screwing 10 lag bolts (3 lag bolts on each side panel and 4 lag bolts on the back panel).

e. Attach the front panel from the shipping container by screwing 17 lag bolts (3 lag bolts from the top panel and 14 lag bolts from the front panel).

6-3. MARKING

The marking on the exterior of the container shall be in accordance with MIL-STD-129H.

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists publications that are referenced in this manual that contain information applicable to ther maintenance of the Computer Test Set TS-4393/UYK-42(V)4.

A-2 PUBLICATIONS

Air Force Equipment Maintenance ..... AFR 66-1

Air Force Equipment Improvement Recommendations ..... AFR 900-4

Technical Order System Publication Improvement .....AFTO Form 22

Recommended Changes To Publications and Blank Forms ..... DA Form 2028

Consolidated Index of Army Publications and Blank Forms.....DA PAM 25-30

Department of the Army Maintenance Forms .....DA PAM 738-750

Electrostatic Discharge Control Handbook..... DoD-HDBK-263

ESD Control Program for Protection of DoD-STD-1686

Maintenance Data Collection Subsystem (MDCS).....OPNAVINST 4790.4A

Discrepancy in Shipment Report (DISREP) ..... SF 361

Report of Discrepancy (ROD) ..... SF 364

Quality Deficiency Report. ..... SF 368

Unit, Intermediate Direct Support and General Support Maintenance Manual for Computer, Digital AN/UYK-42(V)4 .....TM11-5895-1308-24

General Support Maintenance Repair Parts and Special Tools List (Including Depot Repair Parts) for Computer, Digital AN/UYK-42(V)4 .....TM11-5895-1308-40P

Preparation for Storage or Shipment..... TM 740-90-1

Unsatisfactory Equipment Reporting.....TO 00-35D-54

APPENDIX B
MAINTENANCE ALLOCATION CHART (MAC)

SECTION I. INTRODUCTION

B-1. GENERAL

This appendix provides a summary of the maintenance operations for the Computer Test Set TS-4393/UYK-42(V)4. It authorizes levels of maintenance for specific maintenance tasks on repairable items and components and the tools and equipment required to perform each task. This appendix may be used as an aid to planning maintenance operations.

B-2. MAINTENANCE FUNCTION

Maintenance functions will be limited to and defined as follows:

a. Inspect To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurements. Consists of comparisons of two instruments, one of which is a certified standard of know accuracy, to detect and adjust any discrepancy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

B-2. MAINTENANCE FUNCTION (Continued)

i. Repair. The application of maintenance services (inspect, test, service, replace) or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item or system. This function includes the trial and error replacement of running spare type items such as fuses and lamps.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) 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. Consists of those services/actions necessary for the 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 (hours, miles, etc.) considered in classifying Army equipments/components.

B-3. COLUMN ENTRIES

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC.

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that mainte-

nance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at difference maintenance levels, appropriate work time figures will be shown for each category. The number of task-hours specified by the work time 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 maintenance allocation chart. Subcolumns of column 4 are as follows:

UNIT

C - Operator/Crew
O - Organizational/Unit

INTERMEDIATE

F - Direct Support
H - General Support

DEPOT

L - Special Repair Activity
D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 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. TOOL AND TEST EQUIPMENT REQUIREMENTS (SECT. III)

a. Tool or Test Equipment Reference Code. The numbers in this column coin 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 Level. The codes in this column indicate the maintenance level allocated to tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parenthesis.

B-5. REMARKS (SECT. IV)

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINT. FUNCT.	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND TEST EQUIPMENT	(6) REMARKS
00	Test Set, Computer Assy TS-432/UYK-42(4)4 (109DO6300-101)	Test Inspect Repair				L(1.5) L(0.2) L(2.0)		1, 2, 3, 4, 8, 9 5.10, 12, 13	 A B, D
01	Rack Assembly (109D06302-101) A1	Test Repair				L(1.2) L(1.5)		1, 2.8, 9 5, 6, 10, 12, 13	e B, C
0101	Expansion Chassis Assy (I09D06305-101) AA1	Replace Test Repair				L(1.0) L(1.0) L(1.2)		5 1, 2, 8, 9 5, 6, 10, 12, 13	 E B, F
010101	Expansion Chassis (109D06333-0D AIAIA4	Replace Test Repair				L(0.5) L(0.3)	 X	5 1	 E G,K
010102	Backplane Auy (1090106333-02) A1A1A5	Replace Test Repair				L(1.0) L(0.2)	 X	5 1	 E G, K
010103	Adapter Asy, UIB In (109D06326-101) A1A1A1	Replace Test Repair				L(0.3) L(0 4) L(1.0)		5 1 5, 12, 13	 1
010104	Adapter Assy, UIB Out (109D06327-100) A1A1A2	Replace Test Repair				L(0.3) L(0.4) L(1.0)		5 1 5, 12, 13	 1
010105	Harness Assy, (109DO6324-101) A1A1W12	Replace Test Repair				L(0.2) L(0.3) L(1.0)		5 1 5, 12, 13	 1
010106	Harness Assy, (109D06325-10) A1A1W13	Replace Test Repair				L(0.2) L(0.4) L(1.0)		5 1 5, 12.13	 1
010107	SMI Test Card CCA (109D06320101) A1A1A3	Replace Test Repair				L(0.2) L(1.0) L(1.0)		5, 10 1, 2, 8, 11 5.6, 7	H H H
010108	Disk Interface CCA (109D06335-03) A1A1A6	Replace Test Repair				L(0.2) L(1.0)	 X	5, 10 1	H E, H G, H.K
0102	AC Pwr Panel Assy 009DQ6303-10D A1A2	Replace Test Repair				L(0.8) L(0.3) L(1.0)		5 1 5	 1
0103	Cable Assy (109D6331-101) A1W14	Replace Test Repair				L(0.4) L(0.1) L(1.0)		5 1 5, 12, 13	 1
0104	Disk Drive (10906335-02) A1A3	Replace Test Repair				L(0.4) L(1.0)	 X	5 1	 E G, J, K

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINT. FUNCT.	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND TEST EQUIPMENT	(6) REMARKS
02	Cooling Kit Any (109D6307-101) A2	Replace Test Repair				L(0.1) L(0.4) L(1.0)		5 1 5	 B
0201	Fan Assembly (109D06344-101) A2A1	Replace Test Repair				L(0.3) L(0.2) L(1.0)		5 1 5	 A, 1
0202	Dummy Connector, Plug (109D06316-101) A2W6	Replace Test Repair				L(0.1) L(0.2) L(0.6)		5 1 5, 1213	 1
03	Console Cable Any (109D06312-101) W1	Replace Test Repair				L(0.1) L(0.2) L(1.0)		 1 5, 12, 13	 1
04	Test Cable Any (109D06313-101) W2	Replace Test Repair				L(0.1) L(0.4) L(1.0)		 1 5, 1233	 1
05	Test Cable Any (109106314-101) W3	Replace Test Repair				L(0.1) L(0.4) L(1.0)		 1 5, 12.13	 1
06	AC Power Cable Any (10906315-101) W4	Replace Test Repair				L(0.1) L(0.4) L(1.0)		 1 5., 12.13	 1
07	Unibus Cable Any (109D00209-00A) W5	Replace Test Repair				L(0.1) L(1.0)	 X	 1	 1 G, K
08	Test Set Power Cable Assy 09DW6317-101)	Replace Test Repair				L(0.1) L(0.2) L(0.5)		 1 5	 1

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR TEST SET, COMPUTER TS-4393/UYK-42(V)4

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	L	MULTIMETER, DIGITAL ANIUSM-486	6625-01-145-2430	FLUKE 80MOA-01
2	L	OSCILLOSCOPE AN/USM-488	4910-01-187-7847	TEK 2235L
3	L	CONSOLE		DEC LAIU-DA
4	L	COMPUTER, ANIUYK-42(V)4	5895-01-205-6149	A3023763
5	L	TOOL KIT, ELECT. TK-17 (INCL. METRIC)	5180-01-195-0855	JENSEN ITK-17RM
6	L	MAINTENANCE KIT, PCB MX-10879/G	5895-01-267-9473	PACE MODEL RNR 8007-0117
7	L	WORKSTATION, STATIC	4910-01-087-3458	3M 8021
8	L	PULSE GENERATOR		WAVETEK MODEL
	80			
9	L	JUMPER CABLE (MALE PIN TO MALE PIN) (4 INCHES)		
10	L	STATIC CONTROL SERVICE KIT	4940-01-168-2044	3M 8012
11	L	POWER SUPPLY		HEWLETT PACKARD HP 6389A HP 6289A
12	L	CRIMP/LOCATOR TOOLS		ASTRO/BUCHANAN 612118/612510.612513, 615758
13	L	EXTRACTOR TOOLS		MS27534-22D M27306/18-2

SECTION IV REMARKS
FOR
TEST SET, COMPUTER
TS-4393/UYK-42(V)4

REFERENCE CODE	REMARKS
A	INSPECT UNIT FOR VISIBLE PHYSICAL DAMAGE
B	REPAIR AT THE APPLICABLE SUBASSEMBLY LEVEL
C	CABLE W15, PIN 109D06335-04, IS NOT REPAIRABLE
D	CABLE W8, PIN BC221D25, IS NOT REPAIRABLE
E	TEST AS PART OF A HIGHER ASSEMBLY
F	CABLES W10&Wll, PIN BC11A-02, ARE NOT REPAIRABLE
G	RETURN UNIT TO VENDOR FOR REPAIR
H	ELECTRO-STATIC SENSITIVE ITEM
I	CONSISTS OF CONTINUITY CHECK
J	IF IDENTIFIED AS BEING FAULTY, ISOLATE BETWEEN 109D06335-02, 109D06335-03 OR 109D06335-04, AND RETURN UNIT TO VENDOR FOR REPAIR. IF ISOLATION NOT SUCCESSFUL, REMOVE 109D06335-02, 109D06335-03 AND 109DW6335-04, AND RETURN UNITS TO VENDOR FOR TESTIREPAIR.
K	VENDOR REPAIRABLE

109D00209-O00A	UNIBUS CABLE	NORDEN SYSTEMS
109D06335-02	DISK DRIVE	DIGITAL EQUIPMENT CORP
109DO6335-03	DISK INTERFACE CCA	DIGITAL EQUIPMENT CORP.
109D06333-01	EXPANSION CHASSIS	DIGITAL EQUIPMENT CORP.
109D06333-02	UNIBUS BACKPLANE	DIGITAL EQUIPMENT CORP.

L VENDOR NON-REPAIRABLE

BC22D-25	RS232 CABLE	DIGITAL EQUIPMENT CORP.
BC11A-02	UNIBUS CABLE (INTERNAL)	DIGITAL EQUIPMENT CORP.
109D-C600-4.1	DIAGNOSTIC SOFTWARE	NORDEN SYSTEMS
109DC600-5.0	ZEROIZING SOFTWARE	NORDEN SYSTEMS
109D06335-04	INTERCONNECT CABLE	DIGITAL EQUIPMEMT CORP

109D-R-3004 REVISION E

APPENDIX C
OPERATOR'S ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

TABLE OF CONTENTS

TABLE OF CONTENTS - Continued

SECTION I
INTRODUCTION

1. SCOPE

This appendix lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for the performance of general support maintenance of the TS-4393/UYK-42(V)4. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as Indicated by the source, maintenance, and recoverability (SMR) codes.

2. GENERAL

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. This list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending item number sequence, with the parts in each group listed in ascending item number sequence. Figure numbers are listed directly beneath the group header. Items listed are shown on the associated illustration.

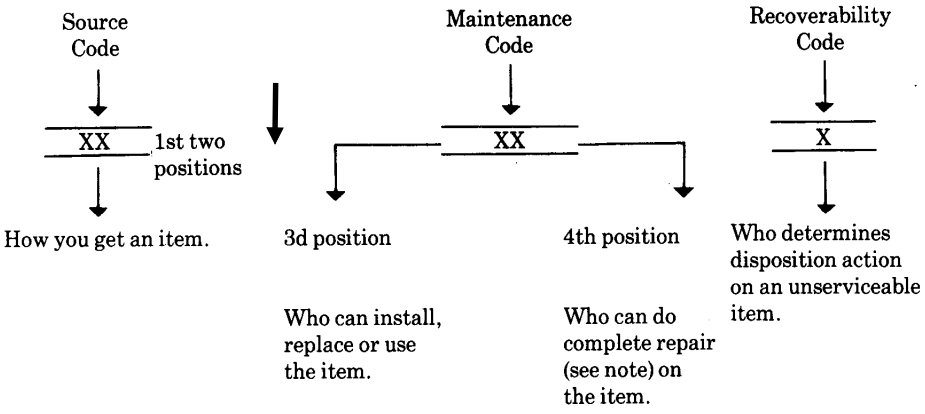
b. Section III. Special Tools List. Not applicable.

c. Section IV Cross-Reference Indexes. A list, in National item identification number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. The figure number and item number index lists figure and item numbers in numeric sequence and cross-references National stock number, Commercial and Government Entity Code, and part numbers.

3. EXPLANATION OF COLUMNS (Section II and III)

a. Item No. (Column (1). Indicates the number used to identify items called out in the illustrations.

b. SMR Code (Column (2). The source, maintenance, and recoverability (SMR) code is a five-position code containing supply/requisitioning information, maintenance category authorization criteria and disposition instruction, as shown in the following breakout:



NOTE

Complete repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of

the "repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Code	***Explanation***
PA PB PC PD PE PF PG	Stocked items: use the applicable NSN to request/requisition items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.
KD KF KB	**NOTE** Items coded PC are subject to deterioration. Items with these codes are not to be requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MO—Made at org/AVUM category MF—Made at DS/AVUM category MH—Made at GS category ML—Made at Specialized Repair Activity (SRA) MD—Made at Depot	Items with these codes are not to be requested/category requisitioned individually. They must be made from bulk material which is identified by the part category number in the description and usable on code (UOC) column and listed in the Bulk Material group of the repair parts list. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at a higher category, order the item from the higher category of maintenance.
AO—Assembled by org/AVUM category AF—Assembled by DS/AVUM category AH—Assembled by GS category AL—Assembled by SRA AD—Assembled by Depot	items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the category of maintenance indicated by the source code. If the third position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher category, order the item from the higher category of maintenance.

Code	***Explanation***
XA	Do not requisition an "XA" coded item. Order its next higher assembly.
XB	If an "XB" item is not available from salvage, order it using the CAGEC and part number given.

XC - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD - Item is not stocked. Order an "XD" coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

(2) *Maintenance code*. Maintenance codes tell you the category of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance category authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following categories of maintenance.

Code		***Application/Explanation***
C	-	Crew or operator maintenance done within organizational or aviation maintenance.
O	-	Organizational or aviation unit category can remove, replace, and use the item.
F	-	Direct support or aviation intermediate category can remove, replace, and use the item.
H	-	General support category can remove, replace, and use the item.
L	-	Specialized repair activity can remove, replace, and use the item.
D	-	Depot category can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance category with the capability to do complete repair (i. e. , perform all authorized repair functions). This position will contain one of the following maintenance codes.

NOTE

Some limited repair may be done on the item at a lower category of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Code		***Explanation***
O	-	Organizational or aviation unit is the lowest category that can do complete repair of the item.
F	-	Direct support or aviation intermediate is the lowest category that can do complete repair of the item.
H	-	General support is the lowest category that can do complete repair of the item.
L	-	Specialized repair activity (designate the specialized repair activity) is the lowest category that can do complete repair of the item.
D	-	Depot is the lowest category that can do complete repair of the item.
Z	-	Nonreparable. No repair is authorized.
B	-	No repair is authorized. (No parts or special tools are assigned for the maintenance of a "B" coded item.) However, the item may be reconditioned by adjusting, lubricating, etc. , at the user category

(3) Recoverability code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR code as follows:

Recoverability Code		***Application/Explanation***
Z	-	Nonreparable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in the third position of SMR code.
O	-	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit category.

Recoverability Code	***Application/Explanation***
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at direct support or aviation intermediate category.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at general support category.
D -	Reparable item. When beyond lower category repair capability, return to depot. Condemnation and disposal of item not authorized below depot category.
L -	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (e. g. , precious metal content, high dollar value, critical material, or hazardous material. Refer to appropriate manuals/directives for specific instructions.

c. *CAGEC (Column (3).* The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc. , that supplies the item.

d. *Part Number (Column (4).* Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. *Description and Usable on Code (UOC) (Column (5).* This column includes the following information.

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The statement "END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both section II and section III.

f. Qty (Column (6). Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

4. EXPLANATION OF COLUMNS (Section IV)

a. National Stock Number (NSN) Index.

(1) *Stock number column*. This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. When requisitioning items use the complete NSN (13 digits) sequence.

(2) *Fig. column*. This column lists the number of the figure where the item is identified/located. The illustrations are in numerical sequence in sections II and III.

(3) *Item column*. The item number identifies the item associated with the figure listed in the adjacent Fig. column. This item is also identified by the NSN listed on the same line.

b. *Part Number Index*. Part numbers in this index are listed by part number in ascending alphanumeric sequence.

(1) *CAGEC column*. This column lists the Commercial and Government Entity Code (CAGEC).

(2) *Part number column*. This column indicates the part number assigned to the item.

(3) *Stock number column*. This column lists the National stock number for the associated part number and manufacturer identified in the part number and CAGEC columns to the left.

(4) *Fig. column.* This column lists the number of the figure where the item is identified/located in sections II and III.

(5) *Item column.* The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. *Figure and Item Number Index.*

(1) *Fig. column*. This column lists the number of the figure where the item is identified/located in sections II and Ill.

(2) *Item column*. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column

(3) *Stock number column*. This column lists the National stock number for the item.

(4) *CAGEC column*. The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc. , that supplies the item.

(5) *Part number column*. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

5. SPECIAL INFORMATION

a. *National Stock Numbers*. National stock numbers (NSN's) that are missing from P source coded items have been applied for and will be added to this TM by future change/revision when they are entered in the Army Master Data File (AMDF). Until the NSN's are established and published, submit exception requisitions to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC- MM, Fort Monmouth, NJ 07703-5007 for the part required to support your equipment.

6. HOW TO LOCATE REPAIR PARTS

a. *When National stock number or part number is not known.*

(1) *First.* Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) *Second*. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) *Third.* Identify the item on the figure and note the item number.

(4) *Fourth.* Refer to the Repair Parts Lists for the figure to find the part number for the item number noted on the figure.

(5) *Fifth*. Refer to the Part Number Index to find the NSN, if assigned.

b. *When National stock number or part number is known*.

(1) *First.* Using the index of National stock numbers and part numbers, find the pertinent National stock number or part number. The NSN index is in National item identification number (NIIN) sequence (para 4a(1). The part numbers in the part number index are listed in ascending alphanumeric sequence (para 4b). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

(2) *Second.* After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

7. ABBREVIATIONS

Not applicable.

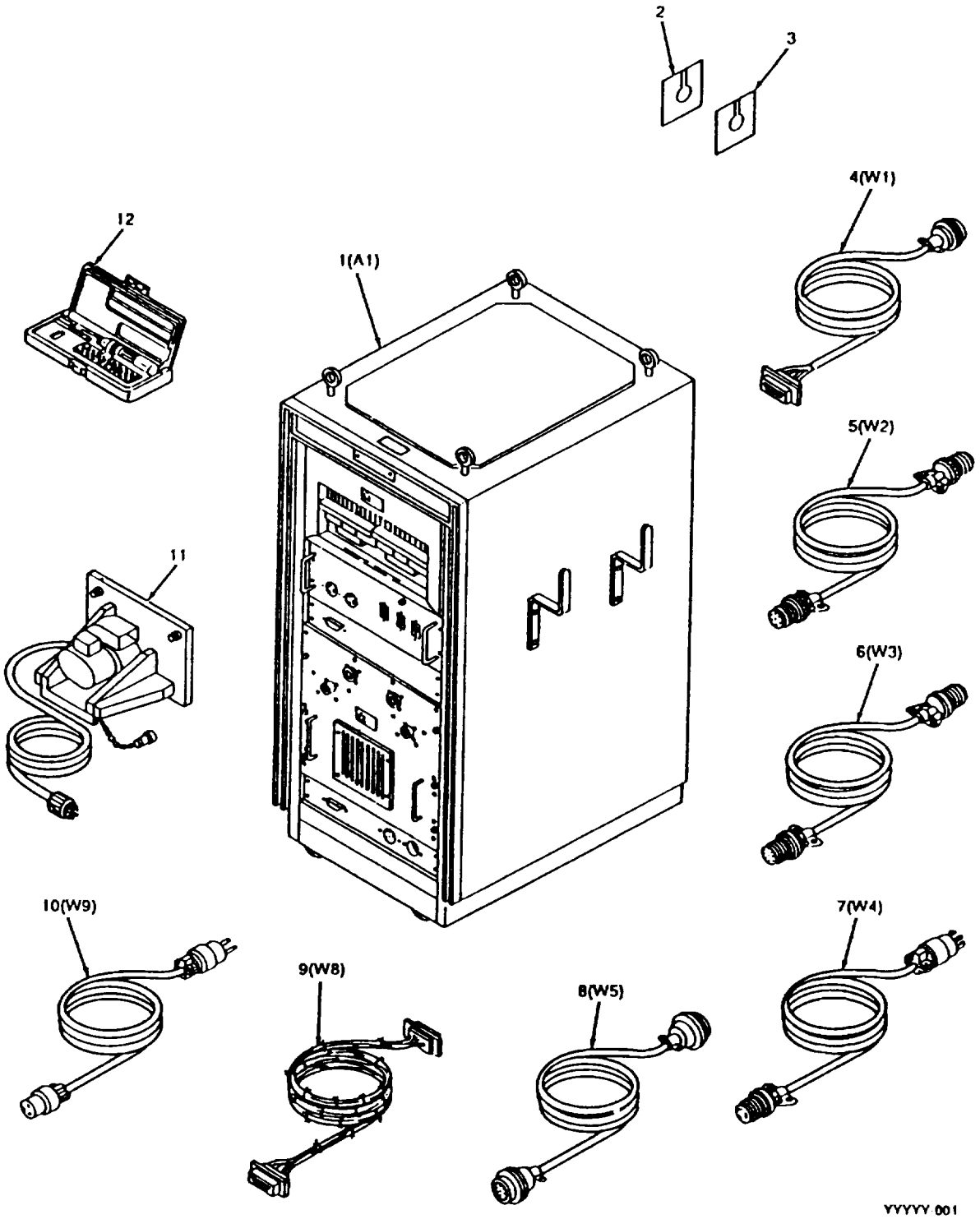


Figure C-1. Computer Test Set TS4393/UYK-42(V)4

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 00 COMPUTER TEST SET TS-4393/UYK-42(V)4 (109D06300-101)	
				FIG. C-1	
1	XBHLL	95542	109D06302-101	RACK ASSEMBLY (SEE FIG. C-2 FOR PARTS)	1
2	XBHZZ	95542	109D-C600-4. 1	DISK, FLEXIBLE	2
3	XBHZZ	95542	109D-C600-5. 0	DISK, FLEXIBLE	2
4	XBHLL	95542	109D06312-101	CABLE ASSEMBLY, SPEC (SEE FIG. C-11 FOR PARTS)	1
5	XBHLL	95542	109D06313-101	TEST CABLE (SEE FIG. C-11 FOR PARTS)	1
6	XBHLL	95542	109D06314-101	TEST CABLE (SEE FIG. C-ll FOR PARTS)	1
7	XBHLL	95542	109D06315-101	CABLE ASSEMBLY. POWE (SEE FIG. C-ll FOR PARTS)	1
8	PBHDD	95542	109D00209-000A	CABLE ASSEMBLY, SPEC	1
9	PAHZZ	15476	BC22D-25	CABLE ASSEMBLYPOWE	1
10	XBHLL	95542	109D06317-101	CABLE ASSEMBLY, POWE (SEE FIG. C-11 FOR PARTS)	1
11	XBHLL	95542	109D06307-101	COOLING KIT ASSY (SEE FIG. C-9 FOR PARTS)	1
12	KBDZZ	49842	CAL36/4K	TORQUE KIT	1

END OF FIGURE

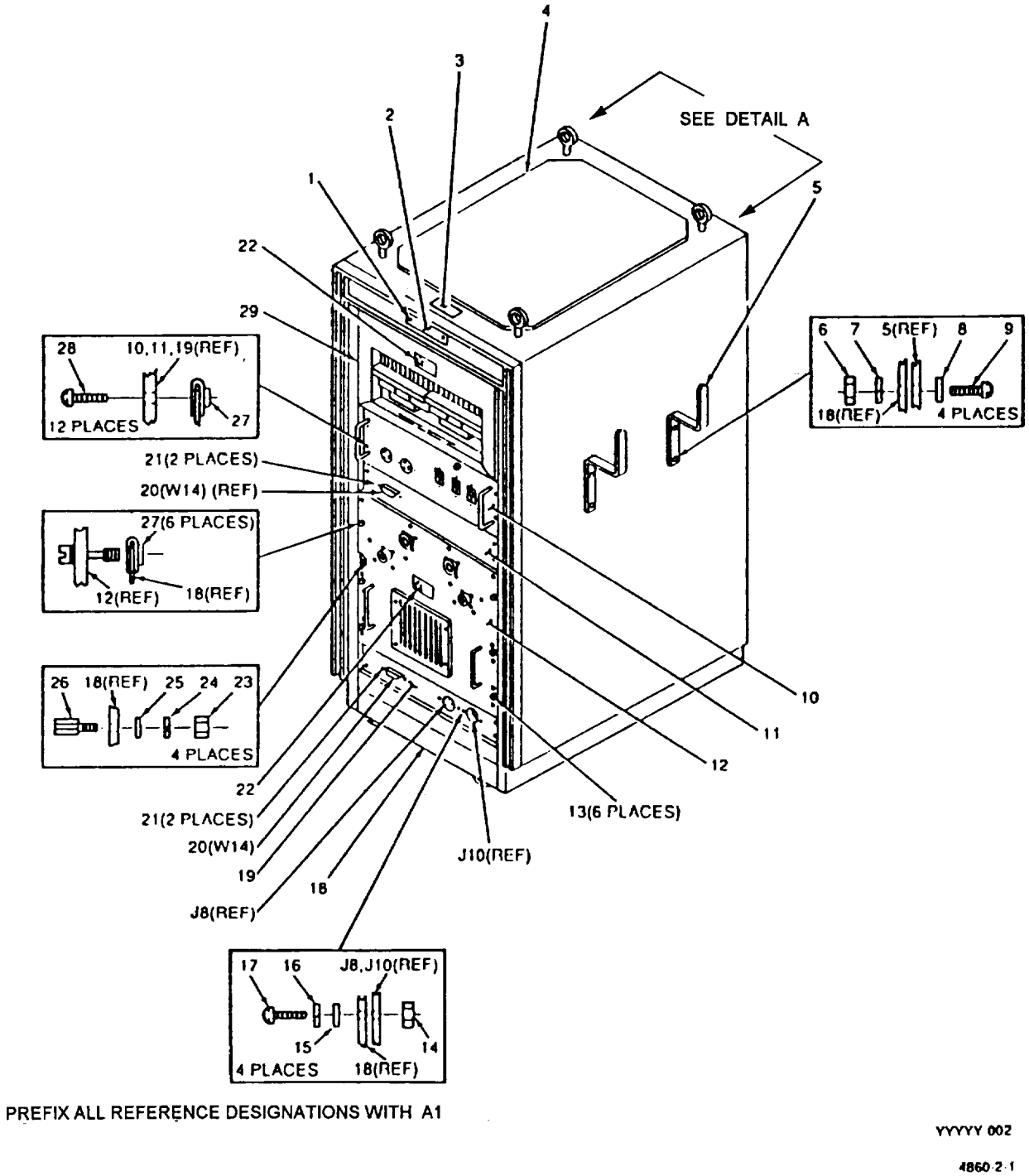


Figure C-2. Rack Assembly (Sheet 1 of 2)
(109D06302-101)

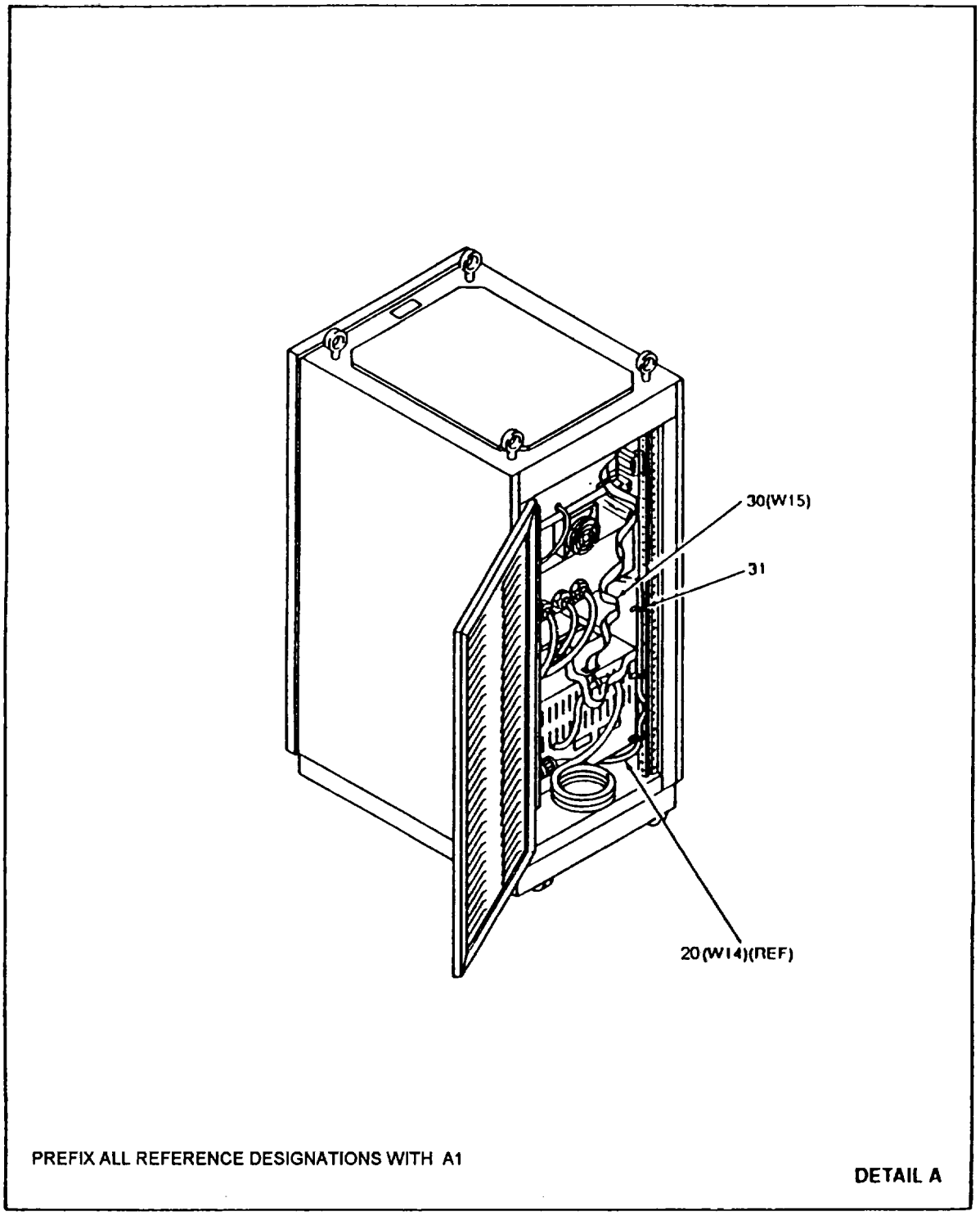


Figure C-2. Rack Assembly (Sheet 2 of 2)
(109D06302-101)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 01 RACK ASSEMBLY, A1 (109D06302-101) FIG. C-2	
1	PAHZZ	96906	MS24630-12	SCREW, TAPPING	2
2	XBHZZ	95542	109DO6353-01	PLATE, IDENTIFICATIO	1
3	XBHZZ	95542	109DO6354-01	PLATE, IDENTIFICATIO	1
4	XBHZZ	95542	109DO6355-01	PAD, RACK	1
5	XBHZZ	95542	109DO6352-01	HANGER, CABLE	2
6	PAHZZ	96906	MS35649-2254	NUT, PLAIN , HEXAGON	13
7	PAHZZ	96906	MS35338-139	WASHER, LOCK	4
8	PAHZZ	96906	MS15795-810	WASHER, FLAT	4
9	PAHZZ	96906	MS51957-80	SCREW, MACHINE	4
10	XBHLL	95542	109DO6303-101	PANEL, POWER DISTRIB (SEE FIG. C-8 FOR PARTS)	1
11	XBHZZ	95542	109D06329-01	PANEL	1
12	XBHLL	95542	109DO6305-101	CHASSIS, ELECTRICAL (SEE FIG. C-3 FOR PARTS)	1
13	PAHZZ	06540	6272D-SS-0832	RETAINER, TURNLOCK	6
14	PAHZZ	96906	MS35649-264	NUT, PLAIN, HEXAGON	4
15	PAHZZ	96906	MS35338-136	WASHER, LOCK	4
16	PAHZZ	96906	MS15795-805	WASHER, FLAT	4
17	PAHZZ	96906	MS51957-28	SCREW, MACHINE	4
18	XBHZZ	95542	109D06318-01	LOWBOY	1
19	XBHZZ	95542	109DO6330-01	PANEL, FRONT, CONSOLE	1
20	XBHLL	95542	109D06331-101	CABLE ASSEMBLY, SPEC (SEE FIG. C-6 FOR PARTS)	1
21	PAHZZ	81349	M24308/26-1	JACKSCREW, ELECTRICA	4
22	XBHZZ	80063	A3028381	LABEL	2
23	PAHZZ	96906	MS35650-304	NUT, PLAIN, HEXAGON	4
24	PAHZZ	96906	MS35338-138	WASHER, LOCK	4
25	PAHZZ	78553	AN960-10C	WASHER, FLAT	4
26	PAHZZ	06540	9753-SS-1032	POST, ELECTRICAL-MEC	4
27	PAHZZ	55355	AHWXO92-003219	NUT, CLIP-ON	18
28	PAHZZ	98587	H47-8	SCREW, MACHINE	12
29	PAHDD	80058	RD-578(V)1/G	DISK DRIVE UNIT	1
30	PAHZZ	15476	BC05L-12	CABLE ASSEMBLYSPEC	1
31	PAHZZ	96906	MS3367-1-9	STRAP, TIEDOWN, ELECT	V

END OF FIGURE

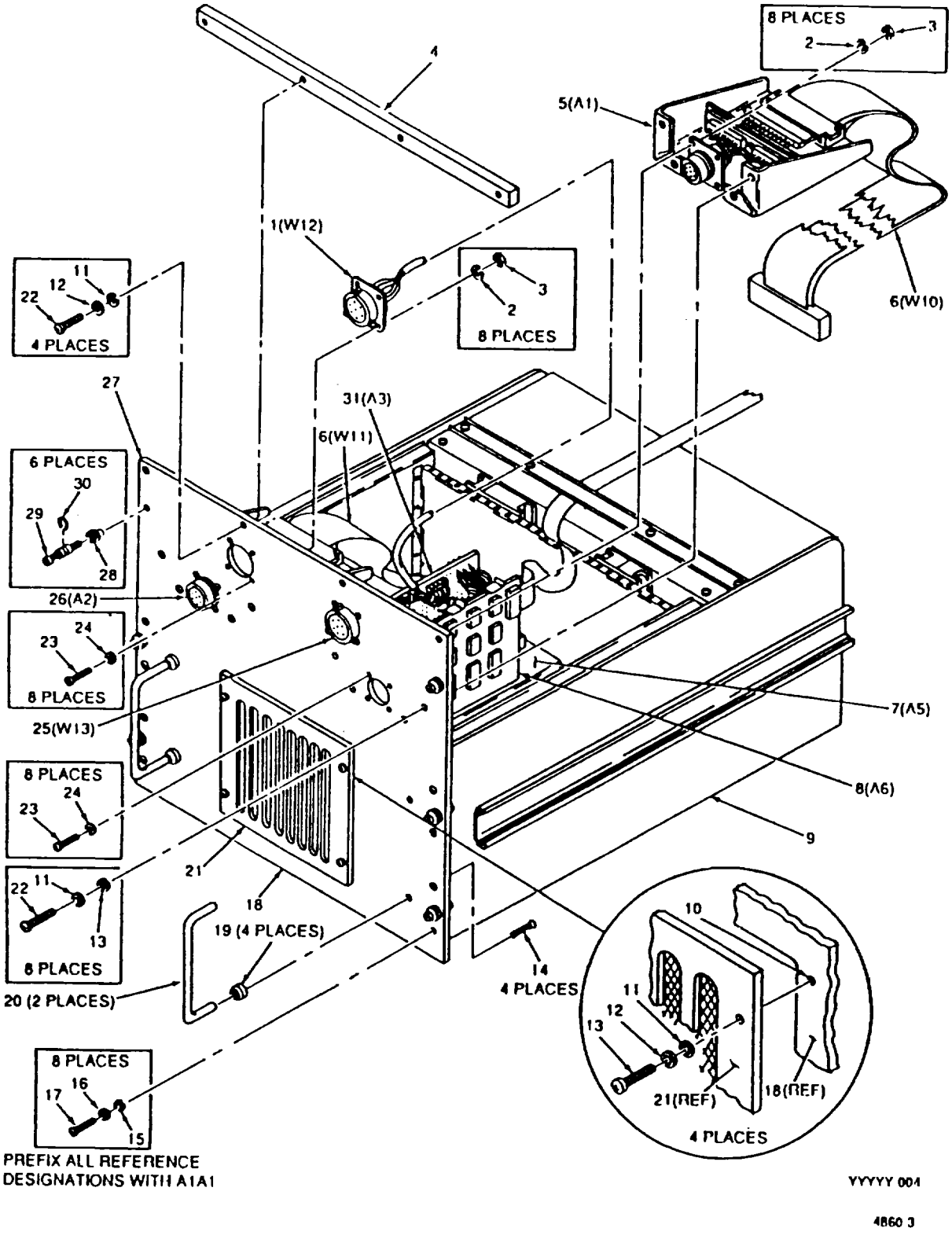


Figure C-3. Expansion Chassis Assembly (109D06305-101)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 0101 EXPANSION CHASSIS ASSEMBLY, A1A1 (109D06305-101)	
				FIG. C-3	
1	XBHLL	95542	109D06324-101	WIRING HARNESS (SEE FIG. C-6 FOR PARTS)	1
2	PAHZZ	96906	MS35338-135	WASHER, LOCK	16
3	PAHZZ	96906	MS35649-244	NUT, PLAIN, HEXAGON	16
4	XBHZZ	95542	109D06349-01	SPACER , PANEL	1
5	XBHLL	95542	109D06326-101	UNIBUS IN ADAPTER (SEE FIG. C-4 FOR PARTS)	1
6	PAHZZ	15476	BC11A-02	CABLE ASSEMBLY, SPEC	2
7	PAHDD	15476	70-11528-00	BACKPLANE ASSEMBLY	1
8	PAHDD	15476	RX211	DISK DRIVE	1
9	XBHDD	15476	BA11A-EX	CHASSIS, ELECTRICAL	1
10	PAHZZ	81349	M45938/1-13C	NUT, PLAIN, CLINCH	4
11	PAHZZ	96906	MS35338-137	WASHER, LOCK	16
12	PAHZZ	96906	MS15795-807	WASHER, FLAT	16
13	PAHZZ	96906	MS51957-46	SCREW, MACHINE	4
14	PAHZZ	96906	MS24693-C50	SCREW, MACHINE	4
15	PAHZZ	96906	MS35338-138	WASHER, LOCK	8
16	PAHZZ	78553	AN960-1OC	WASHER, FLAT	8
17	PAHZZ	96906	MS51958-63	SCREW, MACHINE	8
18	XBHZZ	95542	109D06323	PANEL	1
19	XBHZZ	06540	16022SS	FERRULE, HANDLE	4
20	XBHZZ	06540	10355-SS-0832	HANDLE	2
21	XBHZZ	95542	109D06350-01	PANEL	1
22	PAHZZ	96906	MS51957-45	SCREW, MACHINE	12
23	PAHZZ	96906	MS51957-15	SCREW, MACHINE	16
24	PAHZZ	96906	MS15795-803	WASHER, FLAT	16
25	XBHLL	95542	109D06325-101	WIRING HARNESS, BRAN (SEE FIG. C-6 FOR PARTS)	1
26	XBHLL	95542	109D06327-101	UNIBUS OUT ADAPTER (SEE FIG. C-S FOR PARTS)	1
27	XBHZZ	95542	109D06323-01	PANEL	1
28	XBHZZ	06540	6304D-SS-1032	INSERT, SCREW THREAD	6
29	XBHZZ	06540	6147-SS-1032	SCREW, EXTERNALLY RE	6
30	PAHZZ	71286	2600SW	WASHER, SPLIT	6
31	PAHLL	95542	109D06320-101	CIRCUIT CARD ASSEMB (SEE FIG. C-7 FOR PARTS)	1

END OF FIGURE

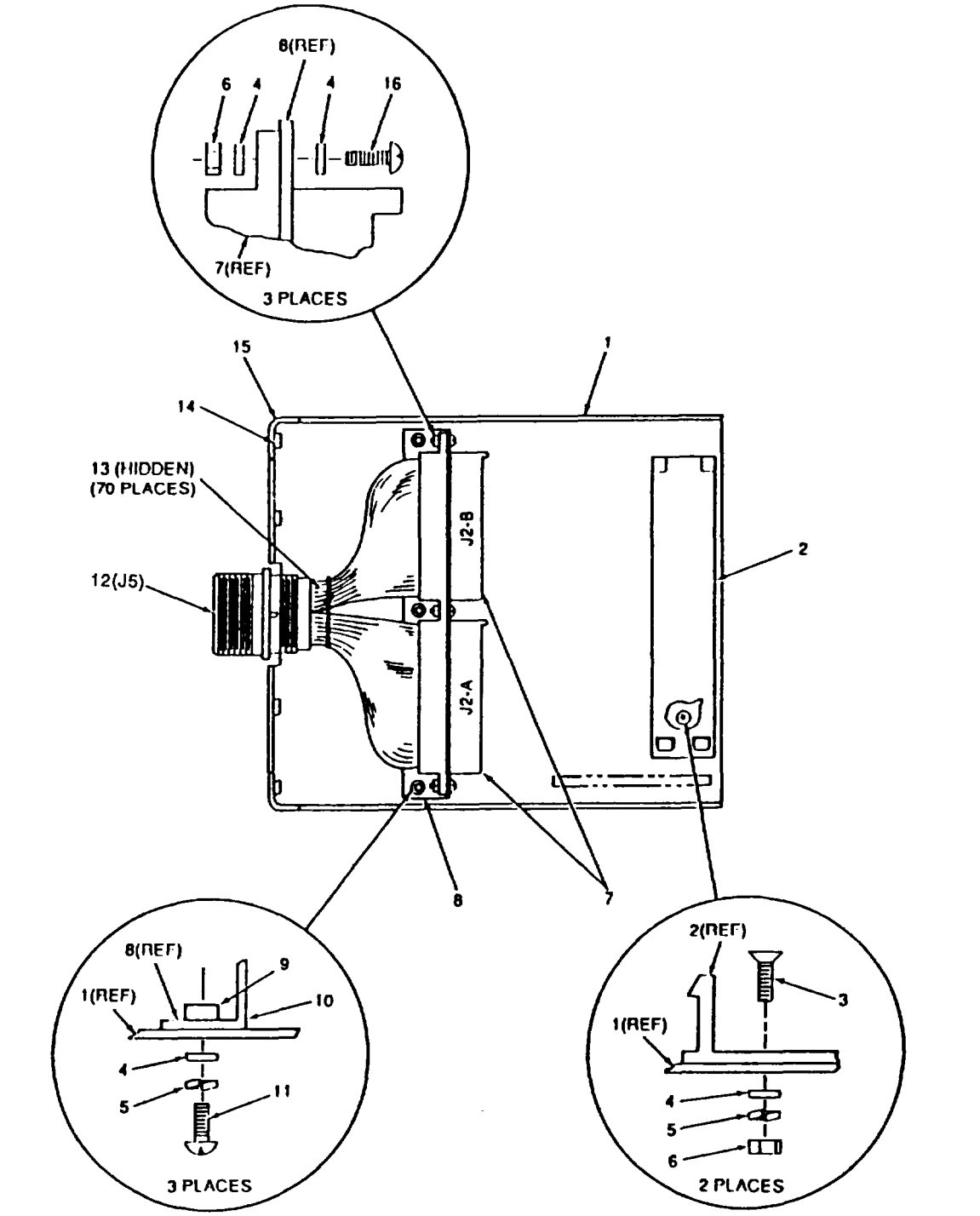


Figure C-4. Adapter Assy. , U/B In (109D06326-101)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 010103 ADAPTER ASSY, U/B IN A1A1A1 (109D06326-101)	
				FIG. C-4	
1	XBHZZ	95542	109D06347	CHASSIS, ELECTRICAL	1
2	XBHZZ	53387	3486-4	CLAMP, LOOP	1
3	PAHZZ	96906	MS51959-29	SCREW, MACHINE	2
4	PAHZZ	96906	MS15795-805	WASHER, FLAT	11
5	PAHZZ	96906	MS35338-136	WASHER, LOCK	5
6	PAHZZ	96906	MS35649-264	NUT, PLAIN, HEXAGON	5
7	PAHZZ	15476	H807	TERMINAL BOARD	2
8	XBHZZ	95542	109D06348	BRACKET, ELECTRICAL	1
9	PAHZZ	81349	M45938/1-5C	NUT, PLAIN, CLINCH	3
10	XBHZZ	95542	109D06348-01	BRACKET	1
11	PAHZZ	96906	MS51957-27	SCREW, MACHINE	3
12	PAHZZ	95542	P114-010-10	CONNECTOR, RECEPTACL	1
13	XBHZZ	06090	D-129-11	SPLICE, CONDUCTOR	70
14	PAHZZ	81349	M45938/1-13C	NUT, PLAIN, CLINCH	4
15	XBHZZ	95542	109D06347-01	CHASSIS, ELECTRICAL	1
16	PAHZZ	96906	MS51957-29	SCREW, MACHINE	3

END OF FIGURE

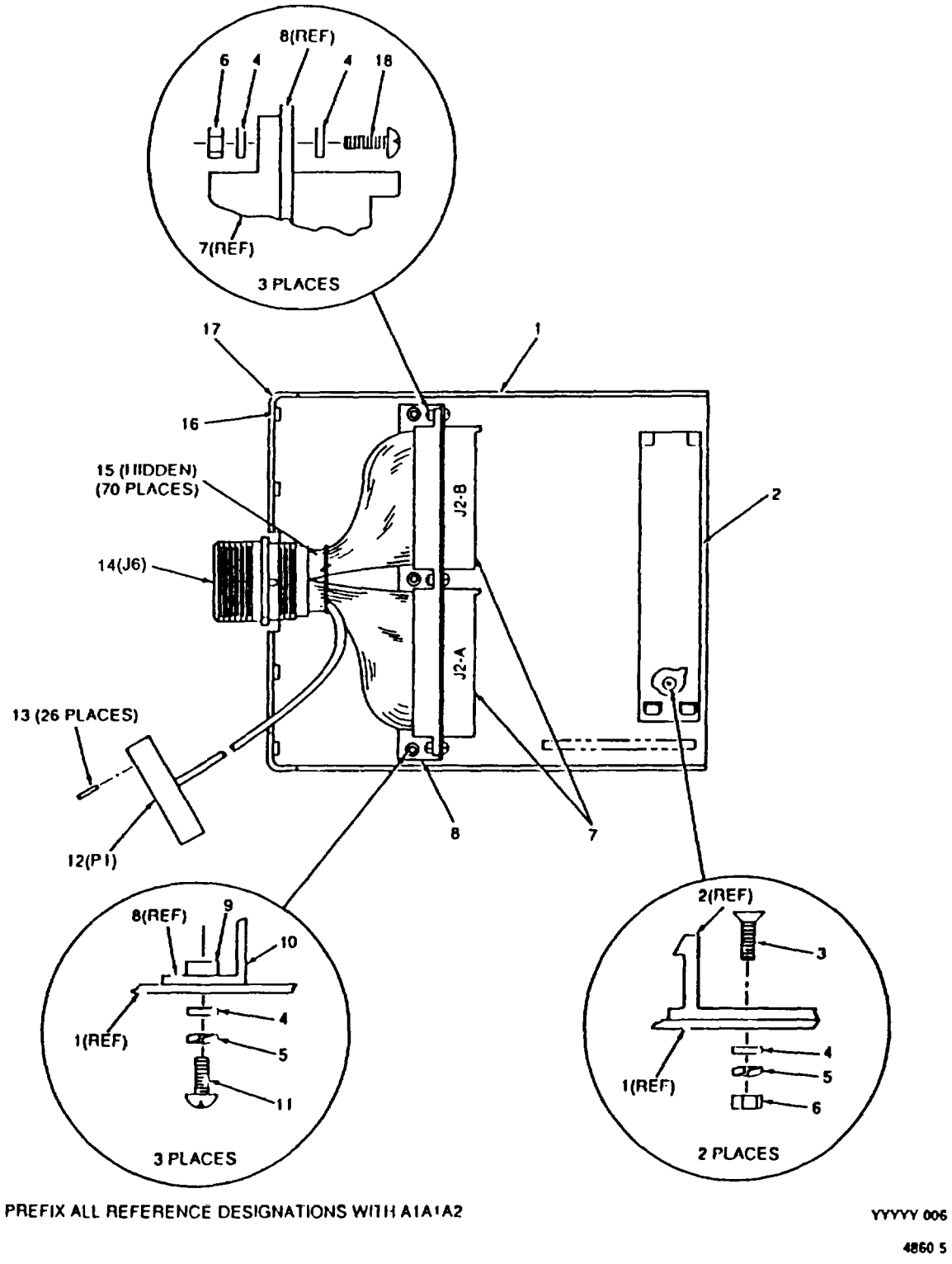


Figure C-5. Adapter Assy. , U/B Out (109D06327-101)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 010104 ADAPTER ASSY, U/B OUT A1A1A2 (109D06327-101)	
				FIG. C-5	
1	XBHZZ	95542	109D06347	CHASSIS, ELECTRICAL	1
2	XBHZZ	53387	3486-4	CLAMPLOOP	1
3	PAHZZ	96906	MS51959-29	SCREW, MACHINE	2
4	PAHZZ	96906	MS15795-805	WASHER, FLAT	11
5	PAHZZ	96906	MS35338-136	WASHER, LOCK	5
6	PAHZZ	96906	MS35649-264	NUT, PLAIN, HEXAGON	5
7	PAHZZ	15476	H807	TERMINAL BOARD	2
8	XBHZZ	95542	109D06348	BRACKET, ELECTRICAL	1
9	PAHZZ	81349	M45938/1-5C	NUT, PLAIN, CLINCH	3
10	XBHZZ	95542	109D06348-01	BRACKET	1
11	PAHZZ	96906	MS51957-27	SCREW, MACHINE	3
12	PAHZZ	00779	2-87456-1	CONNECTOR BODY, PLUG	1
13	PAHZZ	00779	1-87756-8	CONTACT, ELECTRICAL	26
14	PAHZZ	95542	P114-010-01	CONNECTOR, RECEPTACL	1
15	PAHZZ	06090	D-129-11	SPLICE, CONDUCTOR	70
16	PAHZZ	81349	M45938/1-13C	NUT, PLAIN, CLINCH	4
17	XBHZZ	95542	109D06347-01	CHASSIS, ELECTRICAL	1
18	PAHZZ	96906	MS51957-29	SCREW, MACHINE	3

END OF FIGURE

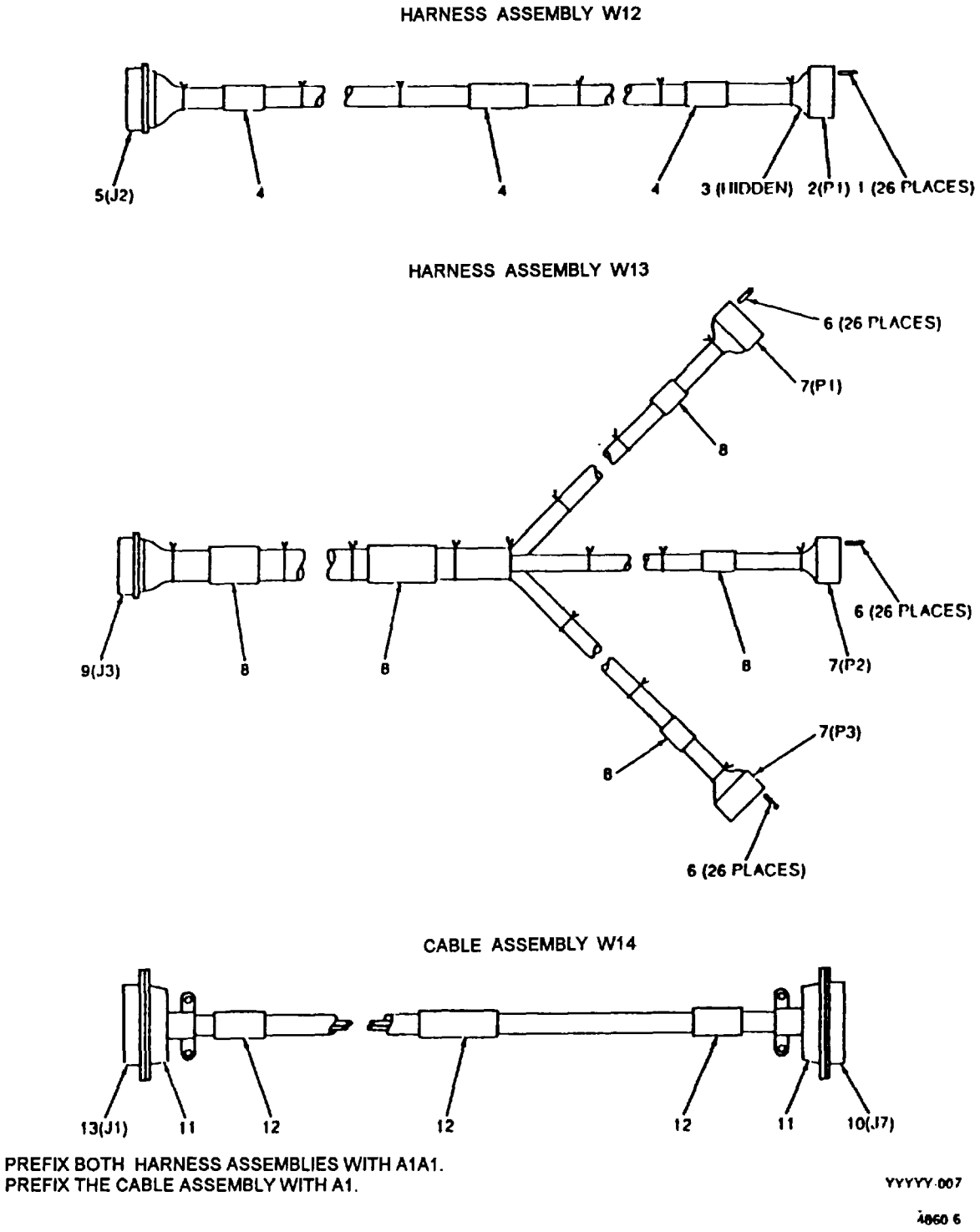


Figure C-6. Harness and Cable Assemblies W12, W13, & W14

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 010105 HARNESS AND CABLE ASSEMBLIES. , A1A1W12 (109D06324-101) A1A1W13 (109D06325-101) A1W14 (109D06331-101)	
				FIG. C-6	
1	PAHZZ	00779	1-87756-8	CONTACT, ELECTRICAL	26
2	PAHZZ	00779	2-87456-1	CONNECTOR BODY, PLUG	1
3	PAHZZ	81349	M83519/1-2	SPLICE, CONDUCTOR	1
4	XBHZZ	08398	WML-717-292	LABEL	3
5	PAHZZ	96906	MS27508E24B35S	CONNECTOR, RECEPTACL	1
6	PAHZZ	00779	1-87756-8	CONTACT, ELECTRICAL	78
7	PAHZZ	00779	2-87456-1	CONNECTOR BODY, PLUG	3
8	XBHZZ	08398	WML-717-292	LABEL	5
9	PAHZZ	96906	MS27508E24B35SA	CONNECTOR, RECEPTACL	1
10	PAHZZ	81349	M24308/4-3	CONNECTOR, RECEPTACL	1
11	XBHZZ	81349	M85049/48-2-3	SHIELD, ELECTRICAL C	2
12	XBHZZ	85480	WML-205-292-75	LABEL	3
13	PAHZZ	81349	M24308/2-3	CONNECTOR, RECEPTACL	1

END OF FIGURE

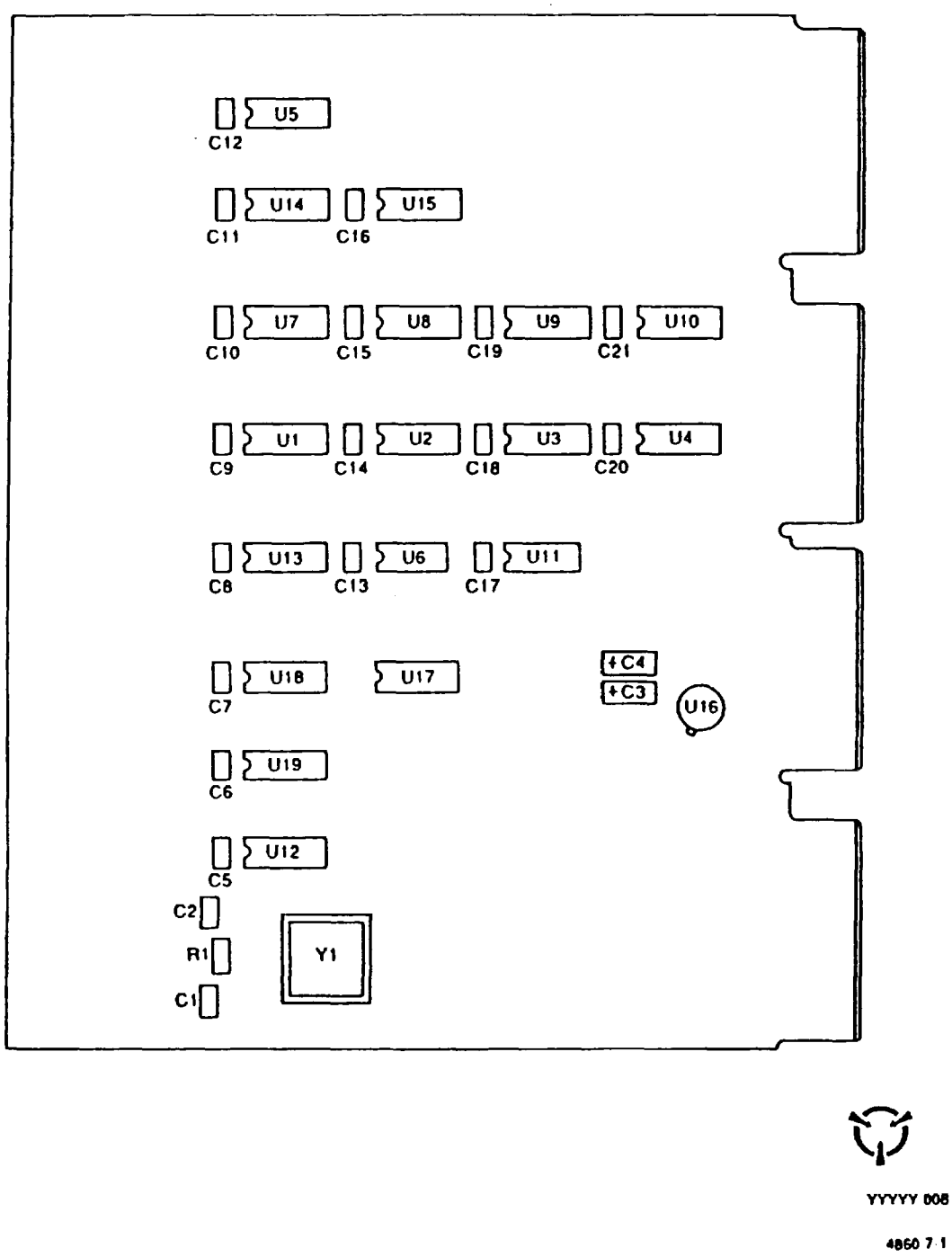


Figure C-7. SMI Test Card CCA (Sheet 1 of 2)
(109D06320-101)

LEGEND

REF. DES.	ITEM NO.	REF. DES.	ITEM NO.	REF. DES.	ITEM NO.
C1	1	C15	3	U7	8
C2	1	C16	3	U8	8
C3	2	C17	3	U9	8
C4	2	C18	3	U10	8
C5	3	C19	3	U11	9
C6	3	C20	3	U12	10
C7	3	C21	3	U13	11
C8	3	R1	4	U14	11
C9	3	U1	5	U15	11
C10	3	U2	5	U16	12
C11	3	U3	5	U17	13
C12	3	U4	5	U18	11
C13	3	U5	6	U19	11
C14	3	U6	7	Y1	14

Figure C-7. SMI Test Card CCA (Sheet 2 of 2)
(109D06320-101)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 010107 SMI TEST CARD CCA, A1A1A3 (109D06320-101)	
				FIG. C-7	
1	PAHZZ	B1349	M39014/01-1335	CAPACITOR, FIXED, CER	2
2	PAHZZ	81349	M39003/01-3076	CAPACITOR, FIXED, ELE	2
3	PAHZZ	81349	M39014/02-1270	CAPACITOR, FIXED, CER	17
4	PAHZZ	81349	RLR07C10O05FS	RESISTOR, FIXED, FIXED FILM	1
5	PAHZZ	81349	M38510/31504BEB	MICROCIRCUIT, DIGITA	4
6	PAHZZ	14933	5962-7502001EX	MICROCIRCUIT, DIGITA	1
7	PAHZZ	81349	M38510/OO804BCA	MICROCIRCUIT, DIGITA	1
8	PAHZZ	81349	M38510/30109BEB	MICROCIRCUIT, DIGITA	4
9	PAHZZ	81349	M38510/32702BCB	MICROCIRCUIT, DIGITA	1
10	PAHZZ	95542	P161-00058	MICROCIRCUIT, DIGITA	1
11	PAHZZ	67268	5962-8672101EA	MICROCIRCUIT, DIGITA	5
12	PAHZZ	67268	5962-8874601TA	MICROCIRCUIT, LINEAR	1
13	PAHZZ	81349	M8340102KlOO101FB	RESISTOR NETWORK, FI	1
14	PAHZZ	95542	117-008-0001	CRYSTAL UNIT, QUARTZ	1

END OF FIGURE

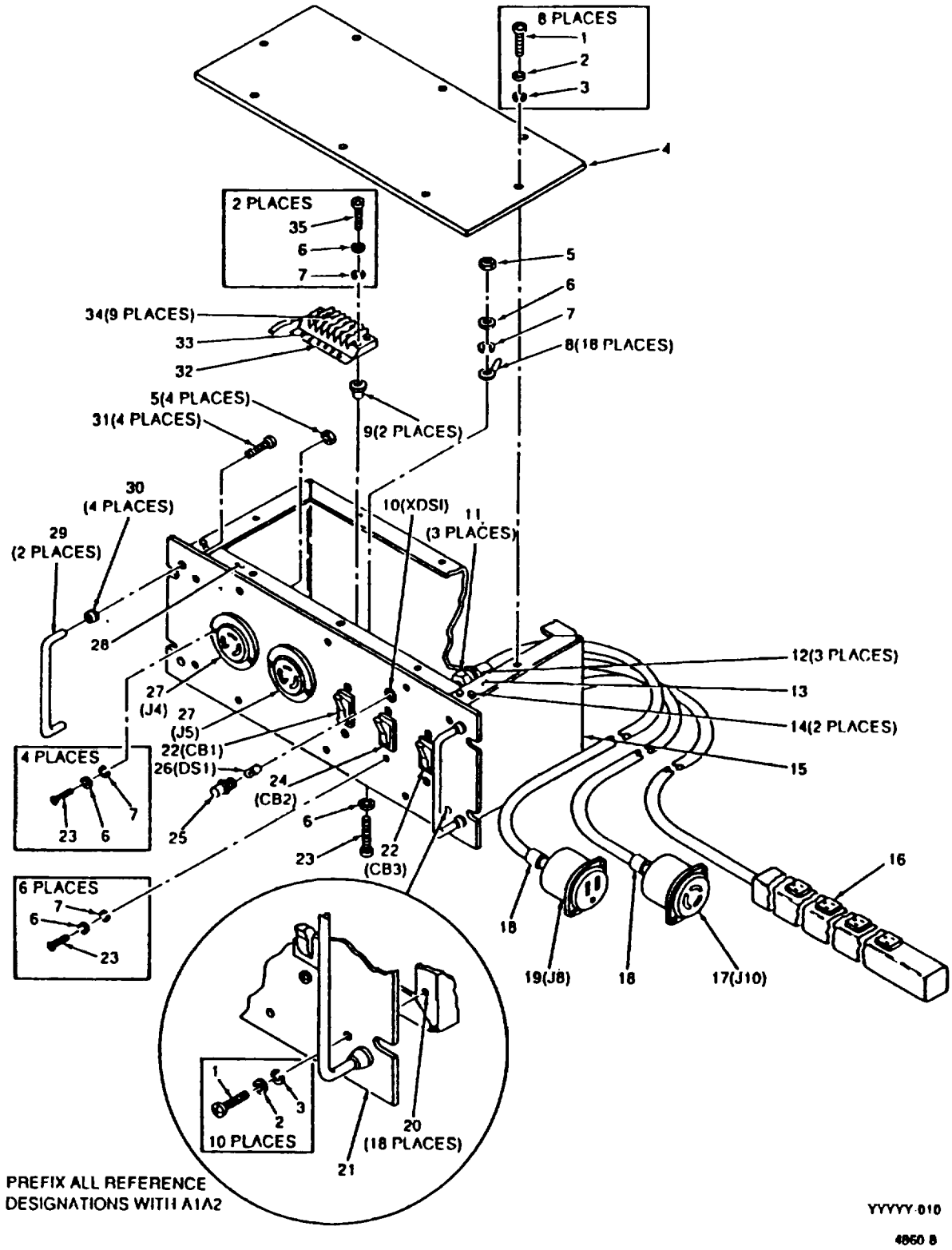


Figure C-8. AC Power Panel Assembly (109D06303-101)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 0102 AC POWER PANEL ASSY, A1A2 (109D06303-101)	
				FIG. C-8	
1	PAHZZ	96906	MS51957-45	SCREW, MACHINE	10
2	PAHZZ	96906	MS15795-807	WASHER, FLAT	10
3	PAHZZ	96906	MS35338-137	WASHER, LOCK	10
4	XBHZZ	95542	109D06342-01	COVER, ACCESS	1
5	PAHZZ	96906	MS35649-264	NUT, PLAIN, HEXAGON	5
6	PAHZZ	96906	MS15795-805	WASHER, FLAT	14
7	PAHZZ	96906	MS35338-136	WASHER, LOCK	13
8	PAHZZ	96906	MS25036-106	TERMINAL, LUG	18
9	PAHZZ	81349	M45938/1-9C	NUT, PLAIN, CLINCH	2
10	PAHZZ	81349	LH74/1	LIGHT, INDICATOR	1
11	PAHZZ	81992	003-22-001	NUT, PLAIN, ROUND	3
12	XBHZZ	81992	SHC-1026	BOX CONNECTOR, ELECT	3
13	XBHZZ	95542	109D06341	CHASSIS, ELECTRICAL	1
14	PAHZZ	96906	MS20426A3-5	RIVET, SOLID	4
15	XBHZZ	95542	109D06341-01	CHASSIS, ELECTRICAL	1
16	PAHZZ	98587	PMA36-6	POWER STRIP, ELECTRI	1
17	PAHZZ	74545	4716-C	CONNECTOR, RECEPTACL	1
18	XBHZZ	08398	WML-711-292	LABEL	2
19	PAHZZ	29436	2125006-002	CONNECTOR, RECEPTACL	1
20	PAHZZ	81349	M45938/1-3C	NUT, PLAIN, CLINCH	18
21	XBHZZ	95542	109D06328-01	PANEL	1
22	PAHZZ	81541	APL-1-1-61-502	CIRCUIT BREAKER	2
23	PAHZZ	96906	MS51957-28	SCREW, MACHINE	11
24	PAHZZ	81541	UPL1-1-66-103C	CIRCUIT BREAKER	1
25	PAHZZ	81349	LC13YN2	LENS, LIGHT	1
26	PAHZZ	81349	M15098/11-001	LAMP, GLOW	1
27	PAHZZ	74545	4715-C	CONNECTOR, RECEPTACL	2
28	XBHZZ	95542	109D06341-02	BRACKET	1
29	XBHZZ	06540	10355-SS-0832	HANDLE	2
30	PAHZZ	06540	16022SS	FERRULE, HANDLE	4
31	PAHZZ	96906	MS24693-C50	SCREW, MACHINE	4
32	PAHZZ	81349	MSA38TB6	MARKER STRIP, TERMIN	1
33	PAHZZ	81349	38TB6F	TERMINAL BOARD	1
34	PAHZZ	96906	MS25036-108	TERMINAL, LUG	9
35	PAHZZ	96906	MS51957-31	SCREW, MACHINE	2

END OF FIGURE

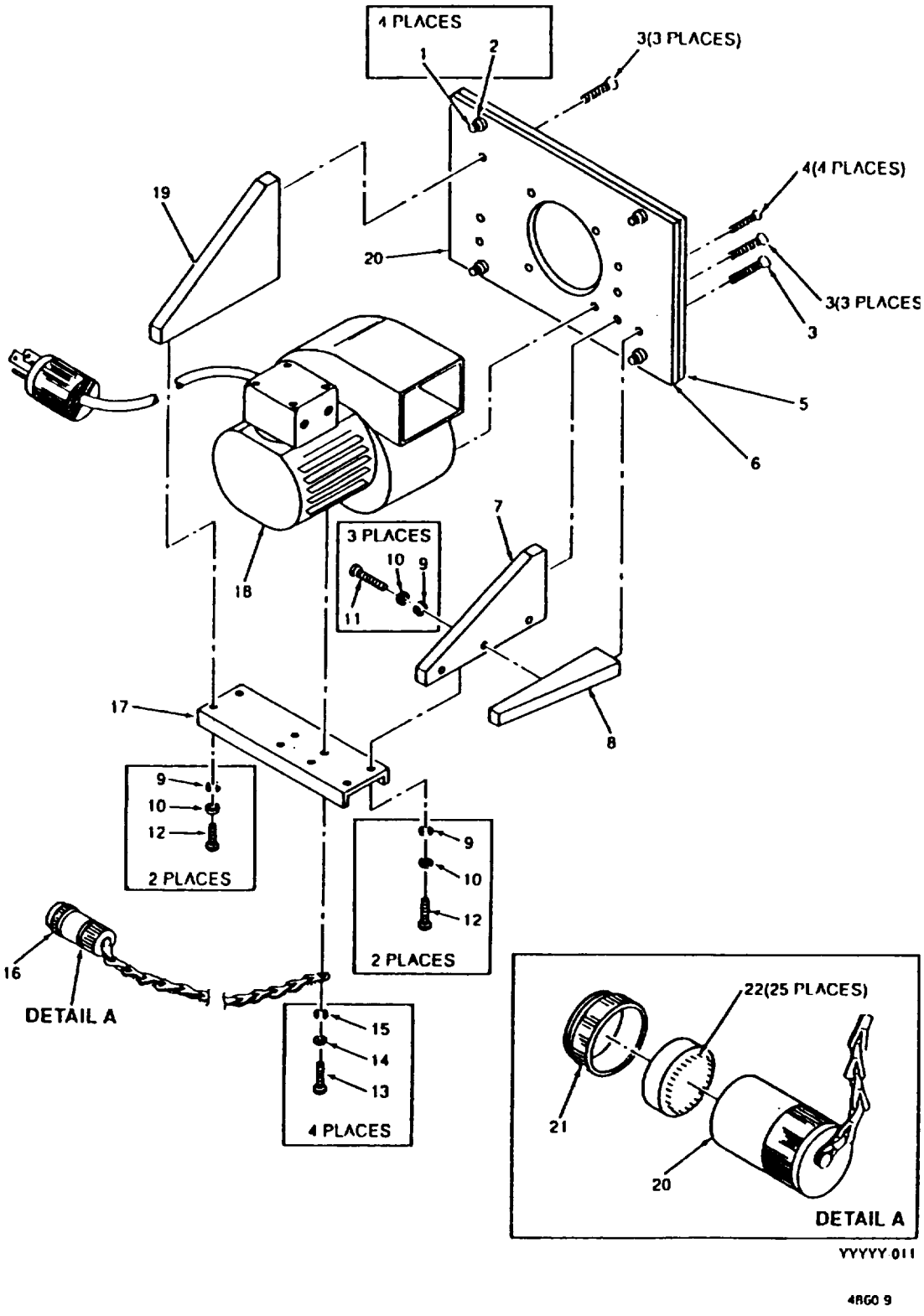


Figure C-9. Cooling Kit Assembly
(109D06307-1 01)

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 02 COOLING KIT ASSY, A2 (109D06307-101)	
				FIG. C-9	
1	PAHZZ	06540	6108SS0832	SCREW, EXTERNALLY RE	4
2	PAHZZ	06540	6272D-SS-0832	RETAINER, TURNLOCK	4
3	PAHZZ	96906	MS24693-C294	SCREW, MACHINE	7
4	PAHZZ	96906	MS24693-C26	SCREW, MACHINE	4
5	XBHZZ	95542	109D06337-01	MOUNTING PAD	1
6	XBHZZ	95542	109D06332	PLATE, MOUNTING	1
7	XBHZZ	95542	109D06308-01	SUPPORT, LEFT	1
8	XBHZZ	95542	109D06310-01	SUPPORT, TOP	1
9	PAHZZ	96906	MS35338-137	WASHER, LOCK	7
10	PAHZZ	96906	MS15795-807	WASHER, FLAT	7
11	PAHZZ	96906	MS51957-47	SCREW, MACHINE	3
12	PAHZZ	96906	MS51957-45	SCREW, MACHINE	4
13	PAHZZ	96906	MS51958-63	SCREW, MACHINE	4
14	PAHZZ	78553	AN960-10C	WASHER, FLAT	4
15	PAHZZ	96906	MS35338-138	WASHER, LOCK	4
16	XBHLL	95542	109D06316-101	DUMMY CONNECTOR, PLU	1
17	XBHZZ	95542	109D06311-01	PLATE, SUPPORT	1
18	XBHLL	95542	109D06344-101	FAN, CENTRIFUGAL (SEE FIG. C-10 FOR PARTS)	1
19	XBHZZ	95542	109D06309-01	SUPPORT, RIGHT	1
20	XBHZZ	95542	109D06332-01	PLATE	1
21	PAHZZ	96906	MS27484E14A35S	CONNECTOR, PLUG, ELEC	1
22	PAHZZ	96906	MS27488-22	PLUG, END SEAL, ELECT	25

END OF FIGURE

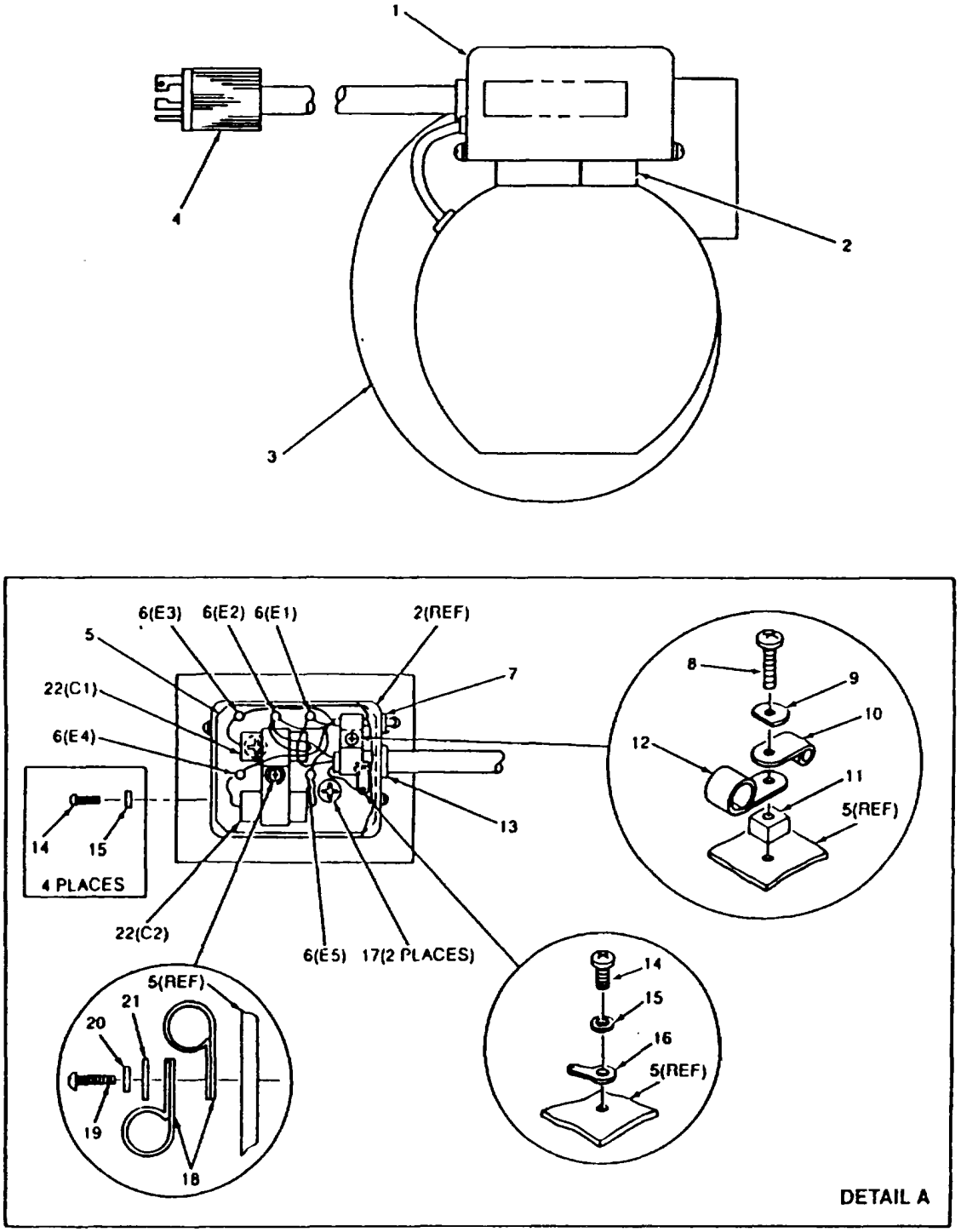


Figure C-10. Fan Assembly
(109D6344-101)

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 0201 FAN ASSEMBLY, A2A1 (109D06344-101)	
				FIG. C-10	
1	XBHZZ	80063	A3028407	COVER, ACCESS	1
2	XBHZZ	80063	A3028405	SPACER	1
3	PBHZZ	80063	A3079126	CRYSTAL UNIT, QUARTZ	1
4	PAHZZ	74545	47CM20C	CONNECTOR, PLUG, ELEC	1
5	XBHZZ	80063	A3028406	PLATE, MOUNTING, CAPA	1
6	PAHZZ	80063	A3079128	TERMINAL, STUD	5
7	PAHZZ	96906	MS35489-1	GROMMET, NONMETALLIC	1
8	PAHZZ	96906	MS51957-32	SCREW, MACHINE	1
9	PAHZZ	80063	A3079130-1	WASHER, SADDLE	1
10	PAHZZ	96906	MS25281F2	CLAMP, LOOP	1
11	XBHZZ	80063	A3079127	SPACER	1
12	PAHZZ	96906	MS25281F6	CLAMP, LOOP	1
13	PAHZZ	96906	MS35489-11	GROMMET, NONMETALLIC	1
14	PAHZZ	96906	MS51957-14	SCREW, MACHINE	5
15	PAHZZ	96906	MS15795-803	WASHER, FLAT	5
16	PAHZZ	96906	MS35431-1	TERMINAL, LUG	1
17	PAHZZ	96906	MS24693-C275	SCREW, MACHINE	2
18	PAHZZ	96906	MS25281F9	CLAMP, LOOP	2
19	PAHZZ	96906	MS51957-31	SCREW, MACHINE	1
20	PAHZZ	96906	MS15795-805	WASHER, FLAT	1
21	PAHZZ	80063	A3079130-2	WASHER, SADDLE	1
22	PAHZZ	81349	M39022/7-1351	CAPACITOR, FIXED, ELE	2
				END OF FIGURE	

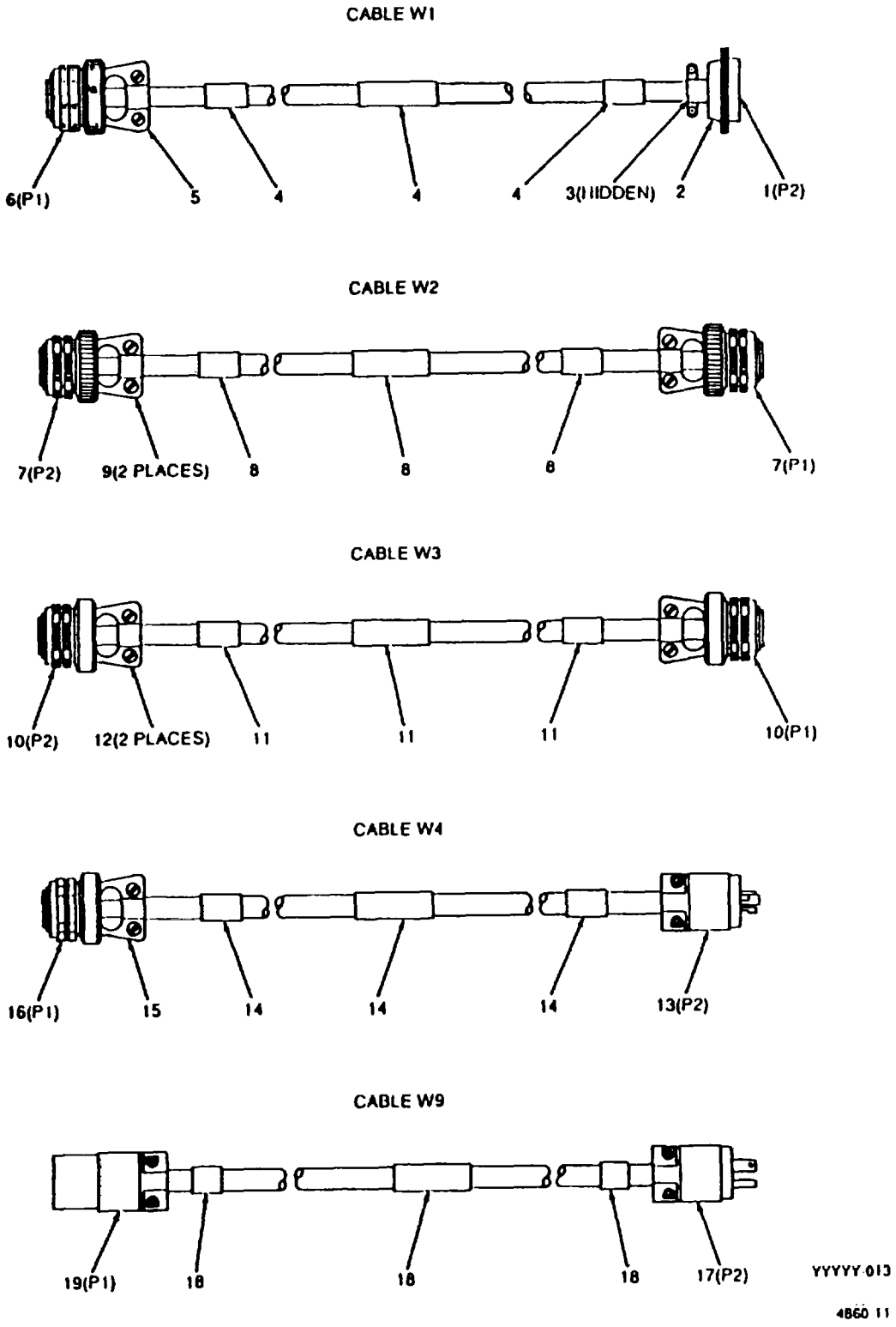


Figure C-11. Cable Assemblies W1, W2, W3, W4, & W9.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 03 CABLE ASSEMBLIES	
				W1 (109D06312-101)	
				W2 (109D06313-101)	
				W3 (109D06314-101)	
				W4 (109DO6315-101)	
				W9 (109DO6317-101)	
				FIG C-11	
1	PAHZZ	81349	M24308/4-3	CONNECTOR, RECEPTACL	1
2	XBHZZ	81349	M85049/48-2-3	SHIELD, ELECTRICAL C	1
3	PAHZZ	81349	M83519/1-2	SPLICE, CONDUCTOR	1
4	XBHZZ	08398	WML-717-292	LABEL	3
5	XBHZZ	81349	M85049/49-2-12W	CLAMP, CABLE, ELECTRI	1
6	PAHZZ	96906	MS27484E12A35PC	CONNECTOR, PLUG, ELEC	1
7	PAHZZ	96906	MS27484T24B35P	CONNECTOR, PLUG, ELEC	2
8	XBHZZ	08398	WML-717-292	LABEL	3
9	XBHZZ	81349	M85049/49-2-24W	CLAMP, CABLE, ELECTRI	2
10	PAHZZ	96906	MS27484E24A35PA	CONNECTOR, PLUG, ELEC	2
11	XBHZZ	08398	WML-717-292	LABEL	3
12	XBHZZ	81349	M85049/49-2-24W	CLAMP, CABLE, ELECTRI	2
13	PAHZZ	74545	47CM20C	CONNECTOR, PLUG, ELEC	1
14	XBHZZ	08398	WML-717-292	LABEL	3
15	XBHZZ	81349	M85049/49-2-12W	CLAMP, CABLE, ELECTRI	1
16	PAHZZ	96906	MS27484E12A35S	CONNECTOR, PLUG, ELEC	1
17	PAHZZ	74545	8215C	CONNECTOR, PLUG, ELEC	1
18	XBHZZ	08398	WML-717-292	LABEL	3
19	PAHZZ	81348	WC596/101-1	CONNECTOR, PLUG, ELEC	1

END OF FIGURE

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
5305-00-052-8880	2	1
5305-00-054-5648	10	14
5305-00-054-5649	3	23
5305-00-054-6651	4	11
	5	11
5305-00-054-6652	2	17
	8	23
5305-00-054-6653	4	16
	5	18
5305-00-054-6655	8	35
	10	19
5305-00-054-6656	10	8
5305-00-054-6670	3	22
	8	1
	9	12
5305-00-054-6671	3	13
5305-00-054-6672	9	11
5305-00-059-3659	3	17
	9	13
5305-00-071-1316	2	9
5975-00-074-2072	2	31
5305-00-079-5835	3	14
	8	31
5910-00-113-5470	7	1
5910-00-113-5499	7	3
5940-00-143-4780	8	34
5940-00-144-2500	10	6
5935-00-148-8190	11	17
5935-00-180-3866	6	5
5935-00-180-3869	6	9
5940-00-226-9724	4	7
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5320-00-234-1556	8	14
5310-00-243-2259	3	30
5310-00-250-9477	2	6
5940-00-283-5280	8	8
5325-00-286-6047	10	7
5325-00-291-9366	10	13
5935-00-351-5944	9	22
5935-00-410-9250	6	13
5305-00-443-5530	2	28
5310-00-454-0542	2	27
5935-00-489-9999	6	10
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5940-00-614-0537	10	16
5310-00-619-1148	2	25
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5305-00-717-5592	10	17
5305-00-721-5948	9	1
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6210-00-809-4274	8	10
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6240-00-892-4420	8	26
5340-00-915-2342	10	12
5310-00-929-6395	2	15
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5310-00-933-8118	3	2
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5310-00-933-8120	2	24
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5310-00-933-8121	2	7
5310-00-934-9748	3	3
5310-00-934-9761	2	14
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	5	6
	8	5
5310-00-934-9765	2	23
5340-00-934-9784	10	18
6210-00-951-9983	8	25
5305-00-958-2918	9	4
5940-00-983-6084	8	33
5340-00-998-0612	10	10
5310-01-008-6774	8	20
5340-01-014-4501	8	30
5935-01-025-9099	10	4
	11	13

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-01-044-2274	4	9			
	5	9			
5310-01-044-6570	8	9			
5935-01-045-7666	8	17			
5962-01-051-3402	7	8			
5935-01-052-9436	2	21			
5935-01-058-6086	11	7			
5962-01-065-7026	7	5			
5962-01-091-0557	7	9			
6150-01-098-2207	3	6			
5935-01-103-6072	8	19			
5935-01-107-2312	11	19			
5935-01-118-1515	8	27			
5962-01-120-4306	7	10			
5935-01-127-8593	4	12			
5935-01-128-9006	5	14			
5998-01-132-2913	3	7			
5940-01-136-2540	6	3			
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6150-01-141-1052	1	9			
5935-01-176-8989	5	12			
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	6	7			
5935-01-196-3278	11	16			
5905-01-205-2787	7	13			
5905-01-211-9873	7	4			
7025-01-221-6095	3	8			
7025-01-229-8570	2	29			
5935-01-250-5072	11	10			
5962-01-253-7435	7	11			
5999-01-253-9104	5	13			
	6	1			
	6	6			
6150-01-260-2899	2	30			
5940-01-268-1547	8	32			
5962-01-285-9164	7	7			
5962-01-309-8737	7	12			
5935-01-315-8902	11	6			
6150-01-332-3529	8	16			
5998-01-373-5826	3	31			
5995-01-375-9236	1	8			

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
55355	AHWX092-003219	5310-00-454-0542	2	27
78553	AN960-10C	5310-00-619-1148	2	25
			3	16
			9	14
81541	APL-1-1-61-502		8	22
80063	A3028381		2	22
80063	A3028405		10	2
80063	A3028406		10	5
80063	A3028407		10	1
80063	A3079126		10	3
80063	A3079127		10	11
80063	A3079128	5940-00-144-2500	10	6
80063	A3079130-1	5310-00-680-5997	10	9
80063	A3079130-2	5310-00-680-7312	10	21
15476	BA11A-EX		3	9
15476	BCOSL-12	6150-01-260-2899	2	30
15476	BC11A-02	6150-01-098-2207	3	6
15476	BC22D-25	6150-01-141-1052	1	9
49842	CAL36/4K		1	12
06090	D-129-11		4	13
			5	15
98587	H47-8	5305-00-443-5530	2	28
15476	H807	5940-00-226-9724	4	7
			5	7
81349	LC13YN2	6210-00-951-9983	8	25
81349	LH74/1	6210-00-809-4274	8	10
81349	MSA38TB6	5940-01-268-1547	8	32
96906	MS15795-803	5310-00-595-6211	3	24
			10	15
96906	MS15795-805	5310-00-722-5998	2	16
			4	4
			5	4
			8	6
			10	20
96906	MS15795-807	5310-00-880-5978	3	12
			8	2
			9	10
96906	MS15795-810	5310-00-582-5677	2	8
96906	MS20426A3-5	5320-00-234-1556	8	14
96906	MS24630-12	5305-00-052-8880	2	1
96906	MS24693-C26	5305-00-958-2918	9	4
96906	MS24693-C275	5305-00-717-5592	10	17
96906	MS24693-C294	5305-00-724-7847	9	3
96906	MS24693-C50	5305-00-079-5835	3	14
			8	31
96906	MS25036-106	5940-00-283-5280	8	8
96906	MS25036-108	5940-00-143-4780	8	34
96906	MS25281F2	5340-00-998-0612	10	10
96906	MS25281F6	5340-00-915-2342	10	12
96906	MS25281F9	5340-00-934-9784	10	18
96906	MS27484E12A35PC	5935-01-315-8902	11	6

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
96906	MS27484E12A35S	5935-01-196-3278	11	16
96906	MS27484E14A35S		9	21
96906	MS27484E24A35PA	5935-01-250-5072	11	10
96906	MS27484T24B35P	5935-01-058-6086	11	7
96906	MS27488-22	5935-00-351-5944	9	22
96906	MS27508E24B355	5935-00-180-3866	6	5
96906	MS27508E24B35SA	5935-00-180-3869	6	9
96906	MS3367-1-9	5975-00-074-2072	2	31
96906	MS35338-135	5310-00-933-8118	3	2
96906	MS35338-136	5310-00-929-6395	2	15
			4	5
			5	5
			8	7
96906	MS35338-137	5310-00-933-8119	3	11
			8	3
			9	9
96906	MS35338-138	5310-00-933-8120	2	24
			3	15
			9	15
96906	MS35338-139	5310-00-933-8121	2	7
96906	MS35431-1	5940-00-614-0537	10	16
96906	MS35489-1	5325-00-286-6047	10	7
96906	MS35489-11	5325-00-291-9366	10	13
96906	MS35649-2254	5310-00-250-9477	2	6
96906	MS35649-244	5310-00-934-9748	3	3
96906	M535649-264	5310-00-934-9761	2	14
			4	6
			5	6
			8	5
96906	MS35650-304	5310-00-934-9765	2	23
96906	MS51957-14	5305-00-054-5648	10	14
96906	MS51957-15	5305-00-054-5649	3	23
96906	MS51957-27	5305-00-054-6651	4	11
			5	11
96906	MS51957-28	5305-00-054-6652	2	17
			8	23
96906	MS51957-29	5305-00-054-6653	4	16
			5	18
96906	MS51957-31	5305-00-054-6655	8	35
			10	19
96906	MS51957-32	5305-00-054-6656	10	8
96906	MS51957-45	5305-00-054-6670	3	22
			8	1
			9	12
96906	MS51957-46	5305-00-054-6671	3	13
96906	MS51957-47	5305-00-054-6672	9	11
96906	MS51957-80	5305-00-071-1316	2	9
96906	MS51958-63	5305-00-059-3659	3	17
			9	13
96906	MS51959-29	5305-00-727-8832	4	3
			5	3

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81349	M15098/11-001	6240-00-892-4420	8	26
81349	M24308/2-3	5935-00-410-9250	6	13
81349	M24308/26-1	5935-01-052-9436	2	21
81349	M24308/4-3	5935-00-489-9999	6	10
			11	1
81349	M38510/00804BCA	5962-01-285-9164	7	7
81349	M38510/30109BEB	5962-01-051-3402	7	8
81349	M38510/31504BEB	5962-01-065-7026	7	5
81349	M38510/32702BCB	5962-01-091-0557	7	9
81349	M39003/01-3076	5910-00-495-0042	7	2
81349	M39014/01-1335	5910-00-113-5470	7	1
81349	M39014/02-1270	5910-00-113-5499	7	3
81349	M39022/7-1351		10	22
81349	M45938/1-13C	5310-00-570-0386	3	10
			4	14
			5	16
81349	M45938/1-3C	5310-01-008-6774	8	20
81349	M45938/1-5C	5310-01-044-2274	4	9
			5	9
81349	M45938/1-9C	5310-01-044-6570	8	9
81349	M8340102K1001FB	5905-01-205-2787	7	13
81349	M83519/1-2	5940-01-136-2540	6	3
			11	3
81349	M85049/48-2-3		6	11
			11	2
81349	M85049/49-2-12W		11	5
			11	15
81349	M85049/49-2-24W		11	9
			11	12
98587	PMA36-6	6150-01-332-3529	8	16
95542	P114-010-01	5935-01-128-9006	5	14
95542	P114-010-10	5935-01-127-8593	4	12
95542	P161-00058	5962-01-120-4306	7	10
80058	RD-578(V)1/G	7025-01-229-8570	2	29
81349	RLR07C100l5FS	5905-01-211-9873	7	4
15476	RX211	7025-01-221-6095	3	8
81992	SHC-1026		8	12
81541	UPL1-1-66-103C		8	24
81348	WC596/101-1	5935-01-107-2312	11	19
85480	WML-205-292-75		6	12
08398	WML-711-292		8	18
08398	WML-717-292		6	4
			6	8
			11	4
			11	8
			11	11
			11	14
			11	18
81992	003-22-001		8	11
00779	1-87756-8	5999-01-253-9104	5	13
			6	1

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PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
00779	1-87756-8	5999-01-253-9104	6	6
06540	10355-SS-0832		3	20
			8	29
95542	109D-C600-4.1		1	2
95542	109D-C600-5.0		1	3
95542	109D00209-OO000A	5995-01-375-9236	1	8
95542	109D06302-101		1	1
95542	109D06303-101		2	10
95542	109D06305-101		2	12
95542	109D06307-101		1	11
95542	109D06308-01		9	7
95542	109D06309-01		9	19
95542	109D06310-01		9	8
95542	109D06311-01		9	17
95542	109D06312-101		1	4
95542	109D06313-101		1	5
95542	109D06314-101		1	6
95542	109D06315-101		1	7
95542	109D06316-101		9	16
95542	109D06317-101		1	10
95542	109D06318-01		2	18
95542	109D06320-101	5998-01-373-5826	3	31
95542	109D06323		3	18
95542	109D06323-01		3	27
95542	109D06324-101		3	1
95542	109D06325-101		3	25
95542	109D06326-101		3	5
95542	109D06327-101		3	26
95542	109D06328-01		8	21
95542	109D06329-01		2	11
95542	109D06330-01		2	19
95542	109D06331-101		2	20
95542	109D06332		9	6
95542	109D06332-01		9	20
95542	109D06337-01		9	5
95542	109D06341		8	13
95542	109D06341-01		8	15
95542	109D06341-02		8	28
95542	109D06342-01		8	4
95542	109D06344-101		9	18
95542	109D06347		4	1
			5	1
95542	109D06347-01		4	15
			5	17
95542	109D06348		4	8
			5	8
95542	109D06348-01		4	10
			5	10
95542	109D06349-01		3	4
95542	109D06350-01		3	21
95542	109D06352-01		2	5

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PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
95542	109D06353-01		2	2
95542	109D06354-01		2	3
95542	109D06355-01		2	4
95542	117-008-0001		7	14
06540	16022SS		3	19
		5340-01-014-4501	8	30
00779	2-87456-1	5935-01-176-8989	5	12
			6	2
			6	7
29436	2125006-002	5935-01-103-6072	8	19
71286	26005W	5310-00-243-2259	3	30
53387	3486-4		4	2
			5	2
81349	38TB6F	5940-00-983-6084	8	33
74545	47CM20C	5935-01-025-9099	10	4
			11	13
74545	4715-C	5935-01-118-1515	8	27
74545	4716-C	5935-01-045-7666	8	17
14933	5962-7502001EX		7	6
67268	5962-8672101EA	5962-01-253-7435	7	11
67268	5962-8874601TA	5962-01-309-8737	7	12
06540	6108550832	5305-00-721-5948	9	1
06540	6147-SS-1032		3	29
06540	6272D-SS-0832		2	13
			9	2
06540	6304D-SS-1032		3	28
15476	70-11528-00	5998-01-132-2913	3	7
74545	8215C	5935-00-148-8190	11	17
06540	9753-SS-1032		2	26

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FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
1	1		95542	109D06302-101
1	2		95542	109D-C600-4.1
1	3		95542	109D-C600-5.0
1	4		95542	109D06312-101
1	5		95542	109D06313-101
1	6		95542	109D06314-101
1	7		95542	109D06315-101
1	8	5995-01-375-9236	95542	109D00209-000A
1	9	6150-01-141-1052	15476	BC22D-25
1	10		95542	109D06317-101
1	11		95542	109D06307-101
1	12		49842	CAL36/4K
2	1	5305-00-052-8880	96906	MS24630-12
2	2		95542	109D06353-01
2	3		95542	109D06354-01
2	4		95542	109D06355-01
2	5		95542	109D06352-01
2	6	5310-00-250-9477	96906	MS35649-2254
2	7	5310-00-933-8121	96906	MS35338-139
2	8	5310-00-582-5677	96906	MS15795-810
2	9	5305-00-071-1316	96906	MS51957-80
2	10		95542	109D06303-101
2	11		95542	109D06329-01
2	12		95542	109D06305-101
2	13		06540	6272D-SS-0832
2	14	5310-00-934-9761	96906	MS35649-264
2	15	5310-00-929-6395	96906	MS35338-136
2	16	5310-00-722-5998	96906	MS15795-805
2	17	5305-00-054-6652	96906	MS51957-28
2	18		95542	109D06318-01
2	19		95542	109D06330-01
2	20		95542	109D06331-101
2	21	5935-01-052-9436	81349	M24308/26-1
2	22		80063	A3028381
2	23	5310-00-934-9765	96906	MS35650-304
2	24	5310-00-933-8120	96906	MS35338-138
2	25	5310-00-619-1148	78553	AN960-10C
2	26		06540	9753-SS-1032
2	27	5310-00-454-0542	55355	AHWX092-003219
2	28	5305-00-443-5530	98587	H47-8
2	29	7025-01-229-8570	80058	RD-578(V)1/G
2	30	6150-01-260-2899	15476	BC05L-12
2	31	5975-00-074-2072	96906	MS3367-1-9
3	1		95542	109D06324-101
3	2	5310-00-933-8118	96906	MS35338-135
3	3	5310-00-934-9748	96906	MS35649-244
3	4		95542	109D06349-01
3	5		95542	109D06326-101
3	6	6150-01-098-2207	15476	BC11A-02
3	7	5998-01-132-2913	15476	70-11528-00
3	8	7025-01-221-6095	15476	RX211

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FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
3	9		15476	BA11A-EX
3	10	5310-00-570-0386	81349	M45938/1-13C
3	11	5310-00-933-8119	96906	MS35338-137
3	12	5310-00-880-5978	96906	MS15795-807
3	13	5305-00-054-6671	96906	MS51957-46
3	14	5305-00-079-5835	96906	MS24693-C50
3	15	5310-00-933-8120	96906	MS35338-138
3	16	5310-00-619-1148	78553	AN960-1OC
3	17	5305-00-059-3659	96906	MS51958-63
3	18		95542	109D06323
3	19		06540	16022SS
3	20		06540	10355-SS-0832
3	21		95542	109D06350-01
3	22	5305-00-054-6670	96906	MS51957-45
3	23	5305-00-054-5649	96906	MS51957-15
3	24	5310-00-595-6211	96906	MS15795-803
3	25		95542	109D06325-101
3	26		95542	109D06327-101
3	27		95542	109D06323-01
3	28		06540	6304D-SS-1032
3	29		06540	6147-SS-1032
3	30	5310-00-243-2259	71286	2600SW
3	31	5998-01-373-5826	95542	109D06320-101
4	1		95542	109D06347
4	2		53387	3486-4
4	3	5305-00-727-8832	96906	MS51959-29
4	4	5310-00-722-5998	96906	MS15795-805
4	5	5310-00-929-6395	96906	MS35338-136
4	6	5310-00-934-9761	96906	MS35649-264
4	7	5940-00-226-9724	15476	H807
4	8		95542	109D06348
4	9	5310-01-044-2274	81349	M45938/1-5C
4	10		95542	109D06348-01
4	11	5305-00-054-6651	96906	MS51957-27
4	12	5935-01-127-8593	95542	P114-010-10
4	13		06090	D-129-11
4	14	5310-00-570-0386	81349	M45938/1-13C
4	15		95542	109D06347-01
4	16	5305-00-054-6653	96906	MS51957-29
5	1		95542	109D06347
5	2		53387	3486-4
5	3	5305-00-727-8832	96906	MS51959-29
5	4	5310-00-722-5998	96906	MS15795-805
5	5	5310-00-929-6395	96906	MS35338-136
5	6	5310-00-934-9761	96906	MS35649-264
5	7	5940-00-226-9724	15476	H807
5	8		95542	109D06348
5	9	5310-01-044-2274	81349	M45938/1-5C
5	10		95542	109D06348-01
5	11	5305-00-054-6651	96906	MS51957-27
5	12	5935-01-176-8989	00779	2-87456-1

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FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
5	13	5999-01-253-9104	00779	1-87756-8
5	14	5935-01-128-9006	95542	P114-010-01
5	15		06090	D-129-11
5	16	5310-00-570-0386	81349	M45938/1-13C
5	17		95542	109D06347-01
5	18	5305-00-054-6653	96906	MS51957-29
6	1	5999-01-253-9104	00779	1-87756-8
6	2	5935-01-176-8989	00779	2-87456-1
6	3	5940-01-136-2540	81349	M83519/1-2
6	4		08398	WML-717-292
6	5	5935-00-180-3866	96906	MS27508E24B35SA
6	6	5999-01-253-9104	00779	1-87756-8
6	7	5935-01-176-8989	00779	2-87456-1
6	8		08398	WML-717-292
6	9	5935-00-180-3869	96906	MS27508E24B355A
6	10	5935-00-489-9999	81349	M24308/4-3
6	11		81349	M85049/48-2-3
6	12		85480	WML-205-292-75
6	13	5935-00-410-9250	81349	M24308/2-3
7	1	5910-00-113-5470	81349	M39014/01-1335
7	2	5910-00-495-0042	81349	M39003/01-3076
7	3	5910-00-113-5499	81349	M39014/02-1270
7	4	5905-01-211-9873	81349	RLR07ClOO5FS
7	5	5962-01-065-7026	81349	M38510/31504BEB
7	6		14933	5962-7502001EX
7	7	5962-01-285-9164	81349	M38510/084BCA
7	8	5962-01-051-3402	81349	M38510/30109BEB
7	9	5962-01-091-0557	81349	M38510/32702BCB
7	10	5962-01-120-4306	95542	P161-00058
7	11	5962-01-253-7435	67268	5962-8672101EA
7	12	5962-01-309-8737	67268	5962-8874601TA
7	13	5905-01-205-2787	81349	M8340102Kl1001FB
7	14		95542	117-008-0001
8	1	5305-00-054-6670	96906	MS51957-45
8	2	5310-00-880-5978	96906	MS15795-807
8	3	5310-00-933-8119	96906	MS35338-137
8	4		95542	109D06342-01
8	5	5310-00-934-9761	96906	MS35649-264
8	6	5310-00-722-5998	96906	MS15795-805
8	7	5310-00-929-6395	96906	MS35338-136
8	8	5940-00-283-5280	96906	MS25036-106
8	9	5310-01-044-6570	81349	M45938/1-9C
8	10	6210-00-809-4274	81349	LH74/1
8	11		81992	003-22-001
8	12		81992	SHC-1026
8	13		95542	109D06341
8	14	5320-00-234-1556	96906	MS20426A3-5
8	15		95542	109D06341-01
8	16	6150-01-332-3529	98587	PMA36-6
8	17	5935-01-045-7666	74545	4716-C
8	18		08398	WML-711-292

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FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
8	19	5935-01-103-6072	29436	2125006-002
8	20	5310-01-008-6774	81349	M45938/1-3C
8	21		95542	109D06328-01
8	22		81541	APL-1-1-61-502
8	23	5305-00-054-6652	96906	MS51957-28
8	24		81541	UPL1-1-66-103C
8	25	6210-00-951-9983	813469	LC13YN2
8	26	6240-00-892-4420	81349	M15098/11-001
8	27	5935-01-118-1515	74545	4715-C
8	28		95542	109D06341-02
8	29		06540	1035-SS-0832
8	30	5340-01-014-4501	06540	16022SS
8	31	5305-00-079-5835	96906	MS24693-C50
8	32	5940-01-268-1547	81349	MSA38TB6
8	33	5940-00-983-6084	81349	38TB6F
8	34	5940-00-143-4780	96906	MS25036-108
8	35	5305-00-054-6655	96906	MS51957-31
9	1	5305-00-721-5948	06540	6108SS0832
9	2		06540	6272D-SS-0832
9	3	5305-00-724-7847	96906	MS24693-C2964
9	4	5305-00-958-2918	96906	MS24693-C26
9	5		95542	109D06337-01
9	6		95542	109D06332
9	7		95542	109D06308-01
9	8		95542	109D06310-01
9	9	5310-00-933-8119	96906	MS35338-137
9	10	5310-00-880-5978	96906	MS15795-807
9	11	5305-00-054-6672	96906	MS51957-47
9	12	5305-00-054-6670	96906	MS51957-45
9	13	5305-00-059-3659	96906	MS51958-63
9	14	5310-00-619-1148	78553	AN960-10C
9	15	5310-00-933-8120	96906	MS35338-138
9	16		95542	109D06316-101
9	17		95542	109D06311-01
9	18		95542	109D06344-101
9	19		95542	109D06309-01
9	20		95542	109D06332-01
9	21		96906	MS27484E14A35S
9	22	5935-00-351-5944	96906	MS27488-22
10	1		80063	A3028407
10	2		80063	A3028405
10	3		80063	A3079126
10	4	5935-01-025-9099	74545	47CM20C
10	5		80063	A3028406
10	6	5940-00-144-2500	80063	A3079128
10	7	5325-00-286-6047	96906	MS35489-1
10	8	5305-00-054-6656	96906	MS51957-32
10	9	5310-00-680-5997	80063	A3079130-1
10	10	5340-00-998-0612	96906	MS25281F2
10	11		80063	A3079127
10	12	5340-00-915-2342	96906	MS25281F6

CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
10	13	5325-00-291-9366	96906	MS35489-11
10	14	5305-00-054-5648	96906	MS51957-14
10	15	5310-00-595-6211	96906	MS15795-803
10	16	5940-00-614-0537	96906	MS35431-1
10	17	5305-00-717-5592	96906	MS24693-C275
10	18	5340-00-934-9784	96906	MS25281F9
10	19	5305-00-054-6655	96906	MSl1957-31
10	20	5310-00-722-5998	96906	MS15795-805
10	21	5310-00-680-7312	80063	A3079130-2
10	22		81349	M39022/7-1351
11	1	5935-00-489-9999	81349	M24308/4-3
11	2		81349	M85049/48-2-3
11	3	5940-01-136-2540	81349	M83519/1-2
11	4		08398	WML-717-292
11	5		81349	M85049/49-2-12W
11	6	5935-01-315-8902	96906	MS27484E12A35PC
11	7	5935-01-058-6086	96906	MS27484T24B35P
11	8		08398	WML-717-292
11	9		81349	M85049/49-2-24W
11	10	5935-01-250-5072	96906	MS27484E24A35PA
11	11		08398	WML-717-292
11	12		81349	M8549/49-2-24W
11	13	5935-01-025-9099	74545	47CM20C
11	14		08398	WML-717-292
11	15		81349	M85049/49-2-12W
11	16	5935-01-196-3278	96906	MS27484E12A35S
11	17	5935-00-148-8190	74545	8215C
11	18		08398	WML-717-292
11	19	5935-01-107-2312	81348	WC596/101-1

APPENDIX D
AN/UYK-42(V)4 DIAGNOSTIC CHAIN PRINTOUT
(SAMPLE PRINTOUT OF DIAGNOSTICS)

D-1. SCOPE

This appendix provides the documentation (Console printout) of a fully operational test of an AN/UYK-42(V)4 computer, utilizing the Computer Test Set TS-4393/UYK-42(V)4.

```
;   ------------------------------------------------
;
;   THIS DIAGNOSTIC CHAIN IS USED TO TEST THE
;   AN/UYK-42(V)4 PROCESSOR UNIT.
;
;   DUE TO THE HIGH DEGREE OF INTERCONNECTION BETWEEN
;   THE CPU MODULES IT MAY BE NECESSARY TO REPLACE AN
;   ANCILLARY MODULE INSTEAD OF THE SPECIFIC MODULE
;   UNDER TEST.  A RECOMMENDED ORDER OF REPLACEMENT IS
;   INCLUDED WITH EACH TEST.
;
;   A FAILURE IS INDICATED IF THE SPECIFIED TEST TIME IS
;   EXCEEDED, OR A PRINTOUT OTHER THAN SPECIFIED IS
;   OUTPUT.  REFER TO THE AN/UYK-42(V)4 MAINTENANCE
;   MANUAL FOR AN EXAMPLE OF A COMPLETED CHAIN PRINTOUT
;   AND TROUBLESHOOTING PROCEDURES.
;
;   IF A FAILURE OCCURS, REMOVE AND REPLACE MODULES IN
;   THE ORDER GIVEN IN THE INTRODUCTION TO THE FAILING
;   TEST.
;
;   ------------------------------------------------
;
;   THE TOTAL TEST TIME IS APPROXIMATELY 18 MINUTES.
;
;   ------------------------------------------------
;
;   11/44 CPU/EIS TEST
;   THIS PROGRAM TESTS THE CPU MODULES
;   (A11,A10,A12,A10,A9,A8).  IT WILL PRINT 'END OF
;   CKKAAA0 11/44 CPU/EIS' WHEN SUCCESSFULLY COMPLETED.
;   TEST TIME IS APPROX. 10 SEC.
;
R KKAAA0/2

END OF  CKKAAA0 11/44 CPU/EIS
END OF  CKKAAA0 11/44 CPU/EIS
```

```
;
;  ------------------------------------------------
;
;  11/44 TRAPS TEST
;  THIS PROGRAM TESTS THE CPU MODULES
;  (A11,A10,A9,A8,A12,A13).  IT WILL PRINT 'END OF
;   CKKABA0 11/44 TRAPS' WHEN SUCCESSFULLY COMPLETED.
;  TEST TIME IS APPROX. 10 SEC.
;
R KKABAN/2

CKKABA0 11/44 TRAPS

NO FLOATING POINT OPTION PRESENT
NO CIS OPTION PRESENT
END OF CKKABA0 11/44 TRAPS


END OF CKKABA0 11/44 TRAPS
;
;  ------------------------------------------------
;
;  11/44 MEMORY MANAGEMENT PART 1 THIS PROGRAM TESTS
;  THE CPU DATA PATH MODULE (A10,A11,A8,A9,A12,A4).  IT
;  WILL PRINT 'END PASS' WHEN SUCCESSFULLY COMPLETED.
;  TEST TIME IS APPROX. 15 SEC.
;
R KKTAB1/2

CKKTAB 11/44 MEM MGMT PRT A

END PASS #     1  TOTAL ERRORS SINCE LAST REPORT      0

END PASS #     2  TOTAL ERRORS SINCE LAST REPORT      0

;
;  ------------------------------------------------
;
;  11/44 MEMORY MANAGEMENT PART 2
;  THIS PROGRAM TESTS THE CPU DATA PATH MODULE
;  (A10,A11,A8,A9,A12,A4).  IT WILL PRINT 'END PASS'
;  WHEN SUCCESSFULLY COMPLETED.
;  TEST TIME IS APPROX. 10 SEC.
;
R KKTBC0/2

CKKTBC0 11/44 MEM MGMT PRT B

END PASS #     1  TOTAL ERRORS SINCE LAST REPORT      0

END PASS #     2  TOTAL ERRORS SINCE LAST REPORT      0
```

```
;
;  ------------------------------------------------
;
;  11/44 UBI BOOT DIAGNOSTIC
;  THIS PROGRAM TESTS THE CPU UNIBUS INTERFACE MODULE
;  (A8,A10,A11,A12,A9,A4,A2,A3).  IT WILL PRINT 'END
;  PASS' WHEN SUCCESSFULLY COMPLETED.
;  TEST TIME IS APPROX. 15 SEC.
;
R ZM9BDM/2

CZM9BD0 M9312/1144 UBI BOOT

DIAG. ROM (E20) (FOR 11-44 UBI: E58)C0

BOOTSTRAP ROM ENTRY POINTS AND DEVICE CODES
LOC.              NO DIAG.       RUN DIAG.       DEVICE CODE

ROM 1(E48)        173004         173006          CT

ROM 2(E49)        173204         173206          DY

ROM 3(E50)        173404         173406          DM

ROM 4(E59)        173604         173606          DX

PSEUDO POWER-FAIL VECTOR ADR./NEW PC   173024    165024

END PASS
END PASS

;
;  ------------------------------------------------
;
;  11/44UBI MAP DIAGNOSTIC
;  THIS PROGRAM TESTS THE CPU UNIBUS INTERFACE MODULE
;  (A8,A11,A10,A12,A9,A4,A2,A3).  IT WILL PRINT 'END

;  PASS' WHEN SUCCESSFULLY COMPLETED.
;  TEST TIME IS APPROX. 30 SEC.
;
R KKUAA0/2

CKKUAA0 11/44 UBI MAP

END PASS #      1  TOTAL ERRORS SINCE LAST REPORT      0

END PASS #      2  TOTAL ERRORS SINCE LAST REPORT      0
.5K RESTORED
```

```
;
;   ------------------------------------------------
;
;   11/44 MULTIFUNCTION DIAGNOSTIC
;   THIS PROGRAM TESTS THE CPU MULTIFUNCTION AND CONSOLE
;   INTERFACE MODULES (A12,A11,A10,A13,A8,A9). IT WILL
;   PRINT 'END PASS' WHEN SUCCESSFULLY COMPLETED.
;   TEST TIME IS APPROX. 25 SEC.
;
R ZDLD01/2

CZDLDE0 DL11-W,1144 MFM SLU
02 DEVICES UNDER TEST
END PASS
END PASS

;
;   ------------------------------------------------
;
;   11/44 KK11B CACHE DIAGNOSTIC
;   THIS PROGRAM TESTS THE CPU CACHE MODULE
;   (A9,A2,A3,A4,A11,A10).  IT WILL PRINT 'END PASS'
;   WHEN SUCCESSFULLY COMPLETED.
;   TEST TIME IS APPROX. 1:15 MIN.
;
R KKKAAN/2

CKKKAA0 11-44 KK11B CACHE
RMI REGISTER (G5179) NOT USED-SKIP HI ORDER BIT ADDRESS TEST


UNIBUS EXERCISER NOT USED- DMA TESTS NOT PERFORMED

END OF PASS #     1
END OF PASS #     2
```

```
;
;   ------------------------------------------------
;
;   MS11 L/M MEMORY DIAGNOSTIC
;   THIS PROGRAM TESTS THE 11/44 MEMORY AND MEMORY
;   INTERFACE MODULES (A2,A3,A4,A9,A10,A11,A12). IT WILL
;   PRINT 'END PASS' WHEN SUCCESSFULLY COMPLETED.
;   TEST TIME IS APPROX. 11 MIN.
;
R ZMSD01/2

 CZMSDA
   11/44 CACHE AVAILABLE
CSR NUMBER 0 CONTROLS TOO MANY BANKS
CSR NUMBER 1 CONTROLS TOO MANY BANKS
   512K OF MS11-M
   512K WORDS OF MEMORY TOTAL

                         MEMORY CONFIGURATION MAP
              1         2         3         4         5         6         7
        01234567012345701234567012345670123456701234567012345670123
ERRORS
CPU MAP 11111111111111111111111111111111
INTRLV  --------------------------------

MEMTYPE MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
CSR     00000000000000001111111111111111
PROTECT PP
             0         1         2         3         4         5         6
        45670123456701234570123456701234567012345670123456701234567
ERRORS
CPU MAP
INTRLV
MEMTYPE
CSR
PROTECT
PROGRAM RELOCATED - ECC TESTS INHIBITED
END PASS #QV     1
PROGRAM RELOCATED - ECC TESTS INHIBITED
END PASS #     2.5K RESTORED
;
```

```
;
;   ------------------------------------------------
;
;   SERIAL MULTIPLEXED INTERFACE(SMI) TESTS
;   THESE PROGRAMS TEST THE SMI MODULES (A7,A6,A5).
;   EACH WILL PRINT 'END PASS' WHEN SUCCESSFULLY
;   COMPLETED.
;   TEST TIME FOR SUPRV1 IS APPROX. 40 SEC.
;   TEST TIME FOR XRSIZ2 IS APPROX. 50 SEC.
;
R SUPRV1/2

REGENCY NET SMI DIAGNOSTIC SUPERVISOR

I-O CARD 0 IS PRESENT AND ACTIVE

I-O CARD 1 IS PRESENT AND ACTIVE

I-O CARD 2 IS NOT PRESENT

I-O CARD 3 IS NOT PRESENT

END PASS #     1

END PASS #     2

;
R XRSIZ2/2

REGENCY NET SMI IO DATA BLOCK TRANSFER

STATUS AFTER 'DRIVER ALIVE'
CNSTAT  IOSTAT  IO ID    REG15
000000  000000  042041  000000


END PASS #     1

END PASS #     2

;
;   ------------------------------------------------
;
;   END OF AN/UYK-42(V)4 DIAGNOSTIC CHAIN
;
;   ------------------------------------------------
```

APPENDIX E
MAINTENANCE AND REPAIR DIAGRAMS AND WIRING LISTS

E-1. SCOPE

Appendix E contains the following:

Figure (Cont.) Page

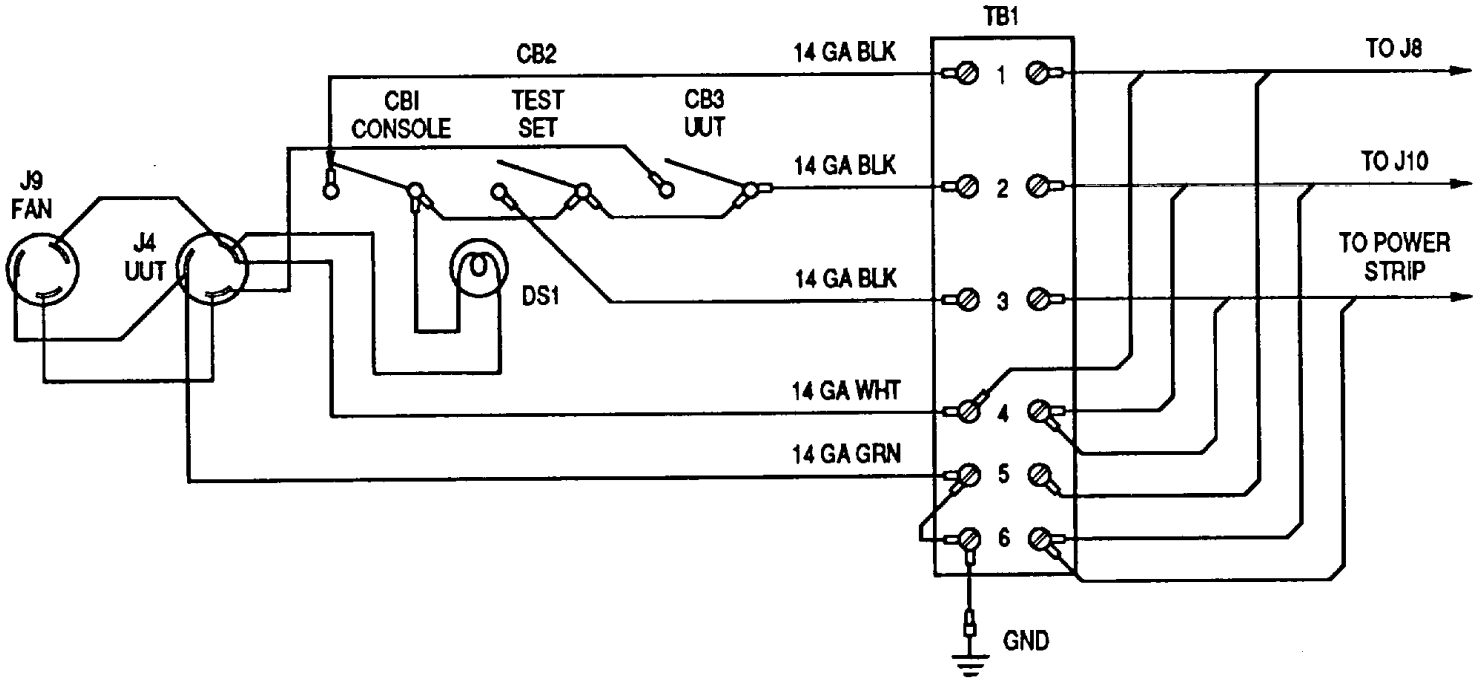
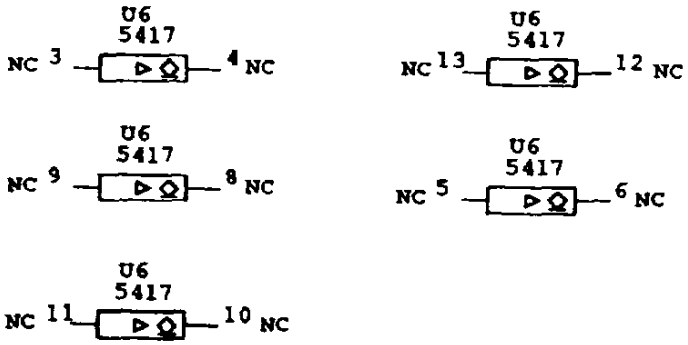


Figure E-1. AC Power Panel Assembly Wiring Diagram (109D06303)

SPARES



NOTES:

1. UNLESS OTHERWISE SPECIFIED, RESISTOR VALUES ARE IN OHMS.
2. FOR ASSEMBLY, SEE 109D06320
3. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION, PREFIX WITH ASSEMBLY AND/OR UNIT NUMBER DESIGNATION(S).
4. SIGNAL NAMES THAT END WITH 'H\I' OR 'L\I' INDICATE SIGNALS THAT GOTO OR FROM A CONNECTOR.
5. SIGNAL NAMES THAT END WITH AN 'H' INDICATES AN ACTIVE HIGH AND AN 'L' INDICATES AN ACTIVE LOW SIGNAL.
6. +5VDC POWER IS INDICATED BY THE SIGNAL NAME VCC H.
7. +5VDC RETURN IS INDICATED BY THE SIGNAL NAME 'GND H/G' OR THE SYMBOL ⏚
8. FOR REFERENCE DESTINATION FLAGGING REFER TO THE LAST SHEET OF SCHEMATIC
9. UNLESS OTHERWISE SPECIFIED, PIN 7 OF ALL 14 PIN MIC DEVICES IS 'GND H\G' AND PIN 14 IS 'VCC H'

Figure E-2. SMI Test Card Schematic Diagram (109D06321) (1 of 8)

POWER PAGE

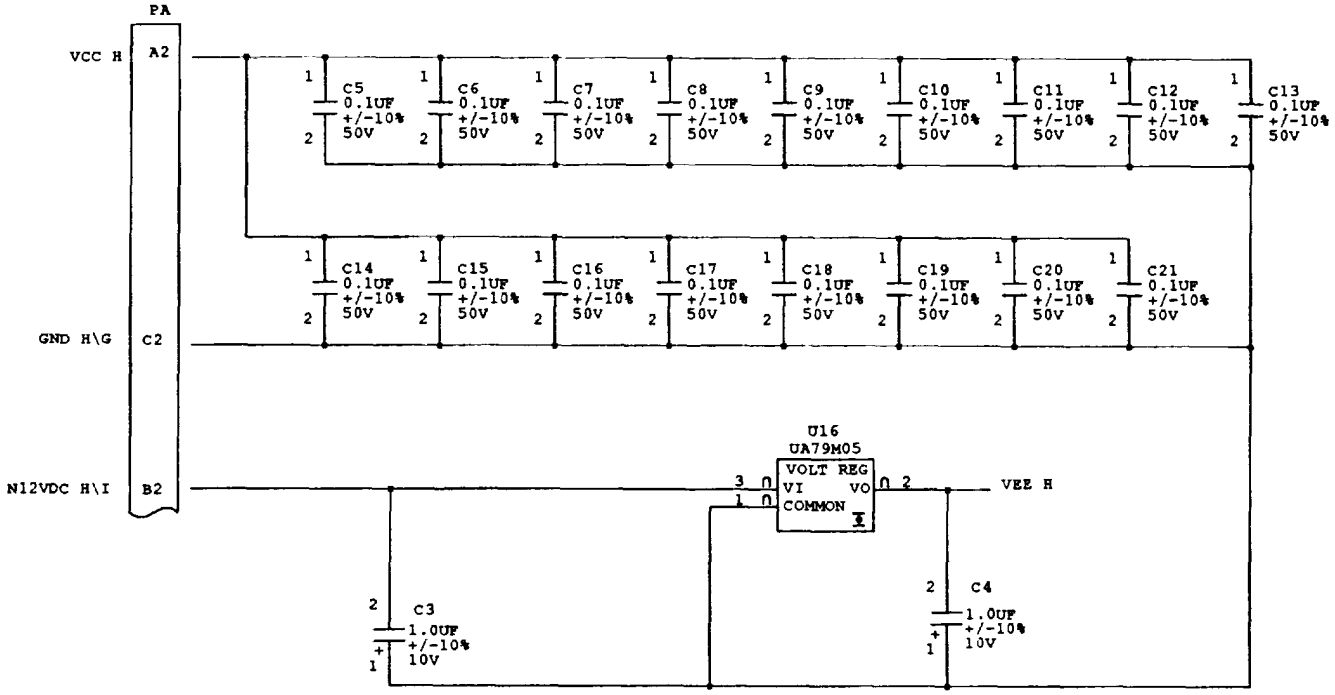
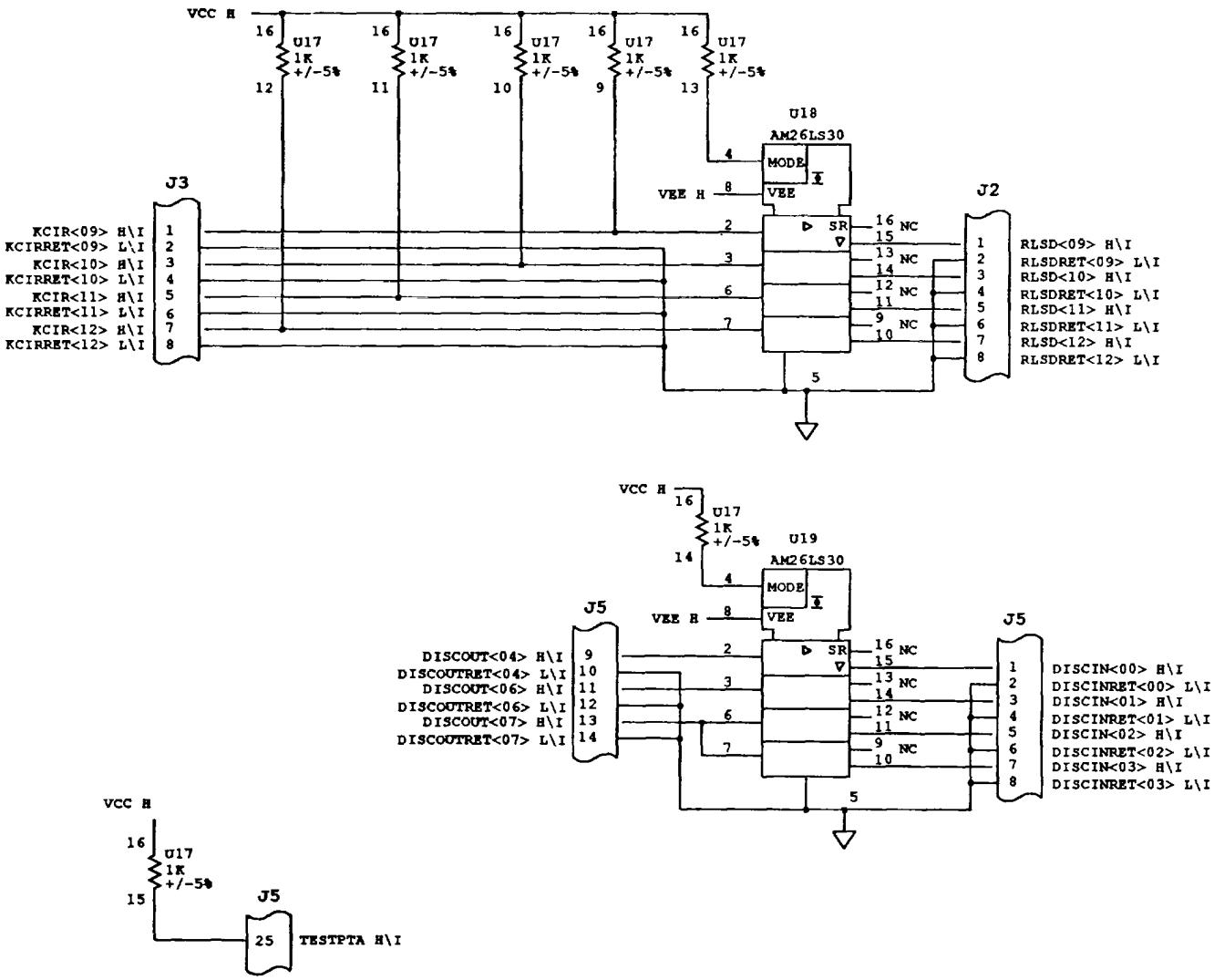


Figure E-2. SMI Test Card Schematic Diagram (109D06321) (2 of 8)



NOTE: EACH SIGNAL THAT HAS A RETURN ASSOCIATED WITH IT AND IS NOT BEING DRIVEN OR RECEIVED DIFFERENTIALLY AT THE END PORTRAYED SHALL HAVE ITS RETURN BE A SEPERATE CONDUCTOR IN A TWISTED PAIR AND:

1) IF ITS IS WIREWRAP, IT WILL BE CONNECTED TO THE GROUND PIN OF THE CHIP DRIVING OR RECEIVING THE SIGNAL OR

2) IF IT IS A CLAD, IT WILL BE A SEPARATE CLAD RUN TO THE GROUND PIN OF THE CHIP DRIVING OR RECEIVING THE SIGNAL

Figure E-2. SMI Test Card Schematic Diagram (109D06321) (3 of 8)

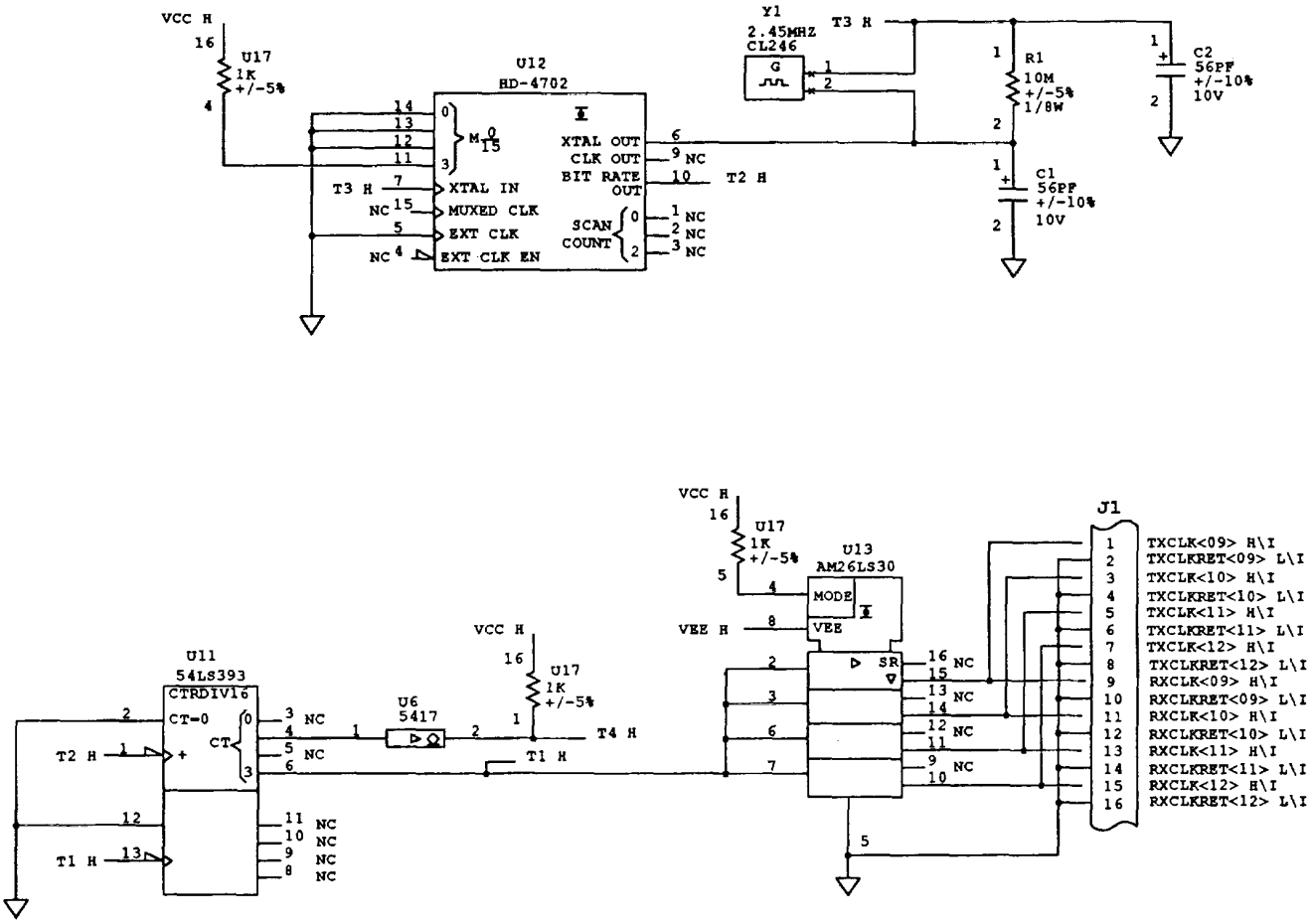
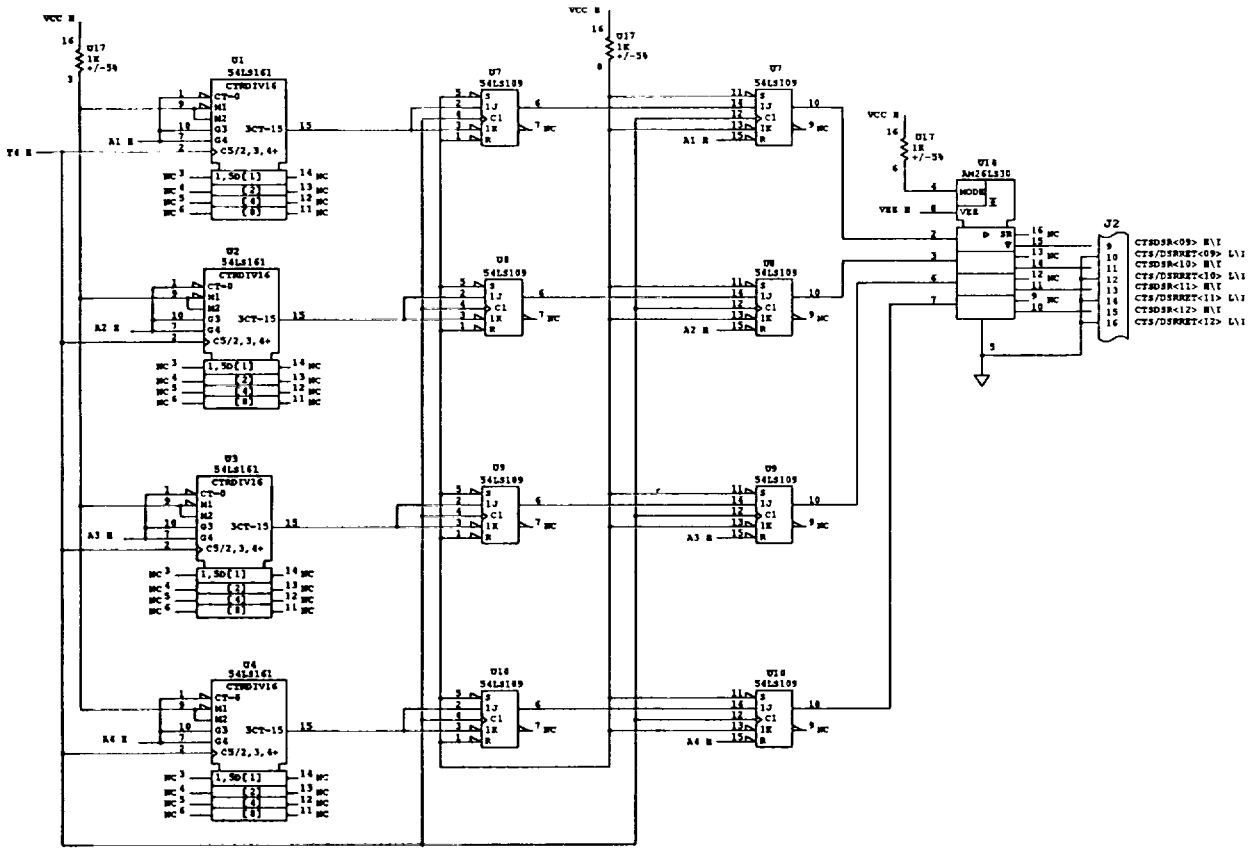


Figure E-2. SMI Test Card Schematic Diagram (109D06321) (4 of 8)



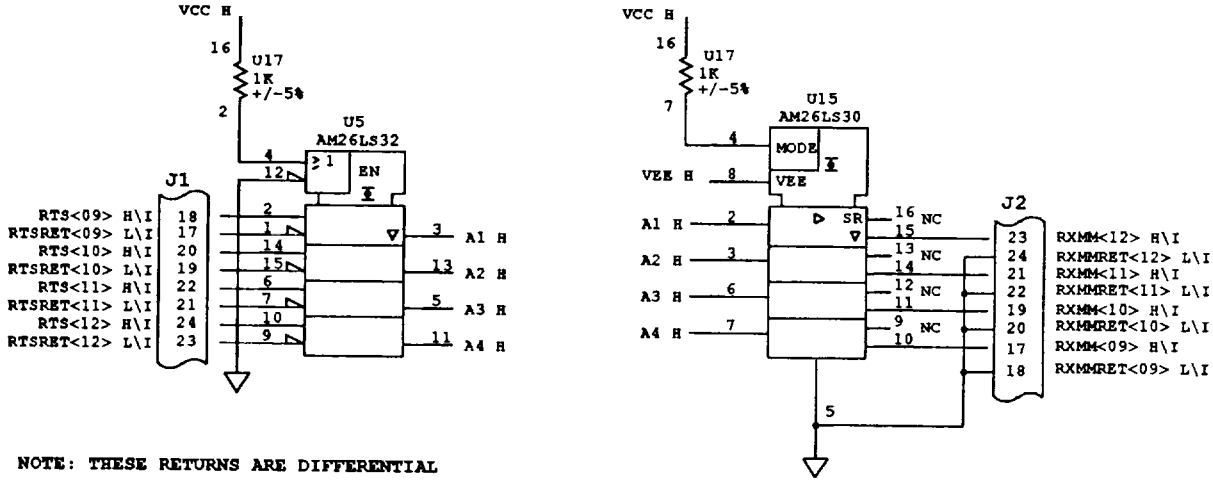


Figure E-2. SMI Test Card Schematic Diagram (109D06321) (5 of 8)

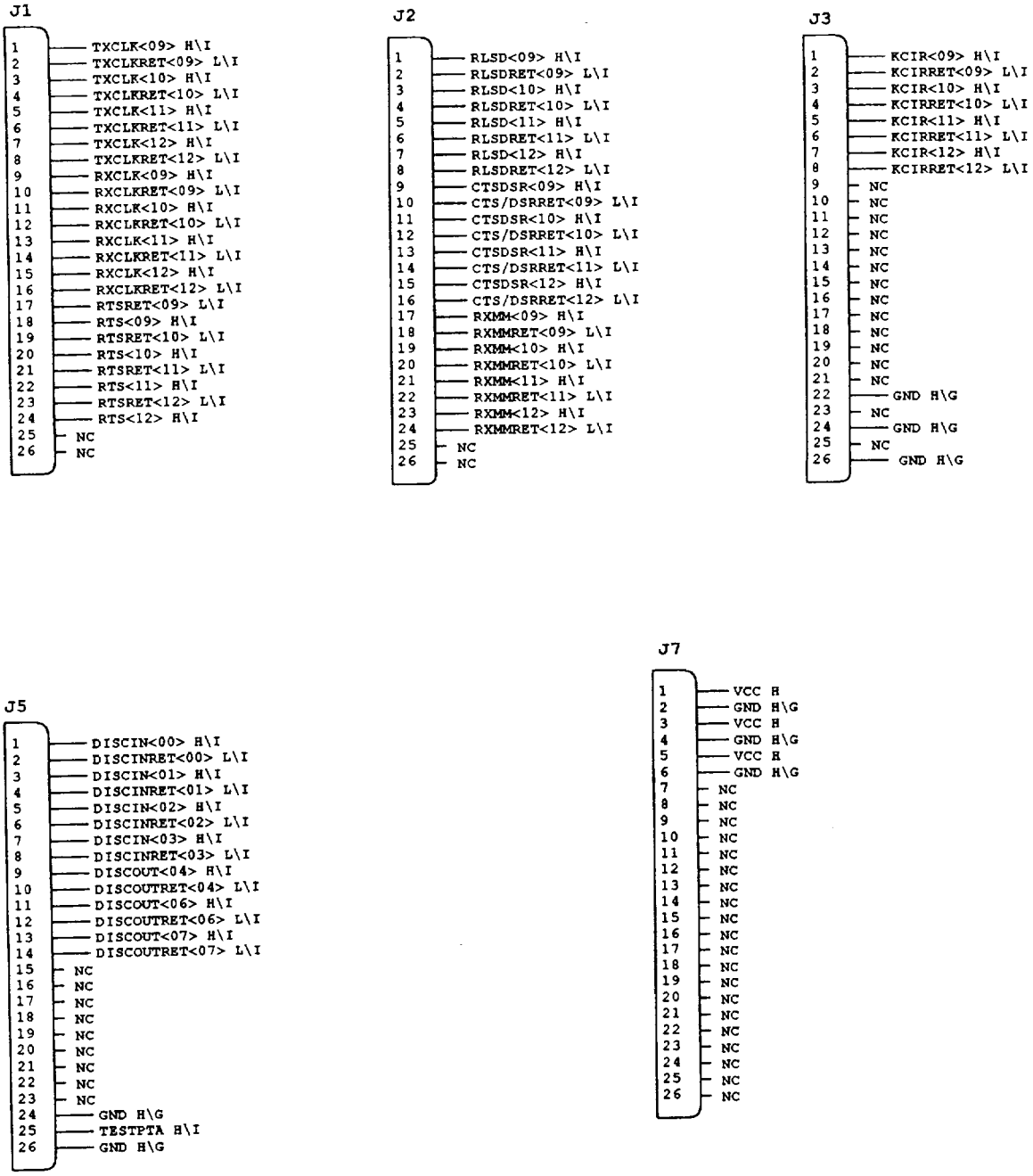


Figure E-2. SMI Test Card Schematic Diagram
(109D06321) (6 of 8)

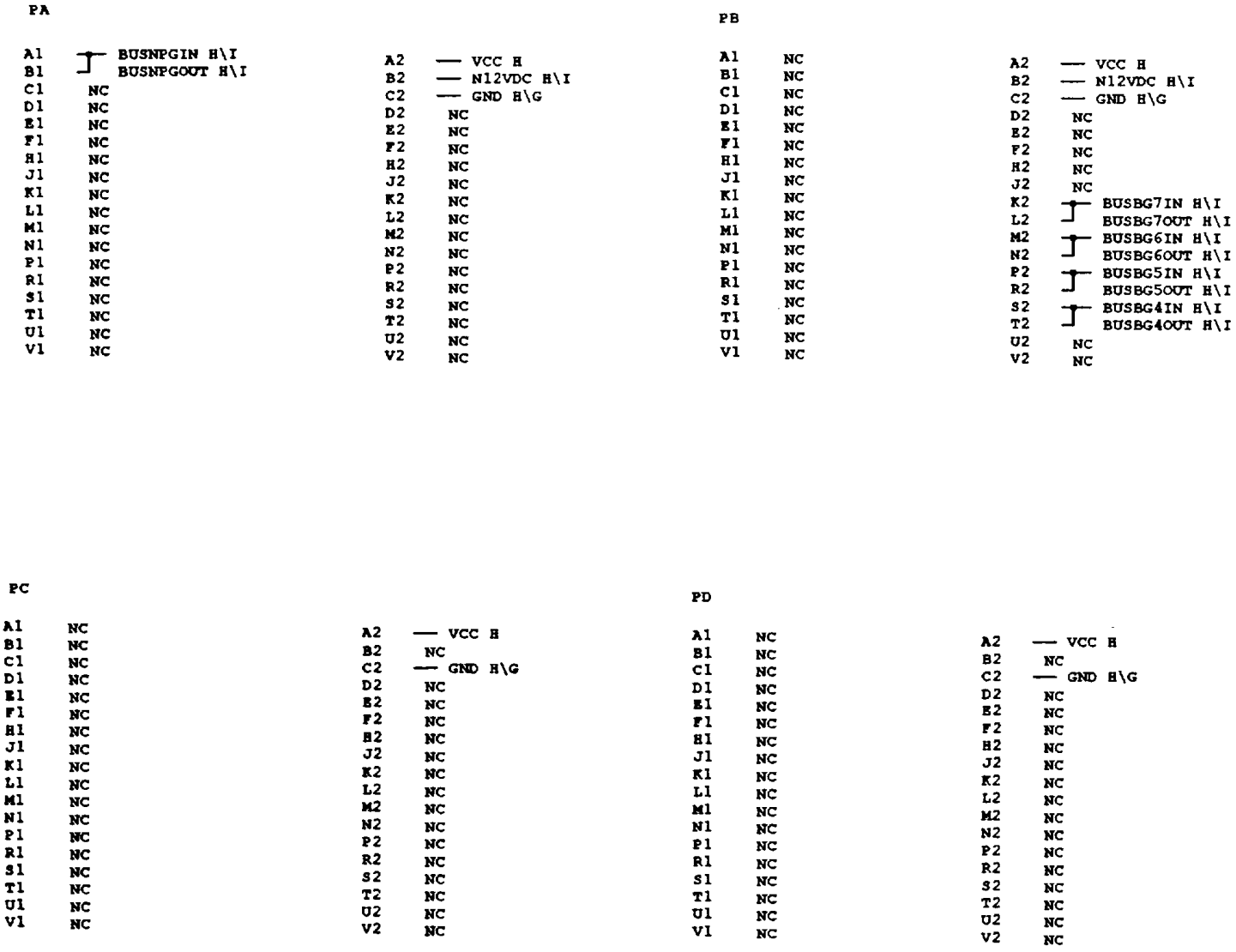


Figure E-2. SMI Test Card Schematic Diagram (109D06321) (7 of 8)

SIGNAL NAME	PAGE LOCATION
A1 H	05 05 05 05
A2 H	05 05 05 05
A3 H	05 05 05 05
A4 H	05 05 05 05
BUSBG4IN H\I	07
BUSBG4OUT H\I	07
BUSBG5IN H\I	07
BUSBG5OUT H\I	07
BUSBG6IN H\I	07
BUSBG6OUT H\I	07
BUSBG7IN H\I	07
BUSBG7OUT H\I	07
BUSNPGIN H\I	07
BUSNPGOUT H\I	07
CTS/DSRRET<09> L\I	06
CTS/DSRRET<10> L\I	06
CTS/DSRRET<11> L\I	06
CTS/DSRRET<12> L\I	06
CTSDSR<09> H\I	05 06
CTSDSR<10> H\I	05 06
CTSDSR<11> H\I	05 06
CTSDSR<12> H\I	05 06
DISCIN<00> H\I	03 06
DISCIN<01> H\I	03 06
DISCIN<02> H\I	03 06
DISCIN<03> H\I	03 06
DISCINRET<00> L\I	06
DISCINRET<01> L\I	06
DISCINRET<02> L\I	06
DISCINRET<03> L\I	06
DISCOUT<04> H\I	03 06
DISCOUT<06> H\I	03 06
DISCOUT<07> H\I	03 06
DISCOUTRET<04> L\I	06
DISCOUTRET<06> L\I	06
DISCOUTRET<07> L\I	06
GND H\G	02 06 06 06 06 06 06 06 06 07 07 07 07
KCIR<09> H\I	03 06
KCIR<10> H\I	03 06
KCIR<11> H\I	03 06
KCIR<12> H\I	03 06
KCIRRET<09> L\I	06
KCIRRET<10> L\I	06
KCIRRET<11> L\I	06
KCIRRET<12> L\I	06
N12VDC H\I	02 07 07
RLSD<09> H\I	03 06
RLSD<10> H\I	03 06
RLSD<11> H\I	03 06
RLSD<12> H\I	03 06
RLSDRET<09> L\I	06
RLSDRET<10> L\I	06
RLSDRET<11> L\I	06
RLSDRET<12> L\I	06
RTS<09> H\I	05 06
RTS<10> H\I	05 06
RTS<11> H\I	05 06
RTS<12> H\I	05 06
RTSRET<09> L\I	05 06
RTSRET<10> L\I	05 06
RTSRET<11> L\I	05 06
RTSRET<12> L\I	05 06
RXCLK<09> H\I	04 06
RXCLK<10> H\I	04 06
RXCLK<11> H\I	04 06
RXCLK<12> H\I	04 06
RXCLKRET<09> L\I	06
RXCLKRET<10> L\I	06
RXCLKRET<11> L\I	06
RXCLKRET<12> L\I	06
RXMM<09> H\I	05 06
RXMM<10> H\I	05 06
RXMM<11> H\I	05 06
RXMM<12> H\I	05 06
RXMMRET<09> L\I	06
RXMMRET<10> L\I	06
RXMMRET<11> L\I	06
RXMMRET<12> L\I	06
T1 H	04 04
T2 H	04 04
T3 H	04 04
T4 H	04 05
TESTPTA H\I	03 06
TXCLK<09> H\I	04 06
TXCLK<10> H\I	04 06
TXCLK<11> H\I	04 06
TXCLK<12> H\I	04 06
TXCLKRET<09> L\I	06
TXCLKRET<10> L\I	06
TXCLKRET<11> L\I	06
TXCLKRET<12> L\I	06
VCC H 02 03 03 03 04 04 04 05 05 05 05 05 06 06 06 07 07 07 07	
VEE H	02 03 03 04 05 05

DESIGNATOR	PART TYPE	GND
U1	I54LS161	8
U2	I54LS161	8
U3	I54LS161	8
U4	I54LS161	8
U5	AM26LS32	8
U6	I5417	7
U7	I54LS109	8
U8	I54LS109	8
U9	I54LS109	8
U10	I54LS109	8
U11	I54LS393	7
U12	HD4702	8
U13	AM26LS30	5
U14	AM26LS30	5
U15	AM26LS30	5
U18	AM26LS30	5
U19	AM26LS30	5

Figure E-2. SMI Test Card Schematic Diagram (109D06321) (8 of 8)

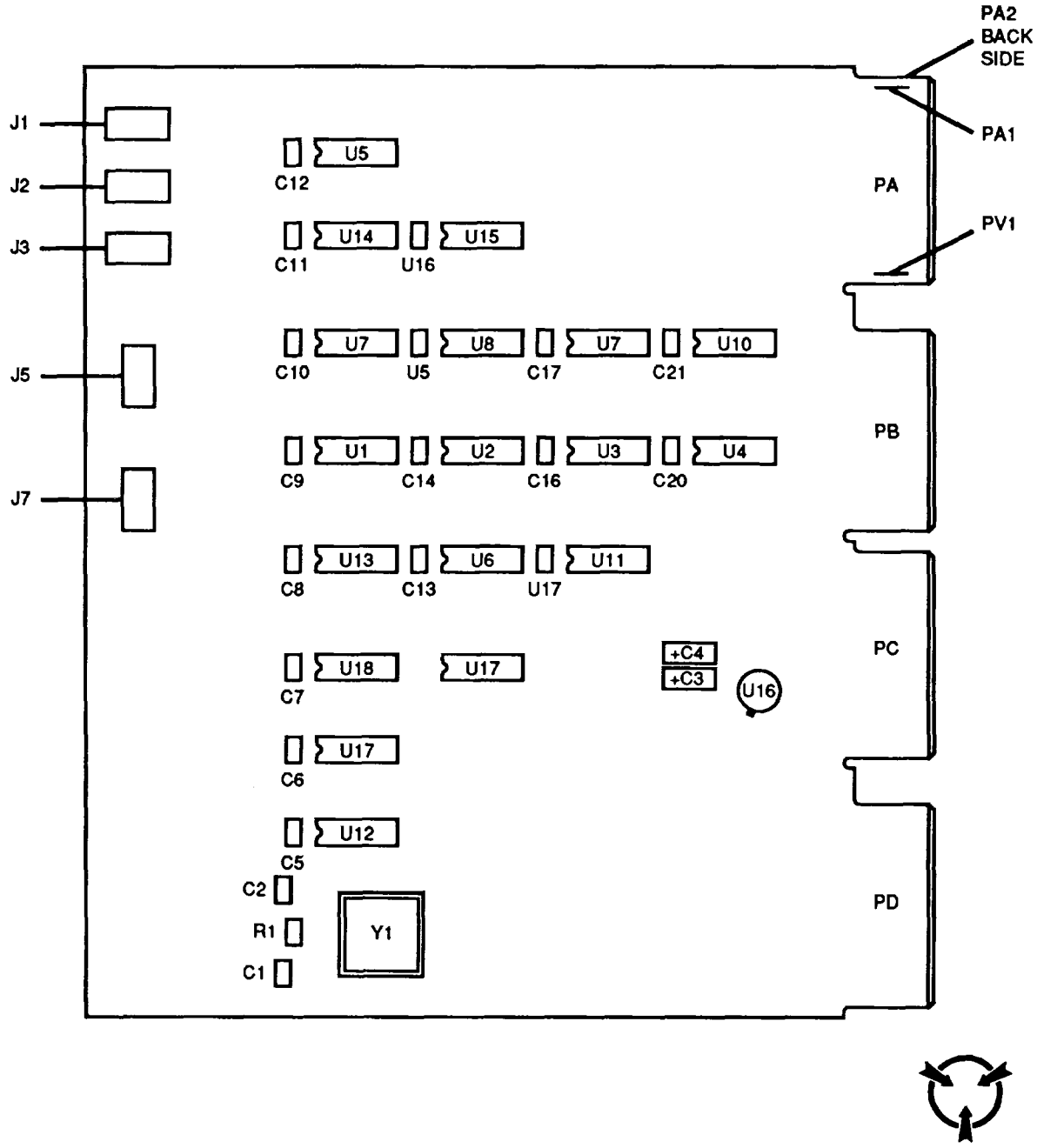


Figure E-3. SMI Test Card CCA Layout (109D06320-101)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J6-75		J2B-U1
J2B-T1		WT1
J2B-V2		WT1
WT1		J6-69
J6-68		J2B-V1
J6-67		J2A-B1
J2A-C2		WT2
J2A-B2		WT2
WT2		J6-59
J6-77		J2A-A1
J6-79		J2A-M1
J2A-P1		WT3
J2A-N1		WT3
WT3		J6-82
J6-76		J2A-N2

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCAT
J6-78		J2B-U
J2B-V2		WT4
J2B-T1		WT4
WT4		J6-71
J6-84		J2B-T
J6-80		J2A-P
J2A-R1		WT5
J2A-T1		WT5
WT5		J6-85
J6-29		J2A-U
J6-49		J2B-D
J2B-D1		WT6
J2B-E1		WT6
WT6		J6-52
J6-38		J2B-E

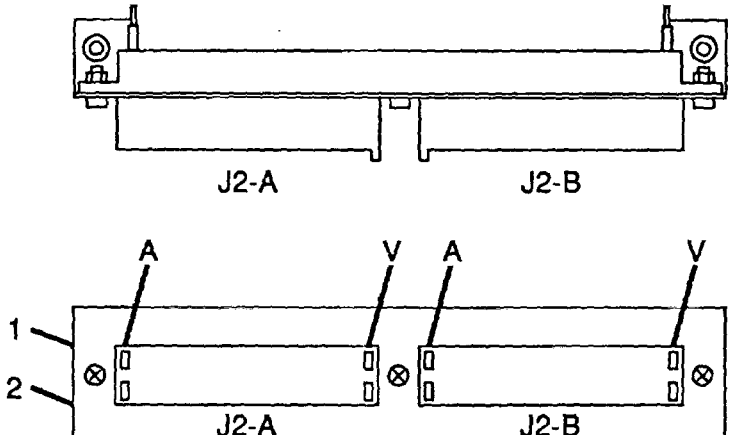


Figure E-4. UNIBUS Out Adapter Assembly Wiring List (109D06327-101) (1 of 4)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J6-54		J2B-B1
J2B-B2		WT7
J2B-C2		WT7
WT7		J6-45
J6-72		J2B-F2
J6-63		J2A-V1
J2A-V2		WT8
J2A-S1		WT8
WT8		J6-42
J6-4		J2A-U1
J6-83		J2A-P2
J2A-P1		WT9
J2A-T1		WT9
WT9		J6-61
J6-66		J2A-T2

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J6-39		J2B-C1
J2B-C2		WT10
J2B-B2		WT10
WT10		J6-21
J6-5		J2B-A1
J6-74		J2A-S2
J6-81		J2A-S1
J6-73		J2B-F1
J6-46		J2B-E1
J6-11		J2B-K2
J6-2		J2B-H1
J6-10		J2B-J1
J6-19		J2B-K1

Figure E-4. UNIBUS Out Adapter Assembly Wiring List (109D06327-101) (2 of 4)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J6-14		J2A- M2
J6-12		J2A-L1
J6-57		J2A-K1
J6-6		J2A-J1
J6-41		J2A-H1
J6-40		J2A-H2
J6-50		J2A-F2
J6-60		J2A-E2
J6-53		J2A-D2
J6-47		J2A-C1
J6-44		J2B-S1
J6-17		J2B-R1
J6-9		J2B-P1
J6-64		J2B-P2
J6-56		J2B-N2

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J6-65		J2B-M1
J6-27		J2B-M2
J6-37		J2B-L1
J6-20		J2A-L2
J6-13		J2A-K2
J6-31		J2A-J2
J6-33		J2A-F1
J6-51		J2A-E1
J6-62		J2A-D1
J6-43		J2B-S2
J6-16		J2B-R2
J6-55		J2B-N1
J6-25		J2B-L2
J6-3		J2B-H2
J6-28		J2B-J2

Figure E-4. UNIBUS Out Adapter Assembly Wiring List (109D06327-101) (3 of 4)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J6-30		P1-1
J6-48		P1-3
J6-58		P1-5

Figure E-4. UNIBUS Out Adapter Assembly Wiring List (109D06327-101) (4 of 4)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J5-75		J2B-U1
J2B-T1		WT1
J2B-V2		WT1
WT1		J5-69
J5-68		J2B-V1
J5-67		J2A-B1
J2A-C2		WT2
J2A-B2		WT2
WT2		J5-59
J5-77		J2A-A1
J5-79		J2A-M1
J2A-P1		WT3
J2A-N1		WT3
WT3		J5-82
J5-76		J2A-N2

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J5-78		J2B-U2
J2B-V2		WT4
J2B-T1		WT4
WT4		J5-71
J5-84		J2B-T2
J5-80		J2A-R2
J2A-R1		WT5
J2A-T1		WT5
WT5		J5-85
J5-29		J2A-U2
J5-49		J2B-D2
J2B-D1		WT6
J2B-E1		WT6
WT6		J5-52
J5-38		J2B-E2

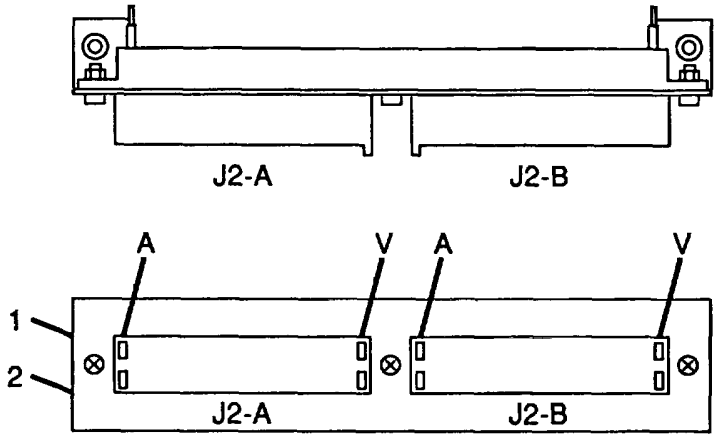
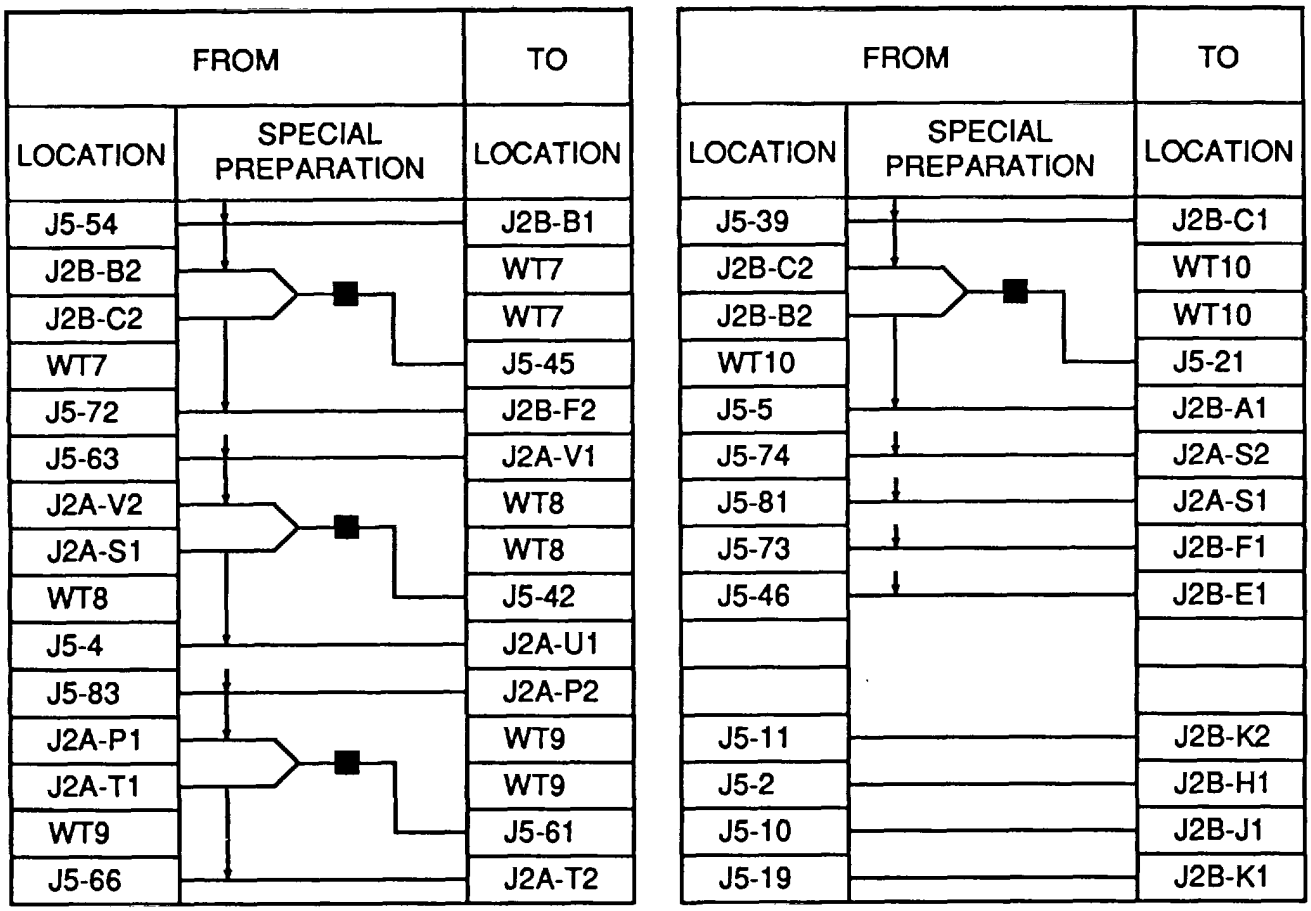


Figure E-5. UNIBUS In Adapter Assembly Wiring List (109D06326-101) (1 of 3)



FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J5-54		J2B-B1
J2B-B2		WT7
J2B-C2		WT7
WT7		J5-45
J5-72		J2B-F2
J5-63		J2A-V1
J2A-V2		WT8
J2A-S1		WT8
WT8		J5-42
J5-4		J2A-U1
J5-83		J2A-P2
J2A-P1		WT9
J2A-T1		WT9
WT9		J5-61
J5-66		J2A-T2

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J5-39		J2B-C1
J2B-C2		WT10
J2B-B2		WT10
WT10		J5-21
J5-5		J2B-A1
J5-74		J2A-S2
J5-81		J2A-S1
J5-73		J2B-F1
J5-46		J2B-E1
J5-11		J2B-K2
J5-2		J2B-H1
J5-10		J2B-J1
J5-19		J2B-K1

Figure E-5. UNIBUS In Adapter Assembly Wiring List (109D06326-101) (2 of 3)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J5-14		J2A- M2
J5-12		J2A-L1
J5-57		J2A-K1
J5-6		J2A-J1
J5-41		J2A-H1
J5-40		J2A-H2
J5-50		J2A-F2
J5-60		J2A-E2
J5-53		J2A-D2
J5-47		J2A-C1
J5-44		J2B-S1
J5-17		J2B-R1
J5-9		J2B-P1
J5-64		J2B-P2
J5-56		J2B-N2

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
J5-65		J2B-M1
J5-27		J2B-M2
J5-37		J2B-L1
J5-20		J2A-L2
J5-13		J2A-K2
J5-31		J2A-J2
J5-33		J2A-F1
J5-51		J2A-E1
J5-62		J2A-D1
J5-43		J2B-S2
J5-16		J2B-R2
J5-55		J2B-N1
J5-25		J2B-L2
J5-3		J2B-H2
J5-28		J2B-J2

Figure E-5. UNIBUS In Adapter Assembly Wiring List (109D06326-101) (3 of 3)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-1		P2-1
P1-2		P2-7
P1-3		P2-3
P1-4		P2-2
P1-7		P2-7
P1-6		P2-20
P1-8		P2-6
P2-4		P2-5

Figure E-6. Console Cable W1 Wire List

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-18		P1-109
P1-28		P1-98
P1-40		P1-55
P1-51		P1-53
P1-46		P1-52
P1-57		P1-41
P1-2		P1-29
P1-108		P1-17
P1-20		P1-21
P1-19		P1-22
P1-30		P1-6
P1-31		P1-7
P1-4		P1-11
P1-5		P1-12
P1-23		P1-13
P1-24		P1-14
P1-71		P1-94

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-72		P1-95
P1-82		P1-73
P1-83		P1-74
P1-84		P1-75
P1-85		P1-76
P1-86		P1-96
P1-87		P1-97
P1-66		P2-66
P1-67		P2-67
P1-68		P2-68
P1-69		P2-69
P1-119		P2-119
P1-121		P2-121
P1-122		P2-122
P1-125		P2-125
P1-126		P2-126

Figure E-7. Test Cable W2 (109D06313-101) Wire List

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-19		P2-19
P1-20		P2-20
P1-44		P2-44
P1-45		P2-45
P1-90		P2-90
P1-91		P2-91
P1-109		P2-109
P1-110		P2-110
P1-23		P2-23
P1-24		P2-24
P1-34		P2-34
P1-35		P2-35
P1-79		P2-79
P1-80		P2-80
P1-113		P2-113
P1-121		P2-121
P1-9		P2-9
P1-10		P2-10
P1-26		P2-26
P1-27		P2-27

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-75		P2-75
P1-76		P2-76
P1-107		P2-107
P1-108		P2-108
P1-21		P2-21
P1-22		P2-22
P1-43		P2-43
P1-42		P2-42
P1-89		P2-89
P1-88		P2-88
P1-111		P2-111
P1-112		P2-112
P1-13		P2-13
P1-46		P2-46
P1-92		P2-92
P1-114		P2-114
P1-18		P2-18
P1-17		P2-17
P1-40		P2-40
P1-41		P2-41

Figure E-8. Test Cable W3 (109D06314-101) Wire List (1 of 2)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-86		P2-86
P1-87		P2-87
P1-66		P2-66
P1-67		P2-67
P1-6		P2-6
P1-7		P2-7
P1-33		P2-33
P1-32		P2-32
P1-77		P2-77
P1-78		P2-78
P1-115		P2-115
P1-116		P2-116
P1-103		P1-15
P1-102		P1-25
P1-84		P1-37
P1-85		P1-36
P1-38		P1-83
P1-39		P1-82
P1-16		P1-105
P1-8		P1-106

Figure E-8. Test Cable W3 (109D06314-101) Wire List (2 of 2)

FROM		TO
LOCATION	SPECIAL PREPARATION	LOCATION
P1-11		P2-HI
P1-12		P2-HI
P1-13		P2-HI
P1-14		P2-LO
P1-15		P2-LO
P1-16		P2-LO
P1-9		P2-GND
P1-10		P2-GND
P1-21		P2-GND
P1-22		P2-GND

Figure E-9. AC Power Cable W4 (109D06315) Wire List

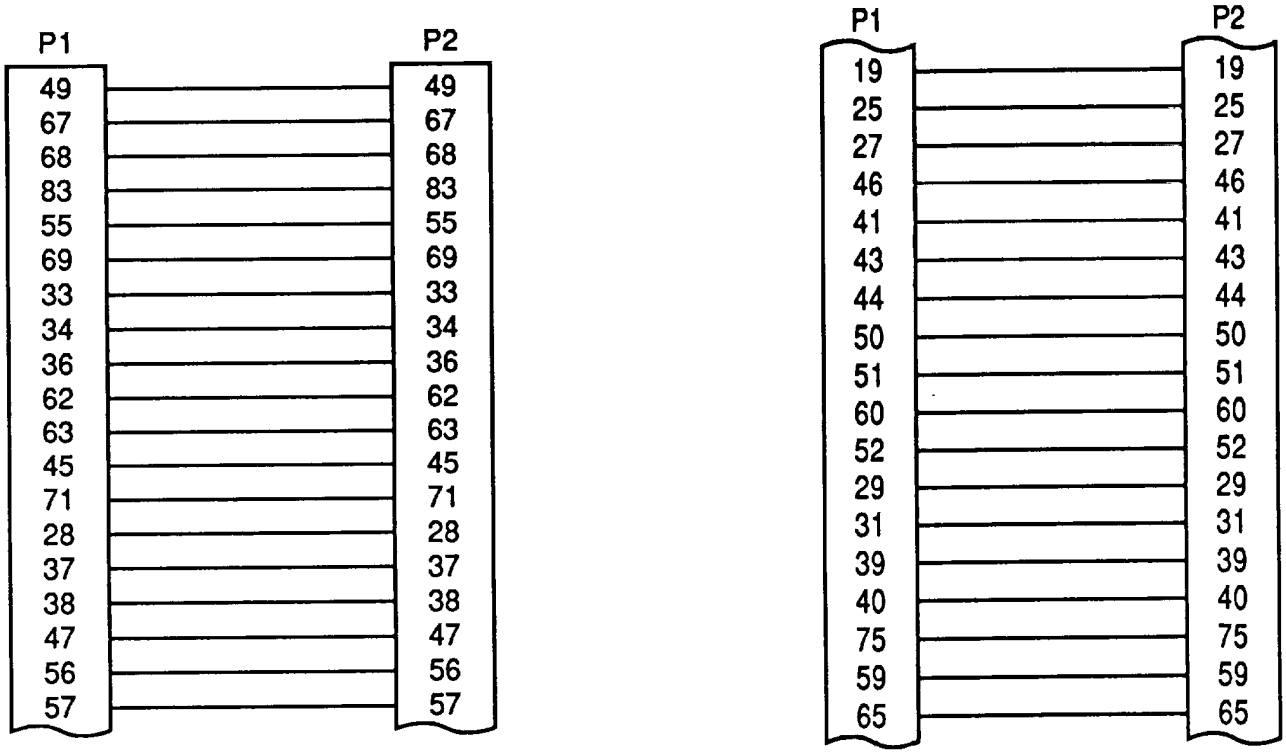


Figure E-10. UUT UNIBUS W5 Cable (109D00209) (1 of 3)

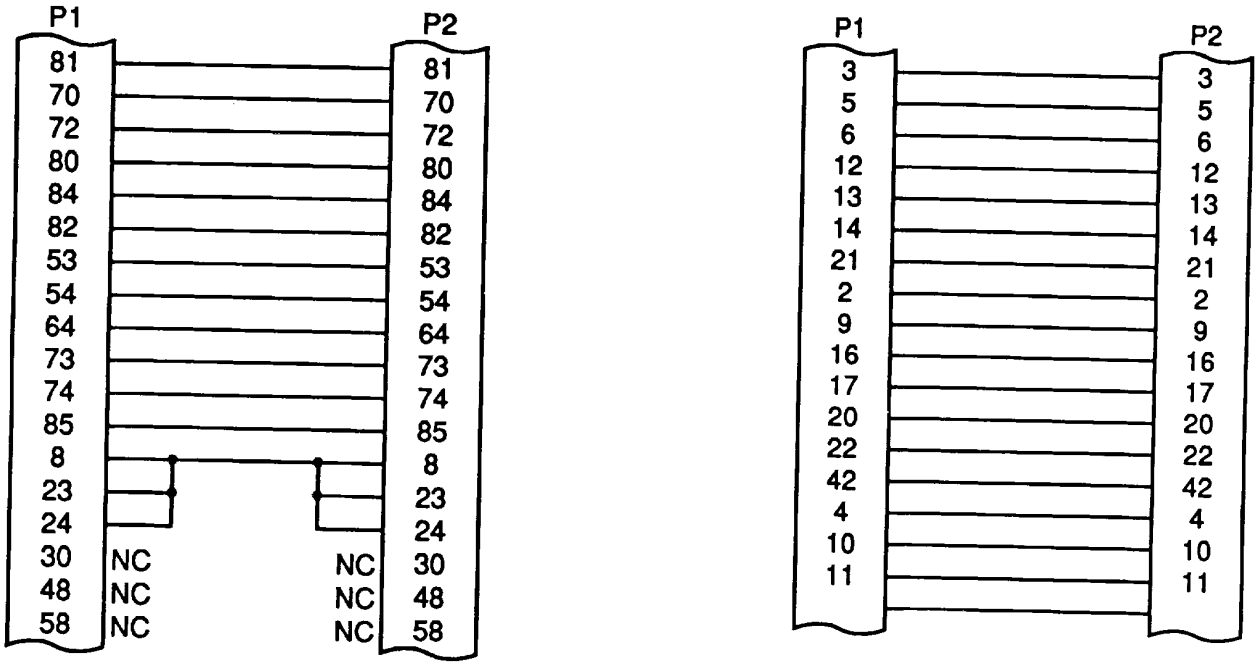


Figure E-10. UUT UNIBUS W5 Cable (109D00209) (2 of 3)

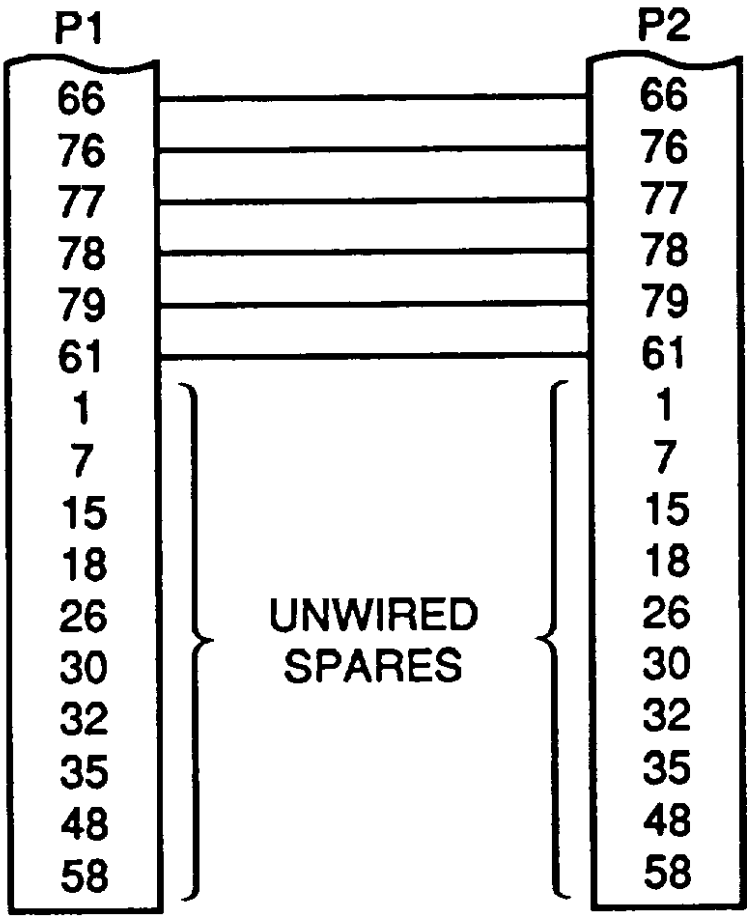


Figure E-10. UUT UNIBUS W5 Cable (109D00209) (3 of 3)

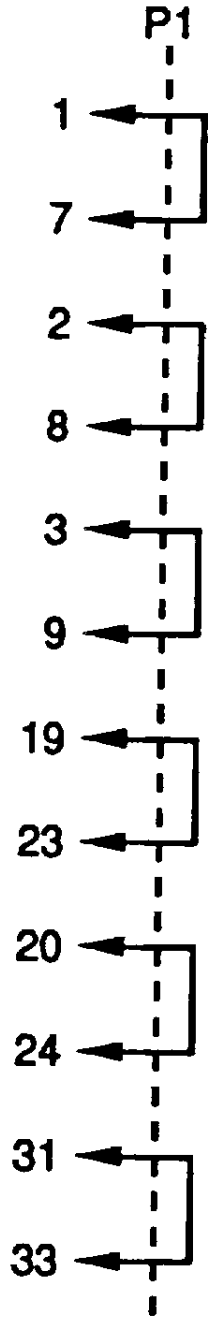
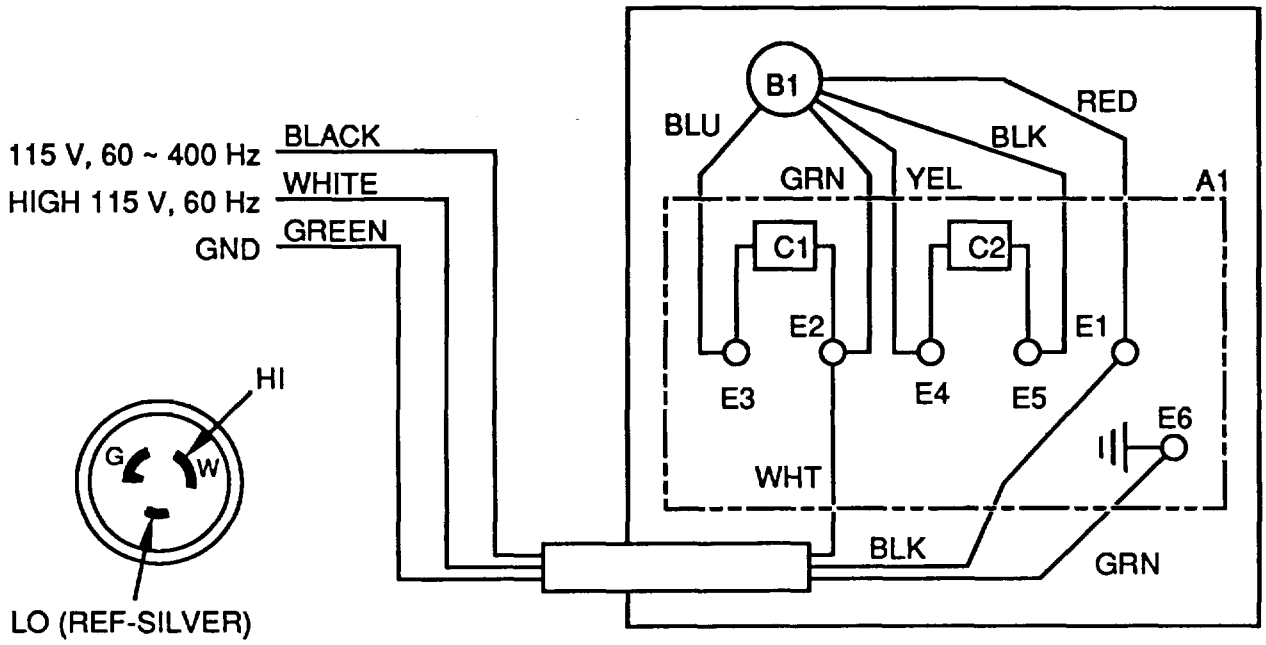


Figure E-11. Dummy Connector, Plug W6



FROM	TO
HI	E1
LO (SILVER)	E2
G	E6

Figure E-12. Fan Assembly (Includes W7) Wiring Diagram(109D06344-101)

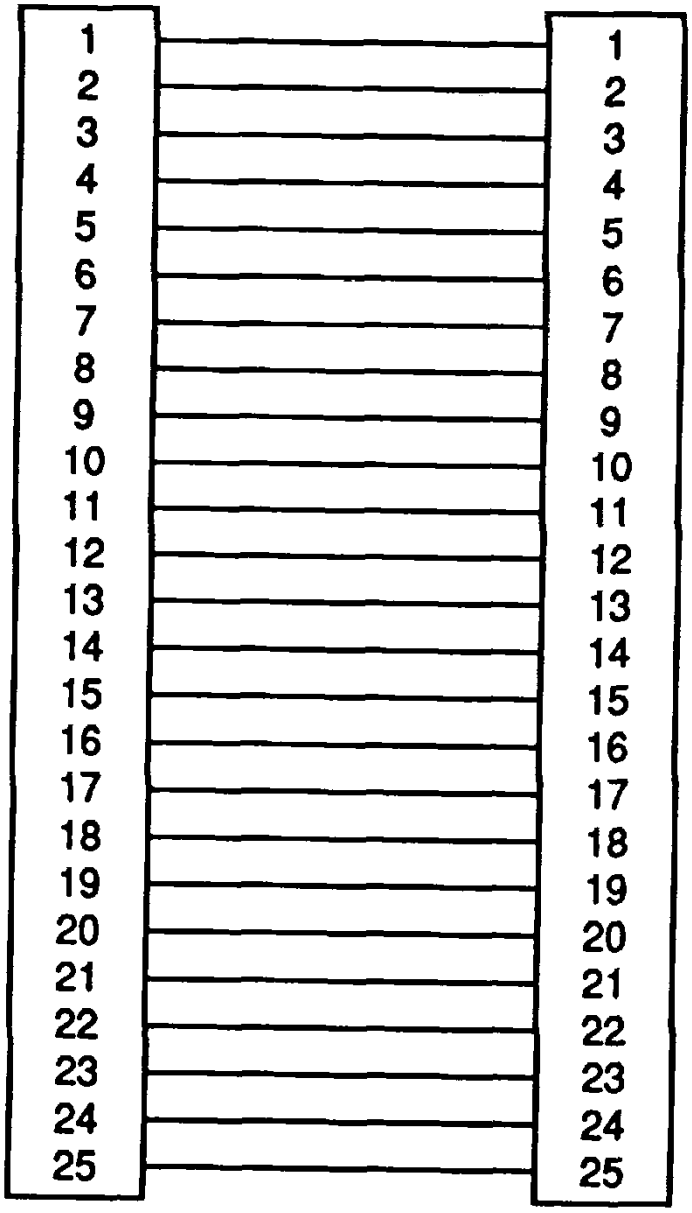


Figure E-13. Console Cable W8

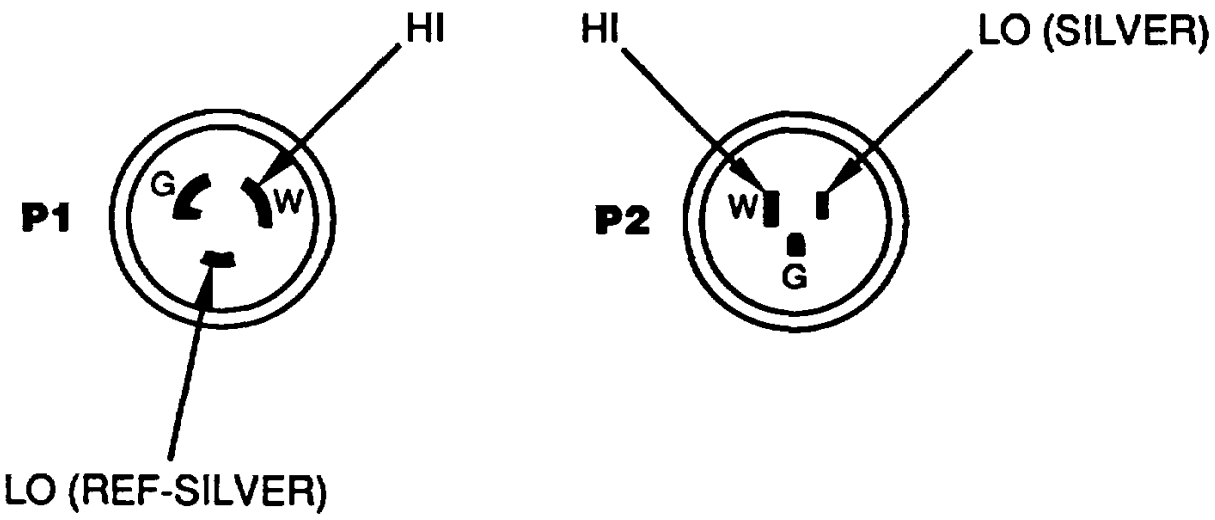


Figure E-14. Test Set Power Cable W9 Wiring Diagram (109D06317-101)

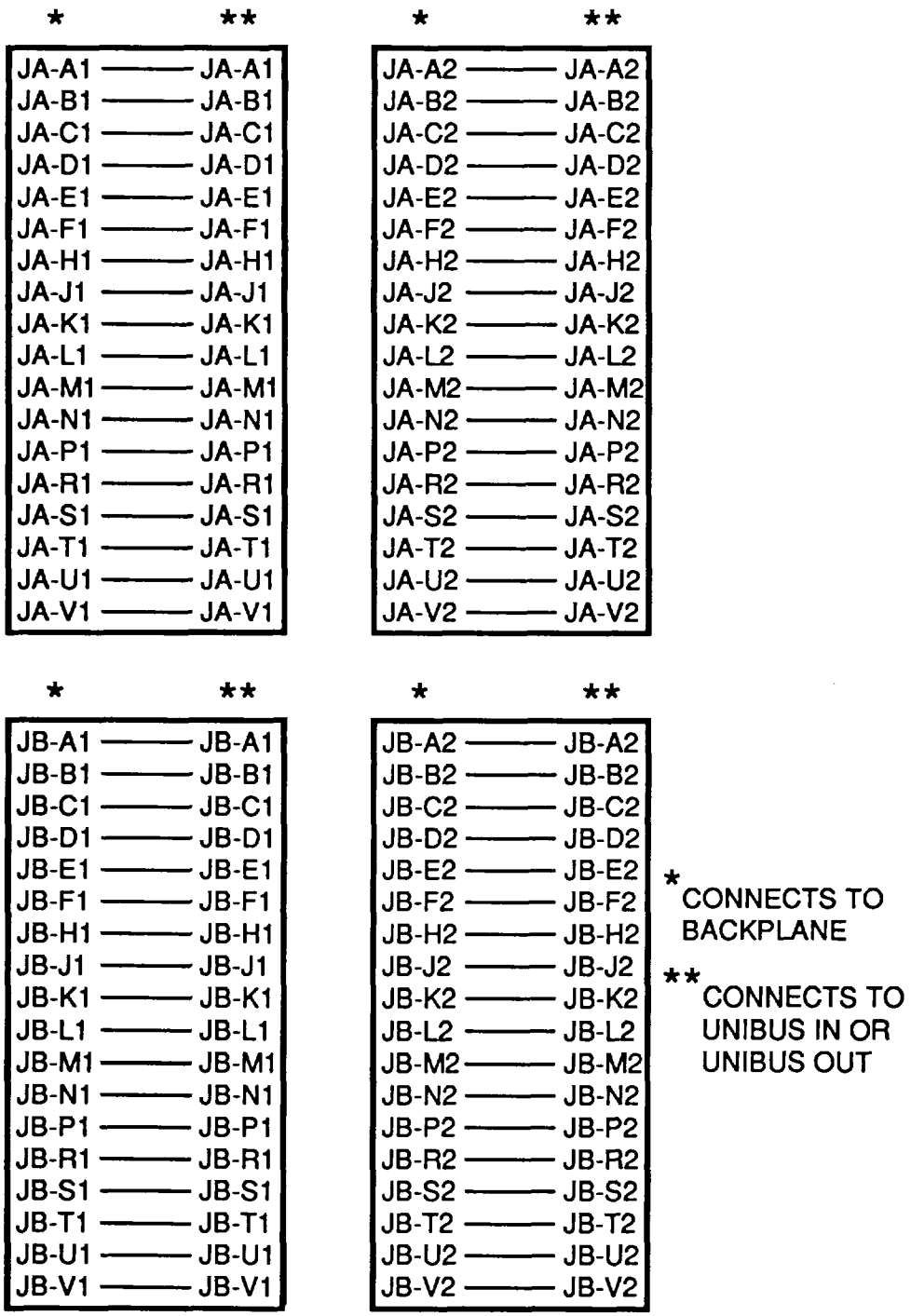


Figure E-15. Internal Cable W10 and Internal Cable W11

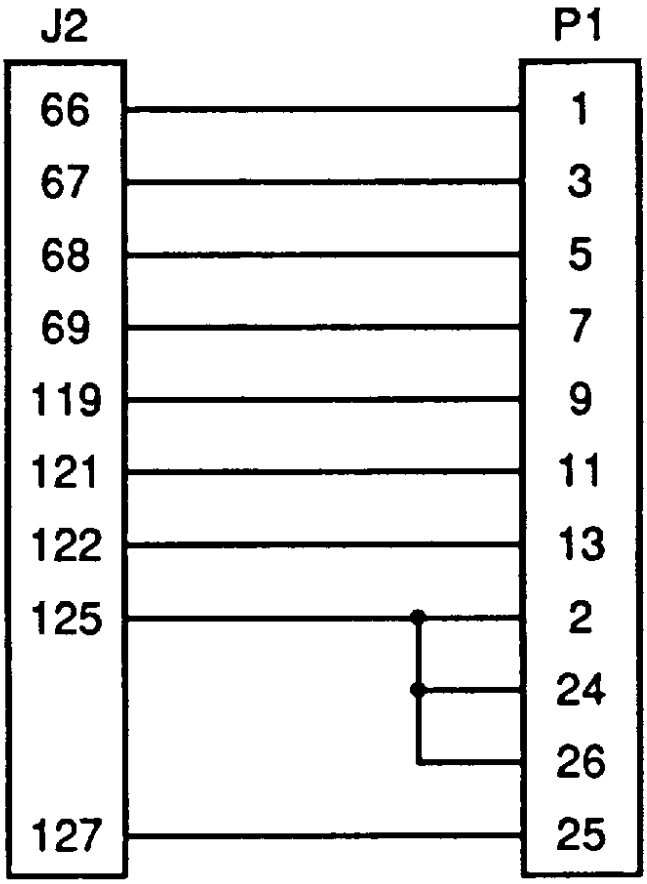


Figure E-16. Harness Assembly W12 (109D06324-101)

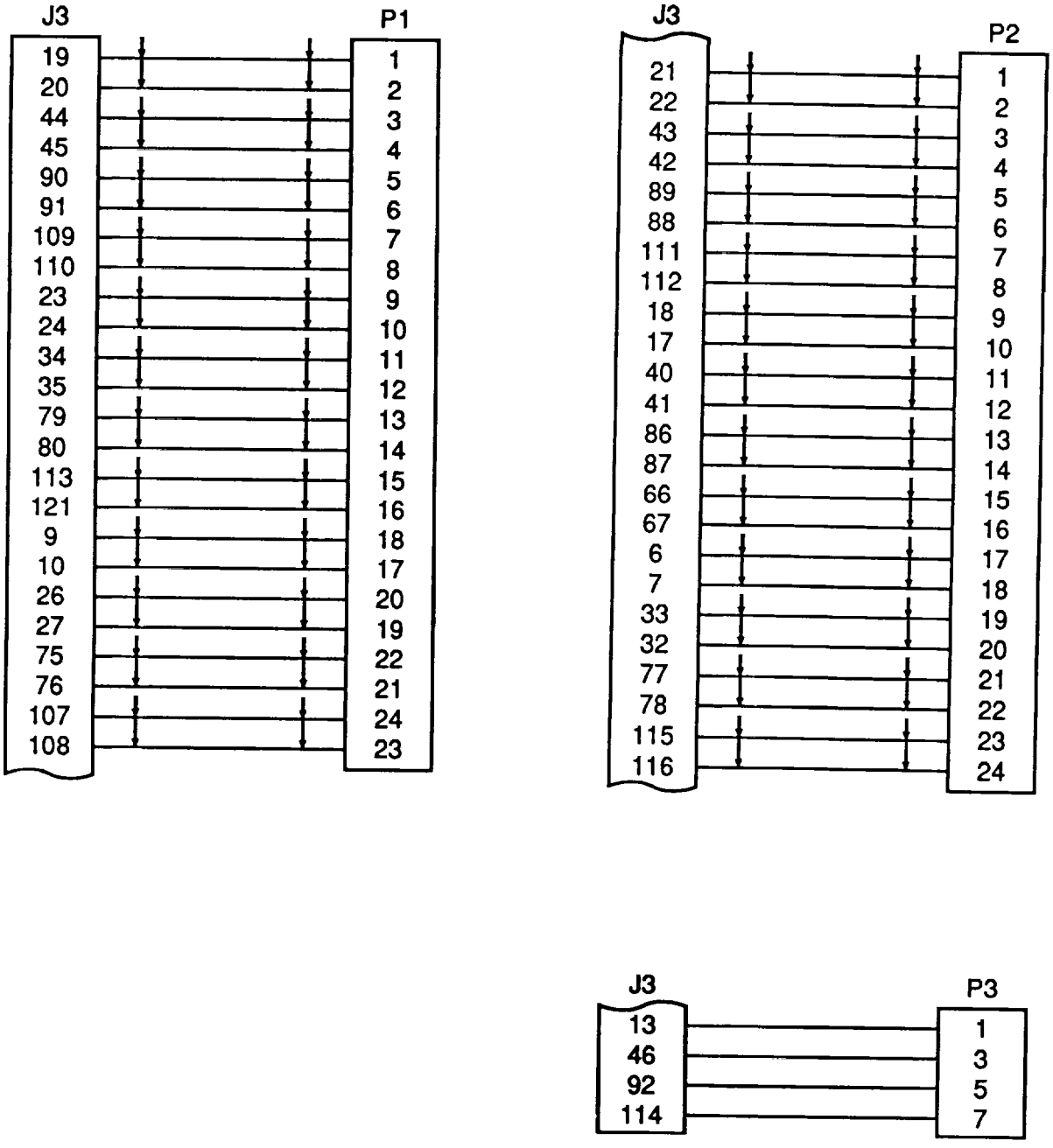
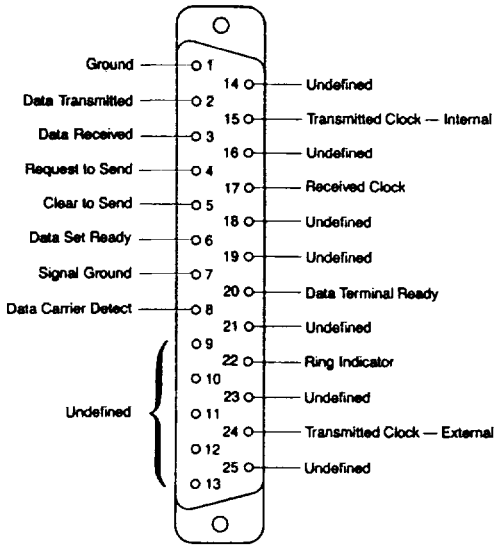


Figure E-17. Harness Assembly W13 (109D06325-101)

FROM		TO	
LOCATION	SPECIAL PREPARATION	LOCATION	
J1-1		J7-1	
J1-2		J7-3	REC DATA
J1-3		J7-2	TRANS DATA
J1-6		J7-20	DATA TERM READY
J1-7		J7-7	SIGNAL GND
J1-20		J7-6	DATA SET READY



Hardware Line Assignments for RS-232C

Figure E-18. Console Cable Assembly W14 (109D06331-101)

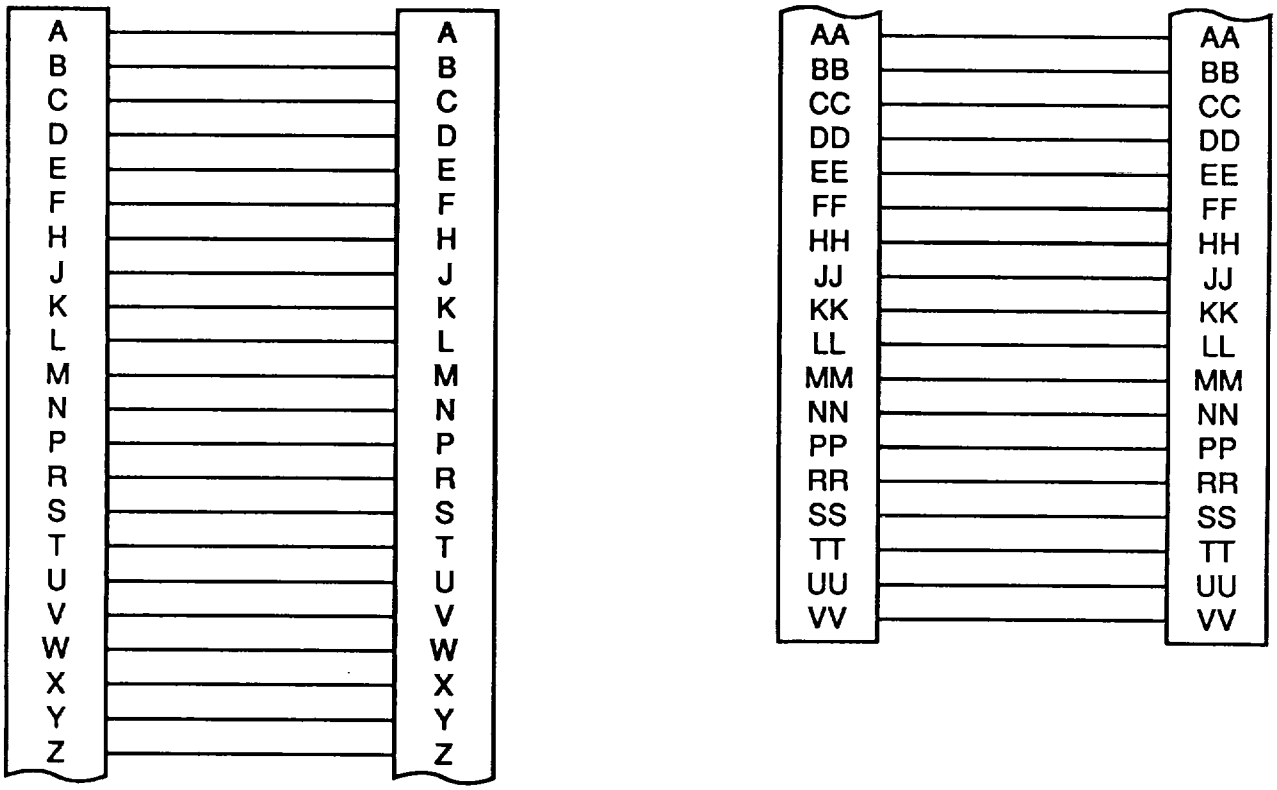


Figure E-19. Disk Drive Cable W15

APPENDIX F
DECLASSIFICATION (ZEROIZING) SOFTWARE PRINTOUT

NOTE

When the prompt NEW = is given, the Computer will stop the zeroizing process. The operator must then manually enter a carriage return <CR> to resume the zeroizing of the Computer.

```
* * * PDP-11/44 DECLASSIFICATION UTILITY * * *
ASSUMED MEMORY SIZE: 512K WORD (1 MEGABYTE)
DECLASS PRAMETER                          CONDITION

CONTINUE AFTER ERROR .....          DISABLE
ERROR HANDLING .....                REPORT
DETAILED ERROR REPORTING.....       DISABLED
RING BELL ON ERROR.....             DISABLED
DECLASS SMI.....                    ENABLED
DECLASS MAIN MEMORY.....            ENABLED
DECLASS CACHE MEMORY .....          ENABLED
PROGRAM RELOCATION.....             ENABLED
RUNTIME ERROR COUNT LIMIT .....     NONE

SWR = 000000
NEW -

STARTING CACHE MEMORY DECLASSIFICATION...
**
**
CACHE MEMORY DECLASSIFICATION COMPLETED

MEMORY BANKS TO BE DECLASSIFIED (DECIMAL): 0 TO 31

STARTING MAIN MEMORY DECLASSIFICATION...
**
**
**
**
**
        5 BANKS COMPLETED
**
**
**
**
```

```
            10 BANKS COMPLETED
**
**
**
**
**
            15 BANKS COMPLETED
**
**
**
**
**
            20 BANKS COMPLETED
**
**
**
**
**
            25 BANKS COMPLETED
**
**
**
**
**
            30 BANKS COMPLETED


ATTEMPTING PROGRAM RELOCATION TO MEMORY BANK 1
***PROGRAM AREA RELOCATED***

**


          ALL BANKS COMPLETED

STARTING SMI DECLASSIFICATION

SMI DECLASSIFICATION COMPLETED

*************************************************************************
***DECLASSIFICATION COMPLETED                                        ***
***       NO ERRORS DETECTED                                        ***
***                                  (NOT RESTARTABLE)              ***
*************************************************************************

NOTE: TEST TIME IS APPROX. 2HRS.

CONSOLE
17777707 005134
>>>
```

APPENDIX G
ADDRESSES FOR VERIFICATION OF DECLASSIFICATION (ZEROIZING)

To verify that that memory circuits of the computer have been zeroized (declassified) type the following addresses (commands) on the console. The response (printout) to each address is to be 177777, indicating that the address is all one's (zeroed).

COMMAND	COMMAND
E 105020<CR>	E 2440252<CR>
E 206444<CR>	E 2540602<CR>
E 306512<CR>	E 2641116<CR>
E 407032<CR>	E 2752370<CR>
E 510100<CR>	E 3062126<CR>
E 105020<CR>	E 2440252<CR>
E 206444<CR>	E 2540602<CR>
E 1012630<CR>	E 3364106<CR>
E 1114672<CR>	E 3467164<CR>
E 1214746<CR>	E 3570102<CR>
E 1316304<CR>	E 3671340<CR>
E 1421536<CR>	E 3777776<CR>
E 1522354<CR>	
E 1627436<CR>	
E 1731062<CR>	
E 2000000<CR>	
E 2031400<CR>	
E 2131760<CR>	
E 2233236<CR>	
E 2333530<CR>	

APPENDIX H

CONSOLE COMMAND SET

H-1 Introduction

The following paragraphs provide a description of the complete set of PDP-11/44 console commands and brief examples of their use. In some cases, examples given may differ slightly for those that apply to the AN/UYK42(V)4, but are provided for completeness.

H-2 Console Commands

The console I/O can be used to input console commands only when the system is in console mode. The console mode is the state in which the console interfaces, via the Console input (J1) connection, to the 8085 microprocessor on the multifunction module. While in the console mode, all characters inputted from the console I/O are interpreted by the console logic (8085) as commands. Console mode can be entered in either of two ways:

1. The processor halting, or

2. The user typing the console break character, control P(AP).

When the system is not in the console mode, it is in the program I/O mode, and data to or from the terminal is controlled by the software currently being executed.

The commands that can be performed in the console mode are listed in Table 1.

NOTE

All addresses specified in a console command are assumed to be 22-bit physical addresses and all data transfers are 16-bit word transfers.

H-2.1 Special Functions

In the descriptions of each console command, several expressions, special characters, and qualifiers are used. Angle brackets, <N>, are used to denote category names. For example, the category name <ADDRESS> is used in an expression to represent any valid address. In an actual command, an address (e.g., 17775604) would be typed in place of the category name. Table 2 lists and describes the terms and characters used in the syntax expressions.

Square brackets, [N], surrounding an expression in a command description indicate that the expression is optional and is not required to issue a valid command.

Table 1. Console Mode Commands

Command	Designation	Command	Designation
ADDER	A	INITIALIZE	I
BOOT	B	MICROSTEP	M
CONTINUE	C	SINGLE-INSTRUCTION STEP	N
DEPOSIT	D	REPEAT	R
EXAMINE	E	START	S
FILL	F	SELF-TEST	T
HALT	H	BINARY LOAD/UNLOAD	X

Table 2. Console Command Terms and Characters

Name	Description
<SP>	One space
<COUNT>	A numeric count in octal
<ADDRESS>	An address argument in octal
<DATA>	A data argument in octal
<QUALIFIER>	A command modifier
<INPUT-PROMPT>	The console's prompt string (>>>)
<CR>	Carriage return
<LF>	Line feed

H-2.1.1 Console Command Qualifiers

Several of the console commands can be modified by typing qualifiers. Qualifiers expand the capability of commands by providing a number of options. All qualifiers are optional and are not required to issue a valid command. A qualifier always begins with a slash (/). Table 3 lists the qualifiers and describes their functions.

H-2.1.2 Special Address Field Characters

The special characters used in the <ADDRESS> field of a command to modify the address argument are listed and defined in Table 4.

H-2.1.3 Control Characters

A number of control characters are available to the user. Table 5 lists control characters and functions.

Table 3. Console Command Qualifiers

Qualifier	Function
/G	A general register qualifier that provides a method of specifying a general register as the address argument. In the examine or deposit command, an E or D can be typed followed by the /G qualifier and the register number (0 to 178), rather than the full 22-bit address (eight octal digits).
/N	This qualifier permits examine or deposit commands to be performed on sequential addresses without issuing a new command for each address. The /N qualifier has an associated qualifier value <COUNT>, which specifies the number of sequential operations to be performed. The syntax for the /N qualifier is: /N [:<COUNT>] The actual number of operations to be performed can be expressed as: the initial operation (I) plus <COUNT - 1> additional operations. The default condition for <COUNT> is one.
/M	This qualifier allows a machine-dependent register to be specified as the address argument similar to the /G qualifier that specifies a general register. The address of each machine-dependent register is defined as follows:

Address	Register
0	Floating-Point Data
1	CIS Micro PC (CPC)
2	CIS Data
3	CPU Data
4	CPU Micro PC (MPC)
5	Cache Data
6	CPU Error Register
7	MFM Data
10	UNIBUS Data
11	Signal Register

Table 3. Console Command Qualifiers (Cont.)

Qualifier	Function
/TB	The take bus qualifier is a maintenance feature which allows the console to perform bus transfers even though the bus may be hung.
/CB	The cache bypass qualifier allows main memory transfers to be performed even though cache is turned on and the transfer would normally result in a cache hit. This only inhibits a hit for the current command.
/E	This qualifier specifies test-extensive and is used only with the self-test (T) command.
/A	This qualifier specifies test-extensive-APT and is used only with the self-test (I) command for manufacturing use.

Table 4. Special Address Field Characters

Character	Function
+	The plus sign in the <ADDRESS> field of a command will cause the last address used to be increment by two and used as the address argument of the command. If the /G or/M qualifier is also specified in the command, the last address is incremented by 1.
-	The minus sign in the <ADDRESS> field of a command will clause the last address to be decremented (by two) and used as the address argument of the command. If the /G or/M qualifier is also specified in the command, the last address is incremented by 1.
@	The "at" sign in the <ADDRESS> field of a command will cause the command to use the last data as the address argument. The "at" sign may be used following an indirect addressing chain of instructions.
*	The asterisk in the <ADDRESS> field of a command will cause the command to use the last address as the address argument.
SW	The letters SW in the <ADDRESS> field of a command will cause the command to use the address of the switch register as the address argument. This may be used with examine or deposit commands.

NOTE

When accessing the switch register by its UNIBUS address, 17 777 570, only a read operation can be performed.

Table 5. Control Characters

Control Character	Echo	Function
<CTRL-C>	^C	Causes all the repetitive console operations to be aborted.
<CTRL-O>	^O	Alternately suppresses and continues the display of data at the terminal. While the display is suppressed, the operation continuesbut no results are printed. An error or the end of the command will cancel the effect of the control character.
<CTRL-P>	^P	Initiates the console mode.
<CTRL-Q>	AQ	Restarts the terminal output that was suspended CTRL-S.
<CTRLS>	AS	Suspends the terminal output until CTRL-Q is typed. No output is lost.
<CTRL-U	AU	Cancels the current input line and discards it.
<RUBOUT> OR <DELETE>		Deletes the last character typed on the terminal. The terminal responds to the first RUBOUT by echoing a back slash (and the character being deleted. Successive RUBOUT will only echo the character being deleted. If the user attempts to rubout beyond the start of the command, the RUBOUT will continue to echo the first character of the input string, The first character typed by the user that is not a RUBOUT will result in the terminal echoing a back slash (and the new character being entered. As an example, if the user types: >>>E<SP> 17713<RUBOUT><RUBOUT>65000<CR> the displayed echo will be: >>>E 1771315000 which is equivalent to the user deleting the entire line by control character CTRL-U, then typing the following: >>>E<SP> 17765000<CR>

H-2.2 ADDER Command

This command prints the 16-bit result of the current address pointer and the last data examined plus 2. This command can be used to calculate the effective address for an instruction using mode 6, register 7 or mode 7, register 7.

The syntax for the ADDER command is as follows:

A<CR>

The following are examples of the ADDER command.

```
001000      016767    MOV     2000,3000
001002      000774
001004      001772
001006      000000    HALT
```

E 1000 <C R>
00001000 016767

E <CR>
00001002 000774

A <C R>
002000

E <C R>
000001004 001772

A<CR>
003000

E <C R>
00001006 00000

H-2.3 BOOT COMMAND

The syntax for the BOOT command is as follows:

B [<SP> <DEVICE-IDENlTIFIER>] <CR>

The BOOT command can be performed only if the processor is halted. When typing B<CR> without the optional device code, a default boot is performed depending on the setup of the boot switches located on the UNIBUS interface (UBI) module. The optional device identifier is a two-character code which identifies the peripheral boot strap to be performed. Device codes for some typical peripherals are listed in Table 6.

H-2.3 BOOT COMMAND (Cont.)

The device identifier may also include the unit number of the peripheral (e.g., DK I boots RK05 unit number 1). If a unit number is not typed, the default number is 0.

When the BOOT command is issued, the device code typed is compared to the device identifiers of the boot ROMs. If the device is not supported by the boot ROMs (i.e., no device match), the console will respond with the console prompt (>>>). If the device is supported or if no device code was typed (default boot), an initialize is issued. The priority bits of the processor status word are set to 7 and the carry bit is set or cleared, depending on the setting of the boot switches. If the carry bit is cleared, the ROM diagnostic programs will be performed prior to the initiation of the boot strap program for the specified device. General register 0 is loaded with the unit number, or with zero if none is typed. The PC is then loaded with the starting address of the boot program. If a device code was not typed, the PC is loaded with the starting address indicated by the boot switches. Once the PC is loaded, the processor is started and the system enters program I/O mode.

Table 6. Device Boot strap Identifiers

Device Identifier	Device	Device Identifier	Device
CT	TA11	DY	RX02
DB	RP04/05/06 RM02/03	MM	TU16/E16(TM02/03)
DD	TU58	MS	TS04
DK	RK03/05/05J (Units 2)	MT	TU10/E10/TS03
DL	RL01	PR	PCO5 (High-Speed Reader)
DM	RK06/07	TT	ASR33 (Low-Speed Reader)
DP	RP02/03	XM	DMC-11
DS	RS03/04	XW	DUP-11
DT	TU55/56	XU	DU11
DX	RX01	XL	DL 11

The following are examples of BOOT command.

>>>B <CR> Perform the default boot.

>>>B <SP> DKI <CR> Boot the RK05, Unit 1.

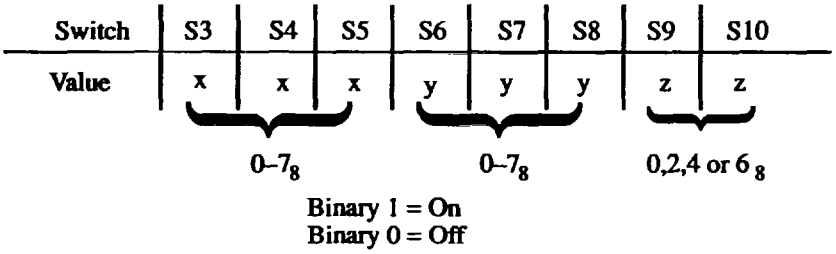
Up to four devices can be selected for program loading. To determine the value of the starting address selected by the switch pack E28(S 101) on the UBI module and the devices which are controlled by a boot strap ROM, perform the following procedure:

H-2.3 BOOT COMMAND (Cont.)

1. Examine address 773024 and evaluate the response as follows:

165 XYZ = Boot to Console Mode
173 XYZ = Boot to selected device

The remaining three octal digits (XYZ) can be separated into the binary values associated with the E58 switch positions as follows:



2. To identify the device boot strap ROMs that are installed, initiate the diagnostic program 109D-C600-4.0 and examine the UBI Boot diagnostic printout; or examine the following five addresses and compare the response with the device ROM identification numbers listed in Table 7.

17776774 (CPU diagnostic ROM)
17773000 (Device ROM 1)
17773200 (Device ROM 2)
17773400 (Device ROM 3)
17773600 (Device ROM 4)

A 177776 response will indicate the continuation of a ROM diagnostic program to an additional ROM.

An XXX777 response will indicate a ROM failure or no ROM present at the addressed location.

H-2.4 CONTINUE Command

The syntax for the CONTINUE command is as follows:

C <CR>

If the processor was halted when the CONTINUE command was initiated, the processor will begin operating and the system will enter the program I/O mode. If the processor was running when the CONTINUE command was initiated, the system will only enter the program IO mode.

Table 7. Bootstrap ROM Identifiers

Octal ID	Device ROM	Octal ID	Device ROM
041460	PDP-1 1/44 Diagnostic	050122	ASR33 <Low-Speed Reader>
041524	TA11		
042104	TU58	054114	
042113	RK03/05/05J	177776	DL11
042113	TU55/56	177776	
042114	RL01		
042115	RK06/07	054115	
042120	RP02/03	177776	DMC-11
042120	RP04/05/06	177776	
042120	RM02/03		
042123	RS03/04	054125	
042130	RX(01	177776	DUll
042131	RX02	177776	
046515	TU16/45/77/TE16		
046523	TS04	054127	
046524	TU10, TE10, TS03	177776	DUP-11
050122	PC05 (High-SpeedReader)	177776	

H-2.5 DEPOSIT Command

The syntax for the DEPOSIT command is as follows:

D [<QUALIFIER>]<SP><ADDRESS><SP><DATA><CR>

The DEPOSIT command will deposit <DATA> into the <ADDRESS> specified. The address space will depend upon the qualifiers specified with the command.

Initiating deposits while the processor is running is illegal unless the deposit is to the console switch register (D<SP>SW<SP> <DATA> <CR>). Since the switch register is internal to the console, the qualifiers /TB and /CB would be useless.

Table 8 lists the qualifiers that can be used with the DEPOSIT command.

The <ADDRESS> in the DEPOSIT command can be a one-to eight-digit octal number, SW or any of the special address characters characters (+, -, *, @). The <DATA> in the command can be a one-to six-digit octal number.

Upon completion of the deposit, the console will respond with the console prompt (>>>).

H-2.5 DEPOSIT Command (Cont.)

The following are examples of the DEPOSIT command.

>>>D<SP> 1000<SP>5	Deposits 5 into location 1000.
>>>D<SP>+<SP>776	Deposits 776 into last address +2. If preceded by above example, then data would be deposited into location 1002.
>>>D<SP>*<SP>400	Deposits 400 into last address. If preceded by above example, then data would be deposited into location 1002.
>>>D/M<SP>4<SP>240	Deposits 240 into the processor micro PC.
>>>D/G/N:5<SP>O<SP>35	Deposits 35 into the next 5 general registers starting with RO.

H-2.6 EXAMINE Command

The syntax for the EXAMINE command is as follows:

E [[<QUALIFIER>]<SP><ADDRESS>]<CR>]

Examines are legal while the processor is running. The console will respond to the examine command by printing the eight-digit physical address examined followed by the six-digit octal data contained in that location. This will occur unless the printout is inhibited by a control character. Upon completion of the examine, the console will respond with the console prompt (>>>).

The qualifiers that can be used with the EXAMINE command are listed in Table 9.

The <ADDRESS> in the EXAMINE command can be a one- to eight-digit octal number, SW or any of the special address characters (+, -, *, @). The <ADDRESS> in the EXAMINE command is optional. If none is typed, the last address is increment by 2 or I if the /G or /M qualifier is used.

Table 8. Deposit Command Qualifiers

Qualifiers	Function
/G	Enables deposits into the general registers without typing the full eight-digit octal address. The qualifiers /N, /TB or/CB can be used in conjunction with the /G qualifier.
/M	The only machine-dependent register that can be deposited into the CPU micro PC register (address 00000004). The data deposited into this register will be used as the next processor micro PC.

Table 8. Deposit Command Qualifiers (Cont.)

Qualifiers	Function
/N	Allows deposits into sequential locations.
/TB	The take bus qualifier is used for maintenance purpose only.
/CB	Using the cache bypass qualifier may cause a cache invalidate if the address specified is in cache.

Table 9. Examine Command Qualifiers

Qualifier	Function
/G	Enables the general registers to be examined without typing the full eight-digit octal address. The qualifiers /N, /IB or /CB can be used in conjunction with the /G qualifier.
/M	Allows the machine-dependent register to be examined. The qualifiers /N, /TB or /CB can be used in conjunction with the /M qualifier.
/N	Allows examines of sequential locations. /TB The take bus qualifier is used for maintenance purpose only.
/CB	Using the cache bypass qualifier may cause a cache invalidate if the address specified is in cache.

The following are examples of the EXAMINE command.

>>> E<SP> 1000<CR> 00001000 002625	Examine location 1000.
>>>E<CR> 00001002 005646	Examine the next location. An equivalent command would be: E <SP>+ <CR>.
>>>E/G<SP>7<CR> 17777707 001514	Examine the PC.
>>>E<SP><,-, <CR> 00001514 012737	Now examine the location pointed to by. the PC (i.e., use the last data for the next address).

H-2.6 EXAMINE Command (Cont.)

>>>E/M/N:5<SP>O<CR>
00000000 130260 — Examine the next 5 machine-dependent registers starting with the machine-dependent register 0.

00000001 177777
00000002 177777
00000003 177777
00000004 000010

H-2.7 FILL Command

The syntax for the FILL command is as follows:

F[<SP> <COUNT>] <CR>

The console will send <COUNT> null characters after each <CR> before any further transmissions. When a power failure occurs, the <COUNT> will be cleared.

The FILL command sets the fill count to the value typed in the <COUNT> field, where <COUNT> is a one- to six-digit octal number. However, the maximum fill count is 17 <octal>. If the <COUNT> entered is greater than 17, then the fill count is set to 17. If no <COUNT> is entered, the fill count is set to zero. Also, on power up, the fill count is set to zero. Upon completion of the FILL command, the console responds with the console prompt (> > >). The FILL command causes the <COUNT> number of null characters to be echoed following a <CR>.

The following are examples of the FILL command.

>>>F<SP>4<CR> — Set fill count to 4. Subsequent carriage returns will be followed by 4 null characters generated by the MFM module as shown below.

>>>E<SP> 1000<CR> <NULL> <NULL> <NULL> <NULL> <LF>

00001000 002625 <CR> <NULL> <NULL> <NULL> <NULL> <LF>

>>>F<CR> — Resets the fill count to 0.

H-2.8 HALT Command

The syntax for the HALT command is as follows:

H<CR>

The HALT command initiates a halt by asserting the CPU halt request. If the request is honored the clock is stopped, the console examines register R7 (the PC), then prints 17777707 and the updated PC value. If the processor does not halt within 600 ms, an error message is printed.

If the processor is halted when the HALT command is issued, the halt request is not asserted and the console responds with the console prompt (>>>). No error message is issued.

The following are examples of the HALT command.

>> >H<CR>	
17777707 001000 <CR>	Halt the CPU and print the contents of R7.
>>>H<CR>	
>>>	Since the processor is already halted, this command is ignored.

H-2.9 INITIALIZE Command

The syntax for the INITIALIZE Command is as follows:

I <CR>

The INITIALIZE Command valid only if the processor is halted. Upon receiving a valid INITIALIZE command, the console issues a UNIBUS initialize. The console then issues the console prompt (>>>).

H-2.10 MICROSTEP Command

The syntax for the MICROSTEP command is as follows:

M [<SP> <COUNT>] <C R>

The CPU is allowed to execute the number of microinstructions specified by the <COUNT> value. If no count is specified, one microinstruction is performed.

The MICROSTEP command is valid only if the processor is halted. The <COUNT>, if specified, is a one- to six-digit octal number. The command will cause the console to perform an initial microinstruction plus <COUNT>-I additional microinstructions. For each microstep, the console enables the processor clock for one cycle, examines the micro PC register, and prints the register address (00000004) and contents of the PC register.

H-2.10 MICROSTEP Command (Cont.)

The count is decrement after each microinstruction is performed. When the count equals 0, the console will print out the last micro PC and the console prompt(> > >). The console is then in the spacebar step mode and an additional microinstruction is performed each time the spacebar is pressed. When no count is specified, the console enters spacebar step mode after the first microinstruction is performed.

The following is an example of the MICROSTEP command:

> > >M<SP> 3 <CR> 00000004 000010 00000004 000015 00000004 000210	Perform 3 microinstructions
>>>	The console is now in the spacebar step mode and another microinstruction can be executed by, pressing the spacebar. Execution of the MICROSTEP command causes the address of the CPU micro PC (00000004) and the contents of that location to be printed. This is the default printout for the MICROSTEP command. Other machine-dependent registers may be monitored during microstepping. The following example illustrates this capability.
>>>M <C R> 00000004 000015 > > > E/M <SP> 10<CR> 00000010 000777	
>>>00000010 000000	This command executes one microstep; sets the console into the spacebar step mode. The second command 10 examines the machine register 10 (UNIBUS data) and changes the default printout. Pressing the spacebar will then clause another microstep to be performed and the new contents of machine register 10 to be printed.

H-2.11 SINGLE-INSTRUCTIONSTEP Command

The syntax for the SINGLE-INSTRUCTION-STEP command is as follows:

N [<SP> <COUNT>] <CR>

The SINGLE-INSTRUCTION-STEP command is valid only if the processor is halted. The <COUNT>, if specified, is a one-to six-digit octal number. This command will cause the console to perform an initial instruction plus <COUNTS> additional instructions. For each instruction step, the console enables the processor clock for one instruction, examines the PC, and prints its address (17777707) and contents.

H-2.11 SINGLE-INSTRUCTION-STEP Command (Cont.)

The count is decrement after each instruction step is performed. When the count equals 0, the console will print out the last PC and the console prompt (>>>). The console is then in spacebar step mode and an additional instruction step can be performed by pressing the spacebar. When no count is specified. the console enters spacebar step mode after the first instruction step is performed.

The following is an examples of the SINGLE-INSTRUCTION-STEP command:

>>>N<SP>3<CR>	Performed 3 single-instruction steps.
17777707 001000	
17777707 001002	
17777707 001004	
>>>	The console is now in spacebar step mode and another instruction can be performed by pressing the spacebar.

H-2.12 START Command

The syntax for the START command is as follows:

S[<SP> <DATA>]<CR>

The START command is valid only if the processor is halted. The <DATA>, if specified, is a one- to six-digit octal number that is deposited into the PC when the command is performed. The console responds to a valid START command by issuing an initialize and depositing data into the PC. If no data specified, the PC is unchanged. Following the initialize and deposit, the processor continues and the system enters the program I/O mode.

The following are examples of the START command.

>>>S<SP> 1000<CR>	Deposits 1000 into the PC and starts the processor from that location.

The following combination of commands is equivalent to the above command:

>>>D/G<SP>7<SP>1000<CR>	Deposits 1000 into the PC.
>>>S<CR>I	Initialize - Continue the processor at current PC (1000).

H-2.13 SELF-TEST Command

The syntax for the SELF-TEST command is as follows:

T [<QUALIFIER>] <CR>

The SELF-TEST command is valid while the processor is running only if no qualifiers are specified. If qualifiers are specified, the processor must be halted. The qualifiers that may be used are /E (test-extensive) or /A (test-extensive-APT).

H-2.13 SELF-TEST Command (Cont.)

The self-test is executed in response to this command and also upon entry into console mode via AP or processor halt.

If the self-test is completed without error, the message CONSOLE is printed followed by the console prompt. If the self-test was entered as a result of a processor halt, then the test is run, the PC is examined, the contents are printed, and the console prompt (>>>) is printed.

If the T/E or T/A command is entered, additional tests are performed along with the self-test. The console responds to the T/E command by printing CONSOLE-TEST B followed by the console prompt.

NOTE

Caution should be exercised in performing these commands because the T/E and T/A commands modify main memory. The T/A command restarts the processor after execution of the command.

If any of the tests being performed detect an error, the appropriate error message is printed and the test program will loop on the error.

H-2.14 BINARY LOAD/UNLOAD Command

The syntax for the BINARY LOAD command is as follows:

X<SP> <ADDRESS> <SP> <COUNT> <CR> <COMMAND CHECKSUM>
<DATA> <LOAD CHECKSUM>

The syntax for the BINARY UNLOAD command is:

X<SP> <ADDRESS> <SP> <COUNT> <CR> <COMMAND CHECKSUM>

NOTE

Bit 15 of the <COUNT> field indicates direction control (1 = UNLOAD, 0 = LOAD).

The BINARY LOAD/UNLOAD command enables strings of bytes of binary data to be read from or written into memory. The number of binary bytes is represented by the <COUNT> field. The console does not perform byte transfers. The load or unload command is executed by assembling the bytes into words before performing the transfer. Since only word transfers are supported, the <COUNT> field must represent an even number.

During the BINARY LOAD command, the processor cannot process control characters typed by the user since the binary data contains similar characters. To prevent the BINARY LOAD command frombeing initiated erroneously, the command is terminated by a special <CHECKSUM> character.

H-2.14 BINARY LOAD/UNLOAD Command (Cont.)

During either the BINARY LOAD/UNLOAD command, the checksum is calculated in a similar manner. The command checksum is a binary byte of data that represents the 2's complement of the sum of the ASCII characters that comprise the command string, including <CR>. As the command string is read by the console, each character is added to a memory location, which is initially set to 0. If no errors occur, the result of the addition will be zero. If the checksum is correct, the console echoes the prompt string but remains in binary mode. If the command is a binary load, the echo of the input data is suppressed. If the checksum is incorrect, an error is reported. The command checksum is not loaded into memory and does not cause the <COUNT> to be decrement.

In the BINARY LOAD command, a binary, string of data of length <COUNT> + 1 will be sent to the console once the requester receives the input prompt which indicates the console's acceptance of the command. The console will sequentially deposit all but the last byte into memory, starting at <ADDRESS>. As the console receives the binary data, it calculates the load checksum. Similar to the command checksum, the load checksum is a binary byte of data which when added to the total checksum, should yield a zero result. Once the <COUNT> is exhausted, the load checksum is sent by the console. If an error is encountered during the load or checksum, the error is reported. If no errors occur, the console will respond with the console prompt.

In the BINARY LOAD command, the console processes the command and checks the checksum. If the checksum is correct, the console responds with the input prompt followed by a string of bytes, which is the binary data requested. As each binary byte is sent from the console, the 2's complement is added to a byte, initially set to zero. This byte will be sent upon completion of the command and it is followed by the input prompt. The receiver of the unloaded data can now check to ensure that all bytes were correctly received.

H-2.15 REPEAT Command

The syntax for the REPEAT command is as follows:

R<SP><COMMAND><CR>

This command will repeatedly execute the EXAMINE or DEPOSIT command and is terminated by the control character CTRL-C (A C).

H-2.16 Summary of Errors

When an error is detected during the performance of a console command, the errors listed in Table 10 may be reported by the console.

Table 10. Summary of Errors

Character	Definition
?01	Syntax error, illegal command.
?11	Illegal internal processor register designated using /M qualifier.
? 15	Command is illegal while processor is running
?20	Transfer error. The console tried to examine or deposit but failed due to memory time-out or parity error.
?21	Halt error. The console tried to halt the processor but failed.
?22	CPU hung. As opposed to ?20, the console directed the processor to initiate a transfer, but the transfer was never started.
?30	Checksum error. In executing a **BINARY LOAD/UNLOAD** command, a checksum error occurred.
?81	Checksum error. In executing the self-test, the console control store was found to have a checksum error in **PROM 1.**
?82	Checksum error. In executing the self-test, the console control store was found to have a checksum error in **PROM 2.**
?85	Error in read/write test for console RAM.
?A7	Halt/continue test of test/extensive failed.
?A8	PAX data bus test of test/extensive failed.
?A9	PAX address test of test/extensive failed.
?AA	Switch register test of test/extensive failed.

Table 11 is a list of the console commands, special characters, modifiers and qualifiers.

Table 11. Console Command Summary

Syntax	Command
B [<SP> <DEVICE IDENT'IIFIER>] <CR>	BOOT
C <C R>	CONTINUE
D [<QUALIFIERS>]<SP><ADDRESS><SP><DATA> <CR>	DEPOSIT
E [<QUALIFIERS> <SP> <ADDRESS>] <CR>	EXAMINE
F [<SP> <COUNT>] <CR>	FILL
H <C R>	HALT
I <C R>	INITIALIZE
M [<SP> <COUNT>] <CR>	MICROSTEP
N [<SP> <DATA>] <CR>	SINGLE INSTRUCTION STEP
S [<SP> <DATA>] <CR>	START
T [<QUALIFIER>] <CR>	SELF-TEST
A <CR>	ADDER
R <COMMAND> <CR>	REPEAT

Special Characters	Function
Control C	Causes the aborting of all repetitive console operations.
Control O	Enables/disables terminal output.
Control P	Forces entry into console mode. Programs in operation will continue, however, no I/O operations to a terminal can occur by program until the program I/O mode is reentered.
Control U	Deletes entire line currently being typed.
Control S	Stops terminal output.
Control Q	Starts terminal output

Table 11. Console Command Summary (Cont.)

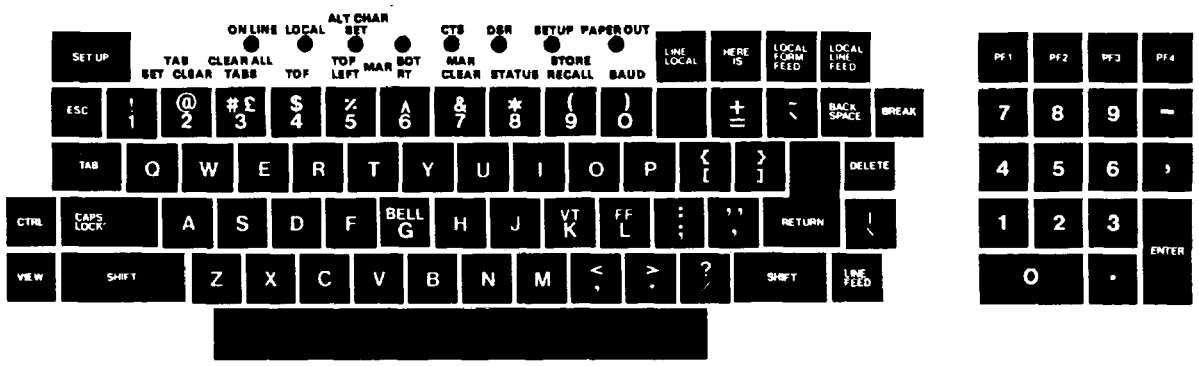
Special Characters	Function
Address Modifiers	
+	Auto increment
-	Auto decrement
*	Use last address
@	Use last data as address
SW	Switch register
Qualifiers	
/G	General register
/N:<COUNT>	Multiple operations
/M	Machine-dependent registers
IYB	Take bus
/CB	Cache bypass
/E	Test-extensive
/A	Test-extensive-APT

APPENDIX I
LA120 OVERVIEW

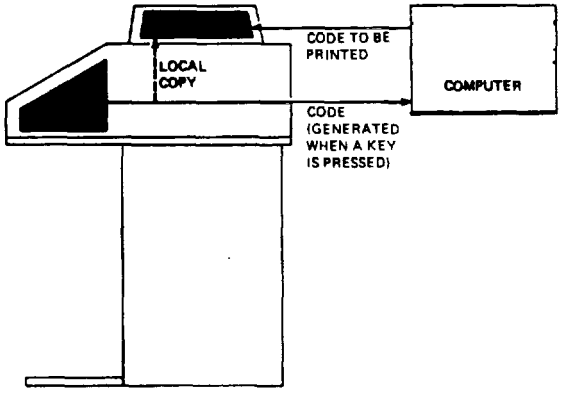
For those personnel who may be utilizing the LA120 DECwriter III terminal as part of their test setup, the following excerpts from the DEC LA120 Users Guide is reprinted for your information.

OPERATOR'S CONSOLE

The LA120 operator's console contains an office typewriter-style keyboard. The keyboard contains a four digit numeric display and eight indicators. There is provision for an optional, field installable numeric keypad.



To better understand the LA120 keyboard think of the LA120 as two things. First, it is an input device to a computer; that is, pressing a key sends information (a code) to a computer. Second, it is a printer; information is sent from the computer to the printing portion of the LA120. However, you can set up your system to send information from the key- board to the printer and computer at the same time.



Sample LA120 Operators' Card

The operators' card is a summary of all LA120 features, plus the keys used to set the features. Once you become familiar with the operation of the LA120. the card will be a valuable memory aid.

LA120 OPERATOR DISPLAY REFERENCE CARD

SET UP

KEY	FUNCTION/COMMENTS
CTRL and SET-UP	Locks LA120 in set-up mode. SET UP light flashes
	To exit set-up mode press SET-UP
SET-UP	Places LA120 in set-up mode while SET-UP is
	held down. SET-UP flashes
	To exit set-up mode release SET-UP

NOTES

1. LA120 must be in set-up mode to set the following features.
2. Do not use SHIFT unless specified .

FORMS

KEY	FUNCTION/COMMENTS
SHIFT	Display current line number
	Releasing SHIFT returns display
	to current column number
1	Set horizontal tab at current column
SHIFT AND 1	Set vertical tab at current line
2	Clear horizontal tab at current column
SHIFT and 2	Clear vertical tab at current line
3	Clear all horizontal tabs
SHIFT and 3	Clear all vertical tabs
4 or SHIFT and 4	Establish top of form (TOF)
5	Set minimum column number (left margin)
SHIFT and 5	Set minimum line n;umber (top margin)
6	Set maximum column number (right margin)
SHIFT and 6	Set maximum line number (bottom margin)
7	Clear left and right margins
SHIFT and 7	Clear top and bottom margins
F	Form Length

NOTE: Changing form length clears top and bottom margins and establishes TOF

DISPLAY	
1 thru 168	Lines per form

FORMS (CONT)

KEY	FUNCTION/COMMENTS
H	Horizontal pith (Characters per inch)

NOTE: Changing horizontal pitch clears left and right margins

DISPLAY	PITCH
5	5.00 CPI
6	6.00 CPI
7	6.60 CPI
8	8.25 CPI
10	10.0 CPI
12	12.0 CPI
13	13.2 CPI
16	16.5 CPI

V

NOTE: Changing vertical pitch clears top and bottom margins.

DISPLAY	PITCH
2	2 LPI
3	3 LPI
4	4 LPI
6	6 LPI
8	8 LPI

OPERATOR COMFORT

KEY	FUNCTION./COMMENTS
G	Bell volume
	0 = Low Volume
	1 = High Volume
K	Key click
	O = Off
	1 = On
R	Auto repeat
	0 = Off
	1 = On
Z	Last character view
	O = Manual
	1 = Auto

COMMUNICATION

KEY	FUNCTION/COMMENTS
A	Auto answerback
	O = Off
	1 = On
B	Buffer control
	O = Small
	1 = Large
C	Printer character set
	1 = United States
	2 = United Kingdom
D	Auto disconnect
	O = Off
	1 = On
E	Local echo
	O = Off
	1 = On

COMMUNICATION (CONT)

KEY	FUNCTION/COMMENTS
J	Auto new line at right margin 0 = Off 1 = On
L	Auto line feed (Return key) 0 = Off 1 = On
M	Modem 1 = FDX, No Modem 2 = FDX, Modem 3 = HDX, Supervisory 4 = HDX, EOT 5 = HDX, ETX
N	Keyboard and printer character set 1 = United States 2 = United Kingdom
O (letter)	Alternate character set O = OFF 1 = ON
P	Parity and data bits

DISPLAY	DATA BITS	PARITY REC	PARITY XMT
1	**7**	**IGNORE**	**MARK**
2	**7**	**IGNORE**	**SPACE**
3	**7**	**IGNORE**	**ODD**
4	**7**	**IGNORE**	**EVEN**
5	**7**	**ODD**	**ODD**
6	**7**	**EVEN**	**EVEN**
7	**7**	**NONE**	**NONE**
8	**8**	**NONE**	**NONE**
9	**8**	**ODD**	**ODD**
10	**8**	**EVEN**	**EVEN**

Q	**HDX initial calling state** **O = Transmit** **1 = Receive**
S	**Secondary channel**

DISPLAY	FDX* MODE	HDX* REV.CH
0	**Speed**	**No**
1	**Restraint**	**Yes**

	***See M Key, Modem**
U	**Break enabled** **0 = No** **1 = Yes**
W	**Printer new line character** **1 = None** **2 = Line feed (LF)** **3 = Return (CR)**
X	**XON/XOFF** **0 = No** **1 = Ues**
Y	**Alternate Keypad mode** **0 = No** **1 = Yes**

COMMUNICATION (CONT)

KEY	FUNCTION/COMMENTS
0 number	Selects receive and transmit baud rates and number of stop bits

BAUD RATE (DISPLAYED)	STOP BITS
50	2
75	2
110	2
134	1
150	1
200	1
300	1
600	1
1200	1
1800	1
2400	1
4800	1
7200	1
9600	1

SHIFT and O	Selects split baud rates O selects receive baud rates: SHIFT and 0 then offers a choce of three transmit baud rates

RECEIVE BAUD RATE (NOT DISPLAYED)	TRANSMIT BAUD RATE (DISPLAYED)	TRANSMIT STOP BITS
600	75	2
	150	1
	600	1
1200	75	2
	150	1
	12OO	1
2400	300	1
	600	1
	2400	1
4800	3OO	1
	600	1
	4800	1

STORE RECALL AND STATUS

KEY	FUNCTION/COMMENTS
1 letter	Select factor set-up parameters
8	Print status message
9	Recall set-up parameters
SHIFT and 9	Store set-up parameters

SELF TEST

KEY	FUNCTION/COMMENTS
T	Initiate printing self test
SHIFT and >	Initiate non-printing self test

NOTE: Type any character in set-up mode to stop self-test.

INTERFACE INFORMATION

EIA Interface

The LA120 interfaces with EIA devices using an optional modem cable. The interface is compatible with Bell 103. 212A. and 202 modems and meets the requirements of EIA specification RS232-C. The following paragraphs describe the interface signals.

EIA Cables

NOTES

1. For longer lengths use BCO3M-(specify length) instead of BC22A.

2. For longer lengths or full 25 conductors use BCO5D-(Specify length) instead of BC22B.

BC22A-10 or 25 (see note 1)--10 and 25 foot lengths for hookup between LA120 and computer. Each end is terminated with a female molded connector. Cable is shielded, contains six conductors, and is wired in a null modem configuration.

BC22B-10 or 25 (see note 2)-10 and 25 foot lengths for hookup between LA120 and modem. Can also be used for cable extension.
Connectors are molded with a male connector at one end and a female at the other end. Cable is shielded. and has 14 conductors.

Protective Ground-This conductor is connected to the LA 120 chassis. It is further connected to external grounds through the third wire of the power cord.
Transmitted Data (TDX) Direction: from LA120-Signals on this circuit represent serially-encoded characters generated by the LA120.
Received Data (RDX) Direction: to LA120--Signals on this circuit represent serially-encoded characters generated by the user's equipment.

Request to Send (RTS) Direction: from LA 120-The on condition of RTS means that the LA120 intends to transmit data. After turning this circuit on. the LA120 waits for a clear to send (transmit enable) condition before starting transmission.

Clear to Send (CTS) Direction: to LA120-Although the LA120 physically receives this signal. it is not used for any purpose. Depending on the modem control protocol in use. either RLSD, SRLSD. or a timeout after asserting RTS is used to provide a clear to send (transmit enable) condition.

Data Set Ready (DSR) Direction: to LA120-The on condition of DSR indicates that the users' equipment is capable of transmitting and receiving data signals. The off condition of DSR causes the LA 120 to ignore all other interface inputs except ring indicator (RI). In full duplex without EIA control, this circuit is assumed to always be in the on condition.

Signal Ground-This circuit establishes the common ground reference potential for all interface circuits except protective ground. The circuit is permanently connected to the protective ground circuit.

Carrier Detect (RLSD) Direction: to LA120-The on condition of RLSD indicates that data transmission from the users' equipment to the LA120 is enabled. In full duplex without EIA control. this circuit is assumed to always be in the on condition.

INTERFACE INFORMATION (Cont)

Speed Indicator (SPDI) Direction: to LA120 (full duplex only)-The on condition of SPDI indicates that the baud rate is 1200, regardless of the rate selected by the operator. The off condition indicates that the operator- selected baud rate is being used.

Secondary Carrier Detect (SRLSD) Direction: to LA120 (half duplex only)-The on condition of SRLSD indicates that the users' equipment is capable of successfully processing the transmitted data from the LA120.

Secondary Request to Send (SRTS) Direction: from LA120-In certain half duplex modes the on condition of SRTS indicates that the LA120 is capable of successfully processing the received data from the users' equipment. In restraint mode, the off condition of SRTS indicates that the users' equipment should temporarily suspend the transmission of data. When SRTS goes on, transmission may be resumed.

Data Terminal Ready (DTR) Direction: from LA120-The on condition of DTR indicates that the LA120 is capable of transmitting and receiving data signals The off condition of DTR may cause the users' equipment to set the data set ready (DSR) to the off condition. The LA 120 ignores all interface inputs except ring indicator (RI) when DTR is off.

Ring Indicator (RI) Direction: to LA120 - If data terminal ready (DTR) is off, the on condition of RI causes DTR to turn on. DTR remains on until data set ready (DSR) turns on or 30 seconds elapses, whichever occurs first. Then DTR turns off. If DTR is on, the on condition of RI causes a 30-second timeout. If no data is received in 30 seconds, DTR is pulsed low for 233 ms - 10 to +10 percent.

Speed Select (SPDS) Direction: from LA120 (full duplex only)--f the operator-selected baud rate is 1200 or higher, the LA120 asserts an on condition on SPDS; otherwise the LA120 holds this circuit in the off condition.

Summary of LA120 EIA Interface Signals

Pin	Source	Name	Function	Circuit CCITT/EIA
1	-		-Protective ground	101/AA
2	LA120	TXD	Transmitted data	103/BA
3	User	RXD	Received data	104/BB
4	LA120	RTS	Request to send	105/CA
5	User	CTS	Clear to send	106/CB
6	User	DSR	Data set ready	107/CC
7	-		-Signal ground	102/AB
8	User	RLSD	Carrier detect	109/CF
9	-	-	-	-
10	-		-	
11	LA120	SRTS	Sec. REQ. to send	120/SCA

INTERFACE INFORMATION (Cont)

Pin	Source	Name	Function	Circuit CCITT/EIA
12	User	SPDI	Speed indicator (FDX)	CI
12	User	SRLSD	Sec. carrier det. (HDX)	122/SCF
13	-		-	
14				
15				
16				
17				
18				
19	LA120	SRTS	Sec. req. to send	120/SCA
20	LA120	DTR	Data term ready	108.2/CD
21	-		-	-
22	User	RI	Ring indicator	125/CE
23	LA120	SPDS	Speed select (FDX)	CH
24				
25				

NOTE
Pins 11, 19, and 23 are driven by a common circuit whose function is determined by the modem and secondary channel SET-UP commands.

IMPEDANCE OF TERMINATOR

The terminating impedance of the receiving end of the interface circuits has a dc resistance of not less than 3000 ohms nor more than 7000 ohms. When the interface plug is disconnected. the interface voltage on terminator circuits is -2 V to +2 V.

RISE AND FALL TIMES

The circuitry that receives signals from an interface circuit is dependent only on the signal voltage and conforms to RS232-C risetime and falltime For control interface circuits. the time required for the signal to pass through the transition region (-3 V to +3 V) during a change in state does not exceed 1 pus. For the transmitted data circuit the risetime and falltime does not exceed 16.7 /As through the 6 V range (-3 V to +3 V). The received data and the clock signals also meet this limit.

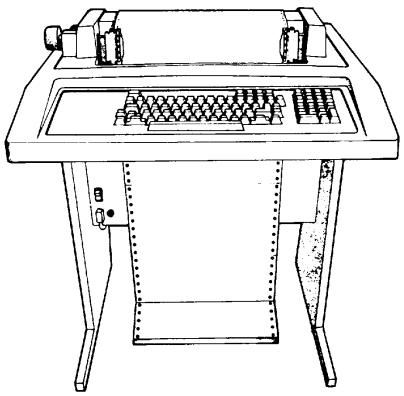
OPEN CIRCUIT VOLTAGES

The open circuit driver voltage for signal ground on any interface circuit does not exceed -12 V to +12 V The terminator on an interface circuit is designed to withstand any input signal within the -25 V to +25 V limit. When the terminating impedance is in the proper range (3000 to 7000 ohms) and the terminator open circuit voltage is zero, the potential at the point of interface is not less than -5 V to +5 V or more than --12 V to +12 V. An open circuit or applied voltage more negative than +0.6 V will be interpreted the same as a legitimate negative applied voltage (-3 V to -25 V).

LA120 SPECIFICATIONS

Printer

Printing technique	Impact dot matrix, smart bidirectional
Print matrix (width by height)	7 by 7
Maximum print speed	180 CPS
Horizontal slew speed	60 IPS
Single linefeed time	33 ms
Vertical slew speed	7.5 IPS
Paper feed	Pin-feed. tractor drive
Paper type	Fanfold. up to six parts (see paper requirements)-
Forms length	1 to 168 lines
Vertical pitch (lines per inch)	2,3.4.6.8.12
Horizontal pitch (characters per inch)	
180 CPS	10.12,13.2. 16.5
90 CPS	5,6.6.6.,8.25
Maximum line length (varies with horizontal pitch)	
5 CPI	66 columns
6 CPI	79 columns
6.6 CPI	87 columns
8 CPI	108 columns
10 CPI	132 columns
12 CPI	158 columns
13.2 CPI	174 columns
16.5 CPI	217 columns
Margins	Left, right, top, bottom
Tabs	217 horizontal, 168 vertical, from key board or line
Forms storage	True nonvolatile memory (no batteries)
Positioning commands	Horizontal and vertical, absolute and relative
Character set	ASCII upper/lowercase set



National character sets

Standard	{	United States United Kingdom
Optional	{	Finland Denmark Sweden Germany Norway France

LA120 SPECIFICATIONS (Cont)

APL character set	Optional
Other printer features	Paper out and cover open interlocks. manual and automatic last character view, selectable auto new line, self-test. status message, 4-digit numeric display used as column counter and to set parameters, factory stored form setup (10 CPI, 6 LPI, 66 lines per form tab stops every eight columns, etc.)

Keyboard Specifications

Keyboard	Typewriter style with multi-key rollover
Selectable auto LF	Standard
Optional numeric keypad	18 keys including 4 function keys
Feature selection	Keyboard entry to nonvolatile memory
Other keyboard features	Local form feed key, local line feed key. auto repeat on all alphanumeric keys, and selectable keyclick

Communication Specifications

Data transfer	Serial. asynchronous
Baud rates (BPS)	50,75,110,134,134.5,150,300,600, 1200,1800.2400.4800.7200.9600.
Split speeds (BPS)	600 or 1200 receive, with 75 or 150 transmit; 2400 or 4800 receive, with 300 or 600 transmit.
Parity	Odd, even, or none (8th bit mark or space transmitted, or data bits only)
Input buffer	1024 characters standard, 4096 characters optional
Interface	Full EIA standard (includes auto answer/disconnect)

Physical Specifications

Dimensions	
Width	69 9 cm (27 5 in)
Height	85.1 cm (33 5 in)
Depth	61 0 cm (24 0 in)
Weight	
Uncrated	46.4 kg (102 lb)
Shipping	63.7 kg (140 lb)

LA120 SPECIFICATIONS (Cont)

Physical Specifications (Cont)

Power	
Transformer power supply	
Voltage	87 to 128 V
Frequency	60 Hz + 1 Hz
Switcher power supply	
Voltage	90-128 V or 180-256 V
Frequency	47-63 Mhz
Input current	4.2 A max. at 1 15 V
Heat dissipation - printing	440 W max.
Temperature	
Operating	10° to 40°C (50° to 104°F)
Nonoperating	-40° to 66°C (-40° to 151°F)
Relative Humidity	
Operating	10 to 90 percent with a maximum wet bulb temperature of 280C (82°F) and a minimum dewpoint of 2°C (360 F). noncondensing
Nonoperating	5 to 95 percent. noncondensing
Paper Requirements	
General	Continuous, fanfold, pin-feed forms
Width	7 6 to 37 8 cm (3 to 14-7/8 in)
Hole spacing	12 7 mm + 0 25 mm (O 500 in + 0.010 in) non-accumulative over 5 cm (2in)
Hole diameter	3 81 to 4 06 mm (O 150 to 0 160 in)
Forms thickness	
Single part	15 lb paper minimum, 0 25 mm (0 010 in) card stock maximum
Multipart	Up to 6 parts (see notes). 0 50 mm (O 020 in) maximum

NOTES

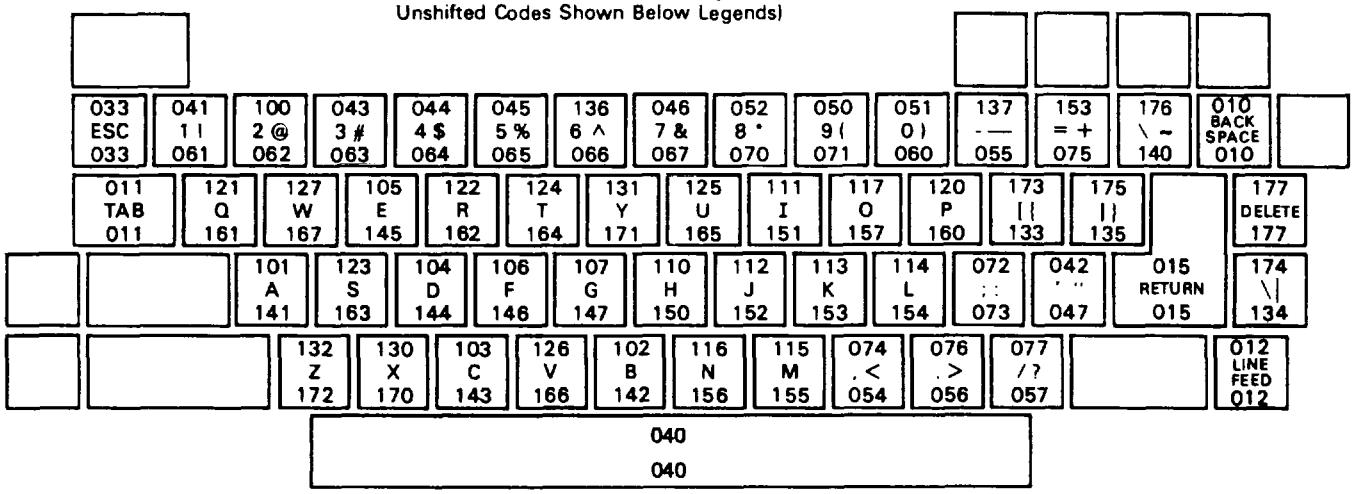
1 Multipart forms may have only one card part. The card part must be the last part

2 Multipart carbonless forms up to six parts may be used Ribbon must be used on the top copy First-surface Impact paper is not recommended

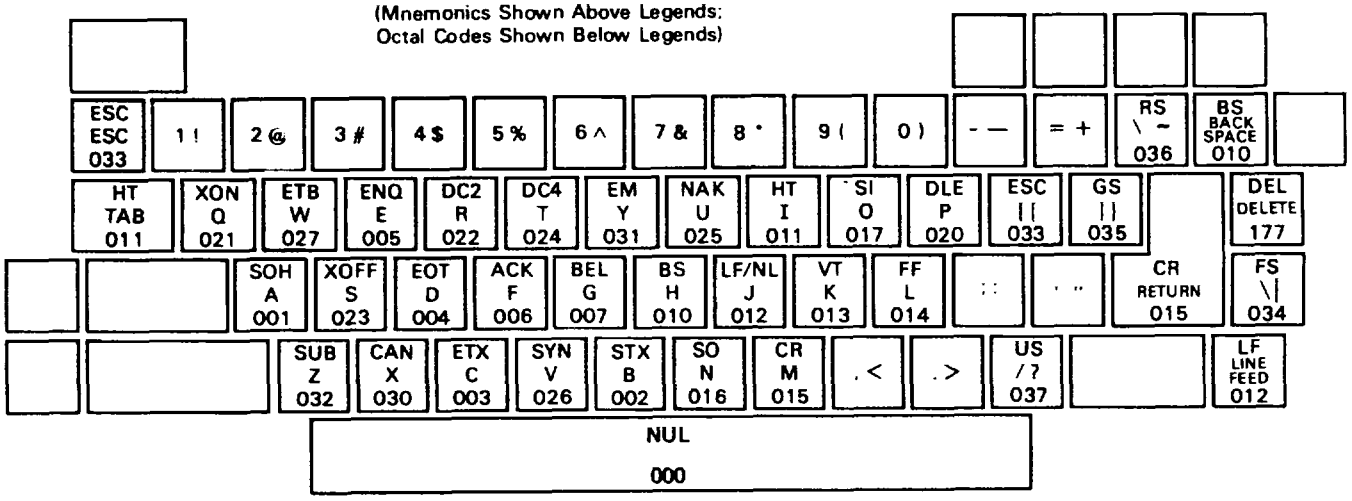
3 Multipart forms with 3- or 4-prong margin crimps on both margins are recommended Stapled forms are not recommended and may damage tractors and other areas of the machine Dot or line glue margins are acceptable if line is on one margin only Line glue on both margins prevents air from escaping and results in poor impressions.

4 Spilt forms with each side containing a different thickness or number of sheets are not recommended

Octal Codes Generated by Keyboard
(Shifted Codes Shown Above Legends;
Unshifted Codes Shown Below Legends)



Characters Generated by Keyboard
with CTRL Key Held Down
(Mnemonics Shown Above Legends;
Octal Codes Shown Below Legends)



GLOSSARY

Section I. ABBREVIATIONS AND ACRONYMS

Uncommon or nonstandard abbreviations used in this manual are defined below:

BOOT ..... Bootstrap

CCA ..... Circuit Card Assembly

DEC ..... Digital Equipment Corporation

DMA ..... Direct Memory Access

DMM ..... Digital Multimeter

GFE ..... Government Furnished Equipment

LED ..... Light Emitting Diode

I/O ..... Input/Output

RPSTL ..... Repair Parts and Special Tools List

SMA ..... Serial Multiplexed Asynchronous

SMI ..... Serial Multiplexed Interface

SMS ..... Serial Multiplexed Synchronous

UUT ..... Unit Under Test

VAC ..... Volts, Alternating Current

VDC ..... Volts, Direct Current

Section II. DEFINITIONS OF UNUSUAL TERMS

Acronyms and expressions which are in common use are explained below:

Bootstrap. A program always resident in the computer which enables it to accept an operational program.
Declassification. Units returned for repair may contain classified information in nonvolatile memory. The units are to be treated as classified hardware until the declassification, or the 'zeroizing' software routines are run on the UUT by the computer test set.
UNIBUS. Proprietary term of Digital Equipment Corporation for their communications interface referring to a parallel bus which carries data, addresses and control information.

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