TECHNICAL MANUAL

ORGANIZATIONAL, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE MANUAL
FOR
SIMULATOR SET
AN/USM-393
(NSN 6625-00-134-2976)

This copy is a reprint which includes current pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1978

WARNING
HIGH VOLTAGE
is used within the van.
DEATH ON CONTACT
may result if operating personnel fail to observe safety precautions.
EXTREMELY DANGEROUS VOLTAGES
EXIST IN THE AC DISTRIBUTION POWER SYSTEMS.
Be careful when working on or near the power connections.
VENTILATION IS ESSENTIAL
To prevent asphyxiation, the van must be ventilated at all times when occupied.
DON'T TAKE CHANCES!

CHANGE 1 }
No. 1 }

Organizational, Direct Support,
and General Support
Maintenance Manual
SIMULATOR SET
ANIUSM-393
(NSN 6625-00-134-2976)

TM 11-6625-2845-24, 28 November 1978 is changed as follows:

1.   New or changed material is indicated by a vertical bar in the margin of the page.
2.   Added or revised illustrations are indicated by a vertical bar in front of the figure caption.
3.   Remove and insert pages as indicated in the page list below:

Remove	*Insert*
None	A and B
i and ii	i and ii
1-1 and 1-2	1-1 and 1-2
2-1 through 2-22	2-1 through 2-28
3-1 through 3-7	3-1 through 3-11
A-1 and A-2	A-I and A-3
B-3 and B-4	B-3 through B-4.2
C-I and C-2	C-I and C-2
D- I through D-4	D-1 through D-4
Index I through Index 4	Index 1 through Index 4
FO-7-1(1)	FO-7-1(1)
FO-7-I(2)	FO-7-1(2)

4.   File this change sheet in front of the publication for reference purposes.

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WARNING
HIGH VOLTAGE
is used within the van.
DEATH ON CONTACT
may result if operating personnel fail to observe safety precautions.
EXTREMELY DANGEROUS VOLTAGES
EXIST IN THE AC DISTRIBUTION POWER SYSTEMS.
DO NOT SERVICE OR ADJUST ALONE
Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

WARNING
Adequate ventilation should be provided while using TRICHLOROTRI FLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

Change 1   A

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

TECHNICAL MANUAL

No.11-6625-2845-24

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**Organizational, Direct Support,
and General Support
Maintenance Manual
for
SIMULATOR SET AN/USM-393
(NSN 6625-00-134-2976)**

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 20282 located in back of this manual direct to: Commander, US Army Communcations Electronics Command and Fort Monmouth, ATTN: DRSEL MEMP, Fort Monmouth, NJ 07703. In either case, a reply will be furnished direct to you.

LIST OF ILLUSTRTATIONS

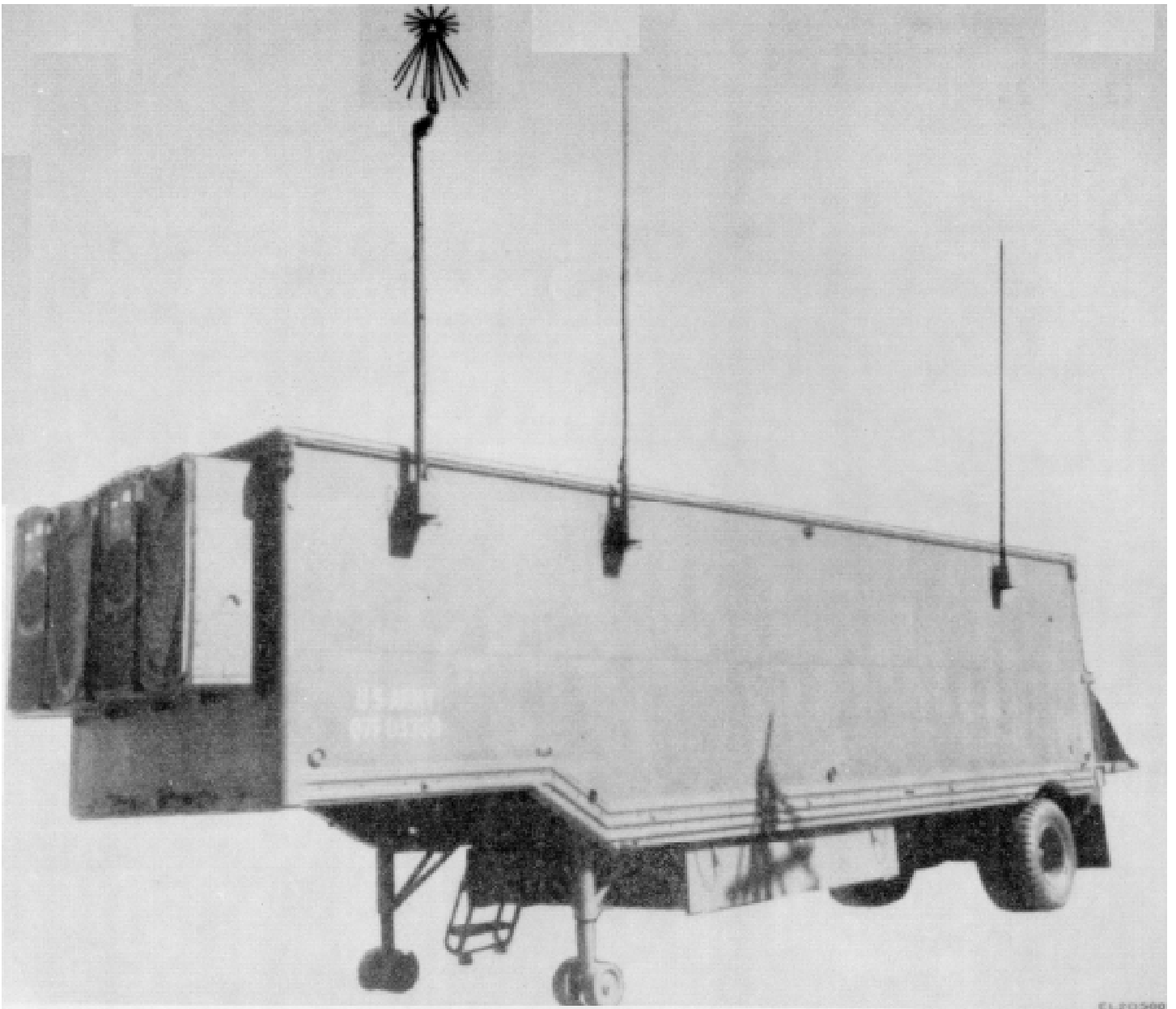## LIST OF TABLES

Change 1 ii

Figure 1-1. Simulator Set AN/USM-33

CHAPTER 1
INTRODUCTION
Section I. GENERAL

1-1. Scope

This manual provides a functional description, and organizational, direct support, and general support maintenance instructions for Simulator Set AN/USM-393, commonly known as the Simulator Set. The manual consists of seven chapters and four appendices.

a. Chapter 1, Introduction, consists of two sections. Section I, furnished information relating to forms, records, reports, and references. Section II references the operator manual for a general description of the equipment and technical characteristics in the form of tabulated data. Additionally, it references the operator manual for a list of items that comprise an operable equipment.

b. Chapter 2, Organizational Maintenance Instructions, consists of six sections. Section I defines the scope of organizational maintenance. Section II lists the tools, test equipment, and materials required. Section III provides repainting and refinishing instructions. Section IV presents instructions for organizational preventive maintenance checks and services. Section V furnishes organizational troubleshooting instructions. Section VI contains unit removal and replacement procedures.

c. Chapter 3, Functioning of the equipment, contains a functional description of the hardware configuration of the Simulator Set AN/USM-393 and its operational relationship to Countermeasures Receiving Set, AN/ALQ-133, Digital Data Set AN/ USQ-61A, and Flight Line Test Set, AN/ALM-154.

d. Chapter 4, Direct Support Maintenance, provides maintenance instructions that are the responsibility of direct support maintenance personnel.

e. Chapter 5, General Support Maintenance, defines the responsibilities of general support maintenance personnel.

f. Chapter 6, Wire Lists, contains wire list information.

g. Chapter 7, Diagrams, furnishes the cable diagrams.

h. Appendix A lists applicable references.

i. Appendix B contains the maintenance allocation chart and a table listing tool and test equipment requirements.

j. Appendix C contains the expendable supplies and materials lists.

k. Appendix D contains coverage on Semitrailer Van V-495/USM-393.

1-2. Maintenance Forms, Records, and Reports 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 TM 38-750, The Army Maintenance Management System (TAMMS).

b. *Report of Packaging and Handling Deficiencies.* Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-21 DLAR 4140.551 NAVMATINST 4355.73/AFR 400541MCO 4430.3E.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/ MP4610.19C/DI, AR 4500.15.

1-3. Consolidated Index of Army Publications and Blank Forms

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

1-4. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750244-2.

1-5. Administrative Storage

Administrative storage requirements are described in TM 740-90-1.

1-6. Calibration

Simulator Set AN/USM-393 does not require calibration as a complete set.

1-7. Reporting Equipment Improvement Recommendations (EIR)

If your Simulator Set, AN/USM-393 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. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

1-8.   References

Equipment publications pertinent to the operation (use) of the equipment covered in this manual are listed in appendix A. These publications are available through AG publications channels.

Section II. DESCRIPTION AND DATA

1-9.   Purpose and Use

Refer to TM 11-5895-955-10-1, Operator Manual for Receiving Set, Countermeasures AN/ALQ-133, Simulator Set AN/USM-393, and Test Set, Flight Line AN/ALM-154 for purpose and use of the equipment, items comprising operable equipment, and equipment description, and illustrations of the simulator set. Refer to TM 11-5895-955-10-2, Operator Manual for Receiving Set, Countermeasures AN/ALQ-133, Simulator Set AN/USM393, and Test Set, Flight Line AN/ALM-154 for classified information related to the simulator set.

1-10.   Tabulated Data Power requirements for this equipment are 30KVA, 120/208 volts, 3-phase, 60 Hz. Refer to TM 115895-955-10-1 for additional tabulated data for the simulator set, including items comprising an operable   equipment.

Change 1 1-2

CHAPTER 2
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. INTRODUCTION

2-1.   General

This chapter lists tools, test equipment, and materials required for organizational maintenance; presents repainting and refinishing instructions; provides preventive maintenance checks and services; presents organizational troubleshooting procedures; and supplies the unit removal and replacement procedures.

2-2.   Definition of Organizational Maintenance

Organizational maintenance consists of daily and weekly preventive maintenance checks and services, and the isolation and replacement of a defective line replaceable unit (LRU) in the Simulator Set. Refer to the maintenance allocation chart in Appendix B for specific organizational maintenance responsibilities.

Section II. TOOLS AND EQUIPMENT

2-3.   Tools, Test Equipment, and Materials Required

Table 2-1 lists tools, test equipment, and materials required to perform organizational maintenance. The test equipment and magnetic tape cartridges listed are required for fault isolation to a defective LRU. The tools listed are required to remove and replace defective LRU. Preventive maintenance requires the cleaning materials,

paint, and painting supplies listed. Consumable maintenance supplies are listed in table 2-2.

2-4.   Special Test Equipment.

No special test equipment is required to perform organizational maintenance.

Section III. REPAINTING AND REFINSIHING INSTRUCTIONS

2-5.   Maintenance of Exterior Surfaces

All exterior surfaces of the unit shall be protected in accordance with MIL-F-14072 and MIL-STD-171.

   a Inspection. The exterior finish of the major component units shall be inspected periodically for signs of deterioration or corrosion.

   b. Cleaning and Surface Preparation.   Refer to TM 43-0139, Painting Instructions for Field Use.

Table 2-1.   Tools, Test Equipment, and Materials Required

Item	Use
Cloth, Lint-free	Preventive maintenance
Trichlorotrifluoroethane, Type TF Freon	Preventive maintenance
Sandpaper, No. 000	Touchup painting
Paint Brush, MIL-G-7241	Touchup painting
Primer, Metal, Zinc Chromate, MIL-P-8585	Touchup painting
Paint, lusterless, olive drab, MIL-L-6805, No. X-34087	Touchup painting
Enamel Semigloss, Light Gray, TT-E-529; No. 26250	Touchup painting
Kit TK-105/G	Removal replacement of Tool major component unit
Multimeter AN/USM-223A	Troubleshooting
Magnetic Tape Cartridge T393-1	AN/USM-393 Simulator Set operating programs
Magnetic Tape Cartridge T153-1	C-9537 Monitor Controller and J-3239 Interface
Magnetic Tape Cartridge T153-2	AN/UYK-23 Digital Computer Set diagnostic programs
Magnetic Tape Cartridge T153-4	Computer peripheral test programs
Magnetic Tape Cartridge T393-2	Disk System Utilities

Table 2-2. Consumable Maintenance Supplies

Item	
Cloth, Lint-free Type TF	None Trichlorotrifluoroethane Freon
Sandpaper	No. 000
Primer, Metal, Zinc Chromate	MIL-P-8585
Paint, Lusterless, Olive Drab	MIL-L-6805, No.X-34087
Enamel Semigloss, Light Gray	TT-E-529, No. 26250

   c. Paint. Zinc chromate metal primer, lusterless olive drab paint, and light gray semigloss enamel listed in SB 11-573, Painting and Preservation Supplies Available for Field Use of Electronics Command Equipment shall be used.

2-6.   Touchup Painting

If the exterior finish of the unit has been scarred or damaged, touchup painting can prevent corrosion of the surface.

2-7.   Cleaning Instructions

   a. Remove dust and loose dirt from the exterior surfaces of the unit with a clean, soft, lint-free cloth.

WARNING
Adequate ventilation should be provided while using TRICHLOROTRIFLUOROE THANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and if

ritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

b. Remove grease, fungus, or hard-to-remove dirt from the exterior surfaces of the unit with a cloth dampened (not wet) with trichlorofluoroethane.

2-8. Surface Preparation

Damaged areas of the exterior finish must be properly prepared for touchup painting.

a. Use. No. 000 sandpaper to clean the damaged surface area down to the bare metal. Obtain a bright, smooth finish.

b. Sand the edges of the damaged area back to the solid paint, then feather the paint edge that leads to the exposed metal.

c. Wipe the prepared area clean of all sanding residue.

2-9. Touchup Painting Instructions

a. Apply one coat of zinc chromate metal primer to the prepared surface with a small paint brush. Let the primer coat dry thoroughly.

b. Apply two thin coats of lusterless olive drab paint or light gray semigloss enamel, as applicable, over the metal primer. Let the first coat dry thoroughly before applying the second coat.

2-10. Care of Painting Equipment

Refer to TM 43-0139 and TB 43-0118 for instructions on the care of paint brushes and painting equipment.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-11. General

Preventive maintenance is the systematic inspection, care, and servicing of equipment. Scheduled preventive maintenance routines help prevent the occurrence of trouble, reduce out-of-service time, and maintain the required performance level of the equipment.

2-12. Preventive Maintenance Checks and Services

To ensure operational readiness, Simulator Set AN/USM-393 must be systematically inspected so that defects may be discovered and corrected before the defects result in serious damage or failure. The required preventive maintenance checks and services to be performed are listed in tables 2-3 and 2-4. The step numbers in each table indicate the sequence of minimum inspection requirements. Defects discovered shall be noted so that correction can be made as soon as operation has been stopped. If a deficiency is noted during operation that would damage the equipment, STOP OPERATION IMMEDIATELY. Record all deficiencies, with the corrective action taken, on the

applicable form prescribed by TM 38-750.

2-13. Preventive Maintenance Checks and Service Periods

The preventive maintenance checks and services listed in tables 2-3 and 2-4 are to be performed at daily and weekly intervals, respectively. Scheduled preventive maintenance intervals may be adjusted by the maintenance supervisor to compensate for any unusual operating conditions. Equipment maintained in a standby condition requires service before operation, but does not require weekly routines. Records and reports of preventive maintenance checks and services shall be made in accordance with TM 38-750. If a defect is noted during preventive maintenance routines that cannot be remedied by organizational personnel, the defect shall be immediately reported to direct support maintenance personnel.

2-14. Cleaning Exterior Surface Areas.

Refer to paragraph 2-7 for exterior surface area cleaning instructions.

Table 2-3. Daily Preventive Maintenance Checks and Services

Step	Item	Procedure	Reference
1.	Simulator Set AN/USM-393	Inspect the entire simulator set for completeness, general condition, and cleanliness. Clean, if required.	Paragraph 2-7
2	Mounting hardware	Check to see that all mounting hardware is in place and tight Tighten, if required.	
3	Cables, connector plugs, and receptacles	Inspect all cables, connector plugs, and receptacles receptacles for cracks, corrosion, and signs of overheating. Check for tightness.	

Table 2-3. Daily Preventive Maintenance Checks and Services

Seq No.	Item	Procedure	Reference
4	Individual units; controls, switches, and indicators	Check the mechanical action of each control and switch for free operation and absence of binding.	
5	Indicators	Check each indicator for cleanliness, general condition and cracked or damaged lens. Clean, if required.	Paragraph 2-7
6	Simulator Set AN/USM-393 preflight/ post flight procedures.	If an operational mission is scheduled, observe The preflight/postflight procedures for any symptoms that could indicate an impending equipment failure. If such indications are noted, take corrective action, as required. See Section IV.	TM 11-5895955-101
7	Forms and records	Complete the required forms and records.	TM 38-750.

Table 2-4. Weekly Preventive Maintenance Checks and Services

Seq No.	Item	Procedure	Reference
1	Simulator Set AN/USM-393	Perform the daily preventive maintenance checks and services.	Table 2-3.
2	Exterior finish	Touchup paint the exterior finish of any Component unit that was noted to be defective in the daily checks and services.	Paragraph 2-16.
3	Mounting assemblies	Inspect the unit and subassembly mounting assemblies and shock mounts, where used, for general condition. Be sure that all mounting hardware is tight.	
4	Air filters	Inspect the air filters on the component units for general condition and cleanliness. Clean, if required.	Paragraph 2-15.

2-15. Cleaning Air Filters
Air filters in major component units require periodic inspection and cleaning. Use the following procedure to clean a dirty air filter.
   a.   Remove the screws that secure the filter material holder in place.
   b.   Remove the holder and filter material from over the honeycombed air passageway.

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   c.   Clean the filter material with cleaning compound. Drain excess cleaning compound from the filter material and let filter dry thoroughly.
   d.   Be sure that the honeycombed air passageways are open and free of lint and dirt.
   e.   Replace the filter material in the holder, and place the holder in position over the honeycombed air passageway.
   f.   Secure the holder in place with screws.

2-16. Touchup Painting
Paragraphs 2-6 through 2-10 are applicable to touchup painting.

Section V. TROUBLESHOOTING

2-17. Organizational Troubleshooting
Organizational troubleshooting of the simulator set is based on malfunctions indicated during preflight data preparation/postflight data reduction, an   operational flight, or daily and weekly preventive maintenance checks and services. Organizational maintenance consists of power input checks, inter connecting cable checks, and fault isolation to one of   the major component units of the simulator set. Refer to the maintenance allocation chart in Appendix B for specific organizational maintenance responsibilities.   Any malfunction beyond the scope of organizational maintenance shall be referred immediately to direct support maintenance personnel.

2-18. Preliminary Troubleshooting Information
An organizational troubleshooting procedure is provided in this section supported by an organizational troubleshooting chart.   The troubleshooting chart provides symptoms, possible causes, checks, and corrective action in a logical order to isolate a defec

tive major component unit of the simulator set. Power connections, power-up/power-down procedures, and equipment operating instructions for the simulator set are contained in TM 11-5895 955-10-1. The troubleshooting procedure will make reference to this manual. Locate the manual and have available for ready reference.

2-19.   Diagnostic and Test Programs

Several diagnostic and test programs are available to maintenance personnel to assist in testing, troubleshooting, maintenance, and repair of the simulator set. These programs are recorded on magnetic tape cartridges. Some tape cartridges contain several programs, which are stacked on the tape. The tape cartridges and the diagnostic programs contained on each are listed as follows by cartridge/program number and name.

   a. *C-9537 Monitor-Controller and J-3239 Interface Unit Diagnostic Program.*

Cartridge number	*Cartridge name*
T153-1	C-9537 Monitor-Controller and J-3239 Interface Unit Diagstic programs

Program name
Diagnostic Loader
Diagnostic DGOI
Diagnostic DG02
Diagnostic DG03
Diagnostic DG04
Diagnostic DG05
Diagnostic DG06
Diagnostic DG07
Diagnostic DG08
Diagnostic DG09
Diagnostic DG IO
Diagnostic DGI1
Diagnostic DG12
Diagnostic DG 13
Diagnostic DG14
Diagnostic DG15
Diagnostic DG16
Diagnostic DG17
Diagnostic DGXX
Diagnostic NIEMDG

   b. *Digital Computer Set, AN/UYK-23 Diagnostic Programs.* These programs are used to verify proper operation of Digital Computer Set, AN/UYK-23.

Cartridge number	Cartridge name
T153-2	AN, UYK-23 Computer Diagnostic programs

   c. *Computer Peripheral Test Programs.* These programs are used to exercise the computer peripheral devices.

Cartridge number	*Cartridge name*
T153-4	Computer Peripheral Test Programs

Program name
RD-392/U or RD-392AIU
    Magnetic Tape Recorder-Reproducer Test Program
Systematics General T-5145G
    Display Terminal Test Program
J-3238iALM-153 Unit Interface Maintenance Test Program
Tally T-5000 Line Printer Test Program
AN/USQ-61A Digital Data Set Test Program

T393-2	Disk System Utilities

2-20.   Standard Operating Procedures

The Memory Initialization and object program loading procedures are used many times during the loading and execution of operating, test, and diagnostic programs. These procedures should be memorized to facilitate operation of the simulator set. The procedural steps are covered in paragraphs 2-21 and 2-22.

2-21.   Memory Initialization Procedure

This procedure is performed on Maintenance Operator Control Panel, *C-9632/ALM-153* to ensure that the memory of Interface Unit *J-3239/USM-393* has been cleared of all possible parity errors each time the interface unit is powered up, and always prior to each program loading.

   a. Press HALT and RST.
   b. Press the REGISTER SELECT A pushbutton.
   c. Press the DATA CLEAR pushbutton.
   d. Enter /78FF into the DATA register.
   e. Press RW.
    f Press the REGISTER SELECT X pushbutton.
   g. Press DATA CLEAR; then, press RW.
   h. Press M.A. CLEAR. All MEMORY ADDRESS indicators will turn off.
   i. Enter /8201 into the DATA register.
   j. Press WI. The MEMORY ADDRESS 15 and REGISTER SELECT indicators will light.
   k. Press DATA CLEAR.
   l. Enter /B700 into the DATA register.
   m. Press WI.
   n. Press RST.
   o. Press RUN. Wait approximately two seconds, then press HALT.
   p. Press the Register Select P pushbutton. The Data register then contains all zeros (no lights on).

NOTE
If incorrect indications are noted in any step, repeat the procedure until correct indications are obtained in all steps.

2-22. Object Program Loading Procedure (Interface Unit)

This procedure is used to load an object program from a magnetic tape cartridge into the memory of Interface Unit J-3239/USM-393.

NOTE
Object programs are stacked sequentially on track 1 of the program tapes. If the desired program is not the first program in the sequence, it will be necessary to repeat steps g through *l* of the loading procedure until the desired program has been loaded. For example; if the desired program is fourth in the sequence, repeat steps g through l four times.

a. Be sure all applicable associated equipment is turned on.
b. Be sure the write-enable control on the magnetic tape cartridge containing the program to be loaded is set to safe.
c. Place the magnetic tape cartridge in the tape deck of the magnetic tape recorder-reproducer.
d. Allow the tape to reach load point, then press the ON LINE pushbutton on the magnetic tape recorder-reproducer. The ON LINE indicator will light.
e. Press HALT, RST and REGISTER SELECT A pushbuttons on the maintenance-operator control panel. The HALT and REGISTER SELECT A indicators are lit. If any other indicators are on, press RST again.
f. Perform the memory initialization procedure (para 2-21).
g. Press the REGISTER SELECT P pushbutton. The P indicator will light.
h. Press DATA CLEAR. All DATA indicators turn off.
i. Enter /2038 into the P register by pressing DATA switches 2, 10, 11, and 12.
j. Press the RW pushbutton.
k. Press the REGISTER SELECT A pushbutton. The REGISTER SELECT A indicator will light.

l. Press RUN. The DATA indicators display changing states. When the DATA display stabilizes, the RUN and IDLE indicators are on.

NOTE
If the IDLE indicator does not light, per form step n and repeat the procedure. If the program to be loaded is the first program on the tape cartridge, proceed to step n.
Otherwise, carefully observe the requirements of step m.

m. Press HALT and RST, then repeat steps g through I the required number of times, determined by the sequential position of the program on the magnetic tape cartridge, until the desired program on the tape is loaded.
n. On the magnetic tape recorder-reproducer, press the ON LINE pushbutton, then press the REWIND pushbutton. Wait for the REWIND indicator to turn off.
o. Press the UNLOAD pushbutton on the magnetic tape recorder-reproducer and wait for the tape cartridge to eject.
p. Press HALT and RST on the maintenance operator control panel.
q. Remove the tape cartridge from the tape deck of the magnetic tape recorder-reproducer.
r. After the program has been successfully loaded, press RUN on the maintenance-operator control panel to execute the program.

2-23. Organizational Troubleshooting Procedure

a. Confer with the simulator set operator to identify the malfunction indicated during preflight/ postflight operation of the equipment, or during equipment operation for a mission flight.
b. Refer to TM 11-5895-955-10-1, and follow the specified instructions to power-up the simulator set. Turn on the circuit breakers, as instructed, to apply power to the individual units. Set the POWER ON/OFF switches on the individual units to ON. If an abnormal indication is observed during the powering sequence, refer to the troubleshooting chart in table 2-5 and correct the problem before proceeding.

Table 2-5 Organizational Troubleshooting Chart

Item No.	Trouble symptom	Probable fault	Checks and corrective action
1	Power circuit (s) failure in the van	Circuit breakers tripped or not turned on. Power source for van Power cable or connections.	Perform the van power up procedure for the simulator set in accordance with TM II-5895-955-10-1 (operator manual) Note the meter readings and failure indications during the

Table 2-5.   Organizational Troubleshooting Chart - Continued

Item No.	Trouble symptom	Probable fault	Checks and corrective action
		Defective van power supply: electrical circuitry or components.	procedure to isolate the problem to a particular part of the power circuitry. Refer to appendix D for the van power distribution troubleshooting instructions
2	System controller program will not load	Magnetic tape Recorder-reproducer RD-392U or RD-392A;U	Attempt to load the interface unit resident program. If the program loads, perform the digital computer set diagnostic tests in paragraph 2-26.
		Digital Computer Set, AN/ UYK-23 Maintenance-Operator Control Panel C-9633 UYK-23	If the program does not load, observe the magnetic tape for movement during the loading procedure. If the tape moves, clean the tape deck head and attempt to load the program again. If the tape does not move, perform the magnetic tape recorder-reproducer diagnostic tests in paragraph 2-26.
3	Interface unit resident program will not load	Interface Unit .1J-3239 USM-393	Perform the interface unit diagnostic tests in paragraph 2-25. Also see item 8.)
4	Diagnostic programs will not load	Maintenance-Operator Control Panel C-9632 ALN-153 Interface Unit .J-32:39 I!SM-393	Perform the maintenance-operator control panel test in paragraph 2-28 Perform the interface unit diagnostic tests in paragraph 2-25. (Also see item 8 i
5	The display terminal does not function properly	Systematics General Display Terminal, T-5145(;(IIP2648A)	Perform the video display terminal diagnostic tests in paragraph 2-30.
6	The line printer does not function properly	line Printer. Tape MNodel T-5000 Interface Unit .J-3239USNM-393	Perform the line printer diagnostic tests in paragraph 2-31 Perform the interface unit diagnostic tests in paragraph 2-25. (Also see item 8.1
7	Paper tape reader/perforator does not function properly	Paper Tape Reader, Perforator System, Remex RA136375BAX Interface Unit.–3239 USM-393 Interface Unit .1-:12381AI.1h-153	Perform the paper tape reader, perforator diagnostic tests in paragraph 2-32 Perform the interface unit diagnostic tests in graph 2-25 (Also see item 8) Replace the .J-3238:AI.MN-153 interface unit.
8	Interface unit diagnostic tests indicate a defective interface unit. but unit replacement does not clear the problem	Power Supply Assemhlies, Lamhda unit 12 and unit 15 (in the equipment rack)	Check the power supply assembly in accordance with the procedure contained in paragraph 2-34
9	Equipment failure and definite symptoms cannot be determined that would lead to performance of a specific diagnostic test Failure indication noted for Digital Data Set, AN USQ-61A, Radio Set AN/A RC-164A(V)16. Transceiver ANXVRC_47	Unknown simulator set unit. Set unit failure.	Perform the diagnostic tests in this section in the order of presentation until the problem unit is isolated. Individual technical manuals are provided for the sets: units of the simulator set listed in this item (9) Refer to the appropriate manual. listed In appendix A, for the organizational troubleshooting procedure for that set unit

c.   Obtain AN/USM-393 Simulator Set Disk System Utilities Magnetic Tape Cartridge T393-2 from the simulator set magnet tape storage files and attempt to load and execute System Controller Program and Interface Unit Resident Program from the tape cartridge.

d.   The following procedure is used by operator to initialize the disk memory system in preparation for performance of associated preflight, mission, and postflight operating procedures. Since the disk operating system programs/routines and data files are resident in disk memory, it is not necessary to perform the entire procedure unless he disk memory data has been destroyed by a malfunction in the equipment or execration of the disk memory diagnostic program. If the disk data has been destroyed, the disk operating system programs/routines must be loaded into the disk memory

from the Tape Cartridge T393-1 (Disk Save Programs Only) and the memory initialized.

NOTE
Wherever the letters "CRT' appear in this procedure, it means the same as display terminal.

(1) Observe the front-panel indicators on the disk memory unit. The green indicator should be on and all of the amber indicators should be off.

(2) Be sure that the video display terminal and the magnetic tape recorder-reproducer are turned on.

NOTE
If the disk data is known to be good, perform 3 through 7 and *23* through *30* below. If

Change 1   2-6

disk data status is unknown, perform 3 through *8* below to make a determination of the status. If step *8* below indicates that the disk data is good, then perform *23* through *30* below. If *8* indicates that the data is not good, perform all of the remaining steps of the procedure.

    (3) Place Disk System Utility Tape Cartridge T393-2 in the left hand tape deck of the magnetic tape recorder-reproducer and place the tape ON LINE.

NOTE

Except for loading tape cartridges in the magnetic tape recorder-reproducer, the operator functions in this procedure are performed on Panel, Maintenance-Operator Control C-9632/ALM-153 and the keyboard of the video display terminal.

    (4) Press HALT and RST. Set SENSE SWITCH 2 (indicator on).

    (5) Enter /2038 into the P-register and press RW.

    (6) Press RUN. The IDLE indicator lights when the program is loaded.

    (7) Press HALT, RST, and RUN. The CRT will display:

      UTOS RVX.XX RESTART
      ENTER COMMAND
      >
      (X.XX IS THE REVISION NUMBER OF
         THE UTOS OPERATING SYSTEM IN
         USE).

    (8) Enter the command TIME (ENTER) on the keyboard.

      (a) If the disk data is good, the CRT will display:

      TIME=XX:XX
      DATE = DD/M M/YY
      OPERATOR=XX
      ENTER COMMAND
      >

      (b) If the disk data has been destroyed, the CRT will display:

      PROGRAM NOT FOUND
      (Error Message)
      ENTER COMMAND

NOTE

If the disk data is good, proceed to *23* below. If the data has been destroyed, perform the remaining steps of the procedure to restore the disk data.

    (9) Press HALT and RST.

    (10) Rewind the tape cartridge T393-2 in the left-hand tape deck of the magnetic tape recorder-reproducer and place the tape ON LINE.

    (11) Place a disk save tape cartridge in the right-hand tape deck and place the tape ON LINE. To completely reinitialize the disk, use TAPE CAR TRIDGE T393-1 (Disk Save Programs Only). To restore the disk to a previous state of data content, use a disk image save created by the procedures given in paragraph 2-68 of TM 11-5895-955-10-1.

NOTE

Make sure that all the write-protect switches on the disk memory systems are in the UP position (unprotected).

    (12) Set SENSE SWITCHES 2 and 3 ON.

    (13) Enter /2038 into the P-register and press RW.

    (14) Press RUN. The LOAD program will load into core, and the CRT will display:

      SET SENSE SWITCHES AS FOLLOWS:
        ALL SENSE SWITCHES OFF=2 DRIVE
          OPERATION
        SS2 ON, ALL OTHERS OFF= RIGHT
          DRIVE ONLY
        SS2 & SS3 ON, ALL OTHERS OFF=LEFT
          DRIVE ONLY THEN START PRESS
          RUN.

NOTE

The disk image save of operating programs and data files can be contained on as many as two tape cartridges. Be sure that the write enable controls on the tape cartridges are set to the SAFE position before placing them in the tape decks.

    (15) For loading a single tape disk save (e.g. Disk Image Operating programs), use the single-drive mode of operation (right or left, whichever is more convenient).

    (16) For loading a multiple-tape disk save, use the same mode that was used in making the save (para 2-68 of TM 11-5895-955-10-1) to insure pro per loading.

    (17) Place tape in drive, set sense switches as appropriate, and press RUN.

    (18) If a tape change was required during the making of the save, the operator will be prompted to make the same change during the loading of the save (a description of these prompts is given in paragraph 2-68b(4) of TM 11-5895-955-10-1). Otherwise, no further operator action is required during the load.

    (19) When the disk image programs (and data files, if any) have been successfully loaded, the CR1' will display:

      UTOS RVX.XX RESTART
      ENTER COMMAND
      >

At this point, set the leftmost two write-protect switches on the disk memory system to the down

position (protected), leaving all others up. This will write-protect the disk-resident copy of UTOS.

NOTE
If at any time the operator suspects that the core-resident copy of UTOS may be dam aged, it may be resorted from disk by the following procedure:
1. Press HALT and RST.
2. Enter /0100 into the P-register, press RW and RUN.
3. The IDLE indicator should illuminate. Press HALT, RST, and RUN. The UTOS RVX.XX RESTART message should appear. If it does not, the UTOS will have to be reloaded from the disk system utility cartridge, using the procedure in 3 above.

(20) If the operating system (UTOS) does not load into core memory successfully from disk after disk load, the CRT will display:

ERROR ON UTOS LOAD

In this case, press RUN to attempt UTOS load. If the Error message is repeated, repeat the procedure from 9 above.

(21) If the disk image programs do not load successfully, the CRT will display:

ERROR ON DISK LOAD

Followed by one of the following type error messages:

DISK FILE DIRECTORY IN ERROR
DISK ERROR
TAPE ERROR
ERROR TYPE NOT SPECIFIED

(22) In cases of error messages in *21* above, repeat the procedure from 9 above, to attempt a successful load.

(23) Enter the command FD (ENTER) on the keyboard. The line printer lists the contents of the file directory. The listing contains a matrix of column headers for entry number, file name, file type, start address in absolute sectors, number of words per record, number of records per file, data of file creation, initials of the file creator, and the number of sectors in the file. On completion of the printout, the CRT will display:

ENTER COMMAND
>

(24) Check that the file directory listing contains the programs listed in paragraph 2-17b(1) of TM 11-5895-955-10-1.

(25) Enter the command SET DA (ENTER) on the keyboard. The CRT will display:

ENTER DATE: DD/MMIYY
>

(26) Enter the date (day, month, and year, using the slashes) followed by (ENTER) on the keyboard. The CRT will display:

ENTER COMMAND
>

(27) Enter the command SET CL (ENTER) on the keyboard. The CRT will display:

ENTER TIME: HH:MM
>

(28) Enter the time in hours and minutes on the keyboard.

(a) For example:
14:21 or 1421
(b) The CRT will display:
ENTER COMMAND
>

(29) Enter the command SET OP (ENTER) on the keyboard. The CRT will display:

ENTER NAME: XX
>

(30) Enter the initials of the operator followed by (ENTER) on the keyboard. The CRT will display:

ENTER COMMAND
>

NOTE
The disk memory is now initialized. The other permission procedures weapon system file maintenance, mission preflight tape build (EOB, SB, HIB) and data link preflight checks can now be performed, as required.

2-24. Corrective Action
a. Replace a component unit that has been deter mined to be defective with one of known quality. Removal and replacement procedures for simulator set units are contained in Section V of this chapter.
b. After a unit has been replaced, repeat the test procedure to verify that the equipment is serviceable.
c. Transport the defective unit to Semi-trailer Mounted Electronics Shop, AN/ALM-153, notify direct support maintenance personnel of the problem, and complete the required forms and records. If unit replacement did not clear the malfunction, report the problem to direct support maintenance personnel.

2-25. Interface Unit J-32391USM-393 Diagnostic Tests
The interface unit diagnostic program consists of 18 routines that are sequentially loaded into the inter face unit memory and executed. These test routines are prepared in a special format, which uses a minimum number of instructions to load the diagnostics from magnetic tape. Therefore, a different loading and execution procedure is used for the interface unit diagnostic program than is normally used for object program loading and execution. Perform the following procedural steps as

presented, to load and execute the interface unit diagnostic program.

a. Obtain C-9537 Monitor-Controller and J-3239 Interface Diagnostic Programs Magnetic Table Cartridge T153-1 from the magnetic tape storage files in the simulator set.

NOTE
The following steps are to be performed on Maintenance-Operator Control Panel C-9632/ALM-153, unless otherwise instructed.

b. Press HALT and RST.

c. Press the REGISTER SELECT A pushbutton. The REGISTER SELECT A indicator will light.

d. Press DATA CLEAR. All DATA indicators turn off.

e. Press DATA pushbutton 0 to enter /8000. The DATA 0 indicator will light.

f. Press RW.

g. Press M.A. CLEAR. All MEMORY ADDRESS indicators turn off.

h. Press WI to enter 1/8000 into memory location 0. MEMORY ADDRESS indicator 15 turns on.

i. Press RST. The REGISTER SELECT A and HALT indicators only turn on.

j. Place Magnetic Tape Cartridge T153-1 in the tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

k. Press RUN. The DATA indicators display changing states and then stabilize.

NOTE
Steps a through k constitute a Memory Initialization procedure, starting at memory location 0. When memory location /2000 is accessed, the core image loader is started. The core image loader then loads a binary loader program from the DG object tape cartridge into interface unit memory.

l. Press HALT and RST. The REGISTER SELECT A and HALT indicators only turn on.

m. Press M.A. CLEAR. All MEMORY ADDRESS indicators turn off.

n. Press DATA CLEAR. All DATA indicators turn off.

o. Press MEMORY ADDRESS pushbuttons 3 through 15 to enter /1FFF. MEMORY ADDRESS indicators 3 through 15 will light.

p. Press RI. MEMORY ADDRESS indicator 15 and DATA indicators 3 through 15 turn on. If the DATA indicator display is not correct, rewind and unload the tape from the magnetic tape recorder reproducer and repeat the procedure from step b.

q. Press HALT and RST. The REGISTER SELECT A and HALT indicators only are lit.

r. On the magnetic tape recorder-reproducer, press the ON LINE, REWIND, and ON LINE pushbuttons. Wait for the tape to stop.

s. Press the REGISTER SELECT P pushbutton. The REGISTER SELECT P indicator will light.

t. Press DATA CLEAR. All DATA indicators turn off.

u. Press DATA pushbuttons 3, 4, 9, and 10 to enter /1860. The corresponding DATA indicators will light.

v. Press RW, and then press the REGISTER SELECT A pushbutton. The REGISTER SELECT A indicator will light.

w. Turn SENSE SWITCH 2 and 4 on.

x. Press RUN. The DATA indicators display changing states.

NOTE
The diagnostic loader will now load routine DG01. When the load operation is complete (all DATA indicators stabilized), DG01 will start and be automatically executed.

y. Observe the display terminal screen. When DG01 starts, the display terminal displays: DGOI.

NOTE
If an error is detected during execution of a DG test, the program stops and an error message is displayed on the display terminal in the following format:
ERROR AT LINE XXXX
An error in a DG test normally causes errors in the DG tests that follow. Note and record the first error message displayed on the display terminal. To repeat the DG test in which an error was detected, press HALT, RST, and RUN. To continue to the next test after an error is detected, perform steps q through x except enter 11865 in step u. Execution times for the DG tests vary from approximately 0.5 second to 3 minutes.

If DG01 executes without an error, the display terminal displays DONE and DG02 loads and executes, automatically. Unless an error is detected, the tests continue without operator action until DGC05 is, loaded and started. i

z. When DG05 starts, observe the display terminal screen closely for requested operator action. Routine DG05 tests the operation of the sense switch instruction. When DG05 enters the sense switch test, the display terminal requests:
TURN SS1 ON

aa. Turn SENSE SWITCH 1 on. The display terminal then requests: TURN SS 2 ON

NOTE
Since the interface unit (central processor) is under test, sophisticated error messages are not possible. If SENSE SWITCH 1 is on

and the display terminal fails to display TURN SS2 ON, a sense switch instruction error has been detected. As the switches are sequentially turned on and off, failure to display the proper display terminal message indicates a sense switch instruction error.

ab. Turn SENSE SWITCH 2, 3, and 4 on as requested on the display terminal and note that the next request for operator action is displayed.

ac. Turn SENSE SWITCH 1, 2, 3, and 4 off as requested on the display terminal. When SENSE SWITCH 4 is turned off as instructed, the display terminal displays:

    SELECT SENSE SWITCH OPTIONS DE-
    SIRED THEN HIT RUN

The IDLE indicator is on. If the message is not displayed or the IDLE indicator does not light, a sense switch instruction error has been detected.

ad. Turn SENSE SWITCH 2 and 4 on.

ae. Press RUN. The display terminal displays DONE, indicating that DG05 is complete. Diagnostic tests DG06 through DG08 are loaded and executed automatically without operator action, in the same manner as DG01 through DG04.

af Observe the display terminal screen on completion of DG08. Test DG09 is loaded and the display terminal displays:

    DG09
    AFTER IDLE HIT HALT, THEN RUN

ag. When the IDLE indicator lights press HALT and RUN. The display terminal displays:

    AFTER IDLE, HIT RUN

If the IDLE indicator does not light or the display terminal message is missing, an IDLE instruction error has been detected.

ah. Press RUN. The display terminal displays DONE, indicating that DG09 is complete. Diagnostic tests DG10 through DG17, and MEM DG are loaded and executed automatically without operator action, in the same manner as DG02 through DG04 and DG06 through DG08.

NOTE

Diagnostic test MEMDG is the last inter face unit diagnostic. When MEMDG is DONE, the IDLE indicator will light. (Control is not returned to the diagnostic loader.)

ai. If incorrect results are obtained, repeat the test to verify the failure. If the results are still incorrect, replace the interface unit with one of known quality and repeat the test to verify proper operation of the exchanged unit. Refer to Section V of this chapter for the unit removal and replacement procedure.

aj. Rewind and remove the diagnostic tape cartridge from the tape deck of the magnetic tape

recorder-reproducer. Return the tape cartridge to the magnetic tape storage files in the simulator set.

2-26. Computer Set, Digital ANIUYK-23 Diagnostic Tests

The Digital Computer Set, ANIUYK-23 is a Univac Model 1816 digital computer. Operating and maintenance instructions for Digital Computer Set, AN/UYK-23 and Maintenance-Operator Control Panel, C-9633/UYK-23 are contained in a separate set of Univac commercial instruction manuals. See appendix A, References. A complete set of diagnostic programs for the digital computer set is contained on AN/UYK-23 Computer Diagnostic Programs Magnetic Tape Cartridge T153-2. Instructions and procedures for performing the diagnostic tests are contained in Digital Computer Set ANIUYK-23 Diagnostic Manual, Univac Part Number PX10906. Obtain the diagnostic manuals and Magnetic Tape Cartridge T153-2 from the storage files in the simulator set.

a. Place Magnetic Tape Cartridge T153-2 in the tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

b. Refer to the Univac diagnostic manuals for instructions, and run the digital computer diagnostics in the digital computer set.

c. If the test results indicate a failure in the digital computer set or the maintenance-operator control panel, repeat the tests to verify the failure. If a failure is still indicated, replace the failed unit with one of known quality and repeat the tests to verify proper operation of the exchanged unit. Refer to Section V of this chapter for unit removal and replacement procedures.

d. Perform the channel communications diagnostic test in accordance with the procedure contained in paragraph 2-27.

2-27. Channel Communications Diagnostic Test

Magnetic Tape Cartridge T153-2 (digital computer set diagnostic programs) also contains the Channel Communications Test Program. This program is used to test channel communications between Inter face Unit J-3239/USM-393 and the digital computer set. This program should run on successful completion of the digital computer set diagnostic programs. Loading and execution instructions for this program are not contained in the Univac diagnostic manuals; channel communications test instructions are provided in the following steps:

a. Perform a memory initialization procedure on Maintenance-Operator Control Panel *C-9632/-* ALM-153 (para 2-21).

NOTE

Except for tape loading, the operator functions for the remaining steps of this pro-

cedure are to be performed on Maintenance Operator Control Panel *C-9633/UYK-23.* This panel is the top control panel mounted in the simulator set equipment rack.

b. Press STOP and MASTER CLEAR.

c. Place Magnetic Tape Cartridge T153-2 in the tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

d. Press STOP and MASTER CLEAR.

e. Enter $012_{(18)}$ in the P-counter.

f Press START STEP. The PROG RUN indicator lights and the tape advances. When the tape stops, the computer halts, the PROG RUN in dicatorturns off, the PROG STOP indicator lights, and the P-counter displays $067z_{(18)}$ indicating a good load.

NOTE

If the indications in step f are incorrect, press STOP and MASTER CLEAR, rewind the tape, and repeat the procedure.

g. Press the REGISTER DISPLAY CLEAR switch to clear the P-counter.

h. Repeat steps *d* through g two more times to load the channel communications test program, which is the third program on the tape.

i. Press STOP and MASTER CLEAR.

j. Set the P-counter to 000500.

k. Press START STEP. The parameter and control computer stops after approximately one second, and the P-counter contains $664_{(18)}$

l. Press START STEP 10 times, and check the P-counter content after each operation of the switch. The P-counter should contain $664_{(18)}$ after each operation of the switch, a minimum of 9 out of 10 times.

m. If the stop address indicated by the P-counter is incorrect more than once in 10 START STEP switch operations, a parameter and control computer interface malfunction is indicated. Repeat the entire procedure to verify the failure. If a failure is still indicated, replace the monitor-controller with one of known quality and repeat the test to verify proper operation of the exchanged unit. Refer to Section V of this chapter for the unit removal and replacement procedures.

n Rewind and remove the diagnostic tape cartridge from the tape deck of the magnetic tape recorder-reproducer. Return the tape cartridge to the magnetic tape storage files in Simulator Set AN/USM-393.

2-28. Maintenance-Operator Control Panel Tests

The following procedural steps are performed on Maintenance-Operator Control Panel *C-9632/* ALM-153 to test the unit for proper operation. Unit tests for Maintenance-Operator Control Panel C 9633/1JYK-23

are contained in the Univac commercial instruction manuals for Digital Computer Set, AN/UYK-23 (Univac Model 1816). See appendix A.

a Press RST, DATA CLEAR, M. . CLEAR, and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators will light.

b. Press DATA pushbutton 15. The indicator will light.

c. Press RW and REGISTER SELECT E. The REGISTER SELECT E indicator will turn on and the REGISTER SELECT A indicator will turn off.

d. Press DATA CLEAR. All DATA indicators will turn off.

e. Press DATA pushbutton 14. The indicator will light.

f Press RW and REGISTER SELECT B. The REGISTER SELECT E indicator will turn off and the REGISTER SELECT B indicator will turn on.

g. Press DATA CLEAR. The lighted indicators in the DATA register will turn off.

h. Press DATA pushbutton 13. The indicator will light.

i. Press RW and REGISTER SELECT X. The REGISTER SELECT B indicator will turn off and the REGISTER SELECT X indicator will turn on.

j. Press DATA CLEAR. The lighted indicators in the DATA register will turn off.

k. Press DATA pushbutton 12. The indicator will light.

l. Press RW and REGISTER SELECT L. The REGISTER SELECT X indicator will turn off and the REGISTER SELECT L indicator will turn on.

m. Press DATA CLEAR. The lighted indicators in the DATA register will turn off.

n. Press DATA pushbutton 11. The indicator will light.

o. Press RW and REGISTER SELECT S. The REGISTER SELECT L indicator will turn off and the REGISTER SELECT S indicator will turn on.

p. Press DATA CLEAR. The lighted indicators in the DATA register will turn off.

q. Press DATA pushbutton 0. The indicator will light.

r. Press RW and REGISTER SELECT BP. The REGISTER SELECT S indicator will turn off and the REGISTER SELECT BP indicator will turn on.

s. Press DATA CLEAR. The lighted indicators in the DATA register will turn off.

t. Press DATA pushbutton 10. The indicator will light.

u. Press RW and REGISTER SELECT P. The REGISTER SELECT BP indicator will turn off and the REGISTER SELECT P indicator will turn on.

v. Press DATA CLEAR. The lighted indicators in the DATA register will turn off.

w. Press DATA pushbutton 9. The indicator will light.

x. Press RW and REGISTER'SELECT A. The REGISTER SELECT P indicator will turn off and the REGISTER SELECT A and bit 15 DATA register indicators will turn on.

y. Press the following pushbutton switch/indicators and verify the on/off status of the associated indicators listed.

REGISTER SELECT pushbuttons	REGISTER SELECT and DATA indicators (ON)	REGISTER SELECT indicators (OFFI
E	E and DATA 14	A
B	B and DATA 13	E
X	X and DATA 12	B
L	L and DATA 11	X
S	S and DATA 0O	L
BP	BP and DATA 10	S
P	P and DATA 9	BP

z. Press SENSE SWITCH pushbuttons 1, 2, 3, and 4. All four SENSE SWITCH indicators will turn on.

aa Press RST and REGISTER SELECT A and HALT indicators will light and stay on. No other indicators will turn on.

ab. Press MEMORY ADDRESS pushbuttons 0 through 15. All MEMORY ADDRESS indicators will light.

ac. Press M.A. CLEAR. All MEMORY ADDRESS indicators will turn off.

ad Press RI. The PAR, REGISTER SELECT M, and MEMORY ADDRESS 15 indicators will light.

ae. Press RST and REGISTER SELECT A. The PAR indicators will turn off. The REGISTER SELECT A and HALT indicators only will light.

af. Press the following pushbutton switch/indicators and verify the on/off status of the associated indicators listed, then press WI.

NOTE

Pushbutton WI must be pressed after each switch/indicator listed is pressed and the indicator status is verified.

DATA register pushbutton	MEMORY ADDRESS indicator ION)	MEMORY ADDRESS indicator (OFF)
15	15, and REG. SEL. M	
14	14	15
13	14, 15	
12	13	14, 15
11	13, 15	
10	13, 14	15
9	13, 14, 15	
8	12	13, 14. 15
7	12, 15	
6	12, 14	15
5	12, 14, 15	
4	12, 13	14, 15
3	12, 13, 15	
2	12, 13, 14	15
1	12, 13, 14, 15	
0	11	All others

NOTE

All DATA register indicators will be on.

ag. Press RST and REGISTER SELECT A and HALT indicators only will be on.

ah Press the RI pushbutton 16 times as in dictated, and verify the on/off status of the associated indicators listed after each operation of the RI switch/indicator.

Pushbutton switch/ indicator	MEMORY ADDRESS (MA) or DATA register indicator (ON)	MEMORY ADDRESS (MA) or REGISTER SELECT indicator (OFFI)
RI	REGISTER SELECT M, DATA 15	A
RI	MA 14; DATA 14, 15	MA 15
RI	MA 13, 15; DATA 13, 14, 15	
RI	MA 13; DATA 12, 13, 14, 15	MA 14, 15
RI	MA 13, 14; DATA 11-15	

NOTE

The MEMORY ADDRESS register increments each time the RI pushbutton is pressed.

RI	DATA 10 through 15
RI	DATA 9 through 15
RI	DATA 8 through 15
RI	DATA 7 through 15
RI	DATA 6 through 15
RI	DATA 5 through 15
RI	DATA 4 through 15
RI	DATA 3 through 15
RI	DATA 2 through 15
RI	DATA 1 through 15
RI	DATA 0 through 15

ai. Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will turn on.

aj. Press DATA pushbuttons 0, 2, 4, 6, 8, 10, 12, and 14.

ak. Press MW. The REGISTER SELECT M indicator will light.

al Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will light.

am. Press MR. DATA indicators 0, 2, 4, 6, 8, 10, 12, and 14 will light.

an. Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will light.

ao. Press DATA pushbuttons 1, 3, 5, 13, 14, and 15.

ap. Press WI. The MEMORY ADDRESS REGISTER WILL INCREMENT.

aq. Press DATA CLEAR. All DATA register indicators will turn off.

ar. Press DATA pushbuttons 1 through 7.

as. Press WI. The MEMORY ADDRESS register will increment.

at. Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will light.

au Press RUN. The RUN and IDLE indicators will light.

av. Press HALT. The HALT indicator will light and the RUN and IDLE indicators will turn off.

aw. Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will light.

ax. Press DATA pushbuttons 0, 6, and 15; then press WI. The MEMORY ADDRESS register will increment.

ay. Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will light.

az. Press BP. The indicator should light. Press DATA CLEAR. All DATA indicators will turn off.

ba Press RW, then press BPI. The BPI and HALT indicators will turn on.

bb. Press HALT. The BPI indicator will turn off.

bc. Press BPR. The BPR and HALT indicators will turn on.

bd Press HALT. The HALT indicator will stay on and the BPR indicator will turn off.

be. Press the REGISTER SELECT X push- button; the indicator will light. Press DATA CLEAR, then press RW.

bf Press BP, DATA pushbutton 14, and RW.

bg. Press BPW. The HALT indicator will stay on and the BPW indicator will light.

bh. Press HALT, The HALT indicator will stay on and the BPW indicator will turn off.

bi. Press RST and REGISTER SELECT A. The REGISTER SELECT A and HALT indicators only will light.

bj. Press IR. The indicator will light.

bk. Press INST. DATA indicators 0, 6, and 15 will light.

bl. Press INST again. DATA indicators 1 through 7 will light.

bm. Press HALT and RST (end of test)

bn. If an error is detected, repeat the entire procedure to verify the failure.

2-29. Magnetic Tape Recorder-Reproducer Diagnostic Tests

The following procedure provides instructions for use of Magnetic Tape Recorder-Reproducer Test Program to test Magnetic Tape Recorder-Reproducer, RD-392/U (single tape transport) and RD 392A/U (two tape transports). This program is provided on Computer Peripheral Test Programs Magnetic Tape Cartridge T153-4. Obtain Magnetic Tape Cartridge T153-4 from the magnetic tape storage files in Simulator Set AN/USM-393, and take cartridge to the flight line test set.

NOTE
The operator functions in this test are per formed on Maintenance-Operator Control Panel C-9632/ALM-153 and the keyboard of the Display Terminal

Systematics General T-5145G (HP2648A).

a. Press HALT and RST on the maintenance operator control panel.

b. Set the controls on the display terminal as follows:

Control	*Setting*
PARITY	NONE
BLOCK MODE	DOWN
DUPLEX	HALF
BAUD RATE	9600'
REMOTE	DOWN
CAP LOCK	DOWN
AUTO LF	DOWN'
MEMORY LOCK	UP

c. Perform a memory initialization procedure on the maintenance-operator control panel (para 2-21).

d. Place Magnetic Tape Cartridge T153-4 in the tape deck of the tape recorder-reproducer, and place the tape ON LINE.

e. Load and execute the recorder-reproducer test program using the object program loading procedure. The recorder-reproducer test program is the first program on Tape Cartridge T153-4.

f Press HALT and RST.

g. Rewind and remove the tape cartridge from the tape deck of the magnetic tape recorder-reproducer.

h. Place a new or recently degaussed write-enabled magnetic tape cartridge in the tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

i. Press RUN. The display terminal displays: I
U440-2 CARTRIDGE TAPE RECORDER
TEST ENTER COMMAND (PC FOR COM-
MAND DESCRIPTIONS).

NOTE
Step j is not mandatory for test performance.

j. Enter the command PC, then press ENTER on the keyboard of the display terminal. The display terminal displays a list of the program commands and a definition of each.

k. Enter the command DG, then press ENTER on the keyboard. The following messages are displayed on the display terminal during test execution. This requires approximately two minutes.
DG
EACH DRIVE WILL BE TESTED IF
LOADED WITH TAPE.
A BINARY COUNT WILL BE WRITTEN TO
DECK 01 TRACK 01
A BINARY COUNT WILL BE WRITTEN TO
DECK 01 TRACK 02
A BINARY COUNT WILL BE WRITTEN TO
DECK 01 TRACK 03

A BINARY COUNT WILL BE WRITTEN TO
DECK 01 TRACK 04
A BINARY COUNT WILL BE READ FROM
DECK 01 TRACK 01
A BINARY COUNT WILL BE READ FROM
DECK 01 TRACK 02
A BINARY COUNT WILL BE READ FROM
DECK 01 TRACK 03
A BINARY COUNT WILL BE READ FROM
DECK 01 TRACK 04
TURN OFF WRITE ENABLE PLUG ON
DECK NO 01
TYPE ENTER RETURN WHEN READY

l. Do not turn off the write enable control.

m. On completion of the test, press ENTER on the keyboard. The display terminal displays:
STATUS=3C22, CARTRIDGE NOT SAFE.
DONE.

NOTE

If a failure is detected during test execution, the program displays an error message on the display terminal. If the IDLE indicator lights after an error message is displayed, press RUN to continue. If a data error occurs, up to 256 error messages can be displayed.

If error messages are displayed on the display terminal, repeat the entire procedure to verify the failure. If a failure is still indicated, press HALT and RST, rewind and remove the tape cartridge, and replace the magnetic tape recorder-reproducer with one of known quality. Then repeat the test to verify proper operation of the exchanged unit. Refer to Section V of this chapter for the unit removal and replacement procedures.

n. If the test completes successfully, press HALT and RST. Rewind and remove the scratch tape cartridge from the tape deck of the magnetic tape recorder-reproducer. Return the tape cartridges to the magnetic tape storage files in Simulator Set AN/USM-393.

2-30.   Display Terminal Diagnostic Tests

The following procedure provides instructions for use of the Systematics General T-5145G Test Pro gram to test the Systematics General T-5145G Display Terminal. This is the second program contained on Computer Peripheral Test Programs Magnetic Tape Cartridge T153-4. Obtain Magnetic Tape Cartridge T153-4 from the magnetic tape storage files in Simulator Set AN/USM-393, and take cartridge to the flight line test set.

NOTE

The operator functions in this test are per formed on Maintenance-Operator Control Panel C-9632/ALM-153 and the keyboard of the display terminal.

a. Press HALT and RST on the maintenance-operator control panel.

b. Set the controls on the display terminal as follows:

Control	Setting
PARITY	NONE
BLOCK MODE	DOWN
DUPLEX	HALF
BAUD RATE	9600
REMOTE	DOWN
CAP LOCK	DOWN
AUTO LF	DOWN
MEMORY LOCK	UP

c. Perform a memory initialization procedure on the maintenance-operator control panel.

d. Place Computer Peripheral Test Programs Magnetic Tape Cartridge T153-4 in the tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

e. Press RST on the maintenance-operator control panel and press home (and CLEAR on the keyboard of the display terminal.

f Load Systematics General T-5145G Test Program. This is second program on the tape cartridge.

g. Press RST, then RUN on the maintenance-operator control panel.

h. Observe the display terminal screen, which is filled with alphanumeric characters. Check that the numerical sequence (0-9) and the alphabetical sequence (A-Z) are correct. Also check that all alpha numeric characters and symbols are aligned vertically in each column (A over A, B over B, etc).

i. Press ENTER on the keyboard when ready to continue. The display terminal displays:
TYPE ALL CHARACTERS ON ONE LINE
AND ENTER

Type all lower and upper case alphabetical and numeric characters and symbols (but not controls) on the keyboard followed by ENTER. The display terminal displays each character as typed and repeats all characters after ENTER is pressed. Verify that all characters typed are repeated. (This step does not verify that all characters have been in put.)
(Enter empty line to continue)

j. The program then performs a graphic test. When complete the display terminal displays:
TEST COMPLETE

k. If an error condition is indicated, repeat the entire procedure to verify the failure. If a failure is still indicated, replace the display terminal with one of known quality and repeat the test to verify proper operation of the exchanged unit. Refer to Section V of this chapter for the unit removal and replacement procedures.

l. Rewind and remove the tape cartridge from the tape deck of the magnetic tape recorder-reproducer. Return the tape cartridge to the magnetic tape storage files in Simulator Set AN/USM-393.

2-31. Line Printer Diagnostic Tests

The following procedure provides instructions for use of Tally T-5000 Line Printer Test Program to test the Tally T-5000 Line Printer. This program is contained on Computer Peripheral Test Programs Magnetic Tape Cartridge T153-4. Obtain the magnetic tape cartridge from the magnetic tape storage files in the simulator set.

NOTE

Maintenance-Operator Control Panel C-9632/ALM-153 is used to load and execute the line printer diagnostic program.

a Press HALT and RST.

b. Set the controls on the display terminal as follows:

Control	Setting
PARITY	NONE
BLOCK MODE	DOWN
DUPLEX	HALF
BAUD RATE	9600
REMOTE	DOWN
CAP LOCK	DOWN
AUTO LF	DOWN
MEMORY LOCK	UP

c. Set the controls on the line printer as follows:

NOTE

The DIP switch is located just inside the rear cover of the line printer on the lower right of the RS-232 circuit card.

(1) Inside rear cover, set DIP switch (fig. 2-1.1) as follows:

Switch	Setting
9600	ON
4800	OFF
2400	OFF
1200	OFF
600	OFF
P ENABLE	OFF
PARITY	EVEN

(2) Lift top cover of the line printer and set the POWER ON-OFF and five toggle switches (fig. 2-1.2) as follows:

Switch	Setting
POWER ON-OFF	ON
STD/ALT CHAR SET	STD
TEST/RUN MODE	RUN
6/8 LPI	6
10/13.3 CPI	10
1/2	Not used

d Perform a memory initialization procedure on the maintenance-operator control panel (para 2-21).

e. Place Magnetic Tape Cartridge T153-4 in the left-hand tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

f. Load and execute the Line Printer Test Program, using the object program loading procedure. This is the fourth program on tape cartridge T153-4.

g. Press HALT and RST.

h. Deleted.

i. Press the ON-LINE switch/indicator (fig. 2-1.3) on the top of the printer. The ON-LINE indicator will light.

NOTE

If the indications observed on the line printer are incorrect at any time during the diagnostic test execution, refer to the Tally Series T-5000 Line Printer commercial instruction manual and correct the problem before proceeding.

If the user attempts to execute the line printer diagnostic with the line printer ON LINE switch OFF or the maintenance operator control panel SENSE SWITCH 2 ON, the display terminal displays and explanatory message for the ON-LINE switch and requests that the operator turn off SENSE SWITCH 2.

j. Verify that SENSE SWITCH 2 on the control panel is off.

k. Press RUN. The line printer prints 132 columns of continuous Vs. Allow the line printer to print two or three pages and verify that the printed output meets the following criteria: (1) One-hundred thirty-two (132) columns are printed.

(2) The characters have uniform density.

(3) The vertical and horizontal character alignment is even.

(4) The dual circuit breaker does not trip.

l. Set SENSE SWITCH 2 on the control panel to ON. The line printer advances the paper to the top of the next page (top of the form) and then prints a sliding test pattern (fig. 2-1).
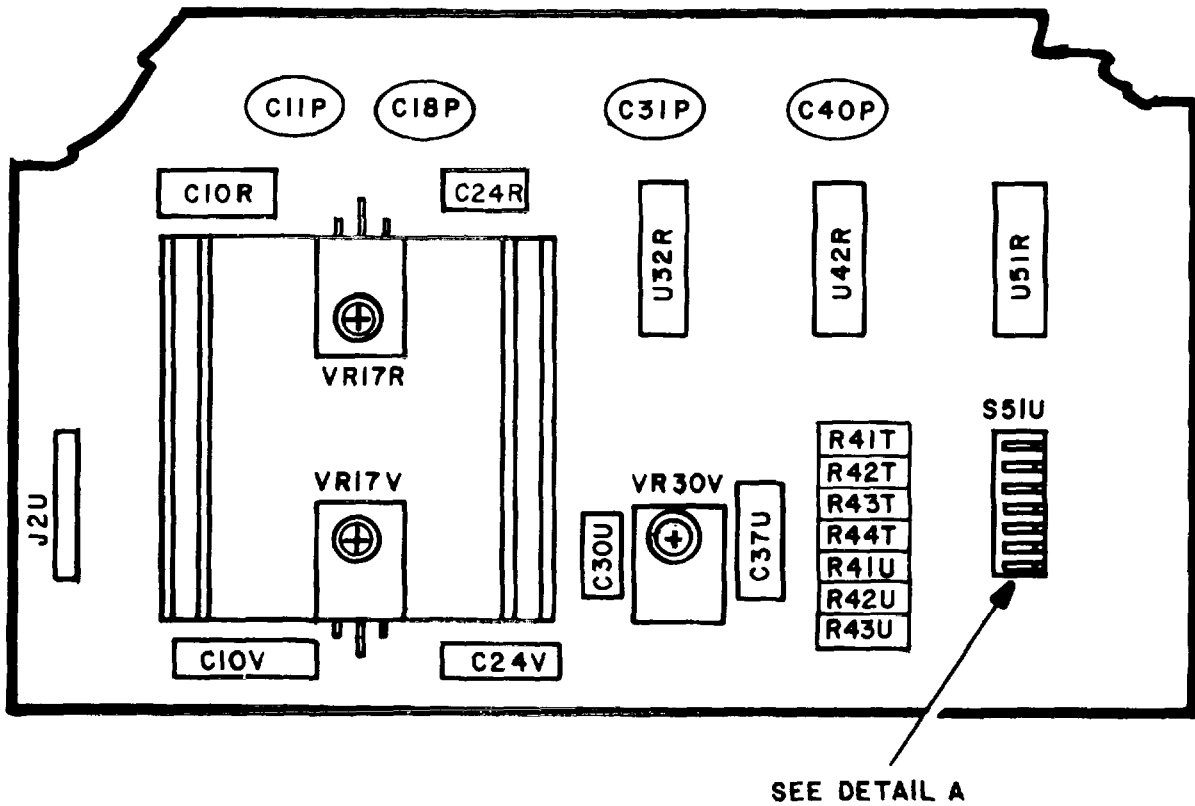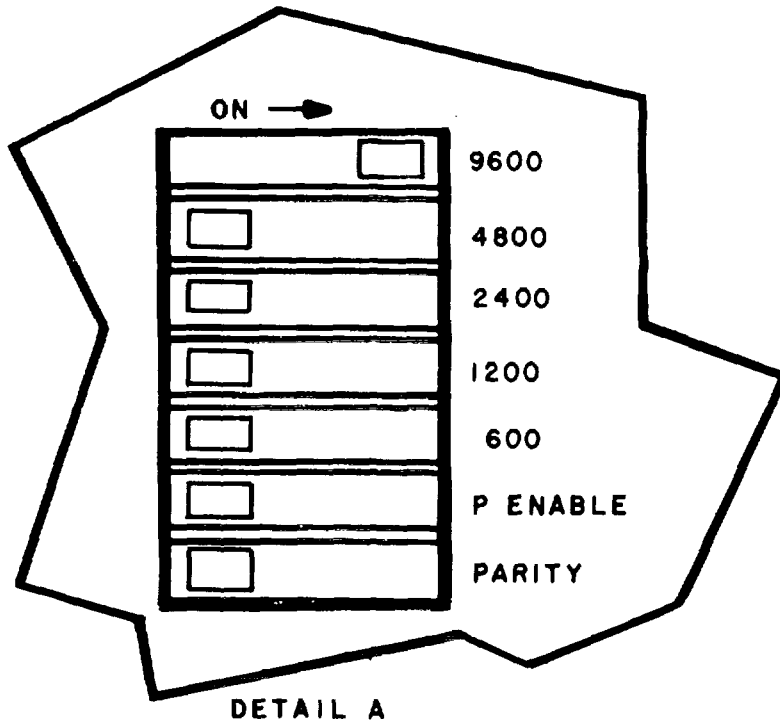
(1) One-hundred thirty-two columns are printed.

(2) The characters have uniform density.

(3) Characters are printed in all horizontal positions.

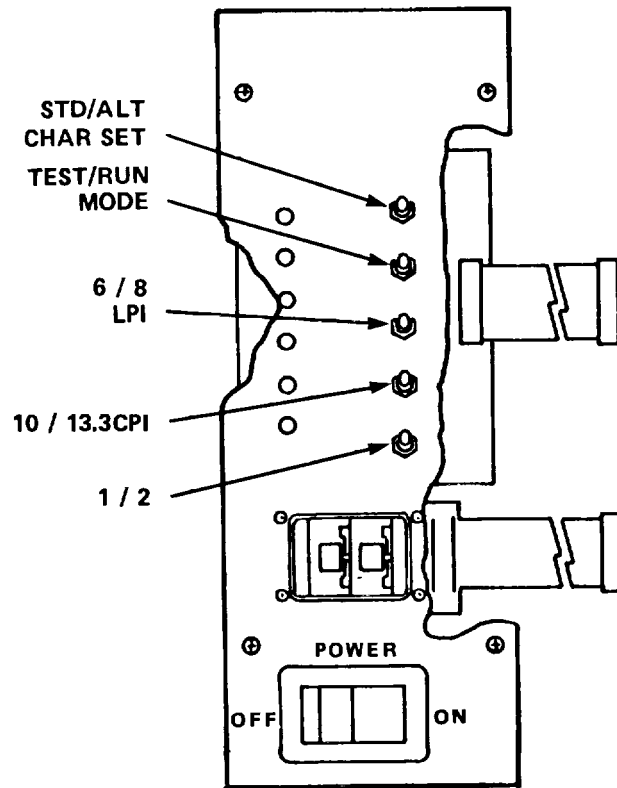(4) All characters are aligned vertically and horizontally.

Figure 2-1. Line Printer Test Pattern

m. Set SENSE SWITCH 2 on the control panel to off. The line printer advances the paper to the top of the next page and then prints a variable-line-length test pattern (fig. 2-2). The first line printed contains a single character and each succeeding line contains one additional character until the line length equals 132.

Change 1 2-16

DETAIL A

SEE DETAIL A

EL20S008

Figure 2-1.1.   Partial View of Circuit Card Assembly, RS-232 I/0

Change 1 2-17

STD/ALT
CHAR SET

TEST/RUN
MODE

6 / 8
LPI

10 / 13.3CPI

1 / 2

POWER

OFF   ON

EL20S009

Figure 2-1.2. Auxiliary Control Panel Assembly

Change 1 2-18

VERTICAL FORMS
ADJUST KNOB

CONTROL PANEL

FORMS THICKNESS
CONTROL (DETAIL A)

GATE LATCH

GATE

PRINT
HELIX

HAMMER BANK

AUXILARY
CONTROL
PANEL

POWER SWITCH

.014
.012
.010
.008
.006
.004
.002

FORMS THICKNESS

DETAIL A
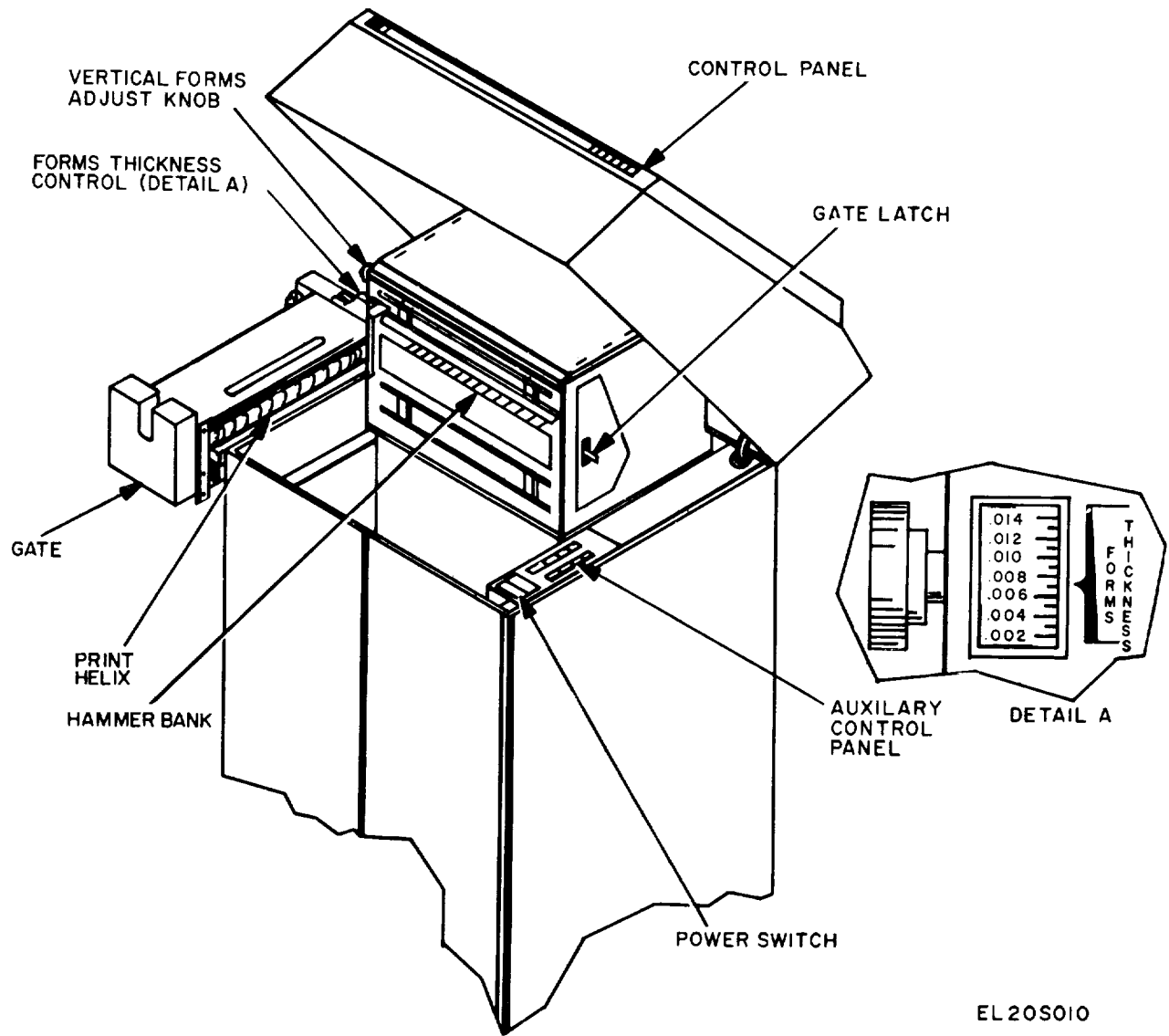
EL 20S010

Figure 2-1.3. Location of Line Printer Controls

Change 1 2-19

characters. The line printer then advances the paper to V pattern once again. the top of the next page and starts to print the con

tinuous V pattern once again.

```
A
AB
ABC
ABCD
ABCDE
ABCDEF
ABCDEFG
ABCDEFGH
ABCDEFGHI
ABCDEFGHIJ
ABCDEFGHIJK
ABCDEFGHIJKL
ABCDEFGHIJKLM
ABCDEFGHIJKLMN
ABCDEFGHIJKLMNO
ABCDEFGHIJKLMNOP
ABCDEFGHIJKLMNOPQ
ABCDEFGHIJKLMNOPQR
ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRST
ABCDEFGHIJKLMNOPQRSTU
ABCDEFGHIJKLMNOPQRSTUV
ABCDEFGHIJKLMNOPQRSTUVW
ABCDEFGHIJKLMNOPQRSTUVWX
ABCDEFGHIJKLMNOPQRSTUVWXY
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZA
ABCDEFGHIJKLMNOPQRSTUVWXYZAB
ABCDEFGHIJKLMNOPQRSTUVWXYZABC
ABCDEFGHIJKLMNOPQRSTUVWXYZABCD
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDE
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEF
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFG
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGH
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHI
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJ
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJK
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKL
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMN
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNO
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQ
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQR
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRST
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTU
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUV
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVW
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWX
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXY
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZA
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZAB
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABC
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCD
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDE
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEF
```

EL2OS003

Figure 2-2. Line Printer Variable-Line-Length Test Pattern

Change 1   2-20

n. Press HALT and RST to stop program execution.

o. Set SENSE SWITCH 1 on the control panel to on. The diagnostic program tests the line printer operation without interrupts.

p. Repeat steps *k* through o.

q. If an error condition is indicated, repeat the entire procedure to verify the failure. If a failure is still indicated, replace the line printer with one of known quality and repeat the test to verify proper operation of the exchanged unit. Refer to Section V in this chapter for the unit removal and replacement procedures.

r. Rewind and remove the diagnostic tape cartridge from the tape deck of the magnetic tape recorder-reproducer. Return the tape cartridge to the magnetic tape storage files in the simulator set.

2-32. Paper Tape Reader/Perforator Diagnostic Tests

The following procedure provides instructions for use of Paper Tape Reader/Perforator Test Program to test the Paper Tape Reader/Perforator System, Remex RAB6375BAX. This program is contained on Computer Peripheral Test Programs Magnetic Tape Cartridge T153-4. The paper tape reader test number is also required to perform the diagnostic tests. Obtain the magnetic tape cartridge and Paper Tape/Reader Test Tape from the magnetic tape storage files in the simulator set.

a. Press HALT and RST on the Maintenance Operator Control Panel C-9632/ALM-153.

b. Set the controls on the display terminal as follows:

Control	Setting
PARITY	NONE
BLOCK MODE	DOWN
DUPLEX	HALF
BAUD RATE	9600
REMOTE	DOWN
CAP LOCK	DOWN
AUTO LF	DOWN
MEMORY LOCK	UP

c. Perform a memory initialization procedure on the C-9632/ALM-153 control panel (para 2-21).

d. Place Magnetic Tape Cartridge T153-4 in the left tape deck of the magnetic tape recorder-reproducer, and place the tape ON LINE.

e. Load and execute the REMEX PAPER TAPE READER/PUNCH DIAG test program, using the object program loading procedure. This is the seventh program on the tape.

NOTE
Control settings in the following steps are performed on Maintenance-Operator Control Panel C-9632/ALM-153.

f. Press HALT and RST.

g. Set SENSE SWITCH 2 to on, then press RUN. The display terminal displays the following message:
PAPER TAPE READER TEST SELECTED LOAD TEST TAPE (OUTPUT FROM PUNCH TEST) IN READER AND PRESS RUN WHEN READY TO START TEST

h. Load Paper Tape Reader Test Tape in the paper tape reader. Position the test tape so that a minimum of six inches of leader remains before the start of the first test pattern.

i. Press RUN. The paper tape starts and the paper tape moves through the reader. The paper tape should stop before the end of the tape is reached. After the tape stops, the display terminal displays:
TEST COMPLETE NO ERRORS FOUND

NOTE
If the indications observed on the paper tape reader/perforator and the display terminal are incorrect, refer to the troubleshooting chart in figure 2-1 and correct the problem before proceeding.

j. Note that the IDLE indicator lights after the TEST COMPLETE message is displayed on the display terminal. Then set SENSE SWITCH 3 to on. (SENSE SWITCHES 2 and 3 should now be on.)

k. Press RUN. The display terminal displays:
PAPER TAPE READER TEST SELECTED LOAD TEST TAPE (OUTPUT FROM PUNCH TEST) IN READER AND PRESS RUN WHEN READY TO START TEST A LEVEL 6 INTERRUPT IS RECEIVED AND CHECKED FOR EACH CHARACTER READ OR PUNCHED

l. Rewind the paper test tape and reload in the paper tape reader as described in step j.

m. Press RUN. The paper tape reader starts, the tape moves through the tape reader, and the tape should stop on the tape trailer before the end of the tape is reached. After the tape stops, the display terminal displays:
TEST COMPLETE NO ERRORS FOUND

n. Note that the IDLE indicator lights after the TEST COMPLETE message is displayed on the display terminal. Then set all SENSE SWITCHES to off.

o. Ensure that the paper tape punch contains an adequate supply of paper tape (one-quarter roll, minimum). The punch test that follows uses approximately 100 feet of paper tape and is executed twice. Be sure that the chad box is emptied each time a new roll of paper tape is loaded into the paper tape punch. Refer to Remex Commercial Instruction Manual RPM-I1A-2 for paper tape loading and chad box removal instructions.

p. Press RUN. The display terminal displays a

message that describes the test tape to be punched. After the message is displayed, the IDLE indicator will light.

q. Press RUN. The paper tape punch starts and runs for approximately two minutes, in which time 8704 (10) characters are punched. After the paper I tape punch stops, the display terminal displays:

TEST COMPLETE PRESS RUN TO CONTINUE

r. Set SENSE SWITCH 3 to on, then press RUN. The display terminal displays the same test tape description displayed in step r and:

A LEVEL 6 INTERRUPT IS RECEIVED AND CHECKED FOR EACH CHARACTER READ OR PUNCHED

s. Press RUN. The paper tape punch again starts and runs for approximately two minutes (see step s).

After the paper tape punch stops, the display terminal displays:

TEST COMPLETE PRESS RUN TO CONTINUE

t. Tear off the test tape and wind into a roll, using the SPOOL switch on the paper tape reader/perforator.

NOTE
The following steps are performed with the assumption that the paper tape reader is functioning properly.

u. Press HALT and RST.

v. Load the test tape just punched and wound into the paper tape reader.

w. Repeat steps **i** k, and *1.*

x. Without rewinding the test tape, repeat steps m, o, and p. Since the test tape used in this step and step y was generated on the paper tape punch and read on a known good paper tape reader, any errors detected are paper tape punch errors.

y. Press HALT and RST.

z. If an error condition is indicated, repeat the entire procedure to verify the failure. If a failure is still indicated, replace the paper tape reader or paper tape punch with one of known quality and repeat the test to verify proper operation of the exchanged unit, Refer to Section V in this chapter for unit removal and replacement procedures.

aa. Rewind and remove the diagnostic tape cartridge from the tape deck of the magnetic tape recorder-reproducer. Return the tape cartridge to the magnetic tape storage files in the simulator set.

2-33. Disc Memory Diagnostic Tests

The following procedure provides instructions for use of DDC Model 9111-B-4 Disc Diagnostic Program T393-2 to test and verify the interface with the disc controller, Interface Unit J-3239/USM393, and the DDC Model 9111-B-4 disc storage device. This program is furnished on Applications

Object Tape Magnetic Tape Cartridge T393-2. Obtain the magnetic tape cartridge from the magnetic tape storage files in Simulator Set AN/USM-393.

NOTE
This diagnostic program exercises the entire disc memory and destroys previous contents.

a. Ensure that all applicable associated equipment is turned on.

b. Be sure the write-enable control, on the magnetic tape cartridge containing the program to be loaded, is set to SAFE.

c. Place magnetic tape cartridge in the tape deck of the magnetic tape recorder-reproducer.

d. Allow the tape to reach the load point, then press the ON LINE pushbutton on the magnetic tape recorder-reproducer. The ON LINE indicator will light.

e. Press HALT and RST on Maintenance Operator Control Panel C-9632/ALM-153. The HALT indicator will light.

f. Press the REGISTER SELECT P pushbutton. The P indicator will light.

g. Center /2038 into the P-register by pressing DATA switches 2, 10, 11, and 12.

h. Turn SENSE SWITCH 3 and 4 on.

i. Press RUN. The DATA indicators display changing states. When the DATA display stabilizes, the RUN and IDLE indicators are on.

NOTE
The IDLE indicator will light when the program has been successfully loaded. If the IDLE indicator does not light, perform step 10 and repeat the procedure.

j. On the magnetic tape recorder-reproducer, press the ON LINE pushbutton (turning the ON LINE indicator off), then press the REWIND pushbutton. Wait for the REWIND indicator to turn off.

k. Press the UNLOAD pushbutton on the magnetic tape recorder-reproducer and wait for the tape cartridge to eject.

l. Press HALT and RST on the maintenance operator control panel.

NOTE
The disc diagnostic program can be run as a standard short run test by entering address 0 in the P-register, or as a standard long run test by entering address 2 in the P-register.

m. Remove the tape cartridge from the tape deck of the magnetic tape recorder-reproducer. Return the tape cartridge to the magnetic tape storage files in the simulator set.

n. After the program has been successfully loaded, press RUN on the maintenance-operator control panel to execute the program.

2-34. Lambda Power Supply Assemblies (Unit 12 and Unit 14) Troubleshooting and Adjustment Procedures

a. Power Supply Assembly (Unit 12) Troubleshooting Procedure.

(1) Refer to TM 11-5895-955-10-1 for unit location in Simulator Set AN/USM-393.

(2) Confer with operator personnel to obtain trouble indications noted during equipment operation.

(3) Ensure that the front panel power ON/OFF switch is in the ON position. Check the front panel FUSE for continuity. Replace if necessary.

(4) Place the front panel meter selector switch to position 1, and observe the voltmeter 20V scale for a reading of 15 volts +5 percent.

(5) Place the meter selector switch to position 2, and observe the voltmeter 10V scale for a reading of 5 volts +5 percent.

(6) Place the meter selector switch to position 3, and observe the voltmeter 20V scale for a reading of 12 volts +5 percent.

(7) Place the meter selector switch to position 4, and observe the voltmeter 50V scale for a reading of 24 volts +5 percent.

(8) If any of the above voltages are out of tolerance, adjust as directed in c below.

(9) If the fuse replacement and/or voltage adjustments fail to correct the problem, notify direct support maintenance personnel for removal and replacement of the power supply assembly.

b. Model LMG5-OVM-R +5V Power Supply Assembly (Unit 14) Troubleshooting Procedure.

(1) Confer with operator personnel to obtain trouble indications noted during equipment operation.

(2) Check the front panel ON circuit breaker. Reset the circuit breaker if it has tripped.

(3) Observe the front panel voltmeter for a reading of 5 volts +5 percent. If the voltage is out of tolerance, adjust as described in *d* below.

(4) If resetting the circuit breaker and adjusting the voltage fails to correct the problem, notify direct support maintenance personnel for further troubleshooting and/or power supply removal and replacement.

c. Lambda Power Supply Assembly (Unit 12) Adjustment Procedures.

(1) Place the meter selector switch to position 1.

(2) Locate the front panel voltage adjustment:

Model LCS-B-15
Im 3.2A
Fx 100
15V +5%
Bx 1

Loosen the lock nut. Observe the voltmeter 20V scale, and adjust for 15 volts +5 percent. Tighten the lock nut after the proper voltage is obtained.

(3) Place the meter select switch to position 2.

(4) Locate the front panel voltage adjustment:

Model LCS-B-5-OV
Im 5.8A
Dx 1000
5V +5%
Ax 1

Loosen the lock nut. Observe the voltmeter 10V scale, and adjust for 5 volts +5 percent. Tighten the lock nut after the proper voltage is obtained.

(5) Place the meter selector switch to position 3.

(6) Locate the front panel voltage adjustment:

Model LXS-D-12-R
Im 16.0A
Ex 1000
12V +5%
Bx 1

Loosen the lock nut. Observe the voltmeter 20V scale, and adjust for 12 volts +5 percent. Tighten the lock nut after the proper voltage is obtained.

(7) Place the meter selector switch to position 4.

(8) Locate the front panel voltage adjustment:

Model LCS-B-24
Im 2.IA
Fx 1000
24V +5%
Cx 1

Loosen the lock nut. Observe the voltmeter 50V scale, and adjust for 24 volts +5 percent. Tighten the lock nut after the proper voltage is obtained.

d Model LMG5-OVM-R +5V Power Supply Assembly (Unit 14) Adjustment Procedure.

(1) Loosen the lock nut on the front panel voltage adjustment (VOLT ADJ), located below the 8Vdc voltmeter.

(2) Adjust for 5 volts +5 percent on the voltmeter, and tighten the lock nut.

Section VI. UNIT REMOVAL REPLACEMENT PROCEDURES

2-35. General

This section contains removal and replacement procedures for the component units of Simulator Set AN/USM-393, except for Digital Data Set AN/USQ-61A Receiver-Transmitter RT-254A/ VRC, and components of Semitrailer Van, V-495/USM-393. Removal and replacement procedures for this equipment, except for the van, are contained in separate technical manuals. Refer to appendix A, References.

NOTE
When a unit is removed, always check
the associated cables for fraying and the
cable connectors for bent or pushed-
back pins. Most of the units in the
simulator set equipment rack are
mounted on slide assemblies. A portion
of each slide assembly is secured to the
sides of the mounted unit. If a
replacement unit is not equipped with
these parts, the parts must be removed
from a defective unit and secured to the
replacement unit before the unit can be
installed in the equipment rack.

2-36. Digital Computer Set, ANIUYK-23
   a. Removal Procedure.
      (1) Remove and retain the Phillips-head
screws that secure the front panel of the unit to the
equipment rack.
      (2) Pull the unit forward until the slides are
fully extended.
      (3) Mark and carefully disconnect all
electrical connectors from the unit.
      (4) Release the slide locks, and remove the
unit from the slide assembly and the rack.
   b. Replacement Procedure.
      (1) Be sure that the replacement unit is
equipped with slide assembly components.
      (2) Extend the rack-mounted portion of the
slide assembly, release the slide locks, and install the
replacement unit on the slides.
      (3) Observe the markings and carefully
connect the electrical connectors to the proper
receptacles on the unit. Be sure that all connectors are
firmly tightened.
      (4) Slide the unit into the rack, and secure
the front panel to the rack with the previously removed
screws.

**2-37. Maintenance-Operator Control Panel, C-
96331UYK-23**
   a. Removal Procedure.
      (1) Remove and retain the Phillips-head
screws that secure the control panel to the equipment
rack.
      (2) Support the unit and pull forward.
      (3) Mark and carefully disconnect all
electrical connectors from the maintenance-operator
control panel.
      (4) Remove the maintenance-operator
control panel from the equipment rack.
   b. Replacement Procedure.
      (1) Support the replacement unit, observe
the markings, and carefully connect the electrical
connectors to the proper receptacles on the
maintenance-operator control panel. Be sure that all
connectors are firmly tightened.

      (2) Position the unit in place in the
equipment rack, and align the holes for the mounting
screws. Be sure that the cables are not crimped or
binding.
      (3) Secure the control panel to the rack with
the previously removed screws.

2-38. Interface Unit J-32391USM-393
   a. Removal Procedure.
      Be sure that all power is removed from the unit.
      (2) Mark or tag all cables that connect to the
front panel jacks so jacks can be readily identified and
correctly connected on the replacement unit.
      (3) Carefully disconnect all cables from the
unit.
      (4) Turn the two retaining wingnuts
counterclockwise until wingnuts are free of the locked
position.
      (5) Gently pull the interface unit from the
mounting tray, and remove from the equipment shelf
assembly.
   b. Replacement Procedure.
      (1) Slide the replacement interface unit on
the mounting tray until the alignment pins just begin to
enter the holes on the rear of the unit.
      (2) Tighten the two retaining wingnuts until
the unit is firmly seated in the mounting tray.
      (3) Observe the markings or tags, and
carefully connect the cables to the proper jacks on the
front panel of the unit. Be sure that all connectors are
firmly tightened.
      (4) Back off the two retaining wingnuts two
turns, then turn them clockwise until the unit is firmly
seated in the mounting tray. Be sure that the wingnuts
are firmly tightened.

**2-39. Maintenance-Operator Control Panel, C-
96321ALM-153**

   a   Removal Procedure.
      (1) Remove and retain the Phillips-head
screws that secure the front panel of the unit to the
equipment rack.
      (2) Pull the unit forward until the slides are
fully extended.
      (3) Mark and carefully disconnect all
electrical connectors from the unit.
      (4) Release the slide locks, and remove the
unit from the slide assembly and the rack.
   b. Replacement Procedure.
      (1) Be sure that the replacement unit is
equipped with slide assembly components.
      (2) Extend the rack-mounted portion of the
slide assembly, release the slide locks, and install the
replacement unit on the slides.
      (3) Observe the markings, and carefully
connect the electrical connectors to the proper

receptacles on the unit. Be sure that all connectors are firmly tightened.

(4) Slide the unit into the rack, and secure the front panel to the rack with the previously removed screws.

2-40. Interface Unit J-3238/ALM-153

a. *Removal Procedure.*

(1) Remove and retain the Phillips-head screws that secure the front panel of the unit to the equipment rack.

(2) Pull the unit forward until the slides are fully extended.

(3) Mark and carefully disconnect all electrical connectors from the unit.

(4) Release the slide locks, and remove the unit from the slide assembly and the rack.

b. *Replacement Procedure.*

(1) Be sure that the replacement unit is equipped with slide assembly components.

(2) Extend the rack-mounted portion of the slide assembly, release the slide locks, and install the replacement unit on the slides.

(3) Observe the markings, and carefully connect the electrical connectors to the proper receptacles on the unit. Be sure that all electrical connectors are firmly tightened.

(4) Slide the unit into the rack, and secure the front panel to the rack with the previously removed screws.

2-41. Magnetic Tape Recorder Reproducer, *RD-3921U* or RD-392AIU

a. *Removal Procedure.*

(1) Remove and retain the Phillips-head screws that secure the front panel of the unit to the equipment rack.

(2) Pull the unit forward until the slides are fully extended.

(3) Mark and carefully disconnect all electrical connectors from the unit.

(4) Release the slide locks, and remove the unit from the slide assembly and the rack.

b. *Replacement Procedure.*

(1) Be sure that the replacement unit is equipped with slide assembly components.

(2) Extend the rack-mounted portion of the slide assembly, release the slide locks, and install the replacement unit on the slides.

(3) Observe the markings, and carefully connect the electrical connectors to their proper receptacles on the unit. Be sure that all connectors are firmly tightened.

(4) Slide the unit into the rack, and secure the front panel to the rack with screws.

2-42. Paper Tape Reader/Perforator System, Remex Model RAB6375BAX

a. *Removal Procedure.*

(1) Remove and retain the Phillips-head screws that secure the front panel of the unit to the equipment rack.

(2) Pull the unit forward until the slides are fully extended.

(3) Mark and carefully disconnect all electrical connectors from the unit.

(4) Release the slide locks, and remove the unit from the slide assembly and the rack.

b. *Replacement Procedure.*

(1) Be sure that the replacement unit is equipped with slide assembly components.

(2) Extend the rack-mounted portion of the slide assembly, release the slide locks, and install the replacement unit on the slides.

(3) Observe the markings, and carefully connect the electrical connectors to the proper receptacles on the unit. Be sure that all connectors are firmly tightened.

(4) Slide the unit into the rack, and secure the front panel to the rack with screws.

2-43. Display Terminal, Systematics General T-5145G (HP2648A)

a. *Removal Procedure.*

NOTE

The display terminal is attached with isolators to a mounting tray.

(1) Unplug power cable.

(2) Disconnect cable assembly W97.

(3) Release the draw latches from the mounting rails.

(4) Lift the terminal and mounting tray out of the rack.

NOTE

If the display terminal is to be shipped out of the unit for repairs, perform steps (5) through (12) to detach the mounting tray. Work space should be at least twice as large as the base of the display terminal.

(5) Place the display terminal on a large flat work surface.

(6) Release the cabinet latches on each side of the display terminal.

(7) Raise the lid.

(8) Release the lid retainer lever by pressing the reating lever toward the inside of the cabinet while continuing to raise the lid.

(9) Gently lay the lid back onto the flat work surface.

(10) Refer to TM 11-7440-306-34 and remove the display terminal power supply.

(11) Use a 9/16-inch socket wrench and remove the MS35308-305 cap screws from the mainframe shell and studs in the shock mounts.

(12) Lift the display terminal from the mounting tray.

b. Replacement Procedure.

NOTE

If the display terminal is a replacement unit, the mounting tray will not be attached. Perform steps (1) through (12) to attach the mounting tray to the display terminal. If the display terminal is a previously installed unit with the mounting tray attached, proceed to step (13). Work space should be at least twice as large as the base of the display terminal.

(1) Place the display terminal on a large flat work surface.

(2) Release the cabinet latches on each side of the display terminal.

(3) Raise the lid.

(4) Release the lid retainer lever by pressing the retaining lever toward the inside of the cabinet while continuing to raise the lid.

(5) Gently lay the lid back onto the flat work surface.

(6) Refer to TM 11-7440-306-34 and remove the display terminal power supply.

(7) Position the display terminal on the mounting tray.

(8) Align the holes in the mainframe shell over the studs in the shock mounts.

(9) Insert the MS35308-305 cap screws through the holes in the mainframe shell into the studs in the shock mounts and tighten with a 9/16-inch socket wrench.

(10) Refer to TM 11-7440-306-34 and reinstall the power supply.

(11) Replace the lid on top of the mainframe cabinet. Push the lid retainer lever toward the inside of the cabinet in order to fit the retaining lever intd the slot in the lid.

(12) Secure the cabinet latches on each side of the display terminal.

NOTE

The following steps describe the installation of the display terminal with the mounting tray attached.

(13) Locate the position where the unit is to be mounted.

(14) Place the display terminal with the mounting tray attached onto the mounting rails.

(15) Secure the draw latches to the mounting rails.

(16) Carefully route cable W97 through the rack structure to the J-3238 interface unit and connect the cable to jack J6.

NOTE

The display terminal can be operated from either 115 or 230V, 60 hertz line voltage. An optional feature is 230V, 50 hertz.

(17) Refer to TM 11-7440-306-34 and ensure that the display terminal is properly adjusted for available power.

(18) Plug power cable into a grounded power receptacle.

2-44. Line Printer, Tally Model T-5000 WARNING

WARNING

The weight of the line printer is approximately 365 pounds. Six man lift is required. Personal injury may result.

a. Removal Procedure.

(1) Turn off power to line printer. The standby indicator will be off.

(2) Unplug the line printer power cable from the receptacle.

(3) Loosen the two mounting screws on the lower edge of the rear panel.

(4) Gently lift up and out on the top of the rear panel to remove the panel. Be sure that the slots on the bottom of the rear panel clear the mounting screws.

(5) Disconnect cable assembly W11 from the rear of the printer.

(6) Place the rear panel in position above the mounting screws on the lower edge of the printer cabinet.

(7) Lower the rear panel while gently pushing in on it. Be sure that the slots on the lower edge of the rear panel are properly seated on the mounting screws on the lower edge of the printer cabinet.

(8) Tighten the two mounting screws on the lower edge of the printer cabinet.

(9) Open the front doors of the printer cabinet.

(10) Turn counterclockwise and remove the two T-shaped bolts in the floor of the printer cabinet.

(11) Close the front doors of the printer cabinet.

(12) If the printer is to be lifted, use six man lift.

(13) Tilt the printer forward and roll it off the I-beam and shock mounts.

b. Replacement Procedure.

WARNING

The weight of the line printer is approximately 365 pounds. Six man lift is required. Personal injury may result.

(1) If the printer is to be lifted, use six man lift.

(2) Tilt the printer forward and roll it over the I-beam and shock mounts.

(3) Open the front doors of the printer cabinet.

(4) Position the holes in the floor of the printer cabinet over the holes in the shock mounts.

(5) Insert the T-shaped bolts in the holes and tighten securely by turning clockwise.

(6) Close the front doors of the printer cabinet.

(7) Loosen the two mounting screws on the lower edge of the rear panel.

(8) Gently lift up and out on the top of the rear panel. Be sure that the slots on the bottom of the rear panel clear the mounting screws.

(9**)** Connect cable assembly W11 to the rear of the printer.

(10) Plug the line printer power cable into a grounded receptacle.

(11) Place the rear panel in position above the mounting screws on the lower edge of the printer cabinet.

(12) Lower the panel while gently pushing in on it to set the rear panel in the proper position.

(13) Tighten the two mounting screws in the lower edge of the printer cabinet.

2-45. Power Supply Assembly (Unit 12)

a Removal Procedure. Refer to TM 11-5895955-10-1 for unit location in Simulator Set AN/USM-393.

CAUTION

Due to the weight and position of the power supply assembly, two people are required to remove the unit from the equipment rack.

The second person will also serve as a safety observer while the cables are being disconnected.

(1) Remove the four screws that secure the front panel of the unit to the equipment rack.

(2) Pull the unit forward until the slides are fully extended.

WARNING

When disconnecting the cable wires from the rear panel of the power supply assembly, lethal voltages and currents may be encountered. Personnel must ensure that all power is removed from the unit before proceeding.

(3) Locate the ac power input terminal strip on the rear panel. Tag and remove the three wires of cable W14.

(4) Tag and remove the wires of cables W8 and W16 from the remaining four terminal strips.

(5) Release the slide locks, and remove the unit from the slide assembly and the rack.

NOTE

A portion of each slide assembly is secured to the sides of the mounted unit. If the replacement unit is not equipped with these parts, the parts must be removed from the defective unit and

secured to the sides of there placement unit before the unit can be installed in the rack.

b. Replacement Procedure.

(1) Be sure that the replacement unit is equipped with slide assembly components.

(2) Extend the rack mounted portion of the slide assembly, release the slide locks, and install the replacement unit on the slides.

(3) Observe the tags, and carefully connect the wires of cables W8 and W16 to the terminal strips from which they were removed. Be sure that all terminal strip connections are securely tightened.

(4) Observe the tags, and carefully connect the wires of cable W14 to the ac power input terminal strip. Be sure that all terminal strip connections are securely tightened.

CAUTION

When sliding the unit back into the equipment rack, be sure that the wires of the wiring harness are not crimped or pushed into the cooling fan in the cabinet behind the power supply assembly.

(5) Slide the unit into the rack, and secure the front panel of the unit to the rack assembly with the hardware.

2-46. Power Supply Assembly, Unit 14

a. *Removal Procedure.*

CAUTION

Due to the weight and position of the power supply assembly, two people are required to remove the unit from the equipment rack. The second person will also serve as a safety observer while the cables are being disconnected. It is also necessary to partially remove power supply assembly, unit 12 to gain access to unit 14.

(1) Remove the four screws that secure the front panel of unit 12 to the equipment rack.

(2) Remove the four screws that secure the front panel of unit 14 to the equipment rack.

(3) Pull unit 12 partially out of the rack, then pull unit 14 forward until this slides are fully extended.

WARNING

When disconnecting the cable wires from the rear panel of the power supply assembly, lethal voltages and currents may be encountered. Personnel must ensure that all power is removed from the unit before proceeding.

(4) Locate and tag the three wires of power input cable W13. Remove the power input wires from the terminal strip on the rear panel of unit 14.

(5) Tag and remove the remaining wires of cables W8 and W16.

(6) Release the slide locks, and remove the unit from the slide assembly and the rack.

NOTE

A portion of each slide assembly is secured to the sides of the mounted unit. If the replacement is not equipped with these parts, the parts must be removed from the defective unit and secured to the sides of the replacement unit before the unit can be installed in the rack.

b. Replacement Procedure.

(1) Be sure that the replacement unit is equipped with slide assembly components.

(2) Extend the rack mounted portion of the slide assembly, release the slide locks, and install the replacement unit on the slides.

(3) Connect tagged wires, and secure the front panel of the unit to the rack. See a above.

CHAPTER 3
FUNCTIONING OF THE EQUIPMENT
Section I. GENERAL

3-1. General

Section II describes the general functional operation of Simulator Set AN/USM-393 as used to support the preflight and postflight operations of the Countermeasures Receiving Set AN/ALQ-133. Section III explains the operation of the simulator set units at the major unit block diagram level. References to other technical manuals that present operating instructions for the simulator set, and descriptions, data, and maintenance instructions for the individual units that comprise the simulator set, are provided.

Section II. EM OPERATION

3-2. System Configuration

Simulator Set AN/USM-393 is an equipment subsystem of the Quick Look II Noncommunications Emitter Identification Location System. The other equipment subsystems of the Quick Look II System are listed as follows.

a. Countermeasures Receiving Set AN/ALQ-133.
b. Digital Data Set, AN/USM-61 A,
c. Flight Line Test Set, AN/ALM-154.
d. Semitrailer Mounted Electronics Shop AN/ALM-153.

These equipment subsystems are arranged into a system configuration that consists of both airborne equipment and ground-based support equipment.

3-3. Primary Subsystem Functions

Countermeasures Receiving Set, AN/ALQ-133 and Simulator Set AN/USM-393 form a tactical emitter I location system. Digital Data Set, QsQ-61A provides secure two-way data communications between the airborne countermeasures receiving set and the groundbased simulator set. Flight Line Test Set, AN/ALM-154 provides preflight and postflight services (operating and mission program loading, preflight checkout, postflight checkout, and postflight data dump) for the countermeasures receiving set at the aircraft on the flight line. Semitrailer Mounted Electronics Shop AN/ALM-153 is the maintenance facility for the operating sets that form the system.

3-4. Airborne Equipment Operation and Description

The airborne equipment consists of Countermeasures Receiving Set AN/ALQ-133 and Digital Data Set AN - 641A mounted in Reconnaissance Aircraft RV-1D.

a. Countermeasures Receiving Set, AN/ALQ-133. The countermeasures receiving set collects and processes data received from ground-based, radio-frequency emitters detected along the flightpath of the aircraft. On return of the aircraft to the ground station, the collected information is removed from the countermeasures receiving set data files (data dump) and for-

warded to the simulator set for interpretation and printout in the desired reporting format. The countermeasures receiving set can also respond to control signals transmitted from the simulator set, via the digital data set, that direct the countermeasures receiving set to collect specific data and relay the collected data to the simulator set via the secure data link. Refer to TM 11-5895-955-10-1 for an equipment description, items comprising an operable equipment, and a list of tabulated data for the countermeasures receiving set.

b. Digital Data Set, /us.l-61i. The digital data set provides secure two-way data communications between the airborne countermeasures receiving set and the ground-based simulator set. The full-duplex digital data set is a part of the airborne configuration and the ground-based simulator set, but is not a part of the countermeasures receiving set. Refer to TM 11-7035-200-14 for an equipment description, items comprising an operable equipment, and a list of tabulated data for the digital data set.

3-5. Ground-Based Equipment Operation and Description

The ground-based equipment consists of Simulator Set AN/USM-393, Flight Line Test Set AN/ALM-154, and Semitrailer Mounted Electronics Shop, AN/ALM-153.

a. Simulator Set ANIUSM-393. The simulator set supports the preflight and postflight operations of the countermeasures receiving set and can interrogate the countermeasures receiving set during a mission, via the digital data set. The simulator set can be used by operator personnel to simulate AGTELIS command post operation, and to prepare the necessary information files, flight initialization data, operating program tapes, and support program tapes to satisfy specific mission requirements. The simulator set is also used during preflight to test the secure data link. In postflight operation, recorded data gathered during a mission flight is processed and interpreted for signal intelligence, and a hard copy of the data is provided **in** the desired reporting format. Refer to TM 11-5895-955-10-1 for an equipment description, items

comprising an operable equipment, and a list of tabulated data for the simulator set.

b. Flight Line Test Set, AN/ALAM-154. The transportable flight line test set provides preflight and postflight operational functions and services for the countermeasures receiving set and the digital data set at the flight line. It provides preflight/postflight checkout of the airborne equipment through use of computer-controlled diagnostic programs, and can isolate equipment failures to line replaceable units. During preflight operation, the flight line test set is used to initialize the computers in the countermeasures receiving set with mission data generated in the simulator set. During postflight operation (data dump), the flight line test, on magnetic tape cartridges, are forwarded to the simulator set for processing. Refer to TM 11-5895-955-10-1 for an equipment description, items comprising an operable equipment, and a list of tabulated data for the flight line test set.

c. Semitrailer Mounted Electronics Shop, AN/ALM-153. The electronics shop provides an off-the-flight-line maintenance facility for organizational, direct support, and general support maintenance of the countermeasures receiving set, digital data set, simulator set, and flight line test set. The facility contains standard units of test equipment, special support test equipment, the necessary units and cable for a system-type test configuration, and a complement of spare circuit card assemblies and components. This maintenance facility is intended to support assigned maintenance personnel in the performance of maintenance functions for the airborne and ground-based sets, as specified by the maintenance allocation chart.

3-6. Tactical Deployment and Operation

Tactical deployment and tactical operation of the Quick Look II System is described in TM' 11-5895955-10-2 (CI,ASSIFIED). This technical manual contains all classified data for the system.

3-7. Applicable Operator and Maintenance Manuals
Refer to appendix A, references for a list of technical manuals applicable to the flight line test set. The following listed technical manuals are the primary documents that describe the equipment sets and electronics shop comprising the Quick Look II System.

   a. TM 11-5895-955-10-1 and 2, Operator's Manual for Receiving Set, Countermeasures AN/ALQ-133, Simulator Set AN/USNM-393, and Test Set, Flight Line AN/ALM-154. (Operational interfaces between the sets dictate that operating instructions and procedures be combined in one manual.)

   b. TM 11-5895-831-24, Organizational, Direct Support. and (;general Support *Maintenance Manual for Receiving Set, Counter measurers AN/ALQ-133

   c. TM 11 6625-2656--24, Organizational, Direct Support. and (General Support Maintenance Manual for Test Set, Flight line AN/AI,M-15,4.

   d. T'11 7035-200-141, (Operator's, Organizational, Direct Support, and General Support -Maintenance Manual for Digital Data Set AN'USQ-61A.

   e. TM 11-490-476-14, Operator's, Organizational, Direct Support, and General Support Maintenance Manual for Electronics Shop, Semitrailer Mounted AN/ALM -153.

3-8. Simulator Set Software

The programs resident on the disk system are functionally grouped into the following categories:
   a. Disk operating system (UTOS monitor) with monitor local utilities.
   b. Mission operating programs.
   c. Mission support programs.
   d. General support/utility programs.

3-9. Disk Operating System
The disk operating system (UT'OS monitor) is resident on the disk system and in the J-3239 memory.
The UTOS monitor provides input, output support to the CR'T/keyboard terminal the magnetic tape cartridge recorder-reproducers, the DDC 9111 disk memory, the line printer, the paper tape readerpunch, and digital data set (data link). It also provides file management support for disk files on the DDC 9111 disk system. In addition, the UTOS monitor provides, by means of the keyboard and CRT, a family of utilities known as monitor locals. 'These are identified by the trailing character "'B" in their names and may be called up through the keyboard as follows:

   a *ABORTB. This* program allows the operator to perform a general system reinitialization (close all opened permanent disk files, delete all temporary tiles, etc.) after a nonrecoverable error has occurred (or the system hangs up). The procedure for using this command is as follows: Take the terminal out of BLOCK MODE (BLOCK MODE button up). Press the CNTL, and O keys simultaneously. The CRT will display:
   JOB ABORTED
   ENTER COMMAND
   >
   b. ARCHB. This program creates a magnetic tape cartridge archive, in disk file image, of all permanent files in the disk memory. The procedure for calling up this program is given in paragraph 2-33a, TM 11-5895-955--10-1.
   c. CHECKB. This program compares the archive program on magnetic tape with the program

on the disk file for correctness. This utility is also called automatically by ARCHB after an archive is complete. This utility is described in detail in paragraph 2-33c, TM 11-5895-955-10-1.

d CORRB. This program corrects (changes) the creator's name and the date in the disk file directory as follows:

    (1) To set date:
        (a) Enter: SET DA (ENTER)
The CRT will prompt:
    ENTER DATE DD/MM/YY
    ENTER COMMAND
    >

        (b) Enter the desired date (example: 10/07/79): (ENTER)
        (c) The program terminates and the CRT will prompt:
    ENTER COMMAND
    >
    (2) To change operator's name
    (a) Enter:
    SET OP (ENTER)
The CRT will prompt:
    ENTER OPERATOR NAME
    >
        (b) Enter the operator's initials (for example: PB) (ENTER)
        (c) The UTOS will prompt:
    ENTER COMMAND

        (d) Enter the name of the file to be corrected; i.e.,
    CORR OPFIL
        (e) Check to see if the corrections were made by entering:
    FDL (ENTER)
The line printer will print the disk file directory listing with the corrections made.

e. DELB. This program deletes a file from the disk file directory as follows:

    (1) Type:
  DEL FILE NAME (ENTER)
<center>**NOTE**</center>
Insert name of file where the words "FILE NAME" appear.
    (2) The CRT will prompt:
    VERIFY FILE NAME: FILE NAME (Y/N)
    (3) If the name is correct, type:
    Y (ENTER)
If the file name given is a system subroutine (example: a Monitor Local), the program proceeds to (5) below; otherwise, it proceeds to (6) below.
    (4) If the name entered is not correct, enter: N (ENTER)

The CRT will respond:
    FILE NAME NOT VERIFIED
    ENTER COMMAND
    >

    (5) If a subroutine name was entered above, the CRT will prompt:
    THIS IS A SYSTEM SUBROUTINE
    REPEAT VERIFICATION (Y/N)
Type in:

    Y (ENTER)
    (6) The CRT will display:
    FILE DELETED ENTER
    ENTER COMMAND

f. DUMPB. This program provides a hexadecimal listing of the contents of the core memory or disk memory on the line printer.
    (1) Type:
(Use this procedure for core memory.)
    DUMP CORE START ADDRESS END ADDRESS (ENTER)
(Use this for disk.)
    DUMP DI START SECTOR ADR END SECTOR ADDR (ENTER)
    (2) The system will print the specified memory contents on the line printer, and the CRT will display:
    ENTER COMMAND
    >

g. FDB. This program provides a listing, on the line printer, of the disk file directory or of the directory of the files on a magnetic tape cartridge.
    (1) Type:
(Use for disk.)
    FD (ENTER)
(Use for mag tape where N = deck number, M = track number.)
    FD CT NM (ENTER)
    (2) The system will print the directory on the line printer and the CRT will display:
    ENTER COMMAND
    >

h FDLB. This program provides a listing, on the line printer, of the last 10 entries in the disk file directory.
    (1) Type:
    FDL (ENTER)
    (2) The system will print the short directory, and the CRT will display:
    ENTER COMMAND
    >

i. FILER. This program displays a description of the characteristics of a disk file (disk sector address, number of records, data created, etc.) on the CRT.

<center>**Change 1 3-3**</center>

Type: *The CRT will display:*

FILE FILE NAME (ENTER).

    NAME.................. FILE NAME

ENTRY .... .NN

                (Where NN is the directory
                sequence N.)

TYPE X

                (Where 0-symbolic, 3-binary/
                executable.)

ADDRESS .... HHHH

                (Hexadecimal sector address.)

WORD/REC .... DDD

                (Decimal # of words/record.)

REC/FILE .... DDDD

                (Decimal # of records.)

DATE........................ DD/MM/YY

                (Data created)

CREATOR................. XX

                (Operator initials.)

ENTRIES .... MM

                (Total number of files in
                directory.)

SEC.AV .... HDDD

                (Number of unused disk
                sectors.)

NOTE

First digit is Hex, last 3 are decimal.

NEXTADR .... HHHH

                (Next available sector address
                is hexadecimal)

ENTER COMMAND

       >

j. *INITB.* This program initializes (clears) the disk file directory as follows:

    INIT (ENTER)

    >

NOTE

This utility should be used only when commencing operation on a new, previously unused, system and when a disk-image savetape cartridge (from another system) is not available. Other uses of this utility are strongly discouraged, since the utility destroys irrecoverably all files in the disk memory.

k. *LOADSB.* This program loads an executable SAL program from a disk file into core memory as follows:

    LOADS FILE NAME (ENTER)

NOTE

After loading, if it is desired to operate the program locally, type:

    XEQ USER (ENTER)

l. *MEMB.* This program displays the contents of the core memory on the CRT.

    (1)   Type:

(Use this for contents of a single address.)

    MEM ADDRESS (ENTER)

Or type:

(Use this for a range of addresses.)

MEM START ADDRESS END ADDRESS

    (ENTER)

        (a) If a single address was specified, the CRT will display: AAAA CCCC (The address and contents both given in hexadecimal.)

    ENTER COMMAND

    >

        (b) If a range of addresses was specified, the CRT will display the address and contents. If this will fit more than one display page the CRT will display a full page, and then prompt:

    ENTER EMPTY LINE FOR NEXT PAGE=

    OR

    "A" TO ABORT

    (2)   When finished, the CRT will display:

    ENTER COMMAND

    >

m. *PACKB.* This program compresses the disk memory space occupied by several programs with space left by deleted programs into one compact continuous series of nondeleted programs.

NOTE

This utility should always be used prior to making a disk image save magnetic tape cartridge through the COPY program, to conserve both tape and time.

    (1)   Type:

    PACK (ENTER)

    (2)   The CRT will display:

    DISK PACK IN PROGRESS-DO NOT DISTURB

NOTE

If a power failure should occur at this point, all disk files would be lost and would have to be reloaded from a disk image save magnetic tape (or from an archive tape made by ARCHB).

    (3)   When finished, the system will print a file directory on the line printer, and the CRT will display:

    DISK PACK COMPLETE

    ENTER COMMAND

    >

n. *PATCHB.* This program is used to modify (change) the contents of location in disk memory directly.

    (1)   Type:

    PATCH SECTOR ADDR WORD NUMBER

    NEW VALUE OLD VALUE (ENTER)

NOTE

To obtain word number, use DUMP OI instruction.

  (2) If all entries were made correctly, the CRT will display:

   PATCH COMPLETED
   ENTER COMMAND
   >

  (3) The following CRT readouts are possible errors:

   INCORRECT DISK ADDRESS
    (Invalid section address.)
   INCORRECT WORD ADDRESS
    (Word number too large.)
   CURRENT WORD INCORRECT-PATCH
    REFUSED
   ENTER COMMAND
   >

o. PUNCHB. This program punches SAL loadable object paper tape from disk file which is an executable SAL program. Type:

   PUNCH FILE NAME (ENTER)

p. RECOVB. This program is used to load into the disk memory, disk image files from a magnetic tape cartridge made by either the ARCHB utility or the FCOPY program. This utility is described in paragraph 2-33b, TM 11-5895-955-10-1.

q. RENAMB. This program allows the operator to change the name of an existing disk file.

  (1) Type:
   RENAM OLD NAME NEW
    NAME (ENTER)
  (2) The CRT will display:
   VERIFY FILE NAME NEW NAME (Y/N)
  (3) Type:
   Y (ENTER)
  (4) The CRT will display:
   VERIFY FILE NAME OLD NAME (Y/N)
  (5) Type:
   Y (ENTER)
  (6) The CRT will display:
   FILE RENAMED
   ENTER COMMAND
   >

NOTE

If either name is incorrect and N (ENTER) is typed, the CRT will display: FILE NAME NOT VERIFIED ENTER COMMAND

r. SALODB. This program is used to load a SAL loadable object paper tape into disk memory, creating a disk file which is an executable SAL program.

  (1) Place the paper tape in the reader, turn the reader on and type SALOD (ENTER).

  (2) The system reads the tape, and the CRT will query:

   ADDITIONAL OBJECT? (Y/N)

  (3) If more than one object is to be loaded (multiple object), place the next tape in the reader, and type Y (ENTER); (2) above will be repeated.

  (4) If no more objects are to be loaded, the operator should type N (ENTER). The CRT will query:

   FILE NAME?
   >

  (5) Enter the name (up to six characters, the first one must be a letter) under which the file is to be stored on the disk; e.g.:

   FILEAB (ENTER)
   >

  (6) The CRT will display:
   ENTER COMMAND
   >

s. SEEKB. This program is used to examine and/or modify (change) the contents of an address in the disk file which is an executable SAL program.

  (1) Type:
  SEEK FILE NAME ADDRESS (ENTER)
   (Where ADDRESS is the program memory
   address and not the disk sector address
   where the file is stored.)
  (2) The CRT will display:
   CURRENT WORD = HHHH
     (Hex value.)
   ENTER NEW WORD
   IF NO CHANGE NEEDED, TYPE N
   >

  (3) To change the word, enter the desired value. The CRT will display:

   PATCH COMPLETED

The program will proceed to (6) below.

  (4) If no change is desired, type:
   N (ENTER)
  (5) The CRT will display:
   NO PATCH REQUESTED
  (6) The CRT will display:
   ENTER NEW ADDRESS. IF NO MORE,
   TYPE N.
   >

  (7) To enter more changes in the file, enter the next address. The program will repeat (2) above. If no more changes are desired, type:

   N (ENTER)
  (8) The CRT will display:
   ENTER COMMAND
   >

t. SETB. This program allows the operator to set (change) the system calendar, clock, or operator's name.

  (1) Type:
   SET CL (ENTER)

(2)   The CRT will prompt:
    ENTER ZULU TIME: HHMM
    >
(3)   Enter the ZULU (GMT) time as shown.
(4)   Type:
    SET DA (ENTER)
(5)   The CRT will prompt:
    ENTER DATE: DD/MM/YY
    >
(6)   Enter the data as shown.
(7)   Type:
    SET OP (ENTER)
(8)   The CRT will prompt:
    ENTER NAME: XX
    >
(9)   The operator should enter the initials as shown.
(10) After the entry has been made, the CRT will display:
    ENTER COMMAND
    >
u. STB. This program is used to free-format paper tape into the disk memory, creating an ASCII disk file as follows:
(1)   Load the paper tape into the reader. Turn the reader on. Type:
    ST (ENTER)
(2)   The system will read the tape, and the CRT will query:
    IS THIS TAPE END?
    >
(3)   If no more tape is to be loaded, type Y (ENTER). The program then proceeds to (4) below.
If there are more tapes to be loaded, load, the next one into the reader and type:
    N (ENTER)
The program will return to (1) above.
(4)   The CRT will query:
    FILE NAME
    >
(5)   Enter the name under which the file is to be stored on the disk; e.g.,
    FILEXY (ENTER)
(6)   The CRT will display:
    ENTER COMMAND
    >
v. STJB. This program is used to make the disk memory space occupied by a temporary or deleted permanent file which is the last entry in the file directory available to the system. This utility may be used instead of PACKB when all the deleted files are at the end of the directory.
(1)   To use this program, type:
    STJ (ENTER)
The CRT will prompt:
    ENTER INITIALS
(2)   Enter the initials of the operator.

(3)   The CRT will prompt:
    ENTER COMMAND
    >
w. TIMEB. This program displays the calendar date, clock time, and operator name on the CRT.
(1)   To use this program, type:
    TIME (ENTER)
(2)   The CRT displays:
    TIME = HH MM
    DATE = MM/DD/YY
    OPERATOR = II
    ENTER COMMAND
    >

x. TSALB. This program is used to load a SAL loadable object magnetic tape cartridge into disk memory, creating a disk file which is an executable SAL program.
(1)   Type:
    TSAL (ENTER)
(2)   The CRT will prompt:
    ENTER CARTRIDGE AND TRACK
    NUMBERS.

(3)   Place the object tape cartridge in the drive, put the drive on line, and enter the deck and track number; i.e.:
    N M (ENTER)
    (Where N is the deck number (1-2) and M is the track number (1-4).)
(4)   The CRT will display the header of the first (next) file on the deck and track specified, and will query: LOAD? (Y/N)
    >
(5)   If the file header display is not the one desired, type:
    N (ENTER)
And (4) above will be repeated.
(6)   If the file is desired, the operator should type:
    Y (ENTER)
(7)   The CRT will query:
    ADDITIONAL OBJECT IS NEEDED
(8)   Type:
    N (ENTER)
The program will proceed to (9) below, If additional object is needed, type Y (ENTER). The program will repeat (2) above.
(9)   The CRT will prompt:
    FILE NAME
    >
(10)   Enter the name that is desired to store the file under; e.g.:
    FILE 12 (ENTER)
(11) The CRT will display:
    ENTER COMMAND
    >

3-9.1 Mission Operating Programs

All other programs resident on the disk system may be called up from the UTOS monitor by typing on the keyboard:

XEQ PROGRAM NAME (ENTER) The programs available in the mission operating program are as follows:

a DLTH. The Data Link Transaction Handler program is the operator's vehicle for communicating with the mission aircraft. It enables the operator to obtain the airborne system status and selective dumps of collected emitter data which may be used to generate TACELINT SPOT REPORT MESSAGES directly, or which may be stored on the disk as mission files subsequent analysis and processing. The DLTH program is described in detail in paragraphs 2-86 through 2-90, TM 11-5895-95510-1.

b. MFED. The Mission File Editor program allows the operator to examine and edit the contents of one or more mission files, in the process creating a new mission file. This program is described in detail in paragraph 2-99, TM li-5895-955-10-1.

c. MFLST. This Mission File Listing program provides the operator with a detailed line printer listings of the contents of the mission files, with the options for "filtering" the contents by specified parameters. (The latter option creates a new mission file.) This program is described in paragraph 2-97, TM 11-5895-955-10-1.

d AIFMOD. The Mission File Modify Program allows the operator to initialize or change certain parameters in a mission file, in the process creating a new mission file. This program is described in detail in paragraph 2-106, TM 11-5895-955-10-1.

e. MFSRT. The Mission File Sort program reorders the contents of the mission file (creating a new mission file in the process) for more convenient analysis by the operator. This program is described in paragraph 2-104, TM 11-5895-955-10-1.

f MIRE. The Periodic ELINT Activity Report (MIRE) Generator Program enables the operator to replace SEDSCAF Format A MIRE report message based on data in mission files. It is described in paragraph 2-101, TM 11-5895-955-10-1.

g. MMATCH. The Mission File Master EOB Match File Correlation program allows the operator to correlate the emitters in a mission file with the known EOB sites in a master EOB match file. The program is described in paragraph 2-98, TM 115895-955-10-1.

h. OPREP. The OPREP generator provides the operator with a convenient method of generating the OPREP 1, 2, 4, and 5 messages associated with mission flights in the old USAREUR OPORD format. This program is described in paragraph 2-102, TM 11-5895-955-10-1.

i *PFD.* The Post Flight Dump Adaptation pro gram enables the operator to create a mission file for the post flight dump tape generated by PPV. This program is described in paragraph 2-94, TM 115895-955-10-1.

j. PFT. The Preflight Test program is used by the Ops Van operator during a mission aircraft preflight procedure to verify that the digital data set (data link) is fully operational. This program is described in paragraph 2-79, TM 11-5895--95510-1.

k. RIPS. The RIPS/Freedom Message Generator Program provides the operator with a convenient method of generating the OPREP 1, 2, and 4 messages associated with mission flights in the new Reconaissance Information Processing System (RIPS) format. It also gives the operator the capability of generating a message whose body is in free form text.

l. TACELN. The TACELINT Generator program enables the operator to prepare TACELINT report message based on the data in mission files. It is described in paragraph 2-105, TM 11-5895-95510-1.

3-9.2 Mission Support Programs

a. DLSIM. The DLTH Trainer-Simulator program provides a convenient vehicle for familiarizing operators with all aspects and functions of the DLTH program without requiring a full-up mission (aircraft, data link, targets, etc). It is described in paragraph 2-108, TM 11-5895-955-10-1.

b. EOED. The Electronic Order of Battle (EOB) File Editor program is used to generate and edit EOB disk files and convert them to magnetic tape cartridge format suitable for loading in the airborne system during preflight procedure. The program is described in paragraphs 2-55 through 2-57, TM 11-5895-955-10-1.

c. HIED. The High Interest Band Editor program is used to generate and/or edit high interest band files on magnetic tape cartridges suitable for loading into the airborne system during preflight procedure. This program is described in paragraphs 2-49 and 2-50, TM 11-5895-955-10-1.

d. MAPAID. The Map Aids Utility Program provides the operator with the coordinate conversions and range-bearing calculations associated with work on maps in the course of mission data analysis. It is described in paragraph 2-109, TM 11-5895-955-10-1.

e. MMED. The Master EOB Match File Editor program is used to generate and edit the master EOB match files for correlation against a mission file in the MMATCH program. The MMED program is described in paragraph 2-96, TM 11-5895955-10-1.

f. MSCOPY. The Message Copy Program allows the operator to make an identical copy of a 5-level

(Baudot) paper tape (for example), one of the report message tapes generated by the system). Load the original tape into the reader. Turn on both the reader and the punch. Type:

XEQ MSCOPY (ENTER)

NOTE

When loading the original tape into the reader, be sure it is loaded within 1/2 foot of the first punches and that there is at least 2 feet of trailer at the end.

g. RCED. The Routing Code File Editor program (disk-to-disk version) enables the operator to generate or edit routing code files on disk, producing new routing code files which are used by the system in generating report messages. The program is described in paragraph 2-63, TM 11-5895-95510-1.

h. SBED. The Scan Band File Editor program is used to generate and/or edit scan band files on magnetic tape cartridges suitable for loading into the airborne system during the preflight procedure.
The program is described in paragraphs 2-37 through 2-44, TM 11-5895-955-10-1.

i. SITBLD. The Site Build program is used to generate a system site file which contains all sitedependent parameters used by the system. The program is described in paragraph 2-95, TM 11-5895955-10-1.

j. TTYX. The Routing Code File Editor program (disk-to-paper tape version) is used to generate an ASCII punched paper tape, air routing code file which is either a new file or an edited version of an existing routing code file on disk. The paper tape is primarily intended as a permanent copy of routing code files; however, it may be loaded into the disk using STB monitor local utility to create a new routing code file on disk. The operation of the TTYX program is in all other respects identical to the RCED program, and routing code files on disk produced through either program are compatible with both programs.

k. WSFM. The Weapons System File Maintenance program is used to generate and edit on disk weapon system association files which are used by mission operating programs to identify an emitter in a mission file as a particular system. The program is described in detail in paragraph 2-62, TM 11-5895-955-10-1.

3-9.3. General Support/Utility Program

a. *ASM.* The SAL Assembler program is used to generate SAL loadable object magnetic tape cartridges from SAL source cartridges. The primary function of the ASM program is to generate airborne system BITE tables in SAL loadable object cartridge form from SAL source cartridges

generated by the BITE Parameter File Editor (BPFE) program in the PPY. This procedure is described in paragraph 2-34, TM 11-5895-95510-1.

b. COPY. The COPY program is used to generate a disk image save on magnetic tape cartridge.

NOTE

A disk image save is an exact copy, on magnetic tape, of the entire contents of the disk memory to the extent that it is currently in use. The COPY program is described in paragraph 2-68, TM 11-5895955-10-1.

c. EDIT. The Cartridge Tape File Editor program provides the operator with all utility required for the maintenance of the SAL source files and SAL loadable object files on magnetic tape cartridges. The program is described in paragraph 2-65, TM 11-5895-955-10-1.

NOTE

Only those utilities in the EDIT program which are applicable to normal operator functions are described.

d. FCOPY. The File Copy program is used to make copies of disk image files from disk to magnetic tape. This program is described in paragraph 2-67, TM 11-5895-955-10-1.

NOTE

The magnetic Tape Format produced by the FCOPY program and the ARCHB monitor local utility is mutually compatible; i.e., files may be loaded into disk memory through the RECOVB monitor local utility from tapes made by FCOPY.
SAL loadable object tapes may not be copied through the FCOPY program. The EDIT program must be used for this function.

e. LOAD. The LOAD program is used to restore the disk memory from a disk image save magnetic tape cartridge made by the COPY program. Type:

XEQ LOAD (ENTER)

Follow the procedure described in 2-26, TM 115895-955-10-1.

NOTE

Execution of the LOAD program destroys all contents of the disk memory and replaces them all with the disk image save on the tape; if the disk contains any file of interest, this should be copied to tape by means of the FCOPY program (or a copy of all files should be made through the ARCHB

Monitor Local utility) prior to execution of the LOAD program.

f. *PRFORM.* The Forms Printing Utility program is used to generate multiple hard copies of arbitrary text composed on the CRT screen on the line printer. The program may be used to generate special purpose forms for local use as dictated by local policy, such as message number log sheets, etc.

    (1) Type:
    XEQ PRFORM (ENTER)
    (2) The CRT will display:
    CLEAR THE SCREEN
    COMPOSE THE FORM ON THE SCREEN
      (50 LINES MAXIMUM)
    FOR BLANK LINES, PUT IN AT LEAST
      FOUR SPACES
    ENTER COMPOSED LINES; WHEN
      READY TERMINATE THE FORM BY
    ENTERING AN EMPTY LINE.

    (3) Be sure that the CRT terminal is in "block mode" (BLOCK MODE button down). Press the homing button (then press the CLEAR THE SCREEN button. The form may then be composed by using the alpha cursor and the INSERT CHARACTER, DELETE CHARACTER INSERT LINE, and DELETE LINE function buttons, as ap-

propriate. In all lines except the first one, provide an extra leading space (which will be overwritten on the screen by the prompt character (') when the previous line is ENTER'ed. When ready, put the alpha cursor on the first line and press the ENTER button until all lines have been entered. Enter an empty line to indicate the end of the form.

    (4) The CRT will prompt:
    ENTER NUMBER OF COPIES DESIRED
      (01-99)
    (5) Put the line printer on line and enter the number of copies to be made.

NOTE

For number less than 10, two digits must be entered; e.g.: 5 must be enteres as 05 (ENTER).

    (6) The system will print the number of copies specified, and the program terminates, returning to UTOS.

g. *VERIFY.* The VERIFY program may be used to compare for correctness a disk image save tape to the current contents of the disk memory. The program is also executed automatically from the COPY program. The VERIFY program is described in paragraph 2-68, TM 11-5895-955-10-1.

<center>Section III.   FUNCTIONAL OPERATION</center>

3-10. Simulator Set AN/USM-393

The simulator set consists of a central processor and an imput/output processor with associated maintenance-operator control panels and peripheral devices, configured for installation in Semitrailer Van, V 495/USM-393. The simulator set also contains one-half of a secure, full duplex data link and a transceiver. The paragraphs in this section describe the functional operation of these units. Figure 3-1 is a functional block diagram of the simulator set.

3-11. Digital Computer Set, AN/UYK-23

The digital computer set is a general-purpose digital computer than can be programmed to process tactical data. The digital computer set receives data from external sources, processes the data through arithmetic and logic operations as directed by program instructions, and transmits the resultant data to external media. The digital computer set is the central processor for the simulator set; the simulator set is under control of the simulator set operating programs in the central processor memory. The digital computer set, under software control, performs the functions described in paragraph 3-9. Additionally, refer to paragraph 3-13.

3-12. Interface Unit J-32391USM-393

The interface unit is the input/output processor for the simulator set and is under control of the Interface Unit Resident Program that resides in the interface unit memory. The interface unit, under software control, interfaces the digital computer set with the digital data set and the various computer peripheral devices, to perform the functions specified by the operating programs. Refer to TM 11-7035-201-14 for additional details, tabulated data, and maintenance instructions.

3-13. Maintenance-Operator Control Panel, C-96331UYK-23

This maintenance-operator control panel is used to access and control Digital Computer Set AN/UYK23. The unit provides the necessary control functions to load or read the memory or hardware registers of the associated digital computer set, a means for starting and stopping instruction execution, and provides single instruction and breakpoint operating modes for program debugging. Visual indicators provide simultaneous readout of selected data and memory addresses. Refer to TM 11-7440269-14-1, -2, -3, -4, and -5 for additional details, tabulated data, and maintenance instructions.
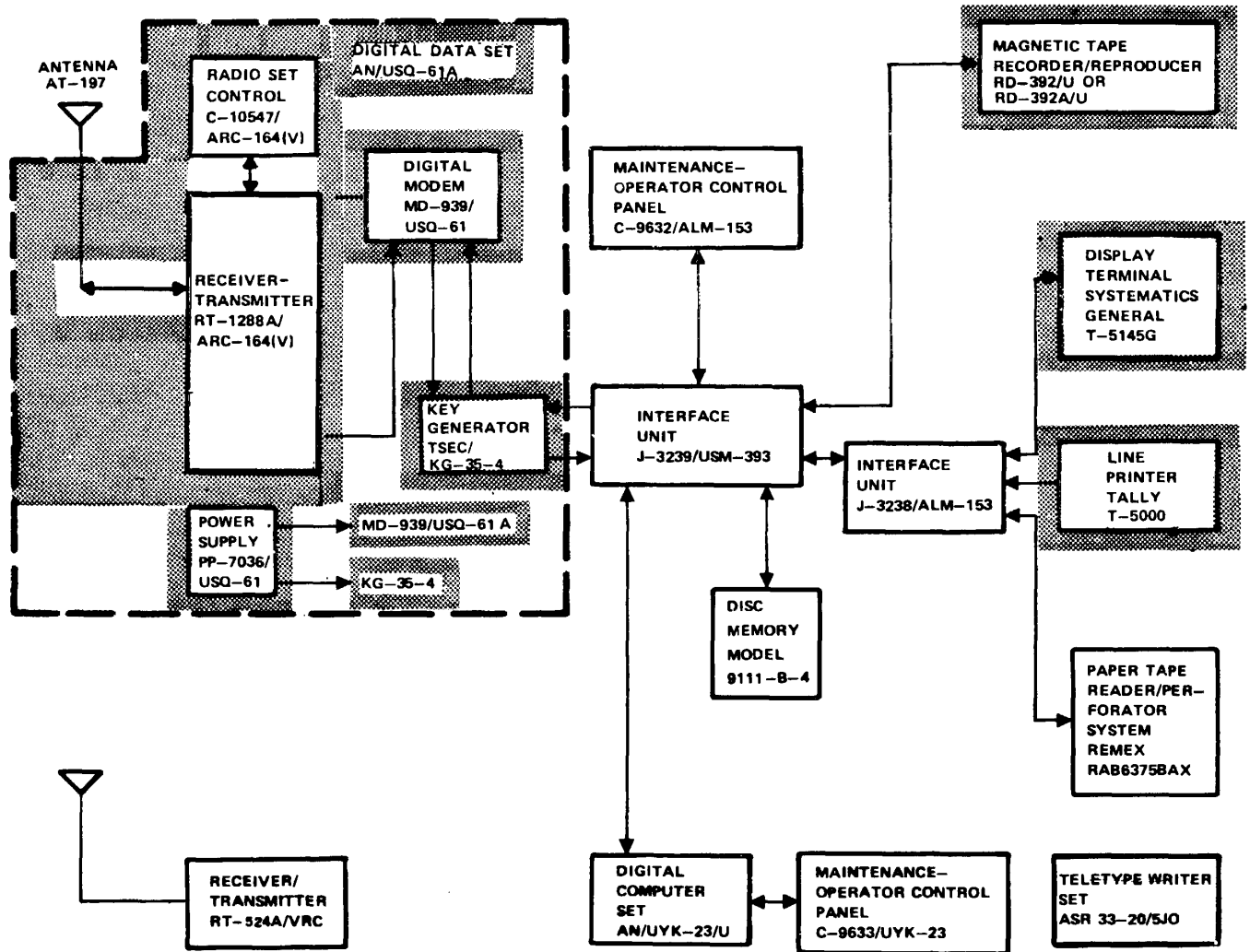
Figure 3-1. Simulator Set, Functional Block Diagram

3-14. Maintenance-Operator Control Panel, C-96321ALM-153

This maintenance-operator control panel is used to access and control Interface Unit J-3239/USM393. The unit provides the necessary control functions to load or read the memory or hardware registers of the interface unit, a means for starting and stopping instruction execution, and provides single instruction and breakpoint operating modes for program debugging. Visual indicators provide simultaneous readout of selected data and memory addresses. The maintenance-operator control panel interfaces the interface unit through three bidirectional, serial data paths. Two paths carry selected data and memory addresses; the third path carries control information. Refer to TM 11-66252649-14 for additional details, tabulated data, and maintenance instructions.

3-15. Interface Unit J-32381ALM-153

The interface unit provides an asynchronous data interface between Interface Unit J-3239/USM-393 and Paper tape Reader/Perforator System, Remex RAB6375BAX, by use of an RS232C interface module. The unit accepts parallel data from a read/write direct (RWD) bus; then serializes, formats, and transmits the information to the paper tape reader/perforator system. The reverse of this operation is performed when data is sent from the paper tape reader/perforator to the interface unit. Baud rate, parity type, and the number of stop bits are under program control. Refer to TM 11-5895-82914 for additional details, tabulated data, and maintenance instructions.

3-16. Computer Peripheral Devices

a. Magnetic Tape Recorder-Reproducer, RD392/U or RD-392A/U. This peripheral device is a digital magnetic tape recorder and formatter that is used to load programs and files from magnetic tape into the interface unit and digital computer set. The magnetic tape recorder-reproducer is also used to record data processed by these units, on magnetic tape, as required by the operating programs. Refer to TM 11-5835-242-14 for additional details, tabulated data, and maintenance instructions.

b. Display Terminal Systematics General T5145G(HP2648A). The display terminal (CRT) is a peripheral device that is used to display program outputs, and to enter data and commands in response to program requests from the interface unit and the digital computer set. Refer to TM 11 7440-306-12-1, -2, -3, -4, -24P, and -34 IHP2648A) for maintenance instructions.

c. Line Printer, Tally Model T-5000.. The line printer is a peripheral device that is used to print a hard copy of the data processed by the interface unit and digital computer set, as required by the operating programs. Refer to TM 11-5895-113514-1 and -2 for additional details, tabulated data, and maintenance instructions.

d. Paper Tape Reader/Perforator System, Remex Model RAB6375BAX. This peripheral device is used to punch data files, or selected protions of data files, on paper tape, as desired, for automated reporting. Refer to TM11-5835-245-14-1 and -2 for additional details, tabulated data, and maintenance instructions. Additionally, refer to TM 11-5835-24414-1 and -2 on Tape Punch Mechanism, Remex Model RPM1075BBX.

e. Disc Memory System, DDC Model 9111-B-4. The disc memory system is a peripheral device that is used to provide high-speed, random-access magnetic storage and retrieval of digital information. Refer to TM 11-7025-200-14-1 and -2 for additional details, tabulated data, and maintenance instructions.

3-17. Deleted.

3-18. Digital Data Set AN/USQ-61A

The digital data set provides secure two-way data communications between the simulator set and the airborne countermeasures receiving set. The digital data set can transmit and receive data in the halfduplex mode at a 12.5 kHz rate. The set consists of a receiver-transmitter, digital modem, crypto device, radio set control, antenna and power supply. The modem modulates data with a reference clock for application to the transmit portion of the receiver-transmitter and demodulates data from the receive portion of the receiver-transmitter to separate data from the reference cock. The modem digitally modulates encrypted data and incorporates the clock signal transmission. This clock signal is removed by a compatible modem in another set and is used to clock the crypto device of that set. In the receive mode, the modem accomplishes bit synchronization, demodulates the data, and removes the clock signal from the incoming data. Demodulated data and the clock signal are then applied to the crypto device for decryption and application to the interface unit. The modem also controls transmitter keying. Refer to TM 11-7035200-14 for additional details, tabulated data and maintenance instructions.

3-19. Receiver/Transmitter RT-254ANRC

The receiver/transmitter provides the simulator set operator with a voice communications link to the flight line test set operator during preflight and postflight operations, and to the pilot of the aircraft during a mission flight. Refer to TM 11-5820401-12 for additional details, tabulated data, and maintenance instructions.

CHAPTER 4
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

4-1. Definition

Direct support maintenance for Simulator Set each entry in the applicable maintenance allocation ANIJUSM-393 consists of the functions indicated by the chart. MAINTENANCE CATEGORY F column of the maintenance allocation chart in appendix B. Direct support maintenance is generally the inspection, testing, and replacement of circuit card in defective line replaceable units that have been replaced by organizational maintenance personnel and transported to Semitrailer Mounted Electronics Shop AN/ALM-153 for repair (para 4-2). Additionally, it includes cable repair. Refer to TM 55-1500-323-25. Specific direct support maintenance responsibilities for each major component unit

and component subassemblies shall be as shown for each entry in the applicable maintenance allocation chart.

4-2. Direct Support Maintenance Instructions.

Direct support maintenance instructions for the component units of the simulator set are furnished in the individual technical manuals for those units. Refer to the applicable technical manual referenced in the maintenance allocation chart for each unit, and follow (the instructions presented therein to perform the maintenance functions that are the responsibility of direct support maintenance personnel.

4-1

CHAPTER 5
GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

5-1. General

There are no general support maintenance responsibilities or requirements assigned in the maintenance allocation chart for the simulator set. Refer to MAINTENANCE CATEGORY column H of the maintenance allocation chart furnished in appendix B.

5-2 General Support Maintenance Instructions

Maintenance requirements beyond the scope of direct support maintenance shall be referred to depot maintenance as indicated by MAINTENANCE CATEGORY column D of the maintenance allocation chart.

5-1

CHAPTER 6
WIRE LISTS

6-1. General

The wire lists or diagrams for the units of the Simulator Set AN/USM-393 are contained in the separate technical manuals for those units. See appendix A, References, for a listing of the manuals. The cables shown in figure FO 7-1 are wiped pin-to-pin between the connectors and, and therefore require no wire lists.

6-1

CHAPTER 7
DIAGRAMS 7-1.

7-1. General

The cabling diagrams for Simulator Set AN/USM-393 are foldout illustrations. They are located at the rear of the manual. A shelter power distribution diagram is located on the interior wall of the shelter.

7-1

APPENDIX A
REFERENCES

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
SB 11-573	Painting and Preservation of Supplies Available for Field Use for Electronics Command Equipment.
SC 5180-91-CL-R07	Tool Kit, Electronic Equipment TK-105/G, (NSN 5180-00-610-8177).
SC 5180-91-CL-S21	Tool Kit, Electronic Equipment TK-100/G, (NSN 5180-00-605-0079).
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 5-4120-222-14	Operator's, Organizational, DS, and GS Maintenance Manual: Air Conditioner, Compact Vertical, 208V, 3 Phase, 18,000 BTUH Cooling, 12,000 BTUH Heating (Trane Models): 50/60 Hz (Model CE20VAL6) (NSN 4120-00-973-4589) and 400 Hz (Model CE20VAL4) (NSN 4120-00-858-5795).
TM 5-6115-365-15	Operator's, Organizational, DS, GS, and Depot Maintenance Manual (Including Repair Parts and Special Tools List) Generator Sets, Gasoline and Diesel Engine Driven, Trailer Mounted PU-236A/G, PU236/G (NSN 6115-00-393-1709), PU-236B/G (NSN 6115-00-7386334), PU-253A/U, PU-253/U (NSN 6115-00-697-2402), PU-304C/MPQ-4 (NSN 6115-00-056-8421), PU-332/G (NSN 6115-00-5778471), PU-332A/G (NSN 6115-00-738-8336), PU-375A/G, PU375/G (NSN 6115-00-753-2231), PU-375B/G (NSN 6115-00-9316789), PU-401/M (NSN 6115-00-823-2217), PU-402/M (NSN 611500-722-3760), PU-406/M (NSN 6115-00-738-6342), PU-409/M (NSN 6115-00-702-3343), PU-409A/M (NSN 6115-00-733-6338), PU-495/G (NSN 6115-00-823-2218), PU-551/G (NSN 6115-00-8891307), PU-564A/G (NSN 6115-00-728-6341), PU-564B/G (NSN 6115-00-179-2789), PU-617/M (NSN 6115-00-738-6335), PU618/M (NSN 6115-00-738-6337), PU-619/M (NSN 6115-00-7386339), PU-620/M (NSN 6115-00-738-6340), PU-625/G (NSN 611500-837-3915), PU-628G (NSN 6115-00-087-0873), PU-629/G (NSN 6115-00-937-5555), PU-631/G (NSN 6115-00-059-5172), PU-656/G (NSN 6115-00-939-3296), and PU-650B/G (NSN 6115-00-2581622).
TM 9-2330-246-14	Operator's, Organizational, DS and GS Maintenance Manual (Including Repair Parts and Special Tools List) for Semi-Trailer, Van: Electronic M348A2 (FSN 2330-678-3838), M348A2C (2330-690-7724), M348A2D (2330-690-7725), M348A2F (2330-690-7726), M348A2G (2330-797-7405), M348A2H (2330-973-1262), M348A2K (2330-7402322), M348A2N (2330-740-2329), M373A2 (2330-705-8932), M373A2C (2330-672-7496), M373A2D (2330-738-5869), M373A3 (2330937-4518), M373A4 (2330-937-4519), and M373A5 (2330-781-7755).
TM 11-4940-476-14	Operator's, Organizational, DS and GS Maintenance Manual: Electronics Shop, Semi-Trailer Mounted AN/ALM-153 (NSN 4940-01018-2505).
TM 11-5805-201-12	Operator and Organizational Maintenance Manual: Telephone Set TA312/PT (NSN 5805-00-543-0012).
TM 11-5820-401-12	Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): Radio Set AN/VRC-12 (NSN 5820 00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820 00-223-7417), AN/VRC-45 (5820-00-223-7413), AN/VRC-46 (5820 00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820

00-223-7435), AN/VRC-49 (5820-00-223-7437), AN/VRC-54 (582000-223-7567), and ANIVRC-55 (5820-00-402-2265); Mounting MT1029/VRC (5820-00-893-1323) and MT-1898/VRC (5820-00-8931324); Antenna AT-912/VRC (5820-00-897-6357); Control, Frequency quency Selector C-2742/VRC (5820-00-892-3343) and Control, Radio Set C-2299/VRC (5820-00-892-3340).

TM 11-5820-765-12	Operator and Organizational Maintenance Manual: Power Supplies PP-763/GRC (NSN 5820-00-937-7690), and PP-4763A/GRC (NSN 5820-00-113-9768).
TM 11-5835-242-14	Operator's, Organizational, DS and GS Maintenance Manual for Recorder-Reproducer, Magnetic Tape RD-392/U (NSN 5865-01-0314052) and RD-392A/U (7050-01-035-1345).
TM 11-5835-245-14-1 and -2	Operator's, Organizational, DS, and GS Maintenance Manual for Tape Punch Mechanism, Remex Model RPM1075BBX.
TM 11-5895-829-14 -1 and -2	Operator's, Organizational, DS, and GS Maintenance Manual for Paper Tape Reader/Perforator System, Remex Model RAB6375BAX (NSN 7025-01-050-4872).
TM 11-5895-829-14	Operator's, Organizational, DS and GS Maintenance Manual: Interface Unit J-3238/ALM-153 (NSN 5865-01-024-0390).
TM 11-5895-831-24-1, -2 and -3	Organizational, DS, and GS Maintenance Manuals: Receiving Set Counter-, measures AN/ALQ-133 (NSN 5865-00-134-2601);
TM11-5895-955-10-1 (C)TM 11-5895-955-10-2	Operator's Manual for Receiving Set, Countermeasures). AN/ALQ-133 (NSN 5865-00-134-2601Simulator Set AN/USM-393 (NSN 6625 00-134-2976) and Test Set, Flight Line AN/ALM-154 (NSN 662500-134-2975).
*TM 11-5895-1135-14-1 and -2	Operation and Maintenance Instructions for T-5000 Line Printer (S&I CDR, CERCOM, ATTN: DRSEL-ME-PEW, Ft. Monmouth, NJ 07703).
TM 11-5985-262-15	Operator's, Organizational, Direct Support and General Support, and Depot Maintenance Manual: Antenna AS-1729/VRC (NSN 598500-985-9024
TM 11-6625-654-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tool Lists (including Depot Maintenance Repair Parts and Special Tools List) for Multimeter AN/USM-223.
TM 11-6625-1703-15	Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Oscilloscope AN/USM-281A (NSN 662500-228-2201).
TM 11-6625-2649-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Panel, Maintenance-Operator Control C-9632/ALM-153 (NSN 5865-01-024-0387).
TM 11-6625-2656-24	Organizational, Direct Support, and General Support Maintenance Manual: Test Set, Flight Line AN/ALM-154 (NSN 2656-00134-2975).
TM 11-6625-2845-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Simulator Set AN/USM-393 (NSN 6625-00-134-2976).
TM 11-7025-200-14-1 and -2	Operator's, Organizational, DS, and GS Maintenance Manual: Disc Memory System Digital Development Corporation Model 9111B-4) (NSN 7025-01-057-2622) (S&I CERCOM).
TM 11-7035-200-14	Operator's, Organizational, DS, and GS Maintenance Manual: Data Set, Digital AN/USQ61A (NSN 7035-01-100-0968).
TM 11-7035-201-14	Operator's, Organizational, DS, and GS Maintenance Manual: Interface and - Unit J-3239/USM-393 (NSN 7050-01-035-1344).
TM 11-7440-269-14-1 thru -5, and 24P	Operator's, Organizational, DS, and GS Maintenance Manual: Digital Computer Set AN/UYK-23 (NSN 7035-01-041-3437).

*TM 11-7440-306-12-1	Operator's and Organizational Maintenance Manual: CRT Terminal Systematics General Model T-5145G (Hewlett-Packard Graphics Terminal 2648A) (To be published).
*TM 11-7440-306-12-2	Operator's and Organizational Maintenance Manual: CRT Terminal Systematics General Model T-5145G (Hewlett-Packard Graphics Terminal 2648A) (Quick Reference Guide).
*TM 11-7440-306-12-3	Operator's and Organizational Maintenance Manual: CRT Terminal Systematics General Model T-5145G (Hewlett-Packard Graphics Terminal 2648A) (User's Manual).
*TM 11-7440-306-12-4	Operator's and Organizational Maintenance Manual: CRT Terminal Systematics General Model T-5145G (Hewlett-Packard Graphics Terminal 2648A) (Reference Manual).
TM 11-7440-306-24P	Organizational, DS and GS, Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): CRT Terminal Systematics General Model T-5145G (Hewlett-Packard Graphics Terminal HP2648A) (To be published).
*TM 11-7440-306-34	Direct Support and General Support Maintenance Manual: Model HP2648A Graphics Terminal (Display Terminal, Systematics General T-5145G) (Composite Service Manual).
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 43-0139	Painting Instructions for Field Use.
TM 55-1500-323-25	Installation Practices for Aircraft Electric and Electronic Wiring.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

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*Requests for this manual must be sent to Commander, US Army Communications-Electronics Command, ATTN: DRSEL-ME-PEW, Ft. Monmouth, NJ 07703.

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations for Simulator Set AN/USM-393. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in 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 measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy 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.

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

i. *Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

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 materiel 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, subassemblies, 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 and RPSTL coincide.

d. *Column 4, Maintenance Category.* Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the " worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as

follows:

    C - Operator/Crew
    0 - Organizational
    F - Direct Support
    H - General Support
    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 coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment

for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

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

d. National/INATO 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 parentheses.

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.

(Next printed page is B-3)

Section II. MAINTENANCE ALLOCATIONCHART
FOR

SIMULATOR SET, AN/USM-393

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
00	SIMULATOR SET, AN/USM-393	Inspect		1.0				1	
		Test		2.0				2,3,4,5,23,	
		Repair		3.0				24	
01	VAN, SEMITRAILER, V-495/USM-393, UNIT 1	Inspect		1.0				1	
	(REFER TO TM 11-4940-476-14)	Service		2.0					
		Repair					2.0		
		Overhaul					16.0		
02	DISPLAY TERMINAL, SYSTEMATICS GENERAL T-5145G, UNIT 2 (REFER TO MAC IN TM 11-7 440-306-12-1, -2, -3, -4, -24P, and -34 HP2648A)								
03	HIGH SPEED PRINTER, TALLY	Inspect		0.5				1	
	MODEL T-5000, UNIT 3	Test		0.6				5	
		Service		2.0				1,	
								1, 6 thru 13	
		Adjust			1.5			1, 6 thru 13	
		Repair			2.0			1, 6 thru 13	
		Replace		1.0				1	
		Install		0.5				1	
		Overhaul					8.0	1, 6 thru 13	
0301	MAIN ASSEMBLY, A1	Inspect			0.5			1	
		Test			1.0			1, 6 thru 13	
		Repair			2.0			1	
		Replace					4.0	1	
030101	FRAME ASSEMBLY	Inspect			0.5			1	
		Repair			2.0			1	
		Replace					4.0	1	
030102	PRINTER UNIT	Inspect			0.5			1	
		Repair			2.0			1	
		Replace					4.0	1	
		Adjust			1.0			1,6,7,11,13	
03010201	PAPER FEED ASSEMBLY	Inspect			0.5			1	
		Repair			1.5			1	
		Replace					3.0	1	
		Adjust			1.0			1,6,7,11,13	
03010202	CARRIAGE ASSEMBLY	Inspect			0.5			1	
		Repair			1.5			1	
		Replace					3.0	1	
		Adjust			1.0			1,8,10,12	
030103	TOP COVER ASSEMBLY A1A1	Inspect			0.3			1	
		Repair			1.0			1	
		Replace			0.5			1	
03010301	CONTROL PANEL ASSEMBLY, A1A1A1	Inspect			0.3			1	
		Repair			0.5			1	
		Replace			0.5			1	
030104	CIRCUIT CARD ASSEMBLY, PROCESSOR, A1A2	Inspect			0.3			1	
		Test			0.5			5	
		Repair			1.0		1.0	1	
		Replace			0.3			1	
030105	CIRCUIT CARD ASSEMBLY, PRINT, A1A3	Inspect			0.3			1	
		Test			0.5			5	
		Repair			1.0		1.0	1	
		Replace			0.3			1	
030106	CIRCUIT CARD ASSEMBLY, POWER #1, A1A4	Inspect			0.3			1	
		Test			0.5			5	
		Repair			1.0		1.0	1	
		Replace			0.3			1	

SECTION II MAINTENANCE ALLOCATION CHART
FOR
SIMULATOR SET, AN/USM-393

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
030107	CIRCUIT CARD ASSEMBLY, POWER #2, AIA5	Inspect			0.3			1	
		Test			0.5			5	
		Repair				1.0		1	
		Replace			0.3			1	
0302	AUXILIARY CONTROL PANEL INSTALLATIONS, A2	Inspect			0.3			1	
		Test			0.5			5	
		Repair			0.5			1	
		Replace			1.0			1	
030201	AUXILIARY CONTROL PANEL ASSEMBLY, A2AI	Inspect			0.3			1	
		Test			0.5			5	
		Repair			0.5			1	
		Replace			0.5			1	
03020101	CIRCUIT CARD ASSEMBLY, CONTROL PANEL, A2AIAI	Inspect			0.5			1	
		Test			0.5			5	
		Repair			0.5			1	
		Replace			0.7			1	
0303	R5232 INTERFACE INSTALLATION A3	Inspect			0.3			1	
		Test			0.5			5	
		Repair			1.5			1	
		Replace			2.5			1	
030301	CIRCUIT CARD ASSEMBLY, RS232 1/O A3AI	Inspect			0.3			1	
		Test			0.5			5	
		Repair					1.5	1	
		Replace			0.3			1	
0304	POWER SUPPLY ASSEMBLY, PSI	Inspect			0.3			1	
		Test			0.5			23,24,25	
		Repair			1.0			1	
0305	LIGHT INSTALLATION	Inspect			0.3			1	
		Test			0,3			5,24	
		Repair			0.5			1	
0306	AUDIBLE ALARM INSTALLATION	Inspect			0.3			1	
		Test			0.3			5,24	
		Repair			0.5			1	
		Replace			0.5			1	
0307	PAPER BASKET INSTALLATION	Inspect			0.3			1	
		Repair			0.5			1	
0308	CONTROL PANEL BUTTON INSTALLATION	Inspect			0.3			1	
		Test			0.3			5,24	
		Repair			0.5			1	
		Replace			0.5			1	
04	MAGNETIC TAPE RECORDER REPRODUCER, RD-392/U OR RD-392A/U, UNIT 4 (REFER TO TM 11-5835-242-14)								
05	INTERFACE UNIT, J-3238/ALHM-153, UNIT 5 (REFER TO TM 11-5895-829-14)								
06	PAPER TAPE READER/PERFORATOR SYSTEM, REMEX MODEL RAB6375BAX, UNIT 6 (REFER TO TM 11-5835-245-141 AND -2)								
0601	PUNCH MECHANISM, REMEX MODEL RPM1075BBX, 6A1 (REFER TO TM 11-5835-244-14-1 AND -2)								
07	DIGITAL COMPUTER SET, AN/UYK-23, UNIT 7 (REFER TO TM 11-7740-269-14-1, -2, -3, -4, AND -5)								
08	PANEL, MAINTENANCE-OPERATOR CONTROL, C-9633 UTK-23, UNIT B (REFER TO TM 11-7440-269-1, -2, -3, -4, AND -5)								

B-4 Change 1

SECTION II. MAINTENANCE ALLOCATION CHART
FOR
SIMULATOR SET, ANI/USM-393

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
09	DIGITAL DATA SET, AN/USQ-61A, UNIT 9 (REFER TO TM 11-7035-200-14)								
10	INTERFACE UNIT, J-3239/USM-393, UNIT 10 (REFERTO TM 11-7035-201-14)								
11	POWER SUPPLY ASSEMBLY, UNIT 12	Inspect		0.2				1	
		Test		0.3				1, 23, 24	
		Adjust		0.4				1, 24	
		Replace		0.4				1, 24	
		Repair		0.6			3.0		
12	PANEL, MAINTENANCE-OPERATOR CONTROL C-9632/ALM-153, UNIT 13 (REFER TO TM 11-6625-5649-14)	Replace	0.4					1, 2	
		Repair	0.6				3.0	2 thru 11	A
13	INTERCONNECTING CABLE GROUP	Inspect	2.0					1	
		Test	4.0					1, 2	
		Repair	0.5	1.0				1, 0 1, 2, 12	B
14	POWER SUPPLY ASSEMBLY UNIT 14	Inspect	0.2					1	
		Test	0.3					1, 2, 3, 4	
		Adjust	0.4					1, 2, 3	
		Replace	0.4					1	
		Repair	0.6				1.0	1, 2	A
15	DISC MEMORY SYSTEM, DDC MODEL 9111-8-4. UNIT 15(REFER TO TM 11-7025-200-14-1 and -2)								

Change 1 B-4.1

**Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
SIMULATOR SET AN/USM393**

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	O, F, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
2	O, F, D	MAGNETIC TAPE CARTRIDGE T393-2		
3	O, F, D	MAGNETIC TAPE CARTRIDGE T153-1		
4	O, F, D	MAGNETIC TAPE CARTRIDGE T153-2		
5	O, F	MAGNETIC TAPE CARTRIDGE T153-4		
6	O, F, D	TORQUE WRENCH, TALLY A465786-2		
7	O, F, D	HAMMER ALIGNMENT TOOL, TALLY A465786-4		
8	O, F, D	FEELER GAUGES, TALLY 8465147-1		
9	O, F, D	TRUARC PLIERS, EXTERNAL, TALLY S360-17		
10	O, F, D	GRIPING PLIERS, TALLY 5360-18		
11	O, F, D	2 1/4 LB. SPRING SCALE, TALLY S360-19		
12	O, F, D	.010 FEELER GAUGE, TALLY 8465147-2		
13	O, F, D	PAPER GUIDE FRONT GAUGE, TALLY T466115		
14	O, F	EXTENDER BOARD, REMEX 111041		
15	O, F	EXTRACTOR TOOI., REMEX 716056-113		
16	O, F	FLEXIBLE FEELER GAUGE, 0.010 TO 0.011		
17	O, F	FREQUENCY COUNTER, 1OHZ TO 10 MHZ, 5 V INPUT		
18	O, F	MAGNETIC TAPE HEAD CLEANER, REMEX 716004-150		
19	O, F	PULSE GENERATOR, 10 HZ to 10 MHZ, UP TO +5V AMPLITUDE, I S TO 100 S WIDTH		
2O	O, F	OSCILLOSCOPE, DC TO 10 MHZ, SINGLE SWEEP		
21	O, F	SPRING SCALE, 1 POUND		
22	O, F	DIGITAL VOLTMETER, 0-0.1 MA, 0-100 MVDC, 0-100 VDC, IOOK IMPEDANCE OR GREATER		
23	O, F, D	OSCILLOSCOPE, AN/USM-281D	6625-00-106-7497	
24	O, F	MULTIMETER, AN/USM-223A	6625-00-999-7465	
25	O, F, D	DIFFERENTIAL VOLTMETER, JOHN FLUKE MODEL 801H	6625-00-996-6343	
26	O, F, D	DUAL CHANNEL PLUG-IN, TEKTRONIX MODEL 7A18N	6625-01-050-4873	
27	O, F, D	ELECTRONICS SHOP, AN/ALM-153	4940-01-018-2505	
28	O, F, D	MAINTENANICE ACCESSORY KIT	5865-01-057-1965	

B-4.2 Change 1

Section IV. REMARKS

Reference Code	Remarks
A	Neither repair parts nor repair procedure furnished. The depot will repair or replace at their discretion.
B	0 Level Repair covers a replacement of complete Cable Assemblies F Level Repair covers replacement of components within the cables.

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. Scope
This appendix lists expendable supplies and materials you will need to operate and maintain Simulator Set AN/USM-393. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. Explanation of Columns

a. *Column I   Item Number.* This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. *Column 2 Level* This column identifies the lowest level of maintenance that requires the listed item.

C -   Operator/Crew
O -   Organizational Maintenance
F -   Direct Support Maintenance

H -   General Support Maintenance

c. *Column 3 National Stock Number.* This is the National stock number assigned to the item; use it to request or requisition the item.

d. *Column 4 Description* Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. *Column 5 Unit of Measure (UIM).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(Next printed page is C-2).

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND FSCM	(5) UNIT OF MEAS.
	o		LINT FREE CLOTH	
	o	6850-00-105-3084	TRICHLOROTRIFLUOROETHANE, TYPE TF FREON	
	o		PAINT, SEMI-GLOSS ENAMEL, LIGHT GRAY, TT-E-529, NO. 26250	
	o	8010-00-292-3053	PAINT, LUSTERLESS, OLIVE DRAB MIL-L-6805, NO. X-24087	
	o	8010-00-835-2114	PAINT, PRIMER, ZINC CHROMATE, MIL-L-8585	

APPENDIX D
VAN, SEMITRAILER V-495/USM-393

Section I. GENERAL

D-1. Introduction

This appendix describes Semitrailer Van V-495/USM-393 (fig. 1-1); and covers installation, operating instructions, and maintenance. The V-495/USM-393 van is a modified M373A2 van. This basic van is covered in TM 9-2330-246-14. Refer to appendix A for a listing of manuals that cover both the basic M373A2 van and other components of the V-495/USM-393 van.

D-2. Purpose and Use

The V-495/USM-393 van provides a mobile facility for Simulator Set AN/USM-393, part of the QUICK LOOK II Emitter Identification-Location System.

D-3. Technical Characteristics

   a. *Power Requirements*.

Type ....30 kW, three-phase, four-wire, wye
Frequency ....60 Hertz
Voltage ....120/208 vac

   b. *Power Consumption.*

Fluorescent lights .... 960 watts
Exhaust blowers (2) .... 300 watts
Electric heaters (4) .... 7, 500 watts
Air conditioners (4) .... 12, 000 watts
Frequency converter .... 5, 000 watts
Dc power supply .... 1, 000 watts

   c. *Van Power Sources.*

120/208 volts, 400 Hertz. No brush generator Frequency Converter
28 volts dc ....Power Supply PP-4763AIU

   d. *Available Power (At Work Positions).*

	Roadside	Curbside
60-Hz outlets (duplex)	16	14
400-Hz outlets (single)	5	2
28-vdc outlets (single)	5	2
28-vdc binding posts	1	
60-Hz receptacle multiple strips	2	2
15-watt fluorescent lamps	1	6

D-4. Items Comprising an Operable Equipment

Quantity	Item	Length	Width	Height	Weight (pounds)
		Dimensions(feet)			
1	Semitrailer Van M373A2	31	8	11	3390 (empty)
1	Frequency Converter, 400 Hz, Generator Model 30-008				
1	Power Supply PP-4763A/GRC (28-volt power supply)				
1	Power monitor panel 1200 amps)				
1	Entrance panel assembly				
1	Radio Set AN/VRC-47				
1	Floodlight adapter assembly rack				
1	Antenna AT-197/GR				
1	Loudspeaker				
1	Microphone M-80/GR				
4	Air conditioners, 18.000 BTU				
1	Pod carriers				
4	Heaters				
1	Antenna AS-1729/VRC				
2	Telephone Sets TA-31 2/PT				
1	Cable assembly. 100 feet (two 50-foot sections)				
1	Cable assembly. 10 feet (pigtail leads one end)				
1	Multimeter AN/USM-223A				
1	Oscilloscope AN/USM-281C				
1	Tool Kit TK-105/G				
1	Tool Kit TK-1OO/G				
1	Typewriter, portable				
1	Antenna Base AB-15/GR				
1 ea	Antenna Element MS-116A, MS-1 17A, and MS-118A				
2	Emergency Light, Exide Miniguard 214C 119481)				
2	Wall Heater, Singer (4520-224-7907)				
2	Fire Extinguisher (4210-595-1777)				
1	Vacuum Cleaner, 400 (7910-530-62601				
2	Lamp, Extension, Desk, Luxo				

Quantity	Item	Dimensions(feet)			Weight (pounds)
		Length	Width	Height	
1	First Aid Kit (6546-526-1903)				
1	Fire Axe (4210-727-8111)				
1	Hammer, Sledge, 8 lbs (5120-251-4489)				
1	Chair, Typist (7110-401-8042)				
1	Chair, Rotary warms (7110-723-8795)				
2	Ground Rod, w/straps 4' rods (5975-00-224-5260)				
1	Box (for mission tapes) (Lab Made)				
1	Pan, dust {(7920-178-8315)				
1	Clock, 24 hr. Chelsea (6645-00-224-8360)				
3	Flood Light Assembly				
3	Stool, Rotary, Drafting 17110-00-281-4469)				
1	Bulletin Board				
1	Ladder, Aluminum 12 feet "Endura Light" (2540-00-964-6034)				
1	Rack, Chassis, 6 ft Contempo (34952) (PC7012)				
1	Rack, Chassis, 5 ft Contempo (34952) (P7012)				
	Lighting Fixtures, Benches Cabinets, Rugs				
2	Keys, Door {Security Lock)				
2	Keys, Door (Storage Box)				
2	Padlock Set: Van Doors w/keys (5340-00-984-5499)				
4	Ash Tray (9920-00-682-6757)				
3	Coat Hook				
1	Cabinet. Filing w/lock 3 point combination (7110-00-920-9310)				
1	Ladder, Step, Van (2540-00-868-5661)				
1	Sharpener, Pencil (7520-00-162-6178)				
48	Lamps. Fluorescent (6240-00-152-2982)				

D-5. Description

a. Exterior

(1) *Front.* The compressor motor, condensor, and the heating elements of four air conditioners have been bracket mounted to the upper sections of the front panel of the van.

(2) *Curbside.* The van has a permanently mounted security box and phone access on the forward section of the panel.

(3) *Roadside.* Three antenna mast assemblies; AT-197/GRC, AS-1729/VRC, and mast base AB-15/GR with mast sections MS-116A, MS-117A, and MS-118A are mounted to the road- side panel of the van.

(4) *Platform.* A platform has been added to the rear of the van. During transport of the van, the platform is held in a vertical position with clevis pins. During operation, the platform is held in a horizontal position with chains.

(5) *adder.* A 12-foot ladder with an extension is supplied with the van.

(6) *Pod Carriers.* A pod carrier is bolted to the underside of the van. The pod carrier will house the 100-foot power cable and the 10-foot extension cable. The ladder ((5(above) is secured for shipment between the pod carrier and the floor of the van.

b. Interior (fig. D-1). The ceiling consists of a grid network that supports a row of light lenses and two rows of fluorescent lights. Two air ducts provide distribution of cooled and heated air from the air coolers and electric heaters. Each of the four combination air conditioners

and heating units, located on the front interior wall, have individual controls for use of one, or all, depending on operating requirements. Damper controls are located on both the curbside and roadside walls and ceilings for control of air or heat flow.

(1) *Chairs.* During transport, chairs are secured in position with metal straps.

(2) *Van power sources.* A 400-Hz converter and a 28-vdc power supply are located adjacent to the emergency door under the power distribution box.

(3) *Roadside (middle).* A light-rack adapter assembly with three sets of floodlights is mounted on the top of the panel. Antenna assembly storage mounts for securing antenna masts are mounted below the floodlights. A 5-foot Formica shelf is mounted to the wall panel adjacent to the assembly mounts. A speaker is mounted to the wall. The VRC transmitter assembly mount, the VRC receiver assembly mount, and the power supply assembly are bolted to the shelf. Six 60-Hz duplex receptacles are spaced at two-foot intervals, two 400-Hz receptacles are located below the 60-Hz power duct, and two 28-vdc receptacles are located below the 400-Hz receptacles. A heater is located near the rear of the van above the floor. Under the shelf is a 2 1/2-foot X 4-foot Formica-top inclosure with two folding shelfs, one on each side. During transport, a vacuum cleaner is stored in the inclosure. A 5-foot desk with six storage drawers is located adjacent to equipment rack No. 1. A drafting chair is secured to the knee-hole opening in the desk during transport.

Above the desk is a 24-hour mechanical clock and an antenna coupling unit. Equipment racks No. 1 and No. 2 ((7) below) are bolted to the wall; each has a 60-Hz receptacle strip extending from the top to the bottom. Another antenna coupler unit is located above equipment rack No. 2. Mounted to the side of the equipment rack is a switch for the data link with a light indicator. Mounted adjacent to equipment rack No. 2 is the 400-Hz main circuit breaker. Below that is the 28-vdc main circuit breaker.

(4) *Roadside front.* A Formica shelf approximately six feet long has five storage cabinets mounted underneath. A panel duct with a strip of ten 60-Hz receptacles, and a fluorescent lamp with a starter and a OFF/ON switch, are located above the desk. Two 400-Hz receptacles and two 28-vdc receptacles with binding posts are located below the receptacle strip. A damper OPEN/CLOSE control is located at the top of the duct panel above the desk, with a vent for HEAT/AIR located on the right side of the panel. An antenna coupling unit is located near the top of the roadside panel. Heater and air conditioner damper controls are concealed in a storage cabinet on the bottom, and are not visible until the cabinet door is opened.

(5) *Curbside (middle).* Located towards the rear are two 6-foot sections of folding tables. A fluorescent lamp and shade holder containing six 15-watt lamps, is located below four duplex 60-Hz receptacles. The lamp has an off-on control switch. A 3-section antenna base mounting assembly is secured to the wall towards the rear. On the floor, a fire extinguisher, sledge hammer, and a heater are

secured adjacent to the folding tables. A security panel is located adjacent to the middle door. A power duct adjacent to the right of the door contains two fluorescent off-on switches, two push-on/push-off switches for the inclosure lights, and an off-on switch for the outside flood lights. An emergency lighting panel is secured to the power duct. The emergency door in the middle has an extension ladder for exit purposes.

(6) *Curbside (front).* To the left of the middle door, two Power Supplies PP-4763A/U for 28 volts dc and the no-brush generator converter for frequency conversion, are inclosed. A sliding panel exposes the AC off-on switch and the meters for the dc power supply. A 200-ampere power distribution panel with a voltmeter, a frequency meter, a three-phase switch, and phase indicating lamp is located above the power supply inclosure. A metal holder is bolted to the wall panel for storage of manuals. A telephone is mounted to the wall below the metal storage rack. A first aid kit is located adjacent to the panel air duct. A 5-foot work bench with three storage drawers and two storage cabinets is secured to the floor towards the curbside front. The knee-hole compartment has an air/heater damper control with a vent panel adjacent to the controls. A fluorescent lamp and shade with three 15-watt lamps is mounted above the desk. Five 60-Hz duplex receptacles are located below the lamp fixture.

(7) *Equipment racks.* For location of simulator set components within the equipment racks, refer to TM 11-5895-955-10-1.

POWER ENTRANCE

400HZ & 28 VDC POWER SUPPLY

DESK

FLOOD

MAP TABLE

LINE PRINTER

RACK NO. 2 | RACK NO.1 | DISPLAY TERMINAL DESK | | | | TELE TYPE

RETURN DUCT

TYPICAL PLAN VIEW

A/c PLENUM

STOWAGE CABINET

VENT W/ EXHAUST BLOWER

FLOOD

60 HZ DIST.PANEL 200 AMP

S1

TYPICAL INTERIOR—CURBSIDE

PWR. ENT.

POWER SUPPLY CABINET

60 ∼ ONLY RACK NO.1 EQUIP.

60 ∼ 28V RACK NO.2 DATA LINK

60 ∼

STOWAGE SHELF

S4

S2

S3

DISPLAY TERMINAL

TYPICAL INTERIOR—ROADSIDE

LINE PRINTER

CRT DESK

EL20S007

Figure D-1. Floor Plan Semitrailer Van V-495/USM-393

D-2.2 Change 1

Section II.

D-6. Siting and Installation

a. General. The site selected for the V-495/USM-393 van is dependent on the access to the equipment being maintained. The site selected depends on terrain, system planning, and physical considerations. Whenever possible, the vans should be located on level, firm, and dry ground with good drainage. Position the van within 100 feet of the power source for power connections.

b. Uncoupling the Van. Uncouple the van from the tractor as follows:

(1) Apply the brakes by operating the airbrake controller in the tractor cab.

(2) Place the wheel chocks under the rear wheels of the van.

(3) Remove the landing gear cranks from their transit positions under the van.

(4) Bearing plates are provided to support the base of the landing gear; be sure to use the bearing plates if the terrain is soft. Supporting timbers or planks may also be used.

CAUTION

Do not place the landing gear on soft or wet soil. Locate the bearing plates or support timbers and planks so the weight from the front of the van does not cause the landing gear to

settle deeply into the earth.

(5) Insert a landing gear crank into each crankcase (pushed in for high-speed operation), and station a man at each crank.

(6) Turn the cranks simultaneously until the base of each landing gear rests on the bearing plate or support timbers and planks.

(7) Close the cutoff cocks on the tractor airbrake hoses.

(8) Disconnect both airbrake hoses from the van by raising each hose coupling until it is free. Disconnecting the airbrake hoses automatically sets the airbrakes on the van.

(9) Couple the tractor hoses together. Place the dust caps on the van couplings.

(10 Disconnect the dc cable between the van and the tractor (if applicable), and close the hinged cover on the van receptacle.

(11) Move the coupler release (on the fifth wheel of the tractor) to the unlocked position.

(12) Drive the tractor forward slowly, and allow the van coupler to slide down the ramp on the fifth wheel. Be sure to move the tractor forward slowly to minimize the impact when the weight of the van is transferred to the landing gear and bearing plates.

c. Leveling the Van

(1) Remove the two clevis pins which secure the side support arm and the leveling jack in the retracted position. Allow the leveling jack assembly to swing downward.

(2) Position the free end of the side support arm into the leveling jack bracket, and insert the clevis pins removed in (1) above.

(3) Remove the third clevis pin which secures the forward support arm to the underside of the van. Position the forward support arm on the leveling jack, and insert the clevis pin.

(4) Remove the leveling jack pads from their storage location, and position a pad at each leveling jack. Be sure that the pads rest on firm, dry ground. If necessary, use planks to ensure that the weight of the van does not cause the pads to settle deeply into the earth.

(5) Remove the lever bars from their transit location, and insert a lever bar into the hole at the base of each leveling jack.

(6) Turn the lever bar until the leveling jack is seated in the leveling jack pad.

(7) Turn the landing gear cranks and the leveling jack levers as necessary until the levels on the van indicate that the van is level.

(8) Remove the personnel ladders from their transit storage position under the van, and install them at the rear.

D-7. Van Preparation

After the van has been installed (para D-6), prepare the van as directed in TM 9-2330-246-14 with the following exceptions:

a. Lower the platform at the rear of the van by removing the clevis pins, and folding the platform down to the horizontal position.

b. Install the rear ladder into the holes provided in the platform, rather than the rear of the van.

c. After each ladder has been installed, loosen the spinners, and slide the extension down to the ground.

d. When the plates of the extension are firmly against the ground, tighten the spinners to secure the extension.

D-8. Grounding Procedures

WARNING

The power source must be earth grounded, by the use of the ground stakes and ground straps provided, before the power source is turned on. Select a grounding site that will not interfere with personnel movement or power cables. Ground the van as instructed here.

a. If possible, select a grounding site within eight feet of the power entrance box. Scoop out a hole about six inches deep.

b. Drive a clean ground rod into the hole until the top of the ground rod is approximately 12 inches above the bottom of the hole. Saturate the ground around the rod with water.

c. Remove a ground strap from storage in the van. Connect one end of the strap to the ground rod, and the other end to the main ground (GND) terminal on the power entrance panel.

D-9. Power Connections

WARNING

Be sure to ground the van before connecting power at the connectors in the power entrance block. Failure to do so may result in severe electrical shock.

a. Preparator

(1) Remove the 100-foot (two interconnected 50foot cables) power cable from the storage rack. Also remove the 10-foot extension cable, and connect the two cables together.

(2) Check to see that all circuit breakers on the power distribution panel are OFF.

b. Connections. The external power source for the 120/208-volt 60-Hz, 3-phase, 30-kw ac power is Generator Set PU-406; 400-Hz, 3-phase power is furnished internally by Generator Frequency Converter No. 30-008. Listed below are the power cable connections for the 60-Hz power source.

(1) Before applying power, visually check that all power source circuit breakers are in the OFF position.

(2) Connect the pig tail leads of the 10-foot, 60Hz, 3-phase ac power cable extension to the bus bar

Generator Set PU-406 as shown below.

Cable Lead	Bus Bar
White	Neutral
Black	Phase 1
Red	Phase 2
Green	Phase 3

   (3)   Connect the other end of the power cable for 120/208-volt, 60-Hz, 3-phase ac power to the POWER IN connector at the entrance panel.

D-10. Installation and Connection of Telephones

Two TA-312/PT telephone sets are supplied for the van. A TA-312/PT is to be installed in a box in the outside wall of the van, and a TA-312/PT is to be installed in a bracket inside the van. Gain access to the brackets in the boxes by opening their associated doors. Install the telephones (if required) as instructed below.

a. Remove the TA-312/PT from its carrying case, install batteries, and prepare for local battery operation (TM 11-5805-201-12).

b. Loosen the wingnut on the side of the mounting bracket.

c. Rotate the clamping arm to obtain access to the flathead screw on the side of the mounting bracket. Tighten the wingnut.

d. Use a screwdriver to remove the flathead screw that secures the holding plate (inside the mounting bracket).

e. Insert the holding plate into the buzzer recess in the side of the TA-312/PT.

f. Place the telephone in the mounting bracket, and replace the flathead screw.

g. Connect a pair of prepared leads to the line binding posts of the TA-312/PT. (A short length of single-pair wire is required in the telephone and signal boxes).

Section III. OPERATING INSTRUCTIONS

D-11. Controls and Indicators

   a. Circuit Breaker (Power Distribution) Boxes. Refer to circuit breaker distribution information inside box cover.

   b. Main 400-Hz and 28-Vdc Switches. One 400-Hz, 30-ampere, ON/OFF MAIN circuit breaker switch and one 28-Vdc, 30-ampere, ON/OFF MAIN circuit breaker switch are located on the roadside panel of the van.

   c. 28-Vdc Power Supply AC OFF/ON Switch. The 28-vdc Power Supply PP-4763A/U has an AC OFF/ON switch located on the control panel of the dc supply panel below the power panel on the curbside wall of the van.

   d. Individual Units. Refer to applicable technical manuals (app A).

D-12. Starting Procedures

   a.   General Before applying power to the van, perform the procedures outlined below.

   (1)   Check that power connections are correctly and securely made to the van before applying power (para D-9).

   (2)   Check the installation of ground rod and strap (para D-8).

   (3)   Set all circuit breakers in van to OFF (para D-11).

   b. Energizing Circuits. Start the PU-406 power source, and perform the following:

NOTE

When the POWER ON indicator is lit, power is being applied to the shelter.

CAUTION

Before closing *any* circuit breakers, be sure that the correct power and phase is applied to the van.

   (1)   Check the phase indicator lamps on the power monitor panel for proper application of three -phase power. If improper phasing is indicated, DO NOT close the MAIN circuit breaker. Turn the power source off, and correct the power cable connections.

   (2)   Set the phase switch to the 1, 2, and 3 positions. The VOLTS meter should indicate 115 to 120 volts, and the FREQUENCY meter should indicate 60 cycles t 1 at each switch position. If the indications above are not obtained, have the power source adjusted as required to apply the correct power to the van.

   (3)   When the proper indications given in (1) and (2) above are obtained, close the MAIN circuit breaker on the power distribution panel.

   (4)   Operate applicable circuit breakers to energize required circuits.

   (5)   Apply power to the heaters or individual air conditioners, and make extensive 60-Hz frequency checks, using the FREQUENCY meter and phase selection switch. If 60-Hz frequency drops off, below 58 Hz, turn off power to the heaters or air conditioners; then recheck the frequency setting of the power source before proceeding with the application of power.

   (6)   Apply power to start the Generator Frequency Converter No. 30-008, and check 400-Hz output.

   (7)   Energize the 28-vdc power supply, and check the output.

D-13. Combination Air Conditioner and Heater Unit Operation

   a. General Cool air, warm air, and fresh air are distributed through the van by the air conditioner blowers. Cool, heat, or provide fresh air in the van as required by following instructions in the air conditioner manual. Additionally, see *b* below.

   b. Damper Controls. The van has damper controls to adjust for air conditioning or heat control throughout the van. Ceiling control of air or heat flow is controlled by a damper switch located towards the middle front of

the ceiling on the van.

(1) The van has a damper control located on the vertical panel adjacent to the equipment rack on the roadside panel.

(2) A damper control for the curbside heat or air flow control is located under the desk.

D-14. Van Operations (General)

The security and telephone facilities provided in the van are given below. Use them in accordance with the requirements of the mission.

a. *Security.* Normally the curbside door of the van should remain locked. The side vestibule and rear doors are locked from the inside. There is a buzzer button in the security or telephone box next to the side door of the van. Use the button to notify personnel inside the van that entrance is desired. The telephone in the box at the side of the van allows conversation between personnel inside and outside the van. There is also a oneway viewer located in the door for visual inspection of personnel desiring entrance to the van. Develop a code to notify personnel when entrance is requested, or if the telephone is to be used.

b. *Telephone&* The TA-312/PT in the van is connected directly to the TA-312/PT installed in the security telephone box mounted on the exterior wall.

D-15. Operation Under Adverse Climatic Conditions

This van has been designed to meet conditions of extremely cold or hot climates. The vans offer complete protection from the elements for personnel and equipment; however, the precautions given in a, *b,* and c below should be observed.

a. *Operation is Cold Climates*

(1) Extreme cold causes power cables and field wire to become hard, brittle, and difficult to handle. Be careful when handling the cables and field wire during connecting procedures so that kinks and unnecessary loops will not result in permanent damage.

(2) Be sure that the binding posts and cable receptacles on the outside of the van are free of frost, snow, and ice by replacing the receptacles covers and securing the covers on the entrance boxes when these items are not being used.

(3) Replace all power cable connector covers as soon as the cables are disconnected from the van. Never drag or place an uncovered cable in the snow. If

possible, provide shelter or protective cover for the power units. Observe all low-temperature operating procedures given in the applicable unit technical manuals.

b. *Operation in Hot Climates.* A canopy is available for use in extremely hot weather. See TM 9-2330-246-14 for installation and use. In hot, dry climates the connectors, receptacles, and binding posts are subject to damage from dirt and dust. Close the covers on the entrance boxes, and replace the covers on the cable connectors and receptacles when these items are not being used. Never drag or place an uncovered cable connector on the ground.

c. *Operation in Warm, Damp Climates.*

(1) In warm, damp climates, the equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the exterior of the equipment with a clean, dry cloth.

(2) The air conditioner and the heaters in the van should be used alternately, whenever possible, to reduce the humidity in the van and to dry out the van interior.

(3) All electrical contact surfaces are susceptible to corrosion, which will cause a high-resistance contact area. Wipe all electrical contact surfaces with a clean, dry cloth before performing any connecting procedures.

D-16. Stopping Procedures

NOTE

To remove power in an emergency, place the MAIN circuit breaker on the power distribution panel in the OFF position.

a. Except in an emergency, remove power from all equipment that is equipped with individual power switches before placing the associated circuit breaker on the power distribution panels in the OFF position.

b. Set all individual circuit breakers to OFF.

c. Set the MAIN circuit breaker on the power distribution panel to OFF.

Section IV. MAINTENANCE

D-17. General

Removal and replacement of fluorescent lamps and starters, and circuit breakers, are covered in this section. Refer to TM 9-2330-246-14 for basic van maintenance. Refer to chapter 2 of this manual for cleaning and touchup painting instructions.

D-18. Removal and Replacement of Fluorescent Lamps and Starters

a. *Fluorescent Lamp*

(1) Lift the light lens up, and slide it over

another

(2) Release the strap at the center of the lamp, and remove the lamp lock from each end of the lamp fixture.

(3) Rotate the lamp in its sockets one-quarter turn, and remove it from the fixture.

(4) Remove the spare lamp from its storage brackets.

(5) Align the lamp with the slots in the fixture sockets.

(6) Press in and rotate the lamp one-quarter turn to seat the pins firmly.

(7) Fasten the strap released in (2) above, and replace the lamp locks.

(8) Replace the light lens under the fluorescent light fixture.

b. Fluorescent Lamp Starter.

(1) Remove the light lens and lamp (a(l), (2), and (3) above) to expose the starter.

(2) Press in and twist the starter one-quarter turn counter-clockwise, and withdraw it.

(3) Remove the spare starter from its storage bracket. Insert the new starter, press in, and turn it clockwise until it seats.

(4) Replace the lamp and light lens (a(5) through (8) above).

D-19. Circuit Breaker Removal and Replacement

WARNING
Be extremely careful when performing TM 11-6625-2845-24 troubleshooting procedures; dangerous voltages are present in the equipment. Disconnect the power input cable from the appropriate power receptacle in the power entrance box before replacing the circuit breakers.

a. Remove the screws from the cover of the power distribution panel, and remove the panel.

b. Pull the defective circuit breaker out of the power distribution panel; tag and disconnect the attached wires.

c. Replace the circuit breaker, and replace the wiring. Check to be sure the circuit breaker is in the OFF position.

d. Replace the cover on the distribution panel.

e. Place the circuit breaker in the ON position, and check for proper operation.

Index 4 Change 1

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USAERDAA (1)	29-134 (1)
USAERDAW (1)	29-136 (1)
USA Dep (1)	29-207 (2)
Sig Sec EUSA Dep (1)	29-610 (2)
WSMR (1)	

NG None
USAR: None
For explanation of abbreviations used see, AR 310-50.
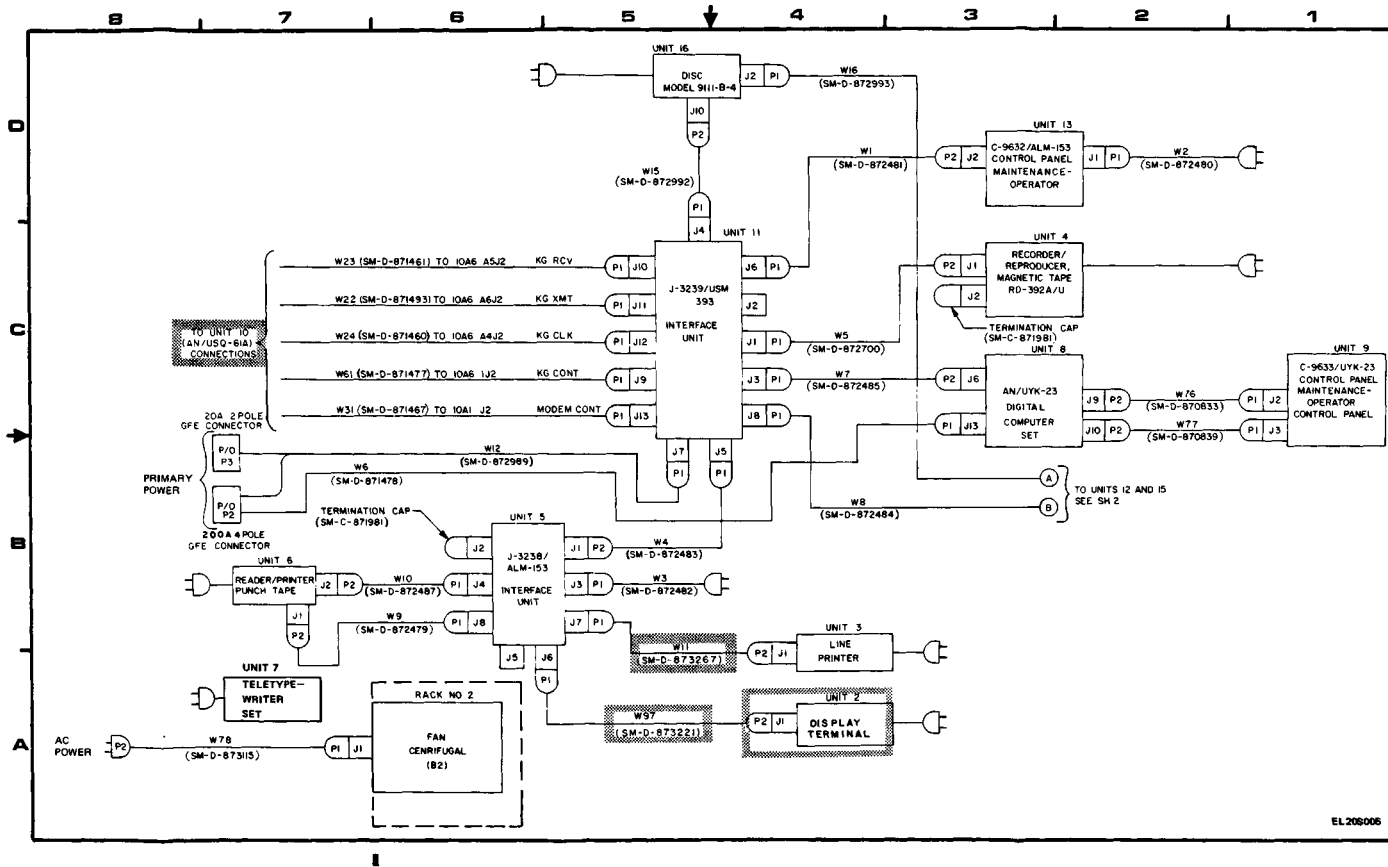
Figure FO 7-1. Simulator Set AN/USM-393, Cabling Diagram (Sheet 1 of 2)
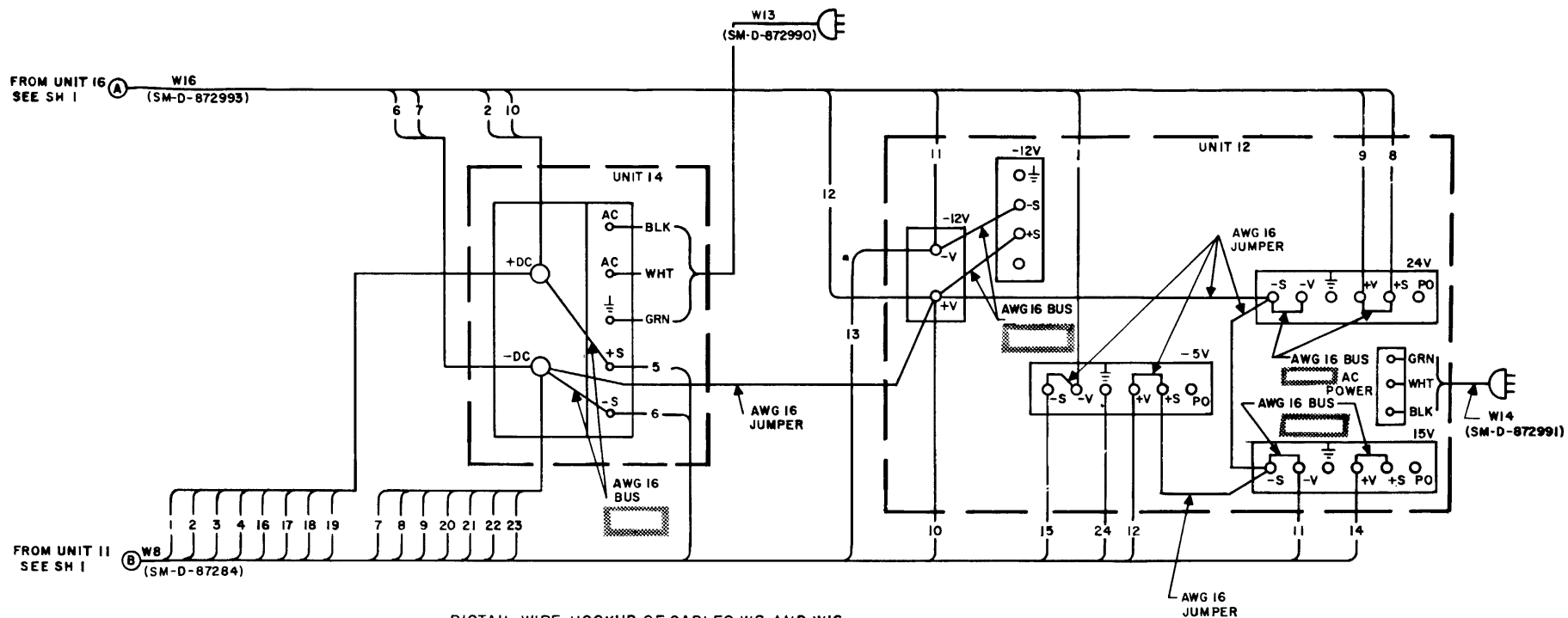
PIGTAIL WIRE HOOKUP OF CABLES W8 AND W16
TO POWER SUPPLIES UNIT 12 (SM-A-874507) AND UNIT 14 (SM-A-874421)

EL20S006

Figure FO 7-2. Simulator Set AN/USM-393, Cabling Diagram (Sheet 2 of 2)

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